Cisco IOS XR System Management Command Reference for the Cisco CRS Router, Release 5.3.x

First Published: 2015-01-01

Last Modified: 2015-09-01

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

Preface

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

Changes to This Document

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

Table 1: Changes to This Document

Date	Change Summary
January 2015	Initial release of this document.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the What's New in Cisco Product Documentation RSS feed. RSS feeds are a free service.

Bulk Content Downloader (BCDL) Commands

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

- IPv4 and IPv6 unicast routing protocols—To provide the ability to download forwarding information from the router Global Routing Information Base (GRIB) to the line cards.
- IPv4 and IPv6 multicast routing protocols—To download the Multicast Routing Information Base (MRIB) entries to consumers managing the Multicast Forwarding Information Base (MFIB) on the various line cards 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.

show bcdl

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

EXEC

mode.

show bcdl [*group_name*]

Syntax Description

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
sysmgr	read

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

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

Sun May 31 06:57:32.153 PST
grp ipv4_rib, gid 2051, sg cnt 1, agent jid 111, node 0/RP0/CPU0, pulse 343, new mbr 0
sg  lwg  fd csmr hdlr-act dnld-act susp wait-lck seq pulse-tot pulse-out
0  2053  15    6       no       no   no        0 386       338         0
```

Table 2: show bcdl Field Descriptions

Field	Description
group	Type of download and the Group Services Protocol (GSP) group name.
gid	Heavyweight group (HWG) in the GSP. This is the group that a consumer initially joins. It is used by the BCDL agent to send control updates.
sg count	Number of subgroups for this particular download type.

Field	Description
agent jid	Job identifier of the BCDL agent. The JID is numerical identifier for a particular process and remains the same across process restarts.
node	Node, expressed in the *rack/slot/module* notation, in which the agent is running.
pulse	Pulse code used by the producer to pulse the BCDL agent.
new mbr	Number of new consumers that have not yet been assigned a subgroup.
sg	Subgroups number.
lwg	Lightweight group in GSP. This is a type of child group of the HWG. The BCDL agent tells the consumers to join this group to receive data.
fd	The connection handle between the producer and the BCDL agent.
csmr	Number of consumers.
hdlr-act	Specifies if there is a download in progress.
dnld-act	Indicates whether the convergence flag has been sent or not.
susp	Indicates whether the download is suspended due to the queue filling up.
wait-lck	If nonzero, some thread is waiting for other thread to take control of this subgroup.
seq	Sequence number of the last message sent on this subgroup.
pulse-tot	Total number of pulses sent by the producer to the BCDL agent.
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

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
sysmgr	read

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

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

Sun May 31 06:18:11.556 PST
group ipv4_rib, gsp gid 2051, 6 consumers, agent jid 111, node 0/RP0/CPU0
(expected 6 consumers to reply, received 6 replies)
      pid       node asg csg  lwg sus  messages       bytes  errs name
   467088 0/RP0/CPU0   0   0 2053   N       386      175152     0 fib_mgr
   303249 0/RP1/CPU0   0   0 2053   N       255       73844     0 fib_mgr
    94295   0/1/CPU0   0   0 2053   N       379      174612     0 fib_mgr
    94295   0/6/CPU0   0   0 2053   N       379      174612     0 fib_mgr
   127074   0/4/CPU1   0   0 2053   N       387      175180     0 fib_mgr
   118884   0/4/CPU0   0   0 2053   N       387      175180     0 fib_mgr
```

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

Table 3: show bcdl consumers Field Descriptions

Field	Description
PID	Process identifier.
node	Consumer node, expressed in the *rack*/*slot*/*module* 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

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
sysmgr	read

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

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

Sun May 31 07:13:19.777 PST
group ipv4_rib, gsp gid 2051, 6 consumers, agent jid 111, 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
   467088 0/RP0/CPU0   0   0 2053   N         0           0     0 fib_mgr
   303249 0/RP1/CPU0   0   0 2053   N         0           0     0 fib_mgr
    94295   0/1/CPU0   0   0 2053   N         0           0     0 fib_mgr
   127074   0/4/CPU1   0   0 2053   N         0           0     0 fib_mgr
    94295   0/6/CPU0   0   0 2053   N         0           0     0 fib_mgr
   118884   0/4/CPU0   0   0 2053   N         0           0     0 fib_mgr
```

Table 2: show bcdl Field Descriptions, on page 2 and Table 3: show bcdl consumers Field Descriptions, on page 5 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

group_name	Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
sysmgr	read

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

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

Sun May 31 07:19:41.409 PST
grp ipv4_rib, gid 2051, sg cnt 1, agent jid 111, node 0/RP0/CPU0, pulse 343, new
 mbr 0
  sg  lwg fd csmr hdlr-act dnld-act susp wait-lck   seq pulse-tot pulse-out
   0 2053 15    6       no       no   no        0   386       338         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: 386, bytes: 175152
   cnsmr 0: pid 467088 on node 0/RP0/CPU0
   cnsmr 1: pid 127074 on node 0/4/CPU1
   cnsmr 2: pid 118884 on node 0/4/CPU0
   cnsmr 3: pid 94295 on node 0/1/CPU0
   cnsmr 4: pid 94295 on node 0/6/CPU0
   cnsmr 5: pid 303249 on node 0/RP1/CPU0
```

The significant fields shown in the display that are not described in Table 2: show bcdl Field Descriptions, on page 2 or Table 3: show bcdl consumers Field Descriptions, on page 5 are described in this table.

Table 4: show bcdl tables Field Descriptions

Field	Description
sgs	Number of subgroups.
table_cnt	Number of tables in this subgroup.
sg	Specific subgroup for which information is provided.
has 1 tables	Number of tables in this subgroup.
messages	Messages sent that are not associated with a particular table ID.
bytes	Bytes sent that are not associated with a particular table ID.
table	Specific table ID for which information is provided.
members	Number of consumers associated with this table.
dnld act	Indicates whether or not the convergence flag has been sent.
messages	Number of messages sent for a particular table.
bytes	Number of bytes sent for a particular table.
cnsmr 0: pid 419725 on node 0/RP0/CPU0	Process ID and node information for each consumer in the specified table.

show bcdl trace

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

EXEC

mode.

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
sysmgr	read

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

```
RP/0/RP0/CPU0:router# show bcdl trace ipv4_rib location 0/1/cpu0

Sun May 31 08:28:40.346 PST
372 wrapping entries (4096 possible, 44 filtered, 372 total)
May 11 15:24:51.388 bcdl/c/ipv4_rib 0/1/CPU0 t3
  LE bcdl_join_internal: timer_create ret 0, id is 11
May 11 15:24:52.417 bcdl/c/ipv4_rib 0/1/CPU0 t5
  LE bcdl_join_internal: group_lookup bcdl_ipv4_rib
  returned gid 2051
May 11 15:24:52.441 bcdl/c/ipv4_rib 0/1/CPU0 t5
  LE join hwg 2051 returns 0
May 11 15:24:52.446 bcdl/c/ipv4_rib 0/1/CPU0 t5
  LE bcdl_join_internal: joined group bcdl_ipv4_rib,
  member count 5
May 11 15:24:53.458 bcdl/c/ipv4_rib 0/1/CPU0 t5
  LE rcv gsp mtype 3: connection init sg 2 cur_seq
  0 lwg_gid 2069 table tag 0x00000000 resend state yes
May 11 15:24:53.459 bcdl/c/ipv4_rib 0/1/CPU0 t5
  LE pc ring high water 0 -> 1, 0 bytes
May 11 15:24:53.464 bcdl/c/ipv4_rib 0/1/CPU0 t3
  LE c_h deliver msg_id 16 connection init,
  table event 0 table tag 0x00000000
May 11 15:24:53.464 bcdl/c/ipv4_rib 0/1/CPU0 t3
  LE conn init, seq 64206 -> 0, sg 65534 -> 2,
  gid 2051, lwg gid -1 -> 2069
 ...
```

Call Home Commands

This module describes the Cisco IOS XR software commands for configuring and sending Call Home messages.

For detailed information about Call Home concepts, configuration tasks, and examples, see the *Configuring Call Home on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco CRS Routers*.

active

To enable a Call Home profile, use the **active** command in call home profile configuration mode. To disable a profile, use the **no** form of this command.

active
no active

Syntax Description

This command has no keywords or arguments.

Command Default

A profile is disabled by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

You must enable a profile using the **active** command so that call home messages can be triggered.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to activate a profile:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# active
```

Related Topics

call-home, on page 15
profile (call home), on page 32

alert-group disable

To disable an individual Call Home alert-group, use the **alert group disable** command in call home configuration mode. To enable an individual Call Home alert-group, use the **no** form of this command.

alert-group *alert-group-name* **disable**
no alert-group *alert-group-name* **disable**

Syntax Description

alert-group-name	A keyword that identifies an alert group. Valid values are: • syslog • inventory

Command Default

Alert groups are enabled by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

By default, alert groups are enabled. Use the **alert-group disable** command to disable alert groups.

Task ID

Task ID	Operation
call-home	read, write

Example

The following example shows how to disable the inventory alert group:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# alert-group inventory disable
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

call-home

To enter call home configuration mode to configure Call Home, use the **call-home** command in global configuration mode. To remove all Call Home settings and set the technical assistance center (TAC) profile as the default, use the **no** form of this command.

call-home
no call-home

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to enter call home configuration mode:

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

Related Commands

Command	Description
show call-home, on page 36	Displays information regarding the Call Home configuration.

call-home request

To send a customer request to Cisco, use the **call-home request** command in EXEC mode.

call-home request {**bugs-list**|**command-reference**|**config-sanity**|**output-analysis** "*show-command*"|**product-advisory**} {**ccoid** *ccoid*|**profile** *profile-name*}

Syntax Description

bugs-list	Sends output of the following commands: • **show running-config sanitized** • **show version** • **show diag**
command-reference	Sends output of the following commands: • **show running-config sanitized** • **show version** • **show diag**
config-sanity	Sends output of the following commands: • **show running-config sanitized** • **show version**
output-analysis *show-command*	Sends output from the specified show command. The *show-command* argument should be enclosed in quotes ("").
product-advisory	Sends output of all commands included in the enventory message in addition to the output from the **show running-config sanitized** command.
ccoid *ccoid*	Specifies the Smart Call Home user registered ID.
profile *profile-name*	Specifies the profile to which to send the message.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The message uses the specified profile or the CiscoTAC-1 profile if no profile name is specified to send out the request the the Cisco backend. This ensures that users who use a transport gateway can use a different profile than the CiscoTAC-1 profile to send the request to their email server first before forwarding to the Cisco backend. CiscoTAC-1 or any profile specified needs to be enabled before you can send out the request.

If the CCO ID is not specified, the contact email address of the device is used.

Each message sent includes the CLI command ouput specified for each subcommand. After the message is sent, a syslog message is displayed indicating whether the request was sent successfully or not.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send a message with output from the **show version** command to engineer@cisco.com:

```
RP/0/RP0/CPU0:router(config)# call-home request config-sanity ccoid
xyz
RP/0/RP0/CPU0:router(config)# call-home request bugs-list
RP/0/RP0/CPU0:router(config)# call-home request output-analysis "show log"
profile TG
RP/0/RP0/CPU0:router(config)#  call-home request output-analysis "show
running-config"
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.
show call-home, on page 36	Displays information regarding the Call Home configuration.

call-home send

To send the output from a specific command as a Call Home message, use the **call-home send** command in EXEC mode.

call-home send **"***cli-command***"** {**email** *email-address*|**tac-service-request** *service-number*}

Syntax Description

cli-command	Any CLI command that can be run at the prompt.
email *email-address*	Specifies the email address to which to send the call home message.
tac-service-request *service-number*	Specifies the Technical Assistance Center (TAC) service request number.

Command Default

If no email address is specified, attach@cisco.com is used.

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The specified CLI command is generally a show command with output that is required by the TAC to analyze a specific issue. The CLI command must be enclosed in quotes. The CLI command output is sent to the specified email address in long text format with the service request number in the subject of the email. If no email address is specified, the TAC service request number must be specified. By default, messages are sent to attach@cisco.com. If no TAC service request number is specified, TAC email is rejected.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send a message with output from the **show version** command to engineer@cisco.com:

```
RP/0/RP0/CPU0:router(config)# call-home send "show version" engineer@cisco.com
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

Command	Description
show call-home, on page 36	Displays information regarding the Call Home configuration.

call-home send alert-group inventory

To send an inventory Call Home message to all subscribed profiles or the specified profile, use the **call-home send alert-group inventory** command in EXEC mode.

call-home send alert-group inventory [**profile** *profile-name*]

Syntax Description

profile *profile-name*	Specifies the profile to which to send the inventory Call Home message.

Command Default

If no profile is specified, the message is sent to all subscribed profiles.

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The profile specified by the *profile-name* argument does not need to be subscribed to the inventory alert-group.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send an inventory message to the myprofile profile:

```
RP/0/RP0/CPU0:router(config)# call-home send alert-group inventory profile myprofile
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.
show call-home, on page 36	Displays information regarding the Call Home configuration.

call-home test

To send a test Call Home message to the specified profile, use the **call-home test** command in EXEC mode.

call-home test [*test-message-text*] **profile** *profile-name*

Syntax Description

test-message-text	Text to be sent in the test message. If the message text is not specified, a default message is sent.
profile *profile-name*	Specifies the profile to which to send the test call home message.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send a test Call Home message:

```
RP/0/RP0/CPU0:router(config)# call-home test "this is a test message" profile myprofile
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.
show call-home, on page 36	Displays information regarding the Call Home configuration.

contact-email-addr

To specify a contact email address for the system, use the **contact-email-addr** command in call home configuration mode. To disable the contact email address, use the **no** form of this command.

contact-email-addr *email-addr*
no contact-email-addr *email-addr*

Syntax Description

email-addr	The email address of the system contact.

Command Default

No contact email address is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The contact email address is a mandatory user-configurable field that must be configured before Call Home messages are triggered.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the contact email address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# contact-email-addr contact@cisco.com
```

contract-id

To specify a contract identifier for the system, use the **contract-id** command in call home configuration mode. To disable the contract identifier, use the **no** form of this command.

contract-id *contract-id-string*
no contract-id *contract-id-string*

Syntax Description

contract-id-string	A string that identifies a service contract.

Command Default

No contract ID is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The contract ID is an optional user-configurable field that can be used for contract information or any other identification information for the support service.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the contract ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# contract-id contract
```

customer-id

To specify a customer identifier for the system, use the **customer-id** command in call home configuration mode. To disable the customer identifier, use the **no** form of this command.

customer-id *contract-id-string*
no customer-id *contract-id-string*

Syntax Description

customer-id-string	A string that identifies the customer.

Command Default

No customer ID is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The customer ID is an optional user-configurable field that can be used for contract information or any other identification information of a support service.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the customer ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# customer-id cisco
```

destination address

To specify an email address to which Call Home messages are sent, use the **destination address** command in call home profile configuration mode. To disable the contract identifier, use the **no** form of this command.

destination address *email-address*
no destination address *email-address*

Syntax Description

email-address	Email address to which short-text and long-text Call Home messages and XML-based Call Home messages are to be sent.

Command Default

No destination email address is defined.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

You must define a destination email address to send out Call Home messages.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the destination email address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination address user@cisco.com
```

Related Commands

Command	Description
profile (call home), on page 32	Enters call home profile configuration mode to create or configure a Call Home profile.

destination message-size-limit

To specify the message size limit for call home messages for a specific profile, use the **destination message-size-limit** command in Call Home profile configuration mode. To disable the message size limit, use the **no** form of this command.

destination message-size-limit *maximum-size*
no destination message-size-limit *maximum-size*

Syntax Description

maximum-size	Maximum message size in bytes.

Command Default

The default maximum message size is 3 Mbytes.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The destination maximum message size can be optionally set to limit the size of Call Home messages.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the contract ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination maximum-message-size 2000
```

Related Commands

Command	Description
profile (call home), on page 32	Enters call home profile configuration mode to create or configure a Call Home profile.

destination preferred-msg-format

To specify the message format for a profile, use the **destination preferred-msg-format** command in call home profile configuration mode. To revert to the default message format, use the **no** form of this command.

destination preferred-msg-format {**long-text**|**short-text**|**xml**}
no destination preferred-msg-format {**long-text**|**short-text**|**xml**}

Syntax Description

long-text	Specifies to send clear text long Call Home messages, that contain formatting to enable easy readability.
short-text	Specifies to send clear text short Call Home messages, that are designed for use with text pagers.
xml	Specifies to send the same text as the long text messages, with the addition of XML tagging and Adaptive Messaging Language (AML) specific transport information to allow machine-readable parsing and correct routing of the message.

Command Default

The default message format is xml.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the message format to short text:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination preferred-msg-format short-text
```

Related Commands

Command	Description
profile (call home), on page 32	Enters call home profile configuration mode to create or configure a Call Home profile.

destination transport-method

To specify the transport method for Call Home messages for a specific profile, use the **destination transport-method** command in call home profile configuration mode. To disable the transport method, use the **no** form of this command.

destination transport-method email
no destination transport-method email

Syntax Description

email	Email is used to send call home messages.

Command Default

The default transport method is email.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The only transport method supported in this release is email.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the transport method to be email:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination transport-method email
```

Related Commands

Command	Description
profile (call home), on page 32	Enters call home profile configuration mode to create or configure a Call Home profile.

mail-server

To specify and configure the various mail servers for sending Call Home messages, use the **mail-server** command in call home configuration mode. To remove the mail server configuration, use the **no** form of this command.

mail-server {*ip-addressname*} **priority** *priority*
no mail-server {*ip-addressname*} **priority** *priority*

Syntax Description

ip-address	An IPv4 address to use as the mail server.
name	Name of server to use as the mail server.
priority *priority*	Priority to be used to determine which of multiple configured servers to use as the mail server. Values can be from 1 to 100. A server with a lower priority is tried first.

Command Default

No mail server is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

You must configure a mail server if the user profile is configured to send email messages only. Only IPv4 addresses are supported.

Up to five mail servers can be configured. Specify a priority for each mail server so the system knows which to try first.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure a mail server:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# email-server 209.165.200.225
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

phone-number

To specify a phone number to contact regarding the system, use the **phone-number** command in call home configuration mode. To remove the configured phone number, use the **no** form of this command.

phone-number *phone-number-string*
no phone-number *phone-number-string*

Syntax Description

phone-number-string	Phone number of the contact for the system. The number should always begin with a plus sign (+).

Command Default

No phone number is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The phone number is an optional user-configurable field.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the phone number of the system contact:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# phone-number +15435432101
```

profile (call home)

To enter call home profile configuration mode to create a user-defined profile or configure an existing Call Home profile, use the **profile** command in call home configuration mode. To delete a user-defined profile, use the **no** form of this command.

profile *profile-name*
no profile *profile-name*

Syntax Description

profile-name	A string that identifies the name of profile to create or configure.

Command Default

The tac profile exists by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Use the profile command to create a new profile or modify an existing profile. When you use the **no profile** command, the user-defined profile is deleted and the CiscoTAC-1 profile is set to default. A warning message is displayed when the CiscoTAC-1 profile is set to default.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to create a profile called new-profile:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile new-profile
RP/0/RP0/CPU0:router(config-call-home-profile)#
```

Related Commands

Command	Description
active, on page 13	Enables a Call Home profile.
destination address, on page 25	Specifies an email address to which Call Home messages are sent.

rate-limit

To specify a Call Home event trigger rate limit, use the **rate-limit** command in call home configuration mode. To disable the configured rate limit, use the **no** form of this command.

rate-limit *events-count*
no rate-limit *events-count*

Syntax Description

events-count	Number of events that can be triggered per minute. The default is five events. The maximum is five events.

Command Default

5 events per minute

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read, write

Example

The following example shows how to configure the rate limit to be 3 events per minute:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# rate-limit 3
```

sender

To specify the from and reply-to email addresses for Call Home email messages, use the **sender** command in call-home configuration mode. To remove these email addresses from the configuration, use the **no** form of this command.

sender {**from**|**reply-to**}*email-address*
no sender {**from**|**reply-to**}*email-address*

Syntax Description

from	Specifies the email address to be used as the from field in Call Home email messages.
reply-to	Specifies the email address to be used as the reply-to field in Call Home email messages.
email-address	A string that identifies a valid email address.

Command Default

No sender email is configured.

Command Modes

Call-home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the from and reply-to email addresses:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# sender from user1@cisco.com
RP/0/RP0/CPU0:router(config-call-home)# sender reply-to user1@cisco.com
```

service active

To enable the Call Home capability, use the **service active** command in call home configuration mode. To disable the Call Home capability, use the **no** form of this command.

service active
no service active

Syntax Description

This command has no keywords or arguments.

Command Default

Call Home is disabled by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

It is mandatory to enable the Call Home capability using the **service active** command to allow events to get triggered and send out Call Home messages.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to enable the Call Home capability:

```
RP/0/RP0/CPU0:router(config-call-home)# service active
```

show call-home

To display information regarding the Call Home configuration, use the **show call-home** command in EXEC mode.

show call-home [detail]

Syntax Description

detail	Displays Call Home general settings, alert group settings, and all available profiles.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read

The following example shows how to display detailed call home configuration information:

```
RP/0/RP0/CPU0:router# show call-home detail

Wed Apr  6 02:00:27.789 DST

Current call home settings:
    call home feature : disable
    call home message's from address: Not yet set up
    call home message's reply-to address: Not yet set up

    contact person's email address: Not yet set up

    contact person's phone number: Not yet set up
    street address: Not yet set up
    customer ID: Not yet set up
    contract ID: Not yet set up
    site ID: Not yet set up

    Mail-server: Not yet set up
    Rate-limit: 5 event(s) per minute

Available alert groups:
    Keyword                 State   Description
    ----------------------- ------- --------------------------------
```

```
    inventory               Enable  inventory info
    syslog                  Enable  syslog info

Profiles:

Profile Name: CiscoTAC-1
    Profile status: INACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): callhome@cisco.com

    Periodic inventory info message is scheduled every 24 day of the month at 16:35

    Alert-group               Severity
    ------------------------  ------------

    inventory                 normal

    Syslog-Pattern            Severity
    ------------------------  ------------
    .*                        major
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

show call-home alert-group

To display available Call Home alert groups, use the **show call-home alert-group** command in EXEC mode.

show call-home alert-group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to display Call Home alert group information:

```
RP/0/RP0/CPU0:router# show call-home alert-group

Tue Apr  5 06:51:02.860 DST

Available alert groups:
    Keyword                  State   Description
    ------------------------ ------- --------------------------------

    inventory                Enable  inventory info
    syslog                   Enable  syslog info
```

show call-home mail-server status

To displays the status of the configured mail servers, use the **show call-home mail-server status** command in EXEC mode.

show call-home mail-server status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read

The following example shows sample output from the **show call-home mail-server status** command:

```
RP/0/RP0/CPU0:router# show call-home mail-server status

Please wait. Checking for mail server status ...

Mail-server[1]: Address: 64.102.124.15 Priority: 50 [Available]
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

show call-home profile

To display the Call Home profiles, use the **show call-home profile** command in EXEC mode.

show call-home profile {**all***profile-name*}

Syntax Description

all	Displays information for all profiles.
profile-name	Name of the profile for which to display information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read

The following example shows sample output from the **show call-home profile** command:

```
RP/0/RP0/CPU0:router# show call-home profile CiscoTAC-1

Profile Name: CiscoTAC-1
    Profile status: INACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): callhome@cisco.com

   Periodic inventory info message is scheduled every 4 day of the month at 12:19

    Alert-group               Severity
    ------------------------  ------------
    environment               minor

    Syslog-Pattern            Severity
    ------------------------  ------------
    .*                        major
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

show call-home statistics

To display Call Home statistics, use the **show call-home statistics** command in EXEC mode.

show call-home statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read

The following example shows sample output from the **show call-home statistics** command:

```
RP/0/RP0/CPU0:router# show call-home statistics

Message Types    Total                Email
-------------   -------------------- --------------------
Total Success   2                    2
    Environment 0                    0
    Inventory   2                    2
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0

Total In-Queue  0                    0
    Environment 0                    0
    Inventory   0                    0
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0

Total Failed    0                    0
    Environment 0                    0
    Inventory   0                    0
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0
```

```
Total Ratelimit
      -dropped  0                    0
    Environment 0                    0
    Inventory   0                    0
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0

Last call-home message sent time: 2010-04-21 01:06:44 GMT+00:00
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

show call-home trace

To display Call Home trace information, use the **show call-home trace** command in EXEC mode.

show call-home trace {**all**|**error**|**event**} {**file** *filename* **original location** *node-id*|**hexdump**|**last** *n*|**location** {*node-id*|**all**}|**reverse**|**stats**|**tailf**|**unique**|**verbose**|**wrapping**}

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
call-home	read

The following example shows how to display Call Home trace information:

```
RP/0/RP0/CPU0:router# show call-home trace event last 15 stats

Wed Apr  6 05:11:59.984 DST
/dev/shmem/ltrace/call_home/trace wrapping: 28.672 Mbytes/sec for 512 entries
59 wrapping entries (512 possible, 0 filtered, 59 total)
Mar  3 13:26:20.281 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:26:20.281 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:27:20.283 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
Mar  3 13:27:20.283 call_home/trace 0/RSP0/CPU0 t14 processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:28:20.285 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:28:20.285 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:29:20.287 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
Mar  3 13:29:20.287 call_home/trace 0/RSP0/CPU0 t14 processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:30:20.289 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:30:20.289 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:31:20.290 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
Mar  3 13:31:20.290 call_home/trace 0/RSP0/CPU0 t14 processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:32:21.067 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:32:21.067 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:33:21.069 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
```

Related Commands

Command	Description
call-home, on page 15	Enters call home configuration mode to configure the call home feature.

site-id

To specify a site identifier for the system, use the **site-id** command in call-home configuration mode. To disable the site identifier, use the **no** form of this command.

site-id *site-id-string*
no site-id *site-id-string*

Syntax Description

site-id-string	A string that identifies the site.

Command Default

No site ID is defined.

Command Modes

Call-home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The site ID is an optional user-configurable field that can be used to specify a Cisco-supplied site ID or other data meaningful to the support service.

Task ID

Task ID	Operation
call-home	read, write

This example shows how to configure the site ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# site-id Cisco-site
```

street-address

To specify the street address of the system, use the **street-address** command in call home configuration mode. To remove the street address configuration, use the **no** form of this command.

street-address *street-address*
no street-address *street-address*

Syntax Description

street address	A string that identifies the street address of the system.

Command Default

No street address is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

The street address is an optional user-configurable field that can be used to provide the address of the system to the support service.

Task ID

Task ID	Operation
call-home	read, write

This example shows how to configure the street address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# street-address 170 West Tasman Dr.
San Jose, CA 95134 USA
```

subscribe-to-alert-group inventory

To configure a destination profile to receive messages for the inventory alert group, use the **subscribe-to-alert-group inventory** command in call home profile configuration mode. To disable the subscription, use the **no** form of this command.

subscribe-to-alert-group inventory [**periodic** {**daily**|**monthly** *day-of-month*|**weekly** *day-of-week*} *time*]
no subscribe-to-alert-group inventory [**periodic** {**daily**|**monthly** *day-of-month*|**weekly** *day-of-week*} *time*]

Syntax Description

periodic	Specifies to send an inventory message periodically.
daily	Sends daily inventory messages.
monthly *day-of-month*	Sends monthly inventory messages on the day of the month specified.
weekly *day-of-week*	Sends weekly inventory messages on the day of the week specified.
time	Time to send the inventory message, in the format `hour:minutes`.

Command Default

The inventory alert group is disabled by default. The default severity for the inventory alert group is normal.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

At least one alert group subscription is mandatory for a profile so that a valid event can be triggered.

There are two types of subscription for an inventory alert group. One is normal subscription, meaning that the severity is set to normal, and any (online insertion and removal) OIR event triggers the event. The second is periodic subscription, using the **periodic** keyword, meaning that an event is triggered only when the specified time arrives.

Task ID

Task ID	Operation
call-home	read, write

This example shows how to configure the sending of inventory messages every Monday:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
```

```
RP/0/RP0/CPU0:router(config-call-home-profile)# subscribe-to-alert-group inventory periodic
 weekly monday
```

Related Commands

Command	Description
profile (call home), on page 32	Enters call home profile configuration mode to create or configure a Call Home profile.
subscribe-to-alert-group syslog, on page 50	Configures a destination profile to receive messages for the syslog alert group.

subscribe-to-alert-group syslog

To configure a destination profile to receive messages for the syslog alert group, use the **subscribe-to-alert-group syslog** command in call home profile configuration mode. To disable the subscription, use the **no** form of this command.

subscribe-to-alert-group syslog severity *severity-level* **pattern** *match*
no subscribe-to-alert-group syslog severity *severity-level* **pattern** *match*

Syntax Description

severity	Specifies the the lowest level of severity events to include in a syslog alert.
severity-level	• **catastrophic**—Includes network-wide catastrophic events in the alert. This is the highest severity. • **critical**—Includes events requiring immediate attention (system log level 1). • **debugging**—Includes debug events (system log level 7). This is the lowest severity. • **disaster**—Includes events with significant network impact. • **fatal**—Includes events where the system is unusable (system log level 0). • **major**—Includes events classified as major conditions (system log level 2). • **minor**—Includes events classified as minor conditions (system log level 3) • **normal**—Specifies the normal state and includes events classified as informational (system log level 6). This is the default. • **notification**—Includes events informational message events (system log level 5). • **warning**—Includes events classified as warning conditions (system log level 4).
pattern	Specifies a syslog string pattern to match.
match	A string that when matched in the syslog message, is included in the alert notification. If the pattern contains spaces, you must enclose it in quotes (" ").

Command Default

The syslog alert group is disabled by default. The default severity for the syslog alert group is debugging.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

At least one alert group subscription is mandatory for a profile so that a valid event can be triggered.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the syslog alert group to include severity notification:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# subscribe-to-alert-group syslog severity
notification pattern "UPDOWN"
```

Related Commands

Command	Description
profile (call home), on page 32	Enters call home profile configuration mode to create or configure a Call Home profile.

Boot Commands

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

For more information about ROM Monitor (ROMMON) and boot tasks, see *ROM Monitor Configuration Guide for Cisco CRS Routers* or *Cisco IOS XR Getting Started Guide for the Cisco CRS Router*.

config-register

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

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

Syntax Description

value	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 5: Common Configuration Register Settings, on page 55.
location {*node-id* | **all**}	(Optional) Specifies the RP node for which to define the configuration register boot value. The **all** keyword specifies all RP nodes.

Command Default

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

Command Modes

Administration EXEC

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	This command was moved from global configuration mode to administration EXEC mode.
Release 3.3.0	Support was added for the **location** keyword.

Usage Guidelines

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

The *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 shelf controller (DSC) of the system. The DSC is the primary RP of the owner secure domain router (owner SDR).

When you have two RPs (Primary RP0 and Standby RP1) and the config-registers of the two are different, you must manually set the config-register in RP1 equal to RP0 in order for RP1 to synchronize with the configurations on RP0.

Use the **show variables boot** command in the EXEC mode to see status of the config-register in both the RPs.

Use the **config-register***x***location***x* command in the Admin mode to change the config-register in either of the RPs.

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

This table describes the most commonly used configuration register settings.

Table 5: Common Configuration Register Settings

Value	Description
0x0	RP enters ROMMON mode (rommon B1>) 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. Both 0x102 and 0x2102 specify the same functionality, as bit 13 in 0x2102 is not significant for Cisco IOS XR software.
0x40	Router enters the password recovery mode on the next system boot.

Task ID

Task ID	Operations
root-lr	read, write

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 Topics

reload, on page 62
show variables boot, on page 79
show version, on page 378

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

location *node-id*	Specifies the node of the RP. It can be a node that is not yet installed if the **preconfigure** keyword is used. The *node-id* argument is entered in the *rack/slot/module* notation.
preconfigure	(Optional) Enables you to specify a node that is not yet installed.
primary-device **:**	Specifies the primary boot device used to store installation packages and configuration files. Supported devices are: • **disk0:** • **disk1:** (if installed)
secondary-device **:**	Storage device on the same RP as the *primary-device*, to where critical data is replicated. Supported devices are the same as for *primary-device* **:**, but *secondary-device* **:** must be different than the *primary-device* **:**.

Command Default

None

Command Modes

Global configuration

Command History

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

The **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

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 Topics

format
mirror pause, on page 59
mirror resume, on page 60

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 {*node-id* | **all**}	(Optional) Specifies the node of the RP. The *node-id* argument is entered in the *rack/slot/module* notation. The **all** keyword specifies all RP nodes.

Command Default

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.

Usage Guidelines

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

The **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

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

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

Related Topics

mirror, on page 57
mirror resume, on page 60

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 {*node-id* | **all**}	(Optional) Specifies the node of the RP. The *node-id* argument is entered in the *rack*/*slot*/*module* notation. The **all** keyword specifies all RP nodes.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

The **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

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

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

Related Topics

mirror, on page 57
mirror pause, on page 59

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 *node-id*	(Optional) Specifies the node of the RP. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

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.

Usage Guidelines

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

The **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

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

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

  Mirror Verify Information for 0/RP0/CPU0.


  ============================================================
  Primary device and secondary device are fully synchronized.
```

Related Topics

mirror, on page 57

reload

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

reload

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Releases	Modifications
Release 2.0	This command was introduced.
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.

Usage Guidelines

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

Use the **reload** command to cause the 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 switchover occurs, the running (active) software configuration is automatically maintained during switchover.

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 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]y
```

Task ID

Task ID	Operations
root-lr	execute

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 Topics

reload (administration EXEC), on page 64
show redundancy, on page 372
config-register, on page 54

reload (administration EXEC)

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

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

Syntax Description

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

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.4.1	The **force** keyword was not supported.

Usage Guidelines

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

Note Before reloading nodes on the 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** command with the **location all** keywords.

To reload all the nodes in a specific chassis, use the **reload** command with the **rack** *rack-number* keyword and argument. 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 in the *rack/slot/module* notation.

Task ID

Task ID	Operations
root-system	execute

The following example shows how to reload all 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:

Related Topics

cfs check
reload, on page 62
show redundancy, on page 372
config-register, on page 54

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

Syntax Description

hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
verbose	(Optional) Displays additional internal debugging information.
wrapping	(Optional) Displays wrapping entries.
file *filename* **original**	(Optional) Specifies the filename of the file to display. You can specify up to four trace files.
location {*node-id* | **all**}	(Optional) Specifies the node of the RP. The *node-id* argument is entered in the *rack/slot/module* notation. You can specify up to four nodes. The **all** keyword specifies all RP nodes.

Command Default

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.

Usage Guidelines

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

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

Task ID

Task ID	Operations
basic services	read

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

```
RP/0/RP0/CPU0:(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** {*node-id*|**all**}]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node of the RP for which to display the mirroring information. The *node-id* argument is entered in the *rack/slot/module* notation. The **all** keyword specifies all RP nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
filesystem	read

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

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

  Mirror Information for 0/RP0/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
```

Table 6: 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 switchover 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.
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. Partitioning of disks is available only 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.

Field	Description
BOOT_DEV_SEQ_CONF=	ROM Monitor environmental variable for the boot disk sequence. This variable is 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 Topics

mirror, on page 57
mirror verify, on page 61

show reboot

To display reboot information for a node, use the **show reboot** command in

EXEC or administration EXEC

mode.

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
system	read

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

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

No  Time                      Cause Code  Reason
--------------------------------------------------------------------------------
01  Thu Jul 19 00:25:03 2007  0x00000001  Cause: User Initiated reload
                                          Process: reload
                                          Traceback: fc1941a0 fc194290 fc0
                                          42d90 48200624 48202120 0
02  Thu Jul 19 20:32:57 2007  0x21000010  Cause: Missed deadline, client: sc-reddrv-main,
                                          timeout: 5
                                          Process: wd-critical-mon
                                          Traceback: fc1941a0 fc194290 482
                                          00738 482013cc 48201c04 fc1d4fb0
03  Thu Jul 19 22:21:05 2007  0x00000000
04  Thu Jul 19 22:44:37 2007  0x00000045  Cause: Non-dSC node booted with composite image

                                          Process: insthelper
                                          Traceback: fc1941a0 fc194290 fc6
                                          1e4a0 4820f928 48210654 48201cc0
05  Thu Jul 19 22:52:19 2007  0x00000045  Cause: Non-dSC node booted with composite image

                                          Process: insthelper
                                          Traceback: fc1941a0 fc194290 fc6
                                          204a0 4820f928 48210654 48201cc0
06  Fri Jul 20 02:10:51 2007  0x00000001  Cause: User Initiated reload
                                          Process: reload
                                          Traceback: fc15a1a0 fc15a290 fc0
                                          45d90 48200624 48202120 0
07  Mon Jul 23 19:39:49 2007  0x00000045  Cause: RP cold booted with incorrect software

                                          Process: insthelper
                                          Traceback: fc1941a0 fc194290 fc6
                                          1a4a0 4820f8b0 48210fc8 48201cc0
08  Mon Jul 23 19:54:45 2007  0x00000002  Cause: User Initiated Reboot
                                          Process: reboot
                                          Traceback: fc1941a0 fc194290 482
                                          00154 48201468 0 0
```

The following example shows 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 #          0xfffc0003
              IBAT3L #             0x40011

              Data BAT Registers
               Index #                Value
              DBAT0U #             0x1ffe
              DBAT0L #               0x12
              DBAT1U #                  0
              DBAT1L #          0x10000012
              DBAT2U #          0x30000ffe
              DBAT2L #          0xf000006a
              DBAT3U #          0xfffc0003
              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
                   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 Topics

reload, on page 62

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** {*node-id*|**all**}

Syntax Description

target-device	(Optional) Displays the backup details and history for the specified device. The supported devices are: • **disk0:** • **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 {*node-id* | **all**}	(Optional) Specifies the node of the RP for which to display information. The *node-id* argument is entered in the *rack*/*slot*/*module* notation. The **all** keyword specifies all RP nodes.

Command Default

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 shelf 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.

Usage Guidelines

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

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

Various 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

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

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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/RP0/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:
hfr-os-mbi-3.4.0
hfr-base-3.4.0
hfr-admin-3.4.0
hfr-fwdg-3.4.0
hfr-lc-3.4.0
hfr-rout-3.4.0
hfr-diags-3.4.0
hfr-k9sec-3.4.0
hfr-mcast-3.4.0
hfr-mgbl-3.4.0
hfr-mpls-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/RP0/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 7: 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 Topics

system backup, on page 83
system boot-sequence, on page 87

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{*node-id* | **all**}	(Optional) Specifies the node to reload. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.4.0	Support was added for the **location** keyword.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
root-lr	read

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

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

Mon Jun  1 05:21:48.580 PST
BOOT variable = disk0:hfr-os-mbi-3.9.0.10I/mbihfr-rp.vm,1;
CONFREG variable = 0x102
```

Related Topics

show variables system, on page 81
show version, on page 378
config-register, on page 54

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **boot** keyword was removed.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
basic-services	read

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

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

  TERM=vt220
  GDB_PDEBUG=-P1
  TERM=vt100
  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=labuser
EXEC_PID=18280619
TASKID_MAP_SIZE=72
HOME=/disk0:/usr
TMPDIR=/disk0:/var/tmp
PWD=/disk0:/usr
```

Related Topics

show variables boot, on page 79
show version, on page 378
config-register, on page 54

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*] **[format]** [{**synchronous**|**asynchronous**}] [**location** {*node-id*|**all**}]

Syntax Description

target-device	(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.
	• The supported storage devices are:
	  • **disk0:**
	  • **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.
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.
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.
location {*node-id* | **all**}	(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** *node-id* keyword and argument to specify an alternative node for the backup files, such as the standby DSDRSC. The *node-id* argument is expressed in the *rack/slot/module* notation. Use the **all** keyword to back 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:.

Command Default

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 designated secure domain router shelf controller (DSDRSC).

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

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

Note The **system backup** command does not make any changes to bootflash content.

Target Device for the Backup

Use the **system boot-sequence** 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. Supported storage devices are:

- **disk0:**
- **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 installed route processors (RPs), 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.

Various 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

The following example shows how to back up the software and configuration files on a router.

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

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

show system backup, on page 75
system boot-sequence, on page 87

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** {*node-id*|**all**}]

Syntax Description

primary-device	Default device where software packages are installed and run. This device is also the default location for router configurations. The value of the *primary-device* argument is normally **disk0:**.
secondary-device	(Optional) Secondary (backup) boot device, used by the **system backup** command to back up system software and configurations. Supported storage devices are: • **disk0:** • **disk1:** (if installed) **Note** The value of the *secondary-device* argument must be different from the value of the *primary-device* argument.
disable	Temporarily disables the automatic recovery mechanism.
location {*node-id* | **all**}	(Optional) Specifies the node of the RP for which to define the boot sequence. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation. The **all** keyword specifies all RP nodes.

Command Default

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.
Release 3.4.1	The **disable** keyword and *secondary-device* argument were introduced.

Usage Guidelines

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

Use the **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 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 Mode Options

- 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.

Displaying the Current Boot Sequence Settings

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

Task ID

Task ID	Operations
root-lr	read, write

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/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# system boot-sequence disk0: disk1:
```

```
Info:  node0_0_CPU0: command succeeded.
```

Related Topics

show system backup, on page 75
system backup, on page 83

Cisco Discovery Protocol (CDP) Commands

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

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

cdp

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

cdp
no cdp

Syntax Description

This command has no keywords or arguments.

Command Default

CDP is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** and **disable** keywords were removed.

Usage Guidelines

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

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

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

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

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

The following example shows how to globally enable CDP:

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

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

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

Related Topics

show cdp, on page 102

cdp advertise v1

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

cdp advertise v1
no cdp advertise [v1]

Syntax Description

This command has no keywords or arguments.

Command Default

Version 2 is enabled.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.0	The **v2** keyword was removed.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
cdp	read, write

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

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

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

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

Related Topics

cdp, on page 92
show cdp, on page 102

cdp holdtime

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

cdp holdtime *seconds*
no cdp holdtime

Syntax Description

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

Command Default

seconds : 180

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
cdp	read, write

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

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

Related Topics

cdp timer, on page 98
show cdp, on page 102

cdp log adjacency changes

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

cdp log adjacency changes
no cdp log adjacency changes

Syntax Description

This command has no keywords or arguments.

Command Default

CDP adjacency table logging is disabled.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
cdp	read, write

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

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

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 Topics

show cdp, on page 102

cdp timer

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

cdp timer *seconds*
no cdp timer

Syntax Description

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

Command Default

seconds : 60

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
cdp	read, write

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

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

Related Topics

cdp holdtime, on page 96
show cdp, on page 102

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 *node-id*	Clears CDP traffic counters for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

The counters are set to zero.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
cdp	read, write

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 Topics

show cdp traffic, on page 111
clear cdp table, on page 100

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Use the **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

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(15la 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 Topics

show cdp, on page 102
show cdp neighbors, on page 108

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 keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Release	Modification
Release 2.0	This command was introduced.
Release 3.0	No modification.
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.
Release 3.9.0	No modification.

Usage Guidelines

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

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

Task ID

Task ID	Operations
cdp	read

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

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

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

Table 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 Topics

cdp advertise v1, on page 94
cdp holdtime, on page 96
cdp timer, on page 98
show cdp entry, on page 104
show cdp neighbors, on page 108
show cdp traffic, on page 111
clear cdp table, on page 100
show cdp interface, on page 106

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

Command Default

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

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
cdp	read, write

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

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

-------------------------
Device ID: TBA04341195(sys-235)
SysName : sys-235
Entry address(es):
  IP address: 172.16.23.9
Platform: WS-C6006,  Capabilities: Trans-Bridge Switch
Interface: MgmtEth0/RP1/CPU0/0
Port ID (outgoing port): 4/18
Holdtime : 157 sec
```

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

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

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

Related Topics

show cdp, on page 102
show cdp neighbors, on page 108
show cdp traffic, on page 111
show cdp interface, on page 106

show cdp interface

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

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

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
location *node-id*	(Optional) Displays detailed CDP information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

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.

Usage Guidelines

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

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

Task ID

Task ID	Operations
cdp	read, write

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

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

```
POS0/2/0/0 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
POS0/2/0/1 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
POS0/2/0/2 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
POS0/2/0/3 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
MgmtEth0/RP1/CPU0/0 is Up
    Encapsulation ARPA
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
```

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

```
RP/0/RP0/CPU0:router# show cdp interface pos 0/2/0/1

POS0/2/0/1 is Up
    Encapsulation HDLC
    Sending CDP packets every 60 seconds
    Holdtime is 180 seconds
```

Table 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 Topics

show cdp, on page 102
show cdp entry, on page 104
show cdp neighbors, on page 108
show cdp traffic, on page 111

show cdp neighbors

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

EXEC

mode.

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

Syntax Description

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	When used with the **detail** keyword, the output was modified to display IPv6 neighbors.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
cdp	read

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

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

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID        Local Intrfce   Holdtme  Capability  Platform  Port ID

TBA04110127      Gi0/7/0/0       173      T S         WS-C6506  3/9
cisco_1          Gi0/7/0/2       171      R           CRS-1

     Gi0/4/0/2
```

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

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

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

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

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

advertisement version: 2
```

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

show cdp, on page 102
show cdp entry, on page 104
show cdp traffic, on page 111
show cdp interface, on page 106

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

Command Default

Displays CDP information aggregated across all nodes.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
cdp	read

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

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

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

Table 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.
Unrecognize Hdr version	Number of packets received from a CDP version that was outside the current configuration.
File open failed	Number of times that CDP failed to connect to one of the underlying services it uses.

Related Topics

show cdp, on page 102
show cdp entry, on page 104
show cdp neighbors, on page 108
show cdp interface, on page 106

Clock Commands

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

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

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

clock read-calendar

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

clock read-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

Read calendar is disabled.

Command Modes

EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
host-services	execute

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

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

14:31:57.089 PST Tue Feb 10 2008
```

Related Topics

clock set, on page 115
clock update-calendar, on page 123
show clock, on page 128
update-calendar, on page 448

clock set

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

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

Syntax Description

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

Command Default

Clock is not set.

Command Modes

EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
host-services	execute

Setting the Software Clock

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

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

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

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

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

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

Displaying the Clock Settings

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

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

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

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

```
RP/0/RP0/CPU0:router# clock set 06:10:00 12 ?

    january    Month of the Year
    february
    march
    april
    may
    june
    july
    august
    september
    october
    november
    december
```

Related Topics

clock timezone, on page 119
show clock, on page 128
clock summer-time, on page 117

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 daylight saving 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

zone	Name of the time zone (for example, PDT) to be displayed when summer time is in effect. Table 14: Common Time Zone Acronyms, on page 119 lists common time zone acronyms used for the *zone* 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.
date	Date of the month.
month	Month.
year	Year (no abbreviation).
hh : *mm*	Time (24-hour format) in hours and minutes.
recurring	Indicates that summer time should start and end on the corresponding specified days every year.
week	Week of the month (values are 1 to 5, first or last).
day	Day of the week.
offset	(Optional) Number of minutes to add during summer time.

Command Default

Summer time is not configured.

offset: 60

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

- Use the **recurring** keyword 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** keyword 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

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, 2008 at 02:00 and end on April 26, 2009 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 2008 2:00 26
April 2009 2:00
```

Related Topics

clock set, on page 115
clock timezone, on page 119

clock timezone

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

clock timezone *zone hours-offset* [*minutes-offset*]
no clock timezone

Syntax Description

zone	Name of the time zone to be displayed when standard time is in effect.
hours-offset	Hours offset from Coordinated Universal Time (UTC). Range is from –23 to +23.
region	Sets the offset according to the region specified.
minutes-offset	(Optional) Minutes offset from UTC.

Command Default

UTC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

This table 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.

Acronym	Time Zone Name and UTC Offset
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.
Australia	
WST	Western Standard Time, as UTC plus 8 hours.
CST	Central Standard Time, as UTC plus 9.5 hours.

Acronym	Time Zone Name and UTC Offset
EST	Eastern Standard/Summer Time, as UTC plus 10 hours (plus 11 hours during summer time).

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

Table 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.

Letter Designator	Word Designator	Difference from UTC
I	India	UTC plus 9 hours.
K	Kilo	UTC plus 10 hours.
L	Lima	UTC plus 11 hours.
M	Mike	UTC plus 12 hours.

Task ID

Task ID	Operations
host-services	read, write

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 Newfoundland Standard Time (NST) for Newfoundland, Canada, which is 3.5 hours behind UTC:

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

Related Topics

clock set, on page 115
show clock, on page 128
clock summer-time, on page 117

clock update-calendar

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

clock update-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
host-services	execute

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

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

Related Topics

clock read-calendar, on page 114

locale country

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

global configuration

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

locale country *country*
no locale country

Syntax Description

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

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Note This command is not fully supported at this time.

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

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

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

```
--More--
```

Task ID

Task ID	Operations
host-services	read, write

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

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

Related Topics

locale language, on page 126

locale language

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

global configuration

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

locale language *language*
no locale language

Syntax Description

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

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Note This command is not fully supported at this time.

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

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

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

Task ID

Task ID	Operations
host-services	read, write

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

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

Related Topics

locale country, on page 124

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).

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

Table 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

The following sample output shows the current clock settings:

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

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

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

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

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

Related Topics

clock set, on page 115

Configuration Management Commands

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

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

abort

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

abort

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

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

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

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

Related Topics

end, on page 163
exit, on page 167

admin

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

admin

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
admin	read, write, execute

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

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

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

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

Related Topics

configure, on page 158

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*[*(param-list)*]*content*
no alias *alias-name*

Syntax Description

alias-name	Name of the command alias. Alias names can be a single word or multiple words joined by a hyphen (-) or an underscore (_).
param-list	(Optional) Parameters assigned to the alias. These parameters are filled in at execution time.
content	Original command syntax. Valid abbreviations of the original command syntax can be entered for the *content* argument.

Command Default

No command aliases are configured.

Command Modes

Global Configuration mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The *param-list* argument was added.

Usage Guidelines

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

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

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

Following is a list of properties for an alias:

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

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

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

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

alias set_host hostname router
```

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

Task ID

Task ID	Operations
logging	read, write

The following example shows how to create an alias named ipbr for the **show ipv4 interface brief** command, commit the configuration, enter 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 :
Configuration 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, mycompany-10ge, for POS interface 1/0/2/3 and then how to use that alias to shut down the interface:

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

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

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

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

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

The following example shows the use of the alias shint_both inEXEC mode:

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

Two commands are issued, as follows:

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

Related Topics

show aliases, on page 216

apply-group

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

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

Syntax Description

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

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

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

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

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

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

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

Task ID

Task ID	Operation
config-services	read, write

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

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

Related Topics

group (configuration), on page 169

apply-group-remove

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

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

Syntax Description

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

Command Default

None

Command Modes

Global configuration or any configuration mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operation
config-services	read, write

Example

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

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

apply-template

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

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

Syntax Description

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

Command Default

No templates are applied to the target configuration.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
config-services	read, write

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

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

Related Topics

end-template, on page 166
show running-config, on page 259
template, on page 263

clear comment

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

clear comment

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Global Configuration mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

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

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

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

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

Task ID

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

The following example shows how to discard the comment associated with the configuration ipv4 address 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 Admin EXEC modeor EXEC mode.

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

Syntax Description

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

Command Default

None

Command Modes

EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	This command was earlier named **clear configuration rollback points** .
Release 3.3.0	Support was added for administration EXEC mode.

Usage Guidelines

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

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

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

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

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

Task ID

Task ID	Operations
config-services	execute

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

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

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

Related Topics

rollback configuration, on page 191
show configuration rollback changes, on page 246

clear configuration inconsistency

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

clear configuration inconsistency

Syntax Description

This command has no keywords or arguments.

Command Default

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

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

Command Modes

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

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

An inconsistency alarm is set when there is a failure to restore the configuration; this can occur during router startup, or when a line card, 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/RP0/CPU0:router# configure

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

```
ADMIN plane running configuration is inconsistent with persistent
  configuration.
No configuration commits will be allowed until an admin plane
'clear configuration inconsistency' command is performed.
```

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

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

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

Command Modes

To clear the inconsistency alarms for the 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

The following example shows how to clear the inconsistency alarms for the admin plane configuration by entering the **clear 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 the SDR configuration are displayed using the **show configuration history** command with the **alarm** keyword:

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

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

Related Topics

load configuration failed, on page 178
show configuration history, on page 236
show configuration failed startup, on page 235

clear configuration inconsistency replica

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

clear configuration inconsistency replica location *node-id*

Syntax Description

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

Command Default

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

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

Command Modes

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

In 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 shelf controller (DSDRSC) .

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

To clear configuration inconsistencies for 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

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 Topics

show configuration inconsistency replica, on page 240

clear configuration sessions

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

clear configuration sessions *session-id*

Syntax Description

session-id	Identifier for the configuration session to be terminated.

Command Default

None

Command Modes

Administration EXEC

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Use the **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/RP0/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

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_RPs1_CPU0  UNKNOWN   Mon Feb  2 01:02:09 2009

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

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

Related Topics

show configuration sessions, on page 254

commit

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

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

Syntax Description

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.
comment *line*	(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 [*seconds* | **minutes** *minutes*]	(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.
force	(Optional) Forces a commit operation in low-memory conditions.
label *line*	(Optional) Assigns a meaningful label. This label is displayed (instead of the autogenerated commit ID) in the output for the **show configuration commit list** .
replace	(Optional) Replaces the entire running configuration with the contents of the target configuration.
save-running filename *file_path*	(Optional) Saves the running configuration to a specified file.

Command Default

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 mode

Global Configuration mode

Admin Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **replace** keyword was added.

Release	Modification
Release 3.3.0	The **confirmed** *minutes* keyword and argument were added. The **confirmed** option is not available in administration configuration mode.
Release 3.7.0	Support was added for the **save-running filename** *file_path* keywords and argument in global configuration mode.
Release 3.8.0	Support was added for the **save-running filename** *file_path* keywords and argument in administration configuration mode.

Usage Guidelines

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

Changes made during a configuration session are inactive until the **commit** command is entered. By default, the commit operation 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 takes effect.

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 the **commit** command to confirm the configuration. If the **commit** command 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.

Note If you use the **commit** command with the **replace** keyword, it does not affect the mode of an 8-port E1/T1 SPA. If the mode is E1 before using the **commit replace** command, it remains E1. However, since the default mode is T1, the router does not recognize that the mode is E1. To change the mode to T1, you must first use the **hw-module subslot cardtype e1** command to add the E1 mode into the configuration so that it correlates with the system. Then manually reload the router and it boots in T1 mode.

For more information regarding the **hw-module subslot cardtype** command, refer to *Interface and Hardware Component Command Reference for Cisco CRS Routers*.

Task ID

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

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

```
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** *line* keyword and 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_RPs1_C  CLI         13:00:53 UTC Wed Feb 04 2004
2    1000000226  user_a    con0_RPs1_C  CLI         12:59:26 UTC Wed Feb 04 2004
3    1000000225  user_a    con0_RPs1_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:router# configure
RP/0/RP0/CPU0:router(config)# hostname router3
RP/0/RP0/CPU0:router(config)# commit confirmed 30
RP/0/RP0/CPU0:router3(config)# end
```

Related Topics

abort, on page 133
end, on page 163
exit, on page 167
configuration commit auto-save, on page 156
load, on page 175
show configuration rollback changes, on page 246

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 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 *file_path*	Specifies the location to which to save the running configuration.

Command Default

None

Command Modes

Global Configuration mode

Admin Configuration mode

Command History

Release	Modification
Release 3.7.0	This command was introduced
Release 3.8.0	This command was first supported in administration configuration mode.
Release 5.1.1	The 'ftp client username' and 'ftp client password' commands can be used to pass the ftp username and password to the 'configuration commit auto-save' command.
Release 6.1.2	The command was enhanced to save the copy of your config with unique filename

Usage Guidelines

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. Use the following syntax when using **tftp**, **ftp**, or **rcp** as options: Configuration commit auto-save filename

[*tftp*|*ftp**rcp*]

The **configuration commit auto-save** command saves the copy of your config with unique filename. The unique filename is generated by appending timestamp to the filename.

For example:

```
router(config)# hostname T2
T2(config)# configuration commit auto-save filename disk0:/CONF_BK
T2(config)# end
```

```
T2(config)# commit
---------
ios.0/0/CPU0:/disk0:ios.0/0/CPU0disk0: $ ls -lt
total 60
-rwx------ 1 <username> eng  399 Jul  3 17:34 CONF_BK_TS.20160703-173423
```

Task ID

Task ID	Operations
config-services	write

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 Topics

commit, on page 152

configure

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

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

Syntax Description

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

Command Default

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

Command Modes

EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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 mode. Configuration changes entered in global configuration mode impact the SDR to which the user is currently logged in.

Admin Configuration mode

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

Router Prompt

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

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

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

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

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

Locking a Configuration Session

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

Committing Changes and Returning to EXEC mode or Admin EXEC mode

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

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

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

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

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# sdr rname
RP/0/RP0/CPU0:router(admin-config-sdr:rname)# location 0/0/*
RP/0/RP0/CPU0:router(admin-config-sdr:rname)# location 0/5/*
RP/0/RP0/CPU0:router(admin-config-sdr:rname)# end
```

Related Topics

abort, on page 133

end, on page 163
exit, on page 167
show configuration (config), on page 220
show running-config, on page 259

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

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

Command Default

No description is configured.

Command Modes

Interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
interface	read, write

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

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

Related Topics

show interfaces

do

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

do *exec-command*

Syntax Description

exec-command	EXEC mode command to be executed.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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 with the **do** command.

Task ID

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

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

Routing Protocol "BGP 1"

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

end

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

end

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

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

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

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

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

Task ID

Task ID	Operations
config-services	read, write

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

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

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

abort, on page 133
exit, on page 167
show configuration (config), on page 220
commit, on page 152

end-group

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

end-group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Group configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operation
config-services	read, write

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

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

Related Topics

group (configuration), on page 169

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 keywords or arguments.

Command Default

No default behavior or values.

Command Modes

Template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read, write

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

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

Related Topics

end, on page 163

exit

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

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

exit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC mode

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

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

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

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

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

Task ID

Task ID	Operations
config-services	read, write

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 1.1.1.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# exit
RP/0/RP0/CPU0:router(config)# exit
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]: yes
```

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

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

router con0_RP1_CPU0 is now available

Press RETURN to get started.
```

Related Topics

abort, on page 133
end, on page 163
commit, on page 152

group (configuration)

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

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

Syntax Description

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

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Task ID

Task ID	Operation
config-services	read, write

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Related Topics

end-group, on page 165
apply-group, on page 138

hostname

To specify or modify the hostname for the router, use the **hostname** command in Global Configuration mode.

hostname *name*

Syntax Description

name	New hostname for the router.

Command Default

The factory-assigned default hostname is “ios.”

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

The hostname is used in prompts and default configuration filenames.

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

Task ID

Task ID	Operations
root-lr	read, write

The following example shows how to change the router hostname:

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

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

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

Command Default

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.

Usage Guidelines

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

Use the **load** 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

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 TenGigE 0/3/0/0
 description My 10 GE Interface
 ipv4 address 10.10.11.20 255.0.0.0
```

```
!
end
```

Related Topics

show configuration failed (config), on page 229
commit, on page 152

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

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
config-services	read, write

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

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

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

load configuration failed

To populate the target configuration with the contents of the previous failed configuration commit, use the **load configuration failed** command in 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 *number-of-reloads*	(Optional) Loads the failed configurations from a previous router reload. Valid *number-of-reloads* values are 1 to 4.
noerror	(Optional) Excludes the error reasons when the failed configurations are loaded.

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	Support was added for the **commit** keyword. Support was added for the **startup** keyword. Support was added for the **previous** *number-of-reloads* keyword and argument. Support was added for the **noerror** keyword.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read, write

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

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

Related Topics

show configuration (config), on page 220

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

config-id	Identifier of the removed configuration to load.

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

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

Use the **load configuration removed** command to populate the target configuration with the contents of the removed configuration during installation operations.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with the contents of the removed configuration during installation:

```
RP/0/RP0/CPU0:router(config)# load configuration removed 20070316021626.cfg
```

Related Topics

show configuration persistent, on page 242

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

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	Support was added for administration configuration mode.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
config-services	read, write

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

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

Building configuration...
Loading.
```

```
302 bytes parsed in 1 sec (301)bytes/sec
```

man

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

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

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

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

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

Task ID

Task ID	Operations
basic-services	read

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

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

COMMAND
arp timeout

DESCRIPTION


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

arp timeout seconds

no arp timeout<seconds>

SYNTAX DESCRIPTION

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

DEFAULTS

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

COMMAND MODES

Interface configuration

COMMAND HISTORY

Release
Modification

Release 2.0
This command was introduced.
```

```
USAGE GUIDELINES

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

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

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

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

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

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

EXAMPLES

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

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

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

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

RELATED COMMANDS

Command
Description

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

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

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

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*|**all**}]{| **begin** *regular-expression*|| **exclude** *regular-expression*|| **include** *regular-expression*}

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.
filesystem:directory-path	File system location of the file to be displayed. Include the file system alias for the *filesystem* argument, followed by a colon, and the directory path of the file to be displayed.
location [*node-id* | **all**]	(Optional) Displays the contents of a file on a designated node or all nodes.
regular-expression	(Optional) Regular expression found in the file.
|	Vertical bar (the "pipe" symbol) indicates that an output processing specification follows.
begin	(Optional) Begins unfiltered output of the **more** command with the first line that contains the regular expression.
exclude	(Optional) Displays output lines that do not contain the regular expression.
include	(Optional) Displays output lines that contain the regular expression.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Use the **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

This table shows filter options for the output displayed by the **more** command.

Table 17: Filtering Options

Command	Purpose
more *filesystem:* | **begin** *regular-expression*	Begins unfiltered output of the **more** command with the first line that contains the regular expression.
more *filesystem:* | **exclude** *regular-expression*	Displays output lines that do not contain the regular expression.
more *filesystem:* | **include** *regular-expression*	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 begin** command output finishes or until you interrupt the output. The use of the keyword does not constitute a filter.

Task ID

Task ID	Operations
filesystem	execute

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

```
SDR# more harddisk:/user/alternate.cfg

!! Last configuration change at 15:52:55 UTC Fri Feb 13 2009 by UNKNOWN
!
line console
exec-timeout 0 0
!
interface MgmtEth0/RP1/CPU0/0
 ipv4 address 10.32.45.154 255.0.0.0
 !
interface TenGigE0/1/0/0
 ipv4 address 10.32.45.155 255.0.0.0
 keepalive disable
```

```
 !
interface TenGigE0/1/0/1
 ipv4 address 10.32.45.156 255.0.0.0
 keepalive disable
 !
interface TenGigE0/1/0/2
/ip
 ipv4 address 10.32.45.157 255.0.0.0
 keepalive disable
 !
interface TenGigE0/1/0/3
 ipv4 address 10.32.45.158 255.0.0.0
 keepalive disable
 !
interface TenGigE0/2/0/0
 ipv4 address 10.32.45.159 255.0.0.0
 keepalive disable
 !
 --More--
```

The following example shows partial sample output from the **more** 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 TenGigE0/3/1/0
 shutdown
!
interface TenGigE0/3/1/2
 shutdown
!
interface TenGigE0/2/1/0
 ipv4 address 1.1.1.1 255.255.255.0
 keepalive disable
!
interface TenGigE0/2/1/1
  ipv4 address 1.1.1.1 255.255.255.0
  keepalive disable
!
interface TenGigE0/2/1/2
  ipv4 address 1.1.1.1 255.255.255.0
  keepalive disable
!
interface TenGigE0/2/1/3
 shutdown
!
  /ipv4

filtering...
 ipv4 address 1.1.1.1 255.255.255.0
 proxy-arp disable
 shutdown
!
interface TenGigE 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 example shows 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 example shows partial sample output from the **more** 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 2009 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 TenGigE0/0/0/0
 ipv4 address 10.30.1.1 255.255.0.0
 keepalive 100
!
interface preconfigure TenGigE0/1/0/1
 shutdown
end
```

Related Topics

show, on page 213

pwd (config)

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

pwd

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any subconfiguration mode

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

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

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

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

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

rollback configuration

To roll back the running configuration to a previous configuration, use the **rollback configuration** command inEXEC or administration EXEC mode.

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

Syntax Description

last *number-of-commits*	Rolls back to the configuration that existed before the last number of commits (specified with the *number-of-commits* argument) were made.
to *commit-id*	Rolls back to the running configuration that existed before the configuration specified with the *commit-id* argument.
best-effort	Rolls back to the configuration that existed before the last n commits, and commits only valid changes (best effort). Some configuration changes might fail due to semantic errors.
force	(Optional) Specifies to override any commit blocks.
label *label*	(Optional) Assigns a text label to this rollback. The *label* argument must begin with a letter.
comment *comment*	(Optional) Assigns a text comment to this rollback. The *comment* argument can be up to 60 characters long.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was added to administration EXEC mode.

Release	Modification
Release 4.0.0	The **best-effort** keyword was added.

Usage Guidelines

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

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

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

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

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

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

Task ID

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

Rolling Back to a Specific Commit ID

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

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

SNo. Label/ID    User      Line         Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~         ~~~~~~      ~~~~~~~~~~
1    1000000009  lab       con0_RPs0_C  Rollback    02:41:08 UTC Sun Sep 26 2009
2    1000000008  lab       con0_RPs0_C  CLI         02:40:30 UTC Sun Sep 26 2009
3    1000000007  lab       con0_RPs0_C  CLI         02:39:54 UTC Sun Sep 26 2009
```

```
4    1000000006  lab       con0_RPs0_C  Rollback    02:38:40 UTC Sun Sep 26 2009
5    1000000005  lab       con0_RPs0_C  CLI         02:37:35 UTC Sun Sep 26 2009
6    1000000004  lab       con0_RPs0_C  CLI         02:37:04 UTC Sun Sep 26 2009

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

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

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

Rolling Back to a Span of Configuration Commits

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

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

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

Related Topics

load rollback changes, on page 181
show configuration rollback changes, on page 246

root

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

root

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any subconfiguration mode except the following:

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

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read

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

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

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

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

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

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

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

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

save configuration

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

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

Syntax Description

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0: from global configuration 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]
```

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 Topics

save configuration commit changes, on page 200
save configuration failed, on page 202
save configuration merge, on page 204
save rollback changes, on page 207
save configuration removed, on page 205
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246

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

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

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

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

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

Related Topics

save configuration commit changes, on page 200
save configuration failed, on page 202
save configuration merge, on page 204
save rollback changes, on page 207
save configuration removed, on page 205
show configuration commit changes, on page 224

show configuration commit list, on page 227
show configuration rollback changes, on page 246

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

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

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

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

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

```
RP/0/RP0/CPU0:router(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]
```

Related Topics

save configuration, on page 196
save configuration changes, on page 198
save configuration failed, on page 202
save configuration merge, on page 204
save rollback changes, on page 207
show configuration history, on page 236
save configuration removed, on page 205
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246

save configuration failed

To save the contents of the failed configuration, use the **save configuration failed** command inglobal 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.
noerrors	(Optional) Excludes the error reasons from the saved configuration.
startup	(Optional) Saves the failed configuration during startup.
previous *number*	(Optional) Saves a failed startup configuration from the specified previous sessions. The *number* argument is a value between 1 and 4 that indicates how many failed startup configurations to save.
device: directory-path	Storage device and directory path of the configuration file to be saved.

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.5.0	The **startup** keyword was added in administration configuration mode.

Usage Guidelines

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

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

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

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

Task ID

Task ID	Operations
config-services	read

The following example saves the failed configuration to disk0:

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

Related Topics

save rollback changes, on page 207
show configuration history, on page 236
save configuration removed, on page 205
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246

save configuration merge

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

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

Syntax Description

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read

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 Topics

save rollback changes, on page 207
show configuration history, on page 236
save configuration removed, on page 205
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246

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

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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** command.

Task ID

Task ID	Operations
config-services	read

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 Topics

save configuration, on page 196
save configuration commit changes, on page 200
save configuration failed, on page 202
save configuration merge, on page 204
save rollback changes, on page 207
show configuration history, on page 236
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246

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

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

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

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

```
RP/0/RP0/CPU0:router(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 Topics

save configuration, on page 196

save configuration commit changes, on page 200
show configuration history, on page 236
show configuration commit list, on page 227
show configuration rollback changes, on page 246

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.

Command Default

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.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
basic-services	read, write

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

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

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

Related Topics

set default-safi, on page 210
set default-vrf, on page 211
show default-afi-safi-vrf, on page 256

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.

Command Default

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.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
basic-services	read, write

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

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

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

Related Topics

set default-afi, on page 209
set default-vrf, on page 211
show default-afi-safi-vrf, on page 256

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

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

Command Default

The default VRF setting is set to empty.

Command Modes

EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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

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

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

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

Task ID

Task ID	Operations
basic-services	read, write

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

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

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

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

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

  % No matching vrf found
```

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

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

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

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

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

Gateway of last resort is 12.29.0.1 to network 0.0.0.0

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

Related Topics

set default-afi, on page 209
set default-safi, on page 210
show default-afi-safi-vrf, on page 256

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

command	Supported **show** command.
|	Vertical bar (the "pipe" symbol) indicates that an output processing specification follows.
regular-expression	(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 *filesystem:*	(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 *filesystem* argument, followed by a colon, and the directory path and filename.
include	(Optional) Displays output lines that contain the regular expression.

Command Default

None

Command Modes

EXEC

Administration EXEC

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

The **show** 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

Search options for the **show** command are shown in this table.

Table 18: Show Command Search Options

Command	Purpose
show *command* | **begin** *regular-expression*	Begins unfiltered output of the **show** command command with the first line that contains the regular expression.
show *command* | **exclude** *regular-expression*	Displays output lines that do not contain the regular expression.
show *command* | **include** *regular-expression*	Displays output lines that contain the regular expression.
show *command* | **file** *filesystem:*	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 **begin** keyword 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

Task ID	Operations
Task ID for the feature used with the **show** command	read

For example, the **show interfaces** command requires read privileges in the interface task ID.

The following example shows output from the **show interface | include protocol** command. In this example, the **show** command 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
  TenGigE0/2/0/0 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/1 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/2 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/3 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, use 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 example shows 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 **begin** keyword 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 TenGigE0/2/0/0
 ipv4 address 172.19.73.215 255.255.0.0
end
```

Related Topics

more, on page 186

show aliases

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

show aliases

Syntax Description

This command has no keywords or arguments.

Command Default

Displays all aliases currently configured on the system.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
basic-services	read

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

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

exec mode aliases:
ipv4_brief              show ipv4 interface brief

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

Related Topics

alias, on page 135

show commit changes diff

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

show commit changes diff

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global Configuration

Command History

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

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

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

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

```
+   end-policy-map
+  !
```

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

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

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

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

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

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

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

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

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

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

show configuration (config)

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

show configuration [merge] [running]

Syntax Description

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

Command Default

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

Command Modes

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

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

Task ID

Task ID	Operations
basic-services	read

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

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

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

```
 end
```

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

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

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

Related Topics

show configuration failed (config), on page 229
show configuration history, on page 236
show configuration sessions, on page 254
show running-config, on page 259
commit, on page 152
load, on page 175
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration failed startup, on page 235
show configuration rollback changes, on page 246
show configuration running-config, on page 251

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 Admin Configuration mode .

show configuration changes [diff]

Syntax Description

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

Command Default

None

Command Modes

Global Configuration mode

Admin Configuration mode

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read
basic-services	read

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

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

  Building configuration...
  # hostname router
  # hostname bla
  - logging console
  - telnet vrf default ipv4 server disable
  - domain ipv4 host xhu-u5
  - domain ipv4 host coax-u10
  - domain ipv4 host coax-u10.cisco.com
  - domain name
  - interface Loopback1
  -  ipv4 address 10.0.0.2 255.255.255.224
  - !
  - interface Loopback2
  -  description
  - !
  - interface Loopback5
  -  description
  - !
  - interface Loopback6
```

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

show configuration commit changes

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 **diff** keyword.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

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

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

SNo. Label/ID    User      Line        Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~        ~~~~~~      ~~~~~~~~~~
1    1000000077  lab       con0_RPs1_C  CLI         15:42:45 UTC Fri Jan 30 2009
2    1000000076  lab       con0_RPs1_C  Rollback    15:30:39 UTC Fri Jan 30 2009
3    1000000075  lab       con0_RPs1_C  Rollback    15:25:26 UTC Fri Jan 30 2009
4    1000000074  lab       con0_RPs1_C  Rollback    15:04:29 UTC Fri Jan 30 2009
5    1000000073  lab       con0_RPs1_C  CLI         14:49:07 UTC Fri Jan 30 2009
6    1000000072  lab       con0_RPs1_C  CLI         14:48:35 UTC Fri Jan 30 2009
```

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

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

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

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

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

Building configuration...
no hw-module node 0/RP0/CPU0 shutdown
hostname router
logging trap
no logging console
logging history size 1
alias exec shrun show configuration running
alias exec shver show version
interface MgmtEth0/RP1/CPU0/0
 ipv4 address 12.25.34.10 255.255.0.0
 no shutdown
 !
 interface preconfigure MgmtEth0/RP0/CPU0/0
 no shutdown
 !
no route ipv4 0.0.0.0/0 12.7.0.1
```

```
route ipv4 0.0.0.0/0 12.25.0.1
route ipv4 223.255.254.254/32 12.25.0.1
telnet ipv4 server enable
end
```

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

+ indicates an added line.

– indicates a deleted line.

# indicates a modified line.

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

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

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

Related Topics

rollback configuration, on page 191
show configuration rollback changes, on page 246

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

number-of-commits	(Optional) Number of commits (beginning with the most recent commit) that are available for rollback.
detail	(Optional) Displays detailed commit information, including comments.

Command Default

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 3.3.0	This command was introduced. This command replaced the **show rollback points** command, which was available in previous releases.
Release 3.4.0	Support was added for the administration EXEC and administration configuration modes.

Usage Guidelines

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

Use the **show configuration commit list** command to list the commit IDs (up to 100) that are available for rollback.

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

The following example shows 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_RP0_C  Rollback    02:25:53 UTC Fri Feb 06 2009
2    1000000009  UNKNOWN   con0_RP0_C  CLI         02:23:09 UTC Fri Feb 06 2009
3    1000000008  UNKNOWN   con0_RP0_C  CLI         02:22:54 UTC Fri Feb 06 2009
4    1000000007  UNKNOWN   con0_RP0_C  CLI         02:22:18 UTC Fri Feb 06 2009
5    1000000006  UNKNOWN   con0_RP0_C  CLI         02:07:21 UTC Fri Feb 06 2009
```

Table 19: show configuration commit list Field Descriptions, on page 228describes the significant fields shown in the display.

