



# Hardware Redundancy and Node Administration Commands

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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.

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# clear canbus

To clear the counters used for statistics regarding the CAN bus, use the **clear canbus** command in administration EXEC mode.

```
clear canbus {client-stats | controller-stats | server-stats} location {all|node-id}
```

Syntax Description		
<b>client-stats</b>		Clears CAN bus client statistics.
<b>controller-stats</b>		Clears CAN bus controller statistics.
<b>server-stats</b>		Clears CAN bus server statistics.
<b>location</b> {all   <i>node-id</i> }		Clears the CAN bus statistics for a specific node or all nodes.

**Command Default** None

**Command Modes** Administration EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

Task ID	Task ID	Operation
	sysmgr	read

The following example illustrates how to use the **clear canbus** command:

```
RP/0/RSP0/CPU0:router(admin)# clear canbus server-stats location all
```

# clear plugin slot counts

To clear the running counts of the backplane connector slot plugins, use the **clear plugin slot counts** command in administration EXEC mode.

**clear plugin slot counts** **location** *node-id*

<b>Syntax Description</b>	<b>location</b> <i>node-id</i> Clears plugin slot counts on the designated node. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
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<b>Command Default</b>	None
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<b>Command Modes</b>	Administration EXEC
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.9.1	This command was introduced.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.
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The **clear plugin slot counts** command can be used only if the revised backplane ID card (BPID-02) is installed. If the BPID-02 card is not installed, the following error message is displayed:

```
0/1/CPU0 slot counts 'current' ...Response error: 'ENVMON' detected the 'warning' condition
'Hardware not available'
```

<b>Task ID</b>	<b>Task</b>	<b>Operation</b>
	sysmgr	execute

The following example illustrates how to use the **clear plugin slot counts** command:

```
RP/0/RSP0/CPU0:router(admin)# clear plugin slot counts location 0/FT1/SP
Fri Jan 15 10:15:55.388 pst

0/FT1/SP slot counts 'current' ... cleared
RP/0/RSP0/CPU0:router(admin)# show plugin slot counts location 0/FT1/SP
Fri Jan 15 10:16:15.503 pst

Backplane connector slot plugin counters

Current          Cumulative
0/FT1/SP         0              14
```

# environment altitude

To specify the chassis altitude, so the system can adjust the fan speed to compensate for lower cooling capability at higher altitudes, use the environment altitude command in administration configuration mode. To remove the altitude setting, use the no form of this command.

**environment altitude** *altitude* **rack** *rack-no*  
**no environment altitude** *altitude* **rack** *rack-no*

Syntax Description		
	<i>altitude</i>	Chassis location altitude in meters. Values can range from 0 to 4000.
	<b>rack</b> <i>rack-no</i>	Specifies the rack number of the chassis.

**Command Default** 1800 meters

**Command Modes** Administration configuration

Command History	Release	Modification
	Release 4.2.0	This command was introduced.

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

Task ID	Task ID	Operation
	root-system	read, write


This example specifies that the chassis is located at sea level:

```
RP/0/RSP0/CPU0:router(admin-config)#environment altitude 0 rack 0
```

## fabric enable mode

To change the fabric operation mode on Cisco ASR 9922 Series routers, use the **fabric enable mode** command in the Admin Configuration mode.

