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 1: 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 2: show environment temperatures Field Descriptions, on page 35 describes the significant fields shown in the display.

Table 2: 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 3: show environment leds Field Descriptions, on page 35describes the significant fields shown in the display.

Table 3: 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 4: 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
```

```
-------------------------------------------------------------------------------------------
1OC768-DPSK/C-O      OPTICS FIRMWARE 101B3      lc   fpga2     101.03        0.0        0.0
-------------------------------------------------------------------------------------------
1OC768-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 5: 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 6: 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 7: 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 8: 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 9: 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 10: 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 11: 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 12: 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 13: show inventory Field Descriptions, on page 68 describes the significant fields shown in the display.

Table 13: 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 14: 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 15: 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 16: 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 17: 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 18: 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 80	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.
```