Table 19: 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 Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
show configuration commit changes, on page 224
show configuration failed startup, on page 235
show configuration rollback changes, on page 246
show configuration running-config, on page 251

show configuration failed (config)

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

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

Syntax Description

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

Command Default

Displays the details of the failed configuration including error reasons.

Command Modes

Any configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
basic-services	read

The following example shows a failed commit operation:

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

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

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

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

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

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

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

Related Topics

show configuration (config), on page 220
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration failed startup, on page 235
show configuration rollback changes, on page 246
show configuration running-config, on page 251

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

Any 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 Topics

show running-config, on page 259

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read

The following example shows a failed commit operation:

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

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

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

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

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

```
!
multicast-routing
 address-family ipv4
  interface all enable
!
!
```

Related Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246
show configuration running-config, on page 251

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read
root-lr	read

Related Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration failed startup, on page 235
show configuration rollback changes, on page 246
show configuration running-config, on page 251

show configuration failed startup

To display information about a configuration that failed at startup, use the **show configuration failed** command inEXEC 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 *number*	(Optional) Displays the previous failed startup configuration or configurations. The *number* argument is a value from 1 to 4, which displays the failed startup configurations in previous of sessions.

Command Default

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.
Release 3.3.0	Support was added for the **previous** *number* keyword and argument.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read

Related Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246
show configuration running-config, on page 251

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

Command Default

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

Command Modes

EXEC

Administration EXEC

Administration configuration

Global Configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.5.0	The **backup** and **rebase** keywords were added.
Release 3.8.0	Support for the **oir** keyword was removed.

Usage Guidelines

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

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

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

The **show configuration history** command in administration EXEC mode does not display records from releases earlier than Cisco IOS XR Release 3.6.0. To see information about commits prior to an upgrade from before Release 3.6.0, use the **show configuration commit list** command in administration EXEC mode.

Task ID

Task ID	Operations
config-services	read

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

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

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

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

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

Sno.  Event      Info                          Time Stamp
~~~~  ~~~~~      ~~~~                          ~~~~~~~~~~
1     startup    configuration applied         Thu Jun 22 15:23:32 2009
2     startup    configuration applied         Sat Jul  1 15:02:24 2009
```

```
3     startup    configuration applied          Sat Jul  8 17:36:52 2009
4     startup    configuration applied          Sun Jul  9 13:40:27 2009
5     startup    configuration applied          Sat Jul 15 18:18:54 2009
```

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

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

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

2)  Event: commit         Time: Thu Jun 22 16:58:18 2009
     Commit ID: 1000000002 Label:
     User: lab        Line: vty2
     Client: CLI           Comment:

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

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

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

Table 20: show configuration history Field Descriptions

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

Related Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration rollback changes, on page 246
show configuration running-config, on page 251

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* **[detail]**

Syntax Description

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

Command Default

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.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

The following example shows a configuration with inconsistencies:

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

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

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

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

Replica is consistent
```

Related Topics

clear configuration inconsistency replica, on page 148

show configuration persistent

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

show configuration persistent [diff]

Syntax Description

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

Command Default

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

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
config-services	read

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

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

Building configuration...
  end
```

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

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

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

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

Related Topics

show running-config, on page 259

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

config-id	Name of removed configuration. Type (?) to see a list of the names of all removed configurations.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was added to the administration EXEC mode.

Usage Guidelines

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

Task ID

Task ID	Operations
config-services	read

The following example shows a removed configuration:

```
RP/0/RP0/CPU0:router# show configuration removed 20060301112919.cfg

xml agent corba
http server
end
```

Related Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
commit, on page 152
load, on page 175

show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration failed startup, on page 235
show configuration rollback changes, on page 246

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 changes** 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

commit-id	Name of configuration. When a specific *commit-id* is specified, only the changes that would occur if only the specified commit is rolled back are displayed.
to *commit-id*	Displays the changes that will occur to the running configuration if the system is rolled back to the configuration specified with the *commit-id* argument.
last *number-of-commits*	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 *number-of-commits* argument.
diff	(Optional) Displays added lines, changed lines, and deleted lines.

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 **diff** keyword.
Release 3.5.0	This command was added to administration EXEC mode.

Usage Guidelines

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

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.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration rollback changes** command with the **to** *commit-id* keyword and 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 argument.

```
RP/0/RP0/CPU0:router# show configuration rollback changes to 1000000007

Building configuration...
hostname old-name
end
```

The following example shows sample output from the **show configuration rollback changes** command **last** *number-of-commits* keyword and 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 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 example shows 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.

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

Building configuration...
 interface Loopback1000
#  ipv4 address 1.1.1.1 255.255.255.255
```

```
!
end
```

Related Topics

load rollback changes, on page 181
rollback configuration, on page 191

show configuration running

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

show configuration running [*config-keyword*]

Syntax Description

config-keyword	(Optional) Specific configuration to display.

Command Default

None

Command Modes

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
basic-services	read

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

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

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

Related Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration sessions, on page 254
show running-config, on page 259
commit, on page 152

load, on page 175
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration failed startup, on page 235
show configuration rollback changes, on page 246
show configuration running-config, on page 251

show configuration running-config

To display the running configuration, use the **show configuration running-config** command in EXEC mode.

show configuration running-config [**inheritance [no-annotation]**] [*config-keyword*]

Syntax Description

inheritance	(Optional) Displays the configuration inherited from any applied configuration group.
no-annotation	(Optional) Suppresses the display of inheritance messages, when the **inheritance** keyword is used.
config-keyword	(Optional) Specific configuration to display.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 4.3.1	The **inheritance** and **no-annotation** keywords were added to support the display of configuration group configurations.

Usage Guidelines

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

Use the *config-keyword* argument to display the running configuration for a specific keyword only.

Display the Configuration from Configuration Groups

By default, if configuration groups are applied in the configuration, they are displayed as they are configured. For example:

```
RP/0/RP0/CPU0:router# show configuration running-config
!
group G-INTERFACE-MTU
  interface 'GigabitEthernet.*'
    mtu 1500
end-group
!
interface GigabitEthernet1/0/0/7
  apply-group G-INTERFACE-MTU
!
```

To display the actual configuration as inherited from any applied configuration groups, use the **inheritance** keyword:

```
RP/0/RP0/CPU0:router# show configuration running-config inheritance
```

```
!
interface GigabitEthernet1/0/0/7
 ## Inherited from group G-INTERFACE-MTU
 mtu 1500
!
```

Use the **no-annotation** keyword to suppress the display of the Inheritance messages, "## Inherited from group ...".

Task ID

Task ID	Operations
basic-services	read

This example shows the currently running (committed) configuration:

```
RP/0/RP0/CPU0:router# show configuration running-config

Building configuration...

  !! Last configuration change at 15:36:31 UTC Thu Nov 17 2009 by lab
  sessions  Users with active configuration sess
!n
hostname router
line consolestartup   Sh
 exec-timeout 0 0onfiguration
!
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 Topics

show configuration (config), on page 220
show configuration failed (config), on page 229
show configuration history, on page 236
show configuration running, on page 249
show configuration sessions, on page 254
show running-config, on page 259
commit, on page 152
load, on page 175
show configuration commit changes, on page 224
show configuration commit list, on page 227
show configuration failed startup, on page 235
show configuration rollback changes, on page 246

show configuration sessions

To display the active configuration sessions, use the **show configuration sessions** command in EXEC or administration EXEC mode.

show configuration sessions [detail]

Syntax Description

detail	(Optional) Displays detailed information.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	Support was added for the **detail** keyword.
Release 3.5.0	*Session* changed to *Current Configuration Session* in the display output.

Usage Guidelines

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

Use the **show configuration sessions** command to display the active configuration sessions. Use the **clear configuration sessions** command to clear a configuration session. The **show configuration sessions** command can be used with the **clear configuration sessions** command to verify that an active configuration session was cleared.

Task ID

Task ID	Operations
config-services	read

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

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

Current Configuration Session  Line       User     Date                     Lock
00000050-001200bb-00000000     con0_5_CPU cisco    Fri Feb 16 17:23:47 2007
```

Table 21: show configuration sessions Field Descriptions

Field	Description
Session	System-generated configuration session ID number.

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 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 Topics

clear configuration sessions, on page 150

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	Display of the default VPN routing and forwarding (VRF) instance was supported.

Usage Guidelines

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

Use the **show default-afi-safi-vrf** command to display the default AFI and SAFI settings for the current session. The AFI and SAFI settings are controlled by the following commands:

- set default-afi, on page 209
- set default-safi, on page 210
- set default-vrf, on page 211

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show default-afi-safi-vrf** command:

```
RP/0/RP0/CPU0:router# show default-afi-safi-vrf

%% Default AFI/SAFI/VRF for this session is:
     Address Family Identifier:       'ipv4'
     Sub-Address Family Identifier:   'unicast'
     Virtual Routing/Forwarding:      ''
```

Related Topics

set default-afi, on page 209
set default-safi, on page 210
set default-vrf, on page 211

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.

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

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

The **show 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

In the following example, the **show history** command is run in EXEC mode to display a history of the command entered inEXEC 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]** [**inheritance [no-annotation]**]

Syntax Description

inheritance	(Optional) Displays the configuration inherited from any applied configuration group.
no-annotation	(Optional) Suppresses the display of inheritance messages, when the **inheritance** keyword is used.
exclude	(Optional) Excludes a specific configuration from the display.
command	(Optional) Command for which to display the configuration.
sanitized	(Optional) Displays a sanitized configuration for safe distribution and analysis.

Command Default

The **show running-config** command without any arguments or keywords displays the entire contents of the running configuration file.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 4.3.1	The **inheritance** and **no-annotations** keywords were added to support the display of configuration group configurations.

Usage Guidelines

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

You can display either the entire running configuration, or a subset of the running configuration. The subset may be all the commands within a specified command mode.

Note In Cisco IOS XR software, the running configuration is automatically used at system startup, reset, or power cycle. The running configuration is the committed configuration.

Sanitized Output

Use the **show running-config** command with the **sanitized** keyword to display the contents of the active running configuration without installation-specific parameters. Some configuration details, such as IP addresses,

are replaced with different addresses. The sanitized configuration can be used to share a configuration without exposing the configuration details.

Command Modes

When the **show running-config** command is entered in administration configuration mode, the configuration for the administration plane is displayed, including the configured logical routers for the system. When the **show running-config** command is entered in any global configuration mode, or in EXEC mode, the configuration for the specific secure domain router (SDR) is displayed.

The **inheritance** and **no-annotations** keywords are not supported in administration EXEC or configuration modes.

Excluding Parts of the Display

Use the **exclude** keyword followed by a *command* argument to exclude a specific configuration from the display.

Display the Configuration from Configuration Groups

By default, if configuration groups are applied in the configuration, they are displayed as they are configured. For example:

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

group G-INTERFACE-MTU
 interface 'POS.*'
  mtu 1500
 !
end-group

interface POS0/4/1/0
 apply-group G-INTERFACE-MTU
!
interface POS0/4/1/1
 apply-group G-INTERFACE-MTU
 mtu 2000
!
```

To display the actual configuration as inherited from any applied configuration groups, use the **inheritance** keyword:

```
RP/0/RP0/CPU0:router# show running-config inheritance

group G-INTERFACE-MTU
 interface 'POS.*'
  mtu 1500
 !
end-group

interface POS0/4/1/0
 ## Inherited from group G-INTERFACE-MTU
 mtu 1500
!
interface POS0/4/1/1
 mtu 2000
!
```

Use the **no-annotations** keyword to suppress the display of the Inheritance messages, "## Inherited from group ...".

Task ID

Task ID	Operations
config-services	read

This example shows how to enter the **show running-config** command with the question mark (?) online help function to display the available subsets of the running configuration that can be entered to display a subset of the running configuration:

```
RP/0/RP0/CPU0:router# show running-config ?

aaa                Authentication, Authorization and Accounting
alias              Create an alias for entity
aps                Configure SONET Automatic Protection Switching (APS)
arp                Global ARP configuration subcommands
as-path            BGP autonomous system path filter
as-path-set        Define an AS-path set
banner             Define a login banner
cdp                Enable CDP, or configure global CDP subcommands
cef                CEF configuration commands
cinetd             Global Cisco inetd configuration commands
class-map          Configure QoS Class-map command
clock              Configure time-of-day clock
community-list     Add a community list entry
community-set      Define a community set
controller         Controller configuration subcommands
dhcp               Dynamic Host Configuration Protocol
domain             Domain service related commands
exception          Coredump configuration commands
exclude            Exclude a feature or configuration item from display
explicit-path      Explicit-path config commands
extcommunity-set   Define an extended communitiy set
fault              Fault related commands
forward-protocol   Controls forwarding of physical and directed IP broadcasts
ftp                Global FTP configuration commands
--More--
```

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

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

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

This example shows sample output from the **show running-config** command with the **sanitized** keyword displays a sanitized version of the running configuration. The sanitized configuration can be used to share a configuration without exposing specific configuration details.

```
RP/0/RP0/CPU0:router# show running-config sanitized


Building configuration...

!! Last configuration change at 05:26:50 UTC Thu Jan 19 2009 by <removed>
!
snmp-server traps fabric plane
snmp-server traps fabric bundle state
```

```
hostname <removed>
line console
exec-timeout 0 0
!
exception choice 1 compress off filepath <removed>
logging console debugging
telnet vrf <removed> ipv4 server max-servers no-limit
snmp-server ifindex persist
snmp-server host 10.0.0.1 traps version <removed> priv <removed> udp-port 2555
snmp-server view <removed> <removed> included
snmp-server community <removed> RO LROwner
snmp-server community <removed> RO LROwner
snmp-server group <removed> v3 priv read <removed> write <removed>
snmp-server traps snmp
snmp-server traps syslog
interface Loopback10
!
interface Loopback1000
!
 --More--
```

This example shows sample output for the SESH on the Carrier Grade Service Engine (CGSE).

```
RP/0/RP0/CPU0:router# show running-config service sesh
Thu Mar  1 13:06:45.023 PST
service sesh instance1
 service-location preferred-active 0/3/CPU0
 service-type nps nps-1
  forced-placement npu 0
  tunnel type gre
   name gre10
   tunnel-destination ipv4 address 209.165.200.225
   ipv4 address 192.0.2.6/24
   remote ipv4 address 192.0.2.5/24
   tunnel-source ipv4 address 209.165.200.226
  !
  package nps-mips64-r2.rpm
  interface ServiceApp1
   remote ipv4 address 209.165.200.227/24
  !
 !
!
```

Related Topics

show configuration (config), on page 220
show configuration running-config, on page 251

template

To create a template name and enter template configuration mode, use the **template** command in global configuration mode. To remove a template definition, use the **no** form of this command.

template *name*
no template *name*

Syntax Description

name	Unique name for the template to be created.

Command Default

No templates are defined.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Use the **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

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

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

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

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

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

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

Related Topics

apply-template, on page 141
end-template, on page 166
show running-config, on page 259

Distributed Route Processor Commands

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.
- 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, see the following Cisco Systems documents:

- *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco CRS Routers*, for instructions on using DRPs in a secure domain router configuration.
- *Process Placement on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco CRS Routers*, 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), on page 266
- pairing (DRP), on page 268

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/module* notation. Node IDs are always specified at the slot level, so the wildcard (*) is used to specify the CPU.

Command Default

None

Note

Command Modes

DRP pairing configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

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** 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/* 0/4/*** takes effect:

```
RP/0/RP0/CPU0:router(admin-config)# pairing pair1
RP/0/RP0/CPU0:router(admin-config-pairing:pair1)# location 0/1/* 0/4/*
RP/0/RP0/CPU0:router(admin-config-pairing:pair1)# location 0/0/* 0/4/*
RP/0/RP0/CPU0:router(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	Operation
system	read, write

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 Topics

location (SDR), on page 530
pairing (DRP), on page 268
pair (SDR), on page 532
sdr, on page 534

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

pair-name	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.

Command Default

None

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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

Use the**pairing** 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** 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

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 Topics

location (DRP), on page 266
location (SDR), on page 530
pair (SDR), on page 532
sdr, on page 534

File System Commands

This chapter describes the Cisco IOS XR software commands used to manage file systems on your router.

Note The commands in this module should not be used to access or modify any Cisco IOS XR software or configuration files. Use only the documented commands for installing and configuring the router. Modifying, deleting, or moving configuration or software package files using the manual commands described in this module is not required and can result in router downtime, loss of service, and a corrupted database.

cd

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

cd *filesystem* **:**

Syntax Description

filesystem **:**	(Optional) Location of the new working directory. Include the file system alias for the *filesystem* argument, followed by a colon and optionally, the name of a directory.

Command Default

The default file directory is **disk0:/usr**.

Command Modes

EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

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

Use **cd** command without an argument to set the working directory back to the default directory, **disk0:/usr**.

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

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

harddisk:
```

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

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

disk0:/usr
```

cfs check

To perform a check on the Configuration File System (CFS), use **cfs check** command in EXEC or administration EXEC mode.

cfs check

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use this command to check the sanity of the configuration file system and attempt to recover from internal inconsistencies; one or more rollback points may be lost depending on the severity of the state of the file system.

Note While this command runs, redundancy of the designated secure domain router shelf controller (DSDRSC) is disabled.

The following example shows how to perform a CFS check:

```
RP/0/RP0/CPU0:router# cfs check

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

copy

To copy a file from a source (such as a network server) to a destination (such as a flash disk), use **copy** command in EXEC or Admin EXEC mode.

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

Syntax Description

source	Filename including the directory path or network location of the file. The possible sources are: *directory-path* —Directory path of the file from which the file is copied. **access-list** { **ipv4** | **ipv6** }—Copies an access list (EXEC mode only). **bootflash:** —Copies from the bootflash: file system. **compactflash:** —Copies from the compactflash: file system. **compactflasha:** —Copies from the compactflasha: file system partition. **disk0:** —Copies from disk0: file system. **disk0a:** —Copies from disk0a: file system partition. **disk1:** —Copies from disk1: file system. **disk1a:** —Copies from disk1a: file system partition. **flash:** —Copies from the flash: file system. The **flash:** keyword is an alias for bootflash:. **ftp:** —Copies from an FTP network server. The syntax is **ftp:**[[[//*username* [:*password*]@]*location*]/*directory*]/*filename.* **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. **lcdisk0:** —Copies from the eUSB flash device. **lcdisk0a:** —Copies from the eUSB flash device partition a. **nvram:** —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:**[[[//*username*@]*location*]/*directory*]/*filename.* **running-config** —Copies from the current system configuration. **tftp:** —Copies from a TFTP network server. The syntax is **tftp:**[[//*location*]/*directory*]/*filename* **xml-schema** —Copies the XML schema files as a tar ball file (.tar.gz) [EXEC mode only].
destination	Filename including the directory path or network location of the file.
location *node-id*	Specifies a node. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation.

location all	Copies to all nodes.
running-config	Applies the source configuration file to the running configuration of the system.
atomic	(Optional) Applies the changes to the running configuration only if there are no errors

Command Default

No default behavior or values

Command Modes

EXEC mode.

Admin EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Source and destination can each be a configuration file, a text file, or a file system. Enter source and destination URL information, usernames, and passwords and issue the **copy** command. The networking device prompts for any missing information.

The exact format of the *source* and *destination* arguments vary according to the file or directory location. Enter the device or network location for the file system type.

Filenames can include the following characters:

! # $ % & ' + 0 1 2 3 4 5 6 7 8 9 ; @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [ ] ^ _ a b c d e f g h i j k l m n o p q r s t u v w x y z { } ~

The following characters can be used with the stated limitations:

- ` needs backslash before this character
- – cannot be the first character
- . cannot be the last character
- = cannot be the filename without other characters

The following characters cannot be used in filenames:

" ( ) * , / : < > ? \ |

The maximum length allowed 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 **location all** keywords.

In the alias syntax for the **ftp:** , **rcp:** , and **tftp:** keywords, the location is either an IP address or a hostname. The filename is specified relative to the directory used for file transfers.

When no alias is specified, the networking device looks for a file in the current directory. To view the current directory, enter the **pwd** command.

Note During processing of the **copy** command, you might see the "C" character. For all files being copied, "C" indicates that the copy process is taking place. The entire copying process might take several minutes and differs from protocol to protocol and from network to network.

Table 22: Network Protocols Supported by Cisco IOS XR Software

Prefix	Name	Description
tftp:	Trivial File Transfer Protocol	*TFTP* is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).
ftp:	File Transfer Protocol	*FTP* is an application protocol, part of the TCP/IP protocol stack, and is used for transferring files between network nodes. FTP requires a username and password.
rcp:	Remote Copy Protocol	The rcp protocol allows users to copy files to and from a file system residing on a remote host or server on the network. The rcp protocol uses TCP to ensure the reliable delivery of data. The rcp protocol downloads require a username.

Additional usage guidelines are in the following sections.

Invalid Combinations of Source and Destination

Some combinations of source and destination are invalid. Specifically, you cannot copy the following:

- From a running configuration to a running configuration
- From a network device to a network device (for example, **copy ftp: rcp:**)

Using TFTP

TFTP is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).

The syntax is as follows:

copy tftp://*hostname* /*ipaddress*/*directory-path pie name target-device* [**location** {*node-id* | **all**}]

Example:

```
RP/0/RP0/CPU0:router# copy tftp://1.1.1.1/images/software.pie disk1:
```

Note Some Cisco IOS XR images may be larger than 32 MB, and the TFTP services provided by some vendors may not support a file this large. If you do not have access to a TFTP server that supports files larger than 32 MB, download the software image using FTP or rcp as described in the following sections.

Using FTP

FTP servers require a username and password for each client request. Cisco IOS XR software sends the first valid username in the following list:

1. The username and password specified in the **copy** command, if a username is specified.

   The syntax is as follows:

   copy ftp:// *username* **:** *password* **@** *hostname or ipaddress*/*directory-path*/*pie-name target-device* [**location** {*node-id* | **all**}]

   Example:

   ```
   RP/0/RP0/CPU0:router# copy ftp://john:secret@10.1.1.1/images/software.pie disk1:
   ```

2. An "anonymous" username and password. The anonymous password is "root@ip address," where "ip address" is the IP address of the local networking device.
3. A password "username@iosname.domain" formed by the networking device. The variable "username" is the username associated with the current session, "iosname" is the configured hostname, and "domain" is the domain of the networking device.

The username and password must be associated with an account on the FTP server. If you are writing to the network server, the FTP server must be properly configured to accept the FTP write request from the user on the networking device.

If the network server has a directory structure, the configuration file or image is written to or copied from the directory associated with the username on the network server. For example, if the system image resides in the home directory of a user on the network server, specify the name of that user as the remote username.

Refer to the documentation for your FTP server for more details.

Using rcp

The rcp protocol requires a username upon each request. When you copy a configuration file or image between the networking device and an rcp server, the Cisco IOS XR software sends the first valid username in the following list:

1. The remote username specified in the **copy** command, if one is specified.
2. The username set by the **rcp client username** command, if the command is configured.
3. The networking device hostname.

For the rcp copy request to process successfully, an account must be defined on the network server for the remote username. If the network administrator of the destination server did not establish an account for the remote username, this command does not run successfully. If the network server has a directory structure, the configuration file or image is written to or copied from the directory associated with the remote username on the network server. For example, if the system image resides in the home directory of a user on the network server, specify the name of that user as the remote username.

If you are writing to the network server, the rcp server must be properly configured to accept the rcp write request from the user on the networking device. For UNIX systems, add an entry to the .rhosts file for the remote user on the rcp server. Suppose the networking device contains the following configuration lines:

```
hostname Rtr1
```

```
ip rcp remote-username User0
```

If the IP address of the networking device translates to company.com, then the .rhosts file for User0 on the rcp server should contain the following line:

```
company.com Rtr1
```

See the documentation for your rcp server for more details.

If you are using a personal computer as a file server, the computer must support remote shell (rsh) protocol.

Using xml-schema

Use the **xml-schema** keyword to obtain the most up-to-date XML schemas (.xsd files) from the router. Using this keyword is useful to prevent the use of outdated schemas in the event that router software updates include schema updates. The tar ball file includes all active schema files. It does not include schemas that are activated by specific package installation envelopes (PIEs) if those PIEs are not installed and activated on the router.

Copying to the Running Configuration

When you use the **copy** command to copy a configuration file to the **running-config** destination, the configuration in the file is applied to the running configuration of the system. This is a configuration operation. By default, the copy is carried out in a best-effort manner. This means that if some configuration lines from the file cannot be applied, the remaining configuration is still integrated into the system. In this case, a partial configuration is committed. When the **atomic** keyword is used, partial configurations are not committed. This means that even if one error occurs in the parsing or committing phase, no changes are made to the system. To view any errors when applying the configuration, use the **show configuration failed** command.

Task ID

Task ID	Operations
filesystem	execute

The following example shows how to copy a file from a FTP server to disk1:

```
RP/0/RP0/CPU0:router# copy ftp://john:secret@10.1.1.1/images/comp-hfr-full.pie disk1:
```

The following example shows how to copy a file from an rcp server to disk1:

```
RP/0/RP0/CPU0:router# copy rcp://john@10.1.1.1/images/comp-hfr-full.pie disk1:
```

The following example shows how to copy a file from a TFTP server to disk1:

```
RP/0/RP0/CPU0:router# copy tftp://10.1.1.1/images/comp-hfr-full.pie disk1:
```

delete

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

delete [**/noprompt**] [**/ena**] *filesystem***:** *filename* **location** {*node-id*|**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 *filesystem* argument, followed by a colon, and, optionally, the name of a directory.
filename	Filename of the file to be deleted.
harddisk	Deletes the harddisk
location {*node-id* | **all**}	Deletes a file from a designated node. The *node-id* argument is entered in the *rack*/*slot*/*module* notation. The **all** keyword specifies to delete the file from all nodes.

Command Default

A filename must be specified. If a filename is entered without a file system or directory path, the present working directory is used.

Command Modes

EXEC mode.

Admin EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

When a file is deleted, it is removed from the system and cannot be restored (undeleted).

Use the **dir** command to display the list of files on a storage device.

The following example shows how to delete a file:

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

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

dir

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

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

Syntax Description

/all	(Optional) Lists deleted files, undeleted files, and files with errors.
/ena	(Optional) Recognizes subdirectories.
/recurse	(Optional) Recursively lists subdirectories.
filesystem **:**	(Optional) Name of the directory containing the files to be displayed. Include the file system alias for the *filesystem* argument, followed by a colon, and, optionally, the name of a directory.
filename	(Optional) Name of the files to display. The files can be of any type. You can use wildcards in the filename. A wildcard character (*) matches all patterns. Strings following a wildcard are ignored.
location {*node-id* | **all**}	(Optional) Specifies the node from which to display a list of files. The *node-id* argument is entered in the *rack*/*slot*/*module* notation. The **all** keyword specifies to display files on all nodes.

Command Default

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

Command Modes

EXEC mode.

Admin EXEC mode.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

If you enter the **dir** command without specifying a directory, the contents of the present working directory are displayed. The **all** keyword displays all files, including deleted files. The size associated with the directory name is the total size for all files in that directory.

The following example shows how to display the contents of a directory:

```
RP/0/RP0/CPU0:router# dir harddisk:/log

Directory of harddisk:/log

5527        drwx  4096        Thu Aug 28 11:21:48 2008  boot_28_Aug_2008_11_21_49
5533        drwx  4096        Thu Aug 28 11:38:54 2008  boot_28_Aug_2008_11_38_54
5538        drwx  4096        Fri Sep  5 13:28:54 2008  boot_05_Sep_2008_13_28_54
5543        drwx  4096        Mon Sep  8 08:55:52 2008  boot_08_Sep_2008_06_59_08
```

```
--More--
```

mkdir

To create a new directory on a file system, use the **mkdir** command in the appropriate mode.

mkdir *filesystem*:[**location** {*node-id*|**all**}]

Syntax Description

filesystem:	File system on which to create a new directory.
location {*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot/module* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Admin EXEC.

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

After you issue the **mkdir** command, Cisco IOS XR software prompts you to specify the name of the directory to be created. When specifying the name of the new directory, include the directory path where you want the new directory to reside. If you do not specify a directory path, the new directory is created in the /usr directory of the file system specified for the *filesystem:* argument.

The following example shows how to create a directory named newdir. The **dir** command is used to verify that the directory has been added.

```
RP/0/RP0/CPU0:router# mkdir harddisk:

Create directory filename []?newdir
Created dir harddisk:/newdir
RP/0/RP0/CPU0:router# dir harddisk:

  Directory of harddisk:

  11193       drwx  4096        Fri Feb 13 06:45:05 2009  newdir
  37146       drwx  4096        Sun Dec 14 15:30:48 2008  malloc_dump
  43030       drwx  4096        Wed Dec 24 11:20:52 2008  tracebacks
  43035       drwx  4096        Thu Jan  8 18:59:18 2009  sau
  51026       drwx  4096        Sat Dec 27 02:52:46 2008  tempA
  51027       drwx  4096        Sat Dec 27 02:04:10 2008  dir.not.del
  -430307552  -rwx  342         Fri Jan 16 10:47:38 2009  running-config
  -430305504  -rwx  39790       Mon Jan 26 23:45:56 2009  cf.dat

  39929724928 bytes total (39883231232 bytes free)
```

pwd

To display the present working directory, use the **pwd** command in

EXEC mode

.

pwd

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

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

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

```
RP/0/RP0/CPU0:router# pwd
disk0:/usr
```

rmdir

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

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

Syntax Description

filesystem	Name of the file system from which to delete a directory, followed by a colon.
location {*node-id* | **all**}	Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Use the **rmdir** command to remove directories (for example, to free up disk space) from a file system. After you issue the **rmdir** command, the Cisco IOS XR software prompts you to specify the name of the directory to be deleted.

When a directory contains files, you must remove the files before deleting the directory. Use the **delete** command to remove files.

The following example shows how to delete a subdirectory from the hard disk. The **dir** command is used to verify that the directory has been deleted.

```
RP/0/RP0/CPU0:router# rmdir harddisk:

Remove directory filename []?newdir
Delete harddisk:/newdir[confirm]y
RP/0/RP0/CPU0:router# dir harddisk:

  Directory of harddisk:

  37146       drwx  4096        Sun Dec 14 15:30:48 2008  malloc_dump
  43030       drwx  4096        Wed Dec 24 11:20:52 2008  tracebacks
  43035       drwx  4096        Thu Jan  8 18:59:18 2009  sau
  51026       drwx  4096        Sat Dec 27 02:52:46 2008  tempA
  51027       drwx  4096        Sat Dec 27 02:04:10 2008  dir.not.del
  -430307552  -rwx  342         Fri Jan 16 10:47:38 2009  running-config
  -430305504  -rwx  39790       Mon Jan 26 23:45:56 2009  cf.dat

  39929724928 bytes total (39883235328 bytes free)
```

show filesystem

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

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

Syntax Description

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

Command Default

The file system for the active RP is displayed.

Command Modes

EXEC mode

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

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

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

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

File Systems:

       Size(b)     Free(b)      Type  Flags  Prefixes
             -           -   network     rw  qsm/dev/fs/tftp: tftp:
             -           -   network     rw  qsm/dev/fs/rcp: rcp:
             -           -   network     rw  qsm/dev/fs/ftp: ftp:
   39929724928 39852978176   harddisk     rw  harddisk:
    1024606208   863584256  flash-disk     rw  disk0:
       2092032     2059264       nvram     rw  nvram:
      62390272    62381260       flash     rw  bootflash:
```

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

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

File Systems:
```

```
      Size(b)      Free(b)      Type  Flags  Prefixes
            -            -   network     rw  qsm/dev/fs/tftp: tftp:
            -            -   network     rw  qsm/dev/fs/rcp: rcp:
            -            -   network     rw  qsm/dev/fs/ftp: ftp:
  39929724928  39883235328  harddisk     rw  harddisk:
      2092032      2019328     nvram     rw  nvram:
   1024606208    847888384  flash-disk     rw  disk0:
     62390272     62153616     flash     rw  bootflash:
```

Table 23: 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 {*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation. Use the **all** keyword to indicate all nodes.

Command Default

The disk storage media for the active RP is displayed.

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

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

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

```
sysadmin-vm:0_RP0 #show media
Thu Nov 30 14:57:14.002 WET
Media Information for local node.
-----------------------------------------------
Partition                    Size     Used  Percent    Avail
rootfs:                      2.7G     1.5G      59%     1.1G
apphost:                     1.9G      61M       4%     1.7G
/dev/sde                     870M     401M      50%     409M
harddisk:                    2.4G     966M      43%     1.3G
log:                         459M      67M      16%     359M
config:                      159M     2.5M       2%     144M
disk0:                       1.3G     108M       9%     1.1G
-------------------------------------------------
rootfs: = root file system (read-only)
log: = system log files (read-only)
config: = configuration storage (read-only)
```

Table 24: show media Field Descriptions

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

Field	Description
Avail	Available free partition space.

Hardware Redundancy and Node Administration Commands

This module describes the commands used to manage the hardware redundancy, power, and administrative status of the nodes on a router running Cisco IOS XR software.

crs8 set min-power-modules

To configure the minimum number of modular power entry modules (PEMs) on the 8-slot line card chassis, use the **crs8 set min-power-modules** command in administration configuration mode. To remove the configuration and revert to the default, use the **no** form of this command.

crs8 set min-power-modules *number*
no crs8 set min-power-modules *number*

Syntax Description

number	Minimum number of power modules for the chassis. Values can be from 0 to 4.

Command Default

Four DC power modules or three AC power modules

Command Modes

Administration configuration

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines

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

Use the **crs8 set min-power-modules** command to configure the number of modular PEMs to be used if you are using less than the default number. If you do not use this command and you install less then the default number of PEMs, you receive alarm messages.

Task ID

Task ID	Operation
system	read, write

This example shows how to set the minimum number of modular power modules to three:

```
RP/0/RP0/CPU0:router(admin-config)# crs8 set min-power-modules 3
```

crs16 set min-power-modules

To configure the minimum number of modular power entry modules (PEMs) on the 16-slot line card chassis, use the **crs16 set min-power-modules** command in administration configuration mode. To remove the configuration and revert to the default, use the **no** form of this command.

crs16 set min-power-modules *number* **location** *node-id*
no crs16 set min-power-modules *number* **location** *node-id*

Syntax Description

number	Minimum number of power modules for the chassis. Values can be from 0 to 8.
location *node-id*	Location of an alarm module for which to specify the number of power modules. The *node-id* is expressed in the notation *rack*/*slot*/*****

Note Enter the **show platform** command to see the location of alarm nodes installed in the router.

Command Default

Six DC power modules or five AC power modules

Command Modes

Administration configuration

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines

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

Use the **crs16 set min-power-modules** command to configure the number of modular PEMs to be used if you are using less than the default number. If you do not use this command and you install less then the default number of PEMs, you receive alarm messages.

Task ID

Task ID	Operation
system	read, write

This example shows how to set the minimum number of modular power modules to six:

```
RP/0/RP0/CPU0:router(admin-config)# crs16 set min-power-modules 6 location 0/AM0/SP
```

dsc serial

To define the 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

serial_id	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 *rack_num*	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.

Command Default

No default behavior or values

Command Modes

Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The task ID was updated to system.

Usage Guidelines

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

For more information about identifying and selecting a DSC on your router, see *Cisco IOS XR Getting Started Guide for the Cisco CRS Router*.

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

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
```

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 keywords or arguments.

Command Default

Environment monitoring is enabled.

Command Modes

Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **env disable** command was moved from the root-system task ID to the system task ID.

Usage Guidelines

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

By default, 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

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
```

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 keywords or arguments.

Command Default

Power supply monitoring is enabled.

Command Modes

Administration configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
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 3.4.1	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.

Usage Guidelines

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

Task ID

Task ID	Operations
system	read, write

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
```

fpd auto-upgrade

To enable the automatic upgrade of FPD images during a software upgrade, use the **fpd auto-upgrade** command in Admin Configuration mode. To disable automatic FPD upgrades, use the **no** form of this command.

fpd auto-upgrade

Syntax Description

This command has no keywords or arguments.

Command Default

FPD images are not automatically upgraded.

Command Modes

Admin Configuration mode

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines

By default automatic upgrades of the FPD images are not performed during a software upgrade. Once the **fpd auto-upgrade** command is enabled, when you upgrade the software and an FPD upgrade is required, the FPD upgrade is done automatically before the router is rebooted. The automatic FPD upgrade works only if the FPD image is upgraded together with the mini installation PIE. For example, use the **install add** and **install activate** commands as shown here:

```
(admin)# install add comp-hfr-mini.pie hfr-fpd.pie hfr-mpls-p.pie
(admin)# install activate disk0:/comp-hfr-mini.pie disk0:/hfr-fpd.piedisk0: hfr-mpls-p.pie
```

Task ID

Task ID	Operation
system	read, write

The following example shows how to enable automatic FPD upgrades:

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

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

Command Default

No default behavior or values

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.9.0	This command was deprecated.

Usage Guidelines

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

Note This command is deprecated as of Cisco IOS XR Release 3.9.0.

Before you can upgrade a single-chassis system from a release of Cisco IOS XR software prior to Release 3.3.0, 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, refer to the 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.

Task ID

Task ID	Operations
root-system	read, write
root-lr	read, write

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
```

hw-module high-bandwidth

To upgrade the RSP3 Lite card from 80Gig per line card capacity to 220Gig per Line card capacity (for Enhanced ethernet linecards), use the **hw-module high-bandwidth** command in the appropriate mode. To restore the default capacity, use the **no** form of the command.

hw-module high-bandwidth
no hw-module high-bandwidth

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin config

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

This command can be used only after applying the appropriate license to RSPLite3. Traditional or smart licensing can be used.

Task ID

Task ID	Operation
sysmgr	execute

Example

This example shows how to use the **hw-module high-bandwidth** command:

```
RP/0/RP0/CPU0:router (config) # hw-module high-bandwidth
```

hw-module location

To configure various hardware attributes for a specific node, or for all nodes installed in the router, use the **hw-module location** command in EXEC or administration EXEC mode.

EXEC Mode
hw-module location *node-id* {**maintenance-mode**|**reload** *path*}
Administration EXEC Mode
hw-module location *node-id* **reload** *path*

Syntax Description

node-id	Slot whose hardware attributes you want to configure. The *node-id* is expressed in the notation *rack*/*slot*/*****. **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.
path	Specific image you want to download onto the specific node or nodes. Replace *path* with the TFTP or disk path to the image you want to download.

Command Default

None

Command Modes

EXEC

Global Configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.4.0	The **maintenance-mode** keyword was added in EXEC mode.
Release 4.1.0	The warm reload option was removed.

Usage Guidelines

To reset a specific node, or to put a node into maintenance mode, use the **hw-module location** command in Admin EXEC mode.

To reset a specific node or all nodes, use the **hw-module location** command in administration EXEC mode.

Starting with Cisco IOS XR Release 4.0.1, it is recommended to use the partially qualified node ID in the **hw-module location** command. Specify an entire slot using the notation *rack*/*slot*/*****.

Note Before reloading nodes, 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)

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 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 power disable location *node-id*

Syntax Description

location *node-id*	Identifies the node whose power-on feature you want to disable. The *node-id* argument is expressed in the *rack/slot/module* notation.

Command Default

Power is on for all nodes.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.9.0	The option to use this command without the **disable** keyword was removed.

Usage Guidelines

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

Use the **show 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

The following example shows how to disable the node power-on feature 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 disable location 0/0/CPU0
```

hw-module port-control license

To request (and apply) license for (A9K-4T16GE-TR and A9K-4T16GE-SE) combo card , use the **hw-module port-control license** command in the appropriate mode. To remove the applied license, use the **no** form of the command.

hw-module port-control license location *node-id*
no hw-module port-control license location *node-id*

Syntax Description

location *node-id*	Interface details.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

The **hw-module port-control license** command is used to apply the requested license on the combo card. The granted license is permanent , unless the user wants to remove license on this card and use it on some other card. LC reload is mandatory for the license to take effect. When the LC comes up after the reload, the licenses are installed and can be verified using the **show license entitlement** command.

If the user wants to use the combo license on some other line-card instead of the current one, then the license has to be removed. The **no hw-module port-control license** command removes the applied license.

Task ID

Task ID	Operation
sysmgr	execute

Example

This example shows how to use the **hw-module port-control license** command:

```
RP/0/RP0/CPU0:router (config) # hw-module port-control license location 0/1/CPU0
```

hw-module port-control non-combo-mode

To use all the four Tengig ports, instead of the Gigabit ethernet ports, use the **hw-module port-control non-combo-mode** command in the appropriate mode. To remove the non-combo configuration, use the **no** form of the command.

hw-module port-control non-combo-mode location *linecard-slot*
no hw-module port-control non-combo-mode location *linecard-slot*

Syntax Description

location *linecard-slot*	The interface and slot details.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

On the (A9K-4T16GE-TR and A9K-4T16GE-SE) combo card, the customer can either use 16Gigabit Ethernet + 2Tengig or 4Tengig ports. This option is when the customer does not have the Wildchild combo license. If the License is installed, all the ports will be enabled. In case, the license is not available and the customer wants to use all the 4 Tengig ports instead of the Gigabit ethernet ports, then , this command needs to be used. This is the non-combo mode.

Note LC reload is mandatory for the mode to take effect.

If the **hw-module port-control non-combo-mode** command is not configured, the line card will operate in the default mode. In the default mode, the two Tengig ports which are enabled are - 0/*/0/16 and 0/*/0/17.

Task ID

Task ID	Operation
sysmgr	execute

Example

This example shows how to use the **hw-module port-control non-combo-mode** command:

```
RP/0/RP0/CPU0:router (config) # hw-module port-control non-combo-mode location 0/1/CPU0
```

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	Disables the node reset feature on the specified node.
location *node-id*	Identifies the node you want to reload. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

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.

Usage Guidelines

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

The **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

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
```

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

node-id	Location of the service card that you want to move into offline mode. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

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.

Usage Guidelines

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

In 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.

Task ID

Task ID	Operations
root-lr	read, write

The following example shows how to move the card at 0/1/CPU0 into maintenance mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# hw-module service maintenance-mode location 0/1/CPU0
```

hw-module service offline location

To configure offline mode as the role for a specific node, use the **hw-module service offline location** 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

node-id	Location of the service card that you want to move into offline mode. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

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

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

The following example shows how to move the card at 0/1/CPU0 into offline mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# hw-module service offline location 0/1/CPU0
```

hw-module shutdown

Note Effective with Cisco IOS XR Release 3.9.0, the **hw-module shutdown** command is not supported.

To administratively shut down a specific node, use the **hw-module shutdown** command in Admin 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 *node-id*	Identifies the node you want to shut down. The *node-id* argument is expressed in the *rack/slot/module* notation.

Command Default

Nodes are in the up state.

Command Modes

Admin Configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 3.9.0	This command was removed.

Usage Guidelines

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.

Enter the **show platform** command in Admin EXEC mode to display the results of the **hw-module shutdown** command.

Task ID

Task ID	Operations
root-system	read, write
root-lr	read, write

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
```

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

subslot-id	Specifies the subslot to be restarted. The *subslot-id* argument is entered in the *rack*/*slot*/*subslot* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

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

The following example shows how to restart the SPA in slot 2, subslot 1:

```
RP/0/RP0/CPU0:router# hw-module subslot 0/2/1 reload
```

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

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

Command Default

Shutdown is powered if no option is specified.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
root-lr	read, write

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

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

isolation enable

To configure the route processor to collect debug information like a process coredump from a failed route processor, when NSR triggers failover, use the **isolation enable** command in global configuration mode. To disable RP isolation during failover, use the **no** form of this command.

isolation enable
no isolation enable

Syntax Description

This command has no keywords or arguments.

Command Default

If the **isolation enable** is not configured, the **nsr process-failures switchover** command immediately restarts the active RP during NSR failover and hence the active RP cannot collect the required debug information to identify the cause of the failure.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

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

During RP failover, the standby RP takes over as the active RP immediately without a protocol flap and NSR restarts the active RP. This switchover time is less than the timeout for the protocol to flap. Because the active RP is restarted immediately, it is not possible to get debug details to identify the cause of the failure.

The **isolation enable** command enables NSR to trigger RP switchover without protocol flap and collect the required debug information to identify the cause of the failure. The RP isolation feature keeps the active RP in an isolated state wherein it continues to operate even after the switchover. Using the **isolation enable** command you can enable RP isolation, thereby providing sufficient time for the failed RP to collect the necessary debug information like a process coredump before restarting a failed route processor.

Task ID

Task ID	Operation
transport	read, write

This example shows how to configure the route processor to collect debug information when NSR triggers failover:

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

isolation multiple

To configure the route processor to collect debug information of multiple protocols from a failed route processor when multiple protocols trigger NSR, which in turn triggers failover, use the **isolation multiple** command in the global configuration mode. To disable RP isolation during failover, caused by multiple protocols, use the **no** form of this command.

isolation multiple
no isolation multiple

Syntax Description

This command has no keywords or arguments.

Command Default

If the **isolation multiple** command is not configured and the failover is triggered by multiple protocols, the **isolation enable** command enables a failed RP to collect the required debug information of only the first failed protocol.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

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

During RP failover, the standby RP takes over as the active RP immediately and restarts the active RP to support NSR without a protocol flap. This switchover time is less than the timeout for the protocol to flap. Because the active RP is restarted immediately, it is not possible to get debug details to identify the cause of the failure.

The **isolation enable** command enables NSR to trigger RP switchover without protocol flap and collect the required debug information to identify the cause of the failure.

If multiple protocols trigger NSR, the **isolation enable** command does not enable the RP to collect the required debug information. Use the **isolation multiple** command to enable the active RP to collect debug information even if the failure is caused by multiple protocols.

Task ID

Task ID	Operation
transport	read, write

This example shows how to configure the route processor to collect debug information when multiple protocols trigger NSR, which in turn triggers failover:

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

led mode

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

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

Syntax Description

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

Command Default

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

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operation
system	read, write

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

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

Uncommitted changes found, commit them? [yes]:
RP/0/RP0/CPU0:router(admin)# show led location all | i 0/RP0/CPU0

     LOCATION        MESSAGE        MODE      STATUS
    ================================================
```

```
     0/0/SP       IOX-RUN       DEFAULT   UNLOCKED
     0/1/SP       IOX-RUN       DEFAULT   UNLOCKED
0/RP0/CPU0        STBY_RP       DEFAULT   UNLOCKED
0/RP1/CPU0       ACTV RP        DEFAULT   UNLOCKED
```

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 switchover, use the **no** form of this command.

redundancy switchover [**location** *node-id*]
no redundancy switchover [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Specifies the primary RP on which to force a switchover. The *node-id* argument is expressed in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The **redundancy switchover** command was moved from the system task ID to the root-lr task ID.
Release 3.5.0	This command was supported in administration EXEC mode.

Usage Guidelines

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

Use the **redundancy switchover** command to trigger a switchover from the primary RP to the standby RP. When the **redundancy switchover** command is issued, the running (committed) configuration is automatically saved and loaded during switchover, and the standby RP becomes the active primary RP, while the original primary RP becomes the standby RP.

Note The **redundancy switchover** command can be used only if the standby RP is in the ready state. Use the **show redundancy** command to view the status of the RPs.

Task ID

Task ID	Operations
root-lr	read, write

The following example shows partial output for a successful redundancy switchover operation:

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

  Redundancy information for node 0/RP0/CPU0:
  ==========================================
  Node 0/RP0/CPU0 is in ACTIVE role
  Partner node (0/RP1/CPU0) is in STANDBY role
  Standby node in 0/RP1/CPU0 is ready

  Reload and boot info
  ----------------------
  RP reloaded Tue Mar 28 09:02:26 2006: 5 hours, 41 minutes ago
  Active node booted Tue Mar 28 09:02:56 2006: 5 hours, 41 minutes ago
  Last switch-over Tue Mar 28 09:09:26 2006: 5 hours, 34 minutes ago
  Standby node boot Tue Mar 28 09:10:37 2006: 5 hours, 33 minutes ago
  Standby node last went not ready Tue Mar 28 09:25:49 2006: 5 hours, 18 minutes
  go
  Standby node last went ready Tue Mar 28 09:25:51 2006: 5 hours, 18 minutes ago
  There has been 1 switch-over since reload
  ....
RP/0/RP0/CPU0:router# redundancy switchover

  Initializing DDR SDRAM...found 2048 MB
  Initializing ECC on bank 0
  ...
  Turning off data cache, using DDR for first time

  Initializing NVRAM...
  Testing a portion of DDR SDRAM ...done
  Reading ID EEPROMs ...
  Initializing SQUID ...
  Initializing PCI ...

  PCI0 device[1]: Vendor ID 0x10ee

  Configuring MPPs ...
  Configuring PCMCIA slots ...
  --More--
```

If the standby RP is not in the ready state, the switchover operation is not allowed. The following example shows output for a failed redundancy switchover attempt:

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

  This node (0/RP0/CPU0) is in ACTIVE role
  Partner node (0/RP1/CPU0) is in UNKNOWN role

RP/0/RP0/CPU0:router# redundancy switchover

  Standby card not running; failover disallowed.
```

show 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	Displays DSC information from all available nodes in the system.
mine	Displays information about the current node.
location *node-id*	Displays DSC information for a specific node. The *node-id* is expressed in the *rack/slot/module* notation.

Command Default

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
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.

Usage Guidelines

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

For more information about identifying and selecting a DSC on your router, see *Cisco IOS XR Getting Started Guide for the Cisco CRS Router*.

Task ID

Task ID	Operations
system	read

The following example shows sample output from the **show dsc** command with the **mine** keyword.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show dsc mine
Sun Jan 25 04:26:33.103 PST

NODE           ROLE        PRIORITY      TBEACON   PRESENT  SERIAL ID
```

```
==============================================================================
0/RP0/CPU0      DSC          DEFAULT       300       YES      TBA09160TBA
------------------------------------------------------------------------------
```

Table 25: show dsc Field Descriptions

Field	Description
NODE	Location of the node in the *rack*/*slot*/*module* notation.
ROLE	Role this node is performing.
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 example shows sample output from the **show dsc** command with the **all** keyword:

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

NODE            ROLE        PRIORITY      TBEACON   PRESENT  SERIAL ID

==============================================================================
0/RP0/CPU0      DSC          DEFAULT       300       YES      TBA09370035
------------------------------------------------------------------------------
0/RP1/CPU0      BACKUP       DEFAULT       300       YES      TBA09370035
------------------------------------------------------------------------------
0/4/CPU0        NON-DSC      65            300       YES      TBA09370035
------------------------------------------------------------------------------
0/4/CPU1        NON-DSC      66            300       YES      TBA09370035
------------------------------------------------------------------------------
```

show environment

To display environmental monitor parameters for the system, use the **show environment** command in the appropriate mode.

EXEC Mode:
show environment [{**all**|**last**|**leds**|**location** {**all***node-id*}|**table**|**temperatures**|**voltages**}] [*node-id*]
Administration EXEC Mode:
show environment [{**all**|**fans**|**last**|**leds**|**location** {**all***node-id*}|**power-supply**|**table**|**temperatures**|**trace**|**voltages**}] [*node-id*]

Syntax Description

all	(Optional) Displays information for all environmental monitor parameters.
fans	(Optional) Displays information about the fans.
last	(Optional) Displays the environmental statistics at the time of the last shutdown.
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.
power-supply	(Optional) Displays power supply voltage and current information.
table	(Optional) Displays environmental parameter ranges.
temperatures	(Optional) Displays system temperature information.
trace	(Optional) Displays trace data for environment monitoring.
voltages	(Optional) Displays system voltage information.
node-id	(Optional) Node whose information you want to display. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation.

Command Default

All environmental monitor parameters are displayed.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The optional *node-id* argument was supported. The **show environment** command was moved from the root-system task ID to the system task ID.

Usage Guidelines

The **show environment** command displays information about the hardware that is installed in the system, including fans, LEDs, power supply voltage, and current information and temperatures.

Task ID

Task ID	Operations
system	read

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

```
RP/0/RP0/CPU0:router# show environment temperatures

  R/S/I   Modules         Inlet           Exhaust         Hotspot
                          Temperature     Temperature     Temperature
                          (deg C)         (deg C)         (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
```

The following example shows sample output from the **show environment** command with the **temperatures** keyword on the Cisco CRS Series Modular Services Card 140G:

```
RP/0/RP0/CPU0:router(admin)# show environment tempuratures location 0/0/cpu0

Thu Oct 28 10:45:05.852 UTC

R/S/I   Modules         Inlet           Exhaust         Hotspot
                        Temperature     Temperature     Temperature
                        (deg C)         (deg C)         (deg C)
0/0/*
```

```
host              33, 31          48, 45          47, 48, 52,
                                                      38, 57, 47, 35
cpu                                               52, 36
plimasic          34              46              44, 42
```

Table 26: show environment temperatures Field Descriptions, on page 325 describes the significant fields shown in the display.

Table 26: show environment temperatures Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format *rack*/*slot*/*module*.
Modules	Module for which temperature information is displayed.
Inlet Temperature (deg C)	Current temperature of the inlet sensor, in degrees Celsius. **Note** The inlet temperature corresponds to the room air temperature entering the router.
Exhaust Temperature (deg C)	Current temperature of the exhaust sensor, in degrees Celsius. **Note** The exhaust temperature corresponds to the air being exhausted from the router.
Hotspot Temperature (deg C)	Current temperature of the hotspot, in degrees Celsius.

The following example shows 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 27: show environment leds Field Descriptions, on page 325describes the significant fields shown in the display.

Table 27: show environment leds Field Descriptions

Field	Description
rack_num/*slot_num*/*:	Rack number and slot number where the node resides.
Module (host) LED status says:	Current LED status of the specified node.

The following example shows sample output from the **show environment** command the with the **power-supply** keyword:

```
RP/0/RP0/CPU0:router(admin)# show env power-supply
```

```
Thu Aug  5 00:18:29.492 DST
                Power Supply        Voltage        Current
                AC-REC AC-REC         (V)             (A)
 Zone 1:        [A], [B]        54.965, 54.181   3.447,  4.073
 Zone 2:        [A], [B]        54.671, 54.083   8.983,  8.670
 Zone 3:        [A], [B]        55.063, 54.279   3.865,  4.073

 Total Current:   33.111 A
 Total Power  : 1804.049 W
```

This table describes the significant fields shown in the display.

Table 28: show environment power-supply Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format PEM/Power Module/* (for example 0/PM0/*).
Modules	Module for which power information is displayed.
Capacity	Power capacity of each power module in Watts.
Status	Operational status of power modules.
Power Draw	Real (measured) power drawn from each power module.
Voltage	Real (measured) power module voltage.
Current	Real (measured) power module current draw.
Power Shelves Type	AC or DC.
Total Power Capacity	Sum of the power capacity of each of the modules installed in the chassis.
Usable Power Capacity	Sum of the power capacity of each of the powered and operational power modules installed in the chassis.
Supply Failure Protected Capacity	Protected power capacity of the chassis with power module redundancy (ASR 9010 AC 3+3, ASR 9010 DC 5+1, ASR 9006 AC 2+1, ASR 9010 DC 2+1).
Feed Failure Protected Capacity	Feed protected power capacity. This value applies to the ASR 9010 AC system only.
Worst Case Power Used	Sum of the estimated power draw of each of the load modules in the chassis. Load modules can be fan trays, RSPs and line cards.
Worst Case Power Available	Usable power capacity minus the worst case power used.
Supply Protected Capacity Available	Supply failure protected capacity minus the worst case power used.
Feed Protected Capacity Available	Feed failure protected capacity minus the worst case power used.

Field	Description
Power Budget Enforcement	This field displays the Power Budget Enforcement status as Enabled or Disabled.
Power Budget Mode	This field displays the power redundancy mode used (for example, N+1).
N+1 Supply Failure Protected Capacity	This field represents the Supply Protected Power capacity of the chassis with power module redundancy in N+1 mode.

show fpd package

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

show fpd package

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.4.1	The **show fpd package** command output was updated to display the ROMMON images.

Usage Guidelines

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

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

Task ID

Task ID	Operations
sysmgr	read

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

```
RP/0/RP0/CPU0:Router# admin
RP/0/RP0/CPU0:Router(admin)# show fpd package

Thu Jun 24 10:58:49.319 UTC

================================ ============================================
                                        Field Programmable Device Package
                                 ============================================
                                                              SW      Min Req   Min Req
Card Type            FPD Description            Type Subtype  Version  SW Ver    HW Vers
==================== ========================== ==== ======= ========== ========  =========
1OC768-ITU/C         OPTICS FIRMWARE 104B4      lc   fpga2     104.04        0.0       0.0

-------------------------------------------------------------------------------------------
1OC768-DWDM-L        OPTICS FIRMWARE 104B4      lc   fpga2     104.04        0.0       0.0

-------------------------------------------------------------------------------------------
1OC768-DPSK/C        OPTICS FIRMWARE 101B3      lc   fpga2     101.03        0.0       0.0
```

```
-------------------------------------------------------------------------------------------
10C768-DPSK/C-O      OPTICS FIRMWARE 101B3      lc   fpga2     101.03        0.0        0.0
-------------------------------------------------------------------------------------------
10C768-DPSK/C-E      OPTICS FIRMWARE 101B3      lc   fpga2     101.03        0.0        0.0
-------------------------------------------------------------------------------------------
CRS-ADVSVC-PLIM      FPGA mCPU0 0.557           lc   fpga2      0.557        0.0        0.0
                     FPGA sCPU0 0.557           lc   fpga3      0.557        0.0        0.0
                     FPGA mCPU1 0.557           lc   fpga4      0.557        0.0        0.0
                     FPGA sCPU1 0.557           lc   fpga5      0.557        0.0        0.0
                     FPGA PLIM_SVC 0.41013      lc   fpga1      0.41013      0.0        0.0
-------------------------------------------------------------------------------------------
CRS1-SIP-800         JACKET FPGA swv6.0         lc   fpga1      6.00         5.0        0.0
                    FPGA swv6.0 hwv80          lc   fpga1      6.00        5.0       0.80
-------------------------------------------------------------------------------------------
8-10GBE              FPGA swvA.0                lc   fpga1     10.00        0.0        0.0
-------------------------------------------------------------------------------------------
OC48-POS-16-ED       FPGA PLIM_OC48 9.0         lc   fpga1      9.00        0.0        0.0
-------------------------------------------------------------------------------------------
4-10GE               SQUIRREL FPGA 10.0         lc   fpga1     10.00        0.0        0.0
-------------------------------------------------------------------------------------------
42-1GE               FPGA swv6.0                lc   fpga1      6.00        0.0        0.0
                    FPGA swv6.0 hwv0.80        lc   fpga1      6.00        0.0       0.80
-------------------------------------------------------------------------------------------
20-1GE-FLEX          FPGA swv6.0                lc   fpga1      6.00        0.0        0.0
                    FPGA swv6.0 hwv0.80        lc   fpga1      6.00        0.0       0.80
-------------------------------------------------------------------------------------------
2-10GE-WL-FLEX       FPGA swv6.0                lc   fpga1      6.00        0.0        0.0
                    FPGA swv6.0 hwv0.80        lc   fpga1      6.00        0.0       0.80
-------------------------------------------------------------------------------------------
Route Processor      ROMMONA swv1.54 asmp       lc   rommonA    1.52        0.0        0.0
                     ROMMONA swv1.54 dsmp       lc   rommonA    1.52        0.0        0.0
                     ROMMONB swv1.54 asmp       lc   rommon     1.54        0.0        0.0
                     ROMMONB swv1.54 dsmp       lc   rommon     1.54        0.0        0.0
-------------------------------------------------------------------------------------------
SC                   ROMMONA swv1.54 asmp       lc   rommonA    1.52        0.0        0.0
                     ROMMONA swv1.54 dsmp       lc   rommonA    1.52        0.0        0.0
                     ROMMONB swv1.54 asmp       lc   rommon     1.54        0.0        0.0
                     ROMMONB swv1.54 dsmp       lc   rommon     1.54        0.0        0.0
```

```
-------------------------------------------------------------------------------------------
RP                  ROMMONA swv1.54 asmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
Shelf Controller GE ROMMONA swv1.54 asmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
RP                  ROMMONA swv1.54 asmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
Shelf Controller GE2 ROMMONA swv1.54 asmp      lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
DRP                 ROMMONA swv1.54 asmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 sp         lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
DRP_B               ROMMONA swv1.54 asmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52         0.0         0.0
                    ROMMONA swv1.54 sp         lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
```

```
S1S2S3              ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
S1S3                ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
S2                  ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
Fabric HS123        ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
Fabric HS123 Star   ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
Fabric HS13 Star    ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
Fabric QQS123       ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
LED                 ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
40G-MSC             ROMMONA swv1.54 asmp       lc   rommonA     1.52        0.0        0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52        0.0        0.0
                    ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54        0.0        0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
--------------------------------------------------------------------------------------------
MSC_B               ROMMONA swv1.54 asmp       lc   rommonA     1.52        0.0        0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.52        0.0        0.0
                    ROMMONA swv1.54 sp         lc   rommonA     1.52        0.0        0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54        0.0        0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54        0.0        0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54        0.0        0.0
```

```
-------------------------------------------------------------------------------------------
FP40                ROMMONA swv1.54 asmp       lc   rommonA     1.53         0.0         0.0
                    ROMMONA swv1.54 dsmp       lc   rommonA     1.53         0.0         0.0
                    ROMMONA swv1.54 sp         lc   rommonA     1.53         0.0         0.0
                    ROMMONB swv1.54 asmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 dsmp       lc   rommon      1.54         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
PSAL                ROMMONA swv1.54 sp         lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
Unknown             ROMMONA swv1.54 sp         lc   rommonA     1.54         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
FAN                 ROMMONA swv1.54 sp         lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
FC Fan Controller   ROMMONA swv1.54 sp         lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
LED                 ROMMONA swv1.54 sp         lc   rommonA     1.52         0.0         0.0
                    ROMMONB swv1.54 sp         lc   rommon      1.54         0.0         0.0
-------------------------------------------------------------------------------------------
SPA-4XT3/E3         SPA E3 Subrate FPGA        spa  fpga2       1.04         0.0         0.0
                    SPA T3 Subrate FPGA        spa  fpga3       1.04         0.0         0.0
                    SPA I/O FPGA               spa  fpga1       1.00         0.0         0.0
                    SPA ROMMON                 spa  rommon      2.12         0.0         0.0
-------------------------------------------------------------------------------------------
SPA-2XT3/E3         SPA E3 Subrate FPGA        spa  fpga2       1.04         0.0         0.0
                    SPA T3 Subrate FPGA        spa  fpga3       1.04         0.0         0.0
                    SPA I/O FPGA               spa  fpga1       1.00         0.0         0.0
                    SPA ROMMON                 spa  rommon      2.12         0.0         0.0
-------------------------------------------------------------------------------------------
SPA-OC192POS        SPA FPGA swv1.3            spa  fpga1       1.03         0.0         0.0
-------------------------------------------------------------------------------------------
SPA-8XOC12-POS      SPA FPGA swv1.0            spa  fpga1       1.00         0.0         0.5
-------------------------------------------------------------------------------------------
```

```
SPA-4XOC3-POS        SPA FPGA swv3.4            spa  fpga1       3.04        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-OC192POS-XFP     SPA FPGA swv1.2            spa  fpga1       1.02        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-8X1GE            SPA FPGA swv1.8            spa  fpga1       1.08        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-2XOC48POS/RPR    SPA FPGA swv1.0            spa  fpga1       1.00        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-4XOC48POS/RPR    SPA FPGA swv1.0            spa  fpga1       1.00        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-10X1GE-V2        SPA FPGA swv1.10           spa  fpga1       1.10        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-8X1GE-V2         SPA FPGA swv1.10           spa  fpga1       1.10        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-5X1GE-V2         SPA FPGA swv1.10           spa  fpga1       1.10        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-1X10GE-L-V2      SPA FPGA swv1.9            spa  fpga1       1.09        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-1X10GE-WL-V2     SPA FPGA swv1.11           spa  fpga1       1.11        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-1XOC3-ATM-V2     SPA FPGA swv1.2            spa  fpga1       1.03        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-2XOC3-ATM-V2     SPA FPGA swv1.2            spa  fpga1       1.03        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-3XOC3-ATM-V2     SPA FPGA swv1.2            spa  fpga1       1.03        0.0        0.0
--------------------------------------------------------------------------------------------
SPA-1XOC12-ATM-V2    SPA FPGA swv1.2            spa  fpga1       1.03        0.0        0.0
--------------------------------------------------------------------------------------------
```

This table describes the significant fields shown in the display:

Table 29: show fpd package Field Descriptions

Field	Description
Card Type	Module part number.
FPD Description	Description of all FPD images available for the SPA.
Type	Hardware type. Possible types can be: • spa—Shared port adapter • lc—Line card

Field	Description
Subtype	FPD subtype. These values are used in the **upgrade hw-module fpd** command to indicate a specific FPD image type to upgrade.
SW Version	FPD software version recommended for the associated module running the current Cisco IOS XR software.
Min Req SW Vers	Minimum required FPD image software version to operate the card. Version 0.0 indicates that a minimum required image was not programmed into the card.
Min Req HW Vers	Minimum required hardware version for the associated FPD image. A minimum hardware requirement of version 0.0 indicates that all hardware can support this FPD image version.

Note In the **show fpd package** command output, the "subtype" column shows the FPDs that correspond with each SPA image. To upgrade a specific FPD with the **upgrade hw-module fpd** command, replace the *fpga-type* argument with the appropriate FPD from the "subtype" column, as shown in the following example:

```
RP/0/RP0/CPU0:router(admin)# upgrade hw-module fpd fpga2 location 0/3/1 reload
```

show hw-module fpd

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

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

Syntax Description

location {*node-id* | **all**}	Specifies the location of the module. The *node-id* argument is expressed in the *rack/slot/module* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	The **show hw-module fpd** command output was updated to display the ROMMON images.

Usage Guidelines

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

Task ID

Task ID	Operations
sysmgr	read
root-lr	read

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

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

==================================== ========================================
                                     Existing Field Programmable Devices
                                     ========================================
                                       HW                        Current SW Upg/
Location     Card Type               Version Type Subtype Inst   Version   Dng?
============ ======================= ======= ==== ======= ==== =========== ====
0/1/CPU0     CRS1-SIP-800              0.96  lc   fpga    0       2.0       No
------------------------------------------------------------------------------
0/1/0        SPA-4XOC3-POS             1.0   spa  fpga    0       3.4       No
------------------------------------------------------------------------------
0/1/5        SPA-8X1GE                 2.2   spa  fpga    5       1.8       No
------------------------------------------------------------------------------
0/6/CPU0     CRS1-SIP-800              0.96  lc   fpga    0       2.0       No
------------------------------------------------------------------------------
0/6/0        SPA-4XOC3-POS             1.0   spa  fpga    0       3.4       No
```

```
--------------------------------------------------------------------------------
0/6/4        SPA-8XOC3-OC12-POS         1.1   spa  fpga    4       0.5      Yes
--------------------------------------------------------------------------------
0/6/5        SPA-8X1GE                  2.2   spa  fpga    5       1.8      No
--------------------------------------------------------------------------------
NOTES:
1.  One or more FPD needs an upgrade or a downgrade.  This can be accomplished
    using the "admin upgrade hw-module fpd" CLI.


RP/0/RP0/CPU0:router# show hw-module fpd location 0/6/cpu0

Sun Apr 18 03:18:24.903 DST

==================================== ========================================
                                     Existing Field Programmable Devices
                                     ========================================
                                       HW                        Current SW Upg/
Location     Card Type                Version Type Subtype Inst   Version   Dng?
============ ======================== ======= ==== ======= ==== =========== ====
0/6/CPU0     CRS1-SIP-800               0.96  lc   fpga1   0       6.00     No
                                              lc   rommonA 0       2.100    No
                                              lc   rommon  0       2.100    No
--------------------------------------------------------------------------------
```

If the cards in the system do not meet the minimum requirements, the output contains a “NOTES” section that states how to upgrade the FPD image.

Table 30: show hw-module fpd Field Descriptions

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

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

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

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

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

The following example shows sample output for the **show hw-module subslot brief** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/0 brief

  Subslot 0/1/0 brief info:
  -------------------------
  SPA inserted: YES
  SPA type:     4xOC3 POS SPA
  SPA operational state: READY
  SPA cfg admin up: YES
```

Table 31: 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

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack/slot/module* notation.
device	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • **analog-digital-converter**—Displays analog-to-digital converter information. • **c2w**—Displays Cisco-to-wire bus device information. • **fpga**—Displays SPA field-programmable gate array information. • **framer**—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • **hdlc**—Displays SPA hdlc information, where applicable. • **l2-tcam**—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • **mac**—Displays SPA MAC information. (Not applicable to POS SPAs.) • **pluggable-optics**—Displays pluggable-optics module information. • **power-margining**—Displays power-margining device information. • **sar**—Displays SPA ATM SAR information. • **sdcc**—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • **serdes**—Displays SPA serializer/deserializer information. • **spi4**—Displays system packet interface level 4.2 bus device information. • **temperature-sensor**—Displays temperature sensor information.
device-index	(Optional) Index of the specific device if there are multiple devices of the same type.
device-subindex	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes

EXEC

Release 5.0.0

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows sample output for the **show hw-module subslot config** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/6/cpu0 config

 Thu Feb 19 00:33:02.921 PST

Subslot 0/6/0 config info:
-------------------------
SPA inserted: YES
SPA cfg admin up: YES
SPA cfg power up: YES

Subslot 0/6/1 config info:
-------------------------
SPA inserted: YES
SPA cfg admin up: YES
SPA cfg power up: YES

Subslot 0/6/2 config info:
-------------------------
SPA inserted: NO
SPA cfg admin up: YES
SPA cfg power up: NO

Subslot 0/6/3 config info:
-------------------------
SPA inserted: NO
SPA cfg admin up: YES
SPA cfg power up: NO

Subslot 0/6/4 config info:
-------------------------
SPA inserted: NO
SPA cfg admin up: YES
SPA cfg power up: NO

Subslot 0/6/5 config info:
-------------------------
SPA inserted: NO
```

```
SPA cfg admin up: YES
SPA cfg power up: NO
```

Table 32: show hw-module subslot config Field Descriptions

Field	Description
SPA inserted	Indicates if a SPA is currently detected in the subslot.
SPA cfg admin up	Configured state of the SPA: YES—the SPA is not shut down; NO—the SPA is shut down.
SPA cfg power up	Indicates whether the subslot is currently configured as powered or not.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot counters

To display statistics related to the processing of internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot counters** command in EXEC

mode.

show hw-module subslot [*node-id*] **counters** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
device	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • **analog-digital-converter**—Displays analog-to-digital converter information. • **c2w**—Displays Cisco-to-wire bus device information. • **fpga**—Displays SPA field-programmable gate array information. • **framer**—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • **hdlc**—Displays SPA hdlc information, where applicable. • **l2-tcam**—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • **mac**—Displays SPA MAC information. (Not applicable to POS SPAs.) • **pluggable-optics**—Displays pluggable-optics module information. • **power-margining**—Displays power-margining device information. • **sar**—Displays SPA ATM SAR information. • **sdcc**—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • **serdes**—Displays SPA serializer/deserializer information. • **spi4**—Displays system packet interface level 4.2 bus device information. • **temperature-sensor**—Displays temperature sensor information.
device-index	(Optional) Index of the specific device if there are multiple devices of the same type.
device-subindex	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows sample output for the **show hw-module subslot counters** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/cpu0 counters

Subslot 0/1/0 counts info:
------------------------
SPA inserted: YES
SPA type:     8xGE SPA
SPA operational state: READY
SPA insertion time:  Wed Jan 14 11:33:24 2009
SPA last time ready: Wed Jan 14 11:33:37 2009
SPA uptime [HH:MM:SS]: 852:54:24

Subslot 0/1/1 counts info:
------------------------
SPA inserted: YES
SPA type:     5xGE SPA
SPA operational state: READY
SPA insertion time:  Wed Jan 14 11:33:24 2009
SPA last time ready: Wed Jan 14 11:33:38 2009
SPA uptime [HH:MM:SS]: 852:54:23
 --More--
```

Table 33: 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.

Field	Description
SPA last time ready	Time the SPA module last changed state to up or ready (the last time the module was loaded or reloaded).
SPA uptime	The time in service or amount of time since the module was last out of service due to a reload, power cycle, or configuration event.