**fabric enable mode** [**highbandwidth** | **a99-highbandwidth**]

<b>Syntax Description</b>	<p><b>highbandwidth</b> Enables high scale Virtual Queuing Instance (VQI). In this mode, the maximum number of VQI that can be defined on the router is 2048.</p> <p>In the default mode, a maximum of 1024 VQI is supported and only first five switch fabric links can be used in each line card slot.</p>						
	<p><b>a99-highbandwidth</b> Enables the use of all seven switch fabric links in each line card slot. In this mode, the maximum number of VQI that can be defined on the router is 2048.</p> <p><b>Note</b> This keyword is allowed only when all the line cards in the chassis are of A99 type (for example, A99-12X100GE, A99-8X100GE, and so on).</p>						
<b>Command Default</b>	<p>In Cisco IOS XR, default operating mode is not configured (None).</p> <p>In Cisco IOS XR 64 bit, default operating mode is <b>highbandwidth</b>.</p>						
<b>Command Modes</b>	<p>Admin Configuration mode.</p>						
<b>Command History</b>	<table border="1"> <thead> <tr> <th data-bbox="344 1066 441 1108">Release</th> <th data-bbox="500 1066 646 1108">Modification</th> </tr> </thead> <tbody> <tr> <td data-bbox="344 1119 441 1182">Release 6.1.2</td> <td data-bbox="500 1119 1058 1150">a99-highbandwidth keyword support was introduced.</td> </tr> <tr> <td data-bbox="344 1203 441 1266">Release 5.3.0</td> <td data-bbox="500 1203 831 1234">This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.1.2	a99-highbandwidth keyword support was introduced.	Release 5.3.0	This command was introduced.
Release	Modification						
Release 6.1.2	a99-highbandwidth keyword support was introduced.						
Release 5.3.0	This command was introduced.						
<b>Usage Guidelines</b>	<p>In Cisco IOS XR 64 bit, <b>highbandwidth</b> mode is enabled by default. Therefore, only <b>a99-highbandwidth</b> keyword can be used during command execution on Cisco IOS XR 64 bit routers.</p>						
	<p> <b>Note</b> Ensure to remove all the line cards that are unsupported for an operating mode before executing this command; the command will otherwise be rejected.</p>						



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**Note** Remove all unsupported line cards in the chassis before enabling the **highbandwidth** operating mode. This mode is **NOT** available on the following line cards:

- A9K-2X100GE
  - A9K-1X100GE
  - A9K-36X10GE
  - A9K-24X10GE
  - A9K-MOD160
  - A9K-MOD80
  - A9K-16T
  - A9K-8T
  - A9K-4T
  - A9K-2T20GE
  - A9K-40GE
  - A9K-SIP-700
- 

**Example:**

This example shows the available fabric operating modes:

```
RP/0/RSP0/CPU0:router (admin-config) # fabric enable mode ?
A99-highbandwidth  A99 High bandwidth cards only
highbandwidth      High bandwidth cards only
```

# fpd auto-upgrade

To enable the automatic upgrade of FPD images during a software upgrade, use the **fpd auto-upgrade** command in 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.pie disk0:/hfr-mpls-p.pie
```

Task ID	Task ID	Operation
	system	read, write

The following example shows how to enable automatic FPD upgrades:

```
RP/0/RSP0/CPU0:router (admin-config) # fpd auto-upgrade
```



# fpd auto-reload

To enable the automatic reload of a line card after successful FPD software upgrade, use the **fpd auto-reload** command in Admin Configuration mode. To disable automatic LC reload, use the **no** form of this command.

## fpd auto-reload

**Syntax Description** This command has no keywords or arguments.

**Command Default** None.

**Command Modes** Admin Configuration mode

Command History	Release	Modification
	Release 6.5.1	This command was introduced.

**Usage Guidelines** The **fpd auto-reload** command works only if **fpd auto-upgrade** command is configured.

```
(admin-config)#fpd auto-reload
(admin-config)#fpd auto-upgrade
(admin-config)#commit
```

This command is supported on Cisco IOS XR 32-bit OS.

Task ID	Task ID	Operation
	system	read, write

The following example shows how to enable automatic LC reload after FPD upgrades:

```
RP/0/RSP0/CPU0:router(admin-config)# fpd auto-reload
```

## fpd auto-reload (Cisco IOS XR 64-bit)

To enable or disable automatic reload of a line card after successful FPD upgrade, use the **fpd auto-reload** command in Global Configuration mode.

**fpd auto-reload** {enable | disable}

Syntax Description	
<b>enable</b>	Enables LC auto reload after FPD auto upgrade.
<b>disable</b>	Disables LC auto reload after FPD auto upgrade.

**Command Default** None.

**Command Modes** Global Configuration mode

Command History	Release	Modification
	Release 6.5.1	This command was introduced.

**Usage Guidelines** This command is supported on Cisco IOS XR 64-bit OS.

Task ID	Task ID	Operation
	system	read, write

The following example shows how to enable automatic LC reload after successful FPD upgrades:

```
RP/0/RSP0/CPU0:router(config)# fpd auto-reload enable
```

# hw-module cmp disable

To disable the Console Management Port (CMP) on a RSP880/RP2, use the **hw-module cmp disable** command in Admin Configuration mode. Disabling unused CMP ensures a higher level of security.

To enable a CMP, use the **no** form of this command.

**hw-module cmp disable**  
**no hw-module cmp disable**

<b>Syntax Description</b>	<b>location</b> <i>loc-name</i> RSP880/RP2 location.				
<b>Command Default</b>	CMP on a RSP880/RP2 is <b>enabled</b> .				
<b>Command Modes</b>	Admin configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.3.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.3.1	This command was introduced.
Release	Modification				
Release 6.3.1	This command was introduced.				

**Usage Guidelines** By default, CMP on a RSP880/RP2 is **enabled** and you can disable the port later by executing the command. If CMP is already disabled using this command, it will automatically be re-enabled when the RSP is re-loaded (at boot-up). However, after the RSP is in a stable state/UP state, the port gets disabled again as the configuration is automatically re-applied.



**Note** After CMP is disabled using this command, the CMP shell access session will be terminated. This command can be executed only RSPs; not on Line Cards.

This example shows how to disable CMP on a RSP/RP:

```
RP/0/RSP0/CPU0:router (admin-config) # hw-module cmp disable location 0/RSP0/CPU0
```

This example shows how to enable CMP on a RSP/RP:

```
RP/0/RSP0/CPU0:router (admin-config) # no hw-module cmp disable location 0/RSP0/CPU0
```

## hw-module external-usb disable

To disable USB ports on any RSP, use the **hw-module external-usb disable** command in Admin Configuration mode. Disabling unused USB ports ensures a higher level of security.

To enable a USB port, use the **no** form of this command.

On Cisco IOS XR 64 bit, use **external-usb disable** and **no external-usb disable** commands in Admin Configuration mode for the same.

**hw-module external-usb disable**  
**no hw-module external-usb disable**

**Syntax Description** This command has no keywords or arguments.

**Command Default** USB port on a RSP is **enabled**.

**Command Modes** Admin configuration

Command History	Release	Modification
	Release 6.3.1	This command was introduced.

**Usage Guidelines** By default, USB port on a RSP is **enabled**. If USB is already inserted into a port and then the USB port is disabled using this command, the existing USB continues to be recognized until it is removed.



**Note** Inserting a USB will **not** be detected after a USB port is disabled using this command.  
 This command can be executed only RSPs; not on Line Cards.

This example shows how to disable a USB port on a RSP:

```
RP/0/RSP0/CPU0:router (admin-config) # hw-module external-usb disable
```

This example shows how to enable a USB port on a RSP:

```
RP/0/RSP0/CPU0:router (admin-config) # no hw-module external-usb disable
```

## hw-module high-bandwidth

To upgrade the RSP3 Lite card from 80Gig per line card capacity to 220Gig per Line card capacity (for Enhanced ethernet linecards), use the **hw-module high-bandwidth** command in the appropriate mode. To restore the default capacity, use the **no** form of the command.

**hw-module high-bandwidth**  
**no hw-module high-bandwidth**

<b>Syntax Description</b>	This command has no keywords or arguments.
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<b>Command Default</b>	None
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<b>Command Modes</b>	Admin config
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.3.0	This command was introduced.

<b>Usage Guidelines</b>	This command can be used only after applying the appropriate license to RSPLite3. Traditional or smart licensing can be used.
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<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	execute

### Example

This example shows how to use the **hw-module high-bandwidth** command:

```
RP/0/RSP0/CPU0:router (config) # hw-module high-bandwidth
```

# hw-module location port breakout

To convert the speed of a interface port from one to another, for example, 100G port to 40G port, use the **hw-module location *node-id* port *port number* breakout *interface*** command in the global configuration mode.

**hw-module location *node-id* port *number* breakout *interface***

## Syntax Description

<b><i>node-id</i></b>	Node whose hardware attributes you want to configure. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
<b>Note</b>	Enter the <b>show platform</b> command to see the location of all nodes installed in the router.
<b>port <i>port-number</i></b>	Indicates the optics port number. Depending on the line card, the port numbers and its type might vary.
<b>breakout <i>interface</i></b>	Configures the breakout interface.

## Command Default

No default behavior or values

## Command Modes

Global configuration mode

## Command History

Release	Modification
Release 6.4.2	This command was introduced.
Release 7.1.3	This command was updated. The command is supported on two new hardware: <ul style="list-style-type: none"> <li>• Cisco ASR 9000 12-Port 100GE line card (A99-12x100GE)</li> <li>• Cisco ASR 9000 4-Port 100GE line card (A9K-4x100GE)</li> </ul>

## Usage Guidelines

This command is supported only on these routers and line cards:

- Cisco ASR 9901 Routers
- Cisco ASR 9000 12-Port 100GE line card (A99-12x100GE)
- Cisco ASR 9000 4-Port 100GE line card (A9K-4x100GE)

## Task ID

Task ID	Operations
root-system	read, write

Task ID	Operations
root-lr	read, write

This example shows how to convert 100G port to 40G port:

```
RP/0/RSP0/CPU0:router(config)# hw-module location 0/0/CPU0 port 20 breakout 1xFortyGigE
```

## hw-module location breakout

To configure the breakout option for a specified interface, use the **hw-module location breakout** command in the appropriate mode. To delete the breakout option, use the **no** form of the command.

**hw-module location** *node-id* [ **preconfigure** ] **bay** *bay-number* **port** *port-number* **breakout** *interface*  
**no hw-module location** *node-id* [ **preconfigure** ] **bay** *bay-number* **port** *port-number* **breakout** *interface*

### Syntax Description

<b>location</b> <i>node-id</i>	Interface details.
<b>preconfigure</b>	(Optional) Enables the user to preconfigure breakout on an empty slot.
<b>bay</b> <i>bay-number</i>	Bay number of the device (Upper, left, right, lower).
<b>port</b> <i>port-number</i>	Specifies the port on which you want to enable breakout. This port is also known as the CPAK port.
<b>breakout</b> <i>interface</i>	Enables breakout. The modes supported are 10x10 GE.

### Command Default

None

### Command Modes

Global config

### Command History

Release	Modification
Release 5.3.0	This command was introduced.

### Usage Guidelines

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

SR10 CPAK can operate in the 10x10GE mode.

Use the **show ipv4 interfaces brief** command to get the details of the breakout interfaces:

```
show ipv4 interfaces brief | include Ten
TenGigE0/0/0/2/0          unassigned      Shutdown        Down
TenGigE0/0/0/2/1          unassigned      Shutdown        Down
TenGigE0/0/0/2/2          unassigned      Shutdown        Down
TenGigE0/0/0/2/3          unassigned      Shutdown        Down
TenGigE0/0/0/2/4          unassigned      Shutdown        Down
TenGigE0/0/0/2/5          unassigned      Shutdown        Down
TenGigE0/0/0/2/6          unassigned      Shutdown        Down
TenGigE0/0/0/2/7          unassigned      Shutdown        Down
TenGigE0/0/0/2/8          unassigned      Shutdown        Down
TenGigE0/0/0/2/9          unassigned      Shutdown        Down
```

### Task ID

Task ID	Operation
sysmgr	read



### Example

This example shows how to use the **hw-module location breakout** command:

```
RP/0/RSP0/CPU0:router (config) # hw-module location 0/0/CPU0 bay 0 port 2 breakout 10xTenGigE
```

This example shows how to use the **hw-module location breakout** to enable 1 GbE port mode option command:

```
RP/0/RSP0/CPU0:router (config) # hw-module location 0/0/CPU0 bay 0 slice 0 config-mode 1x100GE,1x100GE,5x1GE_5x10GE,5x1GE_5x10GE
```

# hw-module location bay port port-mode

To configure an MPA with optics in 200G mode use the `hw-module location bay port port-mode` command in the global configuration mode.



**Note** Staircase FEC is supported only in 100gig mode.

**hw-module location** *location* **bay** *bay-number* **port** *port-number* **port-mode** *port-mode*

Syntax Description	Parameter	Description
	<b>location</b> <i>location</i>	Indicates the location of the MPA, which is the line card ID.
	<b>bay</b> <i>bay-number</i>	Indicates the bay number of the line card.
	<b>port</b> <i>port-number</i>	Indicates the port number of the optical-module or optic. You can configure the port number with only the value, 0.
	<b>port-mode</b> <i>port-mode</i>	Configures the 200G port mode. Port mode can be: <ul style="list-style-type: none"> <li>• <i>2xHundredGigE-16QAM</i>: Configures 200G 16QAM port mode for EP</li> <li>• <i>2xHundredGigE-8QAM</i>: Configures 200G 8QAM port mode for EP</li> </ul> <p>A higher QAM value leads to higher data transmission rates, but also increases the risk of errors that necessitates re-sends.</p>

**Command Default** If this command is not configured, the MPA and optics work in 100G mode.

**Command Modes** Global configuration

Command History	Release	Modification
	Release 7.0.1	This command was introduced.

**Usage Guidelines** You can configure this command only at port 0 of a router.

Task ID	Task ID	Operation
	root-system	read, write
	root-lr	read, write

This example shows how to configure 200G for an optical module of a router.