The following example shows sample output for the **show hw-module subslot counters** command with the **framer** keyword:

```
RP/0/RP0/CPU0:router# show hw-module subslot counters framer

  SPA device framer index 0 subindex 0 info:

  Milan Framer counters:
  STREAM 0
  Rx Bytes (48-bit) (#0x381fa078-0x883c): 163857232569448
  Rx Good Bytes (48-bit) (#0x381fa080-0x8840): 1964924
  Rx Good Packets (48-bit) (#0x381fa040-0x8820): 26234
  Tx Byte Cnt Reg (48-bit) (#0x381fe070-0xa838): 9375380
  Tx Good Bytes Cnt Reg (48-bit) (#0x381fe068-0xa834): 8909442
  Tx Transmitted Packet Cnt Reg (48-bit) (#0x381fe040-0xa820): 114692
```

show hw-module subslot errors

To display error information about internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot errors** command in

EXEC

mode.

show hw-module subslot [*node-id*] **errors** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack/slot/module* notation.
device	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • **analog-digital-converter**—Displays analog-to-digital converter information. • **c2w**—Displays Cisco-to-wire bus device information. • **fpga**—Displays SPA field-programmable gate array information. • **framer**—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • **hdlc**—Displays SPA hdlc information, where applicable. • **l2-tcam**—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • **mac**—Displays SPA MAC information. (Not applicable to POS SPAs.) • **pluggable-optics**—Displays pluggable-optics module information. • **power-margining**—Displays power-margining device information. • **sar**—Displays SPA ATM SAR information. • **sdcc**—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • **serdes**—Displays SPA serializer/deserializer information. • **spi4**—Displays system packet interface level 4.2 bus device information. • **temperature-sensor**—Displays temperature sensor information.
device-index	(Optional) Index of the specific device if there are multiple devices of the same type.
device-subindex	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows partial sample output for the **show hw-module subslot errors** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/0 errors

Subslot 0/1/0 errors info:
  ------------------------
  SPA inserted: YES
  SPA type:     4xOC3 POS SPA
  SPA operational state: READY
  SPA last reset reason:   UNKNOWN
  SPA last failure reason: UNKNOWN

  Subslot 0/1/1 errors info:
  ------------------------
  SPA inserted: YES
  SPA type:     1x10GE XFP SPA
  SPA operational state: READY
  SPA last reset reason:   UNKNOWN
  SPA last failure reason: UNKNOWN

  Subslot 0/1/2 errors info:
  ------------------------
  SPA inserted: NO

  Subslot 0/1/3 errors info:
  ------------------------
  SPA inserted: NO

  Subslot 0/1/4 errors info:
  ------------------------
  SPA inserted: YES
  SPA type:     4xOC48 POS/RPR HHSPA
  SPA operational state: READY
  SPA last reset reason:   UNKNOWN
  SPA last failure reason: UNKNOWN

  Subslot 0/1/5 errors info:
  ------------------------
```

```
SPA inserted: YES
SPA type:     8xGE SPA
SPA operational state: READY
SPA last reset reason:   UNKNOWN
SPA last failure reason: UNKNOWN

 --More--
```

Table 34: show hw-module subslot errors Field Descriptions

Field	Description
Subslot */*/* errors info	SPA for which error information is being displayed. The location of the SPA is expressed in the *rack/slot/module* notation.
SPA inserted	Indication if a SPA is currently detected in the subslot.
SPA type	Description of SPA including the technology type, number of ports, height of SPA (HHSPA—single-height, FHSPA—double-height), and optics type.
SPA operational state	Current operational state of the SPA module.
SPA last reset reason	Reason for the most recent reset of this SPA.
SPA last failure reason	Reason for the last failure on this SPA.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot plim-subblock

To display SPA firmware information for a shared port adapter (SPA), use the **show hw-module subslot plim-subblock** command in

EXEC

mode.

show hw-module subslot [*node-id*] **plim-subblock**

Syntax Description

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

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

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
device	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • **analog-digital-converter**—Displays analog-to-digital converter information. • **c2w**—Displays Cisco-to-wire bus device information. • **fpga**—Displays SPA field-programmable gate array information. • **framer**—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • **hdlc**—Displays SPA hdlc information, where applicable. • **l2-tcam**—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • **mac**—Displays SPA MAC information. (Not applicable to POS SPAs.) • **pluggable-optics**—Displays pluggable-optics module information. • **power-margining**—Displays power-margining device information. • **sar**—Displays SPA ATM SAR information. • **sdcc**—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • **serdes**—Displays SPA serializer/deserializer information. • **spi4**—Displays system packet interface level 4.2 bus device information. • **temperature-sensor**—Displays temperature sensor information.
device-index	(Optional) Index of the specific device if there are multiple devices of the same type.
device-subindex	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows sample output for the **show hw-module subslot registers** command:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/1/cpu0 registers

 Thu Feb 19 00:38:32.908 PST

Subslot 0/1/0 registers info:
----------------------------
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/1 registers info:
----------------------------
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/2 registers info:
----------------------------
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/3 registers info:
----------------------------
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/4 registers info:
----------------------------
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A

Subslot 0/1/5 registers info:
----------------------------
SPA hardware ID : 0x0
SPA SW FPGA rev.: 0x1000A
```

Table 35: show hw-module subslot registers Field Descriptions

Field	Description
SPA hardware ID	SPA hardware identifier in hexadecimal format.
SPA SW FPGA rev.	SPA software field-programmable gate array (FPGA) revision number in hexadecimal format.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show hw-module subslot status

To display status information about internal hardware devices for a shared port adapter (SPA), use the **show hw-module subslot status** command in EXEC

mode.

show hw-module subslot [*node-id*] **status** [*device* [*device-index* [*device-subindex*]]]

Syntax Description

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack/slot/module* notation.
device	(Optional) Internal hardware device for which to display the specified information. Valid devices include: • **analog-digital-converter**—Displays analog-to-digital converter information. • **c2w**—Displays Cisco-to-wire bus device information. • **fpga**—Displays SPA field-programmable gate array information. • **framer**—Displays SONET framer information. (Not applicable to Ethernet SPAs.) • **hdlc**—Displays SPA hdlc information, where applicable. • **l2-tcam**—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.) • **mac**—Displays SPA MAC information. (Not applicable to POS SPAs.) • **pluggable-optics**—Displays pluggable-optics module information. • **power-margining**—Displays power-margining device information. • **sar**—Displays SPA ATM SAR information. • **sdcc**—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.) • **serdes**—Displays SPA serializer/deserializer information. • **spi4**—Displays system packet interface level 4.2 bus device information. • **temperature-sensor**—Displays temperature sensor information.
device-index	(Optional) Index of the specific device if there are multiple devices of the same type.
device-subindex	(Optional) Subindex of the specific device if there are multiple devices of the same device index.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows sample output for the **show hw-module subslot status** command with the **temperature-sensor** option:

```
RP/0/RP0/CPU0:router# show hw-module subslot 0/2/CPU0 status temperature-sensor

   SPA device temperature-sensor index 0 subindex 0 info:

  DS1631 (0x0803c2e4) device status:
  temperature = 0x1c80 (28.5 degree C)

   SPA device temperature-sensor index 0 subindex 0 info:

  DS1631 (0x08063bec) device status:
  temperature = 0x1e00 (30.0 degree C)
```

Table 36: show hw-module subslot status Field Descriptions

Field	Description
DS1631 (0x0803c2e4) device status	Device for which the temperature status is displayed.
temperature = 0x1c80 (28.5 degree C)	Current temperature of the specified device, in hexadecimal format and degrees Celsius.

Related Commands

Command	Description
show controllers	Displays the controller type and other information.

show inventory

To retrieve and display information about all the Cisco products that are installed in the router, use the **show inventory** command in EXEC or administration EXEC mode.

EXEC Mode
show inventory [{*node-id*|**all**|**location** {*node-id*|**all**}|**raw**}]
Administration EXEC Mode
show inventory [{*node-id*|**all**|**chassis**|**fans**|**location** {*node-id*|**all**}|**power-supply**|**raw**}]

Syntax Description

node-id	(Optional) Location for which to display the specified information. The *node-id* argument is entered in the *rack/slot/module* notation.
all	(Optional) Displays inventory information for all the physical entities in the chassis.
location {*node-id*|**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.

Command Default

All inventory information for the entire chassis is displayed.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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, the output displays incorrect PIDs, and version ID (VID) and serial number (SN) elements may be missing.

For UDI compliance products, the PID, VID, and SN are stored in EEPROM and NVRAM. Use the **show inventory** command to display this information.

Task ID

Task ID	Operations
sysmgr	read

The following example shows partial sample output from the **show inventory** command with the **raw** keyword:

```
RP/0/RP0/CPU0:router# show inventory raw

 Sun Jan 25 07:40:57.903 PST
NAME: "0/1/*", DESCR: "Cisco CRS-1 Series Modular Services Card"
PID: CRS-MSC           , VID: V02, SN: SAD09280BS9

NAME: "0/1/* - cpu", DESCR: "cpu"
PID:                   , VID: V00, SN: SAD093000JR

NAME: "0/1/* - cpu - 1.6V_P0", DESCR: "Voltage Sensor"
PID:                   , VID: N/A, SN:

NAME: "0/1/* - cpu - 1.8V_A", DESCR: "Voltage Sensor"
PID:                   , VID: N/A, SN:

NAME: "0/1/* - cpu - 2.5V_A", DESCR: "Voltage Sensor"
PID:                   , VID: N/A, SN:

NAME: "0/1/* - cpu - 3.3V_A", DESCR: "Voltage Sensor"
PID:                   , VID: N/A, SN:

NAME: "0/1/* - cpu - 5V_A", DESCR: "Voltage Sensor"
PID:                   , VID: N/A, SN:

NAME: "0/1/* - cpu - Hotspot0", DESCR: "Temperature Sensor"
PID:                   , VID: N/A, SN:
--More--
```

The following example shows partial sample output from the **show inventory** command:

```
RP/0/RP0/CPU0:router# show inventory

Tue Apr 27 02:57:55.671 DST
NAME: "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 37: show inventory Field Descriptions, on page 358 describes the significant fields shown in the display.

Table 37: show inventory Field Descriptions

Field	Description
NAME	Hardware for which the inventory information is displayed. If you are displaying the chassis inventory, this field shows "chassis." If you are displaying raw inventory, or all inventory information for all nodes in the chassis, this field shows the node name in partially qualified format. For a node, the NAME is expressed in *rack/slot/module* 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** command in EXEC or administration EXEC mode.

show led [**location** {*node-id*|**all**}]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node for which to display LED information. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation. Use the **all** keyword to indicate all nodes.

Command Default

If no node is specified, information about all LEDs on the router is displayed.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
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.

Usage Guidelines

Enter the **show platform** command to see the location of all nodes installed in the router.

Task ID

Task ID	Operations
system	read

The following example sample output from the **show led** command with the **all** keyword:

```
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 38: show led location Field Descriptions

Field	Description
LOCATION	Location of the node. LOCATION is expressed in the *rack*/*slot*/*module* notation.
MESSAGE	Current message displayed by the LED.
MODE	Current operating mode of the specified node.
STATUS	Current status of the specified 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*]**[descriptive]**

Syntax Description

mda-class	Name of the management data API (MDA) class to output. To specify a class name in hierarchy, all classes must be specified from the top of the class to the specific class name that you are interested in. MDA classes are case-sensitive. To view all available MDA classes, use the question mark (**?**) online help function.
descriptive	Displays more descriptive information.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Although the **show operational** command uses the schema database, the command displays the information in a string format like the other **show** commands. No XML related setups or knowledge is required to use the command.

Task ID

Task ID	Operations
Depends on the MDA class for which you are displaying the information	read

The following example shows sample output from the **show operational** command. Not all the output is shown.

```
RP/0/RP0/CPU0:router# show operational BGP DefaultVRF GlobalProcessInfo descriptive
[BGP DefaultVRF GlobalProcessInfo]
InStandaloneMode: true[Standalone or Distributed mode]
RouterID: 0.0.0.0[Router ID for the local system]
ConfiguredRouterID: 0.0.0.0[Configured router ID]
LocalAS: 10[Local autonomous system #]
RestartCount: 1[No of times BGP has started]
ISRedistributeIBGPToIGPsEnabled: false[Redistribute iBGP into IGPs enabled]
```

```
IsFastExternalFalloverEnabled: true[Fast external fallover enabled]
IsBestpathMissingMEDIsWorstEnabled: false[Bestpath: Treat missing MED as worst]
.
.
.
DefaultLocalPreference: 100[Default local preference]
KeepAliveTime: 60[Default keepalive timer (seconds)]
HoldTime: 180[Default hold timer (seconds)]
GenericScanPeriod: 60[Period (in seconds) of generic scanner runs]
.
.
.
VrfIsActive: true[VRF state ]
VrfName: "default"[Name of the VRF ]
```

This example shows sample output from the **show operational** command where only the top-level MDA class is specified. Not all of the output is shown.

```
RP/0/RP0/CPU0:router# show operational Inventory

Thu Feb 19 00:54:41.251 PST
[Inventory]
RackTable
  Rack/Number=0
    SlotTable
      Slot/Number=0
        CardTable
          Card/Number=0
            PortSlotTable
              PortSlot/Number=0
                Port
                  BasicAttributes
                    BasicInfo
                      Description: CPU_PORT_0
                      VendorType: 1.3.6.1.4.1.9.12.3.1.10
                      Name: 0/0/SP/0
                      IsFieldReplaceableUnit: false
                      CompositeClassCode: 983040
                BasicAttributes
                  BasicInfo
                    Description: CE Port Slot
                    VendorType: 1.3.6.1.4.1.9.12.3.1.5.115
                    Name: portslot 0/0/SP/0
                    IsFieldReplaceableUnit: false
                    CompositeClassCode: 0
            SensorTable
              Sensor/Number=0
                BasicAttributes
                  BasicInfo
                    Description: Temperature Sensor
                    VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
                    Name: 0/0/* - host - Inlet0
                    CompositeClassCode: 720898
                    EnvironmentalMonitorPath: /admin/oper/inventory/
                     rack/0/entity/0/entity/0/entity/0/entity/0/attrib/
              Sensor/Number=1
                BasicAttributes
                  BasicInfo
                    Description: Temperature Sensor
                    VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
                    Name: 0/0/* - host - Inlet1
                    CompositeClassCode: 720898
```

```
                    EnvironmentalMonitorPath: /admin/oper/inventory/
                     rack/0/entity/0/entity/0/entity/0/entity/1/attrib/
                Sensor/Number=2
                  BasicAttributes
                    BasicInfo
                      Description: Temperature Sensor
                      VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
                      Name: 0/0/* - host - Exhaust0
                      CompositeClassCode: 720898
--More--
```

show power allotted

To display the power allotted to the cards in the chassis, use the **show power allotted** command in administration EXEC mode.

show power allotted {**location** *node-id*|**rack** *rack-no*|**summary**}

Syntax Description

location *node-id*	Displays the power consumption for the specified location. The node-id argument is entered in the *rack/slot/module* notation.
rack *rack-no*	Displays the power consumption for the specified rack.
summary	Displays summary information for all racks.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The display for modular power supplies is by card. The display for fixed power supplies is by zone and card.

Task ID

Task ID	Operation
power	read

This example shows sample output from the **show power allocated** command on a modular power supply:

```
RP/0/RP0/CPU0:router(admin)# show power allotted location 0/0/*

Sun Nov 18 22:00:51.176 UTC
nodeid = 0x2a00000f
Node              Card Type         State             PID               Power Allotted
----------------- ----------------- ----------------- ----------------- ------------------
0/0/*             FP-140G           POWERED UP        CRS-MSC-FP140       450.0W
0/0/PL0           14-10GbE          POWERED UP        14X10GBE-WL-XF      150.0W
```

This example shows sample output from the **show power allotted** command on a fixed power supply:

```
RP/0/RP0/CPU0:router(admin)# show power allotted rack 0
```

```
Tue Nov 20 18:51:56.404 OST
Zone              Node              Card Type         State             PID
Power Allotted
----------------- ----------------- ----------------- ----------------- -----------------
-----------------
Zone 1:
                  0/FAN-TR0         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W
                  0/FAN-TR1         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W


Zone 2:
                  0/RP0/*           UNKNOWN           N/A
   175.0W
                  0/RP1/*           RP(H)-X86v1       N/A               CRS-8-PRP-6G
   175.0W
                  0/SM0/*           UNKNOWN           N/A
   185.0W
                  0/SM1/*           FC-140G/S(H)      N/A               CRS-8-FC140/S
   185.0W
                  0/SM2/*           UNKNOWN           N/A
   185.0W
                  0/SM3/*           FC-140G/S(H)      N/A               CRS-8-FC140/S
   185.0W


Zone 3:
                  0/6/*             MSC-B             POWERED UP        CRS-MSC-B
   390.0W
                  0/6/PL0           JACKET CARD       POWERED UP
   150.0W
                  0/7/*             MSC-140G          UNPOWERED
     7.0W
                  0/FAN-TR0         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W
                  0/FAN-TR1         FAN TRAY          N/A               CRS-8-LCC-FAN-
    75.0W
```

show power capacity

To display the power capacity of the router, use the **show power capacity** command in administration EXEC mode.

show power capacity {**rack** *rack-no*|**summary**}

Syntax Description

rack *rack-no*	Displays the power capacity for the specified rack.
summary	Displays summary power capacity for the chassis.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The display for modular power supplies is by card. The display for fixed power supplies is by zone and card.

Task ID

Task ID	Operation
power	read

This example shows sample output from the **show power capacity** command on a modular power supply:

```
RP/0/RP0/CPU0:router(admin)# show power capacity rack 0

Sun Nov 18 22:02:11.394 UTC
-------------------------------------------------------
Rack 0: Cisco CRS Series AC Power System
-------------------------------------------------------
Power Module      State                Power Capacity
----------------- ----------------- ---------------------
0                  OK                1900.0W
1                  OK                1900.0W
2                  OK                1900.0W
3                  OK                1900.0W
-------------------------------------------------------
Total Rack Power Capacity:           7600.0W
```

This example shows sample output from the **show power capacity** command on a fixed power supply:

```
RP/0/RP0/CPU0:router(admin)# show power capacity rack 0

Sun Dec  9 02:40:09.464 PST
------------------------------------------------------------------------------
Rack 0: Cisco CRS Fixed AC Power System
------------------------------------------------------------------------------
Zone              Power Module      State             Zone Power Capacity
----------------- ----------------- ----------------- --------------------
 Zone 1:           A[0]               OK                 1460.0W

                   B[0]               OK
 Zone 2:           A[0]               OK                 1460.0W

                   B[0]               OK
 Zone 3:           A[0]               OK                 1460.0W

                   B[0]               OK
------------------------------------------------------------------------------
Total Rack Power Capacity:                               4380.0W
```

show power summary

To display a summary of the power information for a rack, use the **show power** command in administration EXEC mode.

show power summary rack *rack-no*

Syntax Description

rack *rack-no*	Displays summary output for the specified rack

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The display for modular power supplies is by card. The display for fixed power supplies is by zone and card.

Task ID

Task ID	Operation
power	read

This example shows sample output from the **show power summary** command on a modular power supply.

```
RP/0/RP0/CPU0:router(admin)# show power summary rack 0

Sun Nov 18 22:02:40.434 UTC
Location          Power Capacity    Power Allotted    Power Available
----------------- ----------------- ----------------- ------------------
Rack :  0            7600.0W           1285.0W            6315.0W
```

This example shows sample output from the **show power summary** command on a fixed power supply.

```
RP/0/RP0/CPU0:router(admin)# show power summary rack 0

Wed Nov 14 00:29:06.354 PST
Location          Power Capacity    Power Allotted    Power Available
----------------- ----------------- ----------------- ------------------
Rack 0:

Zone 1:             1460.0W             650.0W             810.0W
Zone 2:             1460.0W            1534.0W             -74.0W
```

```
Zone 3:             1460.0W              650.0W              810.0W
```

show platform

To display information and status for each node in the system, use the **show platform** command in EXEC or administration EXEC mode.

show platform [*node-id*]

Syntax Description

node-id	(Optional) Node for which to display information. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

Status and information are displayed for all nodes in the system.

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The **show platform** command was first supported in administration EXEC mode. In EXEC mode, the **show platform** command was moved from the root-system task ID to the system task ID.
Release 4.0.1	Support was added for the MSC-140G.

Usage Guidelines

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.

For , EP1 will be displayed as, **Not allowed online**, until the required license is bought.

Task ID

Task ID	Operations
system	read (in EXEC mode)
root-system	read (in administration EXEC mode)

The following example shows 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
```

This example shows sample output from the **show platform** command on the Cisco CRS Series Modular Services Card 140G:

```
RP/0/RP0/CPU0:router# show platform 0/3/*

Thu Aug 26 15:37:34.263 UTC
**************************************************************************

********** Router is running in Dual Router configuration **********
**************************************************************************
Node            Type                PLIM            State           Config State
--------------------------------------------------------------------------------------
0/3/CPU0        MSC-140G            20-10GbE        IOS XR RUN      PWR,NSHUT,NMON
```

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
```

This table describes the significant fields shown in the display.

Table 39: show platform Field Descriptions

Field	Description
Node	Identifier of the node in the *rack*/*slot*/*module* notation.
Type	Type of node.
PLIM	Type of physical layer interface module currently supported on the module.
State	Current state of the specified node.
Config State	Current status of the specified node.

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**|**summary**}]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node for which to display LED information. The *node-id* argument is expressed in the *rack/slot/module* notation. Use the **all** keyword to indicate all nodes.
statistics	(Optional) Displays redundancy statistics information.
summary	(Optional) Displays a summary of all redundant node pairs in the router.

Command Default

Route processor redundancy information is displayed for all nodes in the system.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show redundancy** command to display the redundancy status of the 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)

The following example shows sample output from the **show redundancy** command:

```
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 40: show redundancy 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 *rack*/*slot*/*module*, 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 *rack*/*slot*/*module* 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 sample output shows the status of the redundant RPs in the system. 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.

```
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)
```

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.

Command Default

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.
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.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

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 41: 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 role

To display the current service role on service cards, use the **show services role** command in

EXEC

mode.

show services role [detail] [location *node-id*]

Syntax Description

detail	Displays the reason a role has not been enacted, if applicable.
location *node-id*	Location for which to display the specified information. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Operations
interface	read

This example displays sample output from the **show services role** command:

```
RP/0/RP0/CPU0:router# show services role
Thu Mar  1 14:53:55.530 PST
Node       Configured Role     Enacted Role        Enabled Services
--------------------------------------------------------------------------------
0/3/CPU0   SESH                SESH                 ServiceInfra
```

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 keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The **show version** command was moved from the sysmgr task ID to the basic-services task ID.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show version** command displays a variety of system information, including hardware and software version, router uptime, boot settings (configuration register), and active software.

Task ID

Task ID	Operations
basic-services	read

This 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 42: show version Field Descriptions

Field	Description
Cisco IOS XR Software, Version #	Cisco IOS XR software version number currently running on the router.
ROM	System bootstrap version number currently running on the router.
router uptime	Number of uninterrupted days, hours, minutes, and seconds the system has been up and running.
System image file is	Location and name of the system image file currently running on the router.
Packet over SONET/SDH network interface(s)	Number of Packet-over-SONET/SDH interfaces available on the current router.
SONET/SDH Port controller(s)	Number of SONET or SDH[1] interfaces available on the current router.
Ethernet/IEEE 802.3 interface(s)	Number of Ethernet or IEEE 802.3 interfaces available on the current router.
GigabitEthernet/IEEE interface(s)	Number of Gigabit Ethernet or IEEE 802.3 interfaces available on the current router.
bytes of non-volatile configuration memory	Available volatile configuration memory, in bytes.
bytes of ATA PCMCIA card at disk 0	ATA PCMCIA[2] available on the card in disk 0, in bytes.
Package active on node 0/1/SP	Details about the current software package that is running on the SP node in slot 1.

[1] SDH = Synchronous Digital Hierarchy
[2] ATA PCMCIA = AT Attachment Personal Computer Memory Card Industry Association

upgrade 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 *node-id*	Upgrades the CPU controller bits on a specific node. The *node-id* 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.
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.

Command Default

Default location for the ROMMON image: **internal**

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.
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.
Release 3.9.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **upgrade cpuctrlbits** command is only applicable to boards that use the Squid CPU controller, and not the Squirt controller. Use the **internal** keyword 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
          PCIX 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
          PCIX 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

This 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 cpucrtlbits 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.

Command	Description
show platform, on page 370	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 Admin EXEC mode.

upgrade hw-module fpd {**all**|**fabldr***fpga-type*|**rommon**} [**force**] **location** [{*node-id*|**all**}]

Syntax Description

all	Upgrades all FPD images on the selected module.
fabldr	Upgrades the fabric-downloader FPD image on the module.
fpga-type	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 {*node-id* |**all**}	Specifies the node for which to upgrade the FPD image. The *node-id* argument is expressed in the *rack*/*slot*/*subslot* notation. Use the **all** keyword to indicate all nodes.

Command Default

None

Command Modes

Admin EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	Support for multiple FPGA images was added.

Usage Guidelines

Note The use of the force option when doing a fpd upgrade is not recommended except under explicit direction from Cisco engineering or TAC.

During the upgrade procedure, the module must be offline (shut down but powered).

Naming notation for the *node-id* argument is *rack*/*slot*/*subslot*; a slash between values is required as part of the notation.

- *rack* —Chassis number of the rack.
- *slot* —Physical slot number of the SPA interface processor (SIP).
- *subslot* —Subslot number of the SPA.

For more information about the syntax for the router, use the question mark (?) online help function.

When you start the FPD upgrade procedure or log into a router that is running the FPD upgrade procedure, the following message is displayed to the screen on TTY, console and AUX ports:

```
FPD upgrade in progress on some hardware, reload/configuration change on those
is not recommended as it might cause HW programming failure and result in RMA
of the hardware.
```

If you enter administration mode while the FPD upgrade procedure is running, the following message is displayed to the screen on TTY, console and AUX ports:

```
FPD upgrade in progress on some hardware, reload/configuration change on those
is not recommended as it might cause HW programming failure and result in RMA
of the hardware. Do you want to continue? [Confirm (y/n)]
```

If you enter global configuration mode while the FPD upgrade procedure is running, the following message is displayed to the screen on TTY, console and AUX ports:

```
FPD upgrade in progress on some hardware, configuration change on those is not
recommended as it might cause HW programming failure and result in RMA of the
hardware. Do you want to continue? [Confirm (y/n)]
```

When the FPD upgrade global timer expires, the following warning message displayed to the screen.

```
FPD upgrade has exceeded the maximum time window, the process will terminate now.
Please check the status of the hardware and reissue the upgrade command if required.
```

Task ID

Task ID	Operations
system	read, write
sysmgr	read, write

The following example shows how to upgrade the default FPGA on a SPA:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# upgrade hw-module fpd fpga 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
/net/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.
```

Manageability Commands

This chapter describes the Cisco IOS XR software commands used to enable the HTTP server, enable router management through Extensible Markup Language (XML) agent services, and support the Common Object Request Broker Architecture (CORBA) infrastructure.

The XML Parser Infrastructure provides parsing and generation of XML documents with Document Object Model (DOM), Simple API for XML (SAX), and Document Type Definition (DTD) validation capabilities:

- DOM allows customers to programmatically create, manipulate, and generate XML documents.
- SAX supports user-defined functions for XML tags.
- DTD allows for validation of defined document types.

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

ssl	(Optional) Enables Secure Socket Layer (SSL).
access-group *name*	(Optional) Enables access to the CWI from IP addresses that meet the conditions of the access control list (ACL) specified for the *name* argument.

Command Default

The HTTP server is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support for access groups was added. The **access-group** keyword and *name* argument were added to support access groups.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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 **ssl** keyword 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.

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, see the *Implementing Management Plane Protection on Cisco IOS XR Software* module in *System Security Configuration Guide for Cisco CRS Routers*.

Task ID

Task ID	Operations
config-services	read, write

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 addresses that meet 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/RP0/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
```

ipv4 disable

To disable IPv4 XML transport, use the **ipv4 disable** command in XML agent configuration mode. To enable IPv4 XML transport, use the **no** form of this command.

ipv4 disable
no ipv4 disable

Syntax Description

This command has no keywords or arguments.

Command Default

IPv4 XML transport is enabled by default.

Command Modes

XML agent configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to disable IPv4 XML transport:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent) ipv4 disable
```

Related Topics

ipv6 enable (XML), on page 391

ipv6 enable (XML)

To enable IPv6 XML transport, use the **ipv6 enable** command in XML agent configuration mode. To disable IPv6 XML transport, use the **no** form of this command.

ipv6 enable
no ipv6 enable

Syntax Description

This command has no keywords or arguments.

Command Default

IPv6 XML transport is disabled by default.

Command Modes

XML agent configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to enable IPv6 XML transport:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent) ipv6 enable
```

Related Topics

ipv4 disable, on page 390

iteration

To configure the iteration size for large XML agent responses, use the iteration command in xml agent configuration mode. To revert to the default iteration settings, use the **no** form of this command.

iteration {**off** | **on** **size** *iteration-size*}
no iteration

Syntax Description

off	Disables iteration, meaning that the entire XML response is returned, regardless of its size. Use of this option is not recommended.
on	Enables iteration, meaning that large XML responses are broken into chunks according to the iteration chunk size.
size *iteration-size*	Specifies the size of the iteration chunk, in Kbytes. Values can range from 1 to 100,000.

Command Default

Iteration is enabled; the *iteration-size* is 48.

Command Modes

XML agent

TTY XML agent

SSL XML agent

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the XML agent returns a large response, it splits the response into chunks and returns one chunk at a time. External clients then need to send a GetNext request to obtain the next chunk. Use the **iteration** command to control the size of iteration chunks. A larger chunk value allows larger chunks to be received in a shorter period of time, possibly making the router system busier. A smaller chunk value allows smaller chunks to be received over a longer period of time, but does not make the router busy You can also specify to disable iteration completely using the **iteration off** command.

Note It is not recommended to disable iteration, since this could result in large transient memory usage.

To specify the TTY or SSL iteration size specifically, use the **iteration** command from the appropriate command mode.

Task ID

Task ID	Operations
config-services	read, write

Example

The following example shows how to configure the iteration chunk size to 100 Kbytes.

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# iteration on size 100
```

The following example shows how to disable iteration:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# iteration off
```

The following example shows how to turn on iteration with the default iteration size:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# no iteration off
```

The following example shows how to change the iteration size to the default iteration size.

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# no iteration on size 100
```

The following example shows how to change the iteration size of the TTY agent to 3 Kbytes:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-tty)# iteration on size 3
```

The following example shows how to turn off the iteration of the SSL agent:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
RP/0/RP0/CPU0:router(config-xml-ssl)# iteration off
```

Related Topics

xml agent, on page 406
xml agent ssl, on page 407
xml agent tty, on page 408

streaming

To configure the streaming size of the response while the XML agent is retrieving data from the source, use the **streaming** command in the appropriate mode.

streaming on **size** *size in kbytes*

Syntax Description

size *size in kbytes*	Streaming size of the xml response. Range is 1 to 100000.

Command Default

Default is 48 KB.

Command Modes

XML agent mode

Command History

Release	Modification
Release 4.1	This command was introduced.

Usage Guidelines

Iteration must be off. The sub-response block size is a configurable value specific to each transport mechanisms on the router (the XML agent for the dedicated TCP connection and Secure Shell (SSH), Telnet, or Secure Sockets Layer (SSL) dedicated TCP connection).

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to configure the streaming size to 100 KB:

```
RP/0/RP0/CPU0:router (config) # xml agent
RP/0/RP0/CPU0:router (config-xml) # streaming on size 100
```

session timeout

To configure an idle timeout for the XML agent, use the **session timeout** command in xml agent configuration mode. To remove the session timeout, use the **no** form of this command.

session timeout *timeout*

Syntax Description

timeout	Amount of idle time in minutes that must pass before the XML agent closes the session. Values can range from 1 to 1440.

Command Default

There is no session timeout.

Command Modes

xml agent

xml agent ssl

xml agent tty

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

The following example illustrates how to configure the dedicated agent to close the session after 5 minutes of idle time:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# session timeout 5
```

The following example illustrates how to configure the XML TTY agent to close the session after 60 minutes of idle time:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-agent-tty)# session timeout 60
```

The following example illustrates how to configure the XML TTY agent to have no timeout (the default):

```
RP/0/RP0/CPU0:router(config)# xml agent tty
```

```
RP/0/RP0/CPU0:router(config-xml-agent)# no session timeout
```

Related Topics

xml agent, on page 406

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show xml schema** command runs the XML schema browser so that you can browse the XML schema and data.

Task ID

Task ID	Operations
config-services	read

This example shows how to enter the XML schema browser and the available commands:

```
RP/0/RP0/CPU0:router# show xml schema

Username: xxxx
Password:
Enter 'help' or '?' for help
xml-schema[config]:> ?

config            oper              action
adminoper         adminaction       cd
pwd               classinfo         list
ls                datalist          walk
walkdata          get               hierarchy
quit              exit              help
xml-schema[config]:>
```

Related Topics

copy

show xml sessions

To display the status of an Extensible Markup Language (XML) session, use the **show xml sessions** command in

EXEC

mode.

show xml sessions [{**default**|**ssl**|**tty**}] **[detail]**

Syntax Description

default	Displays the status of the default XML agent.
ssl	Displays the status of the XML agents over secure socket layer (SSL).
tty	Displays the status of XML agents over telnet.
detail	Displays details regarding the XML sessions.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read

Example

This example illustrates sample output of the **show xml sessions** command with no optional keywords specified:

```
RP/0/RP0/CPU0:router# show xml sessions

Session  Client                 Agent    User  Date                     State
00000001 192.168.10.85 (default) tty      cisco Fri Jun 19 22:42:29 2009 idle
10000001 10.12.24.15 (VRF1)      default  lab   Fri Jun 19 22:32:12 2009 busy
```

This example illustrates sample output of the **show xml sessions** command with the **tty** keyword:

```
RP/0/RP0/CPU0:router# show xml sessions tty
```

```
Session  Client                  Agent User  Date                      State
00000001 192.168.10.85 (default) tty   cisco Fri Jun 19 22:42:29 2009 idle
00000002 10.12.24.15 (VRF1)      tty   lab   Fri Jun 19 22:32:12 2009 busy
```

This example illustrates sample output of the **show xml sessions** command with the **detail** keyword:

```
RP/0/RP0/CPU0:router#
show xml sessions detail


Session: 00000001
  Client:                 192.168.10.85 (default)
  Agent type:             tty
  User:                   cisco
  State:                  idle
  Config session:         -
  Alarm notification:     Registered
  Start Date:             Tue Aug 24 18:21:29 2010
  Elapsed Time:           00:00:27
  Last State Changed:     00:00:27
Session: 10000001
  Client:                 10.12.24.15 (VRF1)
  Agent type:             default
  User:                   lab
  State:                  busy
  Config session:         00000010-0005b105-00000000
  Alarm notification:     Not registered
  Start date:             Tue Aug 24 18:21:29 2010
  Elapsed Time:           00:01:10
  Last State Changed:     00:01:10
```

Related Topics

xml agent, on page 406

shutdown (VRF)

To configure the dedicated XML agent to not receive or send messages via the default VRF, use the **shutdown** command in xml agent vrf configuration mode. To enable the dedicated XML agent to receive or send messages via the default VRF, use the **no** form of this command.

shutdown
no shutdown

This command has no keywords or arguments.

Command Default

The default VRF instance is enabled by default.

Command Modes

xml agent vrf configuration

xml agent ssl vrf configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

Example

The following example illustrates how to configure the XML dedicated agent to send and receive messages via VRF1 only:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-vrf)# shutdown
```

The following example illustrates how to configure the XML SSL agent to send and receive messages via VRF1 only:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
RP/0/RP0/CPU0:router(config-xml-agent-ssl)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent-ssl)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-ssl-vrf)# shutdown
```

The following example illustrates how to enable the default VRF after it has been disabled:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-vrf)# no shutdown
```

Related Topics

vrf (XML), on page 404

streaming

To configure XML response streaming, use the **streaming** command in one of the XML agent configuration modes. To disable XML response streaming, use the **no** form of this command.

streaming on size *size*

Syntax Description

on	Turns on XML streaming.
size *size*	Specifies the size of the stream in Kbytes.

Command Default

XML streaming is disabled.

Command Modes

XML agent

XML agent ssl

XML agent tty

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to set the XML response streaming size to 5000 Kbytes.

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# streaming on size 5000
```

throttle

To configure the XML agent processing capabilities, use the **throttle** command in XML agent configuration mode.

throttle {**memory** *size*|**process-rate** *tags*}

Syntax Description

memory	Specifies the XML agent memory size.
size	Maximum memory usage of XML agent per session in MB. Values can range from 100 to 600. The default is 300.
process-rate	Specifies the XML agent processing rate.
tags	Number of tags that the XML agent can process per second. Values can range from 1000 to 30000.

Command Default

The process rate is not throttled; memory size is 300 MB.

Command Modes

XML agent configuration

Command History

Release	Modification
Release 3.8.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **throttle** command to control CPU time used by the XML agent when it handles large data.

Task ID

Task ID	Operation
config-services	read, write

Example

This example illustrates how to configure the number of tags that the XML agent can process to 1000:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# throttle process-rate 1000
```

vrf (XML)

To configure a dedicated agent to receive and send messages via the specified VPN routing and forwarding (VRF) instance, use the vrf command in one of the xml agent configuration mode. To disable the receiving and sending of messages via a specific VRF instance, use the **no** form of this command.

vrf {**default***vrf-name*}

Syntax Description

default	Configures the default VRF instance.
vrf-name	Configures the specified VRF instance.

Command Default

The default VRF is enabled by default.

Command Modes

XML agent configuration

XML agent SSL configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default VRF is enabled by default. To disable the default VRF, use the **shutdown** command.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to configure the dedicated XML agent to receive and send messages via VRF1, VRF2 and the default VRF:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF2
```

This example shows how to remove access to VRF2 from the dedicated agent:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# no vrf VRF2
```

Related Topics

xml agent, on page 406
xml agent ssl, on page 407
shutdown (VRF), on page 400

xml agent

To enable Extensible Markup Language (XML) requests over a dedicated TCP connection and enter XML agent configuration mode, use the **xml agent** command in

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

Command Default

XML requests are disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

There are two XML agents: a legacy XML agent and an enhanced-performance XML agent. We recommend that you use the enhanced-performance agent. The legacy agent is supported for backward compatibility. Use the **xml agent** command to enable the enhanced-performance XML agent. Use the **xml agent tty** command to enable the legacy XML agent.

Use the **no** form of the **xml agent** command to disable the enhanced-performance XML agent.

Task ID

Task ID	Operations
config-services	read, write

This example shows how to enable XML requests over a dedicated TCP connection:

```
RP/0/RP0/CPU0:router(config)# xml agent
```

xml agent ssl

To enable Extensible Markup Language (XML) requests over Secure Socket Layer (SSL) and enter SSL XML agent configuration mode, use the **xml agent ssl** command in

global configuration

mode. To disable XML requests over SSL, use the **no** form of this command.

xml agent ssl
no xml agent ssl

Command Default

SSL agent is disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The k9sec package is required to use the SSL agent. The configuration is rejected during commit when the security software package is not active on the system. When the security software package is deactivated after configuring SSL agent, the following syslog message is displayed to report that the SSL agent is no longer available.

```
xml_dedicated_ssl_agent[420]:
%MGBL-XML_TTY-7-SSLINIT : K9sec pie is not active, XML service over
SSL is not available.
```

Task ID

Task ID	Operations
config-services	read, write

This example shows how to enable XML requests over SSL:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
```

xml agent tty

To enable Extensible Markup Language (XML) requests over Secure Shell (SSH) and Telnet and enter TTY XML agent configuration mode, use the **xml agent tty** command in

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 superceded by an enhanced performance XML agent and is supported only for backward compatibility. To enable the enhanced-performance XML agent, use the **xml agent** command.

xml agent tty
no xml agent tty

Command Default

XML requests over SSH and Telnet are disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

There are two XML agents: a legacy XML agent and an enhanced-performance XML agent. We recommend that you use the enhanced-performance agent. The legacy agent is supported for backward compatibility. The **xml agent tty** command enables the legacy XML agent. Use the **xml agent** command to enable the enhanced-performance XML agent.

Use the **no** form of the **xml agent tty** command to disable the legacy XML agent.

Task ID

Task ID	Operations
config-services	read, write

This example shows how to enable XML requests over Secure Shell (SSH) and Telnet:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
```

Network Time Protocol (NTP) Commands

This chapter describes the Cisco IOS XR Network Time Protocol (NTP) commands used to perform basic network time management tasks, including synchronizing time settings and coordinating time distribution over the network.

When an NTP server or client is configured, NTP features are available on all router interfaces. NTP features can be disabled for any specified interface, local or remote, to the route processor (RP).

For detailed information about NTP concepts, configuration tasks, and examples, see the *Implementing NTP on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco CRS Routers*.

access-group (NTP)

To control access to Network Time Protocol (NTP) services for an IPv4 or IPv6 access list, use the **access-group** command in one of the NTP configuration modes. To remove the **access-group** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

access-group [**vrf** *vrf-name*] [{**ipv4**|**ipv6**}] {**peer**|**query-only**|**serve**|**serve-only**} *access-list-name*
no access-group [**vrf** *vrf-name*] [{**ipv4**|**ipv6**}] {**peer**|**query-only**|**serve**|**serve-only**}

Syntax Description

vrf *vrf-name*	(Optional) Applies the access control configuration to a specified nondefault VRF. If not specified, the configuration is applied to the default VRF.
ipv4	(Optional) Specifies an IPv4 access list (default).
ipv6	(Optional) Specifies an IPv6 access list.
peer	Allows time requests and NTP control queries and allows a networking device to synchronize to the remote system.
query-only	Allows only NTP control queries. Cisco IOS XR software uses NTP Version 4, but the RFC for Version 3 (RFC 1305: *Network Time Protocol (Version 3)—Specification, Implementation and Analysis*) still applies.
serve	Allows time requests and NTP control queries, but does not allow the networking device to synchronize to the remote system.
serve-only	Allows only time requests.
access-list-name	Name of an IPv4 or IPv6 access list.

Command Default

No NTP access control is configured.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	Support was added for: • **vrf** *vrf-name* keyword and argument • **ipv4** keyword • **ipv6** keyword

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The access group options are scanned in the following order from least restrictive to most restrictive:

1. **peer**—Allows time requests and NTP control queries and allows the router to synchronize itself to a system whose address passes the access list criteria.
2. **serve**—Allows time requests and NTP control queries, but does not allow the router to synchronize itself to a system whose address passes the access list criteria.
3. **serve-only**—Allows only time requests from a system whose address passes the access list criteria.
4. **query-only**—Allows only NTP control queries from a system whose address passes the access list criteria.

Access is granted for the first match that is found. If no access groups are specified, all access is granted to all sources. If any access groups are specified, only the specified access is granted. This facility provides minimal security for the time services of the system. However, it can be circumvented by a determined programmer. If tighter security is desired, use the NTP authentication facility.

If you use the **access-group** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to allow itself to be synchronized by a peer from an IPv4 access list named access1 and to restrict access to allow only time requests from an IPv4 access list named access2:

```
RP/0/RP0/CPU0:router(config-ntp)# access-group peer access1
RP/0/RP0/CPU0:router(config-ntp)# access-group serve-only access2
```

The following example shows how to configure the router to allow itself to be synchronized by peers from the IPv6 access list named access20 that route through the vrf10 VRF:

```
RP/0/RP0/CPU0:router(config-ntp)# access-group vrf vrf10 ipv6 peer access20
```

Related Commands

Command	Description
ipv4 access-list	Defines an IPv4 access list by name.
ipv6 access-list	Defines an IPv6 access list by name.
vrf	Configures a VRF instance for a routing protocol.

authenticate (NTP)

To enable Network Time Protocol (NTP) authentication, use the **authenticate** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

authenticate
no authenticate

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP authentication is configured.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **authenticate** command to prevent the system from synchronizing with unauthenticated and unconfigured network peers.

If the **authenticate** command is specified, and when a symmetric active, broadcast, or multicast NTP packet is received, the system will not synchronize to the peer unless the packet carries one of the authentication keys specified in the **trusted-key** command.

You must enable **authenticate** when enabling **broadcast client** or **multicast client** command in NTP configuration mode unless you have other measures (such as using the **access-group** command in NTP configuration mode) to prevent unauthorized hosts from communicating with the NTP service on the device.

The **authenticate** command does not ensure authentication of peer associations that are created using the **server** and **peer** commands in NTP configuration mode. When creating associations using the **server** and **peer** commands in NTP configuration mode, specify the **key** keyword to ensure the authentication of packets that move to and from the remote peer.

Use the **no authenticate** command to allow synchronizing with unauthenticated and unconfigured network peers.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to a system that provides an authentication key 42 in its NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
```

```
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

Related Topics

authentication-key (NTP), on page 414
trusted-key, on page 447

authentication-key (NTP)

To define an authentication key for a trusted Network Time Protocol (NTP) time source, use the **authentication-key** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

authentication-key *key-number* **md5** [{**clear**|**encrypted**}] *key-name*
no authentication-key *key-number*

Syntax Description

key-number	Authentication key. A number in the range from 1 to 65535.
md5	Provides message authentication support using the Message Digest 5 (MD5) algorithm.
clear	(Optional) Specifies that the key value entered after this keyword is unencrypted.
encrypted	(Optional) Specifies that the key value entered after this keyword is encrypted.
key-name	Key value. The maximum length is 32 characters.

Command Default

No authentication key is defined for NTP.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **authentication-key** command to define authentication keys for use with trusted NTP time sources.

Note When this command is written to NVRAM, the key is encrypted so that it is not displayed when the configuration is displayed.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in their NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
```

```
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

Related Topics

authenticate (NTP), on page 412
peer (NTP), on page 432
server (NTP), on page 435
trusted-key, on page 447

broadcast

To create a Network Time Protocol (NTP) broadcast server on a specified NTP interface, use the **broadcast** command in NTP interface configuration mode. To remove the command from the configuration file and restore the system to its default condition, use the **no** form of this command.

broadcast [**destination** *ip-address*] [**key** *key-id*] [**version** *number*]
no broadcast [**destination** *ip-address*] [**key** *key-id*] [**version** *number*]

Syntax Description

destination *ip-address*	(Optional) Specifies the host IPv4 address.
key *key-id*	(Optional) Defines the authentication key, where *key-id* is the authentication key to use when sending packets to this peer. The key identified by the *key-id* value is also used for packets received from the peer.
version *number*	(Optional) Specifies a number from 1 to 4, indicating the NTP version.

Command Default

No NTP broadcast servers are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcast** command to create an NTP broadcast server on an NTP interface to send NTP broadcast packets.

Use the **broadcast client** command to set a specific interface to receive NTP broadcast packets.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure interface 0/0/0/1 to send NTP packets to destination host IP address 10.0.0.0:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface tengige 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast destination 10.0.0.0
```

Related Topics

broadcast client, on page 418

broadcastdelay, on page 419

broadcast client

To allow a networking device to receive Network Time Protocol (NTP) broadcast packets on an interface, use the **broadcast client** command in NTP interface configuration mode. To remove the configuration and restore the system to its default condition, use the **no** form of this command.

broadcast client
no broadcast client

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP broadcast clients are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcast client** command to configure and create an NTP broadcast client and to associate the client with an interface to receive and handle NTP broadcast packets. If no NTP client has been created for an interface, the received NTP broadcast packets are dropped. Use this command to allow the system to listen to broadcast packets on an interface-by-interface basis.

To prevent synchronization with unauthorized systems, whenever this command is specified, authentication must be enabled using the **authenticate (NTP)** command or access must be restricted to authorized systems using the **access-group (NTP)** command. See the documentation of the respective commands for more information.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure interface 0/0/0/1 to send NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp interface tengige 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast client
```

Related Topics

broadcast, on page 416
broadcastdelay, on page 419

broadcastdelay

To set the estimated round-trip delay between a Network Time Protocol (NTP) client and an NTP broadcast server, use the **broadcastdelay** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

broadcastdelay *microseconds*
no broadcastdelay *microseconds*

Syntax Description

microseconds	Estimated round-trip time for NTP broadcasts, in microseconds. The range is from 1 to 999999. The default is 3000.

Command Default

microseconds: 3000

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcastdelay** command to change the default round-trip delay time on a networking device that is configured as a broadcast client.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to set the estimated round-trip delay between a networking device and the broadcast client to 5000 microseconds:

```
RP/0/RP0/CPU0:router(config-ntp)# broadcastdelay 5000
```

interface (NTP)

To enter a Network Time Protocol (NTP) interface mode and run NTP interface configuration commands, use the **interface** command in one of the NTP configuration modes. To remove an NTP interface configuration, use the **no** form of this command.

interface *type interface-path-id* [**vrf** *vrf-name*] **[disable]**
no interface *type interface-path-id* **[disable]**

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
vrf *vrf-name*	(Optional) Applies the interface configuration to a specific nondefault VRF.
disable	(Optional) Disables NTP on the specified interface.

Command Default

No NTP interfaces are configured.

Command Modes

NTP configuration mode

VRF-specific NTP configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	Support was added for the **vrf** keyword and the *vrf-name* argument.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **interface** command to place the router in NTP interface configuration mode, from which NTP broadcast and multicast servers and clients can be configured. By default, after the NTP process is started, NTP features become available for all interfaces. To exit NTP interface configuration mode, use the **exit** command.

If you use the **interface** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

By default, NTP is enabled on every interface. To disable NTP on a specific interface, use the **interface** command with the **disable** keyword. To reenable NTP on an interface, use the **no** form of the **interface** command with the **disable** keyword.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to enter NTP configuration mode, specify an NTP interface to be configured, and enter NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface POS 0/1/0/0
RP/0/RP0/CPU0:router(config-ntp-int)#
```

The following example shows how to enter a VRF-specific NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface TenGiGE 0/1/1/0 vrf vrf_10
RP/0/RP0/CPU0:router(config-ntp-int)#
```

The following example shows a different way to enter a VRF-specific NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp vrf vrf_10
RP/0/RP0/CPU0:router(config-ntp-vrf)# interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)#
```

master

To configure the router to use its own Network Time Protocol (NTP) master clock to synchronize with peers when an external NTP source becomes unavailable, use the **master** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

master [*stratum*]
no master [*stratum*]

Syntax Description

stratum	(Optional) NTP stratum number that the system claims. Range is from 1 to 15. The default is 8.

Command Default

By default, the master clock function is disabled. When the function is enabled, the default stratum is 8.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

NTP uses the concept of a "stratum" to describe how many NTP "hops" away a machine is from an authoritative time source. A stratum 1 time server has a radio or atomic clock attached directly. A stratum 2 time server receives its time through NTP from a stratum 1 time server, a stratum 3 from a stratum 2, and so on.

Caution Use the **master** command with extreme caution. It is easy to override other valid time sources using this command, especially if a low-stratum number is configured. Configuring multiple machines in the same network with the **master** command can lead to instability in time-keeping if the machines do not agree on the time.

The networking device is normally synchronized, directly or indirectly, with an external system that has a clock. Cisco IOS XR software does not support directly attached radio or atomic clocks. The **master** command should be used only when there is a temporary disruption in a reliable time service. It should not be employed as an alternative source by itself in the absence of a real-time service.

If the system has the **master** command configured and it cannot reach any clock that has a lower stratum number, the system claims to be synchronized at the configured stratum number. Other systems synchronize with it through NTP.

Note The system clock must have been manually set from some source before the **master** command has an effect. This precaution protects against the distribution of erroneous time after the system is restarted.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a networking device as an NTP master clock to which peers may synchronize:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# master 9
```

max-associations

To set the maximum number of Network Time Protocol (NTP) associations, use the **max-associations** command in NTP configuration mode. To restore the default setting, use the **no** form of this command.

max-associations *number*
no max-associations *number*

Syntax Description

number	Maximum number of NTP associations. Range is from 0 to 4294967295. The default is 100.

Command Default

The default setting for the maximum number of NTP associations is 100.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **max-associations** command to specify the maximum number of associations for an NTP server.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to set the maximum number of associations to 200:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# max-associations 200
```

Related Topics

show ntp associations, on page 439

multicast client

To configure an NTP interface as an NTP multicast client, use the **multicast client** command in NTP interface configuration mode. To remove the NTP multicast client configuration from an interface, use the **no** form of this command.

multicast client [*ip-address*]
no multicast client [*ip-address*]

Syntax Description

ip-address	IPv4 or IPv6 IP address of the multicast group to join. The default is the IPv4 address 224.0.1.1.

Command Default

The interface is not configured as an NTP multicast client.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **multicast client** command to configure an NTP interface to receive multicast packets that are sent to an IPv4 or IPv6 multicast group IP address. If you do not specify an IP address, the interface is configured to receive multicast packets sent to the IPv4 multicast group address 224.0.1.1. You can configure multiple multicast groups on the same interface.

To prevent synchronization with unauthorized systems, whenever this command is specified, authentication must be enabled using the **authenticate (NTP)** command or access must be restricted to authorized systems using the **access-group (NTP)** command. See the documentation of the respective commands for more information.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to receive NTP multicast packets to the multicast group address of 224.0.1.1:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast client
```

Related Topics

multicast destination, on page 426

multicast destination

To configure an NTP interface as an NTP multicast server, use the **multicast destination** command in NTP interface configuration mode. To remove the NTP multicast server configuration from an interface, use the **no** form of this command.

multicast destination *ip-address* [**key** *key-id*] [**ttl** *ttl*] [**version** *number*]
no multicast destination *ip-address* [**key** *key-id*] [**ttl** *ttl*] [**version** *number*]

Syntax Description

ip-address	The IPv4 or IPv6 multicast group IP address to which to send NTP multicast packets.
key *key-id*	(Optional) Specifies an authentication key, where the value of the *key-id* argument is the authentication key to use when sending multicast packets to the specified multicast group.
ttl *ttl*	(Optional) Specifies the time to live (TTL) of a multicast packet.
version *number*	(Optional) Specifies the NTP version number.

Command Default

The interface is not configured as an NTP multicast server.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to send NTP multicast packets to the multicast group address of 224.0.1.1:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast destination 224.0.1.1
```

Related Topics

multicast client, on page 425

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 *vrf-name*	(Optional) Enters a VRF-specific NTP configuration mode.

Command Default

No defaults behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	Support was added for the **vrf** *vrf-name ip-address* keyword and arguments.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

NTP configuration commands can also be run from global configuration mode by preceding the command string with the **ntp** keyword. From NTP configuration mode, the following NTP configuration commands are available:

```
RP/0/RP0/CPU0:router(config-ntp)# ?

    access-group        Control NTP access
    authenticate        Authenticate time sources
    authentication-key  Authentication key for trusted time sources
    broadcastdelay      Estimated round-trip delay
    commit              Commit the configuration changes to running
    default             Set a command to its defaults
    describe            Describe a command without taking real actions
    do                  Run an exec command
    exit                Exit from this submode
    interface           Configure NTP on an interface
    master              Act as NTP master clock
    max-associations    Set maximum number of associations
    no                  Negate a command or set its defaults
    peer                Configure NTP peer
    port                Enable NTP port
    server              Configure NTP server
    show                Show contents of configuration
    source              Configure interface for source address
    trusted-key         Key numbers for trusted time sources
```

```
    update-calendar     Periodically update calendar with NTP time
```

Use the **ntp** command with the **vrf** *vrf-name* keyword and argument to enter an NTP configuration mode specific to the specified VRF.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to enter NTP configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)#
```

The following example shows how to enter an NTP configuration mode for a VRF called VRF1:

```
RP/0/RP0/CPU0:router(config)# ntp vrf vrf1
RP/0/RP0/CPU0:router(config-ntp-vrf)#
```

ntp clear

To clear all Network Time Protocol (NTP) peers or a specific NTP peer, use the **ntp clear** command in EXEC

mode.

ntp clear {*peer*|**all**|**vrf** *vrf-name ip-address*}

Syntax Description

peer	IPv4 address or hostname of the NTP peer to be cleared.
all	Clears all NTP peers.
vrf *vrf-name*	Clears a peer on the specified nondefault VRF.
ip-address	IPv4 or IPv6 IP address of the peer.

Command Default

No defaults behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	The ***** keyword was replaced by the **all** keyword. Support was added for the **vrf** *vrf-name ip-address* keyword and arguments.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to clear all NTP peers:

```
RP/0/RP0/CPU0:router# ntp clear all
```

ntp 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.

Command Default

No defaults behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **ntp reset drift** command to set the loopfilter state to NSET (never set) and reset the drift. Resetting the loopfilter state and drift enables the router to relearn the frequency of the NTP server clock. This is necessary if there is a synchronization error caused by a large frequency error. This can arise, for example, if the router switches from synchronizing with one NTP server to synchronizing with another NTP server with a different frequency.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to reset the NTP drift and loopfilter state:

```
RP/0/RP0/CPU0:router# ntp reset drift

Thu Nov 13 11:21:04.381 JST
```

The following example shows NTP status before and after resetting NTP drift and loopfilter state:

```
RP/0/RP0/CPU0:router# show ntp status

Thu Nov 13 11:20:53.122 JST

Clock is synchronized, stratum 3, reference is 192.168.128.5
nominal freq is 1000.0000 Hz, actual freq is 1000.2787 Hz, precision is 2**24
reference time is CCC60CBE.9F836478 (11:17:34.623 JST Thu Nov 13 2008)
clock offset is -3.172 msec, root delay is 189.289 msec
```

```
root dispersion is 70.03 msec, peer dispersion is 0.11 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is -0.0002785891 s/s
system poll interval is 128, last update was 199 sec ago

RP/0/RP0/CPU0:router# ntp reset drift
Thu Nov 13 11:21:04.381 JST

RP/0/RP0/CPU0:router# show ntp status
Thu Nov 13 11:21:10.595 JST

Clock is unsynchronized, stratum 16, no reference clock
nominal freq is 1000.0000 Hz, actual freq is 1000.0000 Hz, precision is 2**24
reference time is CCC60CBE.9F836478 (11:17:34.623 JST Thu Nov 13 2008)
clock offset is -3.172 msec, root delay is 0.000 msec
root dispersion is 0.09 msec, peer dispersion is 0.00 msec
loopfilter state is 'NSET' (Never set), drift is 0.0000000000 s/s
system poll interval is 64, last update was 216 sec ago
```

Related Topics

show ntp status, on page 443

peer (NTP)

To configure the system clock to synchronize a peer or to be synchronized by a peer, use the **peer** command in one of the NTP configuration modes. To remove the **peer** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

peer [**vrf** *vrf-name*] [{**ipv4**|**ipv6**}] *ip-address* [**version** *number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*] **[prefer] [burst] [iburst]**
no peer [**vrf** *vrf-name*] [{**ipv4**|**ipv6**}] *ip-address*

Syntax Description

vrf *vrf-name*	(Optional) Applies the peer configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
ip-address	IPv4 or IPv6 address of the peer providing or being provided with the clock synchronization.
version *number*	(Optional) Defines the Network Time Protocol (NTP) version number, where the *number* argument is a value from 1 to 4. The default is 4.
key *key-id*	(Optional) Defines the authentication key, where the *key-id* argument is the authentication key to use when packets are sent to this peer. The authentication key is also used for packets received from the peer. By default, no authentication key is used.
minpoll *interval*	(Optional) Defines the shortest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll *interval*	(Optional) Defines the longest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 10.
source	(Optional) IP source address. The default is the outgoing interface.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
prefer	(Optional) Makes this peer the preferred peer that provides synchronization.
burst	(Optional) Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	(Optional) Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Command Default

No peers are configured by default.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	Support was added for the following keywords and arguments: • **vrf** *vrf-name* • **ipv4** • **ipv6** • **burst** • **iburst**

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **peer** command to allow this machine to synchronize with the peer, or conversely.

Caution Although using the **prefer** keyword can help reduce the switching among peers, you should avoid using the keyword because it interferes with the source selection mechanism of NTP and can result in a degradation in performance.

The value for the **minpoll** keyword must be less than or equal to the value for the **maxpoll** keyword. If this is not the case, the system issues an error message.

To provide peer-level service (as opposed to client/server-level service), it may be necessary to explicitly specify the NTP version for the peer if it is not version 4.

If you use the **peer** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Note To change the configuration of a specific IP address from peer to server or from server to peer, use the **no** form of the **peer** or **server** command to remove the current configuration before you perform the new configuration. If you do not remove the old configuration before performing the new configuration, the new configuration does not overwrite the old configuration.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a networking device to allow its system clock to be synchronized with the clock of the peer (or conversely) at IP address 10.0.0.0 using NTP. The source IP address is the address of interface 0/0/0/1.

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# peer 10.0.0.0 minpoll 8 maxpoll 12 source tengige 0/0/0/1
```

Related Topics

authentication-key (NTP), on page 414
server (NTP), on page 435
source (NTP), on page 445

server (NTP)

To allow the system clock to be synchronized by a time server, use the **server** command in one of the NTP configuration modes. To remove the **server** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

server [**vrf** *vrf-name*][{**ipv4**|**ipv6**}] *ip-address* [**version** *number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*][**prefer] [burst] [iburst]**
no server [**vrf** *vrf-name*] [{**ipv4**|**ipv6**}] *ip-address*

Syntax Description

vrf *vrf-name*	(Optional) Applies the server configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
ip-address	IPv4 or IPv6 address of the time server providing the clock synchronization.
version *number*	(Optional) Defines the Network Time Protocol (NTP) version number, where the *number* argument is a value from 1 to 4. The default is 4.
key *key-id*	(Optional) Defines the authentication key, where the *key-id* argument is the authentication key to use when packets are sent to this peer. By default, no authentication key is used.
minpoll *interval*	(Optional) Defines the shortest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll *interval*	(Optional) Defines the longest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 10.
source	(Optional) Specifies the IP source address. The default is the outgoing interface.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
prefer	(Optional) Makes this peer the preferred server that provides synchronization.
burst	(Optional) Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	(Optional) Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Command Default

No servers are configured by default.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	Support was added for the following keywords and arguments: • **vrf** *vrf-name* • **ipv4** • **ipv6** • **burst** • **iburst**

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The value for the **minpoll** keyword must be less than or equal to the value for the **maxpoll** keyword. If this is not the case, the system issues an error message.

Using the **prefer** keyword reduces switching back and forth among servers.

If you use the **server** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Note To change the configuration of a specific IP address from peer to server or from server to peer, use the **no** form of the **peer** or **server** command to remove the current configuration before you perform the new configuration. If you do not remove the old configuration before performing the new configuration, the new configuration does not overwrite the old configuration.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a router to allow its system clock to be synchronized with the clock of the peer at IP address 209.165.201.1 using NTP:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# server 209.165.201.1 minpoll 8 maxpoll 12
```

Related Topics

authentication-key (NTP), on page 414
peer (NTP), on page 432
source (NTP), on page 445

show calendar

To display the system time and date, use the **show calendar** command in the EXEC .

show calendar

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

The time format of the **show calendar** output depends on the time format set using the **clock timezone** command.

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show calendar** command:

```
RP/0/RP0/CPU0:router# show calendar

01:29:28 UTC Thu Apr 01 2004
```

Related Topics

show clock, on page 128

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*]

Syntax Description

detail	(Optional) Displays detailed information about each NTP association.
location *node-id*	(Optional) Displays the status of NTP associations from the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	The output was modified to display nondefault VRF instances and to accommodate IPv6 addresses.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Output for the **show ntp associations** command is displayed only if NTP is configured on the router.

Task ID

Task ID	Operations
ip-services	read

This example shows 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, - outlayer, x falseticker, ~ configured
```

Table 43: show ntp associations Field Descriptions

Field	Description
*	Peer has been declared the system peer and lends its variables to the system variables.
#	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.
+	Peer is a survivor and a candidate for the combining algorithm.
-	Peer is discarded by the clustering algorithm as an outlier.
x	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 since last NTP packet was received from peer, in milliseconds.
poll	Polling interval, in 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.

This example shows sample output from the **show ntp associations** command with the **detail** keyword:

```
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
filterror =     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
filterror =     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
filterror =     0.00    0.02    0.03    0.05    0.06    0.08    0.09    0.11
```

Table 44: 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.
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.

Field	Descriptions
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 of each sample, in milliseconds.
filtoffset	Clock offset of each sample, in milliseconds.
filterror	Approximate error of each sample.

Related Topics

show ntp status, on page 443

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*]

Syntax Description

location *node-id*	(Optional) Displays the status of NTP from the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No defaults behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	The output was modified to display nondefault VRF instances and IPv6 addresses. The loopfilter state, drift, system poll interval, and last update display fields were added to the output.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read

This example shows sample output from the **show ntp status** command:

```
RP/0/RP0/CPU0:router# show ntp status

Clock is synchronized, stratum 3, reference is 192.168.128.5
nominal freq is 1000.0000 Hz, actual freq is 1000.0021 Hz, precision is 2**24
reference time is CC38EC6A.8FCCA1C4 (10:10:02.561 JST Tue Jul 29 2008)
clock offset is -124.051 msec, root delay is 174.060 msec
root dispersion is 172.37 msec, peer dispersion is 0.10 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is -0.0000021106 s/s
system poll interval is 32, last update was 19 sec ago
```

Table 45: show ntp status Field Descriptions

Field	Description
synchronized	Synchronized system to an NTP peer.
stratum	NTP stratum of this system.
reference	IPv4 address or first 32 bits of the MD5 hash of the IPv6 address of the peer to which clock is synchronized.
vrf	VRF through which the peer routes.
nominal freq	Nominal frequency in Hertz (Hz) of the system hardware clock.
actual freq	Measured frequency in Hz of the system hardware clock.
precision	Precision of the clock of this system in Hz.
reference time	Reference time stamp.
clock offset	Offset of clock to synchronized peer, in milliseconds.
root delay	Total delay along path to root clock, in milliseconds.
root dispersion	Dispersion of root path.
peer dispersion	Dispersion of synchronized peer.
loopfilter state	The state of the clock state machine transition function.
drift	Drift of the hardware clock.
system poll interval	Poll interval of the peer.
last update	Time the router last updated its NTP information.

Related Topics

show ntp associations, on page 439

source (NTP)

To use a particular source address in Network Time Protocol (NTP) packets, use the **source** command in one of the NTP configuration modes. To remove the **source** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

source [**vrf** *vrf-name*] *type interface-path-id*
no source

Syntax Description

vrf *vrf-name*	(Optional) Applies the source address configuration to the specified nondefault VRF.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

The source address is determined by the outgoing interface.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	Support was added for the **vrf** *vrf-name* keyword and argument.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **source** command to use a particular source IP address for all NTP packets. The address is taken from the named interface. This command is useful if the address on an interface cannot be used as the destination for reply packets. If the **source** keyword has been configured with the **server** (NTP) or **peer** (NTP) command, that value overrides the global value.

Use the **source** command in a VRF-specific NTP configuration mode or use the **vrf** *vrf-name* keyword and argument to configure the source address for a specific nondefault VRF. Otherwise, the configuration is applied to the default VRF.

Task ID

Task ID	Operations
ip-services	read, write

This example shows how to configure the router to use the IP address of interface 0/0/0/1 as the source address of all outgoing NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# source tengige 0/0/0/1
```

Related Topics

peer (NTP), on page 432
server (NTP), on page 435

trusted-key

To designate a Network Time Protocol (NTP) trusted key, use the **trusted-key** command in NTP configuration mode. To remove the **trusted-key** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

trusted-key *key-number*
no trusted-key *key-number*

Syntax Description

key-number	Authentication key number to be trusted. Range is from 1 to 65535.

Command Default

No NTP trusted key is designated.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If authentication is enabled, use the **trusted-key** command to define one or more key numbers (corresponding to the keys defined with the **authentication-key** [NTP] command) that a NTP system must provide in its NTP packets for this system to synchronize to it. Because the other system must know the correct authentication key, this precaution provides protection against accidentally synchronizing the system to a system that is not trusted.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in its NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

Related Topics

authenticate (NTP), on page 412
authentication-key (NTP), on page 414

update-calendar

To update the calendar periodically from Network Time Protocol (NTP), use the **update-calendar** command in NTP configuration mode. To remove the **update-calendar** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

update-calendar
no update-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

This command is disabled.

Command Modes

NTP configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Your router has a calendar that is separate from the software clock. This calendar runs continuously, even if the router is powered off or rebooted.

If a router is synchronized to an outside time source through NTP, it is a good idea to update the router's calendar with the time learned from NTP. Otherwise, the calendar may gradually lose or gain time.

After you configure the **update-calendar** command, NTP updates the calendar with the software clock every hour.

Task ID

Task ID	Operations
ip-services	read, write

This example shows how to configure the router to update the calendar periodically from the software clock:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# update-calendar
```

Related Topics

clock read-calendar, on page 114
clock update-calendar, on page 123

Object Tracking Commands

This chapter describes the Cisco IOS XR software commands used to track objects. For information about how to use these commands to configure object tracking, see *System Management Configuration Guide for Cisco CRS Routers*.

delay

To configure the delay, in seconds, before the track or interface state should be polled for a change in status, use the **delay** command in track configuration mode. To delete the configuration of delay tracking, use the **no** form of this command.

delay {**up**|**down**} *seconds*
no delay {**up**|**down**} [*seconds*]

Syntax Description

delay up *seconds*	Sets delay of from 1 to 180 seconds before communication of up status of the tracked object or list of objects.
delay down *seconds*	Sets delay of from 1 to 180 seconds before communication of down status of the tracked object or list of objects.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **delay** command can be used in conjunction with all track types:

- type line-protocol state, on page 461
- type list boolean, on page 462
- type route reachability, on page 466

When using the **no** form of the command, the use of the *seconds* argument is optional.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows that the tracking process is configured to notify the network administrator that the interface should be polled for its up state in five-second intervals:

```
RP/0/RP0/CPU0:router# configuration
RP/0/RP0/CPU0:router(config)# track name1
RP/0/RP0/CPU0:router(config-track)# delay up 5
```

Related Topics

track, on page 458

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

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To access the **interface** command, you must be in line protocol tracking configuration submode.

For information about interface keywords, see *Interface and Hardware Component Command Reference for Cisco CRS Routers*.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows the **interface** command in the context of object tracking:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track12
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface atm 0/2/0/0.1
```

Related Topics

track, on page 458
type line-protocol state, on page 461
type list boolean, on page 462
type route reachability, on page 466

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

object-name	Name of object being tracked.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows how the **line-protocol track** command is used:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track PREFIX1
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 7.0.0.0/24
RP/0/RP0/CPU0:router(config-track-route)# interface service-ipsec 1
RP/0/RP0/CPU0:router(config-if)# vrf 1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 70.0.0.2 255.25.255.0
RP/0/RP0/CPU0:router(config-if)# line-protocol track PREFIX1
```

Related Topics

interface (track), on page 452
track, on page 458

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

object-name	Name of the object to be tracked.
not	(Optional) Deletes a preivously configured track based on whether an interface object is not up or down.

Command Default

No default behavior or values

Command Modes

List tracking configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To delete a previously configured track based on whether an interface object is *not* up or down, use the **not** keyword together with the **object** command in a list of tracked objects based on a Boolean expression.

The **object** command can be used only for a track based on a Boolean expression.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows how to configure an object, using the optional **not** keyword, in a tracked list of objects based on a Boolean calculation:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track connection100
RP/0/RP0/CPU0:router(config-track-list)# type list boolean and
RP/0/RP0/CPU0:router(config-track-list)# object obj3 no
```

Related Topics

track, on page 458
type list boolean, on page 462

route ipv4

To configure that an IP prefix and subnet mask should be used as the basis to track route reachability, use the **route ipv4** command in route tracking configuration mode. To remove this configuration, use the **no** form of the command.

route ipv4 *IP prefix and subnet mask*
no route ipv4

Syntax Description

IP prefix and subnet mask	Network and subnet mask; for example, 10.56.8.10/16.

Command Default

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The *IP prefix* and *subnet mask* arguments are optional for the **no** form of this command.

Task ID

Task ID	Operations
sysmgr	read, write

The following example displays use of the **route ipv4** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 10.56.8.10/16
```

Related Topics

type route reachability, on page 466
vrf (track), on page 469

show track

To display information about objects that were tracked and to specify the format of the report, use the **show track** command in EXEC mode.

show track [{*track-name*|**interface**|**ipv4 route**}] **[brief]**

Syntax Description

track-name	(Optional) Name of track used for tracking objects; for example, track1.
brief	(Optional) Displays a single line of information related to the preceding argument or keyword.
interface	(Optional) Displays tracked interface objects.
ipv4 route	(Optional) Displays the tracked IPv4 route objects.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following sample output illustrates use of the **show track** command:

```
RP/0/RP0/CPU0:router# show track Track_name3

  Track_name3
         List boolean and is DOWN
         1 change, last change 10:26:20 SJC Sun Aug 05 2007
                 object name2 not UP
                 object name1 UP
```

Related Topics

track, on page 458

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 *track-name*	Name of track used for tracking objects; for example, track1.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you use the **track** command, you enter track configuration mode.

Task ID

Task ID	Operations
sysmgr	read, write

This example shows that the tracking process is configured to notify the network administrator about the up state of the tracked object list every five seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track LIST2
RP/0/RP0/CPU0:router# track LIST2 delay up 5
```

Related Topics

delay, on page 450
show track, on page 457
type line-protocol state, on page 461
type list boolean, on page 462
type route reachability, on page 466

threshold percentage

To configure tracking threshold values based on percentages, use the **threshold percentage** command in track list threshold configuration mode. To remove a threshold percentage, use the **no** form of the command.

threshold percentage **up** *weight* [**down** *weight*]

Syntax Description

up	Maximum threshold value for the specific range beyond which a track is set to the DOWN state.
weight	Percentage limit to define the maximum threshold value.
down	Minimum threshold value for the specific range below which a track is set to the DOWN state.
weight	Percentage limit to define the minimum threshold value.

Command Default

None

Command Modes

Tack list threshold configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

Use the **threshold percentage** command to specify the tracking threshold value used to determine the state of a percentage threshold-weighted list.

- A percentage threshold-weighted list is set to the UP state when the percentage of objects is between UP threshold value and DOWN threshold value.
- A percentage threshold-weighted list is set to the DOWN state when the percentage of objects is out of the range in a configuration.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to specify the weight thresholds for a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)#  threshold percentage up 50 down 33
```

Related Topics

type list threshold percentage, on page 464

threshold weight

To configure tracking threshold values based on weights, use the **threshold weight** command in track list threshold configuration mode. To remove a threshold weight, use the **no** form of the command.

threshold weight **up** *weight* [**down** *weight*]

Syntax Description

up	Maximum threshold value for the specific range beyond which a track is set to the DOWN state.
weight	Percentage limit to define the maximum threshold value.
down	Minimum threshold value for the specific range below which a track is set to the DOWN state.
weight	Percentage limit to define the minimum threshold value.

Command Default

None

Command Modes

Tack list threshold configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

Use the **threshold weight** command to specify the threshold value used to determine the state of a threshold-weighted list.

- A threshold-weighted list is set to the UP state when the cumulative sum of the weight of objects is between UP threshold value and DOWN threshold value.
- A threshold-weighted list is set to the DOWN state when the cumulative sum of the weight of objects is out of the range in a configuration.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to specify the weight thresholds for a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# threshold weight up 18 down 5
```

Related Topics

type list threshold weight, on page 465

type line-protocol state

To configure tracking of the line protocol state of an interface object, use the **type line-protocol** command in track configuration mode. To delete the configuration of line-protocol tracking, use the **no** form of this command.

type line-protocol state
no type line-protocol state

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **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

This example shows how to use the **type line-protocol state** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track12
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
```

Related Topics

delay, on page 450
interface (track), on page 452
show track, on page 457
track, on page 458

type list boolean

To configure a tracked list of objects based on a Boolean calculation, use the **type list boolean** command in track configuration mode. To remove an object tracking list based on a Boolean calculation, use the **no** form of the command.

type list boolean {**and**|**or**}
no type list boolean {**and**|**or**}

Syntax Description

and	Specifies that the list is up if all objects are up, or down if one or more objects are down. For example, when tracking two interfaces, up means that both interfaces are up, and down means that either interface is down.
or	Specifies that the list is up if at least one object is up. For example, when tracking two interfaces, up means that either interface is up, and down means that both interfaces are down.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **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

This example shows how to use the **type list boolean** command in creating a list of objects to be tracked:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track LIST2
RP/0/RP0/CPU0:router(config-track)# type list boolean and
RP/0/RP0/CPU0:router(config-track-list)# object IPSec1 not
RP/0/RP0/CPU0:router(config-track-list)# object IPSec2
```

```
RP/0/RP0/CPU0:router(config-track-list)# object PREFIX1
RP/0/RP0/CPU0:router(config-track-list)# exit
RP/0/RP0/CPU0:router(config)# track IPSec1
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface tengige 0/0/0/3
RP/0/RP0/CPU0:router(config-track-line-prot)# exit
RP/0/RP0/CPU0:router(config-track)# track IPSec2
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface ATM0/2/0.1
RP/0/RP0/CPU0:router(config-track-line-prot)# exit
RP/0/RP0/CPU0:router(config)# track PREFIX1
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 7.0.0.0/24
RP/0/RP0/CPU0:router(config-track-route)# exit
RP/0/RP0/CPU0:router(config-track)# interface service-ipsec 1
RP/0/RP0/CPU0:router(config-if)# vrf 1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 70.0.0.2 255.255.255.0
RP/0/RP0/CPU0:router(config-if)# profile vrf_1_ipsec
RP/0/RP0/CPU0:router(config-if)# line-protocol track LIST2
RP/0/RP0/CPU0:router(config-if)# tunnel source 80.0.0.2
RP/0/RP0/CPU0:router(config-if)# tunnel destination 80.0.0.1
RP/0/RP0/CPU0:router(config-if)# service-location preferred-active 0/2/0
RP/0/RP0/CPU0:router(config-if)# commit
```

Related Topics

delay, on page 450
line-protocol track, on page 454
object, on page 455
show track, on page 457
track, on page 458
type line-protocol state, on page 461
type route reachability, on page 466

type list threshold percentage

To configure a tracked list of objects based on a percentage threshold, use the **type list threshold percentage** command in track configuration mode. To remove an object tracking list based on a percentage threshold, use the **no** form of the command.

type list threshold percentage

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Track configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

Use the **threshold percentage** command to specify the tracking threshold value used to determine the state of a percentage threshold-weighted list. A percentage threshold-weighted list is set to the UP state when the percentage of objects in the UP state is between UP threshold value to DOWN threshold value. A percentage threshold-weighted list is set to the DOWN state when the percentage of objects is out of the range in a configuration.

Use the **object** command to add tracked objects to the threshold-weighted list. A maximum of 200 track objects are allowed.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to add objects to a percentage threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold percentage
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 2
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 3
```

Related Topics

object, on page 455
threshold percentage, on page 459

type list threshold weight

To configure a tracked list of objects based on a weight threshold, use the **type list threshold weight** command in track configuration mode. To remove an object tracking list based on a weight threshold, use the **no** form of the command.

type list threshold weight

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Track configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

Use the **threshold weight** command to specify the threshold value used to determine the state of a threshold-weighted list. When the cumulative sum of the weight of objects in the UP state is between UP threshold value to DOWN threshold value, the threshold-weighted list is set to the UP state. A threshold-weighted list is set to the DOWN state when the cumulative sum of the weight of objects in the UP state is out of the range in a configuration.

Use the **object** command to add tracked objects to the threshold-weighted list. A maximum of 200 track objects are allowed.

Task ID

Task ID	Operation
sysmgr	read, write

This example illustrates how to add objects to a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track t4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1 weight 10
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 2 weight 5
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 3 weight 3
```

Related Topics

object, on page 455
threshold weight, on page 460

type route reachability

To configure the routing process to notify the tracking process when the route state changes due to a routing update, use the **type route reachability** command in track configuration mode. To remove a track based on route reachability, use the **no** form of this command.

type route reachability
no type route reachability

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

This example shows how to track for route reachability:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
```

Related Topics

delay, on page 450
show track, on page 457

track, on page 458

type rtr

To configure the router to track the return code of IP service level agreement (SLA) operations, use the **type rtr** command in track configuration mode. To remove a track based on IP SLA return code, use the **no** form of this command.

type rtr *ipsla-no* **reachability**
no type rtr

Syntax Description

ipsla-no	IP SLA operation number. Values can range from 1 to 2048.
reachability	Tracks whether the route is reachable or not.

Command Default

None

Command Modes

Track configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **type rtr** command in conjunction with a configuration that uses:

- The

  track keyword in the **permit** command within an ACL definition. For example:

```
ipv4 access-list abf-track
  10 permit any any nexthop track track1 1.2.3.4
```

- An IP service level agreement configuration.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to configure IPSLA object tracking:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type rtr 1 reachability
```

vrf (track)

To configure a VRF table to be used as the basis to track route reachability, use the **vrf** command in route tracking configuration mode. To delete the configuration of a VRF table for the purpose of IP route tracking purposes, use the **no** form of the command.

vrf *vrf-table-name*
no vrf [*vrf-table-name*]

Syntax Description

vrf-table-name	Network and subnet; for example, 10.56.8.10/16.

Command Default

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read, write

The following example displays the use of the **vrf** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# vrf vrf1
```

Related Topics

delay, on page 450
route ipv4, on page 456
type route reachability, on page 466

Process and Memory Management Commands

This chapter describes the Cisco IOS XR software commands used to manage processes and memory.

For more information about using the process and memory management commands to perform troubleshooting tasks, see *Cisco IOS XR Getting Started Guide for the Cisco CRS Router*.

clear context

To clear core dump context information, use the **clear context** command in the appropriate mode.

clear context location {*node-id*|**all**}

Syntax Description

location {*node-id* | **all**}	(Optional) Clears core dump context information for a specified node. The *node-id* argument is expressed in the *rack/slot/module* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear context** command to clear core dump context information. If you do not specify a node with the **location** *node-id* keyword and argument, this command clears core dump context information for all nodes.

Use the **show context** command to display core dump context information.

Task ID

Task ID	Operations
diag	execute

The following example shows how to clear core dump context information:

```
RP/0/RP0/CPU0:router# clear context
```

Related Topics

show context, on page 506

dumpcore

To manually generate a core dump, use the **dumpcore** command in EXEC mode Admin EXEC mode.

dumpcore {**running**|**suspended**} *job-id* **location** *node-id*

Syntax Description

running	Generates a core dump for a running process.
suspended	Suspends a process, generates a core dump for the process, and resumes the process.
job-id	Process instance identifier.
location *node-id*	Generates a core dump for a process running on the specified node. The *node-id* argument is expressed in the *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

When a process crashes on the Cisco IOS XR software, a core dump file of the event is written to a designated destination without bringing down the router. Upon receiving notification that a process has terminated abnormally, the Cisco IOS XR software then respawns the crashed process. Core dump files are used by Cisco Technical Support Center engineers and development engineers to debug the Cisco IOS XR software.

Core dumps can be generated manually for a process, even when a process has not crashed. Two modes exist to generate a core dump manually:

- **running** —Generates a core dump for a running process. This mode can be used to generate a core dump on a critical process (a process whose suspension could have a negative impact on the performance of the router) because the core dump file is generated independently, that is, the process continues to run as the core dump file is being generated.
- **suspended** —Suspends a process, generates a core dump for the process, and resumes the process. Whenever the process is suspended, this mode ensures data consistency in the core dump file.

Core dump files contain the following information about a crashed process:

- Register information
- Thread status information
- Process status information
- Selected memory segments

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to generate a core dump in suspended mode for the process instance 52:

```
RP/0/RP0/CPU0:router# dumpcore suspended 52

RP/0/RP0/CPU0:Sep 22 01:40:26.982 : sysmgr[71]: process in stop/continue state 4104
RP/0/RP0/CPU0Sep 22 01:40:26.989 : dumper[54]: %DUMPER-4-CORE_INFO : Core for pid = 4104
 (pkg/bin/devc-conaux) requested by pkg/bin/dumper_gen@node0_RP0_CPU0
RP/0/RP0/CPU0Sep 22 01:40:26.993 : dumper[54]: %DUMPER-6-SPARSE_CORE_DUMP :
 Sparse core dump as configured dump sparse for all
RP/0/RP0/CPU0Sep 22 01:40:26.995 : dumper[54]: %DUMPER-7-DLL_INFO_HEAD : DLL path
 Text addr.  Text size   Data addr.  Data size   Version
RP/0/RP0/CPU0Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libplatform.dll  0xfc0d5000  0x0000a914  0xfc0e0000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysmgr.dll  0xfc0e2000  0x0000ab48  0xfc0c295c  0x00000368        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libinfra.dll  0xfc0ed000  0x00032de0  0xfc120000  0x00000c90        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libios.dll  0xfc121000  0x0002c4bc  0xfc14e000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libc.dll  0xfc150000  0x00077ae0  0xfc1c8000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsyslog.dll  0xfc1d2000  0x0000530c  0xfc120c90  0x00000308        0
RP/0/RP0/CPU0Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libbackplane.dll  0xfc1d8000  0x0000134c  0xfc0c2e4c  0x000000a8        0
RP/0/RP0/CPU0Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libnodeid.dll  0xfc1e5000  0x00009114  0xfc1e41a8  0x00000208        0
RP/0/RP0/CPU0Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
```

```
 /pkg/lib/libttyserver.dll  0xfc1f1000  0x0003dfcc  0xfc22f000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttytrace.dll  0xfc236000  0x00004024  0xfc1e44b8  0x000001c8        0
RP/0/RP0/CPU0Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libdebug.dll  0xfc23b000  0x0000ef64  0xfc1e4680  0x00000550        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_procfs_util.dll  0xfc24a000  0x00004e2c  0xfc1e4bd0  0x000002a8        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdb.dll  0xfc24f000  0x000452e0  0xfc295000  0x00000758        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdbutils.dll  0xfc296000  0x0000ae08  0xfc295758  0x000003ec        0
RP/0/RP0/CPU0Sep 22 01:40:27.002 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_tty_svr_error.dll  0xfc2a1000  0x0000172c  0xfc1e4e78  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.002 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_tty_error.dll  0xfc2a3000  0x00001610  0xfc1e4f00  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.003 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libwd_evm.dll  0xfc2a5000  0x0000481c  0xfc295b44  0x00000188        0
RP/0/RP0/CPU0Sep 22 01:40:27.003 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttydb.dll  0xfc2aa000  0x000051dc  0xfc295ccc  0x00000188        0
RP/0/RP0/CPU0Sep 22 01:40:27.004 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttydb_error.dll  0xfc23a024  0x00000f0c  0xfc295e54  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.004 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/librs232.dll  0xfc2b0000  0x00009c28  0xfc2ba000  0x00000470        0
RP/0/RP0/CPU0Sep 22 01:40:27.005 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_rs232_error.dll  0xfc2bb000  0x00000f8c  0xfc295edc  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.005 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libst16550.dll  0xfc2bc000  0x00008ed4  0xfc2ba470  0x00000430        0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libconaux.dll  0xfc2c5000  0x00001dc0  0xfc2ba8a0  0x000001a8        0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_conaux_error.dll  0xfc1ee114  0x00000e78  0xfc295f64  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttyutil.dll  0xfc2c7000  0x00003078  0xfc2baa48  0x00000168        0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libbag.dll  0xfc431000  0x0000ee98  0xfc40cc94  0x00000368        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libchkpt.dll  0xfc474000  0x0002ecf8  0xfc4a3000  0x00000950        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdbbackend.dll  0xfc8ed000  0x0000997c  0xfc8d3aa8  0x0000028c        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttymgmtconnection.dll  0xfce85000  0x00004208  0xfce8a000  0x00000468
0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttymgmt.dll  0xfcea4000  0x0000e944  0xfce8abf0  0x000003c8        0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttynmspc.dll  0xfcec7000  0x00004a70  0xfcec6644  0x000002c8        0
RP/0/RP0/CPU0Sep 22 01:40:28.396 : dumper[54]: %DUMPER-5-CORE_FILE_NAME :
 Core for process pkg/bin/devc-conaux at harddisk:/coredump/devc-conaux.by.
 dumper_gen.sparse.20040922-014027.node0_RP0_CPU0.ppc.Z
RP/0/RP0/CPU0Sep 22 01:40:32.309 : dumper[54]: %DUMPER-5-DUMP_SUCCESS : Core dump success
```

exception coresize

Halts the creation of the core file beyond the configured core file size limit.

exception coresize *size*
no exception coresize

Syntax Description

coresize	*size*	Defines the maximum limit of the core file size beyond which the core file creation is halted and only the stack trace output is printed on the screen. The core file size limit can range from 1 to 4095 MB.

Command Default

This command has no default behavior.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how you can disable the creation of core dump files by specifying the limit for core file size.

```
RP/0/RP0/CPU0:router(config)# exception coresize 1024
RP/0/RP0/CPU0:router(config)# commit
```

exception filepath

To modify core dump settings, use the **exception filepath** command in the appropriate configuration mode. To remove the configuration, use the **no** form of this command.

exception [**choice** *preference*] [**compress** {**on**|**off**}] **filename** *filename lower-limit−higher-limit* **filepath** *filepath-name*
no exception [**choice** *preference*] [**compress** {**on**|**off**}] **filename** *filename lower-limit−higher-limit* **filepath** *filepath-name*

Syntax Description

choice *preference*	(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 *filename lower-limit-higher-limit*	(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. **filename** *filename lower-limit-higher-limit* See Table 46: Default Core Dump File Naming Convention Description, on page 480 for a description of the default core dump file naming convention. Vali **filename** *filename lower-limit-higher-limit* d 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. **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 *lower-limit* argument and continuing until the higher limit value configured for the *higher-limit* 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-name	Local file system or network protocol, followed by the directory path. All local file systems are supported. The following network protocols are supported: TFTP and FTP.

Command Default

If you do not specify the order of preference for the destination of core dump files using the **choice** *preference* keyword and argument, the default preference is the primary location or 1.

Core dump files are sent compressed.

The default file naming convention used for core dump files is described in Table 46: Default Core Dump File Naming Convention Description, on page 480.

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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.

In addition to the three preferred destinations that can be configured, Cisco IOS XR software provides three default fallback destinations for core dump files in the event that user-defined locations are unavailable.

The default fallback destinations are:

- harddisk:/dumper
- disk1:/dumper
- disk0:/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 Cisco IOS XR software does not save a core file on a local storage device if the size of the core dump file creates a low-memory condition.

By default, Cisco IOS XR software assigns filenames to core dump files according to the following format:

process [.by. *requester* |.abort][.sparse]. *date-time* . *node* . *processor-type* [.Z]

For example:

```
packet.by.dumper_gen.20040921-024800.node0_RP0_CPU0.ppc.Z
```

Table 46: Default Core Dump File Naming Convention Description, on page 480 describes the default core dump file naming convention.

Table 46: Default Core Dump File Naming Convention Description

Field	Description
process	Name of the process that generated the core dump.
.by. *requester* | .abort	If the core dump was generated because of a request by a process (requester), the core filename contains the string ".by.*requester*" where the *requester* variable is the name or process ID (PID) of the process that requested the core dump. If the core dump was due to a self-generated abort call request, the core filename contains the string ".abort" instead of the name of the requester.
.sparse	If a sparse core dump was generated instead of a full core dump, "sparse" appears in the core dump filename.
.*date-time*	Date and time the dumper process was called by the process manager to generate the core dump. The .*date-time* time-stamp variable is expressed in the *yyyy.mm.dd-hh.mm.ss* format. Including the time stamp in the filename uniquely identifies the core dump filename.
. *node*	Node ID, expressed in the *rack*/*slot*/*module* notation, where the process that generated the core dump was running.
.*processor-type*	Type of processor (mips or ppc).
.Z	If the core dump was sent compressed, the filename contains the .Z suffix.

You can modify the default naming convention by specifying a filename to be appended to core dump files with the optional **filename** *filename* keyword and argument and by specifying a lower and higher limit ranges of values to be appended to core dump filenames with the *lower-limit* and *higher-limit* arguments, respectively. The filename that you specify for the *filename* argument is appended to the core dump file and the lower and higher limit ranges of core dump files to be sent to a specified destination before the filenames are recycled. Valid values for the *lower-limit* argument are 0 to 4. Valid values for the *higher-limit* argument are 5 to 64. A hyphen (-) must immediately follow the *lower-limit* argument. In addition, to uniquely identify each core dump file, a value is appended to each core dump file, beginning with the lower-limit value specified

with the *lower-limit* argument and continuing until the higher-limit value specified with the *higher-limit* argument has been reached. When the configured higher-limit value has been reached, Cisco IOS XR software begins to recycle the values appended to core dump files, beginning with the lower-limit value.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to 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 Topics

exception pakmem, on page 482
exception sparse, on page 484
exception sprsize, on page 486
show exception, on page 512

exception pakmem

To configure the collection of packet memory information in core dump files, use the **exception pakmem** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception pakmem {**on**|**off**}
no exception pakmem {**on**|**off**}

Syntax Description

on	Enables the collection of packet memory information in core dump files.
off	Disables the collection of packet memory information in core dump files.

Command Default

Packet memory information is not included in core dump files.

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception pakmem** command with the **on** keyword to configure the collection of packet memory information in core dump files. Cisco Technical Support Center engineers and development engineers use packet memory information to debug packet memory issues related to a process.

Caution Including packet memory information in core dump files significantly increases the amount of data generated in the core dump file, which may delay the restart time for the process.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to configure core dumps to include packet memory information:

```
RP/0/RP0/CPU0:router(config)# exception pakmem on
```

Related Topics

exception filepath, on page 478
exception sparse, on page 484
exception sprsize, on page 486
show exception, on page 512

exception sparse

To enable or disable sparse core dumps, use the **exception sparse** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception sparse {**on**|**off**}
no exception sparse

Syntax Description

on	Enables sparse core dumps.
off	Disables sparse core dumps

Command Default

Sparse core dumps are disabled.

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception sparse** command to reduce the amount of data generated in the core dump file. Sparse core dumps reduce the amount of time required to generate the core dump file because only referenced data is generated in the core file (at the cost of lost information in the core file). Reducing the time required to generate core dump files corresponds to faster process restart times.

Note Use the **exception sparse off** command in administration configuration mode to get a complete coredump of the transient processes on the RP.

Sparse core dumps contain the following information about crashed processes:

- Register information for all threads, and any memory pages referenced in these register values
- Stack information for all threads, and any memory pages referenced in these threads
- All memory pages referenced by a loaded dynamic loadable library (DLL) data section, if the final program counter falls in a DLL data section
- Any user-specified marker pages from the lib_dumper_marker DLL

The **exception sparse** command dumps memory pages based on trigger addresses found in the previously listed dump information, according to the following criteria:

- If the trigger address in the memory page is in the beginning 128 bytes of the memory page, the previous memory page in the continuous address region is dumped also.
- If the trigger address in the memory page is in the final 128 bytes of the memory page, the next memory page in the continuous address region is dumped also.
- In all other instances, only the memory page that includes the trigger address is dumped.

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to enable sparse core dumps:

```
RP/0/RP0/CPU0:router(config)# exception sparse on
```

Related Topics

exception filepath, on page 478
exception pakmem, on page 482
exception sprsize, on page 486
show exception, on page 512

exception sprsize

To specify the maximum file size for core dumps, use the **exception sprsize** command in administration configuration mode or in global configuration mode. To remove the configuration, use the **no** form of this command.

exception sprsize *megabytes*
no exception sprsize

Syntax Description

megabytes	Size in megabytes (MB).

Command Default

megabytes : 192

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception sprsize** command to specify the maximum file size for core dumps. The maximum file size configured for the *megabytes* argument is used with the configuration set for the exception sparse, on page 484 command to determine whether or not to generate a sparse core dump file. If sparse core dumps are disabled and a core dump file is predicted to exceed the default value (192 MB) uncompressed or the value specified for the *megabytes* argument uncompressed, a sparse core dump file is generated. If sparse core dumps are enabled, a sparse core dump file is generated, regardless of the size of the core dump file.

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to set the file size of sparse core dumps to 300 MB:

```
RP/0/RP0/CPU0:router(config)# exception sprsize 300
```

Related Topics

exception sparse, on page 484

follow

To unobtrusively debug a live process or a live thread in a process, use the **follow** command in EXEC modeAdmin 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 *job-id*	Follows a process by job ID.
process *pid*	Follows the process with the process ID (PID) specified for the *pid* argument.
location *node-id*	Follows the target process on the designated node. The *node-id* argument is expressed in the *rack/slot/module* notation.
all	(Optional) Follows all threads.
blocked	(Optional) Follows the chain of thread IDs (TIDs) or PIDs that are blocking the target process.
debug *level*	(Optional) Sets the debug level for the following operation. Valid values for the level argument are 0 to 10.
delay *seconds*	(Optional) Sets the delay interval between each iteration. Valid values for the *seconds* argument are 0 to 255 seconds.
dump *address size*	(Optional) Dumps the memory segment starting with the specified memory address and size specified for the *address* and *size* arguments.
iteration *count*	(Optional) Specifies the number of times to display information. Valid values for the *count* argument are 0 to 255 iterations.
priority *level*	(Optional) Sets the priority level for the following operation. Valid values for the *level* argument are 1 to 63.
stackonly	(Optional) Displays only stack trace information.
thread *tid*	(Optional) Follows the TID of a process or job ID specified for the *tid* argument.
verbose	(Optional) Displays register and status information pertaining to the target process.

Command Default

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 mode

Admin EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

Use this command to unintrusively debug a live process or a live thread in a process. This command is particularly useful for debugging deadlock and livelock conditions, for examining the contents of a memory location or a variable in a process to determine the cause of a corruption issue, or in investigating issues where a thread is stuck spinning in a loop. A livelock condition is one that occurs when two or more processes continually change their state in response to changes in the other processes.

The following actions can be specified with this command:

- Follow all live threads of a given process or a given thread of a process and print stack trace in a format similar to core dump output.
- 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

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

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/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 = 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/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_evm.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 0xfcec5000 0x00006e9c 0xfcecc000 0x00003000        0
/pkg/lib/libltimes.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 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)
---------------------------------------------------------------------

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_evm.dll   0xfc2a9000 0x0000481c 0xfc299b88 0x00000188         0
/pkg/lib/lrdlib.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 Topics

monitor threads, on page 495
show processes, on page 524

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 *number*	(Optional) Number of times the statistics display is to be updated, in the range from 0 to 4294967295.
location *node-id*	(Optional) Displays the output from the command from the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

When all keywords are omitted, the **monitor threads** command displays the first ten threads for the local node, sorted in descending order by the time used. The display is cleared and updated every 5 seconds until you quit the command.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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 47: Interactive Display Commands for the monitor threads Command, on page 496.
- To terminate the display and return to the system prompt, enter the **q** key.
- To list the interactive commands, type ? during the display.

Table 47: Interactive Display Commands for the monitor threads Command, on page 496 describes the available interactive display commands.

Table 47: Interactive Display Commands for the monitor threads Command

Command	Description
?	Displays the available interactive commands.
d	Changes the delay interval between updates.
k	Kills a process.
l	Refreshes the screen.
n	Changes the number of threads to be displayed.
q	Quits the interactive display and returns the prompt to EXEC mode.

Task ID

Task ID	Operations
basic-services	execute

The following example shows sample output from the **monitor threads** command:

```
RP/0/RP0/CPU0:router# monitor threads

195 processes; 628 threads;
CPU states: 98.2% idle, 0.9% user, 0.7% kernel
Memory: 2048M total, 1576M avail, page size 4K

   JID   TID LAST_CPU PRI STATE  HH:MM:SS      CPU  COMMAND
     1    12   1       10 Rcv     0:00:09     0.42% procnto-600-smp-cisco-instr
     1    25   1       10 Run     0:00:30     0.36% procnto-600-smp-cisco-instr
   342     1   1       19 Rcv     0:00:07     0.20% wdsysmon
    52     5   0       21 Rcv     0:00:03     0.15% devc-conaux
    52     3   1       18 Rcv     0:00:02     0.07% devc-conaux
532670     1   0       10 Rply    0:00:00     0.07% top
   293     6   0       55 Rcv     0:00:06     0.03% shelfmgr
    55     8   0       10 Rcv     0:00:02     0.03% eth_server
   315     3   0       10 Rcv     0:00:11     0.03% sysdb_svr_local
    55     7   0       55 Rcv     0:00:11     0.02% eth_server
```

The following example shows sample output from the **monitor threads** command using the optional **location** keyword:

```
RP/0/RP0/CPU0:router# monitor threads location 0/RP0/CPU0

Computing times...195 processes; 628 threads;
CPU states: 95.1% idle, 2.7% user, 2.0% kernel
Memory: 2048M total, 1576M avail, page size 4K

   JID   TID LAST_CPU PRI STATE  HH:MM:SS      CPU  COMMAND
     1    25   0       10 Run     0:00:32     2.08% procnto-600-smp-cisco-instr
   265     5   0       10 SigW    0:00:09     0.89% packet
   279     1   1       10 Rcv     0:00:00     0.65% qsm
557246     1   0       10 Rply    0:00:00     0.51% top
   293     5   1       55 Rcv     0:00:01     0.07% shelfmgr
   180    13   1       10 Rcv     0:00:02     0.07% gsp
   315     3   0       10 Rcv     0:00:12     0.07% sysdb_svr_local
```

```
   55     7   1      55 Rcv     0:00:12     0.04% eth_server
  180     1   0      10 Rcv     0:00:01     0.04% gsp
  298     9   0      10 Rcv     0:00:01     0.04% snmpd
```

Table 48: monitor threads Field Descriptions, on page 497 describes the significant fields shown in the display.

Table 48: monitor threads Field Descriptions

Field	Description
JID	Job ID.
TIDS	Thread ID.
LAST_CPU	Number of open channels.
PRI	Priority level of the thread.
STATE	State of the thread.
HH:MM:SS	Run time of process since last restart.
CPU	Percentage of CPU used by process thread.
COMMAND	Process name.

Using Interactive Commands

When the **n** or **d** interactive command is used, the **monitor threads** command prompts for a number appropriate to the specific interactive command. The following example shows sample output from the **monitor threads** command using the interactive **n** command after the first display cycle to change the number of threads:

```
RP/0/RP0/CPU0:router# monitor threads

Computing times... 87 processes; 249 threads;
CPU states: 84.8% idle, 4.2% user, 10.9% kernel
Memory: 256M total, 175M avail, page size 4K

   JID   TID PRI STATE  HH:MM:SS      CPU  COMMAND
     1     6  10 Run     0:00:10    10.92% kernel
553049     1  10 Rply    0:00:00     4.20% top
    58     3  10 Rcv     0:00:24     0.00% sysdbsvr
     1     3  10 Rcv     0:00:21     0.00% kernel
    69     1  10 Rcv     0:00:20     0.00% wdsysmon
     1     5  10 Rcv     0:00:20     0.00% kernel
   159     2  10 Rcv     0:00:05     0.00% qnet
   160     1  10 Rcv     0:00:05     0.00% netio
   157     1  10 NSlp    0:00:04     0.00% envmon_periodic
   160     9  10 Intr    0:00:04     0.00% netio
n

Enter number of threads to display: 3
Please enter a number between 5 and 40
Enter number of threads to display: 8
```

```
87 processes; 249 threads;
CPU states: 95.3% idle, 2.9% user, 1.7% kernel
Memory: 256M total, 175M avail, page size 4K

   JID   TID PRI STATE  HH:MM:SS      CPU  COMMAND
     1     6  10 Run     0:00:11     1.76% kernel
    69     1  10 Rcv     0:00:20     1.11% wdsysmon
    58     3  10 Rcv     0:00:24     0.40% sysdbsvr
   157     1  10 NSlp    0:00:04     0.23% envmon_periodic
   159    19  10 Rcv     0:00:02     0.20% qnet
553049     1  10 Rply    0:00:00     0.20% top
   159    12  10 Rcv     0:00:03     0.13% qnet
   160     1  10 Rcv     0:00:05     0.10% netio
```

When a number outside the acceptable range is entered, the acceptable range is displayed:

```
Please enter a number between 5 and 40
Enter number of threads to display:
```

Related Topics

monitor processes

process

To start, terminate, or restart a process, use the **process** command in admin EXEC mode.

process {**crash**|**restart**|**shutdown**|**start**} {*executable-namejob-id*} **location** {*node-id*|**all**}

Syntax Description

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.
executable-name	Executable name of the process to be started, terminated, or restarted. Supplying an executable name for the executable-name argument performs the action for all the simultaneously running instances of the process, if applicable.
job-id	Job ID of the process instance to be started, terminated, or restarted. Supplying a job ID for the *job-id* argument performs the action for only the process instance associated with the job ID.
location { *node-id* | **all**}	Starts, terminates, or restarts a process on the designated node. The *node-id* argument is entered in the *rack/slot/module* notation. The **all** keyword specifies all nodes.

Command Default

None

Command Modes

Admin EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **shutdown** keyword was introduced to replace the **kill** keyword. Support for the **crash** keyword was added to crash a process.
Release 3.5.0	This command was removed from EXEC mode.
Release 3.8.0	The **blocked** keyword was not supported.

Usage Guidelines

Under normal circumstances, processes are started and restarted automatically by the operating system as required. If a process crashes, it is automatically restarted.

Use this command to manually start, stop, or restart individual processes.

Caution Manually stopping or restarting a process can seriously impact the operation of a router. Use these commands only under the direction of a Cisco Technical Support representative.

process 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 switchover, 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.

Task ID

Task ID	Operations
root-lr	execute

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_STARTUP_START : Cold controlled start beginning
RP/0/RP0/CPU0:Mar 30 15:27:31 : isis[352]: %ISIS-6-INFO_STARTUP_FINISH :
   Cold controlled start completed
```

This example shows how to restart a process:

Related Topics

process mandatory, on page 504
show processes, on page 524

process core

To modify the core dump options for a process, use the **process core** command in administration EXEC mode.

process {*executable-namejob-id*} **core** {**context**|**copy**|**fallback**|**iomem**|**mainmem**|**off**|**sharedmem**|**sparse**|**sync**|**text**} [**maxcore** *value*] **location** *node-id*

Syntax Description

executable-name	Executable name of the process for which you want to change core dump options. Specifying a value for the *executable-name* argument changes the core dump option for multiple instances of a running process.
job-id	Job ID associated with the process instance. Specifying a *job-id* 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 *value*	(Optional) Specifies the maximum number of core dumps allowed for the specified process on its creation.
location *node-id*	Sets the core dump options for a process on a designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

By default, processes are configured to dump shared memory, text area, stack, data section, and heap information.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Release	Modification
Release 3.2	The command was made available in administration EXEC mode. The **mainmem-sharedmem** , **mainmem-text** , and **mainmem-text-sharedmem** keywords were removed. The **context** , **fallback** , **iomem** , **sync** , and **text** keywords were introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The modular architecture of 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 job-id* argument changes the core dump option for all instances of the process. Specifying a job ID for the value changes the core dump option for a single instance of a running process.

Task ID

Task ID	Operations
root-lr	execute

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 Topics

show processes, on page 524

process mandatory

To set the mandatory reboot options for a process, use the **process mandatory** command in the appropriate mode.

process mandatory
process mandatory {**on**|**off**} {*executable-namejob-id*} **location** *node-id*

process mandatory reboot
process mandatory reboot {**enable**|**disable**}

process mandatory toggle
process mandatory toggle {*executable-namejob-id*} **location** *node-id*

Syntax Description

on	Turns on mandatory process attribute.
off	Turns off the mandatory process attribute. The process is not considered mandatory.
reboot { **enable** | **disable**}	Enables or disables the reboot action when a mandatory process fails.
toggle	Toggles a mandatory process attribute.
executable-name	Executable name of the process to be terminated. Specifying an executable name for the *executable-name* argument terminates the process and all the simultaneously running copies, if applicable.
job-id	Job ID associated with the process to be terminated. Terminates only the process associated with the job ID.
location *node-id*	Sets the mandatory settings for a process on a designated node. The node-id argument is expressed in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If a process unexpectedly goes down, the following action occurs based on whether the process is considered mandatory.

- If the process is mandatory and the process cannot be restarted, the node automatically reboots.
- If the process is not mandatory and cannot be restarted, it stays down and the node does not reboot.

Task ID

Task ID	Operations
root-lr	execute

The following example shows how to turn on a mandatory attribute. In this example, the mandatory attribute is turned on for the media_ether_config_di process.

```
RP/0/RP0/CPU0:router# process mandatory on media_ether_config_di
```

The following example shows how to turn the reboot option on. In this example, the router is set to reboot the node if a mandatory process goes down and cannot be restarted.

```
RP/0/RP0/CPU0:router# process mandatory reboot enable

RP/0/RP00/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/RP00/CPU0:Mar 19 19:31:20 : sysmgr[71]: %SYSMGR-4-MANDATORY_REBOOT_OVERRIDE
: mandatory reboot option overridden by request
```

Related Topics

show processes, on page 524

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

coredump-occurrence	(Optional) Core dump context information to be displayed based on the occurrence of the core dump. Valid values are 1 to 10.
clear	(Optional) Clears the current context information.
location { *node-id* | **all**}	Displays core dump information that occurred on the designated node. The *node-id* argument is expressed in the *rack/slot/module* notation. The **all** keyword specifies to display information for all nodes.

Command Default

If no *coredump-occurrence* value is specified, core dump context information for all core dumps is displayed.

Command Modes

EXEC, Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show context** command to display core dump context information. This command displays context information for the last ten core dumps. Cisco Technical Support Center engineers and development engineers use this command for post-analysis in the debugging of processes.

Use the clear context, on page 472 command to clear core dump context information.

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show context** command:

```
RP/0/RP0/CPU0:router# show context

Crashed pid = 20502 (pkg/bin/mbi-hello)
Crash time: Thu Mar 25, 2004: 19:34:14
```

```
Core for process at disk0:/mbi-hello.20040325-193414.node0_RP0_CPU0

    Stack Trace
#0 0xfc117c9c
#1 0xfc104348
#2 0xfc104154
#3 0xfc107578
#4 0xfc107734
#5 0x482009e4
                Registers info
            r0       r1       r2       r3
  R0   0000000e  481ffa80  4820c0b8  00000003
            r4       r5       r6       r7
  R4   481ffb18  00000001  481ffa88  48200434
            r8       r9      r10      r11
  R8   00000000  00000001  00000000  fc17ac58
           r12      r13      r14      r15
  R12  481ffb08  4820c080  481ffc10  00000001
           r16      r17      r18      r19
  R16  481ffc24  481ffc2c  481ffcb4  00000000
           r20      r21      r22      r23
  R20  00398020  00000000  481ffb6c  4820a484
           r24      r25      r26      r27
  R24  00000000  00000001  4820efe0  481ffb88
           r28      r29      r30      r31
  R28  00000001  481ffb18  4820ef08  00000001
           cnt       lr      msr       pc
  R32  fc168d58  fc104348  0000d932  fc117c9c
           cnd      xer
  R36  24000022  00000004

                      DLL Info
DLL path    Text addr.  Text size   Data addr. Data size   Version
/pkg/lib/libinfra.dll  0xfc0f6000  0x00032698  0xfc0f5268  0x00000cb4
```

The following example shows sample output from the **show context** command. The output displays information about a core dump from a process that has not crashed.

```
RP/0/RP0/CPU0:router# show context

node:      node0_RP0_CPU0
------------------------------------------------------------------

Crashed pid = 28703 (pkg/bin/packet)
Crash time: Tue Sep 21, 2004: 02:48:00
Core for process at harddisk:/packet.by.dumper_gen.20040921-024800.node0_RP0_CPU0.ppc.Z
```

Table 49: show context Field Descriptions, on page 507 describes the significant fields shown in the display.

Table 49: show context Field Descriptions

Field	Description
Crashed pid	Process ID (PID) of the crashed process followed by the executable path.
Crash time	Time and date the crash occurred.
Core for process at	File path to the core dump file.

Field	Description
Stack Trace	Stack trace information.
Registers Info	Register information related to crashed threads.
DLL Info	Dynamically loadable library (DLL) information used to decode the stack trace.

Related Topics

clear context, on page 472

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]**|**[symbol]address** *virtual-address*|**dllname** *dll-virtual-path*|**memory**|**virtual**}] [**location** *node-id*]

Syntax Description

jobid *job-id*	(Optional) Displays DLL information for the specified job identifier.
virtual	(Optional) Displays the virtual path of DLLs. The virtual path is expressed in the /pkg/lib/library-name.dll format where the library name is the name of the DLL followed by the .dll suffix.
symbol	(Optional) Displays the symbol at the virtual address specified for the *virtual-address* argument.
address *virtual-address*	(Optional) Displays the DLL that is mapped at the virtual address specified for the *virtual-address* argument.
dllname *dll-virtual-path*	(Optional) Displays the process IDs (PIDs) of the process that have downloaded the DLL specified for the *dll-virtual-path* argument.
memory	(Optional) Displays a summary of DLL memory usage.
location *node-id*	(Optional) Displays DLLs for the specified node. The *node-id* argument is expressed in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC, Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show dll** command. In this example, the output displays all the DLLs loaded on the router.

```
RP/0/RP0/CPU0:router# show dll

DLL path                              Text VA    Text Sz    Data VA    Data Sz    Refcount
------------------------------------------------------------------------------------------
/lib/libui.dll                        0xfc000000 0x00007000 0xfc007000 0x00001000    1
/disk0/hfr-base-0.48.0/lib/liblogin.dll 0xfc008000 0x00006000 0xfc00e000 0x00001000    1
/mbi/lib/libbanner.dll                0xfc00f000 0x00003000 0xfc012000 0x00001000    1
/disk0/hfr-base-0.48.0/lib/libaaav2.dll 0xfc013000 0x0000f000 0xfc022000 0x00001000    1
/disk0/hfr-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/hfr-admin-0.48.0/lib/libfqm_ltrace_util_common.dll 0xfc0d43b0 0x00000bfc 0xfc391f7c
 0x00000068    1
/lib/libplatform.dll                  0xfc0d5000 0x0000aa88 0xfc0e0000 0x00002000  165
/lib/libsysmgr.dll                    0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368  166
/lib/libinfra.dll                     0xfc0ed000 0x0003284c 0xfc120000 0x00000c70  169
/lib/libios.dll                       0xfc121000 0x0002c4bc 0xfc14e000 0x00002000  166
/lib/libc.dll                         0xfc150000 0x00077ae0 0xfc1c8000 0x00002000  175
/mbi/lib/libltrace.dll                0xfc1ca000 0x00007f5c 0xfc0c2cc4 0x00000188   96
/lib/libsyslog.dll                    0xfc1d2000 0x0000530c 0xfc120c70 0x00000308  129
/disk0/hfr-base-0.48.0/lib/liblpts_ifib_platform.dll 0xfc1d730c 0x00000cc8 0xfcef4000
0x00000068    1
/lib/libbackplane.dll                 0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8  163
/disk0/hfr-base-0.48.0/lib/libipv6_platform_client.dll 0xfc1d934c 0x00000c48 0xfcef4f8c
0x00000068    1
/mbi/lib/libpkgfs_node.dll            0xfc1da000 0x000092d4 0xfc1e4000 0x000001a8    3
```

The following example shows sample output from the **show dll** command with the optional **jobid** *job-id* keyword and argument:

```
RP/0/RP0/CPU0:router# show dll jobid 186

DLLs mapped by PID 86111
DLL path                              Text VA    Text Sz    Data VA    Data Sz    Refcount
------------------------------------------------------------------------------------------
/lib/libovl.dll                       0xfc0c8000 0x0000c3b0 0xfc0c21f0 0x0000076c   23
/lib/libplatform.dll                  0xfc0d5000 0x0000aa88 0xfc0e0000 0x00002000  165
/lib/libsysmgr.dll                    0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368  167
/lib/libinfra.dll                     0xfc0ed000 0x0003284c 0xfc120000 0x00000c70  169
/lib/libios.dll                       0xfc121000 0x0002c4bc 0xfc14e000 0x00002000  166
/lib/libc.dll                         0xfc150000 0x00077ae0 0xfc1c8000 0x00002000  175
/mbi/lib/libltrace.dll                0xfc1ca000 0x00007f5c 0xfc0c2cc4 0x00000188   96
/lib/libsyslog.dll                    0xfc1d2000 0x0000530c 0xfc120c70 0x00000308  129
/lib/libbackplane.dll                 0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8  163
/lib/libnodeid.dll                    0xfc1e5000 0x000091fc 0xfc1e41a8 0x00000208  163
/mbi/lib/libinst_mem.dll              0xfc232000 0x000044f8 0xfc1e43b0 0x00000108    4
/lib/libdebug.dll                     0xfc23c000 0x0000ef64 0xfc1e4680 0x00000550  159
```

Table 50: show dll Field Descriptions, on page 511 describes the significant fields shown in the display.

Table 50: show dll Field Descriptions

Field	Description
DLL path	Physical path of the DLL on the router.
Text VA	Virtual address of the text segment of the DLL.
Text Sz	Size of the text segment of the DLL.
Data VA	Virtual address of the data segment of the DLL.
Data Sz	Size of the data segment of the DLL.
Refcount	Number of clients using the DLL.

The following example shows sample output from the **show dll** command with the optional **dllname** *dll-virtual-path* keyword and optional argument:

```
RP/0/RP0/CPU0:router# show dll dllname /pkg/lib/libinst_mem.dll

PID:     4102  Refcount: 1
PID:     4105  Refcount: 1
PID:    24600  Refcount: 1
PID:    86111  Refcount: 1
```

Table 51: show dll dllname Field Descriptions, on page 511 describes the significant fields shown in the display.

Table 51: show dll dllname Field Descriptions

Field	Description
PID:	Process ID of the process.
Refcount	Number of references to the DLL by the process.

The following example shows sample **show dll** output from the command with the optional **memory** keyword:

```
RP/0/RP0/CPU0:router# show dll memory
------------------------------------------------------------------------------

Total DLL Text - 14778896 bytes  Total DLL Data - 12688500 bytes
Total DLL Memory - 27467396 bytes
```

show exception

To display the configured core dump settings, use the **show exception** command in

administration EXEC mode or in EXEC

mode.

show exception [**core-options** [**process** *process-name*] **location** *node-id*]

Syntax Description

core-options	(Optional) Displays process core option values.
process *process-name*	(Optional) Specifies the process for which to display the information.
location *node-id*	(Optional) Displays configured settings for a specified node. The *node-id* argument is expressed in the *rack/slot/module* notation.

Command Default

None

Command Modes

EXEC, Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.9.0	Support for the **core-options** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show exception** command to display the configured core dump settings. The output from this command displays the core dump settings configured with the following commands:

- exception filepath, on page 478
- exception pakmem, on page 482
- exception sparse, on page 484
- exception sprsize, on page 486

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show exception** command with the **location** keyword. All processes for the specified node are displayed.

```
RP/0/RP0/CPU0:router# show excep core-options location 0/rp0/cpu0

Mon Nov 30 01:31:31.391 PST
```

```
Process
        Options
attach_server:
        TEXT SHAREDMEM MAINMEM
attachd:
        TEXT SHAREDMEM MAINMEM
ksh-aux:
        TEXT SHAREDMEM MAINMEM
bcm_logger:
        TEXT SHAREDMEM MAINMEM
devf-scrp:
        TEXT SHAREDMEM MAINMEM
bfm_server:
        TEXT SHAREDMEM MAINMEM
ksh:
        TEXT SHAREDMEM MAINMEM
dllmgr:
        COPY
dumper:
        TEXT SHAREDMEM MAINMEM
eth_server:
        COPY SPARSE
inflator:
        TEXT SHAREDMEM MAINMEM
insthelper:
        TEXT SHAREDMEM MAINMEM
mbi-hello:
        TEXT SHAREDMEM MAINMEM
cat:
        TEXT SHAREDMEM MAINMEM
mq:
        COPY
mqueue:
        TEXT SHAREDMEM MAINMEM
nname:
        TEXT SHAREDMEM MAINMEM
nvram:
        TEXT SHAREDMEM MAINMEM
 --More--
```

The following example shows sample output from the **show exception** command for a specific process:

```
RP/0/RP0/CPU0:router# show excep core-options process upgrade_daemon location 0/6/cpu0

Mon Nov 30 01:32:20.207 PST
Process
        Options
upgrade_daemon:
        TEXT SHAREDMEM MAINMEM
```

Related Topics

exception filepath, on page 478
exception pakmem, on page 482
exception sparse, on page 484
exception sprsize, on page 486

show memory

To display the available physical memory and memory usage information of processes on the router, use the **show memory** command in EXEC or administration EXEC mode.

show memory [{*jobid*|**summary** [{**bytes**|**detail**}]}] **location** *node-id*

Syntax Description

job id	(Optional) Job ID associated with a process instance. Specifying a job ID for the *job-id* argument displays the memory available and memory usage information for only the process associated with the specified job ID. If the *job-id* 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 *node-id*	Displays the available physical memory from the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To display detailed memory information for the entire router, enter the **show memory** command without any parameters.

Task ID

Task ID	Operations
basic-services	read

This example shows 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
```

This example shows 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
```

This example shows how to display a detailed summary of memory information for the router:

```
RP/0/RP0/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 52: 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.

Related Topics

show memory heap, on page 520
show processes, on page 524

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 EXEC or administration EXEC mode.

show memory compare {**start**|**end**|**report**}

Syntax Description

start	Takes the initial snapshot of heap memory usage for all processes on the router and sends the report to a temporary file named /tmp/memcmp_start.out.
end	Takes the second snapshot of heap memory usage for all processes on the router and sends the report to a temporary file named /tmp/memcmp_end.out. This snapshot is compared with the initial snapshot when displaying the heap memory usage comparison report.
report	Displays the heap memory comparison report, comparing heap memory usage between the two snapshots of heap memory usage.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

Use the **show memory compare** command to display details about the heap memory usage of all processes on the router at different moments in time and compare the results. This command is useful for detecting patterns of memory usage during events such as restarting processes or configuring interfaces.

Use the following steps to create and compare memory snapshots:

1. Enter the **show memory compare** command with the **start** keyword to take the initial snapshot of heap memory usage for all processes on the router.

Note The snapshot is similar to that resulting from entry of the show memory heap, on page 520 command with the optional **summary** keyword.

2. Perform the test you want to analyze.
3. Enter the **show memory compare** command with the **end** keyword to take the snapshot of heap memory usage to be compared with the initial snapshot.
4. Enter the **show memory compare** command with the **report** keyword to display the heap memory usage comparison report.

Task ID

Task ID	Operations
basic-services	read

This example shows sample output from the **show memory compare** command with the **report** keyword:

```
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   fctl                 41596        41656        60           2
  54    sysmgr               171772       171076       -696         -5
  269   ifmgr                539308       530652       -8656        -196        *
```

Table 53: show memory compare report Field Descriptions

Field	Description
JID	Process job ID.
name	Process name.
mem before	Heap memory usage at start (in bytes).

Field	Description
mem after	Heap memory usage at end (in bytes).
difference	Difference in heap memory usage (in bytes).
mallocs	Number of unfreed allocations made during the test period.
restarted	Indicates if the process was restarted during the test period.

Related Topics

show memory heap, on page 520
show processes, on page 524

show memory heap

To display information about the heap space for a process, use the **show memory heap** command in EXEC or administration EXEC mode.

show memory heap [allocated] [dllname] [failure] [free] {*jobid*|**all**}

Syntax Description

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.
job-id	Job ID associated with the process instance.
all	(Optional) Displays information about the heap space for all processes. The **all** keyword is only available when the **failure** or **summary** keywords are used.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

This example shows 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 54: 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 example shows sample output from the **show memory heap** command, specifying the **summary** *job-id* keyword and argument:

```
RP/0/RP0/CPU0:router# show memory heap summary 65

  Malloc summary for pid 20495 process pcmciad:
    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 alloced: 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 alloced: 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 alloced: 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 alloced: 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 alloced: 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 alloced: 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 alloced: 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 alloced: 1, Block freed: 0
  allocs: 1, frees: 0
  allocmem: 72, freemem: 792, overhead: 80
  blocks: 1, blknodes: 12
```

Table 55: 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.
free	Bytes available in the heap.
overhead	Malloc library overhead in bytes.
mallocs	Number of malloc calls.

Field	Description
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 alloced	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 Topics

show memory, on page 514

show processes

To display information about active processes, use the **show processes** command in EXEC or administration EXEC mode.

show processes {*job-idprocess-name*|**aborts**|**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

job-id	Job identifier for which information for only the process instance associated with the *job-id* argument is displayed.
process-name	Process name for which all simultaneously running instances are displayed, if applicable.
aborts	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 switchover information.
family	Displays the process session and family information.
files	Displays information about open files and open communication channels.
location *node-id*	Displays information about the active processes from a designated node. The *node-id* argument is entered in the *rack/slot/module* 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 available only with the *process-name* argument.
run	(Optional) Displays information for only running processes. This option is available only with the *process-name* argument.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.
Release 3.5.0	The use of this command with no keywords or arguments was not supported.

Usage Guidelines

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** command to determine the top processes and threads based on CPU usage.

Task ID

Task ID	Operations
basic-services	read

The **show processes** command with the *process-name* argument 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 56: 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 started or restarted (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** command with the **memory** keyword 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
  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
  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 57: show processes memory Field Descriptions

Field	Description
Text	Size of text region (process executable).
Data	Size of data region (initialized and uninitialized variables).
Stack	Size of process stack.
Dynamic	Size of dynamically allocated memory.
Process	Process name.

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    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 58: show processes all Field Description

Field	Description
JID	Job ID.
Last Started	Date when the process was last started.
State	State of the process.

Field	Description
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.
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 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 Topics

monitor processes

monitor threads, on page 495

Secure Domain Router Commands

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, see the *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco CRS Routers*.

location (SDR)

To assign a node to a secure domain router (SDR), use the **location** command in SDR configuration mode. To remove a node from an SDR and return the node to the owner SDR, use the **no** form of this command.

location *node-location*
location *partially-qualified-nodeid* **[primary]**
no location

Syntax Description

partially-qualified-nodeid	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) Configures the node as the DSDRSC for a secure domain router.

Command Default

All nodes are assigned to the owner SDR.

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	The term logical router (LR) was changed to secure domain router (SDR). Added support for the **primary** keyword.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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.

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. RPs must be added in redundant pairs. The value of the *partially-qualified-nodeid* argument for RPs is entered in the *rack*/*slot*/***** 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. 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.

Task ID

Task ID	Operations
system	read, write

In the following example, a new SDR "rname2" is created. 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/*
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# end
```

The following example shows how to remove a node from SDR "rname2":

```
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
```

Related Topics

pair (SDR), on page 532
sdr, on page 534

pair (SDR)

To assign a distributed route processor (DRP) pair to a secure domain router (SDR), use the **pair** command in SDR configuration mode. To remove a DRP pair from the configuration, use the **no** form of this command.

pair *pair-name* **[primary]**
no pair *pair-name*

Syntax Description

pair-name	Specifies a DRP pair to be assigned to the specified secure domain router. The *pair-name* argument is the name assigned to the DRP pair. For instructions to create a DRP pair name, see the **pairing** (drp) command in the *Distributed Route Processor Commands on Cisco IOS XR Software*.
primary	(Optional) Specifies the named DRP pair as the primary and standby designated secure domain router system controllers (DSDRSC).

Command Default

None

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **pair** command with the *pair-name* argument to assign a DRP pair to an SDR. Enter the **pair** command with the **primary** keyword to assign the DRP pair as the DSDRSCs (primary and standby DSDRSCs).

To assign a DRP pair to an SDR, you must first create a DRP pair name as described in *Distributed Route Processor Commands on Cisco IOS XR Software* and *Configuring Secure Domain Routers on Cisco IOS XR Software*. When the DRP pair is created, you can add the *pair-name* to the SDR.

When a DRP pair is assigned to a non-owner SDR, it is automatically removed from the owner SDR inventory. When a DRP pair is removed from a non-owner SDR configuration, it is automatically returned to the owner SDR inventory.

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.

Task ID

Task ID	Operation
system	read, write

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 Topics

location (DRP), on page 266
pairing (DRP), on page 268
location (SDR), on page 530
sdr, on page 534

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

sdr-name	Name of the SDR to be created or modified.

Command Default

The system comes configured as a single secure domain router known as the *owner SDR*.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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. 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 Number of SDR Configurations

A maximum of eight SDRs are supported, including one owner SDR and up to seven non-owner SDRs.

Task ID

Task ID	Operations
system	read, write

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.

```
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 Topics

location (DRP), on page 266
pairing (DRP), on page 268
location (SDR), on page 530
pair (SDR), on page 532

show sdr

To display information about the currently defined secure domain routers (SDRs), use the **show sdr** command in the appropriate configuration mode.

Administration EXEC Mode
show sdr [{**name** *sdr-name* **[detail]**|**summary**}]

EXEC Mode
show sdr [detail]

Syntax Description

name *sdr-name*	Specifies a specific SDR.
detail	Displays more detailed information for a specific SDR.
summary	Displays summary information about all SDRs in the system.

Command Default

Administration EXEC Mode 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 Mode:

- Displays information about the local SDR.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show sdr** command in administration EXEC mode to display the inventory of nodes in the Owner SDR or in a specific named SDR. The **show sdr** command in EXEC mode displays the inventory of nodes in the current SDR.

Task ID

Task ID	Operations
system	read

This example shows sample output from the **show sdr** command in

EXEC

mode:

Table 59: 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 *rack*/*slot*/*module* 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 *rack*/*slot*/*module* notation.

This 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 60: 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.

Simple Network Management Protocol (SNMP) Server Commands

This chapter describes the Cisco IOS XR software commands used to configure and monitor the Simple Network Management Protocol (SNMP) for network monitoring and management.

For detailed information about SNMP concepts, configuration tasks, and examples, see the *Implementing SNMP on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco CRS Routers*.

Note The **snmp-server** commands enable SNMP on Management Ethernet interfaces by default. For information about how to enable SNMP server support on other inband interfaces, see the *Implementing Management Plane Protection on Cisco IOS XR Software* module in *System Security Configuration Guide for Cisco CRS Routers*.

add (bulkstat object)

To add a MIB object to a Simple Network Management Protocol (SNMP) bulk statistics object list, use the **add** command in bulk statistics object list configuration mode. To remove a MIB object from an SNMP bulk statistics object list, use the **no** form of this command.

add {*object-nameOID*}
no add {*object-nameOID*}

Syntax Description

object-name	Name of the MIB object to add to the list. Object names are limited to those with mappings shown in the **show snmp mib object-name** command.
OID	Object identifier (OID) of the MIB object to add to the list.

Command Default

No MIB objects are configured for an object list.

Command Modes

Bulk statistics object list configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All object names and OIDs in a single object list should belong to the same MIB index, but the objects need not belong to the same MIB table. For example, it is possible to group ifInoctets and a CISCO-IF-EXTENSION-MIB object in the same schema because the containing tables are indexed by the ifIndex (in the IF-MIB).

The **add** command should be repeated as necessary until all MIB objects have been added to the object list.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to add various MIB objects to an object list.

```
RP/0/RP0/CPU0:router(config-bulk-objects)# add 1.3.6.1.2.1.2.2.1.11
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifAdminStatus
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifDescr
```

Related Topics

show snmp mib, on page 584

buffer-size

To configure a maximum buffer size for the transfer of bulk statistics files, use the **buffer-size** command in bulk statistics transfer configuration mode. To remove a previously configured buffer size from the configuration, use the **no** form of this command.

buffer-size *bytes*
no buffer-size [*bytes*]

Syntax Description

bytes	Size of the bulk statistics transfer buffer, in bytes. The valid range is from 1024 to 2147483647. The default is 2048.

Command Default

The default bulk statistics transfer buffer is 2048 bytes.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A configured buffer size limit is available primarily as a safety feature. Normal bulk statistics files should not generally meet or exceed the default value while being transferred.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to set the buffer size to 1024 bytes:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# buffer-size 1024
```

clear snmp counters

To clear the Simple Network Management Protocol (SNMP) packet statistics shown by the **show snmp** command, use the **clear snmp counters** command in EXEC mode.

clear snmp counters

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear snmp counters** command provides the ability to clear all SNMP counters used in the **show snmp** command without restarting any processes.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to clear the SNMP counters:

```
RP/0/RP0/CPU0:router# clear snmp counters
```

Related Topics

show snmp, on page 565

enable (bulkstat)

To begin the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **enable** command in bulk statistics transfer configuration mode. To disable the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **no** form of this command.

enable
no enable

Syntax Description

This command has no keywords or arguments.

Command Default

Bulk statistics transfer is disabled.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Specific bulk statistics configurations are identified with a name, as specified in the **snmp-server mib bulkstat transfer-id** command. The **enable** command begins the periodic MIB data collection and transfer process.

Collection (and subsequent file transfer) starts only if this command is used. Conversely, the **no enable** command stops the collection process. Subsequently, issuing the **enable** command starts the operations again.

Each time the collection process is started using the **enable** command, data is collected into a new bulk statistics file. When the **no enable** command is used, the transfer process for any collected data immediately begins (in other words, the existing bulk statistics file are transferred to the specified management station).

To successfully enable a bulk statistics configuration, at least one schema with a non-zero number of objects must be configured.

Task ID

Task ID	Operation
snmp	read, write

The following example shows the bulk statistics transfer configuration named bulkstat1 as enabled:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# enable
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

show snmp mib bulkstat transfer, on page 587
snmp-server mib bulkstat transfer-id, on page 661

format (bulkstat)

To specify the format to be used for the bulk statistics data file, use the **format** command in bulk statistics transfer configuration mode. To disable a previously configured format specification and return to the default, use the **no** form of this command.

format {**bulkBinary**|**bulkASCII**|**schemaASCII**}
no format [{**bulkBinary**|**bulkASCII**|**schemaASCII**}]

Syntax Description

bulkBinary	Binary format.
bulkASCII	ASCII format.
schemaASCII	A human-readable ASCII format that contains additional bulk statistics schema tags. This is the default.

Command Default

The default bulk statistics transfer format is schemaASCII

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The bulk statistics data file (VFile) contains two types of fields: tags and data. Tags are used to set off data to distinguish fields of the file. All other information is in data fields.

Transfers can only be performed using schemaASCII format.

For each transfer/schema pair there is a header with tags for each object collected, followed by the collected data. For example, if the transfer name is T1 and the schemas in it are S1 (which collects ifInOctets and ifOutOctets) and S2 (which collects ifInUcastPkts and ifInDiscards). Then the output file looks like this:

```
Schema-def cempt1.cempWild "%u, %s, %s, %d" Epochtime instanceoid
1.3.6.1.4.1.9.9.221.1.1.1.1.3 1.3.6.1.4.1.9.9.221.1.1.1.1.2
cempt1.cempWild: 1339491515, 8695772.1, processor, 2
cempt1.cempWild: 1339491515, 8695772.2, reserved, 11
cempt1.cempWild: 1339491515, 8695772.3, image, 12
cempt1.cempWild: 1339491575, 8695772.1, processor, 2
cempt1.cempWild: 1339491575, 8695772.2, reserved, 11
cempt1.cempWild: 1339491575, 8695772.3, image, 12
Schema-def cempt1.cempRepeat "%u, %s, %s, %d" Epochtime instanceoid
1.3.6.1.4.1.9.9.221.1.1.1.1.3 1.3.6.1.4.1.9.9.221.1.1.1.1.2
cempt1.cempRepeat: 1339491515, 8695772.1, processor, 2
cempt1.cempRepeat: 1339491515, 8695772.2, reserved, 11
cempt1.cempRepeat: 1339491515, 8695772.3, image, 12
cempt1.cempRepeat: 1339491515, 26932192.1, processor, 2
cempt1.cempRepeat: 1339491515, 26932192.2, reserved, 11
cempt1.cempRepeat: 1339491515, 26932192.3, image, 12
```

```
cempt1.cempRepeat: 1339491515, 35271015.1, processor, 2
cempt1.cempRepeat: 1339491515, 35271015.2, reserved, 11
cempt1.cempRepeat: 1339491515, 35271015.3, image, 12
cempt1.cempRepeat: 1339491515, 36631989.1, processor, 2
cempt1.cempRepeat: 1339491515, 36631989.2, reserved, 11
cempt1.cempRepeat: 1339491515, 36631989.3, image, 12
cempt1.cempRepeat: 1339491515, 52690955.1, processor, 2
cempt1.cempRepeat: 1339491515, 52690955.2, reserved, 11
cempt1.cempRepeat: 1339491515, 52690955.3, image, 12
```

Task ID

Task ID	Operation
snmp	read, write

This example shows how to specify the data format:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# format schemaASCII
```

Related Topics

show snmp mib bulkstat transfer, on page 587
snmp-server mib bulkstat transfer-id, on page 661

index persistence

To enable index persistence on an Simple Network Management Protocol (SNMP) interface, use the **index persistence** command in SNMP interface configuration mode. To restore the default conditions with respect to this command, use the **no** form of this command.

index persistence
no index persistence

Syntax Description

This command has no keywords or arguments.

Command Default

Index persistence is disabled.

Command Modes

SNMP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **index persistence** command to enable ifIndex persistence for individual entries (corresponding to individual interfaces) in the ifIndex table of the IF-MIB. IfIndex persistence retains the mapping between the ifName object values and the ifIndex object values (generated from the IF-MIB) across reboots, allowing for consistent identification of specific interfaces using SNMP.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to assign ifIndex persistence on interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface tengige 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# index persistence
```

Related Topics

show snmp interface, on page 579
snmp-server engineid local, on page 634
snmp-server ifindex persist, on page 644
snmp-server interface, on page 649

instance (bulkstat schema)

To configure the MIB object instances to be used in a Simple Network Management Protocol (SNMP) bulk statistics schema, use the **instance** command in bulk statistics configuration mode. To remove the instance definition, use the **no** form of this command.

instance {**exact** |**wild** } {**interface** *interface-id* **[sub-if]**|**oid** *oid*}
no instance

Syntax Description

exact	Specifies that the specified interface or object identifier (OID), when appended to the object list, is the complete OID to be used in this schema.
wild	Specifies that all instances that fall within the the specified OID or interface are included in this schema.
interface *interface-id*	Specifies an interface to be used to define the schema instance.
[sub-if]	(Optional) Specifies that the object instances are polled for all subinterfaces of the specified interface in addition to the object instances for the main interface.
oid *oid*	Specifies an OID to be used to define the schema instance.

Command Default

No instances are configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **instance** command specifies the instance information for objects in the schema being configured. The specific instances of MIB objects for which data is collected are determined by appending the value of the instance command to the objects specified in the associated object list. In other words, the schema object-list when combined with the schema instance specifies a complete MIB object identifier.

The **instance exact** command indicates that the specified instance, when appended to the object list, is the complete OID.

The **instance wild** command indicates that all subindices of the specified OID belong to this schema. For example, the command `instance wild oid 1` includes all subindices of the instance, such as 1.1, 1.2 and so on. It does not include other instances that start with the number 1, such as 10 and 11.

Instead of specifying an OID, you can specify a specific interface. The **interface** *interface-id* keyword and argument allow you to specify an interface name and number (for example, gigabitethernet 0/6/5/0) instead of specifying the ifIndex OID for the interface.

The optional **sub-if** keyword, when added after specifying an interface, includes the ifIndexes for all subinterfaces of the interface you specified.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following examples show two different ways to configure an instance.

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance wild oid 1
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance exact interface FastEthernet 0/1.25
```

Related Topics

instance range, on page 553
instance repetition, on page 554
snmp-server mib bulkstat schema, on page 659

instance range

To specify a range of instances for objects in a schema, use the **instance** command in bulk statistics schema configuration mode. To remove the configured instance information, use the **no** form of this command.

instance range start *start-oid* **end** *end-oid*
no instance

Syntax Description

start *start-oid*	Specifies the first OID value of a range of values.
end *end-oid*	Specifies the last OID value of a range of values.

Command Default

No instances are configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a range of instances.

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance range start 1 end 2
```

Related Topics

instance (bulkstat schema), on page 551
snmp-server mib bulkstat schema, on page 659

instance repetition

To configure bulk statistics data collection to begin at a particular instance of a MIB object and to repeat for a given number of instances , use the **instance repetition** command in bulk statistics schema configuration mode. To delete a previously configured repetition of instances, use the **no** form of this command.

instance repetition *oid-instance* **max** *repeat-number*
no instance

Syntax Description

oid-instance	Object ID of the instance to be monitored.
max *repeat-number*	Specifies the number of times the instance should repeat.

Command Default

No instance repetition is configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **instance repetition** command is used to configure data collection to repeat for a certain number of instances of a MIB object.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following example configures 4 repetitions of the OID of value 1.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifOutOctets
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifInOctets

RP/0/RP0/CPU0:router(config-bulk-objects)# exit
RP/0/RP0/CPU0:router(config)# snmp mib-server bulkstat schema IFMIB

RP/0/RP0/CPU0:router(config-bulk-sc)# object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 1
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance repetition 1 max 4
```

Related Topics

instance (bulkstat schema), on page 551
instance range, on page 553
snmp-server mib bulkstat schema, on page 659

notification linkupdown

To enable or disable linkUp and linkDown trap notifications on a Simple Network Management Protocol (SNMP) interface, use the **notification linkupdown** command in SNMP interface configuration mode. To revert to the default setting, use the **no** form of this command.

notification linkupdown disable
no notification linkupdown disable

Syntax Description

disable	Disables linkUp and linkDown trap notifications on an SNMP interface.

Syntax Description

This command has no keywords or arguments.

Command Default

By default, for all main interfaces the linkUp and linkDown trap notifications are enabled; for all subinterfaces they are disabled.

Command Modes

SNMP interface configuration

SNMP interface subset configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** keyword was removed.
Release 3.9.0	This command was supported in the SNMP interface subset configuration mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Enabling of linkUp and linkDown notifications is performed globally using the **snmp-server traps snmp** command. Issue the **notification linkupdown** command to disable linkUp and linkDown notifications on an interface.

Use the **no** form of this command to enable linkUp and linkDown notifications on an interface, if linkUp and linkDown notifications have been disabled.

You can also use the **snmp-server interface subset** command to enable or disable groups of interfaces.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to disable linkUp and linkDown trap notifications on interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface tengige 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# notification linkupdown disable
```

Related Topics

show snmp interface, on page 579
snmp-server engineid local, on page 634
snmp-server ifindex persist, on page 644
snmp-server interface, on page 649
snmp-server interface subset, on page 651
snmp-server traps snmp, on page 711

object-list

To specify the bulk statistics object list to be used in the bulk statistics schema, use the **object-list** command in bulk statistics schema configuration mode. To remove an object list from the schema, use the **no** form of this command.

object-list *list-name*
no object-list [*list-name*]

Syntax Description

list-name	Name of a previously configured bulk statistics object list.

Command Default

No bulk statistics object list is specified.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command associates a bulk statistics object list with the schema being configured. The object list should contain a list of MIB objects to be monitored. Only one object list can be specified for each schema. Use the **snmp-server mib bulkstat object-list** command to create an object list.

Task ID

Task ID	Operation
snmp	read, write

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat schema schema1
RP/0/RP0/CPU0:router(config-bulk-sc)# object-list obj1
```

Related Topics

show snmp mib bulkstat transfer, on page 587
snmp-server mib bulkstat schema, on page 659
snmp-server mib bulkstat object-list, on page 658

poll-interval

To configure the polling interval for a bulk statistics schema, use the **poll-interval** command in bulk statistics schema configuration mode. To remove a previously configured polling interval, use the **no** form of this command.

poll-interval *minutes*
no poll-interval

Syntax Description

minutes	Integer in the range from 1 to 20000 that specifies, in minutes, the polling interval of data for this schema. The default is 5.

Command Default

Object instances are polled once every five minutes.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **poll-interval** command sets how often the MIB instances specified by the schema and associated object list are to be polled. Collected data is stored in the local bulk statistics file for later transfer.

Task ID

Task ID	Operation
snmp	read, write

In this example, the polling interval for bulk statistics collection is set to once every 3 minutes in the schema called GigE2/1-CAR:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server mib bulk schema GigE2/1-CAR
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 3
```

Related Topics

snmp-server mib bulkstat schema, on page 659

retain

To configure the retention interval for bulk statistics files, use the **retain** command in bulk statistics transfer configuration mode. To remove a previously configured retention interval from the configuration, use the **no** form of this command.

retain *minutes*
no retain [*minutes*]

Syntax Description

minutes	Length of time, in minutes, that the local bulk statistics file should be kept in system memory (the retention interval). The valid range is 0 to 20000. The default is 0.

Command Default

The bulk statistics file retention interval is 0 minutes.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **retain** command specifies how long the bulk statistics file should be kept in system memory, in minutes, after the completion of the collection interval and a transmission attempt is made. The default value of zero (0) indicates that the file is deleted immediately from local memory after a successful transfer.

If the **retry** command is used, you should configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries are attempted once every 5 minutes. Therefore, if the **retain** command is not configured (retain default is 0), no retries are attempted.

Note Once a successful transmission has occurred the bulk file is not retained regardless of the retain time.

Task ID

Task ID	Operation
snmp	read, write

In the following example, the bulk statistics transfer retention interval is set to 10 minutes:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 2
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 10
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

retry, on page 562
show snmp mib bulkstat transfer, on page 587
snmp-server mib bulkstat transfer-id, on page 661

retry

To configure the number of retries that should be attempted for a bulk statistics file transfer, use the **retry** command in bulk statistics transfer configuration mode. To return the number of bulk statistics retries to the default, use the **no** form of this command.

retry *number*
no retry [*number*]

Syntax Description

number	Number of transmission retries. The valid range is from 0 to 100.

Command Default

No retry attempts are made.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If an attempt to send the bulk statistics file fails, the system can be configured to attempt to send the file again using the **retry** command. One retry includes an attempt first to the primary destination and then, if the transmission fails, to the secondary location; for example, if the retry value is 1, an attempt will be made first to the primary URL, then to the secondary URL, then to the primary URL again, and then to the secondary URL again.

If the **retry** command is used, you should also use the **retain** command to configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries are attempted once every 5 minutes. Therefore, if the **retain** command is not configured (or the **retain 0** command is used) no retries are attempted.

Task ID

Task ID	Operation
snmp	read, write

In the following example, the number of retries for the bulk statistics transfer is set to 2:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 2
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 10
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

retain, on page 560
show snmp mib bulkstat transfer, on page 587
snmp-server mib bulkstat transfer-id, on page 661

schema

To specify the bulk statistics schema to be used in a specific bulk statistics transfer configuration, use the **schema** command in bulk statistics transfer configuration mode. To remove a previously configured schema from a specific bulk statistics transfer configuration, use the **no** form of this command.

schema *schema-name*
no schema [*schema-name*]

Syntax Description

schema-name	Name of a previously configured bulk statistics schema.

Command Default

No bulk statistics schema is specified.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The schema must be previously defined using the **snmp-server mib bulkstat schema** command.

Repeat the **schema** command as desired for a specific bulk statistics transfer configuration. Multiple schemas can be associated with a single transfer configuration; all collected data will be in a single bulk statistics data file (VFile).