```
Router(config)# hw-module location 0/2/CPU0 bay 0 port 0 port-mode 2xHundredGigE-16QAM
```

# hw-module location reload

To reset the power-cycle or reload the hardware for a specific node, or for all nodes installed in the router, use the **hw-module location reload** command in EXEC or administration EXEC mode.

**hw-module location** *node-id* **reload** [*path* | **warm**]

## Syntax Description

*node-id* Node whose hardware attributes you want to configure. 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.

*path* TFTP or disk path to the image you want to download onto the specific node or nodes.

**warm** Specifies a warm reload of the node.

## Command Default

No default behavior or values

## Command Modes

EXEC

Administration EXEC

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

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

To reset a specific node, use the **hw-module location reload** command in EXEC mode.

To reset a specific node or all nodes, use the **hw-module location reload** command in administration EXEC mode.



**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.

## Task ID

Task ID	Operations
root-lr	execute (in EXEC mode)
sysmgr	execute (in EXEC mode and administration EXEC mode)

This example shows how to reset the hardware on a specific node from EXEC mode:

```
RP/0/RSP0/CPU0:router # hw-module location 0/1/CPU0 reload
```

This example shows how to reset the hardware on a specific node from administration EXEC mode:

```
RP/0/RSP0/CPU0:router# admin  
RP/0/RSP0/CPU0:router(admin)# hw-module location 0/3/CPU0 reload
```

This example shows how to reset the hardware on a specific fabric card node:

```
RP/0/RSP0/CPU0: router (admin) # hw module location 0/fc0/SP reload
```

## hw-module location slice config-mode

To convert the speed of a interface port from one to another, for example, 10GE port to 1GE port, use the **hw-module location *node-id* slice *number* config-mode *interface*** command in the global configuration mode.

**hw-module location *node-id* slice *number* config-mode *interface***

<b>Syntax Description</b>	<i>node-id</i>	Node whose hardware attributes you want to configure. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
		<b>Note</b> Enter the <b>show platform</b> command to see the location of all nodes installed in the router.

**Command Default** No default behavior or values

**Command Modes** Global configuration mode

**Command History**

**Usage Guidelines** This command is supported on Cisco ASR 9902 router.

The 5x1GE\_5x10GE port mode enables 1GE support in the following ports:

- Slice 0: Ports 1, 3, 5, 7, 13, 15, 17, 19, 21, and 23
- Slice 1: Ports 25, 27, 29, 31, 33, 35, 41, 43, 45, and 47

Task ID	Task ID	Operations
	root-system	read, write
	root-lr	read, write

This example shows how to enable 5x1GE\_5x10GE port mode:

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#hw-module location 0/0/CPU0 slice 0 config-mode config-mode
1x100GE,1x100GE,5x1GE_5x10GE,5x1GE_5x10GE
RP/0/RP0/CPU0:ios(config)#commit
```

# hw-module location slice power-down

To power off a specified slice, use the **hw-module location slice power-down** command in the Global Configuration mode. To power on a slice, use the **no** form of the command.

**hw-module location** *node-id* **slice number** **power-down**

<b>Syntax Description</b>	<b>location</b> <i>node-id</i>	Specifies the line card node location.
	<b>slice number</b>	Specifies the slice number that should be power off.

**Command Default** All slices are power on.

**Command Modes** Global Configuration mode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.0.1	This command was introduced.