Task ID

Task ID	Operation
snmp	read, write

This example adds three different schemas to a bulk statistics transfer configuration:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-CAR
RP/0/RP0/CPU0:router(config-bulk-tr)# schema Ethernet2/1-IFMIB
```

Related Topics

show snmp mib bulkstat transfer, on page 587
snmp-server mib bulkstat schema, on page 659

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the `show snmp` command to show counter information for SNMP operations. It also displays the chassis ID string defined with the **snmp-server chassis-id** command.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the `show snmp` command:

```
RP/0/RP0/CPU0:router# show snmp

  Chassis: 01506199
  37 SNMP packets input
  0 Bad SNMP version errors
  4 Unknown community name
  0 Illegal operation for community name supplied
  0 Encoding errors
  24 Number of requested variables
  0 Number of altered variables
  0 Get-request PDUs
  28 Get-next PDUs
  0 Set-request PDUs
  78 SNMP packets output
  0 Too big errors (Maximum packet size 1500)
  0 No such name errors
  0 Bad values errors
  0 General errors
```

```
24 Response PDUs
13 Trap PDUs
SNMP logging: enabled
Logging to 172.25.58.33.162, 0/10, 13 sent, 0 dropped.
```

Table 61: show snmp Field Descriptions, on page 566 describes the significant fields shown in the display.

Table 61: show snmp Field Descriptions

Field	Description
Chassis	Chassis ID string.
SNMP packets input	Total number of SNMP packets input.
Bad SNMP version errors	Number of packets with an invalid SNMP version.
Unknown community name	Number of SNMP packets with an unknown community name.
Illegal operation for community name supplied	Number of packets requesting an operation not allowed for that community.
Encoding errors	Number of SNMP packets that were improperly encoded.
Number of requested variables	Number of variables requested by SNMP managers.
Number of altered variables	Number of variables altered by SNMP managers.
Get-request PDUs	Number of get requests received
Get-next PDUs	Number of get-next requests received.
Set-request PDUs	Number of set requests received.
SNMP packets output	Total number of SNMP packets sent by the device.
Too big errors	Number of SNMP packets that were larger than the maximum packet size.
Maximum packet size	Maximum size of SNMP packets.
No such name errors	Number of SNMP requests that specified a MIB object that does not exist.
Bad values errors	Number of SNMP set requests that specified an invalid value for a MIB object.
General errors	Number of SNMP set requests that failed due to some other error. (It is not a noSuchName error, badValue error, or any of the other specific errors.)
Response PDUs	Number of responses sent in reply to requests.
Trap PDUs	Number of SNMP traps sent.

Field	Description
SNMP logging	Enabled or disabled logging.
sent	Number of traps sent.
dropped	Number of traps dropped. Traps are dropped when the trap queue for a destination exceeds the maximum length of the queue, as set by the **snmp-server queue-length** command.

Related Topics

show snmp mib, on page 584
snmp-server chassis-id, on page 622
snmp-server queue-length, on page 674

show snmp context

To display the enhanced SNMP context mappings, use the **show snmp context** command in EXEC mode.

show snmp context

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp context** command to display the protocol instance, topology and VRF mappings associated with an SNMP context.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp context** command:

```
RP/0/RP0/CPU0:router# show snmp context

Tue Dec 21 03:41:08.065 PST
Context-name       Vrf-name      Topology-Name   Instance-Name             Feature
con5                  vf5           tp5             in5                     OSPF
con6                  vf6           tp6             in6                     OSPF
con7                  vf7           tp7             in7                     OSPF
con8                  vf8           tp8             in8                     OSPF
```

Related Topics

snmp-server context mapping, on page 630

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The SNMP agent handles queries based on SNMP contexts created by client features. Use the **show snmp context-mapping** command to display the SNMP context mapping table. Each entry in the table includes the name of an SNMP context created by a client instance and the name of the client that created the context.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp context-mapping** command:

```
RP/0/RP0/CPU0:router# show snmp context-mapping

Wed Aug 6 01:42:35.227 UTC
Context-name                  Feature-name                  Feature
ControlEthernet0_RP0_CPU0_S0  ControlEthernet0_RP0_CPU0_S0  BRIDGEINST
ControlEthernet0_RP1_CPU0_S0     ControlEthernet0_RP1_CPU0_S0     BRIDGEINST
```

Table 62: 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.

Field	Definition
Feature	Name of the client whose instance created the context.

show snmp engineid

To display the identification of the local Simple Network Management Protocol (SNMP) engine that has been configured on the router, use the **show snmp engineid** command in EXEC mode.

show snmp engineid

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An *SNMP engine* is a copy of SNMP that can reside on a local device.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp engineid** command:

```
RP/0/RP0/CPU0:router# show snmp engineid

  Local SNMP engineID: 00000090200000000C025808
```

Related Topics

snmp-server engineid local, on page 634

show snmp entity

To display the entPhysicalName and entPhysicalIndex mappings, use the **show snmp entity** command in

EXEC

mode.

show snmp entity

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp entity** command to view the entity index to use in the **snmp test trap entity** command. To use the **show snmp entity** command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp entity** command:

```
RP/0/RP0/CPU0:router# show snmp entity

Thu Aug 13 02:10:06.741 UTC
entPhysicalIndex:      22001 entPhysicalName: portslot 0/0/CPU0/7
entPhysicalIndex:      23006 entPhysicalName: portslot 0/0/CPU0/129
entPhysicalIndex:      23557 entPhysicalName: portslot 0/0/CPU0/3
entPhysicalIndex:      47719 entPhysicalName: 0/0/* - ingresspse - 1.2V
entPhysicalIndex:     320862 entPhysicalName: 0/0/* - host - 5V_C
entPhysicalIndex:     322450 entPhysicalName: 0/0/* - host - 1.5V
entPhysicalIndex:     428209 entPhysicalName: 0/PL2/*
entPhysicalIndex:    1038801 entPhysicalName: 0/0/* - ingressq - 2.5V
entPhysicalIndex:    1040485 entPhysicalName: 0/0/* - ingressq - 1.25V_0123
entPhysicalIndex:    1152042 entPhysicalName: 0/2/CPU0/7
entPhysicalIndex:    2031334 entPhysicalName: 0/SM0/* - host - Inlet1
entPhysicalIndex:    2032954 entPhysicalName: 0/SM0/* - host - 1.8V_L
entPhysicalIndex:    2034510 entPhysicalName: 0/SM0/* - host - brd-ok-led
entPhysicalIndex:    2110001 entPhysicalName: 0/PL2/* - plimasic - Exhaust0
entPhysicalIndex:    2111557 entPhysicalName: 0/PL2/* - plimasic - 1.8V
entPhysicalIndex:    2358084 entPhysicalName: 0/0/* - egressq
entPhysicalIndex:    2359704 entPhysicalName: 0/0/* - cpu
```

```
entPhysicalIndex:    2469162 entPhysicalName: 0/2/* - egressq - Hotspot0
entPhysicalIndex:    2559937 entPhysicalName: 0/0/* - egressq - 1.2V
entPhysicalIndex:    2577533 entPhysicalName: 0/2/CPU0/0
entPhysicalIndex:    2853020 entPhysicalName: 0/0/* - egressqse - 5V
entPhysicalIndex:    3497583 entPhysicalName: 0/SM1/* - host - brd-ok-led
entPhysicalIndex:    3500791 entPhysicalName: 0/SM1/* - host - Inlet1
 --More—
```

```
RP/0/RP0/CPU0:router# show snmp entity

Mon Nov 15 11:19:23.609 UTC
entPhysicalIndex:     172193 entPhysicalName: portslot 0/0/CPU0/1
entPhysicalIndex:     322450 entPhysicalName: voltages 0/0/CPU0
entPhysicalIndex:     345071 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     346659 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     349835 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     546880 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     845998 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     847586 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    1192623 entPhysicalName: 0/25/CPU0
entPhysicalIndex:    1227530 entPhysicalName: voltages 0/21/CPU0
entPhysicalIndex:    1460256 entPhysicalName: temperatures 0/18/CPU0
entPhysicalIndex:    1795138 entPhysicalName: temperatures 0/20/CPU0
entPhysicalIndex:    3079213 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    3080801 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    3082421 entPhysicalName: slot 7/0
entPhysicalIndex:    5037675 entPhysicalName: 0/21/CPU0
entPhysicalIndex:    5509481 entPhysicalName: voltages 0/9/CPU0
entPhysicalIndex:    6182130 entPhysicalName: voltages 0/9/CPU0
entPhysicalIndex:    6369487 entPhysicalName: portslot 0/9/CPU0/2
entPhysicalIndex:    8392407 entPhysicalName: temperatures 0/17/CPU0
entPhysicalIndex:    8548798 entPhysicalName: 0/21/CPU0 - host
entPhysicalIndex:   10735504 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   10737188 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   10738808 entPhysicalName: slot 1/1
entPhysicalIndex:   11312388 entPhysicalName: slot 7
entPhysicalIndex:   11314008 entPhysicalName: slot 3
entPhysicalIndex:   12644344 entPhysicalName: voltages 0/19/CPU0
entPhysicalIndex:   12761695 entPhysicalName: slot 24
entPhysicalIndex:   12763283 entPhysicalName: slot 20
entPhysicalIndex:   12907576 entPhysicalName: voltages 0/0/CPU0
entPhysicalIndex:   13262622 entPhysicalName: slot 16
entPhysicalIndex:   13290941 entPhysicalName: temperatures 0/16/CPU0
entPhysicalIndex:   13404457 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13406077 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13701859 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13900492 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13903700 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13905384 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   14106204 entPhysicalName: portslot 0/8/CPU0/2
entPhysicalIndex:   14256525 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   14979942 entPhysicalName: slot 2/2
entPhysicalIndex:   14981562 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   15141782 entPhysicalName: 0/19/CPU0
entPhysicalIndex:   15873651 entPhysicalName: temperatures 0/22/CPU0
entPhysicalIndex:   15986678 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   15988234 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   15991442 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16136999 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16138619 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16285636 entPhysicalName: temperatures 0/1/CPU0
entPhysicalIndex:   16287256 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16606045 entPhysicalName: voltages 0/8/CPU0
```

```
entPhysicalIndex:   16607633 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   16733769 entPhysicalName: 0/2/CPU0 - host
entPhysicalIndex:   16949774 entPhysicalName: portslot 0/0/CPU0/0
entPhysicalIndex:   17098539 entPhysicalName: temperatures 0/0/CPU0
entPhysicalIndex:   17122684 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17124272 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17127448 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17205790 entPhysicalName: 0/2/CPU0
entPhysicalIndex:   17322905 entPhysicalName: temperatures 0/7/CPU0
entPhysicalIndex:   17324589 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17595466 entPhysicalName: 0/25/CPU0 - host
entPhysicalIndex:   17620307 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17621991 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17623611 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   18003523 entPhysicalName: temperatures 0/21/CPU0
entPhysicalIndex:   18237837 entPhysicalName: voltages 0/18/CPU0
entPhysicalIndex:   18571163 entPhysicalName: voltages 0/20/CPU0
---More---
```

show snmp group

To display the names of groups on the router, security model, status of the different views, and storage type of each group, use the **show snmp group** command in

EXEC

mode.

show snmp group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp group** command:

```
RP/0/RP0/CPU0:router# show snmp group

  groupname: public security model:snmpv1
  readview : v1default writeview: -
  notifyview: v1default
  row status: nonVolatile

  groupname: public security model:snmpv2c
  readview : v1default writeview: -
  notifyview: v1default
  row status: nonVolatile
```

Table 63: 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.

Field	Definition
readview	String identifying the read view of the group.
security model	Security model used by the group, either v1, v2c, or v3.
writeview	String identifying the write view of the group.
notifyview	String identifying the notify view of the group.
row status	Settings that are set in volatile or temporary memory on the device, or in nonvolatile or persistent memory where settings remain after the device is turned off and on again.

Related Topics

snmp-server group, on page 637

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp host** command:

```
RP/0/RP0/CPU0:router# show snmp host

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3auth security model: v3 auth

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3noauth security model: v3 noauth

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3priv security model: v3 priv

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userv2c security model: v2c
```

Table 64: show snmp host Field Descriptions

Field	Definition
Notification host	Name or IP address of target host.
udp-port	UDP port number to which notifications are sent.
type	Type of notification configured.
user	Security level of the user.
security model	Version of SNMP used to send the trap, either v1, v2c, or v3.

show snmp interface

To display the interface index identification numbers (ifIndex values) for all the interfaces or a specified interface, use the **show snmp interface** command in the appropriate mode.

show snmp interface [*type interface-path-id* **ifindex**]

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
ifindex	(Optional) Displays the ifIndex value for the specified interface.

Command Default

Enter the **show snmp interface** command without keywords or arguments to display the ifIndex value for all interfaces.

Command Modes

EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example 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 65: show snmp interface Field Descriptions

Field	Definition
ifName	Interface name.
ifIndex	ifIndex value.

Related Topics

snmp-server ifindex persist, on page 644
snmp-server interface, on page 649

show snmp interface notification

To display the linkUp and linkDown notification status for a subset of interfaces, use the **show snmp interface notification** command in EXEC mode.

show snmp interface notification {**subset** *subset-number*|**regular-expression** *expression*|[*type interface-path-id*]}

Syntax Description

subset *subset-number*	Specifies the identifier of the interface subset. The subset-number argument is configured using the **snmp-server interface subset** command.
regular-expression *expression*	Specifies a subset of interfaces matching a regular expression, for which to display information.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Regular expressions have two constraints:

- Regular expressions must always be entered within double quotes to ensure that the CLI interprets each character correctly.
- All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*?)</\1, you would enter ([A-Z][A-Z0-9]*)\\b[^>]*>(.*\?)</\\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in *Cisco IOS XR Getting Started Guide for the Cisco CRS Router* for more information regarding regular expressions.

When using the **subset** or **regular-expression** keywords, the actual display might not match the configuration if there are higher priority *subset-number* values that actually apply to the interface. This can happen for a set of interfaces that are included in two or more configured regular expressions or where an individual interface configuration is enabled.

Task ID

Task ID	Operation
snmp	read

The following example illustrates how to display linkUp and linkDown notification status for a subset of interfaces identified by a specific *subset-number* :

```
RP/0/RP0/CPU0:router# show snmp interface notification subset 3
```

This example illustrates how to display linkUp and linkDown notification status for a subset of interfaces identified by a regular expression:

```
RP/0/RP0/CPU0:router# show snmp interface notification regular-expression
"^Gig[a-zA-Z]+[0-9/]+\."
```

show snmp interface regular-expression

To display interface names and indices assigned to interfaces that match a regular expression, use the **show snmp interface regular-expression** command in EXEC mode.

show snmp interface regular-expression *expression*

Syntax Description

expression	Specifies a subset of interfaces matching a regular expression, for which to display information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*?)</\1, you would enter ([A-Z][A-Z0-9]*)\\b[^>]*>(.*\?)</\\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in *Cisco IOS XR Getting Started Guide for the Cisco CRS Router* for more information regarding regular expressions.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to display information for interfaces that match the given regular expression:

```
RP/0/RP0/CPU0:router# show snmp interface regular-expression "^Gig[a-zA-Z]+[0-9/]+\."
```

Related Topics

snmp-server interface subset, on page 651

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*|**dll**}]

Syntax Description

object-name	(Optional) Specific MIB object identifier or object name.
dll	(Optional) Displays a list of all MIB DLL filenames and the OID supported by each DLL filename on the system.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	The **detailed** keyword was not supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows sample output from the **show snmp mib** command:

```
RP/0/RP0/CPU0:router# show snmp mib

1.3.6.1.2.1.47.1.1.1.1.2
1.3.6.1.2.1.47.1.1.1.1.3
1.3.6.1.2.1.47.1.1.1.1.4
1.3.6.1.2.1.47.1.1.1.1.5
1.3.6.1.2.1.47.1.1.1.1.6
1.3.6.1.2.1.47.1.1.1.1.7
1.3.6.1.2.1.47.1.1.1.1.8
1.3.6.1.2.1.47.1.1.1.1.9
1.3.6.1.2.1.47.1.1.1.1.10
1.3.6.1.2.1.47.1.1.1.1.11
1.3.6.1.2.1.47.1.1.1.1.12
1.3.6.1.2.1.47.1.1.1.1.13
1.3.6.1.2.1.47.1.1.1.1.14
1.3.6.1.2.1.47.1.1.1.1.15
1.3.6.1.2.1.47.1.1.1.1.16
1.3.6.1.2.1.47.1.2.1.1.2
1.3.6.1.2.1.47.1.2.1.1.3
1.3.6.1.2.1.47.1.2.1.1.4
1.3.6.1.2.1.47.1.2.1.1.5
1.3.6.1.2.1.47.1.2.1.1.6
1.3.6.1.2.1.47.1.2.1.1.7
1.3.6.1.2.1.47.1.2.1.1.8
1.3.6.1.2.1.47.1.3.1.1.1
--More-
```

This example shows sample output from the **show snmp mib** command with the **detailed** keyword:

```
RP/0/RP0/CPU0:router# show snmp mib detailed

Entitymib:dll=/pkg/lib/mib/libEntitymib.dll, config=Entity.mib, loaded
1.3.6.1.2.1.47.1.1.1.1.2
1.3.6.1.2.1.47.1.1.1.1.3
1.3.6.1.2.1.47.1.1.1.1.4
1.3.6.1.2.1.47.1.1.1.1.5
1.3.6.1.2.1.47.1.1.1.1.6
1.3.6.1.2.1.47.1.1.1.1.7
1.3.6.1.2.1.47.1.1.1.1.8
1.3.6.1.2.1.47.1.1.1.1.9
1.3.6.1.2.1.47.1.1.1.1.10
1.3.6.1.2.1.47.1.1.1.1.11
```

```
1.3.6.1.2.1.47.1.1.1.1.12
1.3.6.1.2.1.47.1.1.1.1.13
1.3.6.1.2.1.47.1.1.1.1.14
1.3.6.1.2.1.47.1.1.1.1.15
1.3.6.1.2.1.47.1.1.1.1.16
1.3.6.1.2.1.47.1.2.1.1.2
1.3.6.1.2.1.47.1.2.1.1.3
1.3.6.1.2.1.47.1.2.1.1.4
1.3.6.1.2.1.47.1.2.1.1.5
1.3.6.1.2.1.47.1.2.1.1.6
1.3.6.1.2.1.47.1.2.1.1.7
1.3.6.1.2.1.47.1.2.1.1.8
--More--
```

This example shows sample output from the **show snmp mib** command with the **dll** keyword:

```
RP/0/RP0/CPU0:router# show snmp mib dll

Entitymib:dll=/pkg/lib/mib/libEntitymib.dll, config=Entity.mib, loaded
bgp4mib:dll=/pkg/lib/mib/libbgp4mib.dll, config=bgp4.mib, loaded
cdpmib:dll=/pkg/lib/mib/libcdpmib.dll, config=cdp.mib, loaded
ciscoprocessmib:dll=/pkg/lib/mib/libciscoprocessmib.dll,
 config=ciscoprocess.mib, loaded
ciscosyslogmib:dll=/pkg/lib/mib/libciscosyslogmib.dll,
 config=ciscosyslog.mib, loaded
ciscosystemmib:dll=/pkg/lib/mib/libciscosystemmib.dll,
 config=ciscosystem.mib, loaded
confcopymib:dll=/pkg/lib/mib/libconfcopymib.dll, config=confcopy.mib,
 loaded
configmanmib:dll=/pkg/lib/mib/libconfigmanmib.dll, config=configman.mib,
 loaded
dot3admib:dll=/pkg/lib/mib/libdot3admib.dll, config=dot3ad.mib,
 loaded
fabhfrmib:dll=/pkg/lib/mib/libfabhfrmib.dll, config=fabhfr.mib,
 loaded
fabmcastapplmib:dll=/pkg/lib/mib/libfabmcastapplmib.dll,
 config=fabmcastappl.mib, loaded
fabmcastmib:dll=/pkg/lib/mib/libfabmcastmib.dll, config=fabmcast.mib,
 loaded
flashmib:dll=/pkg/lib/mib/libflashmib.dll, config=flash.mib,
 loaded
hsrpmib:dll=/pkg/lib/mib/libhsrpmib.dll, config=hsrp.mib, loaded
icmpmib:dll=/pkg/lib/mib/libicmpmib.dll, config=icmp.mib, loaded
ifmib:dll=/pkg/lib/mib/libifmib.dll, config=if.mib, loaded
ipmib:dll=/pkg/lib/mib/libipmib.dll, config=ip.mib, loaded
mempoolmib:dll=/pkg/lib/mib/libmempoolmib.dll, config=mempool.mib,
 loaded
mplsldpmib:dll=/pkg/lib/mib/libmplsldpmib.dll, config=mplsldp.mib,
 loaded
.
.
.
```

Related Topics

show snmp, on page 565

show snmp mib bulkstat transfer

To display completed local bulk statistics files, use the **show snmp mib bulkstat transfer** command in EXEC mode.

show snmp mib bulkstat transfer [*transfer-name*]

Syntax Description

transfer-name	Specifies a named transfer file to display.

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp mib bulkstat transfer** command lists all bulk statistics virtual files (VFiles) on the system that have finished collecting data. (Data files that are not complete are not displayed.)

The output lists all of the completed local bulk statistics files, the remaining time left before the bulk statistics file is deleted (remaining retention period), and the state of the bulk statistics file. The state of the bulk statistics file should be Retry. Retry indicates that one or more transfer attempts have failed and that the file transfer will be attempted again. The number of retry attempts remaining is displayed in parenthesis. After the successful retry or retry attempts, the local files created by the MIB process in the router are deleted and data collection begins again.

To display only the status of a named transfer (as opposed to all configured transfers), specify the name of the transfer in the *transfer-name* argument. The *transfer-name* argument names a file which is supposed to be created even before the retries.

Task ID

Task ID	Operation
snmp	read

```
RP/0/RP0/CPU0:router# show snmp mib bulkstat transfer

Transfer Name : ifmib
 Retained files

 File Name        : Time Left (in seconds)   :STATE
 ----------------------------------------------------------
```

```
ifmib_Router_020421_100554683 : 173 : Retry (2 Retry attempt(s) Left)
```

show snmp request duplicates

To display the number of duplicate protocol data unit (PDU) requests dropped by the SNMP agent, use the **show snmp request duplicates** command in

EXEC

mode.

show snmp request duplicates

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp request duplicates** command:

```
RP/0/RP0/CPU0:router# show snmp request duplicates

No of Duplicate request received/Dropped : 0
```

show snmp request incoming-queue detail

To show the details of the queue of incoming SNMP requests, use the **show snmp request incoming-queue detail** command in EXEC mode.

show snmp request incoming-queue detail

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command shows an output for maximum of 15 queues and an additional general queue. The entry will be deleted when any queue is not polled for 30 minutes.

This command shows these details:

Field	Description
NMS Address	Source address (IPv4 or IPv6) of network management system (NMS) queue. Specifies the NMS packet requests in this queue.
Q Depth	Number of packets to be processed in the queue.
Deque Count	Number of packets that are processed.
Priority	Priority of queue with packets to be processed. The priority ranges from 1 to 5, 1 indicates low priority and 5 indicates high priority.
Enque time	Time stamp of last request in the queue.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request incoming-queue detail
 Wed Mar 12 05:16:59.505 PDT

NMS ADDRESS          Q Depth      Deque count          Priority             Enque time
```

```
4.5.6.7               0                1223             1                    Wed Mar 12
05:16:25

1.2.3.4               0                1193             1                    Wed Mar 12
05:15:06

General Q             0                 0               0                    Wed Mar 12
05:14:49

NMS ADDRESS       : 4:5:6::7

  Q Depth     Deque count           Priority               Enque time

  0                1220               1                    Wed Mar 12 05:16:02

NMS ADDRESS       : 1:2:3::4

  Q Depth     Deque count          Priority               Enque time

  0               1221               1                     Wed Mar 12 05:15:37
```

show snmp request type summary

To show the types of requests sent from each network management system (NMS), use the **show snmp request type summary** command in EXEC mode.

show snmp request type summary

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp request type summary** command shows these details:

Field	Description
NMS address	IP address of the NMS that sent the request.
Get	Number of requests of Get type.
Getnext	Number of requests of Getnext type.
Getbulk	Number of requests of Getbulk type.
Set	Number of requests of Set type.
Test	Number of requests of Test type that is part of Set request.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request type summary
 Wed Mar 12 05:17:14.643 PDT
NMS Address          Get      GetNext      GetBulk      Set      Test
 1.2.3.4             0          1254         0          0         0
 4.5.6.7             0          5101         0          0         0

NMS Address : 1:2:3::4
 Get      GetNext      GetBulk      Set      Test
  0          2536        0          0         0
```

```
NMS Address : 4:5:6::7
 Get       GetNext       GetBulk       Set       Test
  0           3817          0           0          0
```

show snmp request type detail

To shows the group that is polled frequently and from which network management system (NMS), use the **show snmp reqest type detail** command in EXEC mode.

show snmp request type detail

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp request type detail** command shows these details:

Field	Description
NMS Address	Address of Network Management Station from which the request is received.
Request	Number of requests from NMS.
SNMPD	Number of requests to snmpd.
Interface	Number of requests to mibd_interface.
Entity	Number of requests to mibd_entity.
Route	Number of requests to mibd_route.
Infra	Number of requests to mibd_infra.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request type detail
Wed Mar 12 05:17:34.838 PDT
NMS Address      Request    AGENT    INTERFACE    ENTITY    ROUTE    INFRA
1.2.3.4          1193       52          742        70       267        123
4.5.6.7          1223       52          742        100      267        123
1:2:3::4         1221       52          742        100      265        123
4:5:6::7         1220       52          742        100      265        122
```

show snmp request drop summary

To show the summary of overall packet drop, use the **show snmp request drop summary** command in EXEC mode.

show snmp request drop summary

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp request drop summary** command shows these details:

Field	Description
NMS Address	Address of network management station from which request is received.
IN Q	Number of packets dropped in incoming queue as the dropped packets are not processed more than 10 seconds.
Encode	Number of packets dropped because of encode errors.
Duplicate	Number of requests dropped with duplicate request feature.
Stack	Numbers of requests are dropped in stack.
AIPC	Number of packets dropped at AIPC module.
Overload	Number of packets dropped because of overload control notification.
Timeout	Number of packets are dropped because of slow response from MIB.
Internal	Number of packets dropped because of internal failures.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request drop summary
 Fri Mar 14 05:32:31.732 PDT
NMS Address          INQ    Encode    Duplicate    Stack    AIPC   Overload   Timeout
Internal
 1.2.3.4              0     0         0            0      0         218        0         0

NMS Address : 1:2:3::4
INQ      Encode     Duplicate    Stack    AIPC    Overload     Timeout     Internal
0         0           0            0       0       109           0           0
```

show snmp request overload stats

To show the number of packets dropped due to overload feature, use the **snmp request overload stats** command in EXEC mode.

show snmp request overload stats

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the latest 100 entries.

The show snmp request overload stats command shows these details:

Field	Description
StartTime	Time when overload control notification is received.
InQInDrop	Number of packet drops before inserting in incoming queue.
InQOutDrop	Number of packets dropped from incoming queue.
EndTime	Time when overload control notification ends.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request overload stats
Thu Mar 13 07:00:45.575 UTC
StartTime                          InQInDrop        InQOutDrop                EndTime

Thu Mar 13 07:00:28                   1               0                        Thu Mar
13 07:00:38
```

show snmp statistics oid group

To show the statistics of object ID (OID), use the **show snmp statistics oid group** command in EXEC mode.

show snmp statistics oid group {**interface**|**infra**|**route**|**entity**}

Syntax Description

interface	mibd_interface sub-agent process
infra	mibd_infra sub-agent process
route	mibd_route sub-agent process
entity	mibd_entity sub-agent process

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The latest 500 entries for each group is displayed and a maximum of 2000 entries is displayed for four groups.

The **show snmp statistics oid group** command shows these details:

Field	Description
SerNum	Unique serial number for each request processing in sub-agents.
Type	Request type.
NumObj	Number of OIDs processing in this request.
MIBMGR-IN	Time stamp of request received from AIPC.
PDU-IN	Time stamp of request sent to MIB for processing. This will be offset in milli seconds from MIBMGR_IN time stamp.
FROM-MIB	Time stamp of response sent from MIB after processing. This will be offset in milli seconds from MIBMGR_IN time stamp.
PDU-OUT	Time stamp of response sent to SNMP through AIPC . This will be offset in milli seconds from MIBMGR_IN.
OID	OID info processing this request.

Field	Description
MIB-IN	Time stamp of the request sent to MIB for each OID.
MIB-OUT	Time stamp of response sent from MIB after processing. This will be offset in milli seconds from MIB-IN.
ExpNext	Request Exp-Next.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics oid group interface
Thu Mar 13 07:10:30.310 UTC
SerNum: 2489   Type: GETNEXT     NumObj: 1
  MIBMGR-IN    PDU-IN[ms]          PDU-OUT[ms]          MIBMGR-OUT[ms]
  Mar 13 07:00:49.933                1030                 1030
    OID: 1.3.6.1.2.1.10.32.4.2.0      Exp-Next: Yes
      MIB-IN : Mar 13 07:00:49.933   MIB-OUT[ms] : 1030
SerNum: 10203    Type: GETNEXT     NumObj: 1
  MIBMGR-IN      PDU-IN[ms]          PDU-OUT[ms]           MIBMGR-OUT[ms]
  Mar 13 06:36:16.976    0             1031                  1031
    OID: 1.3.6.1.2.1.10.32.4.2.0  Exp-Next: Yes
      MIB-IN : Mar 13 06:36:16.976   MIB-OUT[ms] : 1031
```

show snmp statistics pdu

To show if processing time of any protocol data unit (PDU) is more than threshold limit, use the **show snmp statistics pdu nms** command in EXEC mode.

show snmp statistics pdu nms[address]

Syntax Description

nms [address]	Address of Network Management Station from which request has arrived. The PDU statistics is filtered for each NMS.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The PDU processing time can exceed the threshold limit in these scenarios:

- SNMPD not able to dispatch the request to MIB because of any failures in snmpd.
- MIB response after threshold limit.
- MIB does not respond to SNMPD.

Default threshold limit is 2 seconds. To change the default threshold value, use the command:

```
Snmp-server timeouts pdu stats <1-10>
```

The maximum number of entries per network management system (NMS) is 500 and the maximum number of NMS is 30.

This command shows these details:

Field	Description
NMS	Address of Network Management Station from which request has arrived.
Port	Port number of application that requested the SNMP query.
REQID	Request ID for each PDU.
Type	Type of PDU.
SerNum	The unique number generated for every request and sent to all MIBDs.

Field	Description
Timeout	If the request was timeout out set to TRUE, else set to FALSE.
InputQ-In	Time stamp of the PDU when queued into input Q.
InputQ-Out	Time stamp of the PDU when queued into input Q, This will be in milliseconds, Offset from INPUT-IN time stamp.
ProcQ-In	Time stamp of the PDU when queued into Processing Q. This will be in milliseconds, Offset from INPUT-IN time stamp.
Response	Time stamp in milli seconds of the PDU when response is received from sub agents. Offset from INPUT-IN time stamp.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics pdu nms
 Thu Mar 13 08:03:17.322 UTC
NMS: 64.103.222.6   PORT: 35028
  REQID:962974264  TYPE: 161  SerNum: 9428 TIMEOUT: No
  INPUTQ-IN                    INPUTQ-OUT[ms]       PROCQ-IN[ms]        RESPONSE[ms]
 Mar 13 08:03:15.269            0                    0                   1056
```

show snmp statistics slow oid

To show the object ID (OID) that has exceeded beyond the threshold time for processing and the number of times that the threshold limit is exceeded with the latest timestamp, use the **show snmp statistics slow oid** command in EXEC mode.

show snmp statistics slow oid

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Default threshold limit for this data as 500 milli seconds. To change the default value, use the command:

```
Snmp-server logging threshold oid-processing < <0-20000>
```

The latest 500 entries for each sub agent is displayed and a total of upto 2000 entries is maintained.

The **show snmp statistics slow oid** command shows these details:

Field	Description
Type	Request type for slow OID.
Exact OID	Requested OID from NMS.
Resp OID	Response OID for the Request type and EXACT OID.
Slow Count	Number of times OID is slow.
Slow Time	Time taken for processing the OID in milli seconds.
Time Stamp	Time stamp of the slow OID when MIB responded to MIBD.

Task ID

Task ID	Operations
snmp	read, write

This example shows a slow OIDs that exceeds the specified threshold time.

```
RP/0/RP0/CPU0:router# show snmp statistics slow oid
```

```
 Group:agent

  TYPE                : GETNEXT
  REQ_OID           : 1.3.6.1.2.1.1.1.0
  RESP_OID         : 1.3.6.1.2.1.1.1.2
  COUNT               : 2
  TIME[ms]            : 0
  TIME_STAMP     : Mar 13 05:36:52.279

Group:infra

Group:route

  TYPE               : GETNEXT
  REQ_OID         :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID       :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT            : 4
  TIME[ms]         : 14
  TIME_STAMP   : Mar 13 05:36:52.279
  TYPE               : GET
  REQ_OID         :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID       :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT            : 4
  TIME[ms]         : 14
  TIME_STAMP   : Mar 13 05:36:52.279

Group:entity

Group:interface

  TYPE                : GETNEXT
  REQ_OID          : 1.3.6.1.2.1.2.1
  RESP_OID        : 1.3.6.1.2.1.2.1.0
  COUNT            : 1
  TIME[ms]         : 0
  TIME_STAMP    : Mar 13 05:36:52.279
```

show snmp statistics poll oid all

To show all object IDs (OIDs) polled from all network management system (NMS) and how many times it has polled, use the **show snmp statistics poll oid all** command in EXEC mode.

For this command to work, the following configuration has to be committed:

(config)#snmp-server oid-poll-stats

show snmp statistics poll oid all

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The maximum number of entries equals the number of OIDs that were polled. The maximum number of NMS details for each OID is 15.

The **show snmp statistics poll oid all** command shows these details:

Field	Description
Object ID	OID requested from NMS.
NMS	List of NMS IP address requested for each OID.
Count	Number of times OID is polled for each NMS.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics poll oid all
 Object ID   :   1.3.6.1.2.1.1.3
 NMS                 COUNT
 10.2.1.3              10
 10.3.1.2              30
 10.4.1.3              20
 10.12.1.3             5

Object ID    :    1.3.6.1.2.1.1.4
NMS                  COUNT
10.2.1.3               10
```

```
10.3.1.2                5
10.4.1.3                20
10.12.1.3               30

Object ID   :  1.3.6.1.2.1.1.5
NMS                    COUNT
10.2.1.3                10
10.3.1.2                3
10.4.1.3                2
```

Show snmp statistics poll oid nms

To show which object ID (OID) is polled from which network management system (NMS) and how many times it has polled, use the **show snmp statistics poll oid nms** command in EXEC mode.

show snmp statistics poll oid nms<V4 / V6 address>

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp statistics poll oid nms** command shows these details:

Field	Description
Object ID	OID requested from NMS.
NMS	List of NMS IP address requested for each OID.
Count	Number of times OID is polled for each NMS.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics poll nms 1.2.3.4
 NMS Address   : 1.2.3.4
Object ID                 Count
1.3.6.1.2.1.2.2.1.2       14
```

show snmp statistics slow oid [after/before] hh:mm:ss day mday year

To show the object ID (OID) that has exceeded beyond the threshold time for processing and the number of times that the threshold limit is exceeded with the latest timestamp, use the **show snmp statistics slow oid [after/before] hh:mm:ss day mday year** command in EXEC mode.

show snmp statistics slow oid[after/before] hh:mm:ss day mday year

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Default threshold limit for this data as 500 milli seconds. To change the default value, use the command:

```
Snmp-server logging threshold oid-processing < <0-20000>
```

The latest 500 entries for each sub agent is displayed and a total of upto 2000 entries is maintained.

The **show snmp statistics slow oid [after/before] hh:mm:ss day mday year** command shows these details:

Field	Description
Type	Request type for slow OID.
Exact OID	Requested OID from NMS.
Resp OID	Response OID for the Request type and EXACT OID.
Slow Count	Number of times OID is slow.
Slow Time	Time taken for processing the OID in milli seconds.
Time Stamp	Time stamp of the slow OID when MIB responded to MIBD.

Task ID

Task ID	Operations
snmp	read, write

This example shows a slow OIDs that exceeds the specified threshold time.

```
RP/0/RP0/CPU0:router# show snmp statistics slow oid
Group:agent

  TYPE                : GETNEXT
  REQ_OID          : 1.3.6.1.2.1.1.1.0
  RESP_OID        : 1.3.6.1.2.1.1.1.2
  COUNT             : 2
  TIME[ms]          : 0
  TIME_STAMP    : Mar 13 05:36:52.279

Group:infra
Group:route
  TYPE              : GETNEXT
  REQ_OID        :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID      :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT           : 4
  TIME[ms]        : 14
  TIME_STAMP  : Mar 13 05:36:52.279

  TYPE              : GET
  REQ_OID        :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID      :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT           : 4
  TIME[ms]        : 14
  TIME_STAMP  : Mar 13 05:36:52.279

Group:entity
Group:interface
  TYPE               : GETNEXT
  REQ_OID         : 1.3.6.1.2.1.2.1
  RESP_OID       : 1.3.6.1.2.1.2.1.0
  COUNT            : 1
  TIME[ms]         : 0
  TIME_STAMP   : Mar 13 05:36:52.279
```

show snmp mib ifmib general

To show how many requests get data from internal cache and how many requests are sent to statsd to get data, use the **show snmp mib ifmib general** command in EXEC mode.

show snmp mib ifmib general

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Default IFMIB internal cache is 15 seconds. To change the duration, use the command:

```
snmp-server ifmib internal cache max-duration <0-60>
```

The default duration is 15 seconds, 0 seconds to disable the IFMIB internal cache.

To service the requests from Stats cache instead of Drivers, use the command:

```
snmp-server ifmib stats cache
```

The **show snmp mib ifmib general** command shows these details:

Field	Description
Cache Hit	Number of times the request retrieves data from IFMIB internal cache.
Cache Miss	Number of times the request processed from statsd, and not from IFMIB internal cache
Last Access Time	Latest time stamp of corresponding hit or miss.
Count	Number of times the data is retrieved.

The Cache Hit and Cache Miss are 32 bit counters. The maximum value is 2^31 and reset to 0 if the maximum value is exceeded.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# Show snmp mib ifmib general
```

```
 Fri Mar 14 05:05:50.408 PDT

Type                    Count           Last Access Time

Cache Hit               328             Mar 14 05:05:47.480

Cache Miss               2              Mar 14 05:05:47.386
```

show snmp mib ifmib cache

To show the Ifindex that has exceeded the threshold time for processing, the request type and the time stamp, use the **show snmp mib ifmib cache** command in EXEC mode. The threshold time for the data to create an entry is 500 milli seconds.

show snmp mib ifmib cache

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the latest 500 entries. An entry will be added when the difference between Cache in and Cache out time is more than 500 milli seconds. The timeout value cannot be changed.

The **show snmp mib ifmib cache** command shows these details:

Field	Description
Index	Interface index.
MIB IN	Time stamp of the request when IFMIB starts processing.
Cache In	Time stamp in milli seconds when data retrieval from the cache starts for the request. It is offset from MIB IN time stamp.
Cache Out	Time stamp in milli seconds when data is retrieved from cache. It is offset from MIB IN time stamp.
MIB Out	Time stamp in milli seconds of the response from IF MIB. It is offset from MIB IN time stamp.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp mib ifmib cache
IFIndex    Type          MIB IN                    CACHE IN[ms]          CACHE OUT[ms]
```

```
        MIB OUT[ms]

2          NEXT          Mar 18 07:14:41.815           4                     701
           701

2          NEXT          Mar 18 07:15:36.815           0                     679
           679

2          NEXT          Mar 18 07:16:00.735           0                     684
           684
```

show snmp mib ifmib statsd

To show the Ifindex that has exceeded the threshold time for processing, the request type and the time stamp, use the **show snmp mib ifmib statsd** command in EXEC mode. The threshold time for the data to create an entry is 500 milli seconds.

show snmp mib ifmib statsd

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the latest 500 entries. An entry will be added when the difference between Stats in and Stats out time is more than 500 milli seconds. The timeout value cannot be changed.

The **show snmp mib ifmib statsd** command shows these details:

Field	Description
Index	Interface index.
MIB IN	Time stamp of the request when IFMIB starts processing.
Stats In	Time stamp in milli seconds when data retrieval from the Statsd starts for the request. It is offset from MIB IN time stamp.
Stats Out	Time stamp in milli seconds when data is retrieved from Statsd. It is offset from MIB IN time stamp.
MIB Out	Time stamp in milli seconds of the response from IF MIB. It is offset from MIB IN time stamp.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp mib ifmib statsd
IFIndex    Type          MIB IN                    STATS IN[ms]      STATS OUT[ms]     MIB
```

```
 OUT[ms]

2           NEXT          Mar 18 07:14:41.815         4                   701
701

2           NEXT          Mar 18 07:15:36.815         0                   679
679

2           NEXT          Mar 18 07:16:00.735         0                   684
684
```

show snmp traps details

To show the details about the traps generated for each host, the sent and drop count and the timestamp, use the **show snmp traps details** command in EXEC mode.

show snmp traps details

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp traps details** command shows these details:

Field	Description
TrapOID	Generated trap.
Sent	Number of times the trap sent from the host and port configured.
Drop	Number of times the trap dropped from the host and port configured.
Last-sent	Time stamp when the last trap was sent from the host and port.
Last-drop	Time stamp when the last trap dropped from the host and port.
Host	Configured address of the host to receive traps
udp-port	Configured port to receive traps

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp traps details
Mon Apr  7 17:14:07.241 UTC
HOST:9.22.24.150, udp-port:3333
```

```
------------------------------
TrapOID                          Sent    Drop     Last-sent                     Last-drop
ciscoConfigManMIB.2.0.1            2          0      Mon Apr 07 14 17:12:29          ~
ciscoFlashDeviceInsertedNotif      1          0      Mon Apr 07 14 17:12:28          ~
ciscoFlashDeviceRemovedNotif       1          0      Mon Apr 07 14 17:12:28          ~
```

show snmp informs details

To show the details about the informs generated for each host, the drop and retry count and the timestamp, use the **show snmp informs details** command in EXEC mode.

show snmp informs details

This command has no keywords or arguments.

Command Modes

Global configuration

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp informs details** command shows these details:

Field	Description
InformOID	Generated inform.
Sent	Number of times the Inform is sent from the inform host and port configiured.
Drop	Number of times the Inform is sent from the inform host and port configiured.
Retry	Number of times the Inform retries from the inform host and port configiured
Last-sent	Time stamp when the last inform was sent from the host and port.
Last-drop	Time stamp when the last inform dropped from the host and port.
Host	Configured address of the host to receive traps.
udp-port	Configured port to receive traps.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp informs details
Mon Apr  7 17:14:17.212 UTC
HOST:9.22.24.150, udp-port:5555
------------------------------
InformOID                          Sent    Drop    Retry   Last-sent
Last-drop
ciscoConfigManMIB.2.0.1            8       2       6       Mon Apr 07 14 17:12:54      Mon
 Apr 07 14 17:12:42
ciscoFlashDeviceInsertedNotif      4       1       3       Mon Apr 07 14 17:12:55      Mon
 Apr 07 14 17:12:42
ciscoFlashDeviceRemovedNotif       4       1       3       Mon Apr 07 14 17:12:54      Mon
 Apr 07 14 17:12:42
ciscoMgmt.117.2.0.1                8       2       6       Mon Apr 07 14 17:12:53      Mon
 Apr 07 14 17:12:42
ciscoMgmt.117.2.0.2                4       1       3       Mon Apr 07 14 17:12:52      Mon
 Apr 07 14 17:12:42|
```

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An SNMP user must be part of an SNMP group, as configured using the **snmp-server user** command.

Use the **show snmp users** command to display information about all configured users.

When configuring SNMP, you may see the logging message "Configuring snmpv3 USM user." USM stands for the User-Based Security Model (USM) for SNMP Version 3 (SNMPv3). For further information about USM, see RFC 3414, *User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)*.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp users** command:

```
RP/0/RP0/CPU0:router# show snmp users

  User name:user1
  Engine ID:localSnmpID
  storage-type:nonvolatile active
```

Table 66: show snmp users Field Descriptions

Field	Definition
User name	String identifying the name of the SNMP user.
Engine ID	String identifying the name of the copy of SNMP on the device.
storage-type	Settings that are set in volatile or temporary memory on the device, or in nonvolatile or persistent memory where settings remain after the device is turned off and on again.

Related Topics

snmp-server group, on page 637
snmp-server user, on page 717

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp view** command:

```
RP/0/RP0/CPU0:router# show snmp view

  view1 1.3 - included nonVolatile active
  v1default 1.3.6.1 - included nonVolatile active
```

Related Topics

snmp-server group, on page 637
snmp-server user, on page 717

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

serial-number	Unique identification string to identify the chassis serial number.

Command Default

On hardware platforms, where the serial number can be read by the device, the default is the serial number. For example, some Cisco devices have default chassis ID values of their serial numbers.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server chassis-id** command to provide a message line identifying the SNMP server serial number.

The chassis ID message can be displayed with the **show snmp** command.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to specify the chassis serial number 1234456:

```
RP/0/RP0/CPU0:router# snmp-server chassis-id 1234456
```

Related Topics

show snmp, on page 565

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 *community-string* is clear text and should be encrypted when displayed by the **show running** command.
encrypted	(Optional) Specifies that the entered *community-string* is encrypted text and should be displayed as such by the **show running** command.
community-string	Community string that acts like a password and permits access to the SNMP protocol. The maximum length of the *community-string* argument is 32 alphabetic characters. If the **clear** keyword was used, *community-string* is assumed to be clear text. If the **encrypted** keyword was used, *community-string* is assumed to be encrypted. If neither was used, *community-string* is assumed to be clear text.
view *view-name*	(Optional) Specifies the name of a previously defined view. The view defines the objects available to the community.
RO	(Optional) Specifies read-only access. Authorized management stations are able only to retrieve MIB objects.
RW	(Optional) Specifies read-write access. Authorized management stations are able both to retrieve and to modify MIB objects.
SDROwner	(Optional) Limits access to the owner service domain router (SDR).
SystemOwner	(Optional) Provides system-wide access including access to all non-owner SDRs.
access-list-name	(Optional) Name of an access list of IP addresses allowed to use the community string to gain access to the SNMP agent.

Command Default

By default, an SNMP community string permits read-only access to all MIB objects.

By default, a community string is assigned to the SDR owner.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Release	Modification
Release 3.3.0	The optional keywords **LROwner** and **SystemOwner** were added.
Release 3.6.0	The **LROwner** keyword was changed to **SDROwner** . The **clear** and **encrypted** keywords were added.
Release 4.2.0	IPv6 was supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community** command to configure the community access string to permit access to SNMP.

To remove the specified community string, use the **no** form of this command.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

When the **snmp-server community** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the **snmp-server community** command is entered with the **SystemOwner** keyword, SNMP access is granted to 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.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to assign the string comaccess to SNMP, allowing read-only access, and to specify that IP access list 4 can use the community string:

```
RP/0/RP0/CPU0:router(config)# snmp-server community comaccess ro 4
```

The following example shows how to assign the string mgr to SNMP, allowing read-write access to the objects in the restricted view:

```
RP/0/RP0/CPU0:router(config)# snmp-server community mgr view restricted rw
```

This example shows how to remove the community comaccess:

```
RP/0/RP0/CPU0:router(config)#no snmp-server community comaccess
```

Related Topics

snmp-server view, on page 720

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 *community-string* argument is clear text.
encrypted	(Optional) Specifies that the community-string argument is encrypted text.
community-string	Name of the community.
context *context-name*	(Optional) Name of the SNMP context to which this community name is to be mapped.
security-name *security-name*	(Optional) Security name for this community. By default, the *string* is the security name.
target-list *target*	(Optional) Name of the target list for this community.

Command Default

The value of the *community-string* argument is also the security name.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community-map** command to map an SNMPv1 or SNMPv2c community name to one or more of the following:

- **context name**—Maps a community name to a specific SNMP context name. This allows MIB instances in an SNMP context to be accessed through SNMPv1 or SNMPv2c using this community name.
- **security name**—By default, the community name is used to authenticate SNMPv1 and SNMPv2c. Configure a security name for a community name to override the default and authenticate SNMP with the security name.
- **target**—Target list identifies a list of valid hosts from which SNMP access can be made using a specific security name. When such mapping is done for a particular community name, SNMP access is allowed only from hosts included in the target list.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

Task ID

Task ID	Operations
snmp	read, write

This example maps the community name “sample 2” to the SNMP context name “sample1”:

```
RP/0/RP0/CPU0:router(config)# snmp-server community-map sample2 context sample1
```

Related Topics

snmp-server context, on page 629
snmp-server target list, on page 675

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

system-contact-string	String that describes the system contact information. The maximum string length is 255 alphanumeric characters.

Command Default

No system contact is set.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server contact** command to set the system contact string. Use the **no** form of this command to remove the system contact information.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to specify a system contact string:

```
RP/0/RP0/CPU0:router(config)# snmp-server contact Dial System Operator at beeper # 27345
```

Related Topics

snmp-server location, on page 656

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

context-name	Name of the SNMP context.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command creates an SNMP context. By default, all the SNMP MIB instances are in a default context. Create an SNMP context and map it to a particular feature to enable similar instances of the same object to co-exist in different SNMP contexts.

Task ID

Task ID	Operations
snmp	read, write

This example creates a new SNMP context named “sample1:”

```
RP/0/RP0/CPU0:router(config)# snmp-server context sample1
```

Related Topics

snmp-server community-map, on page 626
snmp-server vrf, on page 722

snmp-server context mapping

To map an SNMP context with a protocol instance, topology or VRF entity, use the **snmp-server context mapping** command in global configuration mode.

snmp-server context mapping *context-name* [**feature** *feature-name*] [**instance** *instance-name*] [**topology** *topology-name*] [**vrf** *vrf-name*]

Syntax Description

context-name	Name of the SNMP context.
feature *feature-name*	Specifies the protocol for which to map the context. Available options are: • **bridge**—Layer 2 VPN bridge • **vrf**—Virtual Routing and Forwarding
instance *instance-name*	Maps the context to the specified protocol instance.
topology *topology-name*	Maps the context to the specified protocol topology.
vrf *vrf-name*	Maps the context to the specified VRF logical entity.

Command Default

No context mappings exist by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A device can support multiple instances of a logical network entity, such as protocol instances or VRFs. Most existing MIBs cannot distinguish between these multiple logical network entities. For example, the original OSPF-MIB assumes a single protocol instance on a device, but you can now configure multiple OSPF instances on a device.

The **snmp-server context mapping** command maps a context to a protocol instance, topology or VRF logical entity.

Note The snmp-server context mapping command does not work for OSPF and OSPFv3. Refer to the **snmp context** commands.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to map an snmp context to an OSPF instance:

```
RP/0/RP0/CPU0:router(config)# snmp-server context mapping con5 feature ospf instance in1
```

Related Topics

snmp context (OSPF)
show snmp context, on page 568

snmp-server drop report acl

To apply an ACL policy for restricting an SNMPv3 unknown engine-id report to be sent out to NMS, use the **snmp-server drop report acl** command in the configuration mode.

snmp-server drop report acl IPv4 *IPv4-acl-name* **IPv6** *IPv6-acl-name*

Syntax Description

acl	Specifies IP Access Control Lists (ACL) policy
IPv4 *IPv4-acl-name*	Defines an IPv4 ACL name.
IPv6 *IPv6-acl-name*	Defines an IPv6 ACL name.

Command Default

Unknown engine-id reports will be sent to all polling stations (even if other ACLs are configured).

Command Modes

Configuration mode

Command History

Release	Modification
Release 6.2.3	This command was introduced.

Usage Guidelines

To drop an unknown engine-id report, you can either configure IPv4/IPv6 ACL name or both. When router is polled with wrong engine-id or no engine-id during a snmpv3 packet exchange, the unknown engine-id report will be sent based on the ACL policy that is configured.

Unknown engine-id reports will be sent only to polling station addresses that are permitted by ACL.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to configure the SNMP server to drop the unknown engin-id report:

```
RP/0/RP0/CPU0:router (config) #  snmp-server drop report acl IPv4 nms-block IPv6
nms-block-ipv6
```

snmp-server drop unknown-user

To avoid error PDUs being sent out of router when polled with incorrect SNMPv3 user name, use the **snmp-server drop unknown-user** command in the appropriate mode. If the configuration is not set, by default it will respond with error PDUs.

snmp-server drop unknown-user

Syntax Description

drop unknown-user	Drop the error PDUs to be sent when router is polled with incorrect SNMPv3 user name.

Command Default

Unknown error PDUs will be sent when router is polled with incorrect SNMPv3 user name.

Command Modes

XR config

Command History

Release	Modification
Release 6.2.3	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to configure the SNMP server to drop the error PDUs:

```
RP/0/RP0/CPU0:router (config) #  snmp-sever drop unknown-user
```

snmp-server engineid local

To specify Simple Network Management Protocol (SNMP) engine ID on the local device, use the **snmp-server engineid local** command in

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

engine-id	Character string that identifies the engine ID. Consists of up to 24 characters in hexadecimal format. Each hexadecimal number is separated by a colon (:).

Command Default

An SNMP engine ID is generated automatically.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure the SNMP engine ID on the local device:

```
RP/0/RP0/CPU0:router(config)# snmp-server engineID local 00:00:00:09:00:00:00:a1:61:6c:20:61
```

Related Topics

show snmp engineid, on page 571

snmp-server engineid remote

To specify a Simple Network Management Protocol (SNMP) engine ID on a remote device, use the **snmp-server engineid remote** command in

global configuration

mode. To return the engine ID to the default, use the **no** form of this command.

snmp-server engineid remote *ip-address engine-id* **udp-port** *port*
no snmp-server engineid remote *ip-address engine-id* **udp-port** *port*

Syntax Description

ip-address	IP address of remote SNMP notification host
engine-id	Character string that identifies the engine ID. Consists of up to 24 characters in hexadecimal format. Each hexadecimal number is separated by a colon (:).
udp-port *port*	(Optional) Specifies the User Datagram Protocol (UDP) port of the host to use. Range is from 1 to 65535. The default UDP port is 161.

Command Default

An SNMP engine ID is generated automatically.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The IP address of the remote host can be in either IPv4 or IPv6 format.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to configure the SNMP engine ID on the local device:

```
RP/0/RP0/CPU0:Router(config)# snmp-server engineID remote 172.16.4.1
00:00:00:09:00:00:00:a1:61:6c:20:61
```

Related Topics

show snmp engineid, on page 571
snmp-server engineid local, on page 634

snmp-server entityindex persist

To enable the persistent storage of ENTITY-MIB data across process restarts, switchovers, and device reloads, use the **snmp-server entityindex persist** command in

global configuration

mode. To disable the persistent storage of ENTITY-MIB data, use the **no** form of this command.

snmp-server entityindex persist
no snmp-server entityindex persist

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example illustrates how to enable persistent storage of ENTITY-MIB indices:

```
RP/0/RP0/CPU0:router(config)# snmp-server entityindex persist
```

Related Topics

snmp-server mibs cbqosmib persist, on page 665

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

name	Name of the group.
v1	Specifies a group that uses the SNMPv1 security model. The SNMP v1 security model is the least secure of the possible security models.
v2c	Specifies a group that uses the SNMPv2c security model. The SNMPv2c security model is the second least secure of the possible security models.
v3	Specifies a group that uses the SNMPv3 security model. The SNMP v3 security is the most secure of the possible security models.
auth	Specifies authentication of a packet without encrypting it.
noauth	Specifies no authentication of a packet.
priv	Specifies authentication of a packet with encryption.
read *view*	(Optional) Specifies a read view string (not to exceed 64 characters) that is the name of the view that allows only the contents of the agent to be viewed.
write *view*	(Optional) Specifies a write view string (not to exceed 64 characters) that is the name of the view used to enter data and configure the contents of the agent.
notify *view*	(Optional) Specifies a notify view string (not to exceed 64 characters) that is the name of the view used to specify a notify or trap.
context *context-name*	(Optional) Specifies the SNMP context to associate with this SNMP group and associated views.
access-list-name	(Optional) Access list string (not to exceed 64 characters) that is the name of the access list.

Command Default

See Table 67: snmp-server group Default Descriptions, on page 638.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Release	Modification
Release 3.2	The **access** keyword was removed.
Release 3.3.0	Support was added for the **context** *context-name* keyword and argument.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This table describes the default values for the different views:

Table 67: snmp-server group Default Descriptions

Default	Definition
read *view*	Assumed to be every object belonging to the Internet (1.3.6.1) object identifier (OID) space, unless the user uses the **read** option to override this state.
write *view*	Nothing is defined for the write view (that is, the null OID). You must configure write access.
notify *view*	Nothing is defined for the notify view (that is, the null OID). If a view is specified, any notifications in that view that are generated are sent to all users associated with the group (provided an SNMP server host configuration exists for the user).

Configuring Notify Views

Do not specify a notify view when configuring an SNMP group for the following reasons:

- The **snmp-server host** command autogenerates a notify view for the user, and then adds it to the group associated with that user.
- Modifying the notify view of the group affects all users associated with that group.

The notify view option is available for two reasons:

- If a group has a notify view that is set using SNMP, you may need to change the notify view.
- The **snmp-server host** command may have been configured before the **snmp-server group** command. In this case, reconfigure the **snmp-server host** command or specify the appropriate notify view.

Instead of specifying the notify view for a group as part of the **snmp-server group** command, use the following commands in global configuration mode:

- **snmp-server user**—Configures an SNMP user.
- **snmp-server group**—Configures an SNMP group, without adding a notify view.
- **snmp-server host**—Autogenerates the notify view by specifying the recipient of a trap operation.

Working with Passwords and Digests

No default values exist for authentication or privacy algorithms when this command is configured. In addition, no default passwords exist. The minimum length for a password is one character, although we recommend using eight characters for security. A plain-text password or localized Message Digest 5 (MD5) password can be specified. Forgotten passwords cannot be recovered, and the user must be reconfigured.

SNMP Contexts

SNMP contexts provide Virtual Private Network (VPN) users with a secure way of accessing MIB data. When a VPN is associated with a context, that VPN's specific MIB data exists in that context. Associating a VPN with a context enables service providers to manage networks with multiple VPNs. Creating and associating a context with a VPN enables a provider to prevent the users of one VPN from accessing information about users of other VPNs on the same networking device.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to configure an SNMP version 3 group named group1 that requires the authentication of packets with encryption:

```
RP/0/RP0/CPU0:router(config)# snmp-server group group1 v3 priv
```

Related Topics

show snmp, on page 565
show snmp group, on page 575
snmp-server host, on page 640
snmp-server view, on page 720

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**}] **[informs] [traps]** [**version** {**1**|**2c**|**3** {**auth**|**noauth**|**priv**}}] *community-string* [**udp-port** *port*] [*notification-type*]
nosnmp-server host *address* [{**clear**|**encrypted**}] **[informs] [traps]** [**version** {**1**|**2c**|**3** {**auth**|**noauth**|**priv**}}] *community-string* [**udp-port** *port*] [*notification-type*]

Syntax Description

address	Name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the *community-string* argument is encrypted text.
informs	(Optional) Specifies to send inform messages to this host.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version	(Optional) Specifies the version of the SNMP used to send the traps.
1	Specifies SNMPv1, the default.
2c	Specifies SNMPv2C.
3	Specifies SNMPv3. Version 3 is the most secure model because it allows packet encryption. If you specify the SNMPv3 keyword, you must specify the security level.
auth	Enables Message Digest 5 (MD5) algorithm and Secure Hash Algorithm (SHA) packet authentication.
noauth	Specifies that the noAuthNoPriv security level applies to this host. This is the default security level for SNMPv3.
priv	Enables Data Encryption Standard (DES) packet encryption (also called "privacy").
community-string	Password-like community string sent with the notification operation. We recommend defining this string using the **snmp-server community** command prior to using the **snmp-server host** command.
udp-port *port*	(Optional) Specifies the User Datagram Protocol (UDP) port of the host to use. Range is from 1 to 65535. The default UDP port is 161.

notification-type	(Optional) Type of notification to be sent to the host. If no type is specified, all available notifications are sent. The notification type can be one or more of these keywords: • **bgp** —Enables SNMP Border Gateway Protocol Version 4 (BGPv4) traps. • **config** —Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is (1) ciscoConfigManEvent. • **copy-complete** —Enables CISCO-CONFIG-COPY-MIB ccCopyCompletion traps. • **entity** —Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as: (1) entConfigChange. • **fabric** —Enables SNMP fabric traps. • **fru-ctrl** —Enables SNMP entity field-replaceable unit (FRU) control traps. • **mpls** —Enables SNMP Multiprotocol Label Switching (MPLS) traps. • **sensor** —Enables SNMP entity sensor traps. • **snmp** —Enables SNMP traps. • **syslog** —Controls error message notifications (Cisco-syslog-MIB). Specify the level of messages to be sent with the **logging history** command.

Command Default

This command is disabled by default. No notifications are sent.

The default UDP port is 161.

When this command is entered without keywords, the default is to send all trap types to the host.

If no version keyword is entered, the default is version 1.

If version 3 is specified, but the security level is not specified, the default security level is noauth.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 4.1.0	The **informs** keyword was added.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps. Traps are unreliable because the receiver does not send acknowledgments when it receives traps. The sender cannot determine if the traps were received. Traps are discarded as soon as they are sent. Traps are also sent only once.

When the **snmp-server host** command is not entered, no notifications are sent. To configure the device to send SNMP notifications, configure at least one **snmp-server host** command. When the command is entered without keywords, all trap types are enabled for the host.

To enable multiple hosts, issue a separate **snmp-server host** command for each host. You can specify multiple notification types in the command for each host.

When multiple **snmp-server host** commands are given for the same host and kind of notification (trap), each succeeding **snmp-server host** command overwrites the previous command. Only the last **snmp-server host** command is in effect. For example, if an **snmp-server host** command with the **traps** keyword is entered for a host and then another command with the **traps** keyword is entered for the same host, the second command replaces the first.

Either a host name or IP address can be used to specify the host. Both IPv4 and IPv6 IP address formats are supported.

The **snmp-server host** command is used with the **snmp-server engineid** command. Use the **snmp-server traps** command to specify which SNMP notifications are sent globally. For a host to receive most notifications, at least one **snmp-server traps** command and the **snmp-server host** command for that host must be enabled.

However, some notification types cannot be controlled with the **snmp-server traps** command. For example, some notification types are always enabled. Other notification types are enabled by a different command.

The availability of a notification-type depends on the device type and Cisco software features supported on the device.

To display which notification types are available on the system, use the question mark (**?**) online help function at the end of the **snmp-server host** command.

The **no snmp-server host** command used with no keywords disables traps.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

If the **informs** keyword is used, the SNMP version can be only SNMPv2C or SNMPv3.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to send RFC 1157 SNMP traps to the host specified by the name myhost.cisco.com. Other traps are enabled, but only SNMP traps are sent because only the **snmp** keyword is specified in the **snmp-server host** command. The community string is defined as comaccess.

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com comaccess snmp
```

This example shows how to send the SNMP traps to address 172.30.2.160:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp
RP/0/RP0/CPU0:router(config)# snmp-server host 172.30.2.160 public snmp
```

This example shows how to enable the router to send all traps to the host, myhost.cisco.com, using the community string public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public
```

This example shows how to prevent traps from being sent to any host. The BGP traps are enabled for all hosts, but only the configuration traps are enabled to be sent to a host.

```
RP/0/RP0/CPU0:router(config)# snmp-server traps bgp
RP/0/RP0/CPU0:router(config)# snmp-server host hostabc public config
```

This example shows how to send SNMPv3 informs to a host:

```
RP/0/RP0/CPU0:router(config)# snmp-server host 172.30.2.160 informs version 3
```

Related Topics

snmp-server engineid local, on page 634
snmp-server traps bgp, on page 690
snmp-server inform, on page 648

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 keywords or arguments.

Command Default

Global interface persistence is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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

This example shows how to enable ifIndex persistence globally:

```
RP/0/RP0/CPU0:router(config)# snmp-server ifindex persist
```

Related Topics

index persistence, on page 550
notification linkupdown, on page 556
show snmp interface, on page 579

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 keywords or arguments.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server 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

This 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 internal cache max-duration

To configure the refresh interval for the IF-MIB statistics cache, use the **snmp-server ifmib internal cache max-duration** command in global configuration mode. To revert to the default cache interval, use the **no** form of this command.

snmp-server ifmib internal cache max-duration *timeout*

Syntax Description

timeout	Length of time before the cache is refreshed. Values can range from 0 to 60 seconds. The default is 15.

Command Default

timeout: 15 seconds

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.3	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server ifmib internal cache max-duration** command controls the refresh interval of the cache. If the *timeout* value in the **snmp-server ifmib internal cache max-duration** command is set to zero, the cache is disabled. By default, the counters are cached for 15 secs in the ifmib internal cache, after which it will be discarded.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to change the refresh interval for the IF-MIB statistics cache.

```
RP/0/RP0/CPU0:routerrouter(config)# snmp-server ifmib internal cache max-duration 60
```

Related Topics

snmp-server ifmib stats cache, on page 647

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 keywords or arguments.

Command Default

Cached statistics are not enabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.2	This command was introduced.
Release 3.4.0	This command was not supported.
Release 3.5.0	This command was supported

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

This 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#
```

Related Topics

snmp-server ifmib internal cache max-duration, on page 646

snmp-server inform

To configure Simple Network Management Protocol (SNMP) inform message options, use the **snmp-server inform** command in global configuration mode. To revert to the default informs options, use the **no** form of this command.

snmp-server inform {**pending** *max-no*|**retries** *no-retries*|**timeout** *seconds*}
no snmp-server inform {**pending** *max-no*|**retries** *no-retries*|**timeout** *seconds*}

Syntax Description

pending *max-no*	Specifies the maximum number of inform messages to hold in the queue. The default is 25.
retries *no-retries*	Specifies the retry count for inform messages. Values can be from 1 to 100. The default is three.
timeout *seconds*	Specifies the inform message timeout value in seconds. The default is 15.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To enable the sending of SNMP inform messages, use the **snmp-server host** command with the **informs** keyword. When SNMP server informs are enabled, the SNMP version can be only SNMPv2C or SNMPv3.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure SNMP inform messages:

```
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com informs comaccess
RP/0/RP0/CPU0:router(config)# snmp-server inform pending 40
RP/0/RP0/CPU0:router(config)# snmp-server inform retries 10
```

Related Topics

snmp-server host, on page 640

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

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

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.
Release 3.2	The following keywords were removed: • **ifindex** • **clear** • **persist** • **enable** • **trap** • **link-status**

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server 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

This 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 Topics

show snmp interface, on page 579
snmp-server engineid local, on page 634
snmp-server ifindex persist, on page 644

snmp-server interface subset

To enter snmp-server interface subset configuration mode for a set of interfaces, use the **snmp-server interface subset** command in global configuration mode. To revert to the default interface settings, use the **no** form of this command.

snmp-server interface subset *subset-number* **regular-expression** *expression*
no snmp-server interface subset *subset-number*

Syntax Description

subset-number	Identifying number of the interface subset, which also indicates its relative priority.
regular-expression *expression*	Specifies for which subset of interfaces to enter snmp-server interface subset configuration mode. The *expression* argument must be entered surrounded by double quotes.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The *subset-number* argument is used to set the priority for an interface that matches more than one configured regular expressions. Lower values of the *subset-number* have a higher priority. If a single interface becomes part of a multiple-interface configured regular expression, the configuration with the lower *subset-number* value is applied.

Regular expressions have two constraints:

- Regular expressions must always be entered within double quotes to ensure that the CLI interprets each character correctly.
- All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*?)</\1, you would enter ([A-Z][A-Z0-9]*)\\b[^>]*>(.*\?)</\\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in *Cisco IOS XR Getting Started Guide for the Cisco CRS Router* for more information regarding regular expressions.

From the snmp-server interface mode of a subset of interfaces, SNMP linkUp and linkDown notifications can be enabled or disabled using the **notification linkupdown disable** command.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to configure all Gigabit Ethernet interfaces:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server int subset 2
    regular-expression "^Gig[a-zA-Z]+[0-9/]+\."
RP/0/RP0/CPU0:router(config-snmp-if-subset)#
```

Related Topics

notification linkupdown, on page 556
show snmp interface notification, on page 581
show snmp interface regular-expression, on page 583

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

value	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**, **cs7**.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server 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

This 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)

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server ipv4 precedence** command to specify an IP Precedence value to give SNMP traffic higher or lower priority in your network.

Task ID

Task ID	Operations
snmp	read, write

This 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

system-location	String indicating the physical location of this device. The maximum string length is 255 alphanumeric characters.

Command Default

No system location string is set.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to specify a system location string:

```
RP/0/RP0/CPU0:router(config)# snmp-server location Building 3/Room 214
```

Related Topics

snmp-server contact, on page 628

snmp-server mib bulkstat max-procmem-size

To configure the overall per-process memory size limit used by all bulk statistics files in the process, use the **snmp-server mib bulkstat max-procmem-size** command in

global configuration

mode. To remove the overall per-process memory size, use the **no** form of this command.

snmp mib bulkstat max-procmem-size *size*
no snmp mib bulkstat max-procmem-size [*size*]

Syntax Description

size	Overall per-process memory size limit in kilobytes. The valid range is from 100 to 200000. The default is 200000.

Command Default

The maximum process memory size is 200000 KB.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Currently 300 MB is the maximum process memory available for MIB and SNMP processes.

Task ID

Task ID	Operation
snmp	read, write

This example sets the maximum process memory size to 100000 KB.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat max-procmem-size 100000
```

snmp-server mib bulkstat object-list

To configure a Simple Network Management Protocol (SNMP) bulk statistics object list and enter bulk statistics objects configuration mode, use the **snmp-server mib bulkstat object-list** in

global configuration

mode. To remove an SNMP object list configuration, use the **no** form of this command.

snmp-server mib bulkstat object-list *object-list-name*
no snmp-server mib bulkstat object-list *object-list-name*

Syntax Description

object-list-name	Name or object identifier (OID) of the bulk statistics object list to configure.

Command Default

No SNMP bulk statistics object list is configured.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server mib bulkstat object-list** command allows you to name an object list. Bulk statistics object lists are used for the Periodic MIB Data Collection and Transfer Mechanism.Use the **add** command to add objects to the object list configured with the **snmp-server mib bulkstat object-list** command. Bulk statistics object lists can be reused in multiple schemas.

Task ID

Task ID	Operation
snmp	read, write

In this example, a bulk statistics object list called ifmib is configured to include two objects:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifOutOctets
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifInOctets
```

Related Topics

add (bulkstat object), on page 543
show snmp mib bulkstat transfer, on page 587

snmp-server mib bulkstat schema

To configure a Simple Network Management Protocol (SNMP) bulk statistics schema and enter bulk statistics schema configuration mode, use the **snmp-server mib bulkstat schema** command in

global configuration

mode. To remove the SNMP bulk statistics schema, use the **no** form of this command.

snmp-server mib bulkstat schema *schema-name*
no snmp-server mib bulkstat schema *schema-name*

Syntax Description

schema-name	Specifies the name of the schema to configure.

Command Default

No schemas are configured.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server mib bulkstat schema** command names the schema and enters bulk statistics schema configuration mode. Bulk statistics schema configuration mode is used to configure the object list, instance, and polling interval to be used in the schema.

The specific instances of MIB objects for which data should be collected are determined by appending the value of the **instance** command to the objects specified in the object list.

Multiple schemas can be associated with a single bulk statistics file when configuring the bulk statistics transfer options.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a bulk statistics schema called GigE0/6/5/0:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat schema tengige 0/6/5/0
RP/0/RP0/CPU0:router(config-bulk-sc)# object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 3
RP/0/RP0/CPU0:router(config-bulk-sc)# instance exact interface tengige 0/6/5/0 subif
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# exit
```

Related Topics

instance (bulkstat schema), on page 551
poll-interval, on page 559

snmp-server mib bulkstat transfer-id

To identify the bulk statistics transfer configuration and enter bulk statistics transfer configuration mode, use the **snmp-server mib bulkstat transfer-id** command in

global configuration

mode. To remove a previously configured transfer, use the **no** form of this command

snmp-server mib bulkstat transfer-id *transfer-id*
no snmp-server mib bulkstat transfer-id *transfer-id*

Syntax Description

transfer-id	Name of the transfer configuration.

Command Default

Bulk statistics transfer is not configured.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The name, *transfer-id*, you specify for the bulk statistics transfer configuration is used in the filename of the bulk statistics file when it is generated and is used to identify the transfer configuration in the output of the **show snmp mib bulkstat transfer** command.

Task ID

Task ID	Operation
snmp	read, write

In this example, The bulk statistics transfer is given the name bulkstat1 and contains two schemas:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# schema CAR
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary
ftp://user1:pswrd@cbin2-host/users/user1/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# url secondary
tftp://user1@10.1.0.1/tftpboot/user1/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# format schemaASCII
RP/0/RP0/CPU0:router(config-bulk-tr)# transfer-interval 30
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 5
RP/0/RP0/CPU0:router(config-bulk-tr)# buffer-size 1024
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 30
RP/0/RP0/CPU0:router(config-bulk-tr)# end
```

Related Topics

buffer-size, on page 544
format (bulkstat), on page 548
retain, on page 560
retry, on page 562
schema, on page 564
show snmp mib bulkstat transfer, on page 587
transfer-interval, on page 732
url, on page 734

snmp-server mibs cbqosmib cache

To enable and configure caching of the QoS MIB statistics, use the **snmp-server mibs cbqosmib cache** command in global configuration mode. To disable caching, use the **no** form of this command.

snmp-server mibs cbqosmib cache {**refresh time** *time*|**service-policy count** *count*}
no snmp-server mibs cbqosmib cache [{**refresh time** *time*|**service-policy count** *count*}]

Syntax Description

refresh	Enables QoS MIB caching with a specified cache refresh time.
time *time*	Specifies the cache refresh time, in seconds. The *time* argument can be between 5 and 60. The default is 30.
service-policy	Enables QoS MIB caching with a limited number of service policies to cache.
count *count*	Specifies the maximum number of service policies to cache. The count argument can be between 1 and 5000.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example illustrates how to enable QoS MIB caching with a refresh time:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs cbqosmib cache refresh time 45
```

This example illustrates how to enable QoS MIB caching with a service policy count limitation:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs cbqosmib cache service-policy count 10
```

Related Topics

snmp-server entityindex persist, on page 636
snmp-server mibs cbqosmib persist, on page 665

snmp-server mibs cbqosmib persist

To enable persistent storage of the CISCO-CLASS-BASED-QOS-MIB data across process restarts, switchovers, and device reloads, use the **snmp-server mibs cbqosmib persist** command in global configuration mode. To disable persistent storage of the MIB data, use the **no** form of this command.

snmp-server mibs cbqosmib persist
no snmp-server mibs cbqosmib persist

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example illustrates how to enable persistent storage of CISCO-CLASS-BASED-QOS-MIB data:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs cbqosmib persist
```

Related Topics

snmp-server entityindex persist, on page 636

snmp-server mibs eventmib congestion-control

To configure the generation of SNMP traps when congestion exceeds configured thresholds, use the **snmp-server mibs eventmib congestion-control** command in global configuration mode. To restore the default values, use the **no** form of this command.

snmp-server mibs eventmib congestion-control *type interface-path-id* **falling** *lower-threshold* **interval** *sampling-interval* **rising** *upper-threshold*
no snmp-server mibs eventmib congestion-control *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
falling *lower-threshold*	Specifies the lower threshold for which to determine whether an mteTriggerFalling SNMP Trap is generated.
interval *sampling-interval*	Specifies how often the congestion statistics are polled. The *interval* argument, in minutes, can be between 5 and 1440; it must be a multiple of 5.
rising *upper-threshold*	Specifies the upper threshold for which to determine whether an mteTriggerRising SNMP Trap is generated.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note A maximum of 100 interfaces can be monitored for congestion.

Congestion configurations using the **snmp-server mibs eventmib congestion-control** command cannot be modified using SNMP SET and vice versa.

When the congestion between two intervals increases above the *upper-threshold* argument, an mteTriggerRising SNMP trap is generated. This trap is not generated until the congestion drops below the lower threshold and then rises above the upper threshold.

When the congestion between two intervals falls below the *lower-threshold* argument, and an SNMP mteTriggerRising trap was generated previously, an SNMP mteTriggerFalling trap is generated. The mteTriggreRising trap is not generated until the congestion goes above the upper threshold and then falls back below the lower threshold.

The *lower-threshold* value (falling) should be set to a value less than or equal to the *upper-threshold* value (rising).

The **snmp-server mibs eventmib congestion-control** command is configured on a specific interface and is supported on the following cards:

- 8-port 10 Gigabit Ethernet PLIM
- 16-port OC-48c/STM-16 POS/DPT PLIM
- 1-port OC-768c/STM-256 POS PLIM
- 4-port OC-192c/STM-64 POS/DPT PLIM
- All Ethernet SPAs
- 2-port and 4-port OC-3c/STM-1 POS SPAs
- 2-port, 4-port, and 8-port OC-12c/STM-4 POS SPAs
- 2-port and 4-port OC-48c/STM-16 POS/RPR SPAs
- 1-port OC-192c/STM-64 POS/RPR SPA

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure the generation of SNMP traps in response to congestion:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs eventmib congestion-control pos 0/1/0/0
    falling 1 interval 5 rising 2
```

snmp-server mibs eventmib packet-loss

To configure the generation of SNMP traps when packet loss exceeds configured thresholds, use the **snmp-server mibs eventmib packet-loss** command in global configuration mode. To restore the default values, use the **no** form of this command.

snmp-server mibs eventmib packet-loss *type interface-path-id* **falling** *lower-threshold* **interval** *sampling-interval* **rising** *upper-threshold*
no snmp-server mibs eventmib packet-loss *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
falling *lower-threshold*	Specifies the lower threshold for which to determine whether an mteTriggerFalling SNMP Trap is generated.
interval *sampling-interval*	Specifies how often the packet loss statistics are polled. The *interval* argument, in minutes, can be between 5 and 1440; it must be a multiple of 5.
rising *upper-threshold*	Specifies the upper threshold for which to determine whether an mteTriggerRising SNMP Trap is generated.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note A maximum of 100 interfaces can be monitored for packet loss.

Packet loss configurations using the **snmp-server mibs eventmib packet-loss** command cannot be modified using SNMP SET and vice versa.

When the packet loss between two intervals increases above the *upper-threshold* argument, an mteTriggerRising SNMP trap is generated. This trap is not generated until the packet loss drops below the lower threshold and then rises above the upper threshold.

When the packet loss between two intervals falls below the *lower-threshold* argument, and an SNMP mteTriggerRising trap was generated previously, an SNMP mteTriggerFalling trap is generated. The mteTriggreRising trap is not generated until the packet loss goes above the upper threshold and then falls back below the lower threshold.

The *lower-threshold* value (falling) should be set to a value less than or equal to the *upper-threshold* value (rising).

The **snmp-server mibs eventmib packet-loss** command is configured on a specific interface and is supported on the following cards:

- 8-port 10 Gigabit Ethernet PLIM
- 16-port OC-48c/STM-16 POS/DPT PLIM
- 1-port OC-768c/STM-256 POS PLIM
- 4-port OC-192c/STM-64 POS/DPT PLIM
- All Ethernet SPAs
- 2-port and 4-port OC-3c/STM-1 POS SPAs
- 2-port, 4-port, and 8-port OC-12c/STM-4 POS SPAs
- 2-port and 4-port OC-48c/STM-16 POS/RPR SPAs
- 1-port OC-192c/STM-64 POS/RPR SPA

Task ID

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure the generation of SNMP traps in response to packet loss:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs eventmib packet-loss pos 0/1/0/0
    falling 1 interval 5 rising 2
```

snmp-server mibs sensormib cache

To enable and configure caching for sensor mib values, use **snmp-server mibs sensormib cache** command in global configuration mode. To restore the default values, use the **no** form of this command.

snmp-server mibs sensormib cache

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration mode.

Command History

Release	Modification
Release 5.3.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Example

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs sensormib cache
```

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 *time*	Specifies how much time, in minutes, a notification remains in the log. Values for the *time* argument can range from 0 to 4294967295; the default is 15.
globalSize *size*	Specifies the maximum number of notifications that can be logged in all logs. The default is 500.
default	Specifies to create a default log.
disable	Specifies to disable logging to the default log.
size *size*	Specifies the maximum number of notifications that the default log can hold. The default is 500.

Command Default

NOTIFICATION-LOG-MIB notifications are not logged.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Logging of NOTIFICATION-LOG-MIB notifications begins when the default log is created. Named logs are not supported, therefore only the default log can be created.

Task ID

Task ID	Operations
snmp	read, write

The following example creates a default log for notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server notification-log-mib default
```

This example removes the default log:

```
RP/0/RP0/CPU0:router(config)# no snmp-server notification-log-mib default
```

This example configures the size of all logs to be 1500:

```
RP/0/RP0/CPU0:router(config)# snmp-server notification-log-mib globalSize 1500
```

Related Topics

snmp-server community-map, on page 626

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

size	Packet size, in bytes. Range is from 484 to 65500. The default is 1500.

Command Default

size: 1500

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server packetsize** command to establish control over the largest SNMP packet size permitted when the SNMP server is receiving a request or generating a reply.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the maximum size of SNMP packets to 1024 bytes:

```
RP/0/RP0/CPU0:router(config)# snmp-server packetsize 1024
```

snmp-server queue-length

To establish the message queue length for each trap host for Simple Network Management Protocol (SNMP), use the **snmp-server queue-length** command in

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 5000.

Command Default

length : 100

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server queue-length** command to define the length of the message queue for each trap host. After a trap message is successfully sent, Cisco IOS XR software continues to empty the queue at a throttled rate to prevent trap flooding.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the SNMP notification queue to 20 events:

```
RP/0/RP0/CPU0:router(config)# snmp-server queue-length 20
```

snmp-server target list

To create a Simple Network Management Protocol (SNMP) target list, use the **snmp-server target list** command in

global configuration

mode. To remove an SNMP target list, use the **no** form of this command.

snmp-server target list *target-list* {**vrf** *vrf-name*|**host** *hostname*}
no snmp-server target list *target-list*

Syntax Description

target-list	Name of the target list.
vrf *vrf-name*	Specifies the name of the VRF hosts included in the target list.
host *hostname*	Assigns a hostname to the target list. The *hostname* variable is a name or IP address.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to create an SNMP target list and assign hosts to the list. When a target list is mapped to a community name using the **snmp-server community-map** command, SNMP access is restricted to the hosts in the target list (for that community name).

The host IP address can be in either IPv4 or IPv6 format.

Task ID

Task ID	Operations
snmp	read, write

In this example, a new target list “sample3” is created and assigned to the vrf server “server2:”

```
RP/0/RP0/CPU0:router(config)# snmp-server target list sample3 vrf server2
```

Related Topics

snmp-server community-map, on page 626

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

time	Throttle time for the incoming queue, in milliseconds. Values can be from 50 to 1000.

Command Default

time : 0

Command Modes

Global configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server throttle-time 500
```

Related Topics

snmp-server community-map, on page 626

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

timeout	The timeout used by the SNMP agent when waiting for a response from a MIB module, in seconds. The default is 10.

Command Default

timeout : 10

Command Modes

Global configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the timeout is set to 8 seconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server timeouts subagent 8
```

snmp-server timeouts duplicate

To set the timeout value for the snmp-sever duplicate request feature, use the **snmp-server timeouts duplicate** command in the appropriate mode. To delete the set value, use the **no** form of the command.

snmp-server timeouts duplicate *timeout-value*
no snmp-server timeouts duplicate *timeout-value*

Syntax Description

timeout-value Timeout value in seconds. Range is 0 to 20 seconds.

- 0- To Remove this feature support. i.e SNMP will process all the packets irrespective of duplicate (retry) Packets.
- 1- This is the default value, i.e if no configuration is present , then, the timeout value is set to 1. If any packet takes more than 1 second for getting processed, then the Duplicate drop feature is enabled.
- 2 to 20 - if the packet processing is done between 2 and 20 seconds, then the Duplicate drop feature is enabled.

Command Default

1 second

Command Modes

Global configuration

Command History

Release	Modification
Release 5.1.1	This feature was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to use the **snmp-server timeouts duplicate** command:

```
RP/0/RP0/CPU0:router (config) #  snmp-server timeouts duplicate 10
```

snmp-server trap authentication vrf disable

To disable authentication traps on VPNs, use the **snmp-server trap authentication vrf disable** command in global configuration mode.

snmp-server trap authentication vrf disable

Syntax Description

This command has no keywords or arguments.

Command Default

Authentication traps are enabled on VPNs by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to disable authentication traps on VPNs:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap authentication vrf disable
```

Related Topics

snmp-server vrf, on page 722

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
nosnmp-server trap link ietf

Syntax Description

This command has no keywords or arguments.

Command Default

The default varbind used is cisco.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For more information about linkUP and linkDown notifications, see RFC 2863, *The Interface Group MIB*, and RFC 3418, *Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)*.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the RFC 2863 standard varbind:

```
RP/0/RP0/CPU0:router# snmp-server trap link ietf
```

Related Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps bgp, on page 690
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

snmp-server trap throttle-time

To specify the throttle time for handling more Simple Network Management Protocol (SNMP) traps, use the **snmp-server trap throttle-time** command in

global configuration

mode. To restore the throttle time to its default value, use the **no** form of this command.

snmp-server trap throttle-time *time*
no snmp-server trap throttle-time

Syntax Description

time	Throttle time in milliseconds. Values can be from 10 to 500.

Command Default

250

Command Modes

Global configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the trap throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap throttle-time 500
```

Related Topics

snmp-server throttle-time, on page 677

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 *notification-type*

(Optional) Type of notification (trap) to enable or disable. If no type is specified, all notifications available on the device are enabled or disabled.

The notification type can be one or more of the following keywords:

bfd

Enables Bidirectional Forwarding Detection (BFD) traps.

bgp

Enables BGP4-MIB and CISCO-BGP4-MIB traps.

bridgemib

Enables SNMP traps for the Bridge MIB.

config

Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is: (1) ciscoConfigManEvent.

copy-complete

Enables CISCO-CONFIG-COPY-MIB ccCopyCompletion traps.

ds1

Enables SNMP Cisco DS1 traps.

ds2

Enables SNMP Cisco DS2 traps.

entity

Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as: (1) entConfigChange.

ethernet

Enables Ethernet link OAM and 802.1ag connectivity fault management traps.

fabric bundle

Enables SNMP fabric bundle traps.

fabric plane

Enables SNMP fabric plane state-change traps.

flash insertion

Enables ciscoFlashDeviceInsertedNotif.

flash removal

Enables ciscoFlashDeviceRemovedNotif.

fru-ctrl

Enables SNMP entity field-replaceable unit (FRU) control traps.

hsrp

Enables SNMP HSRP traps.

ipsec tunnel start

Enables SNMP IPsec tunnel start traps.

ipsec tunnel stop

Enables SNMP IPsec tunnel stop traps.

isakmp

Enables ISAKMP traps.

l2vpn all

Enables all Layer 2 VPN traps.

l2vpn vc-down

Enables Layer 2 VPN VC down traps.

l2vpn vc-up

Enables Layer 2 VPN VC up traps.

mpls frr all

Enables all MPLS fast reroute MIB traps.

mpls frr protected

Enables MPLS fast reroute tunnel protected traps.

mpls ldp

Enables SNMP Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) traps.

mpls traffic-eng

Enables SNMP MPLS traffic engineering traps.

msdp peer-state-change

Enables SNMP MSDP Peer state change traps.

ntp

Enables SNMP Cisco NTP traps.

otn

Enables SNMP Cisco optical transport network (OTN) traps.

pim

Enables SNMP PIM traps.

rf

Enables RF-MIB traps.

sensor

Enables SNMP entity sensor traps.

snmp

Enables SNMP traps.

sonet

Enables SONET traps.

syslog

Controls error message notifications (Cisco-syslog-MIB). Specify the level of messages to be sent with the **logging history** command.

system

Enables SNMP SYSTEMMIB-MIB traps.

vpls

Enables virtual private LAN service (VPLS) traps.

vrrp events

Enables Virtual Router Redundancy Protocol (VRRP) traps.

Note To display the trap notifications supported on a platform, use the online help (**?**) function.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** keyword was removed from the command name.
Release 3.5.0	The following traps were introduced: • **flash** • **ipsec** • **l2vpn** • **mpls**
Release 3.6.0	The RF-MIB trap was introduced.
Release 3.8.0	The **bfd**, **bridgemib**, and **system** keywords were introduced.
Release 3.9.0	The **ds1** , **ds3** , **otn** , , and **vrrp events** keywords were introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server traps** command to enable trap requests for the specified notification types. To configure the router to send SNMP notifications, specify at least one **snmp-server traps** command. When the command is entered with no keyword, all notification types are enabled. When a notification type keyword is specified,

only the notification type related to that keyword is enabled. To enable multiple types of notifications, issue a separate **snmp-server traps** command for each notification type.

More information about individual MIBs can be found in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

Some SNMP trap notifications require additional Task IDs as indicated in the following table:

Notification Type	Task ID	Operations
bfd	bgp	read, write
	ospf	read, write
	isis	read, write
	mpls-te	read, write
	snmp	read, write
bgp	bgp	read, write
copy-complete	config-services	read, write
ipsec	crypto	read, write
isakmp	crypto	read, write
l2vpn	l2vpn	read, write
mpls frr	mpls-ldp	read, write
	mpls-te	read, write
mpls l3vpn	ipv4	read, write
	mpls-ldp	read, write
	mpls-te	read, write
mpls ldp	mpls-ldp	read, write
	mpls-te	read, write
mpls traffic-eng	mpls-ldp	read, write
	mpls-te	read, write

Notification Type	Task ID	Operations
ospf	ospf	read, write
syslog	sysmgr	read, write
vpls	l2vpn	read, write

This example shows how to enable the router to send all traps to the host specified by the name myhost.cisco.com, using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public
```

Related Topics

snmp-server host, on page 640
snmp-server traps bgp, on page 690
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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 keywords or arguments.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** keyword was removed from the command name.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

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 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

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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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** *seconds*|**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 *seconds*	Specifies the time interval for reissuing a maximum threshold notification, in seconds.
mid-threshold-exceeded	Enables mid-threshold exceeded traps.
vrf-down	Enables VRF down traps.
vrf-up	Enables VRF up traps.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

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 Topics

snmp-server traps, on page 683

snmp-server traps ospf errors

To enable Open Shortest Path First (OSPF) error Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospf 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.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

This 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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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 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

This 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 Topics

snmp-server engineid local, on page 634

snmp-server host, on page 640
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

This 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 Topics

snmp-server engineid local, on page 634

snmp-server host, on page 640
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

snmp-server traps ospf 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** 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
{**if-state-change**|**neighbor-state-change**|**virtif-state-change**|**virtneighbor-state-change**}
no snmp-server traps ospf state-change
{**if-state-change**|**neighbor-state-change**|**virtif-state-change**|**virtneighbor-state-change**}

Syntax Description

if-state-change	Enables SNMP traps for OSPF non-virtual interface state chages.
neighbor-state-change	Enables SNMP traps for OSPF neighbor state changes
virtif-state-change	Enables SNMP traps for OSPF virtual interface state changes.
virtneighbor-state-change	Enables SNMP traps for OSPF virtual neighbor state changes.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

Use the **snmp-server traps ospf state-change** command to enable or disable OSPF server state-change notifications, as defined in the MIB. One notification type 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** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable 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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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 keywords or arguments.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server 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

This 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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps pim invalid-message-received, on page 704

snmp-server traps pim neighbor-change, on page 706
snmp-server traps pim rp-mapping-change, on page 708
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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 keywords or arguments.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server 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

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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps pim interface-state-change, on page 702

snmp-server traps pim neighbor-change, on page 706
snmp-server traps pim rp-mapping-change, on page 708
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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 keywords or arguments.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server traps 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

This 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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps pim interface-state-change, on page 702
snmp-server traps pim invalid-message-received, on page 704

snmp-server traps pim rp-mapping-change, on page 708
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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 keywords or arguments.

Command Default

PIM SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

This 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 Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps pim interface-state-change, on page 702
snmp-server traps pim neighbor-change, on page 706
snmp-server traps pim invalid-message-received, on page 704
snmp-server traps snmp, on page 711

snmp-server traps syslog, on page 713

snmp-server traps rsvp

To enable the sending of Resource Reservation Protocol (RSVP) notifications, use the **snmp-server traps rsvp** command in global configuration mode. To disable RSVP notifications, use the **no** form of this command.

snmp-server traps rsvp {**all**|**lost-flow**|**new-flow**}

Syntax Description

all	Enables the sending of both new flow lost flow traps.
lost-flow	Enables the sending of traps when a flow is deleted.
new-flow	Enables the sending of traps when a flow is created.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
mpls-te	read, write
ouni	read, write
snmp	read, write

This example illustrates how to enable all SNMP RSVP MIB traps.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server traps rsvp all
```

snmp-server traps snmp

To enable the sending of RFC 1157 Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps snmp** command in the appropriate configuration mode. To disable RFC 1157 SNMP notifications, use the **no** form of this command.

snmp-server traps snmp [{**authentication**|**coldstart**|**linkdown**|**linkup**|**warmstart**}]
no snmp-server traps snmp [{**authentication**|**coldstart**|**linkdown**|**linkup**|**warmstart**}]

Syntax Description

authentication	(Optional) Controls the sending of SNMP authentication failure notifications.
linkup	(Optional) Controls the sending of SNMP linkUp notifications
linkdown	(Optional) Controls the sending of SNMP linkDown notifications
coldstart	(Optional) Controls the sending of SNMP coldStart notifications.
warmstart	(Optional) Controls the sending of SNMP warmStart notifications.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** keyword was removed from the command name.
Release 3.9.0	The **authentication**, **linkup**, **linkdown**, **coldstart**, and **warmstart** keywords were added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server traps snmp** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

The optional **authentication** keyword controls the sending of SNMP authentication failure notifications. In order to send notifications, you must configure at least one **snmp-server host** command. An authentication Failure (4) trap signifies that the sending device is the addressee of a protocol message that is not properly authenticated. The authentication method depends on the version of SNMP being used. For SNMPv1 or SNMPv2c, authentication failure occurs for packets with an incorrect community string. For SNMPv3,

authentication failure occurs for packets with an incorrect Secure Hash Algorithm (SHA) or Message Digest 5 (MD5) authentication key or for a packet that is outside the window of the authoritative SNMP engine.

The optional **linkup** keyword controls the sending of SNMP linkUp notifications. The linkUp(3) trap signifies that the sending device recognizes one of the communication links represented in the agent's configuration coming up.

The optional **linkdown** keyword controls the sending of SNMP linkDown notifications. The linkDown(2) trap signifies that the sending device recognizes a failure in one of the communication links represented in the agent's configuration.

The **snmp-server traps snmp** command with the **linkup** or **linkdown** keywords globally enables or disables SNMP linkUp and linkDown traps. After enabling either of these traps globally, you can enable or disable these traps on specific interfaces using the **no notification linkupdown disable** command in interface configuration mode. According to RFC 2863, linkUp and linkDown traps are enabled for interfaces that do not operate on top of any other interface (as defined in the ifStackTable), and are disabled otherwise. This means that you do not have to enable linkUp and linkdown notifications on such interfaces. However, linkUp and linkDown notifications will not be sent unless you enable them globally using the **snmp-server traps snmp** command.

The optional **coldstart** keyword controls the sending of SNMP coldStart notifications. The coldStart(0) trap signifies that the sending device is reinitializing itself such that the agent's configuration or the protocol entity implementation may be altered.

The optional **warmstart** keyword controls the sending of SNMP coldStart notifications. The warmStart(1) trap signifies that the sending device is reinitializing itself such that neither the agent configuration nor the protocol entity implementation is altered.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the device to send all traps to the host myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public snmp
```

The following example shows how to enable only linkUp and linkDown traps:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp linkup
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp linkdown
```

Related Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps bgp, on page 690
snmp-server traps syslog, on page 713

snmp-server traps syslog

To enable Simple Network Management Protocol (SNMP) notifications of Cisco-syslog-MIB error messages, use the **snmp-server traps syslog** command in the appropriate configuration mode. To disable these types of notifications, use the **no** form of this command.

snmp-server traps syslog
no snmp-server traps syslog

Syntax Description

This command has no keywords or arguments.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** keyword was removed from the command name.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server traps syslog** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable Cisco-syslog-MIB error message notifications to the host at the address myhost.cisco.com, using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps syslog
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps bgp, on page 690
snmp-server traps snmp, on page 711

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

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

No interface is specified.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows how to specify that the IP address for interface 0/0/1/0 is the source for all SNMP notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-source tengige 0/0/1/0
```

Related Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps bgp, on page 690
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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

seconds	Integer that sets the interval for resending the messages, in seconds). Value can be from 1 to 1000.

Command Default

seconds : 30

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Before Cisco IOS XR software tries to send a trap, it looks for a route to the destination address. If there is no known route, the trap is saved in a retransmission queue. Use the **snmp-server trap-timeout** command to determine the number of seconds between retransmission attempts.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to set an interval of 20 seconds to try resending trap messages on the retransmission queue:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-timeout 20
```

Related Topics

snmp-server engineid local, on page 634
snmp-server host, on page 640
snmp-server traps bgp, on page 690
snmp-server traps snmp, on page 711
snmp-server traps syslog, on page 713

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** {**3des**|**aes** *aes-bit-encryption*|**des56**} {**clear**|**encrypted**} *priv-password*]]} [{**SDROwner**|**SystemOwner**}] [*access-list-name*]
no snmp-server user *username groupname*

Syntax Description

username	Name of the user on the host that connects to the agent. **Note** The recommended range for a user-defined username is 2-253 characters.
groupname	Name of the group to which the user belongs.
v1	Specifies that the SNMPv1 security model should be used.
v2c	Specifies that the SNMPv2c security model should be used.
v3	Specifies that the SNMPv3 security model should be used.
auth	(Optional) Specifies which authentication level should be used. If this keyword is used, you must specify an authentication level and an authorization password.
md5	Specifies the HMAC-MD5-96 authentication level.
sha	Specifies the HMAC-SHA-96 authentication level.
clear	Specifies that an unencrypted password follows.
encrypted	Specifies that an encrypted password follows.
auth-password	Authentication password, which is a string (not to exceed 64 characters) that enables the agent to receive packets from the host.
priv	(Optional) Specifies that encryption parameters follow.
3des	Specifies the 168-bit Triple Data Encryption Standard (3DES) level of encryption for the user.
aes *aes-bit-encryption*	Specifies the Advanced Encryption Standard (AES) level of encryption for the user. Supported options are 128, 192 and 256 bit encryption.
des56	Specifies the 56-bit Data Encryption Standard (DES) level of encryption for the user.

priv-password	Privacy password, which can be clear or encrypted text, according to what is specified.
SDROwner	(Optional) Limits access to the agents for the owner secure domain router (SDR) only.
SystemOwner	(Optional) Provides system-wide access to the agents for all SDRs.
access-list-name	(Optional) Access list to be associated with this SNMP user. The *access-list-name* argument represents a value from 1 to 99, that is, the identifier of the standard IP access list.

Command Default

By default, access is limited to agents on the owner SDR only.

See also Table 68: snmp-server user Default Descriptions, on page 719.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 3.6.0	The **LROwner** keyword was changed to the **SDROwner** keyword.
Release 3.9.0	AES and 3DES encryption formats were supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use 3DES and AES encryption standards, you must have installed the security package (k9sec). For information on installing software packages, see *Upgrading and Managing Cisco IOS XR Software* in *System Management Configuration Guide for Cisco CRS Routers*.

Note Only one remote host can be assigned to the same username for SNMP version 3. If you configure the same username with different remote hosts, only the last username and remote host combination will be accepted and will be seen in the **show running** configuration. In the case of multiple SNMP managers, multiple unique usernames are required.

Table 68: snmp-server user Default Descriptions

Characteristic	Default
passwords	Text strings are assumed.
access lists	Access from all IP access lists is permitted.

SDR and System-wide Access

When the **snmp-server user** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the **snmp-server user** command is entered with the **SystemOwner** keyword, SNMP access is granted to 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.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enter a plain-text password for the string *abcd* for user2 in group2:

```
RP/0/RP0/CPU0:router(config)# snmp-server user user2 group2 v3 auth md5 clear abcd
```

To learn if this user has been added to the configuration, use the **show snmp user** command.

If the localized Message Digest 5 (MD5) or Secure Hash Algorithm (SHA) digest is known, specify that string instead of the plain-text password. The digest should be formatted as AA:BB:CC:DD where AA, BB, CC, and DD are hexadecimal values. The digest should also be exactly 16 octets long.

This example shows how to specify the command with a digest name of 00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF:

```
RP/0/RP0/CPU0:router(config)# snmp-server user user2 group2 v3 auth md5 encrypted
     00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF
```

Related Topics

snmp-server group, on page 637

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

view-name	Label for the view record being updated or created. The name is used to reference the record.
oid-tree	Object identifier (OID) of the ASN.1 subtree to be included or excluded from the view. To identify the subtree, specify a text string consisting of numbers, such as 1.3.6.2.4, or a word, such as *system*. Replace a single subidentifier with the asterisk (*) wildcard to specify a subtree family; for example 1.3.*.4.
excluded	Excludes the MIB family from the view.
included	Includes the MIB family in the view.

Command Default

No view entry exists.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Other SNMP commands require a view as a keyword. Use the **snmp-server view** command to create a view to be used as keywords for other commands that create records including a view.

Instead of defining a view explicitly, you can rely on the following predefined views, which are supported by the SNMP agent:

all

Predefined view indicating that a user can see all objects.

CfgProt

Predefined view indicating that a user can see all objects except the SNMPv3 configuration tables.

vacmViewTreeFamilyEntry

Predefined view indicating that a user can see the default configuration of vacmViewTreeFamilyEntry.

The predefined views supported on Cisco IOS XR software, however, do not match the predefined views specified in RFC 3415.

Task ID

Task ID	Operations
snmp	read, write

This example creates a view that includes all objects in the MIB-II subtree:

```
RP/0/RP0/CPU0:router(config)# snmp-server view mib2 1.3.6.1.2.1 included
```

This example shows how to create a view that includes all objects in the MIB-II system group and all objects in the Cisco enterprise MIB:

```
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1 included
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.4.1.9 included
```

This example shows how to create a view that includes all objects in the MIB-II system group except for sysServices (System 7) and all objects for interface 1 in the MIB-II interfaces group:

```
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1 included
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1.7 excluded
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.2.2.1.*.1 included
```

Related Topics

show snmp view, on page 621
snmp-server group, on page 637

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

vrf-name	Name of the VRF.
host *address*	(Optional) Specifies the name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the *community-string* argument is encrypted text.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version {**1** | **2c** | **3**}	(Optional) Specifies the version of the SNMP used to send the traps. The default is SNMPv1. When the **version** keyword is used, one of these keywords must be specified: • **1**—SNMPv1 • **2c**—SNMPv2C • **3**—SNMPv3
security-level	(Optional) Security level for SNMPv3. Options are: • **auth**—authNoPriv • **noauth**—noAuthNoPriv • **priv**—authPriv
community-string	Specifies the community string for SNMPv1 and SNMPv2, or the SNMPv3 user.
udp-port *port*	(Optional) Specifies the UDP port to which notifications should be sent.
context *context-name*	(Optional) Name of the context that must be mapped to VRF identified by value of the *vrf-name* argument.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 4.2.0	Support for IPv6 was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to enter SNMP VRF configuration mode and configure an SNMP notification recipient on a VRF. You can also map a VRF to an SNMP context.

SNMP notification recipient that is reachable by way of a VRF can be configured. Notification is forwarded to the recipient represented by its address using the routing table instance identified by the VRF name.

The *address* argument can be either a host name or an IP address. Both IPv4 and IPv6 formats are supported.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

An SNMP context identified by the value of the *context-name* argument can be mapped to a VRF in this mode. This context must be created using **snmp-server context** command.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure a host IP address for a VRF name:

```
RP/0/RP0/CPU0:router(config)# snmp-server vrf vrfa
RP/0/RP0/CPU0:router(config-snmp-vrf)# host 12.21.0.1 traps version
2c public udp-port 2525
```

Related Topics

snmp-server context, on page 629
snmp-server host, on page 640

snmp test trap all

To send a Simple Network Management Protocol (SNMP) trap message to the trap receivers for all supported traps, use the **snmp test trap all** command in

EXEC

mode.

snmp test trap all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use the **snmp test trap** command, SNMP must be configured on the router. This command is not intended for testing scalability, performance, or high availability scenarios.

Use the **snmp test trap all** command to generate test traps for all supported traps. The following traps are supported:

- coldStart—SNMP agent Initializing and its configuration may have changed.
- warmStart—SNMP agent Initializing and its configuration is unaltered.
- linkUp—Interface ifOperStatus is Up.
- linkDown—Interface ifOperStatus is Down.
- clogMessage Generated—Syslog message generated.
- ciscoFlashDeviceInsertedNotif—Flash device inserted.
- ciscoFlashDeviceRemovedNotif—Flash device removed.
- ciscoRFProgressionNotif—RF state change.
- ciscoRFSwactNotif—Switchover.
- ciscoConfigManEvent—Command-line interface (CLI) configuration management event.
- newRoot—SNMP agent is a new root of the spanning tree.
- topologyChange—Bridge port has transitioned to the Forwarding state.
- cefcFanTrayOperStatus—Fan tray cefcFanTrayOperStatus is Up.

- cefcModuleStatusChange—Module cefcModuleOperStatus is OK (module up) or module cefcModuleOperStatus is Failed (module down).
- entSensorThresholdNotification—entSensorValue crossed the entSensorthresholdValue.
- cefcPowerStatusChange—Redundant PowerSupply fails.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap all** command:

```
RP/0/RP0/CPU0:router# snmp test trap all
```

Related Topics

show snmp entity, on page 572

snmp test trap entity

To send a test SNMP Entity trap message to the trap receivers, use the **snmp test trap entity** command in

EXEC

mode.

snmp test trap entity {**fru** {**power status-change failed**|**module status-change** {**up**|**down**}|**fan-tray oper-status up**}|**sensor threshold-notification**}[**entity-index** *index*]

Syntax Description

fru	Sends a field replacement unit trap.
power status-change failed	Sends a cefcPowerStatusChange trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
module status-change{**up** | **down**}	Sends a cefcModuleStatusChange trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
fan-tray oper-status up	Sends a cefcFanTrayOperStatus trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
sensor	Sends a sensor trap.
threshold-notification	Sends a entSensorThresholdNotification trap for the CISCO-ENTITY-SENSOR-MIB.
entity-index *index*	Specifies the physical index for which to generate the trap.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap entity** command tests the sending of Entity MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use the **snmp test trap** command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap entity** command:

```
RP/0/RP0/CPU0:router# snmp test trap entity sensor threshold index
```

Related Topics

show snmp entity, on page 572

snmp test trap infra

To send a test Simple Network Management Protocol (SNMP) Infra trap message to the trap receivers, use the **snmp test trap infra** command in

EXEC

mode.

snmp test trap infra {**bridge** {**new-root**|**topology-change**}|**config event**|**flash** {**device-inserted**|**device-removed**}|**redundancy** {**progression**|**switch**}|**syslog message-generated**}

Syntax Description

bridge	Sends a bridge trap.
new-root	Sends a newRoot trap for the BRIDGE-MIB.
topology-change	Sends a topologyChange trap for the BRIDGE-PORT.
config event	Sends a ciscoConfigManEvent trap for the CISCO-CONFIG-MAN-MIB.
flash	Sends a flash trap.
device-inserted	Sends a ciscoFlashDeviceInsertedNotif trap for the CISCO-FLASH-MIB.
device-removed	Sends a ciscoFlashDeviceRemovedNotif trap for the CISCO-FLASH-MIB.
redundancy	Sends an RF trap.
progression	Sends a ciscoRFProgressionNotif trap for the CISCO-RF-MIB.
switch	Sends a ciscoRFSwactNotif trap for the CISCO-RF-MIB.
syslog message-generated	Sends a clogMessageGenerated for the CISCO-SYSLOG-MIB.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap infra** command tests the sending of Infra MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap infra** command:

```
RP/0/RP0/CPU0:router# snmp test trap infra syslog message-generated
```

snmp test trap interface

To send a test Simple Network Management Protocol (SNMP) interface trap message to the trap receivers, use the **snmp test trap interface** command in

EXEC

mode.

snmp test trap interface {**link-down**|**link-up**}**ifindex** *index*

Syntax Description

link-down	Sends a linkDown trap for the IF-MIB.
link-up	Sends a linkUp trap for the IF-MIB.
ifindex *index*	Specifies the interface index for which to send the IF-MIB trap.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap interface** command tests the sending of IF-MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap interface** command:

```
RP/0/RP0/CPU0:router# snmp test trap interface link-down
```

snmp test trap snmp

To send a test Simple Network Management Protocol (SNMP) trap message to the trap receivers, use the **snmp test trap snmp** command in

EXEC

mode.

snmp test trap snmp {**cold-start**|**warm-start**}

Syntax Description

cold-start	Sends a coldStart trap for the SNMPv2-MIB.
warm-start	Sends a warmStart trap for the SNMPv2-MIB.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap snmp** command tests the sending of MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

The following example illustrates how to use the **snmp test trap snmp** command:

```
RP/0/RP0/CPU0:router# snmp test trap snmp cold-start
```

transfer-interval

To configure how long bulk statistics should be collected before a bulk statistics transfer is initiated, use the **transfer-interval** command in bulk statistics transfer configuration mode. To remove a previously configured interval from a bulk statistics configuration, use the **no** form of this command.

transfer-interval *minutes*
no transfer-interval *minutes*

Syntax Description

minutes	Length of time, in minutes, that the system should collect MIB data before attempting the transfer operation. The valid range is from 1 to 2147483647. The default is 30.

Command Default

Bulk statistics file transfer operations start 30 minutes after the **enable (bulkstat)** command is used.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Bulk statistics data is collected into a new file when a transfer attempt begins, which means that this command also configures the collection interval.

If the maximum buffer size for a bulk statistics file is reached before the transfer interval time expires, the transfer operation is still initiated, and bulk statistics MIB data are collected into a new file in the system buffer.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a transfer interval of 20 minutes for the bulk statistics configuration bulkstat1:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# transfer-interval 20
```

Related Topics

enable (bulkstat), on page 546
show snmp mib bulkstat transfer, on page 587

snmp-server mib bulkstat transfer-id, on page 661

url

To specify the host to which bulk statistics files should be transferred, use the **url** command in bulk statistics transfer configuration mode. To remove a previously configured destination host, use the **no** form of this command.

url [{**primary**|**secondary**}] *url*
no url [{**primary**|**secondary**}] *url*

Syntax Description

primary	Specifies the URL to be used first for bulk statistics transfer attempts.
secondary	Specifies the URL to be used for bulk statistics transfer attempts if the transfer to the primary URL is not successful.
url	Destination URL address for the bulk statistics file transfer. Use FTP or TFTP. The syntax for these URLs is as follows: • **ftp:**[[[//*username* [:*password*]**@**]*location*]/*directory*]/*filename* • **tftp:**[[/*location*]/*directory*]/*filename* The location argument is typically an IP address.

Command Default

No host is specified.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For bulk statistics transfer retry attempts, a single retry consists of an attempt to send first to the primary URL, and then to the secondary URL.

Task ID

Task ID	Operation
snmp	read, write

In the following example, an FTP server is used as the primary destination for the bulk statistics file. If a transfer to that address fails, an attempt is made to send the file to the TFTP server at 192.168.10.5. No retry command is specified, which means that only one attempt to each destination will be made.

```
RP/0/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer ifMibTesting
RP/0/RP0/CPU0:router(config-bulk-tr)# schema carMibTesting1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema carMibTesting2
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user2:pswd@192.168.10.5/functionality/

RP/0/RP0/CPU0:router(config-bulk-tr)# url secondary tftp://user2@192.168.10.8/tftpboot/
RP/0/RP0/CPU0:router(config-bulk-tr)# enable
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Related Topics

show snmp mib bulkstat transfer, on page 587

Software Entitlement Commands

For detailed information about software entitlement concepts, configuration tasks, and examples, see the *Software Entitlement on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco CRS Routers*.

clear license

To delete all licenses from the router persistent storage, use the **clear license** command in administration EXEC mode.

clear license

Command Default No default behavior or values

Command Modes Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear license** command removes all licenses from the router persistent storage.

Task ID

Task ID	Operations
pkg-mgmt	execute

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.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear 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

The following example illustrates how to use the **clear license log** command to clear the operational logs:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# clear license log operational
```

Related Topics

show license log, on page 777

hw-module linecard throughput

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 *node-id*	Specifies the node to configure. The *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

The default throughput is 20 Gbps.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default 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 *System Management Configuration Guide for Cisco CRS Routers*.

Task ID

Task ID	Operations
interface	read, write

The following example shows how to configure a node to operate at 40 Gbps:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# hw-module linecard throughput 40 location 0/6/0
```

Related Topics

show hw-module linecard throughput, on page 757

license

To configure a license to be used for specific slots or for any slots, use the **license** command in administration configuration mode. To remove the configuration of the license, use the **no** form of this command.

license *feature-id* [{**type** [{**evaluation**|**permanent**}]|**location** *node-id*}]
no license *feature-id* [{**type** [{**evaluation**|**permanent**}]|**location** *node-id*}]

Syntax Description

feature-id	Identifier for the feature.
type [**evaluation** | **permanent**]	(Optional) Specifies whether the license is evaluation or permanent.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

Licenses are not configured.

Command Modes

Administration configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If the **license** command is not configured during a license acquisition, the acquisition fails. This command is required to be configured for every licensed feature starting in Cisco IOS XR Release 4.0.0.

Licenses can be optionally configured as either permanent or evaluation. If no location is specified, the license is considered a flexible license available for any location. When a specific location is configured, the feature allowed by the license is considered slot-specific and bound to specific slots only.

Task ID

Task ID	Operation
pkg-mgmt	read, write

The following example shows how to configure a license to a specific slot:

```
RP/0/RSP0/CPU0:router(admin-config)# license A9K-ADV-VIDEO-LIC type permanent
  location 0/1/cpu0
```

Related Topics

show license, on page 759

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 [tar] *license-name* [**sdr** *sdr-name*]

Syntax Description

tar	(Optional) Indicates that the license file is contained in a tar file.
license-name	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 *sdr-name*	(Optional) Adds the license to the specified SDR license pool. The default is owner. The *sdr-name* argument is the name assigned to the SDR.

Command Default

License is added to the owner SDR.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 4.0.0	The **tar** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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 at: 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.

Task ID

Task ID	Operations
pkg-mgmt	execute

The following example shows how to add a software license to the owner SDR:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license add disk1:/P1-LIC-8_TBA09370035_20070207195224661.lic


License command "license add disk1:/P1-LIC-8_TBA09370035_20070207195224661.lic
  sdr Owner" completed successfully.
```

Related Topics

license move, on page 746
show license udi, on page 781
license pool create, on page 750

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

backup-file	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.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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

The following example shows how to back up the licenses on a router:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license backup disk1:/license_back

License command "license backup disk1:/license_back" completed successfully.
```

Related Topics

license restore, on page 754
show license backup, on page 767

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*[{**evaluation**|**permanent**}]

Syntax Description

feature-id	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.
count	Number of licenses to move.
sdr *source-sdr-name*	Specifies the SDR license pool from which to move the specified licenses. The *source-sdr-name* argument is the name assigned to the SDR.
sdr *dest-sdr-name*	Specifies the SDR license pool to which the license should be moved. The *source-sdr-name* argument is the name assigned to the SDR.
evaluation	Specifies to move an evaluation license.
permanent	Specifies to move a permanent license.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.9.0	The evaluation and permanent keywords were added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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 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

The following example shows how to move a license from one license pool to another:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license move crs-msc-40g sdr owner sdr mysdr
```

Related Topics

license add, on page 743
show license, on page 759

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**}[{**evaluation**|**permanent**}]

Syntax Description

feature-id	Identifier for the feature entitled in the licenses to be moved. You can display available licenses using the show license, on page 759 command.
count	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.
node-id	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.
node-id	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.
evaluation	Specifies to move an evaluation license.
permanent	Specifies to move a permanent license.

Command Default

One license is moved.

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.9.0	The evaluation and permanent keywords were added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **license move slot** command moves slot-based licenses from one slot to another slot on the same router.

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

The following example shows how to move a license from one slot to another:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license move crs-msc-40g slot from allocated to available
```

Related Topics

license add, on page 743
show license, on page 759

license pool create

To create a new SDR license pool, use the **license pool create** command in administration EXEC mode.

license pool create sdr *sdr-name*

Syntax Description

sdr *sdr-name*	Creates a license pool on the specified SDR. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Before 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

The following example shows how to create a new license pool for an SDR:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license pool create sdr mysdr

License command "license pool create mysdr" completed successfully.
```

Related Topics

license add, on page 743
license move, on page 746
license pool remove, on page 751

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 *sdr-name*	Creates a license pool on the SDR specified by *sdr-name* . The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, 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

The following example shows how to remove an SDR license pool:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license pool remove sdr mysdr

License command "license pool remove sdr mysdr" completed successfully.
```

Related Topics

license pool create, on page 750

license remove

To remove a license permanently from a router, use the **license remove** command in administration EXEC mode.

license remove *feature-id* {**id**|**ticket** *permission-ticket rehost-ticket*} [**sdr** *sdr-name*] {**evaluation**|**permanent**}

Syntax Description

feature-id	Identifier for the feature entitled in the licenses to be removed. You can display available features using the show license command.
id	Specifies to remove licenses using a unique identifier of the license.
sdr *sdr-name*	Removes the license from the specified SDR license pool.
evaluation	Specifies to move an evaluation license.
permanent	Specifies to move a permanent license.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced.
Release 3.9.0	The evaluation and permanent keywords were added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **license remove** command permanently removes a license from the router and outputs a key or rehost ticket that can be used to prove that the license has been removed. This command accepts a permission ticket, obtained from CCO, that includes the UDI, feature ID and count of licenses to remove. Refer to the license registration tool on CCO for more information: https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet.

If you use a permission ticket that was previously used, the same rehost ticket is created, but no licenses are removed.

Licenses can be removed only if they are in the available state. In other words, you have to clear the feature configuration before that the license can be released back to the appropriate license pool.

Task ID

Task ID	Operation
pkg-mgmt	execute

Example

The following example shows how to remove a license from a license pool:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license remove crs-msc-40g ticket
disk1:/my_permission disk1:/40g_rehost
```

Related Topics

show license, on page 759

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

backup-file	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.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **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

The following example shows how to move a license from one license pool to another:

```
RP/0/RP0/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 Topics

license backup, on page 745

license save credential

To retreive the router credentials and save them to a specified location, use the **license save credential** command in administration EXEC mode.

license save credential *file-name*

Syntax Description

file-name	Name and location of file where the credentials are saved.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following device credentials are saved:

- OPID
- SN—Serial number attached to the chassis.
- UDI—Universal device identifier; the Cisco wide identifier that contains the product ID, serial number, and version.

Task ID

Task ID	Operation
pkg-mgmt	execute

Example

The following example shows how to save the credentials to a file:

```
RP/0/RP0/CPU0:router:router(admin)# license save credential disk1:/cred_file
```

The following example shows the typical information saved to the credential file:

```
Wed Aug  4 12:20:19.544 DST
Device credentials:
    OPID :5
    SN   :FOX1232H67M
    PID  :ASR-9010-AC
```

Related Topics

show license chassis, on page 769
show license udi, on page 781

show hw-module linecard throughput

Note Effective with Cisco IOS XR Release 4.0.0, the **show hw-module linecard throughput** command was removed.

To display the throughput of modular services cards (MSCs) in the Cisco CRS-1 router , use the **show hw-module linecard throughput** command in EXEC mode.

show hw-module linecard throughput [**location** *node-id*]

Syntax Description

location *node-id*	Specifies the node for which to display the throughput. The *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 4.0.0	This command was removed.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show hw-module linecard throughput** command to determine if MSCs are running at 40 Gbps or 20 Gbps throughput.

Task ID

Task ID	Operations
interface	read
drivers	read

The following example displays sample output from the **show linecard throughput** command:

```
RP/0/RP0/CPU0:router# show hw-module linecard throughput

Mon Aug 17 04:48:48.760 DST

 -------------------- Throughput --------------------

 Location    Lic Acquired    Configured    Operating
 --------    ------------    ----------    ---------
 0/1/CPU0        Yes            --             40G
```

```
0/6/CPU0         Yes             --              40G
```

Table 69: 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.

Related Topics

hw-module linecard throughput, on page 740

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

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified SDR license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example shows sample output from the **show license** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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 70: 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.
Status	Indicates the number of licenses in each state. Licenses can have the following states: Available—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—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—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—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

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example displays sample output from the **show license active** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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 70: show license Field Descriptions, on page 760 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

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example displays sample output from the **show license allocated** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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 70: show license Field Descriptions, on page 760 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

feature-id	Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	Specifies the location of the card. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
sdr *sdr-name*	Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example displays sample output from the **show license available** command with only implicit licenses available:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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/RP0/CPU0:router# admin
RP/0/RP0/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 70: show license Field Descriptions, on page 760 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

file-name	Name of the backup license file.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example shows sample output from the **show license backup** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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 71: show license backup Field Descriptions

Field	Description
S/N	Chassis serial number.

Field	Description
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 Topics

license backup, on page 745
license restore, on page 754

show license chassis

To display all licenses with their serial number information, use the **show license chassis** command in administration EXEC mode.

show license chassis

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
pkg-mgmt	read

Example

The following example illustrates sample output from the **show license chassis** command:

```
RP/0/RP0/CPU0:router(admin)# show license chassis
Fri Sep 25 03:50:28.152 DST

FeatureID: CRS-MSC-40G-IMP (Slot based, Implicit[Remaining time: unlimited])
  Total licenses 2
  Available for use         0
  Allocated to location     0
  Active                    2
    Pool: Owner
      Total licenses in pool: 2
      Status: Available     0    Operational:    2
      Locations with licenses: (Active/Allocated) [SDR]
              0/6/CPU0        (1/0) [Owner]
              0/1/CPU0        (1/0) [Owner]

  S/N Information:
    S/N TBA09370035:    0 licenses
```

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

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example displays sample output from the **show license evaluation** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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: 1 day(s) 21:07:46
 Status: Available      6    Allocated      0   Active      0
   SDR: Owner
      Status: Available      6    Operational:      0
```

See Table 70: show license Field Descriptions, on page 760 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

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example displays sample output from the **show license expired** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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 70: show license Field Descriptions, on page 760 for a description of the significant fields shown in the display.

show license features

To display all features that can be licensed on the router, use the **show license features** command in administration EXEC mode.

show license features

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
pkg-mgmt	read

show license file

To display all the XML license files that have been added to a router, use the **show license file** command in administration EXEC mode.

show license file

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
pkg-mgmt	read

Example

The following example shows sample output from the **show license file** command:

```
RP/0/RSP0/CPU0:router(admin)# show license file

Wed Aug  4 03:01:53.506 DST
License File Info:

  Store Name:  Permanent
  Store Index: 1
  License Line:11 A9K-ADV-OPTIC-LIC 3.9 LONG NORMAL STANDALONE EXCL 1_KEYS INFINITE_KEYS
    NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *14BFZ88N4WTJ7GU400 NiL NiL NiL 5_MINS
    <UDI><PID>ASR-9010-AC</PID><SN>FOX1232H67M</SN></UDI><SEQ>0</SEQ>
    q:1jK6WAOl4od1xDXWnQ3J6xDiU1o1aCgQLgCXrnqsLmnGFo78DkiH9E0GWQzabIVe4jB9EUrAe5u:
    N8eDRPXcfZjGwcgBECfKU4OPobqbfQVkeVa:LRYQG2poKwPPHYaRVym0MMluk7n46Awe6GZJcBLX
  Store Name:  Permanent
  Store Index: 2
  License Line:11 A9K-ADV-VIDEO-LIC 3.9 LONG NORMAL STANDALONE EXCL 1_KEYS INFINITE_KEYS
    NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *14BFZ88N4WTJ7GU400 NiL NiL NiL 5_MINS
    <UDI><PID>ASR-9010-AC</PID><SN>FOX1232H67M</SN></UDI><SEQ>1</SEQ>
    ,WGrW73h2JqIhAwAt6dQVhKICQaivZh:eW4ZYJ2c6wLlE1ln0f9eEsU2hwv6V1KKLRo0S2AeLSrBp85nJLO
    8yCVmzUnQrCYojSFHAcpu2aRmfFVxR1BNBMUf7Ik,Urcg16fMaLQc58X0JFUpwM86Hkz2LV

  Store Name:  Permanent
  Store Index: 3
  License Line:11 A9K-AIP-LIC-B 3.9 LONG NORMAL STANDALONE EXCL 1_KEYS INFINITE_KEYS
```

```
    NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *14BFZ88N4WTJ7GU400 NiL NiL NiL 5_MINS
    <UDI><PID>ASR-9010-AC</PID><SN>FOX1232H67M</SN></UDI><SEQ>2</SEQ>
7:Pr2QJwiHdoYnhjRPs13i09kpWOj:
   ,sNex7JziswOf7A9IDCzuZ48e4qRl4QSFELOQHlwT6rfWUbKt4Yt,OoXV876r1M:3APZS4pPxzNQd03NWVak0HP,

    YZq7jRh8H,HEVwf2FrNcwqEpVdEpkS4tiufs

  Store Name:  Permanent
  Store Index: 4
  License Line:11 A9K-AIP-LIC-E 3.9 LONG NORMAL STANDALONE EXCL 1_KEYS INFINITE_KEYS
    NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *14BFZ88N4WTJ7GU400 NiL NiL NiL 5_MINS
    <UDI><PID>ASR-9010-AC</PID><SN>FOX1232H67M</SN></UDI><SEQ>3</SEQ> F44b2Phw6KdqjSnFPU,
   QL7oJjk9q1syjp1XuD3wZBGfDb0TsUx:QPDKx5ee:xrbOf7ib,OxtDNojwpFbdGMQt8VoO2sAkpaK7ezSyVD:I:

    46VvFYd4:WsO87aa8kVgRJGM3RsixQ1tiKk7deWfIygtlofr

  Store Name:  Permanent
  Store Index: 5
  License Line:11 A9K-iVRF-LIC 3.9 LONG NORMAL STANDALONE EXCL 1_KEYS INFINITE_KEYS NEVER
    NEVER NiL SLM_CODE CL_ND_LCK NiL *14BFZ88N4WTJ7GU400 NiL NiL NiL 5_MINS
   <UDI><PID>ASR-9010-AC</PID><SN>FOX1232H67M</SN></UDI><SEQ>4</SEQ> oYkhxBsT:bmcqh3CU9EbLb,


1LKLtOknjPwjf7k83X7f0Xy:DZflBXjgnTozUn7FCf0Jaya9L81hhhS73k4AtrtVOsKvDmh7EdGWAu2WI78E3VnEfZka:

    uSHTBxhNpQ1Blpf0qj5UTH8QxLz6psFsi,KwVd
```

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-idfeature-id*|**sdr** *sdr-name*}

Syntax Description

operational	Displays the operational logs for the license system.
administration	Displays the administration logs for the license system.
request-id	Identifier of a particular log entry.
feature-id	Identifier for the feature entitled in the licenses to be displayed.
sdr *sdr-name*	Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Command Default

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

The following example displays sample output from the **show license log** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/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 70: show license Field Descriptions, on page 760 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.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show 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

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/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show license pools

Pool Name        Feature
=============================================
Owner            CRS-MSC-40G XC-L3VPN


sdr2             CRS-MSC-40G
```

Table 72: show license pools Field Descriptions

Field	Description
Owner	SDR license pool.

Field	Description
Feature	Feature that is enabled in the specified license pool.

Related Topics

license pool create, on page 750

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 keywords or arguments.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show license udi** command displays the complete UDI of the router to which any license is 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 https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet?.

Task ID

Task ID	Operations
pkg-mgmt	read

The following example displays sample output from the **show license udi** command:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# show license udi

Local Chassis UDI Information:
PID          : CRS-8-LCC
S/N          : TBA09370035
Operation ID : 1
```

Table 73: show license udi Field Descriptions

Field	Description
PID	Product ID number.
S/N	Chassis serial number.

Field	Description
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 status

To display the status of all relevant licenses, use the **show license status** command. On Cisco IOS XR, this command runs in Administration mode, and on Cisco IOS XR 64-bit, it runs in EXEC mode.

show license status

Usage Guidelines

This command has no keywords or arguments.

Command Default

None

Command Modes

Administration for Cisco IOS XR

EXEC for Cisco IOS XR 64-bit

Command History

Release	Modification
Release 4.0.0	This command was introduced on Cisco IOS XR.
Release 6.2.1	This command was supported on Cisco IOS XR 64-bit.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
pkg-mgmt	read

Example

The following example shows output for the **show license status** command on Cisco IOS XR:

```
RP/0/RSP0/CPU0:router(admin)# show license status

Sun Jul 18 05:25:09.855 DST
License Type Supported
     permanent   Non-expiring node-locked licenses
     evaluation  Expiring node-locked licenses

License Operation Supported
     add         Add license file to the system
     backup      Backup License
     move        Move licenses
     pool        License pool creation
     remove      Remove license file
     restore     Restore backedup licenses

Device Status
     Device Credential type: IMAGE
     Device Credential Verification: PASS
     Rehost Type: Hardware
```

The following example shows output for the **show license status** command on Cisco IOS XR 64-bit:

```
RP/0/RSP0/CPU0:router # show license status

Smart Licensing is ENABLED
  Initial Registration: SUCCEEDED on Fri Dec 08 2017 15:42:43 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Wed Jun 06 2018 15:45:33 UTC
  Registration Expires: Sat Dec 08 2018 15:39:56 UTC

License Authorization:
  Status: OUT OF COMPLIANCE on Fri Dec 08 2017 15:45:34 UTC
  Last Communication Attempt: SUCCEEDED on Fri Dec 08 2017 15:45:34 UTC
  Next Communication Attempt: Sat Dec 09 2017 03:45:33 UTC
  Communication Deadline: Thu Mar 08 2018 15:39:58 UTC
```

Software Package Management Commands

This chapter describes the Cisco IOS XR commands used to add packages to a router storage device, activate or deactivate packages, upgrade or downgrade existing packages, and display information about packages.

For detailed information about the concepts and tasks necessary to manage Cisco IOS XR software see *Cisco IOS XR Getting Started Guide for the Cisco CRS Router*.

clear install boot-options

To clear the boot options for a specified location or for all locations, use the **clear install boot-options** command in administration EXEC mode.

clear install boot-options [**location** {*node-id*|**all**}]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies a node. The *node-id* argument is expressed in the *rack/slot/module* notation. The **all** keyword specifies all nodes.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear 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

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 Topics

install boot-options, on page 815
show install boot-options, on page 857

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

label	Label defined for an installation rollback point.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear 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

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 Topics

install label, on page 825

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

number	Specifies the number of log entries to clear. The oldest log entries are cleared.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Enter the **clear install log-history oldest** command in EXEC mode to clear the oldest installation history log entries only for the current secure domain router (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

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 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 Topics

show install log, on page 865
clear install rollback oldest, on page 791

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

points	Number of saved installation points to delete, beginning with the oldest saved installation point.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode.
Release 3.4.0	Support was added for EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

In the following example, the **show install rollback ?** command is used to display the available rollback points. The **clear install rollback oldest 2** command is then used to delete the two oldest rollback points. The **show install rollback ?** command 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 Topics

show install log, on page 865
install rollback to, on page 831
show install rollback, on page 884

install abort

To abort an installation transaction, use the **install abort** command in administration EXEC mode.

install abort [*request-id*]

Syntax Description

request-id	(Optional) Request ID assigned to an installation operation.

Command Default

Abort the current installation operation.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 4.0.0	This command was removed from EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install abort** command to halt a software installation operation that is in process or that has been suspended.

Only activation, deactivation, and rollback operations can be aborted. Specifically, the **install abort** command cannot be aborted, but the **install add** command with the **activate** keyword can be aborted.

Use the **install abort** command with the *request-id* argument to halt a specific installation operation if the *request-id* is currently in process.

Task ID

Task ID	Operations
pkg-mgmt	read, write

The following example shows how to halt an installation operation:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install abort

Info: Please confirm your 'install abort' request by pressing Enter or y, or pressing n to
 cancel it.
Do you really want to abort install operation 15? [confirm] <enter>
Abort confirmed.
Please check console to verify the operation is aborted.
```

Related Topics

install activate, on page 795

install add, on page 805
install deactivate, on page 819

install activate

To add software functionality to the active software set, use the **install activate** command in Admin EXEC mode or EXEC mode.

install activate {*device*:*package*|**id** *add-id*} [**auto-abort-timer** *time*] [**location** *node-id*] **[issu] [if-active] [admin-profile]** [{**asynchronous**|**synchronous**}] **[parallel-reload]** [**prompt-level** {**default**|**none**}] **[test]** [**pause sw-change**]

Syntax Description

device:*package*	Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-4.0.0). For the *device* 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. Up to 16 device–package pairs can be specified. **Note** Multiple packages can be activated at one time. Up to 16 packages can be specified in a single **install activate** command. Multiple packages can be specified using the wildcard syntax, for example, harddisk:*4.0*. 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.
id *add-id*	Specifies the ID number of an **install add** operation. The command activates all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified.
auto-abort-timer *time*	(Optional) Specifies an abort timer value, in minutes, which when expired loads the last committed loadpath.

location *node-id*	(Optional) Activates a package on the designated node. The *node-id* argument is expressed in *rack*/*slot*/*module* 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.
issu	Performs an in-service software upgrade.
admin-profile	(Optional. Administration EXEC mode 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 an earlier version of the package is already active. Use the **if-active** keyword 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 command-line interface (CLI) prompt.

Command Default

If the **install prepare** command was not executed prior to **install activate**, executing the **install activate** command without any keywords aborts the process.

- Package is activated for all supported nodes on all SDRs in the system.
- 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

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	This command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was added for the **SDR** *sdr-name* keyword and 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** keyword 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** *add-id* keyword and argument. 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.
Release 4.0.0	This command was removed from EXEC mode. Support for the **sdr** keyword was removed.

Release	Modification
Release 4.1.0	The auto-abort timer was changed to enabled by default. The **off** keyword was added to disable the auto-abort timer. The **issu** keyword was added.

Usage Guidelines

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** *add-id* keyword and argument to activate all packages that were added in one or more specific **install add** operations, or specify packages by name. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Upgrading and Downgrading Packages

- To upgrade a package, activate the later version of the package; the earlier version is automatically deactivated.
- To downgrade a package, activate the earlier version of the package; the later 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.

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 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 an earlier 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 the software activation requires a router reload, a confirmation prompt appears.

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, 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 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. The auto-abort timer is enabled to 60 minutes by default.

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 action 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 you can proceed with the activation whenever you choose. This action 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.

ISSU

Note the following prerequisites before activating software packages using ISSU:

- You must have at least four fabric planes installed, two odd and two even. Use the command **show controller fabric plane all** in administration EXEC mode to verify the number of fabric planes in your router.

```
RP/0/RP0/CPU0:router(admin)# show controller fabric plane all

Thu Jun 23 04:45:40.186 DST
  Flags: P - plane admin down,       p - plane oper down
         C - card admin down,        c - card  oper down
         A - asic admin down,        a - asic oper down
         L - link port admin down,   l - linkport oper down
         B - bundle port admin Down, b - bundle port oper down
         I - bundle admin down,      i - bundle oper down
         N - node admin down,        n - node down
         X - ctrl admin down,        x - ctrl down
         o - other end of link down  d - data down
         f - failed component downstream
         m - plane multicast down,   s - link port permanently shutdown
         t - no barrier input        O - Out-Of-Service oper down
         T - topology mismatch down  e - link port control only
         D - plane admin data down   U - issu down

 Plane  Admin   Oper       up->dn    up->mcast
 Id     State   State      counter   counter
 ---------------------------------------------
 0      UP      UP           0               0
 1      UP      UP           0               0
 2      UP      UP           0               0
 3      UP      UP           0               0
 4      UP      UP           0               0
 5      UP      UP           0               0
 6      UP      UP           0               0
 7      UP      UP           0               0
```

- You must have only UNIGEN flash disks installed in your system. Use the command **show file disk0:** in EXEC mode to verify the flash disk vendor.

```
RP/0/RP0/CPU0:router# show file disk0:

Thu Jun 23 04:48:59.183 DST
   Model:       UNIGEN FLASH
```

```
    Capacity:    8215201 Sectors, Total 4206182912 Bytes, (512 Bytes/sector)
```

- You must have at least 400 MB of memory available on all line cards to be upgraded.
- You must have enough disk space for V1 and V2 images, PIEs and SMUs. This prerequisite is no different than that of a non-ISSU upgrade.
- Cisco recommends that you do a backup of the ASCII configuration before each upgrade.

Note the following restrictions regarding ISSU:

- ISSU does not work if any of the following hardware is running in the chassis. If you have any of these running in your system, manually shut them down before running ISSU, and then bring them back up after ISSU is complete.
  - DRP cards
  - Non-owner SDRs

  If any non-supported hardware is running on your system, you receive an error message similar to this one when ISSU tries to run:

```
RP/0/RP0/CPU0:router(admin)# install activate id 4 6 prompt-level all auto-abort timer
 off issu

Thu Jun  9 13:42:47.217 DST
Install operation 10 '(admin) install activate id 4 6 prompt-level all
auto-abort-timer off issu' started by user 'user1' via CLI at 13:42:48 DST
Thu Jun 09 2011.
/ 1% complete: The operation can still be aborted (ctrl-c for options)
Info:     This operation will activate the following packages:
Info:         disk0:hfr-mini-p-4.3.99
Info:         disk0:hfr-mpls-p-4.3.99
Info:         disk0:hfr-mgbl-p-4.3.99
Info:         disk0:hfr-mcast-p-4.3.99
Info:         disk0:hfr-k9sec-p-4.3.99
Info:         disk0:hfr-fpd-p-4.3.99
Info:         disk0:hfr-doc-p-4.3.99
Info:         disk0:hfr-diags-p-4.3.99
/ 1% complete: The operation can still be aborted (ctrl-c for options)
Error:    ISSU upgrade not supported: 'ISSU is not supported for DRP cards
```

- Refer to your release notes for a complete list of hardware that cannot be upgraded during the ISSU process. If you have any non-supported hardware running in your system, the upgrade process automatically shuts them down and reloads them after the upgrade is complete.
- Ethernet OAM flaps after an ISSU upgrade.
- ISSU downgrade is not supported.
- ISSU is not supported on the NV cluster set-up.

Task ID

Task ID	Operations
pkg-mgmt	execute

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:hfr-mini-p-4.0.0    disk0:hfr-diags-p-4.0.0   disk0:hfr-mcast-p-4.0.0
disk0:hfr-mpls-p.4.0.0    disk0:hfr-k9sec-p-4.0.0   disk0:hfr-mgbl-p-4.0.0
disk0:hfr-fpd-p-4.0.0
```

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 2010.
Info:     This operation will activate the following package:
Info:         disk0:hfr-mcast-p-4.0.0
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 DSDRSC reloads.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install activate disk0:hfr-mpls-4.0.0 synchronous

Install operation 15 'install activate disk0:hfr-mpls-p-4.0.0 synchronous'
started by user 'user_b' at 19:15:33 UTC Sat Apr 08 2010.
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 2010.

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 2010.
```

The following example shows how to activate a package for a specific SDR:

```
RP/0/RP0/CPU0:router(admin)# install activate disk0:hfr-mpls-p-4.0.0 SDR CE1b
```

```
Install operation 2 'install activate disk0:hfr-mpls-4.0.0
  on SDR: CE1b' started by user 'user_b'
Install operation 2 'install activate disk0:hfr-mpls-4.0.0
  on SDR: CE1b' started by user 'user_b' at 15:31:23 GMT Mon Nov 14 2009.
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 2009.
```

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 DSDRSC reloads.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)#  install activate disk0:
hfr-mcast-p-4.0.0
synchronous sdr Owner user_a

Install operation 7 '(admin) install activate disk0:hfr-mcast-p-4.0.0
  synchronous sdr Owner user_a' started by user 'abc' via CLI at 11:32:29
  UTC Mon Sep 25 2009.
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 2009.
```

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:*4.0*
Install operation 2 '(admin) install activate disk0:*4.0*' started
  by user 'user_a' via CLI at 04:30:01 PST Fri Dec 28 2009.
    Info:     This operation will activate the following packages:
    Info:         disk0:hfr-fwdg-4.0.0
    Info:         disk0:hfr-admin-4.0.0
    Info:         disk0:hfr-fpd-4.0.0
    Info:         disk0:hfr-diags-p-4.0.0
    Info:         disk0:hfr-mgbl-4.0.0
```

```
Info:         disk0:hfr-mpls-4.0.0
Info:         disk0:hfr-mcast-4.0.0
Info:         disk0:hfr-k9sec-4.0.0
Warning:  The following packages are already active on the specified nodes:
Warning:      hfr-admin-4.0.0
Warning:      hfr-fwdg-4.0.0
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 2009.
```

Related Topics

install add, on page 805
install deactivate, on page 819
install commit, on page 817

install add

To copy the contents of a package installation envelope (PIE) file to a storage device, use the **install add** command in Admin EXEC mode EXEC mode.

install add [{**source** *source-path*|**tar**}] *file* [**activate** [**pause sw-change**] **[admin-profile]** [**auto-abort-timer** *time*] [**location** *node-id*] **[issu]**] [{**asynchronous**|**synchronous**}] **[parallel-reload]** [**prompt-level** {**default**|**none**}] **[if-active]**

Syntax Description

source *source-path*	(Optional) Specifies the 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* • **rcp:**//*username*@*hostname* or *ip-address*/*directory-path* • **tftp:**//*hostname* or *ip-address*/*directory-path*
tar	(Optional) Indicates that the PIE file is contained in a tar file.
file	Name and location of the PIE file (composite package) to install. If a source path location is specified using the **source** keyword, the *file* 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 *file* argument is a tar file that contains one or more PIE files, or directories containing PIE files. Up to 16 tar files can be added, out of the possible 32 install 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.) 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 *time*	(Optional) Specifies an abort timer value, *time*, in minutes, which when expired loads the last committed loadpath.
location *node-id*	(Optional) Activates a package on the designated node. The *node-id* argument is expressed in *rack/slot/module* 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.
issu	Performs an in-service software upgrade. Refer to the **install activate** command for more detailed information.
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.

Command Default 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 mode

Admin EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 3.8.0	Support was added for the **pause sw-change** keywords.
Release 4.0.0	This command was removed from EXEC mode. The **sdr** keyword was removed.
Release 4.1.0	The issu keyword was added.

Usage Guidelines

Use the **install add** command to unpack the package software files from a PIE file and copy them to the boot device (usually disk0:) .

The package software files are added to the boot device of the designated secure domain router system controller (DSDRSC) for all SDRs on the router, as well as all active and standby Route Processors (RPs), DRPs and fabric shelf controllers (SCs) installed on the router.

Note The package files are also added to any additional installed distributed router processors (DRPs) for the effected SDRs.

Adding and Activating a Package

Software packages remain inactive until activated with the install activate, on page 795 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 install activate, on page 795 for more information.

Note 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 *System Management Configuration Guide for Cisco CRS Routers*.

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 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.

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* argument 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/RP0/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. Up to 32 files can be added, of which 16 can be tar files.

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/RP0/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 previous 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

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-3.8.0activate

Install operation 4 'install add /disk1:hfr-mgbl-p.pie-3.8.0 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-3.8.0
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 Topics

install activate, on page 795
show install log, on page 865
show install request, on page 882
install commit, on page 817

install attach

To attach a terminal to an installation operation, use the **install attach** command in administration EXEC configuration mode.

install attach [*request-id*] [{**asynchronous**|**synchronous**}]

Syntax Description

request-id	(Optional) Request ID assigned to an installation operation.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, this command runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.

Command Default

The command operates in synchronous mode.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.4.0	Support was added for EXEC mode.
Release 4.0.0	This command was removed from EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install attach** command to attach a terminal to an installation operation. This is similar to making the installation operation synchronous, and is used for the following reasons:

- To change an asynchronous installation operation to a synchronous installation operation.
- The installation operation is asynchronous but the terminal that ran the command has been lost (due to a switchover or terminal timeout).

Note An asynchronous operation runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode. A synchronous operation allows the installation process to finish before the prompt is returned.

Task ID

Task ID	Operations
pkg-mgmt	read, write

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:RP/0/RP0/CPU0:router-mcast-3.7.6'
started by user 'user_b' at 08:04:31 UTC Mon Nov 14 2005.
The install operation will continue asynchronously.

RP/0/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
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 Topics

install activate, on page 795
install add, on page 805
install deactivate, on page 819

install auto-abort-timer stop

To deactivate the auto-abort-timer that is set in the **install activate** or **install deactivate** commands, use the **install auto-abort-timer stop** command in administration EXEC mode.

install auto-abort-timer stop

Syntax Description

This command has no keywords or arguments.

Command Default

When activated, the auto-abort-timer runs to expiration and then loads the last committed loadpath.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 4.0.0	This command was removed from EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install auto-abort-timer stop** command to halt the auto-abort-timer that was activated with the **install activate** or **install deactivate** command. Alternatively, you can use the **install commit** command to halt the timer.

If you do not halt the auto-abort-timer, the software loads to the last committed loadpath when the timer expires. If the software has installed successfully, and you intend to continue using the new software, you should disable the auto-abort-timer.

Task ID

Task ID	Operations
pkg-mgmt	read, write

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 Topics

install activate, on page 795
install deactivate, on page 819
install commit, on page 817

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-id*

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 *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install 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 are 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.

Task ID

Task ID	Operations
pkg-mgmt	read, write

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/RP
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/RP0/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/RP
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/RP0/CPU0:router(admin)#
```

install commit

To save the active software set to be persistent across designated system controller (DSC) reloads, use the **install commit** command in Admin EXEC mode EXEC mode.

install commit [{**admin-profile**|**location** *node-id*}]

Syntax Description

admin-profile	(Optional. Administration EXEC mode only.) Commits the active software set on the admin profile only.
location *node-id*	(Optional. Admin EXEC mode mode only.)Specifies a node. The *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

Admin EXEC mode: Commits the active software set for all SDRs.

Command Modes

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was moved from EXEC mode to administration EXEC mode.
Release 3.4.0	Support was added for EXEC mode.

Usage Guidelines

When a package is activated, it becomes part of the current running configuration. To make the package activation persistent across designated secure domain router shelf controller (DSDRSC) reloads, enter the **install commit** command. On startup, the DSDRSC of the SDR loads this committed software set.

If the system is restarted before the active software set is saved with the **install commit** command, the previously committed software set is used.

Task ID

Task ID	Operations
pkg-mgmt	read, write

The following example shows how to make the current active software set persistent across DSDRSC reloads for all SDRs in the system:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install commit

Install operation 16 'install commit' started by user 'user_b' at 19:18:58 UTC
Sat Apr 08 2006.
Install operation 16 completed successfully at 19:19:01 UTC Sat Apr 08 2006.
```

Related Topics

show install log, on page 865

install deactivate

To remove a package from the active software set, use the **install deactivate** command in Admin EXEC mode EXEC mode .

install deactivate {**id** *add-id*|*device*:*package* } [**auto-abort-timer** *time*] [**location** *node-id*] [{**asynchronous**|**synchronous**}] **[parallel-reload]** [**prompt-level** {**default**|**none**}] **[test]** [**pause sw-change**]

Syntax Description

id *add-id*	Specifies the ID number of an **install add** operation. The command deactivates all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified.
device **:** *package*	Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.8.0). For the *device* 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. Up to 32 *device* **:** *package* pairs can be specified.
auto-abort-timer *time*	(Optional) Specifies an abort timer value, *time* , in minutes, which when expired loads the last committed loadpath.
location *node-id*	(Optional) Deactivates a package from the designated node. The *node-id* argument is entered in *rack*/*slot*/*module* 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.

Command Default

The **install deactivate** operation is performed in asynchronous mode: The command runs in the background, and the router prompt is returned as soon as possible.

Command Modes

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was moved from EXEC mode to administration EXEC mode.
Release 3.3.0	Support was added for the **sdr** *sdr-name* keyword and 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 3.8.0	Support was added for the **pause sw-change** keywords and the **id** *add-id* keyword and argument.
Release 4.0.0	This command was removed from EXEC mode. Support was removed for the **sdr** keyword.

Usage Guidelines

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 earlier version. The later package version is deactivated automatically.

Specifying Packages to Deactivate

You can either use the **id** *add-id* keyword and argument to deactivate all packages that were added in one or more specific **install add** operations, or specify packages by name. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command.

If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Router Reloads

If the deactivation requires a router reload, a confirmation prompt appears. 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, on page 865 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

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-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 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-3.8.0 synchronous

Install operation 14 'install deactivate disk0:hfr-mpls-3.8.0 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/RP0/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 the **install operation** *id* **attach synchronous** command.

```
RP/0/RP0/CPU0:router(admin)# install deactivate
disk0:comp-hfr-3.8.0.07I.CSCsr09575-1.0.0
pause sw-change

Install operation 12 '(admin) install deactivate disk0:comp-hfr-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/RP0/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.
```

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/RP0/CPU0:router# install deactivate
disk0:hfr-mpls-3.8.0.10I
sync pause sw-change
Wed Jul 23 14:42:11.273 UTC
Install operation 8 'install deactivate disk0:hfr-mpls-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/RP0/CPU0:router# install operation 8 ?

  abort     Abort the operation
  attach    Attach to the operation
  complete  Phase to run to end of

RP/0/RP0/CPU0:router# install operation 8 complete

Wed Jul 23 14:43:04.562 UTC
RP/0/RP0/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.
```

Related Topics

install activate, on page 795
install remove, on page 828
show install inactive, on page 859
show install log, on page 865
show install request, on page 882
install commit, on page 817

install label

To add a label or description to a state associated with a rollback point, use the **install label** command in administration EXEC mode.

install label *point-id* {**description** *description*|**label-name** *label*}

Syntax Description

point-id	Installation point ID number.
description *description*	Specifies a description for the specified rollback point.
label-name *label*	Specifies a label for the specified rollback point.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.
Release 4.0.0	This command was removed from EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install label** command to put a label and description on an installation rollback point that can be used to identify the rollback point in other commands. Commands that support the rollback label include:

- **clear install rollback**
- **install rollback**
- **show install rollback**

The label can be a maximum of 15 characters which must adhere to the following rules:

- No white-space
- Cannot include any of the following CLI keywords:
  - **active**
  - **all**
  - **asynchronous**
  - **brief**
  - **committed**
  - **description**
  - **detail**
  - **differences**

- **from**
- **force**
- **inactive**
- **install**
- **label**
- **label-name**
- **location**
- **noprompt**
- **rollback**
- **sdr**
- **summary**
- **synchronous**
- **test**
- **to**
- **verbose**

- Cannot contain any of the following characters:
  - Comma (,)
  - Semi-colon (;)
  - Colon (:)
  - Single-quote (‘’)
  - Double-quote (“”)
- Cannot contain uppercase alphabetic characters
- Cannot contain numeric characters only

Task ID

Task ID	Operations
pkg-mgmt	read, write

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 Topics

install activate, on page 795

install remove

To delete inactive packages from a storage device, use the **install remove** command in administration EXEC mode.

install remove {**id** *add-id*|*device*:*package*|**inactive**} [**prompt-level** {**default**|**none**}] [{**asynchronous**|**synchronous**}] **[test]**

Syntax Description

id *add-id*	Specifies the ID number of an **install add** operation. The command deletes all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified
device **:** *package*	Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.8.0). For the *device* argument, the value is a specified storage device, typically **disk0:**. **Note** Multiple packages can be removed at the same time. Up to 32 *device* **:** *package* pairs can be specified.
inactive	Removes all inactive, noncommitted packages from the boot device (usually disk0:).
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.

Command Default

The operation is performed in asynchronous mode: The **install remove** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
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	Modification
Release 3.2	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 3.6.0	The **prompt-level** keyword replaced the **noprompt** keyword.
Release 3.8.0	Support was added for the **id** *add-id* keyword and argument.
Release 4.0.0	This command was removed from EXEC mode. Support was removed for the **sdr** keyword.

Usage Guidelines

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** command with the **inactive** keyword.
- To remove a specific inactive package from a storage device, use the **install remove** command with the *device: package* arguments.

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** *add-id* keyword and argument. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

User Prompts

Use the **install remove** command with the **prompt-level none** keywords to automatically ignore any confirmation prompts and proceed with the package removal.

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, on page 865 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

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/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install remove
disk0:hfr-diags-3.7.90 test

Install operation 30 'install remove disk0:hfr-diags-3.7.90 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-3.7.90
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:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install remove inactive synchronous

RP/0/RP0/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:hfr-compmgmt__installmgr-0.0.5
Proceed with removing these packages? [confirm]
The install operation will continue asynchronously.
```

Related Topics

install add, on page 805
show install log, on page 865
show install inactive, on page 859
show install request, on page 882

install rollback to

To roll back the software set to a saved installation point or to the last committed installation point, use the **install rollback to** command in administration EXEC mode.

Administration EXEC Mode:
install rollback to {*point-idlabel*|**committed**} [**auto-abort-timer** *time*] **location** *node-id* **[admin-profile]** [{**asynchronous**|**synchronous**}] **[parallel-reload]** [**prompt-level** {**default**|**none**}] **[test]** [**pause sw-change**]

Syntax Description

point-id	Installation point ID number.
label	Label associated with an installation point.
committed	Rolls the Cisco IOS XR software back to the last committed installation point.
auto-abort-timer *time*	(Optional) Specifies an abort timer value, *time* , in minutes, which when expired loads the last committed loadpath.
location *node-id*	Specifies a node. The *node-id* argument is expressed in *rack/slot/module* notation.
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.

Command Default

The operation is performed in asynchronous mode. The **install rollback to** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
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 3.6.0	Support was added for the **prompt-level** and **parallel-reload** keywords. Support was removed for the **noprompt** keyword.
Release 3.8.0	Support was added for the **pause sw-change** keywords.
Release 4.0.0	This command was removed from EXEC mode. Support was removed for the **sdr** keyword.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install rollback to** command to roll back the configuration to a saved installation point or to the last committed installation point. Rollback points are created when the router is booted and when packages are activated, deactivated, or committed. When an installation point is created, Cisco IOS XR software assigns an ID number to that rollback point. To roll back to a saved installation point, enter the installation point ID number assigned to it for the *point-id* argument. When a software configuration is committed with the **install commit** command, that configuration is also saved as the last committed installation point. Use the **committed** keyword to roll back to the last committed installation point.

Labels can be assigned to installation points using the **install label** command. Then these labels can be used to identify a specific installation point that you want to roll back to.

To display the saved rollback points available, use the online help function:

```
RP/0/RP0/CPU0:router(admin)# install rollback to ?
0          Specify the id for the install point to rollback to
1          Specify the id for the install point to rollback to
12         Specify the id for the install point to rollback to
15         Specify the id for the install point to rollback to
2          Specify the id for the install point to rollback to
4          Specify the id for the install point to rollback to
6          Specify the id for the install point to rollback to
7          Specify the id for the install point to rollback to
8          Specify the id for the install point to rollback to
9          Specify the id for the install point to rollback to
```

```
committed  Rollback to the last committed installation point
```

If a rollback operation is beyond two saved installation points, a router reload is required to avoid system instability. If a reload is required, a confirmation prompt appears before the reload occurs. Use the **install rollback to** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the rollback operation.

If a software operation requires a node reload, the config-register for that node should be set to autoboot. If the config-register for the node is not set to autoboot, then the system automatically changes the setting and the node reloads. A message describing the change is displayed.

If a rollback operation requires that a package be activated that is no longer on the system (because the package had been removed), a message appears in the output of the **install rollback to** command indicating that the specified installation point is unavailable and that the required package must be added to roll back the software set to the specified installation point.

Use the **test** keyword to verify the effects of the proposed operations and determine whether the rollback operation can be completed. After previewing the effects of the proposed operations, use the **show install log** command for more details about the effects of the proposed operations.

Use the **clear install rollback oldest** command to delete saved installation points from the installation buffer.

Use the **show install rollback** command to display the software set associated with a saved installation point.

Pausing Before Configuration Lock

Use the **pause sw-change** keywords to pause the operation before locking the configuration. A rollback operation begins with preparatory steps, such as software checks, and then proceeds with the actual software change. The configuration is locked for the actual software change. If you specify the **pause sw-change** keywords, the operation pauses before locking the configuration and provides you with the option to hold the operation while you perform configuration changes, and proceed with the software change whenever you choose. This is useful, for example, if your workflow involves configuring a router out of the network during software change and you want to minimize the time that the router is out of the network. You can specify these keywords for both asynchronous and synchronous operations. In both cases, follow the onscreen instructions to control the pausing and completion of the operation.

Task ID

Task ID	Operations
pkg-mgmt	read, write

The following example shows how to roll back to a saved installation point:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install rollback to 8

Install operation 10 'install rollback to 8' started by user
  'user_b' at 07:49:26
UTC Mon Nov 14 2005.
The install operation will continue asynchronously.
RP/0/RP0/CPU0:router(admin)#Info:
The changes made to software configurations will not be persistent
Info:     across system reloads. Use the command
  'admin install commit' to make
Info:     changes persistent.
```

```
Info:     Please verify that the system is consistent following
  the software
Info:     change using the following commands:
Info:         show system verify
Info:         install verify

The currently active software is the same as the committed
  software.

Install operation 10 completed successfully at 07:51:24 UTC Mon
  Nov 14 2005.
```

In the following example, the software is rolled back to the last committed installation point and the rollback is paused before configuration lock and then completed when the user enters the **install operation complete** command:

```
RP/0/RP0/CPU0:router# install rollback to committed pause sw-change

Wed Jul 23 15:37:53.377 UTC
Install operation 16 'install rollback to committed pause sw-change'
  started by user 'userb' on SDR Owner via CLI at 15:37:54 UTC
Wed Jul 23 2008.
The install operation will continue asynchronously.
RP/0/RP0/CPU0:router#Info: Install Method: Parallel Process Restart
Info: Install operation 16 is pausing before the config lock is
  applied for the software change as requested by the user.
Info: No further install operations will be allowed until the
  operation is resumed.
Info: Please continue the operation using one of the following
  steps:
Info:  - run the command 'install operation 16 complete'.
Info:  - run the command 'install operation 16 attach synchronous'
         and then answer the query.
RP/0/RP0/CPU0:router# install operation 16 complete

Wed Jul 23 15:38:35.197 UTC
RP/0/RP0/CPU0:router#Info: Install operation 16 has been resumed.
Info: The changes made to software configurations will not be persistent
  across system reloads. Use the command '(admin)
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/RP0/CPU0:router#
```

Related Topics

show install log, on page 865
show install request, on page 882
clear install rollback oldest, on page 791
install commit, on page 817
install label, on page 825
show install rollback, on page 884

install verify healthcheck

To verify that processes and dynamic link libraries (DLLs) running on a node are correct, use the **install verify healthcheck** command in administration EXEC mode.

install verify healthcheck [{**asynchronous**|**synchronous**}] **[admin-profile]** [**location** *node-id*] **[repair]**

Syntax Description

asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, this command runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.
admin-profile	(Optional. Administration EXEC mode only) Verifies the processes and DLLs in the administration profile only.
location *node-id*	(Optional) Verifies the consistency of previously installed software from the designated node with the package file from which it originated. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.
repair	(Optional) Repairs anomalies found by the **install verify healthcheck** process.

Command Default

The operation is performed in asynchronous mode: The **install verify healthcheck** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 4.0.0	This command was removed from EXEC mode. Support was removed for the **sdr** keyword.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **install verify healthcheck** command is responsible for verifying that processes and DLLs in use by the system are correct and are executing from the correct location.

Note The **install verify healthcheck** command can take up to two minutes per package to process.

Task ID

Task ID	Operations
pkg-mgmt	execute

The following example shows how to use the **install verify healthcheck** command. This command is run in asynchronous mode:

```
RP/0/RP0/CPU0:router# install verify healthcheck

Install operation 10 'install verify healthcheck' started by user
'userb' on SDR Owner via CLI at 04:56:49 UTC Thu Feb 22 2007.
The install operation will continue asynchronously.

Info:     This operation can take 1 minute to completion. Please be patient.
Info:     0/RP0/CPU0 [RP] [SDR: Owner]
Info:          DLLs and processes have right version.
Info:     0/RP1/CPU0 [RP] [SDR: Owner]
Info:          DLLs and processes have right version.
Info:     0/1/CPU0 [LC] [SDR: Owner]
Info:         /pkg/md5/f322c8dff20af6b765c8e8423899401a has wrong version.
Info:     0/6/CPU0 [LC] [SDR: Owner]
Info:         /pkg/md5/f322c8dff20af6b765c8e8423899401a has wrong version.
Info:     Health Check Summary:
Info:         0/RP0/CPU0 DLLs and processes have right version.
Info:         0/RP1/CPU0 DLLs and processes have right version.
Info:         0/1/CPU0 Process(es) with wrong version found.
Info:         0/6/CPU0 Process(es) with wrong version found.
Install operation 10 completed successfully at 04:56:50 UTC Thu Feb 22 2007.
```

The following example shows sample output from the **install verify healthcheck** command when there are problems that are repaired:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# install verify healthcheck repair

Info:     Node: 0/0/CPU0
Info:         process [ERROR] Anomalies Found.
Info:         process insthelper has version: 3.7.7
Info:         dll [SUCCESS] Health-check Successful.
Info:     Node: 0/3/CPU0
Info:         process [SUCCESS] Health-check Successful.
Info:         dll [ERROR] Anomalies Found.
Info:         dll verify has version 3.7.2.
Info:     Node: 0/RP0/CPU0
Info:         process [SUCCESS] Health-check Successful.
Info:         dll [SUCCESS] Health-check Successful.
Info:     Health Check Summary:
Info:         0/0/CPU0: ERROR.
Info:         0/3/CPU0: ERROR.
Info:         0/RP0/CPU0: SUCCESSFUL.
Info:         The processes can be repaired.
Info:     Repair begins
Info:         Restart insthelper on 0/0/CPU0...
Info:         Repair successful.
Info:     Repair ends..
```

Related Topics

show install log, on page 865
show install request, on page 882

install verify packages

To verify the consistency of a previously installed software set with the package file from which it originated, use the **install verify packages** command in administration EXEC mode.

Administration EXEC Mode:

install verify packages [repair] [location *node-id*] **[admin-plane]** [{**asynchronous**|**synchronous**}]

Syntax Description

repair	(Optional) Repairs anomalies found by the **install verify packages** process.
location *node-id*	(Optional) Verifies the consistency of previously installed software from the designated node with the package file from which it originated. The *node-id* argument is expressed in *rack/slot/module* notation.
admin-plane	(Optional) Verify the admin profile only.
asynchronous	(Optional) Performs the command in asynchronous mode. In asynchronous mode, this command runs in the background, and the EXEC prompt is returned as soon as possible. This is the default mode.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.

Command Default

The operation is performed in asynchronous mode: The **install verify packages** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	Support was added for the **sdr** *sdr-name* keyword and argument.
Release 3.4.0	Support was added for EXEC mode.
Release 3.5.0	This command was changed from **install verify** .
Release 3.7.0	This command was extended to check for corruptions in installation state files and MBI image files.
Release 4.0.0	This command was removed from EXEC mode. Support was removed for the **sdr** keyword.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install verify packages** command to verify the consistency of a previously installed software set with the package file from which it originated. This command can be used as a debugging tool to verify the validity

of the files that constitute the packages to determine if there are any corrupted files. This command also checks for corruptions of install state files and MBI image files. This command is particularly useful when issued after the activation of a package or when upgrading the Cisco IOS XR software to a major release.

Note The **install verify packages** command can take up to two minutes per package to process.

Task ID

Task ID	Operations
pkg-mgmt	execute

The following example shows how to verify the consistency of a previously installed software set with the package file from which it originated:

```
RP/0/RP0/CPU0:router# install verify packages

Install operation 2 '(admin) install verify packages' started by user 'admin' via CLI at
07:35:01 UTC Wed May 14 2008.
Info: This operation can take up to 2 minutes per package being verified. Please be patient.
Info: 0/3/CPU0 [LC] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/SM1/SP [SP] [Admin Resource]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/3/SP [SP] [Admin Resource]
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/RP1/CPU0 [RP] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-rout-3.8.0.02I: [SUCCESS] Verification Successful.
Info: 0/RP0/CPU0 [RP] [SDR: Owner]
Info: meta-data: [SUCCESS] Verification Successful.
Info: meta-data: [SUCCESS] Verification Successful.
Info: /install/c12k-os-mbi-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-base-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-admin-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-fwdg-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-lc-3.8.0.02I: [SUCCESS] Verification Successful.
Info: /install/c12k-rout-3.8.0.02I: [SUCCESS] Verification Successful.
Info: Verification Summary:
Info: 0/3/CPU0: SUCCESSFUL. No anomalies found.
Info: 0/SM1/SP: SUCCESSFUL. No anomalies found.
Info: 0/3/SP: SUCCESSFUL. No anomalies found.
```

```
Info: 0/RP1/CPU0: SUCCESSFUL. No anomalies found.
Info: 0/RP0/CPU0: SUCCESSFUL. No anomalies found.
Info: The system needs no repair.
Install operation 2 completed successfully at 07:46:29 UTC Wed May 14 2008
```

Related Topics

show install log, on page 865
show install request, on page 882

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

detail	(Optional) Displays a detailed summary of the active packages for a system, secure domain router (SDR), or node.
summary	(Optional) Displays a summary of the active packages in a system or SDR. Use this command to display the default software profile for SDRs
verbose	(Optional) Displays a detailed summary of the active packages for a system, SDR, or node, including component and file information for each package.
sdr *sdr-name*	(Optional. Administration EXEC mode only.) Displays the active packages for a specific SDR. The *sdr-name* argument is the name assigned to the SDR.
location *node-id*	(Optional) Displays the active packages for a designated node. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was supported in administration EXEC mode.
Release 3.3.0	Support was added for the optional keywords and arguments: **sdr** *sdr-name* , **detail** , **summary** , and **verbose** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note This command 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 or all SDRs

- To display information for a specific SDR from administration EXEC mode, use the **sdr** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.
- To display information for all SDRs in the system, enter the command in administration EXEC mode, without the **sdr** keyword.

Displaying Information for a Specific Node

Use the **location** *node-id* keyword and argument to display information for a specific node. If you do not specify a location with the **location** *node-id* keyword and 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 active** 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

Use the **location** *node-id* keyword and argument to display the active packages for a designated node:

```
RP/0/RP0/CPU0:router# show install location 0/rp0/cpu0

Mon May 31 06:49:47.768 DST
  Node 0/RP0/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/mbihfr-rp.vm
    Active Packages:
      disk0:hfr-upgrade-p-4.0.0.15I
      disk0:hfr-k9sec-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I
      disk0:hfr-mgbl-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-doc-p-4.0.0.15I
      disk0:comp-
hfr-mini-4.0.0.15I
```

```
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
```

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

Mon May 31 06:53:46.777 DST
  Active Packages:
    disk0:hfr-upgrade-p-4.0.0.15I
    disk0:hfr-k9sec-p-4.0.0.15I
    disk0:hfr-mpls-p-4.0.0.15I
    disk0:hfr-mgbl-p-4.0.0.15I
    disk0:hfr-mcast-p-4.0.0.15I
    disk0:hfr-doc-p-4.0.0.15I
    disk0:comp-
hfr-mini-4.0.0.15I
    disk0:hfr-fpd-4.0.0.15I
    disk0:hfr-diags-p-4.0.0.15I
```

Table 74: 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 Topics

install activate, on page 795
show install active, on page 844
show install package, on page 872
show install pie-info, on page 875
show install which, on page 888

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 SDR.
verbose	(Optional) Displays a detailed summary of the active packages for a system, SDR, or node, including component information for each package.
sdr *sdr-name*	(Optional. Administration EXEC mode only.) Displays the active packages for a specific SDR. The *sdr-name* argument is the name assigned to the SDR.
location *node-id*	(Optional) Displays the active packages for a designated node. The *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The command was made available in administration EXEC mode. The **detail** keyword was added.

Usage Guidelines

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.

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the **show install active** command in EXEC mode.

- To display information for all SDRs, enter the **show install active** command in administration EXEC mode.

Displaying Information for a Specific Node

Use the **location** *node-id* keyword and argument to display information for a specific node. If you do not specify a location with the **location** *node-id* keyword and 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.

For Superceded SMUs

The **show install active** command doesnot display superceded SMUs. To get details of the superceded SMUs, use the **show install superceded** command.

Task ID

Task ID	Operations
pkg-mgmt	read

The following example illustrates sample output from the **show install active** command with the **location** *node-id* keyword and argument specified:

```
RP/0/RP0/CPU0:router# show install active location 0/6/cpu0

Wed May 26 04:26:42.446 DST
  Node 0/6/CPU0 [LC] [SDR: Owner]
    Boot Device: mem:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/lc/mbihfr-lc.vm
    Active Packages:
      disk0:hfr-upgrade-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I

      disk0:comp-
hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
```

The following example illustrates sample output from the **show install active** command with the **summary** keyword specified:

```
RP/0/RP0/CPU0:router# show install active summary

Wed May 26 04:33:06.791 DST
  Active Packages:
    disk0:hfr-upgrade-p-4.0.0.15I
    disk0:hfr-k9sec-p-4.0.0.15I
    disk0:hfr-mpls-p-4.0.0.15I
```

```
    disk0:hfr-mgbl-p-4.0.0.15I
    disk0:hfr-mcast-p-4.0.0.15I
    disk0:hfr-doc-p-4.0.0.15I
    disk0:comp-
hfr-mini-4.0.0.15I
    disk0:hfr-fpd-4.0.0.15I
    disk0:hfr-diags-p-4.0.0.15I
```

The following example illustrates sample output from the **show install active** command with the **summary** keyword for a specific SDR:

```
RP/0/RP0/CPU0:router(admin)# show install active summary sdr owner

  Active Packages:
    disk0:c12k-doc-3.9.0.28I
    disk0:c12k-fpd-3.9.0.28I
    disk0:hfr-diags-3.9.0
    disk0:hfr-mgbl-3.9.0
    disk0:hfr-k9sec-3.9.0
    disk0:comp-hfr-mini-3.9.0
```

```
RP/0/RP0/CPU0:router(admin)# show install active summary sdr sdr2

Wed May 26 04:45:28.900 DST
Specific Profile for SDR sdr2:
  Active Packages:
    disk0:hfr-upgrade-p-4.0.0.15I
    disk0:hfr-k9sec-p-4.0.0.15I
    disk0:hfr-mpls-p-4.0.0.15I
    disk0:hfr-mgbl-p-4.0.0.15I
    disk0:hfr-mcast-p-4.0.0.15I
    disk0:hfr-doc-p-4.0.0.15I
    disk0:comp-hfr-mini-4.0.0.15I
    disk0:hfr-fpd-4.0.0.15I
    disk0:hfr-diags-p-4.0.0.15I
```

This example displays the complete output for the **show install active** command:

```
 Domain Router: Owner

  Node 0/1/CPU0 [LC] [SDR: Owner]
    Boot Device: mem:
    Boot Image: /disk0/hfr-os-mbi-4.3.2/lc/mbihfr-lc.vm
    Active Packages:
      disk0:hfr-mpls-px-4.3.2
      disk0:hfr-fpd-px-4.3.2
      disk0:hfr-diags-px-4.3.2
      disk0:hfr-mcast-px-4.3.2
      disk0:hfr-mini-px-4.3.2
      disk0:hfr-px-4.3.2.CSCts44399-1.0.0
      disk0:hfr-px-4.3.2.CSCul20020-1.0.0
      disk0:hfr-px-4.3.2.CSCul26557-1.0.0
      disk0:hfr-px-4.3.2.CSCun00853-1.0.0
      disk0:hfr-px-4.3.2.CSCui74251-1.0.0
      disk0:hfr-px-4.3.2.CSCui99608-1.0.0
      disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
      disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
```

```
    disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
    disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Node 0/RP0/CPU0 [CRS8-RP-x86] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/0x100008/mbihfr-rp-x86e.vm
  Active Packages:
    disk0:hfr-mpls-px-4.3.2
    disk0:hfr-mgbl-px-4.3.2
    disk0:hfr-k9sec-px-4.3.2
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-doc-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-asr9000v-nV-px-4.3.2
    disk0:hfr-mcast-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCuj45792-1.0.0
    disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
    disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Node 0/RP1/CPU0 [CRS8-RP-x86] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/0x100008/mbihfr-rp-x86e.vm
  Active Packages:
    disk0:hfr-mpls-px-4.3.2
    disk0:hfr-mgbl-px-4.3.2
    disk0:hfr-k9sec-px-4.3.2
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-doc-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-asr9000v-nV-px-4.3.2
    disk0:hfr-mcast-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCuj45792-1.0.0
    disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
    disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Node 1/0/CPU0 [LC] [SDR: Owner]
  Boot Device: lcdisk0:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/lc/0x500064/mbihfr-lc-x86e.vm
  Active Packages:
    disk0:hfr-mpls-px-4.3.2
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mcast-px-4.3.2
```

```
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCuj45792-1.0.0
    disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
    disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Node 1/7/CPU0 [LC] [SDR: Owner]
  Boot Device: lcdisk0:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/lc/0x500064/mbihfr-lc-x86e.vm
  Active Packages:
    disk0:hfr-mpls-px-4.3.2
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mcast-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCuj45792-1.0.0
    disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
    disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Node 1/RP0/CPU0 [CRS8-RP-x86] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/0x100008/mbihfr-rp-x86e.vm
  Active Packages:
    disk0:hfr-mpls-px-4.3.2
    disk0:hfr-mgbl-px-4.3.2
    disk0:hfr-k9sec-px-4.3.2
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-doc-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-asr9000v-nV-px-4.3.2
    disk0:hfr-mcast-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCuj45792-1.0.0
    disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
    disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Node 1/RP1/CPU0 [CRS8-RP-x86] [SDR: Owner]
  Boot Device: disk0:
```

```
    Boot Image: /disk0/hfr-os-mbi-4.3.2/0x100008/mbihfr-rp-x86e.vm
    Active Packages:
      disk0:hfr-mpls-px-4.3.2
      disk0:hfr-mgbl-px-4.3.2
      disk0:hfr-k9sec-px-4.3.2
      disk0:hfr-fpd-px-4.3.2
      disk0:hfr-doc-px-4.3.2
      disk0:hfr-diags-px-4.3.2
      disk0:hfr-asr9000v-nV-px-4.3.2
      disk0:hfr-mcast-px-4.3.2
      disk0:hfr-mini-px-4.3.2
      disk0:hfr-px-4.3.2.CSCts44399-1.0.0
      disk0:hfr-px-4.3.2.CSCul20020-1.0.0
      disk0:hfr-px-4.3.2.CSCul26557-1.0.0
      disk0:hfr-px-4.3.2.CSCun00853-1.0.0
      disk0:hfr-px-4.3.2.CSCui74251-1.0.0
      disk0:hfr-px-4.3.2.CSCui99608-1.0.0
      disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
      disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
      disk0:hfr-px-4.3.2.CSCuj45792-1.0.0
      disk0:hfr-px-4.3.2.CSCuj61345-1.0.0
      disk0:hfr-px-4.3.2.CSCul00911-1.0.0
      disk0:hfr-px-4.3.2.CSCul14164-1.0.0

Admin Resources:

  Node 0/1/SP [MSC-DRP-SP] [Admin Resource]
    Boot Device: bootflash:
    Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
    Active Packages:
      disk0:hfr-fpd-px-4.3.2
      disk0:hfr-diags-px-4.3.2
      disk0:hfr-mini-px-4.3.2
      disk0:hfr-px-4.3.2.CSCts44399-1.0.0
      disk0:hfr-px-4.3.2.CSCul20020-1.0.0
      disk0:hfr-px-4.3.2.CSCul26557-1.0.0
      disk0:hfr-px-4.3.2.CSCun00853-1.0.0
      disk0:hfr-px-4.3.2.CSCui74251-1.0.0
      disk0:hfr-px-4.3.2.CSCui99608-1.0.0
      disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
      disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
      disk0:hfr-px-4.3.2.CSCul00911-1.0.0

  Node 0/SM0/SP [140G-Fabric-SP-B] [Admin Resource]
    Boot Device: bootflash:
    Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
    Active Packages:
      disk0:hfr-fpd-px-4.3.2
      disk0:hfr-diags-px-4.3.2
      disk0:hfr-mini-px-4.3.2
      disk0:hfr-px-4.3.2.CSCts44399-1.0.0
      disk0:hfr-px-4.3.2.CSCul20020-1.0.0
      disk0:hfr-px-4.3.2.CSCul26557-1.0.0
      disk0:hfr-px-4.3.2.CSCun00853-1.0.0
      disk0:hfr-px-4.3.2.CSCui74251-1.0.0
      disk0:hfr-px-4.3.2.CSCui99608-1.0.0
      disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
      disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
      disk0:hfr-px-4.3.2.CSCul00911-1.0.0

  Node 0/SM1/SP [140G-Fabric-SP-B] [Admin Resource]
    Boot Device: bootflash:
    Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
    Active Packages:
```

```
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0

Node 0/SM2/SP [140G-Fabric-SP-B] [Admin Resource]
  Boot Device: bootflash:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
  Active Packages:
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0

Node 0/SM3/SP [140G-Fabric-SP-B] [Admin Resource]
  Boot Device: bootflash:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
  Active Packages:
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0

Node 1/SM0/SP [140G-Fabric-SP-B] [Admin Resource]
  Boot Device: bootflash:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
  Active Packages:
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
```

```
Node 1/SM1/SP [140G-Fabric-SP-B] [Admin Resource]
  Boot Device: bootflash:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
  Active Packages:
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0

Node 1/SM2/SP [140G-Fabric-SP-B] [Admin Resource]
  Boot Device: bootflash:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
  Active Packages:
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0

Node 1/SM3/SP [140G-Fabric-SP-B] [Admin Resource]
  Boot Device: bootflash:
  Boot Image: /disk0/hfr-os-mbi-4.3.2/sp/mbihfr-sp.vm
  Active Packages:
    disk0:hfr-fpd-px-4.3.2
    disk0:hfr-diags-px-4.3.2
    disk0:hfr-mini-px-4.3.2
    disk0:hfr-px-4.3.2.CSCts44399-1.0.0
    disk0:hfr-px-4.3.2.CSCul20020-1.0.0
    disk0:hfr-px-4.3.2.CSCul26557-1.0.0
    disk0:hfr-px-4.3.2.CSCun00853-1.0.0
    disk0:hfr-px-4.3.2.CSCui74251-1.0.0
    disk0:hfr-px-4.3.2.CSCui99608-1.0.0
    disk0:hfr-px-4.3.2.CSCuj04528-1.0.0
    disk0:hfr-px-4.3.2.CSCuj18680-1.0.0
    disk0:hfr-px-4.3.2.CSCul00911-1.0.0
```

Table 75: 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.

Related Topics

install activate, on page 795
show install package, on page 872
show install pie-info, on page 875
show install which, on page 888

show install audit

To compare the current active packages and software maintenance upgrades (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 *file-name*	Specifies the location and name of the installation audit file.
sdr *sdr-name*	(Optional. Administration EXEC mode only.) Audits the active packages on a specific secure domain router (SDR). The *sdr-name* argument is the name assigned to the SDR.
location *node-id*	(Optional) Audits the active packages on a designated node. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.
verbose	(Optional) Displays a detailed summary of the audit and can be used for troubleshooting.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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.
- 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:

```
#  R4.0.0
#  some comments
#
comp-
hfr-mini-4.0.0
hfr-mgbl-p-4.0.0
hfr-mcast-p-4.0.0
hfr-mpls-p-4.0.0
hfr-mpls-4.0.0.CSCse00294
comp-
hfr-4.0.0.CSCsd07147
```

Displaying Information for a Specific SDR

- To display information for a specific SDR from administration EXEC mode, use the **sdr** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the **show install audit** command in EXEC mode.

Displaying Information for a Specific Node

Use the **location** *node-id* keyword and argument to display information for a specific node. If you do not specify a location with the **location** *node-id* keyword and 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 about the audit:

- Command completes 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.
- 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 of discrepancy found in the audit:

  - Package specified in the audit file is not present at all. In other words, there was no **install add** performed for this package.

- 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 route processors (RPs) is not active on all RPs audited (either the entire router or a specific SDR, depending on the scope of command).
- 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.
- Extra package that is not present in the audit file is active on all nodes being audited.
- 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.

Task ID

Task ID	Operations
pkg-mgmt	read

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)
Info:  0/5/CPU0, 0/3/CPU0.
Install audit operation completed.
Install audit result: FAILED (discrepancies found)
```

Related Topics

install activate, on page 795
show install active, on page 844
show install package, on page 872
show install pie-info, on page 875
show install which, on page 888

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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show install auto-abort-timer** command displays the timer value configured with the **install activate** and **install deactivate** commands.

Task ID

Task ID	Operations
pkg-mgmt	read

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
```

Related Topics

install activate, on page 795
install deactivate, on page 819

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* | **all**}	(Optional) Specifies a node. The *node-id* argument is expressed in *rack*/*slot*/*module* notation. The **all** keyword specifies all nodes.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show 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

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.
  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 Topics

reload (administration EXEC), on page 64
clear install boot-options, on page 787
show install boot-options, on page 857
install boot-options, on page 815

show install inactive

To display the inactive packages on the designated secure domain router shelf 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

detail	(Optional) Displays summary and component information for inactive packages.
summary	(Optional) Displays a summary of inactive packages.
verbose	(Optional) Displays summary, component, and file information for inactive packages.
sdr *sdr-name*	(Optional. Administration EXEC mode only.) Displays the inactive packages for a the boot device in a specific secure domain router (SDR). The *sdr-name* argument is the name assigned to the SDR.
location *node-id*	(Optional) Displays the inactive software set from a designated node. The *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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	Modification
Release 3.4.0	This command was modified to display inactive packages only for the boot device.

Usage Guidelines

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** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.
- To display information for all SDRs in the system, enter the command in administration EXEC mode, without the **sdr** keyword.

Displaying Information for a Specific Node

Use the **location** *node-id* keyword and argument to display information for a specific node. If you do not specify a location with the **location** *node-id* keyword and 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

The following example shows sample output from the **show install inactive** command:

```
RP/0/RP0/CPU0:router# show install inactive

 Tue Feb  3 02:02:07.970 PST
  Node 0/0/CPU0 [LC] [SDR: Owner]
    Boot Device: bootflash:
    Inactive Packages:
      disk0:comp-hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I
      disk0:hfr-mgbl-p-4.0.0.15I
```

```
  Node 0/1/CPU0 [LC] [SDR: Owner]
    Boot Device: bootflash:
    Inactive Packages:
      disk0:comp-hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I
      disk0:hfr-mgbl-4.0.0.15I

  Node 0/5/CPU0 [LC] [SDR: Owner]
    Boot Device: bootflash:
    Inactive Packages:
      disk0:comp-hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I
      disk0:hfr-mgbl-p-4.0.0.15I

  Node 0/6/CPU0 [LC] [SDR: Owner]
    Boot Device: bootflash:
    Inactive Packages:
      disk0:comp-hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I

  Node 0/RP0/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Inactive Packages:
      disk0:comp-hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-doc-p-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
      disk0:hfr-mgbl-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I

  Node 0/RP1/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Inactive Packages:
      disk0:comp-hfr-mini-4.0.0.15I
      disk0:hfr-fpd-4.0.0.15I
      disk0:hfr-doc-p-4.0.0.15I
      disk0:hfr-diags-p-4.0.0.15I
      disk0:hfr-mgbl-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-mpls-p-4.0.0.15I
```

The following example shows sample output from the **show install inactive** command with the **summary** keyword:

```
RP/0/RP0/CPU0:router# show install inactive summary

Wed May 26 08:51:00.490 DST
  Inactive Packages:
      disk0:hfr-mini-4.0.0.15I
      disk0:hfr-k9sec-p-4.0.0.15I
```

```
      disk0:hfr-mpls-p-4.0.0.15I
      disk0:hfr-mgbl-p-4.0.0.15I
      disk0:hfr-mcast-p-4.0.0.15I
      disk0:hfr-doc-p-4.0.0.15I
      disk0:hfr-fpd-p-4.0.0.15I
```

The following example shows sample output from the **show install inactive** command with the **detail** and **location** keywords:

```
RP/0/RP0/CPU0:router# show install inactive detail location 0/1/cpu0

Tue Feb  3 02:14:31.299 PST
  Node 0/1/CPU0 [LC] [SDR: Owner]
    Boot Device: bootflash:
    Inactive Packages:
      disk0:comp-hfr-mini-3.7.2
        disk0:hfr-lc-3.7.2
        disk0:hfr-fwdg-3.7.2
        disk0:hfr-admin-3.7.2
        disk0:hfr-base-3.7.2
        disk0:hfr-os-mbi-3.7.2
      disk0:hfr-infra-test-3.7.2
      disk0:hfr-fpd-3.7.2
      disk0:hfr-diags-3.7.2
      disk0:hfr-mcast-3.7.2
      disk0:hfr-mpls-3.7.2
```

Table 76: show install inactive Field Descriptions

Field	Description
disk0:hfr-mgbl-3.8.0	Storage device and the name of the package that is inactive.
hfr-mgbl V3.8.0 Manageability Package	Name of the package that is inactive.
Vendor	Name of the manufacturer.
Desc	Name of the package.
Build	The date and time when the inactive package was built.
Source	The source directory where the inactive package was built.

Related Topics

install deactivate, on page 819
show install package, on page 872
show install pie-info, on page 875
show install which, on page 888

show install issu inventory

To display the status of each node and the current status of ISSU, use the **show install issu inventory** command in administration EXEC mode.

show install issu inventory[{**detail**|**type** *ism-card-type*}]

Syntax Description

detail	Displays detailed information about the status of each card.
type *ism-card-type*	displays information regarding a specific card type. *ism-card-type* values can be of the following: **1**—Show inventory of all Active RPs in ndsc Racks **2**—Show inventory of all Standby RPs in ndsc Racks **3**—Show inventory of all Active DRPs (any rack) **4**—Show inventory of all Standby DRPs (any rack) **5**—Show inventory of the dSC node **6**—Show inventory of the Standby dSC node **7**—Show inventory of all Active Non-root SCs **8**—Show inventory of all Standby Non-root SCs **9**—Show inventory of the Root SC **10**—Show inventory of the Root SC backup **11**—Show inventory of all LCs (any rack) **12**—Show inventory of all Non-Fabric SPs. Eg:LC, Alarm, Fan Controller SPs **13**—Show inventory of all Fabric SPs

Command Default

Summary information is displayed

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show install issu inventory** command displays output only when the ISSU process is running.

Task ID

Task ID	Operation
pkg-mgmt	read

show install issu stage

To display the current stage of the running ISSU process, use the **show install issu stage** command in administration EXEC mode.

show install issu stage [detail]

Syntax Description

detail	Displays more information regarding the stage of the process.

Command Default

Displays summary information about the ISSU stage on the router.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show install issu stage** command displays output only when the ISSU process is running.

Task ID

Task ID	Operation
pkg-mgmt	read

This example displays output from the **show install issu stage** command during the load phase:

```
RP/0/RP0/CPU0:router(admin)# show install issu stage

Thu Dec 8 16:09:48.397 UTC
Current State : LOAD phase done (Load phase done)
Status : 31% Completed
Participating nodes : 0
Nodes in progress : 0
```

show install log

To display the details of installation requests, use the **show install log** command in EXEC or administration EXEC mode.

show install log [{*install-id*|**from** *install-id*}] [{**detail**|**verbose**}] **[reverse]**

Syntax Description

install-id	(Optional) Identifier assigned to an installation operation.
from *install-id*	(Optional) Displays information for logs from the specified installation identifier and forward.
detail	(Optional) Displays details including impact to processes and nodes.
verbose	(Optional) Displays the information from the keyword, plus additional information about impacts to files, processes, and dynamic link libraries (DLLs).
reverse	(Optional) Displays the logs in reverse order.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 3.6.0	Support was added for the **from** and **reverse** keywords.

Usage Guidelines

Enter the **show install log** command with no arguments to display a summary of all installation operations, including the changes to files and the processes impacted by each request. Specify the *install-id* argument to display details for a specific operation.

The *install-id* argument is listed beside each operation in the **show install log** summary and is attached to messages from that operation. For example, the third installation operation has “Install 3:” attached to all its status messages.

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 for a Specific SDR or All SDRs

- To display information for a specific SDR from administration EXEC mode, use the **sdr** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.
- To display information for all SDRs in the system, enter the command in administration EXEC mode, without the **sdr** keyword.

Detailed and Verbose Information

Use the **detail** keyword to display detailed information for all previous installations, including impact to processes and nodes impacted. The detailed information is a subset of the information displayed with the **verbose** keyword.

Use the **verbose** keyword 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

The following example shows a summary of all installation requests:

```
RP/0/RP0/CPU0:router# show install log

Thu May 27 11:19:18.177 DST

Install operation 1 started by user 'userx' via CLI at 03:46:56 DST Tue May
11 2010.
 (admin) install add
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-doc.pie-4.0.0.15I.DT_IMAGE
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-fpd.pie-4.0.0.15I.DT_IMAGE
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-k9sec.pie-4.0.0.15I.DT_IMAGE
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-mcast.pie-4.0.0.15I.DT_IMAGE
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-mgbl.pie-4.0.0.15I.DT_IMAGE
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-mpls.pie-4.0.0.15I.DT_IMAGE
 /tftp://172.23.16.140/auto/tftpboot-users/usera/hfr-upgrade.pie-4.0.0.15I.DT_IMAGE activate
Install operation 1 completed successfully at 04:09:19 DST Tue May 11 2010.

------------------------------------------------------------------------------

Install operation 2 started by user 'userx' via CLI at 05:37:25 DST Tue May
11 2010.
    (admin) install commit
    Install operation 2 completed successfully at 05:37:36 DST Tue May 11 2010.

------------------------------------------------------------------------------

2 entries shown
```

The following example shows the details for a specific installation request. The **detail** keyword is used to display additional information about the impact of the operation to processes and nodes:

```
RP/0/RP0/CPU0:router(admin)# show install log 1 detail
Tue Jul 28 02:30:52.089 DST
```

```
Install operation 1 started by user 'user_b' via CLI at 19:42:38 DST Tue Jul 14 2009.
(admin) install add
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-diags-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-doc.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-fpd.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-k9sec-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mcast-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mgbl-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mpls-p.pie-3.9.0.14I
Install operation 1 completed successfully at 20:39:04 DST Tue Jul 14 2009.

Install logs:
    Install operation 1 '(admin) install add
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-diags-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-doc.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-fpd.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-k9sec-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mcast-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mgbl-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mpls-p.pie-3.9.0.14I
    activate' started by user 'user_b' via CLI at 19:42:38 DST
    Tue Jul 14 2009.
    Part 1 of 2 (add software): Started
    Info:     The following packages are now available to be activated:
    Info:
    Info:         disk0:hfr-diags-3.9.0.14I
    Info:         disk0:hfr-doc-3.9.0.14I
    Info:         disk0:hfr-fpd-3.9.0.14I
    Info:         disk0:hfr-k9sec-3.9.0.14I
    Info:         disk0:hfr-mcast-3.9.0.14I
    Info:         disk0:hfr-mgbl-3.9.0.14I
    Info:         disk0:hfr-mpls-3.9.0.14I
    Info:
    Info:     The packages can be activated across the entire router.
    Info:
    Part 1 of 2 (add software): Completed successfully
    Part 2 of 2 (activate software): Started
    Info:     The following sequence of sub-operations has been determined to
    Info:     minimize any impact:
    Info:
    Info:     Sub-operation 1:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-mgbl-3.9.0.14I
    Info:
    Info:     Sub-operation 2:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-k9sec-3.9.0.14I
    Info:
    Info:     Sub-operation 3:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-diags-3.9.0.14I
    Info:
    Info:     Sub-operation 4:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-fpd-3.9.0.14I
    Info:
    Info:     Sub-operation 5:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-doc-3.9.0.14I
    Info:
    Info:     Sub-operation 8:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-mpls-3.9.0.14I
```

```
    Info:
    Info:     Sub-operation 9:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-mcast-3.9.0.14I
    Info:
    Info:     The changes made to software configurations will not be
    Info:     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
    Info:     software change using the following commands:
    Info:         show system verify
    Info:         install verify packages
    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 1 completed successfully at 20:39:04 DST Tue Jul 14 2009.

Summary:
    Sub-operation 1:
    Install method: Parallel Process Restart
    Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
        Activated:    hfr-mgbl-3.9.0.14I
            9 hfr-mgbl processes affected (0 updated, 9 added, 0 removed, 0 impacted)

    Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
        Activated:    hfr-mgbl-3.9.0.14I
            9 hfr-mgbl processes affected (0 updated, 9 added, 0 removed, 0 impacted)

    Sub-operation 2:
    Install method: Parallel Process Restart
    Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
        Activated:    hfr-k9sec-3.9.0.14I
            9 hfr-k9sec processes affected (0 updated, 9 added, 0 removed, 0 impacted)

    Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
        Activated:    hfr-k9sec-3.9.0.14I
            9 hfr-k9sec processes affected (0 updated, 9 added, 0 removed, 0 impacted)

    Sub-operation 3:
    Install method: Parallel Process Restart
    Summary of changes on nodes 0/1/SP, 0/4/SP, 0/6/SP, 0/SM0/SP, 0/SM1/SP,
    0/SM2/SP, 0/SM3/SP:
        Activated:    hfr-diags-3.9.0.14I
        No processes affected

    Summary of changes on nodes 0/1/CPU0, 0/6/CPU0:
        Activated:    hfr-diags-3.9.0.14I
        No processes affected

    Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
        Activated:    hfr-diags-3.9.0.14I
        No processes affected

    Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
        Activated:    hfr-diags-3.9.0.14I
        No processes affected

    Sub-operation 4:
    Install method: Parallel Process Restart
    Summary of changes on nodes 0/1/SP, 0/4/SP, 0/6/SP, 0/SM0/SP, 0/SM1/SP,
    0/SM2/SP, 0/SM3/SP:
        Activated:    hfr-fpd-3.9.0.14I
        No processes affected
```

```
Summary of changes on nodes 0/1/CPU0, 0/6/CPU0:
    Activated:    hfr-fpd-3.9.0.14I
    No processes affected

Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
    Activated:    hfr-fpd-3.9.0.14I
    No processes affected

Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
    Activated:    hfr-fpd-3.9.0.14I
    No processes affected

Sub-operation 5:
Install method: Parallel Process Restart
Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
    Activated:    hfr-doc-3.9.0.14I
    No processes affected

Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
    Activated:    hfr-doc-3.9.0.14I
    No processes affected

Sub-operation 6:
Install method: Parallel Process Restart
Summary of changes on nodes 0/1/CPU0, 0/6/CPU0:
    Activated:    hfr-mpls-3.9.0.14I
        1 hfr-mpls processes affected (0 updated, 1 added, 0 removed, 0 impacted)

Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
    Activated:    hfr-mpls-3.9.0.14I
        7 hfr-mpls processes affected (0 updated, 7 added, 0 removed, 0 impacted)

Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
    Activated:    hfr-mpls-3.9.0.14I
        7 hfr-mpls processes affected (0 updated, 7 added, 0 removed, 0 impacted)

Sub-operation 7:
Install method: Parallel Process Restart
Summary of changes on nodes 0/1/CPU0, 0/6/CPU0:
    Activated:    hfr-mcast-3.9.0.14I
        2 hfr-mcast processes affected (0 updated, 2 added, 0 removed, 0 impacted)

Summary of changes on nodes 0/4/CPU0, 0/4/CPU1:
    Activated:    hfr-mcast-3.9.0.14I
        16 hfr-mcast processes affected (0 updated, 16 added, 0 removed, 0 impacted)

Summary of changes on nodes 0/RP0/CPU0, 0/RP1/CPU0:
    Activated:    hfr-mcast-3.9.0.14I
        16 hfr-mcast processes affected (0 updated, 16 added, 0 removed, 0 impacted)
```

The following example shows information for the installation requests. The **verbose** keyword is used to display detailed information including file changes, impact to processes, and impact to DLLs.

```
RP/0/RP0/CPU0:router(admin)# show install log 2 verbose

Tue Jul 28 02:12:44.899 DST

Install operation 1 started by user 'user_b' via CLI at 19:42:38 DST Tue Jul14 2009.
(admin) install add
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-diags-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-doc.pie-3.9.0.14I
```

```
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-fpd.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-k9sec-p.pie-3.9.0
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mcast-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mgbl-p.pie-3.9.0.14I
/tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mpls-p.pie-3.9.0.14I
Install operation 1 completed successfully at 20:39:04 DST Tue Jul 14 2009.

Install logs:
    Install operation 1 '(admin) install add
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-diags-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-doc.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-fpd.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-k9sec-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mcast-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mgbl-p.pie-3.9.0.14I
    /tftp://172.23.16.81/auto/tftpboot-users/user_b/hfr-mpls-p.pie-3.9.0.14I
  activate' started by user 'user_b' via CLI at 19:42:38 DST
    Tue Jul 14 2009.
    Part 1 of 2 (add software): Started
    Info:     The following packages are now available to be activated:
    Info:
    Info:         disk0:hfr-diags-3.9.0.14I
    Info:         disk0:hfr-doc-3.9.0.14I
    Info:         disk0:hfr-fpd-3.9.0.14I
    Info:         disk0:hfr-k9sec-3.9.0.14I
    Info:         disk0:hfr-mcast-3.9.0.14I
    Info:         disk0:hfr-mgbl-3.9.0.14I
    Info:         disk0:hfr-mpls-3.9.0.14I
    Info:
    Info:     The packages can be activated across the entire router.
    Info:
    Part 1 of 2 (add software): Completed successfully
    Part 2 of 2 (activate software): Started
    Info:     The following sequence of sub-operations has been determined to
    Info:     minimize any impact:
    Info:
    Info:     Sub-operation 1:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-mgbl-3.9.0.14I
    Info:
    Info:     Sub-operation 2:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-k9sec-3.9.0.14I
    Info:
    Info:     Sub-operation 3:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-diags-3.9.0.14I
    Info:
    Info:     Sub-operation 4:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-fpd-3.9.0.14I
    Info:
    Info:     Sub-operation 5:
    Info:         Install Method: Parallel Process Restart
    Info:         hfr-doc-3.9.0.14I
 --More--
```

The following example shows 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 2008.
(admin) install add /tftp:/xx-tftp/user_a/hfr-fpd.pie
Install operation 2 completed successfully at 12:35:19 GMT Mon Oct 29 2008.
-------------------------------------------------------------------------------

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/hfr-mgbl.pie
Install operation 1 completed successfully at 12:32:12 GMT Mon Oct 29 2008.
```

Related Topics

install activate, on page 795
install add, on page 805
install deactivate, on page 819
install remove, on page 828
install commit, on page 817
install rollback to, on page 831
install verify packages, on page 838

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

device : *package*	Device and package, expressed in concatenated form (for example, disk0:hfr-mgbl-3.8.0). For the *device:* 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 about dynamic link libraries (DLLs).

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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.

Usage Guidelines

Use the **show install package** command with the **all** keyword to display a list of the packages on the router or SDR.

Use the **show install package** command with the **detail** keyword to display the version of the package, name of the manufacturer, name of the package, date and time when the package was built, and source directory where the package was built.

Use the **show install package** command with the **verbose** keyword to display the same information as the **detail** keyword, plus additional information about DLLs.

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

The following sample output from the **show install package** command lists all packages that are available on the router:

```
RP/0/RP0/CPU0:router# show install package all

Thu May 27 04:20:35.273 DST
disk0:hfr-fpd-4.0.0.15I

disk0:hfr-doc-p-4.0.0.15I
    disk0:iosxr-docs-4.0.0.15I

disk0:hfr-mgbl-p-4.0.0.15I
    disk0:hfr-mgbl-supp-4.0.0.15I
    disk0:iosxr-mgbl-4.0.0.15I

disk0:hfr-mpls-p-4.0.0.15I
    disk0:iosxr-mpls-4.0.0.15I

disk0:hfr-diags-p-4.0.0.15I
    disk0:hfr-diags-supp-4.0.0.15I

disk0:hfr-k9sec-p-4.0.0.15I
    disk0:hfr-k9sec-supp-4.0.0.15I
    disk0:iosxr-security-4.0.0.15I

disk0:hfr-mcast-p-4.0.0.15I
    disk0:hfr-mcast-supp-4.0.0.15I
    disk0:iosxr-mcast-4.0.0.15I

disk0:comp-hfr-mini-4.0.0.15I
    disk0:hfr-fwding-4.0.0.15I
    disk0:hfr-base-4.0.0.15I
    disk0:hfr-os-mbi-4.0.0.15I
    disk0:iosxr-routing-4.0.0.15I
    disk0:iosxr-fwding-4.0.0.15I
    disk0:iosxr-infra-4.0.0.15I
    disk0:iosxr-diags-4.0.0.15I

disk0:hfr-upgrade-p-4.0.0.15I
    disk0:hfr-doc-4.0.0.15I
    disk0:hfr-k9sec-4.0.0.15I
    disk0:hfr-sbc-4.0.0.15I
    disk0:hfr-diags-4.0.0.15I
    disk0:hfr-mgbl-4.0.0.15I
    disk0:hfr-mcast-4.0.0.15I
    disk0:hfr-mpls-4.0.0.15I
    disk0:hfr-rout-4.0.0.15I
```

```
    disk0:hfr-fwdg-4.0.0.15I
    disk0:hfr-lc-4.0.0.15I
    disk0:hfr-admin-4.0.0.15I
```

The following sample output from the **show install package** command lists all the packages contained in a composite package:

```
RP/0/RP0/CPU0:router# show install package disk0:comp-
hfr
-mini-4.0.0.15I

Thu May 27 04:26:37.095 DST
disk0:comp-
hfr-mini-4.0.0.15I
    disk0:hfr-fwding-4.0.0.15I
    disk0:hfr-base-4.0.0.15I
    disk0:hfr-os-mbi-4.0.0.15I
    disk0:iosxr-routing-4.0.0.15I
    disk0:iosxr-fwding-4.0.0.15I
    disk0:iosxr-infra-4.0.0.15I
    disk0:iosxr-diags-4.0.0.15I
```

Table 77: show install package Field Descriptions

Field	Description
disk0:hfr-rout-3.8.0	Storage device and the name of the package that has been installed.
hfr-rout V3.8.0 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.
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 Topics

show install active, on page 844
show install inactive, on page 859
show install log, on page 865
show install, on page 841
show install pie-info, on page 875
show install which, on page 888

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

device **:** *package*	Device, directory path, and package, expressed in concatenated form.
brief	(Optional) Displays summary information.
detail	(Optional) Displays detailed information.
verbose	(Optional) Displays comprehensive information.

Command Default

Displays summary information.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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. The **summary** keyword was replaced by the **brief** keyword.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **install pie-info** command to display information about a specified PIE installation file.

Task ID

Task ID	Operations
pkg-mgmt	read

The following example illustrates sample output from the **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
tftp://223.255.254.254/auto/tftpboot/users/usera/hfr-mcast-p.pie
Thu May 27 17:05:19.888 UTC
```

```
Contents of pie file '/tftp://223.255.254.254/auto/tftpboot/users/usera/hfr-mcast-p.pie':
  Expiry date       : Oct 17, 2015 01:51:47 UTC
  Uncompressed size : 17694945
  Compressed size   : 7022792

  hfr-mcast-p-4.0.0.18C
    hfr-mcast-supp-4.0.0.18C
    iosxr-mcast-4.0.0.18C
```

The following example illustrates sample output from the **install pie-info** command with the **detail** keyword. 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-3.8.0 detail
Contents of pie file '/disk1:/hfr-mgbl-p.pie-3.8.0':
  Expiry date       : Jan 19, 2007 02:55:56 UTC
  Uncompressed size : 17892613
  hfr-mgbl-3.8.0
  hfr-mgbl V3.8.0[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/3.8.0/hfr/workspace for c28
  Card(s): RP, DRP, DRPSC
  Restart information:
    Default:
      parallel impacted processes restart
      Components in package hfr-mgbl-3.8.0, 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 hfrsemweb 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-mda-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 ()
    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 example illustrates sample output from the **install pie-info** command with the **verbose** keyword. This command displays the same information as the **detail** keyword, plus additional information about 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
        Manageabilty-Debug.info
        Manageabilty.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
        ibhttperr.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_cmn_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
  libxmlcfgmgrops.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-mda-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_cmn_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 ()
  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)
  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 78: 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 Topics

show install active, on page 844
show install inactive, on page 859
show install log, on page 865
show install package, on page 872
show install request, on page 882
show install which, on page 888

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.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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.

Usage Guidelines

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

The following example shows 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 example shows 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 Topics

install activate, on page 795
install add, on page 805
install deactivate, on page 819
install remove, on page 828
install rollback to, on page 831
install verify packages, on page 838

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-idlabel*} [{**detail**|**summary**}] [{**sdr** *sdr-name*|**location** *node-id*}]

EXEC Mode
show install rollback {*point-idlabel*} [{**detail**|**summary**}] [**location** *node-id*]

Syntax Description

point-id	Installation point ID number.
label	Label associated with an installation point ID.
detail	(Optional) Displays a detailed summary of information for a system, SDR, or node, including the packages contained in a composite package.
summary	(Optional) Displays a summary of information in a system or SDR.
sdr *sdr-name*	(Optional) Displays information for a specific secure domain router (SDR). The *sdr-name* argument is the name assigned to the SDR. This option is in administration EXEC mode only.
location *node-id*	(Optional) Displays information for a designated node. The *node-id* argument is expressed in *rack/slot/module* notation.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.0	This command was introduced.
Release 3.2	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** *sdr-name* , **detail** , and **summary** .
Release 3.4.0	Support was added for EXEC mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **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.

Displaying Information for a Specific SDR or All Nodes

- To display information for a specific SDR from administration EXEC mode, use the **sdr** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.
- To display information for all SDRs in the system, enter the command in administration EXEC mode, without the **sdr** keyword.

Displaying Information for a Specific Node

Use the **location** *node-id* keyword and argument to display information for a specific node. If you do not specify a location with the **location** *node-id* keyword and 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

In the following example, the **show install rollback** command with the **?** option 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 a specific rollback point. This display summarizes the packages that are used by the **install rollback to** command:

```
RP/0/RP0/CPU0:router# show install rollback 0
```

```
Thu May 27 05:41:36.484 DST
ID: 0, Label:
Timestamp: 09:35:55 UTC Mon May 10 2010

  Node 0/6/CPU0 [LC] [SDR: Owner]
    Boot Device: mem:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/lc/mbihfr-lc.vm
    Rollback Packages:
      disk0:comp-hfr-mini-4.0.0.15I

  Node 0/RP0/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/mbihfr-rp.vm
    Rollback Packages:
      disk0:comp-hfr-mini-4.0.0.15I

  Node 0/RP1/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/mbihfr-rp.vm
    Rollback Packages:
      disk0:comp-hfr-mini-4.0.0.15I
```

In the following example, the **show install rollback** command with the **detail** keyword displays additional information for the packages, including the individual packages included in the composite packages:

```
RP/0/RP0/CPU0:router# show install rollback 0 detail

Thu May 27 06:01:55.133 DST
ID: 0, Label:
Timestamp: 09:35:55 UTC Mon May 10 2010

  Node 0/6/CPU0 [LC] [SDR: Owner]
    Boot Device: mem:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/lc/mbihfr-lc.vm
    Rollback Packages:
      disk0:comp-hfr-mini-4.0.0.15I
          disk0:hfr-fwding-4.0.0.15I
          disk0:hfr-base-4.0.0.15I
          disk0:hfr-os-mbi-4.0.0.15I
          disk0:iosxr-routing-4.0.0.15I
          disk0:iosxr-fwding-4.0.0.15I
          disk0:iosxr-infra-4.0.0.15I
          disk0:iosxr-diags-4.0.0.15I

  Node 0/RP0/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/mbihfr-rp.vm
    Rollback Packages:
      disk0:comp-hfr-mini-4.0.0.15I
          disk0:hfr-fwding-4.0.0.15I
          disk0:hfr-base-4.0.0.15I
          disk0:hfr-os-mbi-4.0.0.15I
          disk0:iosxr-routing-4.0.0.15I
          disk0:iosxr-fwding-4.0.0.15I
          disk0:iosxr-infra-4.0.0.15I
          disk0:iosxr-diags-4.0.0.15I

  Node 0/RP1/CPU0 [HRP] [SDR: Owner]
    Boot Device: disk0:
    Boot Image: /disk0/hfr-os-mbi-4.0.0.15I/mbihfr-rp.vm
    Rollback Packages:
```

```
disk0:comp-hfr-mini-4.0.0.15I
    disk0:hfr-fwding-4.0.0.15I
    disk0:hfr-base-4.0.0.15I
    disk0:hfr-os-mbi-4.0.0.15I
    disk0:iosxr-routing-4.0.0.15I
    disk0:iosxr-fwding-4.0.0.15I
    disk0:iosxr-infra-4.0.0.15I
    disk0:iosxr-diags-4.0.0.15I
```

Table 79: 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 Topics

clear install rollback oldest, on page 791
install rollback to, on page 831

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

component *name*	Displays the package information for the component specified in the *name* argument.
verbose	(Optional) Displays summary, component, and file information for each component.
file *filename*	Displays the package information for the file specified in the *filename* argument.
sdr *sdr-name*	(Optional. Administration EXEC mode only.) Displays information for a specific secure domain router (SDR). The *sdr-name* argument is the name assigned to the SDR.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.

Command Default

The default search is performed for the active software set.

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	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 **files** keyword. Support was added for the **verbose** keyword. Support was added for the **sdr** *sdr-name* keyword and argument.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show 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.

Displaying Information for a Specific SDR or All SDRs

- To display information for a specific SDR from administration EXEC mode, use the **sdr** *sdr-name* keyword and argument.
- To display information for an SDR when logged into that SDR, enter the command in EXEC mode.
- To display information for all SDRs in the system, enter the command in administration EXEC mode, without the **sdr** keyword.

Displaying Information for a Specific Node

Use the **location** *node-id* keyword and argument to display information for a specific node. If you do not specify a location with the **location** *node-id* keyword and argument, this command displays information from all nodes.

Note 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

The following example shows cisco discovery protocol (CDP) information for a single node. The **show install which** command is entered with the **file** and **location** keywords specified:

```
RP/0/RP0/CPU0:router# show install which file cdp location 0/6/cpu0

Wed Jul 14 05:56:04.873 DST
Node 0/6/CPU0 has file cdp for boot package /disk0/hfr-os-mbi-4.0.0.24I/lc/mbihfr-lc.vm
from iosxr-fwding
Package:
    iosxr-fwding
        iosxr-fwding V4.0.0.24I[Default]  IOS-XR Forwarding Package Definition
        Vendor : Cisco Systems
        Desc   : IOS-XR Forwarding Package Definition
        Build  : Built on Thu Jul  8 09:33:02 DST 2010
        Source : By sjc-lds-836 in
/auto/ioxbuild6/production/4.0.0.24I.SIT_IMAGE/hfr/workspace for pie
        Card(s): RP, RP-B, HRP, DRP, 40G-MSC, SC
        Restart information:
          Default:
            parallel impacted processes restart
        Size Compressed/Uncompressed: 28MB/70MB (39%)

Component:
    cdp V[ci-40-bugfix/9]  Cisco Discovery Protocol (CDP)

File:
    cdp
        Card(s)              : RP, RP-B, HRP, DRP, 40G-MSC, SC
```

```
File type            : Server
Remotely-hosted      : No
Local view           : /pkg/bin/cdp
Local install path   : /disk0/iosxr-fwding-4.0.0.24I/bin/cdp  (Uncompressed)
Central install path : /disk0/iosxr-fwding-4.0.0.24I/0x13/bin/cdp  (Compressed)
Uncompressed size    : 118KB
Compressed size      : 50KB
Uncompressed MD5     : 72a7bcd591b3d0022796b169ce9f612e
Compressed MD5       : 232144071cc7a9416f731fac0d835ba8
```

The following example shows the message displayed if the specified process, component, or package is not active on a node:

```
RP/0/RP0/CPU0:router# show install which file cdp location 0/1/CPU0

File cdp not active on node 0/6/CPU0
```

Table 80: show install which Field Descriptions

Field	Description
Package:	Name of the package that contains the file or component being described.
hfr-base V3.8.0	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 Topics

show install active, on page 844
show install inactive, on page 859

show install log, on page 865
show install package, on page 872
show install request, on page 882
show install, on page 841

show issu-warm-reload control-protocol trace

To display control protocol trace data about the ongoing process of an in-service software upgrade (ISSU), use the **show issu-warm-reload control-protocol trace** command in EXEC mode.

show issu-warm-reload control-protocol trace *data-type* **type**{**all**|**error**|**information**|**packet**} **[hexdump]** [**last** *n*] **[reverse] [stats] [tailf] [unique][verbose] [wrapping]**[**file** *filename* **original**]

Syntax Description

data-type	The type of data to display. Valid options are: • **all**—Displays all trace data. • **chdlc**—Displays Cisco High-Level Data Link Control (cHDLC) Serial Line Address Resolution Protocol (SLARP) data. • **control-io**—Displays control input-output (I/O) data. • **ipv6nd**—Displays IPv6 ND data. • **lacp**—Displays Link Aggregation Control Protocol (LACP) data. • **platform**—Displays platform data. • **ppp**—Displays PPP data. all, chdlc, control-io, ipv6nd, lacp,
type	Specifies the format of trace data to display.
all	Displays error, information and packet traces.
error	Displays error traces.
information	Displays information traces.
packet	Displays packet traces.
hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
verbose	(Optional) Displays additional internal debugging information.

wrapping	(Optional) Displays wrapping entries.
file *filename* **original**	(Optional) Specifies the filename of the file to display. You can specify up to four trace files.

Command Default

None.

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show issu-warm-reload control-protocol trace** command only provides information while the ISSU process is running. After the installation is complete, no information is provided.

Task ID

Task ID	Operation
system	read

Terminal Services Commands

This chapter describes the Cisco IOS XR commands used for setting up physical and virtual terminal connections, managing terminals, and configuring virtual terminal line (vty) pools. It also includes commands for the managing the Craft Panel Interface.

For detailed information about configuring physical and virtual terminals, see the *Implementing Physical and Virtual Terminals on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco CRS Routers*.

absolute-timeout

To set the absolute timeout for line disconnection, use the **absolute-timeout** command in line template configuration mode. To remove the **absolute-timeout** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

absolute-timeout *minutes*
no absolute-timeout *minutes*

Syntax Description

minutes	Absolute timeout interval, in minutes. Range is from 10 to 10000.

Command Default

minutes: 1440

Command Modes

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **absolute-timeout** command to terminate the connection after the specified time has elapsed, regardless of whether the connection is being used at the time of termination. You can specify an absolute-timeout value for each port. The user is notified 20 seconds before the session is terminated.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the session timeout value to 2880 minutes (2 days) for the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# absolute-timeout 2880
```

Related Commands

Command	Description
banner incoming, on page 905	Sets the idle wait timeout interval for user input over a physical terminal connection.
session-timeout, on page 937	Sets the idle wait timeout interval for user input over a virtual terminal connection.

access-class

To restrict incoming and outgoing connections using an IPv4 or IPv6 access list, use the **access-class** command in line template configuration mode. To remove the restriction, use the **no** form of this command.

access-class *list-name* {**in**|**out**}
no accessclass *list-name* {**in**|**out**}

Syntax Description

list-name	IPv4 or IPv6 access list name.
in	Filters incoming connections.
out	Filters outgoing connections.

Command Default

No access class is set.

Command Modes

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **access-class** command to restrict incoming or outgoing connections to addresses defined in an access list. Use the **ipv4 access-list** or **ipv6 access-list** command to define an access list by name.

Note To restrict access of incoming or outgoing connections over IPv4 and IPv6, the IPv4 access list and IPv6 access list must share the same name.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to specify an access class assigned to outgoing connections for the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# access-class vtyacl out
```

The following sample output from the **show ipv4 access-lists** command displays the IPv4 access list named vtyacl:

```
RP/0/RP0/CPU0:router# show ipv4 access-lists vtyacl

ipv4 access-list vtyacl
 10 permit ip host 10.32.162.48 any
 20 permit ip host 10.20.49.170 any
 30 permit ip host 10.60.3.5 any
```

The following sample output from the **show ipv6 access-lists** command displays the IPv6 access list name vtyacl:

```
RP/0/RP0/CPU0:router# show ipv6 access-lists vtyacl

ipv6 access-list vtyacl
 10 permit ipv6 host 2001:db8:2222:: any
 20 permit ipv6 host 2001:db8:0:4::2 any
```

Related Commands

Command	Description
ipv4 access-list	Defines an IPv4 access list by name.
ipv6 access-list	Defines an IPv6 access list by name.

autocommand

To automatically run one or more commands after a user logs in to a vty terminal session, use the **autocommand** command in line default or line template configuration mode. To remove the **autocommand** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

autocommand *command*
no autocommand *command*

Syntax Description

command	Command or command alias to be executed on user login to a vty session.

Command Default

No default behavior or values

Command Modes

Line template configuration

Line default configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **autocommand** command to automatically run a command or command alias when a user logs in to a vty session. To run multiple commands, use a command alias for the *command* argument. When the user logs in, the commands included in the alias are run sequentially.

Note The **autocommand** command is supported on vty connections only; it is not supported on console or aux line connections. Use this command to automatically run a command after user login.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to use the **autocommand** command to automatically run the **show ip interface brief** command when a user logs in to a default vty session:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# autocommand show ip interface brief
RP/0/RP0/CPU0:router(config-line)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes
```

```
RP/0/RP0/CPU0:router# exit

  <Your 'TELNET' connection has terminated>
```

The following example shows how the **show ip interface brief** command is automatically run when the user logs on to a vty session:

```
User Access Verification

Username: lab
Password:

Executing Autocommand 'show ip interface brief'
RP/0/RP0/CPU0:router# show ip interface brief

Interface                      IP-Address      Status                Protocol
MgmtEth0/RP0/CPU0/0            172.16.0.0      Up                    Up
POS0/0/0/0                     unassigned      Up                    Up
POS0/0/0/1                     unassigned      Up                    Up
POS0/0/0/2                     unassigned      Up                    Up
POS0/0/0/3                     unassigned      Up                    Up
POS0/3/0/0                     unassigned      Up                    Up
POS0/3/0/1                     unassigned      Up                    Up
POS0/3/0/2                     unassigned      Up                    Up
POS0/3/0/3                     unassigned      Up                    Up
```

The following example shows how to disable the feature using the **no** form of the **autocommand** command. In this example, the autocommand for the **show ip interface brief** command is disabled. When the user logs out, and logs back in, the **autocommand** command does not run.

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# no autocommand ?

  LINE  Appropriate EXEC command

RP/0/RP0/CPU0:router(config-line)# no autocommand show ip interface brief
RP/0/RP0/CPU0:router(config-line)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes

RP/0/RP0/CPU0:router# exit

<Your 'TELNET' connection has terminated>

User Access Verification

Username: lab
Password:
RP/0/RP0/CPU0:router#
```

The following example shows how to use a command alias with the **autocommand** command to run more than one command when a user logs in to a default vty session. In this example, the alias “test” is created to include the **show ip interface brief** command and the **show users** command. The autocommand feature is then used to run the “test” alias when a user logs in to the vty terminal:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# alias test show ip interface brief; show users
```

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# autocommand test
RP/0/RP0/CPU0:router(config-line)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes

RP/0/RP0/CPU0:router# exit

<Your 'TELNET' connection has terminated>

User Access Verification

Username: lab
Password:

Executing Autocommand 'test'
RP/0/RP0/CPU0:router# test

RP/0/RP0/CPU0:router# show ip interface brief

Interface                      IP-Address      Status                Protocol
MgmtEth0/RP0/CPU0/0            172.16.0.0      Up                    Up
POS0/0/0/0                     unassigned      Up                    Up
POS0/0/0/1                     unassigned      Up                    Up
POS0/0/0/2                     unassigned      Up                    Up
POS0/0/0/3                     unassigned      Up                    Up
POS0/3/0/0                     unassigned      Up                    Up
POS0/3/0/1                     unassigned      Up                    Up
POS0/3/0/2                     unassigned      Up                    Up
POS0/3/0/3                     unassigned      Up                    Up

RP/0/RP0/CPU0:router# show users

   Line            User                Service  Conns   Idle        Location
*  vty0            lab                 telnet       0  00:00:00    172.16.0.0
```

banner exec

To create a message that is displayed when an EXEC process is created (an EXEC banner), use the **banner exec** command in Global Configuration mode.To delete the EXEC banner, use the **no** form of this command.

banner exec *delimiter message delimiter*
no banner exec

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. Text may include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 81: banner exec Tokens, on page 903.

Command Default

No EXEC banner is displayed.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **banner exec** command to specify a message that is displayed when an EXEC process is created (a line is activated or an incoming connection is made to a vty). Follow this command with one or more blank spaces and the delimiting character (c). After entering one or more lines of text, terminate the message with the delimiting character (c).

When a user connects to a router, the message-of-the-day (MOTD) banner appears first, followed by the login banner and prompts. After the user logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

Use tokens in the form $(*token*) in the message text to customize the banner. Tokens display current configuration variables, such as the router hostname and IP address.

The tokens are described in this table.

Table 81: 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

The following example shows how to set an EXEC banner that uses tokens:

```
RP/0/RP0/CPU0:router(config)# banner exec c

  Enter TEXT message.  End with the character 'c'.

THIS IS AN EXEC BANNER
c
```

Related Commands

Command	Description
banner incoming, on page 905	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner login, on page 907	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 909	Defines a customized MOTD banner.
banner prompt-timeout, on page 911	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

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 82: banner incoming Tokens, on page 906.

Command Default

No incoming banner is displayed.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow the **banner incoming** command with one or more blank spaces and the delimiting character (c). After entering one or more lines of text, terminate the message with the second occurrence of the delimiting character (c).

An *incoming connection* is one initiated from the network side of the router. Incoming connections are also called reverse Telnet sessions. These sessions can display message-of-the-day (MOTD) banners and incoming banners, but they do not display EXEC banners.

When a user connects to a router, the MOTD banner (if configured) appears first, followed by the login banner and prompts. After the user logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

Incoming banners cannot be suppressed. If you do not want the incoming banner to appear, you must delete it with the **no banner incoming** command.

To customize the banner, use tokens in the form $(*token*) in the message text. Tokens display current variables, such as the router hostname and IP address.

This table describes the tokens.

Table 82: banner incoming Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to create an incoming connection banner:

```
RP/0/RP0/CPU0:router(config)# banner incoming c

  Enter TEXT message. End with the character 'c'
THIS IS AN INCOMING BANNER.
c
```

Related Commands

Command	Description
banner exec, on page 903	Defines a customized banner that is displayed whenever the EXEC process is initiated.
banner login, on page 907	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 909	Defines a customized MOTD banner.
banner prompt-timeout, on page 911	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

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in Table 83: banner login Tokens, on page 907.

Command Default

No login banner is displayed.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow the **banner login** command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

When a user connects to the router, the message-of-the-day (MOTD) banner (if configured) appears first, followed by the login banner and prompts. After the user successfully logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

To customize the banner, use tokens in the form $(*token*) in the message text. Tokens display current configuration variables, such as the router hostname and IP address.

Tokens are described in the this table.

Table 83: banner login Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set a login banner:

```
RP/0/RP0/CPU0:router(config)# banner login c

Enter TEXT message. End with the character 'c'.
THIS IS A LOGIN BANNER
c
```

Related Commands

Command	Description
banner exec, on page 903	Defines a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 905	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner motd, on page 909	Defines a customized MOTD banner.
banner prompt-timeout, on page 911	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

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No MOTD banner is displayed.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow this command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

This MOTD banner is displayed to all terminals connected and is useful for sending messages that affect all users (such as impending system shutdowns). Use the **no banner motd** command to disable the MOTD banner on a line.

When a user connects to the router, the MOTD banner (if configured) appears first, followed by the login banner and prompts. After the user successfully logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

To customize the banner, use tokens in the form $(token) in the message text. Tokens display current configuration variables, such as the router hostname and IP address.

Tokens are described in this table.

Table 84: 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

The following example shows how to configure an MOTD banner with a token:

```
RP/0/RP0/CPU0:router(config)# banner motd c

  Enter TEXT message.  End with the character 'c'.
Notice: all routers in $(domain) will be upgraded beginning April 20
c
```

Related Commands

Command	Description
banner exec, on page 903	Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 905	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner login, on page 907	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner prompt-timeout, on page 911	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

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No banner is displayed when there is a login authentication timeout.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Follow this command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

This prompt-timeout banner is displayed when there is a login authentication timeout at the username and password prompt.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to configure a prompt-timeout banner:

```
RP/0/RP0/CPU0:router(config)# banner prompt-timeout c

Enter TEXT message.  End with the character 'c'.
THIS IS A PROMPT TIMEOUT BANNER
c
```

Related Commands

Command	Description
banner exec, on page 903	Defines and enables a customized banner that is displayed whenever the EXEC process is initiated.
banner incoming, on page 905	Defines and enables a customized message that is displayed when there is an incoming connection to a terminal line from a host on the network.
banner login, on page 907	Defines and enables a customized banner that is displayed before the username and password login prompts.
banner motd, on page 909	Defines a customized MOTD banner.

clear line

To clear an auxiliary or console line to an idle state, use the **clear line** command in EXEC mode.

clear line {**aux**|**console**} **location** *node-id*

Syntax Description

aux	Clears the auxiliary line.
console	Clears the console line.
location *node-id*	Specifies the location of a route processor (RP) where the auxiliary or console line to be cleared resides. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

None

Command Modes

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
tty-access	execute

The following example shows how to clear the console line, putting it in an idle state:

```
RP/0/RP0/CPU0:router# clear line console location 0/RP1/CPU0
```

Related Commands

Command	Description
show users, on page 946	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*

Syntax Description

line-number	Line number in the range from 0 to 99.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show users** command to determine the origin of the connection and which lines to clear. When a line is cleared to an idle state, the user on the other end of the connection receives notice that the connection was closed by a foreign host.

Task ID

Task ID	Operations
tty-access	execute

The following example shows how to reset vty 3 to the idle state:

```
RP/0/RP0/CPU0:router# clear line vty 3
```

Related Commands

Command	Description
show users, on page 946	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 keywords or arguments.

Command Default

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **cli 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

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
cli whitespace completion, on page 916	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 keywords or arguments.

Command Default

Whitespace completion is disabled.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

The following example shows how to enable whitespace completion:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# cli whitespace completion
```

Related Commands

Command	Description
cli interactive syntax check, on page 915	Enables interactive syntax checking.

databits

To set the data bits per character for physical terminal connections, use the **databits** command in line console configuration mode. To restore the default value, use the **no** form of this command.

databits {**5**|**6**|**7**|**8**}
no databits

Syntax Description

5	Sets the data bits per character to 5.
6	Sets the data bits per character to 6.
7	Sets the data bits per character to 7.
8	Sets the data bits per character to 8.

Command Default

Eight databits per character.

Command Modes

Line console configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **databits** command to set the data bits attributes for physical terminal connections. Physical terminal connections use either the console or auxiliary line template.

The **databits** command masks the high bit on input from devices that generate 7 data bits with parity. If parity is being generated, specify 7 data bits per character. If no parity generation is in effect, specify 8 data bits per character. The keywords **5** and **6** are supplied for compatibility with older devices and generally are not used.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the data bits per character for the console terminal template to 7:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# databits 7
```

Related Commands

Command	Description
show users, on page 946	Displays information about the active lines on the networking device.
stopbits, on page 948	Sets the number of stop bits.

disconnect

To disconnect a network connection, use the **disconnect** command in EXEC mode.

disconnect [{*connection-numbernetwork-name*}]

Syntax Description

connection-number	(Optional) Number of the line of the active network connection to be disconnected. Range is from 1 to 20.
network-name	(Optional) Name of the active network connection to be disconnected.

Command Modes

EXEC mode

Command Default

Disconnects the existing network connection if no arguments are provided.

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

Do not disconnect a line to end a session. Instead, log off the host before ending the session to clear the connection. If you cannot log out of an active session, disconnect the line.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to disconnect from a device (in this example "User1") to return to the router:

```
User1% disconnect
 Connection closed by remote host

RP/0/RP0/CPU0:router#
```

disconnect-character

To define a character to disconnect a session, use the **disconnect-character** command in line template configuration mode. To remove the **disconnect-character** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

disconnect-character [{*numbercharacter*}]
no disconnect-character

Syntax Description

number	(Optional) ASCII decimal equivalent of the disconnect character. Range is from 0 through 255.
character	(Optional) Disconnect character.

Command Default

No disconnect character is defined.

Command Modes

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The break character is represented by 0; null cannot be represented.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the disconnect character for the default line template to the Esc character, which is the ASCII decimal equivalent 27:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# disconnect-character 27
```

Related Commands

Command	Description
escape-character, on page 921	Defines an escape character.

escape-character

To define a character to escape a session, use the **escape-character** command in line template configuration mode. To remove the **escape-character** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

escape-character {**break***numbercharacter*|**default**|**none**}
no escape-character

Syntax Description

break	Sets the escape character to the Break key.
number	ASCII decimal equivalent of the escape character. Range is from 0 through 255.
character	Escape character.
default	Specifies the default escape character (^^X).
none	Disables the escape function.

Command Default

The default escape character is ^^X.

Command Modes

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **escape-character** command to define an escape character sequence that is different from the default. Use the escape character to exit from an existing connection and return to the EXEC prompt.

The default escape key sequence is Ctrl-Shift-6, X (^^X).The **escape-character** command with the **default** keyword sets the escape character to the Break key (the default setting for the Break key is Ctrl-C).

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the escape character for the default line template to Ctrl-P, which is the ASCII decimal character 16:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# escape-character 16
```

Related Commands

Command	Description
disconnect-character, on page 920	Defines a disconnect character.

exec-timeout

To set the interval that the EXEC command interpreter waits until user input is detected, use the **exec-timeout** command in the appropriate line configuration mode. To remove the **exec-timeout** command from the running configuration and restore the system to its default condition, use the **no** form of this command.

exec-timeout *minutes seconds*
no exec-timeout *minutes seconds*

Syntax Description

minutes	Minutes for the wait interval. Range is from 0 to 35791.
seconds	Seconds for the wait interval. Range is from 0 to 2147483.

Command Default

minutes: 10

seconds: 0

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If no input is detected during the interval, the EXEC facility resumes the current connection. If no connections exist, the EXEC facility returns the terminal to the idle state and disconnects the incoming session. To disable the EXEC timeout function so that the EXEC session never timeouts, enter the following command:

```
exec-timeout 00
```

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the timeout interval for the console line template to 60 minutes, 0 seconds:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# exec-timeout 60 0
```

Related Commands

Command	Description
absolute-timeout, on page 897	Sets the absolute timeout for line disconnection.
session-timeout, on page 937	Sets the idle wait timeout interval for user input over a virtual terminal connection.

flowcontrol hardware

To configure the hardware flow control setting for physical terminal connections, use the **flowcontrol hardware** command in line console configuration mode. To remove the attribute from the configuration file and restore the system to its default condition, use the **no** form of this command.

flowcontrol hardware {**in**|**out**|**none**}
no flowcontrol hardware {**in**|**out**|**none**}

Syntax Description

in	Specifies inbound flow control.
out	Specifies outbound flow control.
none	Specifies no flow control.

Command Default

None

Command Modes

Line console configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **flowcontrol hardware** command to set the flow control attribute for physical line connections. Physical line connections use either the console or auxiliary line template.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to restrict the hardware flow control to inbound for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# flowcontrol hardware in
```

Related Commands

Command	Description
show users, on page 946	Displays information about the active lines on the networking device.

lcd alarm-category

To set the alarm-category (will get displayed on the LCD panel), use the **lcd alarm-category** command in the appropriate mode. To delete the set category, use the **no** form of the command.

lcd alarm-category *number*
no lcd alarm-category *number*

Syntax Description

number Number to identify the alarm category. This lists indicates the numbers for classification:

- 1 for critical
- 2 for critical and major
- 3 for critical, major and minor
- 0 for other

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd alarm-category** command:

```
RP/0/RP0/CPU0:router (config) # lcd alarm-category 2
```

lcd message

To set administrative messages (will get displayed on the LCD panel), use the **lcd message** command in the appropriate mode. To delete the set message, use the **no** form of the command.

lcd message *message*

Syntax Description

message	Administrative message for the operator. Limit is 512 alphanumeric characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd message** command:

```
RP/0/RP0/CPU0:router (config) # lcd message abcd
```

lcd name

To set the rack-name (will get displayed on the LCD panel), use the **lcd name** command in the appropriate mode. To delete the set name, use the **no** form of the command.

lcd name *rack-name location*

Syntax Description

rack-name	The rack-name. Limit is 15 alphanumeric characters.
location	The location of the rack (rack-id).

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd name** command:

```
RP/0/RP0/CPU0:router (config) # lcd name lc1
```

length

To set the number of lines that display at one time on the screen, use the **length** command in line template configuration mode. To remove the **length** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

length *lines*
no length *lines*

Syntax Description

lines	Number of lines that displays on a screen. Range is from 0 through 512. 0 specifies no pausing. The default is 24.

Command Default

lines : 24

Command Modes

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **length** command to modify the default length setting for the specified line template. The length setting determines when the screen pauses during the display of multiple-screen output. Specifying a value of 0 for the lines argument prevents the router from pausing between screens of output.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the length of the default line template to 33 lines:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# length 33
```

Related Commands

Command	Description
terminal length, on page 953	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

console	Specifies the line template for the console line.
default	Specifies the default line template.
template *template-name*	Specifies a user-defined line template to be applied to a vty pool.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.3.0	The **aux** keyword was not supported.

Usage Guidelines

Use the **line** command to specify a line template type and enter into line template configuration mode. Line templates are a collection of attributes used to configure and manage physical terminal line connections (the console and auxiliary ports) and vty connections. The following templates are available in Cisco IOS XR software:

- Default line template—The default line template that applies to a physical and virtual terminal lines.
- Console line template—The line template that applies to the console line.
- User-defined line templates—User-defined line templates that can be applied to a range of virtual terminal lines.

The following example shows how to enter line template configuration mode to allow configuration changes to be made to the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)#
```

parity

To set the parity bit for physical terminal connections, use the **parity** command in line console configuration mode. To specify no parity, use the **no** form of this command.

parity {**even**|**none**|**odd**}
no parity {**even**|**none**|**odd**}

Syntax Description

even	Specifies even parity.
none	Specifies no parity.
odd	Specifies odd parity.

Command Default

No parity is set.

Command Modes

Line console configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.4.0	The **mark** and **space** keywords were removed.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Communication protocols provided by devices such as terminals and modems often require a specific parity bit setting.

Use the **parity**command for setting the parity attribute for physical terminal connections. Physical terminal connections use either the console or auxiliary line template.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the line parity configuration to even for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# parity even
```

Related Commands

Command	Description
show users, on page 946	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

connection	(Optional) Name or number of the active network connection; the default is the most recent connection. Number range is from 1 to 20.

Command Default

The most recent connection.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SSH and Telnet sessions can be established to another router or server.

When the network session is being established and without disconnecting the network session, you can resume the router console session by typing a special sequence of characters as shown. After switching back to the router console, the network connection can be resumed by specifying the number of the connection or the name of the connection.

You can have several concurrent sessions open and switch back and forth between them. The number of sessions that can be open is defined using the **session-limit** command.

You can switch between sessions by escaping one session and resuming a previously opened session, as follows:

1. Escape from the current session by pressing the escape sequence (Ctrl Shift-6, x [^^X]) to return to the EXEC prompt.
2. Enter the **show sessions** command to list the open sessions. All open sessions associated with the current terminal line are displayed.
3. Enter the **resume** command and the session number to make the connection.

   You can also resume the previous session by pressing the **Return** key.

   The **^^X** and commands are available for all supported connection protocols.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to escape from one connection and resume another. You can omit the connection name and simply enter the connection number to resume that connection.

```
host1% ^^x
RP/0/RP0/CPU0:router# resume 1

blg_router#
```

Related Commands

Command	Description
session-limit, on page 936	Sets the maximum number of outgoing terminal sessions from the current terminal.
show sessions, on page 942	Displays information about SSH and Telnet connections.
telnet	Logs in to a host that supports Telnet.

send

To send messages to one or all terminal lines, use the **send** command in

EXEC

mode.

send {**line-number*|**aux 0**|**console 0**|**vty** *number*}

Syntax Description

*****	Sends a message to all tty lines.
line-number	Line number to which the message is sent. A number from 0 to 101.
aux 0	Sends a message to the auxiliary line.
console 0	Sends a message to the console line.
vty *number*	Sends a message to a virtual terminal line (vty). Range is 0 to 99.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The system prompts for the message, which can be up to 500 characters long. Enter **Ctrl-Z** to end the message. Enter **Ctrl-C** to abort this command.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to send a message to all lines:

```
RP/0/RP0/CPU0:router# send *

Enter message, end with CTRL/Z; abort with CTRL/C:
The system will be shut down in 10 minutes for repairs.^Z
Send message? [confirm]
RP/0/RP0/CPU0:router#

***
***
```

```
*** Message from tty to all terminals:
***
The system will be shut down in 10 minutes for repairs.
```

session-limit

To set the maximum number of outgoing terminal sessions from the current terminal, use the **session-limit** command in the appropriate line configuration mode. To remove any specified session limit, use the **no** form of this command.

session-limit *connections*
no session-limit

Syntax Description

connections	Maximum number of outgoing connections. Range is from 0 through 20.

Command Default

connections : 6

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to limit the number of active outgoing connections for the default line template to eight:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# session-limit 8
```

session-timeout

To set the timeout interval for all outgoing connections from the current terminal, use the **session-timeout** command in the appropriate line configuration mode. To remove the **session-timeout** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

session-timeout *minutes* **[output]**
no session-timeout *minutes*

Syntax Description

minutes	Timeout interval, in minutes. Range is 0 to 35791. The default is 10.
output	(Optional) Specifies that when traffic is sent to an asynchronous line from the router (within the specified interval), the connection is retained.

Command Default

minutes : 10

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **session-timeout** command to set the interval that Cisco IOS XR software waits for traffic before closing the connection to a remote device and returning the terminal to an idle state. If the **output** keyword is not specified, the session timeout interval is based solely on detected input from the user. If the keyword is specified, the interval is based on input and output traffic.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the session timeout value for the default line template to 120 minutes (2 hours):

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# session-timeout 120
```

show diag lcd-interface

To display details about the LCD interface (of the craft panel) , use the **show diag lcd-interface** command in the appropriate mode.

show diag lcd-interface

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
lcd	read

Example

This example shows how to use the **show diag lcd-interface**

```
RP/0/RP0/CPU0:router # show diag location 0/CI0

Diag Information For : 0/CI0

 0/CI0-IDPROM Info
    Controller Family        : 0084
    Controller Type          : 0932
    PID                      : NCS4K-CRAFT
    Version Identifier       : V00
    UDI Description          : NCS 4000 Craft Panel
    CLEI Code                : NOCLEICODE
    ECI Number               : 11223344
    Top Assy. Part Number    : 800-41609-01
    Top Assy. Revision       : 12
    PCB Serial Number        : SAL1818RL2G
    PCA Number               : 73-14799-03
```

show line

To display the parameters of terminal lines, use the **show line** command in

EXEC

mode.

show line [{**aux location** *node-id*|**console location** *node-id*|**vty** *number*}]

Syntax Description

aux	(Optional) Displays the terminal line parameters for the auxiliary line.
location *node-id*	(Optional) Specifies the location for the route processor (RP) on which the auxiliary or console port resides. The *node-id* argument is entered in the *rack/slot/module* notation.
console	(Optional) Displays the terminal line parameters for the console line.
vty *number*	(Optional) Specifies a virtual terminal line (vty) number. Range is from 0 through 99.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
tty-access	read

The following example shows sample output from the **show line** command. The asterisk (*) indicates the current terminal session.

```
RP/0/RP0/CPU0:router# show line

    Tty             Speed     Modem  Uses   Noise Overruns           Acc I/O
    aux0_0_0         9600       -     -       -      0/0              -/-
*   con0_0_0         9600       -     -       -      0/0              -/-
    vty0             0/0        -     -       -      0/0              -/-
    vty1             0/0        -     -       -      0/0              -/-
    vty2             0/0        -     -       -      0/0              -/-
```

```
    vty3            0/0         -     -       -      0/0              -/-
    vty4            0/0         -     -       -      0/0              -/-
    vty100          0/0         -     -       -      0/0              -/-
    vty101          0/0         -     -       -      0/0              -/-
    vty102          0/0         -     -       -      0/0              -/-
    vty103          0/0         -     -       -      0/0              -/-
    vty104          0/0         -     -       -      0/0              -/-
    vty105          0/0         -     -       -      0/0              -/-
```

Table 85: show line Field Descriptions

Field	Description
Tty	Available ttys and vtys.
Speed	Baud rate that the inbound serial connection is using, in bps.
Modem	Not implemented.
Uses	Not implemented.
Noise	Not implemented.
Overruns	Hardware Universal Asynchronous Receiver/Transmitter (UART) overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
Acc I/O	Not implemented.

The following example shows sample output from the **show line** command with the console line specified:

```
RP/0/RP0/CPU0:router# show line console location 0/rp0/cpu0

    Tty             Speed     Overruns             Acc I/O
    con0/RP0/CPU0    9600          0/0                -/-

  Line con0_RP0_CPU0, Location "0/RP0/CPU0", Type "Console"
  Length: 24 lines, Width: 80 columns
  Baud rate (TX/RX) is 9600, 1 parity, 2 stopbits, 8 databits
  Template: console
  Capabilities: Timestamp Disabled
  Allowed transports are none.
```

Table 86: show line location Field Descriptions

Field	Description
Tty	Unique identifier of the tty; it contains the type of tty and, for physical ttys, it indicates the physical location of the tty.
Speed	Baud rate that the inbound serial connection is using in bps.

Field	Description
Overruns	Hardware UART overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
Acc I/O	Not implemented.
Line	Unique identifier of the TTY. This field displays the type of TTY and the physical location of physical TTYs.
Location	Location of the line.
Type	Line type.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit rate/receive rate of the line, in bps.
parity	Parity bits value used for physical terminal connections.
stopbits	Stop bits value used for physical terminal connections.
databits	Data bits value used for physical terminal connections.
Template	Line template being sourced by the particular connection.
Config	Configuration applied to the tty. This field indicates the allowed incoming transports that can be used to access the router from this tty.
Allowed transports are	Incoming transport protocols that can be used by this tty to access the router.

show sessions

To display information about suspended Secure Shell (SSH) and Telnet connections launched from the terminal session, use the **show sessions** command in

EXEC

mode.

show sessions

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show sessions** command to display the hostname, remote connection service used by the router to access the host, idle time, and connection name.

Task ID

Task ID	Operations
tty-access	read

The following example shows sample output from the **show sessions** command:

```
RP/0/RP0/CPU0:router# show sessions

  Conn Host               Address            Service Idle Conn Name
  *  1 10.26.25.40        10.26.25.40        telnet    15 10.26.25.40
```

The asterisk (*) indicates the current terminal session.

Table 87: show sessions Field Descriptions

Field	Description
Conn	Identifier for the connection used for resuming and disconnecting suspended sessions. An asterisk (*) indicates the current terminal session.

Field	Description
Host	Remote host to which the router is connected. This field displays either the IP address or hostname of the remote host. If the IP address of the remote host is mapped to the hostname (that is, if Domain Name System [DNS] services are enabled) and the session is initiated with the hostname, the output for this field displays the hostname of the host rather than the IP address of the host.
Address	IP address of the remote host.
Service	Remote connection service used.
Idle	Interval (in seconds) since data was last sent on the line.
Conn Name	Equivalent to the “Host” field in Cisco IOS XR software.

Related Commands

Command	Description
disconnect, on page 919	Disconnects a network connection.
resume, on page 932	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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

None.

This example shows sample output from the **show terminal** command:

```
RP/0/RP0/CPU0:router# show terminal

Line vty0, Location "10.56.249.67", Type "VTY"
Length: 24 lines, Width: 80 columns
Baud rate (TX/RX) is 0, 0 parity, 0 stopbits, 0 databits
Template: default
Capabilities: Timestamp Disabled
Allowed transports are telnet ssh.
```

Table 88: show terminal Field Descriptions

Field	Description
Line	Line that is currently being used.
Location	Location of the terminal accessing the router.
Type	Type of line.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit or receive rate of the line, in bps.
parity	Parity bits value used for physical terminal connections.

Field	Description
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 keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show users** command to display the line number, connection name, idle time, hosts, and terminal location. An asterisk (*) indicates the current terminal session.

Note To display all user groups and task IDs associated with the currently logged-in user, use the **show user** command in EXEC mode. See the *Authentication, Authorization, and Accounting Commands on Cisco IOS XR Software* module in *System Security Command Reference for Cisco CRS Routers*.

Task ID

Task ID	Operations
tty-access	read

The following example shows sample output identifying an active vty terminal session:

```
RP/0/RP0/CPU0:router# show users

    Line            User                Service  Conns   Idle        Location
    con0_RP0_CPU0   cisco               hardware     0  18:33:48
    vty0            cisco               telnet       0  00:30:36    10.33.54.132
  * vty1            cisco               telnet       0  00:00:00    10.33.54.132
```

Table 89: show users Command Output Field Descriptions

Field	Description
Line	All current connections. An asterisk (*) indicates the active connection.
User	Username of the user logged into the line.

Field	Description
Service	Physical or remote login service used.
Conns	Number of outgoing connections.
Idle	Interval (in hours:minutes:seconds) since last keystroke.
Location	IP address of remote login host. For local (physical) terminal connections, this field is blank.

Related Commands

Command	Description
show line, on page 939	Displays the parameters of a terminal line.
show user	Displays all user groups and task IDs associated with the currently logged-in user.

stopbits

To set the stop bits used for physical terminal connections, use the **stopbits** command in line console configuration mode. To restore the default, use the **no** form of this command.

stopbits {**1**|**2**}
no stopbits

Syntax Description

1	Specifies one stop bit.
2	Specifies two stop bits. This is the default.

Command Default

Two stop bits.

Command Modes

Line console configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **stopbits** command to set the data bits attributes for physical terminal connections. Physical terminal connections use either the console or auxiliary terminal templates.

Communication protocols provided by devices such as terminals and modems often require a specific stop-bit setting.

Note The number of stop bits configured on the router and a terminal server should be same. The default number of stop bits on the router is two stop-bits.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to change the default from two stop bits to one for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# stopbits 1
```

Related Commands

Command	Description
databits, on page 917	Sets the number of data bits.

terminal exec prompt

To specify prompt attributes for the current terminal session, use the **terminal exec prompt** command in the appropriate mode.

terminal exec prompt {**no-timestamp**|**timestamp**}

Syntax Description

no-timestamp	Disables the time-stamp printing before each command.
timestamp	Enables the time-stamp printing before each command.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

Use the**terminal exec prompt** command with the **timestamp** keyword to show the time-stamp display after each command is entered. Use the **terminal exec** command with the **no-timestamp** keyword to disable the time-stamp display.

Note The **terminal** commands are active for the current terminal session only. To apply a setting to all sessions, use the **line** commands.

This example shows how to enable the time-stamp prompt. When enabled, the date and time are displayed after each command. In this example, the **show version** command is entered, and the date and time is displayed.

```
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
```

terminal exec utility pager

To configure the terminal page display options, use the **terminal exec utility pager** command in the appropriate mode.

terminal exec utility pager {**less**|**more**|**none**}

Syntax Description

less	Specifies to use unix-like "less" bidirectional paging for the terminal display.
more	Specifies to use unix-like "more" unidirectional paging for the terminal display.
none	Specifies that the display is not paginated.

Command Default

No pagination is configured by default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **terminal exec utility pager** command with the **more** keyword to scroll forward through command display one screen at a time. "--More--" is displayed at the end of each screen. Press the Space key to advance one screen. Press the Enter key to advance one line. Press the Esc key to exit the command display.

Task ID

Task ID	Operation
tty-access	Read

This example shows how to limit command display to one screen at a time such that you can move forward through the display:

```
RP/0/RP0/CPU0:router#terminal exec utility pager more
```

terminal length

To set the number of lines that display at one time on the screen for the current terminal session, use the **terminal length** command in

EXEC

mode.

terminal length *lines*

Syntax Description

lines	Number of lines that display on a screen. Range is from 0 through 512.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **terminal length** command to set the terminal length value for only the current terminal session and not save it to the running configuration. Exiting from the terminal session returns the terminal length value to the value configured with the **length** command.

Specifying a value of 0 for the *lines* argument prevents the router from pausing between screens of output.

Note The **terminal** commands are active for the current terminal session only. To apply a setting to all sessions, use the **line** commands.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the length for the current terminal session to 120 lines:

```
RP/0/RP0/CPU0:router# terminal length 120
```

Related Commands

Command	Description
length, on page 929	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*

Syntax Description

characters	Number of characters to display on a screen. Range is from 0 to 512.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **terminal width** command to set the terminal width value for only the current terminal session and not save it to the running configuration. Exiting from the terminal session returns the terminal width value to the value configured with the **width** (display) command.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the terminal width for the current terminal session to 120 characters:

```
RP/0/RP0/CPU0:router# terminal width 120
```

Related Commands

Command	Description
width (display), on page 965	Sets the width of the display terminal.

timestamp disable

To disable time-stamp recording at the top of each command output, use the **timestamp disable** command in the appropriate line configuration mode. To reenable time-stamp recording if disabled, use the **no** form of this command.

timestamp disable
no timestamp disable

Syntax Description

This command has no keywords or arguments.

Command Default

Time-stamp recording at the top of each command output is enabled.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.4.0	No modification.
Release 3.8.0	The command was changed from **timestamp** to **timestamp disable**. The default was changed.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, the time stamp is displayed at the top of any command output. The time stamp records the time at which the command was issued. You can use the **snmp-server view** command to disable this setting so that the time stamp does not appear at the top of the command output. This setting applies to all command outputs on any terminal line to which the current line template applies.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to disable time-stamp recording for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)#  timestamp disable
```

transport input

To define the transport protocols that can be used to access the router, use the **transport input** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport input {**all**|**none**|**ssh**|**telnet**}
no transport input {**all**|**none**|**ssh**|**telnet**}

Syntax Description

all	Specifies the Secure Shell (SSH) and Telnet protocols.
none	Specifies that the router rejects incoming SSH and Telnet transport protocol connections.
ssh	Specifies the SSH transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

All protocols are allowed on the line.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To be accepted, incoming network connections to an asynchronous port (terminal line) must use a transport protocol specified with the **transport input** command. This command can be useful in limiting the acceptable transport protocols to include or exclude those used by different types of users, or to restrict a line to secure connections (SSH connections).

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the transport input setting for the default line template to SSH connections:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport input ssh
```

Related Commands

Command	Description
transport output, on page 959	Determines the protocols that can be used for outgoing connections from a line.
transport preferred, on page 961	Specifies the transport protocol that Cisco IOS XR software uses if the user does not specify one when initiating a connection.

transport output

To specify the transport protocols that can be used for outgoing connections from a line, use the **transport output** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport output {**all**|**none**|**ssh**|**telnet**}
no transport output {**all**|**none**|**ssh**|**telnet**}

Syntax Description

all	Specifies the Secure Shell (SSH) and Telnet transport protocols.
none	Specifies that the router rejects outgoing SSH and Telnet transport protocol connections.
ssh	Specifies the SSH transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

All protocols are allowed on the line.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Any settings made with the **transport output** command override settings made with the **transport preferred** command.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the default line template to prevent any outgoing transport protocol connections:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport output none
```

Related Commands

Command	Description
transport input, on page 957	Defines which protocols to use to connect to a specific line of the router.
transport preferred, on page 961	Specifies the transport protocol that Cisco IOS XR software uses if the user does not specify one when initiating a connection.

transport preferred

To specify the default outgoing transport protocol to be used for initiating network connections, use the **transport preferred** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport preferred {**none**|**ssh**|**telnet**}
no transport preferred {**none**|**ssh**|**telnet**}

Syntax Description

none	Disables the feature.
ssh	Specifies the Secure Shell (SSH) transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

No transport protocol is set as the default outgoing protocol.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **transport preferred** command to provide a default transport protocol to use when initiating outgoing connections. The preferred outgoing transport protocol specified with the **transport preferred** command enables you to initiate an outgoing connection without explicitly specifying the transport protocol.

Cisco IOS XR software assumes that any unrecognized command is a hostname and the software attempts a connection. When the protocol is set to **none**, the system ignores unrecognized commands entered at the EXEC prompt, and does not attempt a connection.

The default setting, the same as using the **transport preferred** command with the **none** keyword, prevents errant connection attempts.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to set the preferred transport setting for the default line template to SSH:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport preferred ssh
```

Related Commands

Command	Description
transport input, on page 957	Defines which protocols to use to connect to a specific line of the router.
transport output, on page 959	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

default	Specifies the default vty pool.
eem	Specifies the embedded event manager vty pool.
pool-name	User-defined vty pool.
first-vty	First vty line in the pool. • For the default vty pool, you must specify 0 for the first vty line. • For a user-defined vty pool, the range is 5 to 99. • For the embedded event manager vty pool, you must specify 100 for the first vty line.
last-vty	Last vty line in the pool. • The default vty pool must contain at least five vtys. Range is 4 to 99. • For a user-defined vty pool, the range is 5 to 99. • The embedded event manager vty pool must contain at least six vtys. Range is 105 to 199.
line-template	(Optional) Specifies the terminal template to be used in the configuration of virtual terminals in the vty pool.
default	Specifies that the vty pool should reference the default template.
template-name	User-defined template to be applied to the vtys in the vty pool.

Command Default

default *vty-pool* : 5 vtys (vty 0 through 4) referencing the default line template.

eem *vty pool* : 6 vtys (vty 100 through 105) referencing the default line template.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.8.0	The keyword **fm** was changed to **eem** .

Usage Guidelines

When creating or modifying vty pools, follow these usage guidelines:

- Before creating or modifying the vty pools, enable the Telnet server using the **telnet server** command in global configuration mode. See *IP Addresses and Services Configuration Guide for Cisco CRS Routers* and *IP Addresses and Services Command Reference for Cisco CRS Routers* for more information.
- The vty range for the default vty pool must start at vty 0 and must contain a minimum of five vtys.
- The vty range from 0 through 99 can reference the default vty pool.
- The vty range from 5 through 99 can reference a user-defined vty pool.
- The vty range from 100 is reserved for the embedded event manager vty pool.
- The vty range for embedded event manager vty pools must start at vty 100 and must contain a minimum of six vtys.
- A vty can be a member of only one vty pool. A vty pool configuration fails if the vty pool includes a vty that is already in another pool.

If you attempt to remove an active vty from the active vty pool when configuring a vty pool, the configuration for that vty pool fails.

This example shows how to configure a user-defined vty pool (test1) that contains vtys 10 through14 and references the user-defined line template test2:

```
RP/0/RP0/CPU0:router(config)# vty-pool test1 10 14 line-template test2
```

width (display)

To set the width of the display terminal, use the **width** command in the appropriate line configuration mode. To remove the **width** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

width *characters*
no width *characters*

Syntax Description

characters	Number of characters to display on a screen. Range is from 0 to 512.

Command Default

characters : 80

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **width** command to modify the default width setting for the specified line template.

Task ID

Task ID	Operations
tty-access	read, write

This example shows how to set the terminal width for the default line template to 99 characters:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# width 99
```

Related Commands

Command	Description
terminal width, on page 955	Sets the width of the display terminal for the current terminal session.

Utility Commands

This module describes the utility commands for Cisco IOS XR software. Utility commands provide CLI equivalents to common UNIX commands.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **universal** keyword can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

utility 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 syntax of the *input-file* argument is as follows: *device* **:**[*/ directory-path*]*/ filename*

Possible values of the *device:* argument are:

disk0:

Uses a file from disk0: file system.

disk0a:

Uses a file from disk0a: file system partition.

disk1:

Uses a file from disk1: file system.

disk1a:

Uses a file from disk1a: file system partition.

ftp:

Uses a file from an FTP network server. The syntax is **ftp:**[[[//*username*[:*password*]@]*location*]/*directory*]/*filename*

harddisk:

Uses a file from the hard disk drive file system (if present).

harddiska:

Uses a file from the hard disk partition (if present).

nvram:

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 (**?**) function to display the available devices and network protocols.

Command Default

If an input file is not specified, the standard input (keyboard) is used.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following file systems were added: **disk0a:** , **disk1a:** and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **utility bc** command to use the interactive, programmable calculator that supports a complete set of control structures, including functions. The utility first processes any specified files, and then reads input from the keyboard (standard input).

Input files (and standard input) are ASCII text files containing sequences of bc statements to be executed.

Note The bc utility uses the bc programming language, an arbitrary precision calculator language with syntax similar to the C programming language. The bc utility does not support character or string manipulation.

The bc utility supports:

- 26 functions
- 26 simple variables
- 26 array variables (up to 2048 elements per array).

The bc utility supports the following common programming language constructs:

- “if”, “while”, and “for” statements
- User-defined functions with parameters
- Local variables

Information About Supported Network Protocols

In the syntax for the **ftp:**, **rcp:**, and **tftp:** network protocols, the location is either an IP address or a hostname. The filename is specified relative to the directory used for file transfers.

When no device is specified, the current directory is used. To view the current directory, enter the **pwd** command.

Table 90: 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).

Prefix	Name	Description
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	*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

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

list *character-list*	(**-c**) Cuts out the characters that are located on each line as specified with the *character-list* argument. The *character-list* argument specifies the character positions or range of the characters to be cut. • Use a comma (,) to indicate more than one character. For example, **utility list 1,2,5** outputs the first, second, and fifth characters. • Use a dash (-) to indicate a range. For example, **utility list 1-64** outputs the first 64 characters of each line, **utility list 5-** outputs the fifth character to the end of the line. **Note** Lines are separated by a delimiter. The default delimiter is tab.
fields *field-list*	(**-f**) Cuts out the fields (lines) as indicated with the *field-list* argument. The *field-list* argument specifies the field numbers or ranges. For example, **utility field 2,9** outputs the second and ninth fields, **utility field 1-3** outputs the first three fields, **utility field -6** outputs the first six fields. **Note** The fields indicated by the *field-list* argument are assumed to be separated in the file by a delimiter character. The default delimiter is tab. Use the **delimiter** *delimiter* option to specify a delimiter character. Lines without field delimiters are processed unless the **nodelim** keyword is specified.
nodelim	(Optional) (**-s**) Ignores lines with no delimiter. Use this optional keyword when the **fields** *field-list* keyword and argument is specified.
delimiter *delimiter-character*	(Optional) (**-d**) Specifies an alternative delimiter to indicate the end of each field. Replace the *delimiter-character* argument with the character used as the delimiter.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
file *input-file*	(Optional) Storage device and directory path of the text file used instead of the standard input (keyboard input). The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.

usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no file is specified, the keyboard input (standard input) is used.

The delimiter is tab.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:**, **disk1a:**and **compactflasha:**.

Usage Guidelines

The **utility cut** command cuts out columns, fields, or characters displayed from standard input or from a file.

Use the **fields** *field-list* keyword and argument if the fields vary in length from line to line. (The lines must be separated by a delimiter character.) By default, the field delimiter character is the Tab key. Use the **delimiter** *delimiter-character* keyword and argument to specify a different delimiter.

Use the **list** *character-list* keyword and argument only if the fields are of a fixed length. Replace the *character-list* argument with the character positions to be extracted.

For the *character-list* argument, use a comma (,) to indicate more than one character, or use a dash (-) to indicate a range. For example, **utility list 1,2,5** outputs the first, second, and fifth characters, **utility list 1-64** outputs the first 64 characters of each line, **utility list 5-** outputs the fifth character to the end of the line.

You can also use the cut utility as a filter. If no files are specified, the keyboard input (standard input) is used.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **fields** keyword can also be entered using the UNIX-equivalent (**-f**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility cut** command is entered with the **list** *character-list* keyword and argument to display the first 10 characters in each line. The output is from the results of the **show version** command, which is entered with the pipe (|) character:

```
RP/0/RP0/CPU0:router# show version | utility cut list 1-10

  Cisco IOS
  Copyright

  ROM: Syste

  router upt
  System ima

  cisco CRS-
```

```
  7457 proce

  16 Gigabit
  2 Ethernet
  20 Packet
  20 SONET/S
  2043k byte
  38079M byt
  1000592k b
  1000640k b

  Configurat
  Package ac
   --More--
```

In the following example, the **utility cut** command is used to extract fields from a file:

```
RP/0/RP0/CPU0:router# utility cut fields 1,5 delimiter : file disk0:/usr/passwd

  root:Super-User
  daemon:
  bin:
  sys:
  adm:Admin
  lp:Line Printer Admin
  uucp:uucp Admin
  nuucp:uucp Admin
  listen:Network Admin
  nobody:Nobody
```

In the following example, the **utility cut** command is used with the **delimiter** keyword to specify an alternative field delimiter:

```
RP/0/RP0/CPU0:router# utility cut fields 1,4,5 delimiter : file disk0:/usr/passwd

  root:1:Super-User
  daemon:1:
  bin:2:
  sys:3:
  adm:4:Admin
  lp:8:Line Printer Admin
  uucp:5:uucp Admin
  nuucp:9:uucp Admin
  listen:4:Network Admin
```

In the following example, a range of fields is specified:

```
RP/0/RP0/CPU0:router# utility cut fields 1-4 delimiter : file disk0:/usr/passwd

  root:x:0:1
  daemon:x:1:1
  bin:x:2:2
  sys:x:3:3
  adm:x:4:4
  lp:x:71:8
  uucp:x:5:5
  nuucp:x:9:9
  listen:x:37:4
```

In the following example, the **list** *character-list* keyword and argument are used to specify the character positions to be extracted:

```
RP/0/RP0/CPU0:router# utility cut list 1-30 file disk0:/usr/passwd

  root:x:0:1:Super-User:/:/sbin/
  daemon:x:1:1::/:
  bin:x:2:2::/usr/bin:
  sys:x:3:3::/:
  adm:x:4:4:Admin:/var/adm:
  lp:x:71:8:Line Printer Admin:/
  uucp:x:5:5:uucp Admin:/usr/lib
  nuucp:x:9:9:uucp Admin:/var/sp
  listen:x:37:4:Network Admin:/u
  nobody:x:60001:60001:Nobody:/:
  noaccess:x:60002:60002:No Acce
  nobody4:x:65534:65534:SunOS 4.

  ================================================================================
```

In the following example, the UNIX equivalent options are used directly. First, the **utility cut** command is entered with the **usage** keyword to display the possible options. Next, the **utility cut** command is entered with the options to extract the desired data.

```
RP/0/RP0/CPU0:router# utility cut usage

  cut -c list [file], cut -f list [-d delim] [-s] [file]

RP/0/RP0/CPU0:router# utility cut -f 1,4 -d : disk0:/usr/passwd

  root:1
  daemon:1
  bin:2
  sys:3
  adm:4
  lp:8
```

utility date

To display the date and time, use the **utility date** command in

EXEC mode or administration EXEC

mode.

utility date {**format** *word*|**universal**|**usage***WORD*}

Syntax Description

format *word*	(Optional) (+) Specifies the format for the date display. Use the online help system to display the available format syntax for the *word* argument.
universal	(Optional) (**-u**) Displays the date in Coordinated Universal Time (UTC) instead of local time. UTC is the standard term for Greenwich Mean Time (GMT).
usage	(Optional) Displays the UNIX options supported by this command.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.

Command Default

The date is displayed in local time.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **utility date** command displays the internal time and date for the router.

Date Format

Use the **format** *word* option to specify the format and content of the displayed date and time. The format is composed of ASCII characters and field descriptors prefaced with %, in a manner similar to a C-language printf() format specifier. In the output, each field descriptor is replaced by its corresponding value; all other characters are copied to the output without change. The format is specified using the following characters:

%C

Century in 'CC' form. For example: 20

%y

Year in 'YY' form. For example: 06

%m

Month in 'MM' form. For example: 08

%d

Date in 'DD' form. For example: 28

%H

Hour in 'hh (24 hr.)' form. For example: 18

%M

Minutes in 'mm' form. For example: 55

%S

seconds in 'ss' form. For example: 24

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **universal** keyword can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

This example shows how to display the router date and time using the **utility date** command:

```
RP/0/RP0/CPU0:router# utility date

  Fri Aug 04 11:53:38 UTC 2006
```

This example shows how to display the router date and time using a variety of options with the **format** keyword:

```
RP/0/RP0/CPU0:router# utility date format "%y%m%d"

  060828

RP/0/RP0/CPU0:router# utility date format "%y-%m-%d"

  06-08-28

RP/0/RP0/CPU0:router# utility date format "%C%y-%m-%d"

  2006-08-28

RP/0/RP0/CPU0:router# utility date format "%C%y-%m-%d:%H:%M:%S"

  2006-08-28:02:09:58

RP/0/RP0/CPU0:router# utility date format "DATE: %y-%m-%d %nTIME: %H:%M:%S"

  DATE: 06-09-17
  TIME: 12:42:24
```

Related Commands

Command	Description
utility date set, on page 979	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

hh	Specifies the hour in 2-digit numerical format. Range is 00 to23.
mm	Specifies the minutes in 2-digit numerical format. Range is 0 to 59.
SS	Specifies the seconds in 2-digit numerical format. Range is 0 to 59.

Command Default

None

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A colon (:) is required between the entry for hour, minutes, and seconds.

Note Generally, if the system is synchronized by a valid outside timing mechanism, such as a Network Time Protocol (NTP) clock source, or if you have a networking device with calendar capability, you need not set the software clock. Use the **date** command or the **clock set** command if no other time sources are available.

Note To manually copy the hardware clock (calendar) settings into the software clock, use the **clock read-calendar** command in EXEC mode.

By default, the system makes a “slow adjustment” if the new time is in the range of the following:

- –2.5 minutes + old time
- 5 minutes + old time

In a slow adjustment, the clock speed increases by less than 100 percent or decreases by less than 50 percent over a period of time from 1 second to 5 minutes until the clock catches up with the new time. This slow adjustment does not cause major discontinuities in the time flow. Use the **-S0** option to disable the slow adjustment.

Task ID

Task ID	Operations
universal	execute

The following example shows how to set the time using the **utility date set** command:

```
RP/0/RP0/CPU0:router(admin)# utility date set 13:07:00

  Fri Sep 15 13:07:00 UTC 2006
```

Related Commands

Command	Description
utility date, on page 976	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

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
kbytes	(Optional) (**-k**) Displays the sizes in 1-K blocks (1024-byte units) instead of the default of 512 byte blocks.
mountinfo	(Optional) (**-n**) Displays the file-system mountpoints and types only.
vsfStats	(Optional) (**-g**) Displays all statvfs() information.
file *input-file*	(Optional) Specifies the storage device and directory path of the device, directory, or file. When a directory or file is specified, the df utility displays the amount of space on the file system that contains the directory or file. If no files are specified, then only the standard input (keyboard) is used. The syntax of the *input-file* argument is as follows: *device* **:**[/ *directory-path*]/ *filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

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.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the (disk free) **utility df** command to display the amount of disk space available for a device, directory, or file. Enter the command without keywords or arguments to display information for all mounted file systems.

Use the **vsfStats** keyword to invoke the statvfs() function, which provides additional details for all mounted file systems.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **kbytes** keyword can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the (disk free) **utility df** command is entered without keywords or arguments to display information for all file systems:

```
RP/0/RP0/CPU0:router(admin)# utility df

  /dev/hd0t6              77987744     61592  77926152       1%  /harddisk:/
  /nvram:                     4086        60      4026       2%
  /dev/disk1t6             2001280    382720   1618560      20%  /disk1:/
  /dev/disk0t6             2001184    533568   1467616      27%  /disk0:/
  /dev/fs0p1                121856        68    121787       1%  /bootflash:
```

See Table 92: utility df Column Descriptions (left to right), on page 984for 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 92: utility df Column Descriptions (left to right), on page 984 for column descriptions.

In the following example, the **mountinfo** keyword is used to display file-system mountpoints and types only:

```
RP/0/RP0/CPU0:router(admin)# utility df mountinfo

  Filesystem           Mounted on        Type
  /dev/hd0t6           /harddisk:/       dos (fat32)
  /nvram:
  /dev/disk1t6         /disk1:/          dos (fat16)
  /dev/disk0t6         /disk0:/          dos (fat16)
  /dev/fs0p1           /bootflash:       flash
```

In the following example, the **vfsStats** keyword is used to invoke the statvfs() function, which provides additional details for all mounted file systems:

```
RP/0/RP0/CPU0:router(admin)# utility df vfsStats

  /dev/hd0t6   /harddisk:/
      Blocks:  9748468 total   9740769 avail   [4096-byte blocks]
      Files :        0 total         0 avail
      Type  : dos (fat32)
      Flags : 00000120 [32bit, noatime]

  /nvram:
      Blocks:     2043 total      2013 avail   [1024-byte blocks]
      Files :        0 total         0 avail
      Type  :
      Flags : 00000000 []

  /dev/disk1t6   /disk1:/
      Blocks:    62540 total     50580 avail   [16384-byte blocks]
      Files :        0 total         0 avail
      Type  : dos (fat16)
      Flags : 00000120 [32bit, noatime]

  /dev/disk0t6   /disk0:/
      Blocks:    62537 total     45863 avail   [16384-byte blocks]
      Files :        0 total         0 avail
      Type  : dos (fat16)
      Flags : 00000120 [32bit, noatime]

  /dev/fs0p1   /bootflash:
      Blocks: 62390272 total  62355240 avail   [1-byte blocks]
      Files :        2 total         0 avail
      Type  : flash
      Flags : 00000000 []
```

This table describes the significant fields shown in the display.

Table 91: utility df Field Descriptions

Field	Description
Files	Number of files in the file system.
Blocks	Amount of space available on the file system in 1-K blocks.
Total	Amount of disk space used by the directory or file.
Avail	Amount of space available for use by the directory or file on the file system.
Type	Type of file system.
Flags	Displays the file system properties.

In the following example, the **file** *source* keyword and argument are used to specify a directory:

```
RP/0/RP0/CPU0:router(admin)# utility df file disk0:/usr
```

```
/dev/disk0t6             2001184    533568   1467616      27%  /disk0:/
```

This table describes the significant fields shown in the display.

Table 92: utility df Column Descriptions (left to right)

Field	Description
Filesystem	File system for the displayed information.
1k-blocks	Amount of space available on the file system in 1-K blocks.
Used	Amount of disk space used by the directory or file.
Available	Amount of space available for use by the directory or file on the file system.
Use%	Percentage of space used on the file system.
Mounted on	Storage device where the file system is mounted.

Related Commands

Command	Description
utility du, on page 985	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

all	(Optional) (**-a**) Displays the disk space used for each file in the directory. By default, information is displayed only for the directory. Use the **all** keyword to display the total disk space used by all files in the directory, including the directory itself.
specified	(Optional) (**-s)** Displays the total disk space used for each specified file, rather than the totals for any subdirectories.
kbytes	(Optional) (**-k**) Displays the disk space used in 1-K blocks (1024-byte units) instead of the default of 512-byte blocks.
bytes	(Optional) (**-p**) Displays the disk space used in bytes (the default is 512-byte blocks). Also generates error messages for exiting files that cannot be displayed.
local	(Optional) (**-x**) Displays information for the local device only.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
file *source*	(Optional) Displays the disk space used for a device, directory, or file. The syntax for the *source* argument is *device* **:** / *directory-path*[/ *filename*] The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols. Enter the **utility du** command without specifying a device, directory, or file to display information for the current directory, and subdirectories. (The command behaves as if the filename dot (.) is entered.)
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Information for the current directory is displayed.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:**, **disk1a:**, and **compactflasha:**.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Enter the **utility du** command without specifying a file to display information for the current directory. The command behaves as if the filename dot (.) is entered.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **kbytes** keyword can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

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-3.8.0/configs37 /disk0:/hfr-mpls-3.8.0/configs
```

In the following example, the **utility du** command is used to display the disk space used for the current working directory:

```
RP/0/RP0/CPU0:router# cd disk0:/
```

```
hfr
-mpls-3.8.0
RP/0/RP0/CPU0:router# utility du

            160 ./schema
            104 ./lib/cerrno
            625 ./lib/mib
           2545 ./lib
           9658 ./bin
             39 ./startup
            840 ./parser
             37 ./configs
             35 ./mib
             35 ./rules
             34 ./partitions
            135 ./etc/compat
            167 ./etc
             66 ./instdb_v
            181 ./lc/bin
             33 ./lc/startup
            246 ./lc
            112 ./instdb
          14006 .
```

Related Commands

Command	Description
utility df, on page 981	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*]

utility egrep *expression* [*WORD*] **[count] [linenum] [matchfile] [matchline] [nocase] [nofile] [reverse]** [**file** *search-file*]

utility egrep usage

Syntax Description

expr *expression*	(**-e**) A regular expression. This form is used when only one expression is specified on the command line. Any names specified after this option are treated as input files.
script *expression-file*	(**-f**) A file containing a set of regular expressions, each separated by a new line. The type of the expressions is determined by the -e and -f options. This form is used when more than one expression is specified. You can specify more than one -f option. The syntax of the *expression-file* argument is: [*device* **:**]*/ filename*
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 20.
count	(Optional) (**-c**) Displays a count of selected lines.
linenum	(Optional) (**-n**) Before each output line, displays the line's line number.
matchfile	(Optional) (**-l**) (“el”) Displays only the names of files containing the selected lines.
matchline	(Optional) (**-x**) Includes only input lines selected against an entire fixed string or regular expression.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
nofile	(Optional) (**-h**) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.
reverse	(Optional) (**-v**) Selects only those lines that don't match the specified patterns.
file *search-file*	(Optional) The file used for the search. Replace the *search-file* argument with the device and directory path of the file. The syntax for the *search-file* argument is: [*device* **:**]*/ filename*.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no files are specified, the keyboard input (standard input) is used.

If more than one input file is specified, then the filename is displayed before each line.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The grep utility searches files for character patterns using regular expressions and returns all lines that contain that pattern. The **utility egrep** command uses full regular expressions (expressions using the full set of alphanumeric and special characters) to match the patterns.

The results are displayed to the standard output (terminal screen).

Note The egrep utility options are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **count** keyword can also be entered using the UNIX-equivalent (**-c**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility egrep** command is used to locate the regular expression "uptime". The **linenum** keyword is also entered to display the line number before each line of output.

```
RP/0/RP0/CPU0:router# show version | utility egrep expr uptime linenum

7:router uptime is 5 days, 19 hours, 27 minutes
```

In the following example, the **utility egrep** command is used to locate a regular expression in a file. In this example, all lines with "adm" are displayed. The * character is used as a wildcard.

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* nofile file disk0:/usr/passwd

adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:/:/bin/false
```

In the following example, the **nocase** keyword is used to ignore the character case:

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* nocase file disk0:/usr/passwd

adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:/:/bin/false
```

In the following example, the **linenum** keyword is used to append the line number to the beginning of each output line:

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* linenum file disk0:/usr/passwd

  5:adm:x:4:4:Admin:/var/adm:
  6:lp:x:71:8:Line Printer Admin:/usr/spool/lp:
  7:uucp:x:5:5:uucp Admin:/usr/lib/uucp:
  8:nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
  9:listen:x:37:4:Network Admin:/usr/net/nls:
 15:ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:/:/bin/false
```

Related Commands

Command	Description
utility fgrep, on page 991	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*]

utility fgrep *expression* [*WORD*] **[count] [linenum] [matchfile] [matchline] [nocase] [nofile] [reverse]** [**file** *search-file*]

utility fgrep usage

Syntax Description

expr *expression*	(**-e**) A regular expression, whose type is determined by the -e and -f options. This form is used when only one expression is specified on the command line. Any names specified after this option are treated as input files.
script *expression-file*	(**-f**) A file containing a set of regular expressions, each separated by a new line. The type of the expressions is determined by the -e and -f options. This form is used when more than one expression is specified. You can specify more than one -f option. The syntax of the *expression-file* argument is: *device* **:**[*/ directory-path*]*/ filename*
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 20.
count	(Optional) (**-c**) Displays a count of selected lines.
linenum	(Optional) (**-n**) Before each output line, displays the line's line number.
matchfile	(Optional) (**-l**) (“el”) Displays only the names of files containing the selected lines.
matchline	(Optional) (**-x**) Includes only input lines selected against an entire fixed string or regular expression.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
nofile	(Optional) (**-h**) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.
reverse	(Optional) (**-v**) Selects only those lines that don't match the specified patterns.
file *search-file*	(Optional) The file used for the search. Replace the *search-file* argument with the device and directory path of the file. The syntax for the *search-file* argument is: *device* **:**[*/ directory-path*]*/ filename*
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

The keyboard input (standard input) is used if no files are specified.

If more than one input file is specified, then the filename is displayed before each line.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:**, **disk1a:** , and **compactflasha:**.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **utility fgrep** command searches files for a fixed character string (as opposed to grep and egrep, which search for a a pattern that matches an expression).

The results are displayed to the standard output (terminal screen).

Note The fgrep utility options are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **count** keyword can also be entered using the UNIX-equivalent (**-c**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

The following example, the **utility fgrep** command is used with the **nocase** and **linenum** keywords:

```
RP/0/RP0/CPU0:router# show version | utility fgrep expr uptime nocase linenum

  7:router uptime is 5 days, 20 hours, 10 minutes
```

Related Commands

Command	Description
utility egrep, on page 988	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* {*LINE*|**name** *filename-pattern*|**user** *user-id*}|**usage**}

Syntax Description

path *directory-path*	Specifies the storage device and directory for the file search. The search is performed for the specified directory and all subdirectories in that directory tree. If a directory path is not specified, then the search is performed in the current directory (a path of . [dot] is assumed).
LINE	(Optional) UNIX command-line expressions provided as a string.
name *filename-pattern*	(Optional) Searches for the name of the file. The *filename-pattern* argument is a regular expression string.
user *user-id*	(Optional) Searches for files belonging to a specific user. The *user-id* argument is the username of the file owner.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If a directory path is not specified, then the search is performed in the current directory.

If a **name** *filename-pattern* is not specified, then the search return all files in the specified directory.

If a user is not specified, then the search is performed for all users.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **utility find** command to locate files within one or more directories. You can perform the search for a specific directory (and its subdirectories). If a directory is not specified, then the search is performed for the current directory.

To search for a regular expression string, use the **name** *filename-pattern* keyword and argument. Replace the *filename-pattern* argument with the regular expression string. If this option is not used, then all files within the specified directory are displayed.

To search for files belonging to a specific user, use the *user-id* argument. If this option is not used, then files belonging to all users are displayed.

Task ID

Task ID	Operations
universal	execute

In the following example, the**utility find** command is used to locate the file named "hfr-fwdg-3.8.0". The path is the root directory of disk0:.

```
RP/0/RP0/CPU0:router# utility find path disk0: name hfr-fwdg-3.4.0

disk0:/instdb/admin_pkgs_mdata/hfr-fwdg-3.8.0
disk0:/hfr-fwdg-3.8.0
```

In the following example, the **utility find** command is used to locate files matching a pattern. In this example, all files ending in ".txt" are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr name *.txt

disk0:/usr/test2.txt
```

In the following example, the UNIX equivalent option is used to locate files matching a pattern. In this example, all files ending in ".txt" are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0: -name *.txt

disk0:/hfr-base-3.8.0/etc/vim/doc/editing.txt
disk0:/hfr-base-3.8.0/etc/vim/doc/help.txt
disk0:/hfr-base-3.8.0/etc/vim/doc/intro.txt
disk0:/hfr-base-3.8.0/etc/vim/doc/uganda.txt
disk0:/usr/test2.txt
```

In the following example, the files belonging to a specific user are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr user 0

disk0:/usr
disk0:/usr/passwd
disk0:/usr/test2.txt
```

In the following example, the UNIX equivalent option is used to display files belonging to a specific user:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr -user 0

disk0:/usr
disk0:/usr/passwd
```

```
disk0:/usr/test2.txt
```

Related Commands

Command	Description
utility which, on page 1011	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.

utilityhead[{*WORD*|**[bytes]** [**count** *number*][**file** *source*]|**usage**}]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Copies the data in bytes from the beginning of each specified file. The default setting is to copy lines of data.
count *number*	(Optional) (**-n**) Specifies the number of lines (default) or bytes to be copied. The *number* argument is an unsigned decimal integer. By default, the **utility head** command copies the first ten units (lines or bytes) of the file. Use the **count** *number* option to change the default.
file *source*	(Optional) Specifies the storage device, directory, and filename for the files. If a file is not specified, the standard input is used.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If the **utility head** command is entered without keywords or arguments, the first ten lines of the file or standard output are copied.

If no file is specified, then the standard input is used.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:**, **disk1a:**, and **compactflasha:**.

Usage Guidelines

The **utility head** command copies the beginning bytes (default) or lines of one or more files to the standard output (usually the user interface display). Use the **bytes** or **lines** keywords to copy the data based on lines or bytes. Use the **count** *number* option to specify the number of bytes or lines to copy. By default, the **utility head** command copies the first 10 lines of each file.

If more than one file is selected, an identifying header is added before the output for each file. If no file is specified, then the standard input (keyboard) is used.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility head** command is used to display the first 15 lines from the output of the **show version** command:

```
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#
```

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

exitEOF	(Optional) (**-E**) Automatically exits the utility the first time an end-of-file is encountered.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
position *line-number*	(Optional) (**-j**) Uses the line at *line-number* on the screen to position matched lines during a patter search.
startat *string*	(Optional) (**-p**) Starts at the first occurrence of the pattern specified by the *string* argument in the file.
file *source-file*	(Optional) Specifies the storage device and directory path for the text file to be displayed. The default is standard input. The syntax for the *source-file* argument is: *device* **:**[/ *directory-path*]/ *filename*

Command Default

If no text file is specified, standard input is assumed.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **utility less**command to display files page by page. You can specify regular expressions for pattern matching using the **startat** keyword. You can scroll up as well as down. When you enter the less mode, commands are similar to the “vi” editor.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

The following example, the **utility less** command is used to display the file "config_store". Only part of the file is shown here.

```
RP/0/RP0/CPU0:router# utility less file disk0:/usr/config_store

  Last configuration change at Tue Feb 20 18:34:02 2007 by xxx
  !
  hostname H1
  line console
   exec-timeout 600 0
   session-timeout 600
  !
  line default
   exec-timeout 600 0
   session-timeout 600
  !
  .
  .
  .
```

utility mv

To rename or move a file from one directory to another, use the **utility mv** command in

EXEC mode or administration EXEC

mode.

utility mv {[{*WORD*|**force**|**interactive**}] **source** *source-file* **target** *target-file*|**usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
force	(Optional) (**-f**) Forces an overwrite if the target file already exists. There is no confirmation prompt.
interactive	(Optional) (**-i**) Specifies to prompt for confirmation before renaming a file.
source *source-file*	Specifies the storage device, directory, and filename for the file to be moved.
target *target-file*	Specifies the new storage device, directory, and filename for the file.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

No default behavior or values

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility mv** command is used to move the file “aaa” from disk0a: to disk1a:

```
RP/0/RP0/CPU0:router# utility mv source disk0a:/aaa target disk1a:/aaa
```

Related Commands

Command	Description
utility cut, on page 972	Cuts characters or lines from the output displayed from standard input or a file.
utility sort, on page 1002	Sorts, merges, or sequence-checks the output displayed from standard input or a file.
utility tail, on page 1005	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

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
dict	(Optional) (**-d**) Sorts in dictionary order. Uses only alphanumeric and blank characters in the sort operation.
fieldSep *character*	(Optional) (**-t**) Specifies a character as the field separator.
ignoreblank	(Optional) (**-b**) Ignores leading blank characters in field comparisons.
key *key-definition*	(Optional) (**-k**) Defines a key to be the sort key. The *key-definition* argument field is defined using the following syntax: *field_start* [*type_string*] [,*field_end*] [*type_string*] • *field_start* and *field_end*—Specifies the beginning and end of the key field. • *type_string*—Specifies attributes specific to the key. The *field_start* and *field_end* arguments are each specified by a pair of digits of the form m.n, where the m refers to the field starting after the mth field separator in a line. For field_start, the .n refers to the nth character of the specified field, and is taken as zero if not specified. For field_end, the .n refers to the nth character after the last character of the specified field, and is taken as zero if not specified. The *type_string* argument may be formed from the characters bdfinr, which apply their defined attributes to the determination of the key. **Note** When ordering options appear independent of key field specifications, the requested field ordering rules are applied globally to all sort keys. When attached to a specific key, the specified ordering options override all global ordering options for that key.
lowercase	(Optional) (**-f**) Folds uppercase letters into lowercase (ignores case and treats upper case characters the same as lowercase characters).
merge	(Optional) (**-m**) Merges sorted files. Assumes that the files are already sorted and so does not sort the files.
numeric	(Optional) (**-n**) Interprets the field as numeric and sorts in numeric order. Includes the sign and optional thousands separator. This keyword also ignores leading blank characters in field comparisons (implies the **ignoreblank** keyword).

outfile *filename*	(Optional) (**-o**) Writes the results to a file. The *filename* argument is the destination disk, directory, and filename. The *filename* argument can be the same as the source file.
printable	(Optional) (**-i**) Ignores all nonprintable characters.
reverse	(Optional) (**-r**) Reverses the sort order. The sort is ascending by default.
unique	(Optional) (**-u**) Suppresses all but one line in each set of lines having equal keys.
file *filename*	(Optional) Specifies a file to be sorted.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no file is specified, then the standard input (keyboard) is used.

If an **outfile** *filename* keyword and argument is not specified, then the standard output (display) is used.

The file is sorted in ascending order.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility sort** command is used to sort the contents of the file "words.txt":

```
RP/0/RP0/CPU0:router# utility sort file disk0:/usr/words.txt

   The
   few
   inquires
  A
  Code.
  Date
  Done
  This
  best-selling
  bestseller
  book
  come
  concerning
  fiction,
```

```
  have
  its
  list
  muscled
  of
  onto
  our
  the
  way
  way
  work
```

In the following example, only the unique characters in the file “words.txt” are displayed:

```
RP/0/RP0/CPU0:router# utility sort unique file disk0:/usr/words.txt

  Code.
  Date
  best-selling
  book
  concerning
  have
  list
  of
  our
  way
  work
```

utility tail

To copy the end portion of a file or the standard input, use the **utility tail** command in

EXEC mode or administration EXEC

mode.

utility tail {[{[*WORD*]|**[bytes] [continuous]** [**count** *number*]}] [**file** *input-file*]|**usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Copies the end of the file measured in bytes. The default is lines.
continuous	(Optional) (**-f**) Continues to copy data from the end of the file after the last line is reached. The operation pauses for 1 second, and then resumes in a continuous loop. The input file must be a regular file, not a terminal or a FIFO special file (a named pipe).
count *number*	(Optional) (**-n**) Copies the number of lines (default) or bytes specified with the *number* argument. The range is 0 to 4294967295. By default, the last 10 lines are copied. The *number* argument is a decimal integer that defines the location in the file to begin copying: • Include the plus (+) character to copy from the beginning of the file. • Include the minus (-) character to copy from the end of the file. • Do not include a character to copy from the end of the file. **Note** Select the **bytes** keyword to copy the information measured in a count of bytes.
file *input-file*	(Optional) Directory path and filename for the input file. If no file is specified, then the standard input is used. The syntax for the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If the **utility tail** command is entered without keywords or arguments, the last 10 lines of the standard input are copied.

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:**, **disk1a:**, and **compactflasha:**.

Usage Guidelines

Use the **utility tail** command to copy data from the end of a file. By default, the last 10 lines are copied. Use the **bytes** keyword to copy the data measured in bytes. Use the **count** *number* option to define the number of lines or bytes to copy. Use the **file** *filename* option to specify an input file.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility tail** command is used to display the last 10 lines of the output from the **show version** command:

```
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-mbi, V 3.4.0[4n_06.09.13], Cisco Systems, at disk0:hfr-os-mbi-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#
```

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

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
afterChars *number*	(Optional) (**-s**) Ignores the first characters on each line of the input file. Use the *number* argument to specify the number of characters. The range is 0 to 4294967295.
afterField *number*	(Optional) (**-f**) Ignores the first fields on each line of the input file. Use the *number* argument to specify the number of fields. The range is 0 to 4294967295.
count	(Optional) (**-c**) Displays the number of times the line appeared in the input file at the beginning of each output line.
nonrepeating	(Optional) (**-u**) Displays only the nonrepeating lines from the input file (repeating lines are not displayed).
repeating	(Optional) (**-d**) Displays only the repeating lines from the input file (nonrepeating lines are not displayed).
infile *input-file*	(Optional) Specifies an input file for processing. The *input-file* argument specifies the device, directory, and filename of the input file. If no input file is specified, then the standard input (keyboard) is used. The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
outfile *output-file*	(Optional) Specifies an output file. The *output-file* argument specifies the device, directory, and filename of the output file. If no file is specified, then the standard output (display) is used. The syntax of the *output-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no input file is specified, then the standard input is used.

If no output file is specified, then the standard output is used.

Command Modes EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines Use the **utility uniq** command to display only lines that are repeated in a file, or to display only lines that appear once. This utility compares only adjacent lines, so the file or standard input must be sorted.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility uniq** command is used to display the repeating lines in the output of the **show environment** command:

```
RP/0/RP0/CPU0:router# show environment | utility uniq repeating

host    5V             4500,5500       4250,5750       4000,6000
fabricq 1.25V          1125,1375       1063,1438       1000,1500
fabricq 1.25V          1125,1375       1063,1438       1000,1500
ingress 1.25V          1125,1375       1063,1438       1000,1500
spa5    1.5V           1500,0          1575,1425       0,0
host    5V             4500,5500       4250,5750       4000,6000
fabricq 1.25V          1125,1375       1063,1438       1000,1500
fabricq 1.25V          1125,1375       1063,1438       1000,1500
ingress 1.25V          1125,1375       1063,1438       1000,1500
spa5    1.5V           1500,0          1575,1425       0,0
```

utility wc

To count words, lines, or bytes in a file, use the **utility wc** command in

EXEC mode or administration EXEC

mode.

utility wc [{[{[*WORD*]|**[bytes] [lines] [words]**}] [**file** *input-file*]|**usage**}]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Displays the number of bytes in each input file.
lines	(Optional) (**-l**) (-œel-?) Displays the number of lines in each input file.
words	(Optional) (**-w**) Displays the number of words in each input file.
file *input-file*	(Optional) Specifies the input file. The *input-file* argument specifies the device, directory, and filename of the input file. If no input file is specified, then the standard input (keyboard) is used. The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Output is displayed in the order bytes, words, and lines, even if the options are entered in a different order.

Command Modes

EXEC, Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The following devices were added: **disk0a:** , **disk1a:** , and **compactflasha:** .

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Output is displayed in the following order:

- When keywords are entered, the output appears in the order bytes, words, and lines.
- When no keyword is entered, the output appears in the order lines, words, and bytes.
- When any UNIX equivalent options are entered, the output appears in the order specified by the options. For example, if the command **utility wc -w -l -c** is entered, the output appears in the order words, lines, and bytes.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility wc**command is issued to display the number of lines, words, and bytes in the output of the **show version** command:

```
RP/0/RP0/CPU0:router# show version | utility wc

        221     1160    10820
```

The output displays the following:

- 221 lines
- 1160 words
- 10820 bytes

In the following example, the **utility wc** command is entered with the **words** keyword to display the number of words in the output of the **show version** command:

```
RP/0/RP0/CPU0:router# show version | utility wc words

       1160
```

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

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
all	(Optional) (**-a**) Displays all occurrences of the program specified by the **program** *pathname* keyword and argument.
fullname	(Optional) (**-f**) Displays the full pathname of the program file.
long [*link*]	(Optional) (**-l**) ("el") Displays the long format for each program found, and also displays link information if the file is a symlink.
program *program-name*	Specifies the name of the program file.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

None

Command Modes

EXEC, Admin EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the**utility 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-3.8.0.1I/sbin/perl
```

In the following example, the **utility which** command is entered with the **long** keyword to display additional details about the perl program file:

```
RP/0/RP0/CPU0:router# utility which long program perl

  -rwxrwxrwx  1     0         0        19245 Jul 28 14:31 /pkg/bin/perl
```

Related Commands

Command	Description
utility find, on page 993	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

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
trace	(Optional) (**-t**) Prints each program on standard error before executing.
program	(Optional) Specifies the name of the program and initial arguments. If a program name is not specified, then the echo utility is used.
program-name	(Optional) Specifies the name of the program. If a program name is not specified, then the echo utility is used.
initial-arguments	(Optional) Specifies the initial arguments.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no program is specified, then the echo utility is used (the input lines are displayed).

Command Modes

EXEC, Administration EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility 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
  .....
```