**Usage Guidelines** This feature is supported on the Cisco ASR 9000 4th Generation Ethernet line cards.



**Note** It is necessary to reload the line card after executing the **hw-module location slice power-down** command.

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	read, write

## Example

This example shows how to power down slice 3, and 7 of the line card at node 0:

```
RP/0/RSP0/CPU0:router (config) # hw-module location 0/0/CPU0 slice 3 power-down
RP/0/RSP0/CPU0:router (config) # hw-module location 0/0/CPU0 slice 7 power-down
RP/0/RSP0/CPU0:router (config) # commit
RP/0/RSP0/CPU0:router (config) # end
RP/0/RSP0/CPU0:router # admin
RP/0/RSP0/CPU0:router (sysadmin) # hw-module location 0/0/CPU0 reload
```

# hw-module power location

To power on a specified line card, use the **hw-module power location** command in administration configuration mode.

**hw-module power** [**override**] **location** *node-id*

Syntax Description	
<b>location</b> <i>node-id</i>	Identifies the node to power on. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
<b>override</b>	Allows the card to be powered up even though there is no power consumption value programmed on the manufacturing EEPROM of the card.

**Command Default** Power is on for all nodes.

**Command Modes** Administration configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

The **hw-module power location** command is available for line cards only; it is not available for route switch processor (RSP) cards.

Use the **hw-module power disable location** command to power off a line card.

Use the **show platform** command to view a summary of the nodes in the router, including status information.

By default, cards that do not have a power consumption value programmed on the manufacturing EEPROM cannot be powered up or booted. To correct an issue with such cards, that possibly is because of an incorrectly programmed EEPROM, you can use the **hw-module power** command with the **override** option.

Task ID	Task ID	Operations
	root-system	read, write
	root-lr	read, write

The following example shows how to power on a line card:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
```

```
RP/0/RSP0/CPU0:router(admin-config)# hw-module power location 0/1/0
```

The following example shows how to disable the power-on feature for a line card:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/CPU0:router(admin-config)# hw-module power disable location 0/SM3/SP
```



# 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 reenble the node power-on feature on a line card, use the **no** form of this command.

```
hw-module power [override] disable location node-id
no hw-module power [override] disable location node-id
```

Syntax Description	override	Specifies to power up the card regardless of the available power budget.
	<b>location</b> <i>node-id</i>	Identifies the node whose power-on feature you want to disable. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

**Command Default** Power is on for all nodes.

**Command Modes** Administration configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

Use the **show 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.

Cards that do not have a power consumption value programmed on the manufacturing EEPROM do not power up or boot. Use the **override** option with the **hw-module power disable** command to power up the card to correct any issue about an incorrectly programmed manufacturing EEPROM. In any event, the system is not allowed to go over the maximum power budget for the system.

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/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
```

```
RP/0/RSP0/CPU0:router(admin-config)# hw-module power disable location 0/0/CPU0
```

The following example shows how to disable the node power-on feature on a fabric card:

```
RP/0/RSP0/CPU0:router (admin-config) # hw-module power disable location 0/fc0/SP
```

# hw-module power saving

To configure the power saving mode for a specified slice, use the **hw-module power saving** command in the appropriate mode. To delete the power saving option, use the **no** form of the command.

**hw-module power saving location** *location slice number*  
**no hw-module power saving location** *location slice number*

## Syntax Description

**location** *location* The interface details.

**slice number** The slice number on which power save mode needs to be enabled. Each slice has two physical ports. Slice 1, 2 ,3 can be configured to the power saving mode. Power save option is not applicable for slice 0.

## Command Default

None

## Command Modes

Admin config

## Command History

Release	Modification
Release 5.3.0	This command was introduced.

## Usage Guidelines

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

Once a slice is configured in the power saving mode, the interfaces will be deleted and hence all traffic passing through the interfaces will be dropped.

## Task ID

Task ID	Operation
sysmgr	read, write

## Example

This example shows how to use the **hw-module power saving** command:

```
RP/0/RSP0/CPU0:router (admin-config) # hw-module power saving location 0/1/cpu0 slice 3
```

## hw-module processor location mode

To configure processor array clusters setting for an ASR 9900 Series 16-Port 100 Gigabit Ethernet Service Edge Line Card, use the **hw-module processor location mode** command in global configuration mode.

**hw-module processor location** *node-id* **mode** {**mode-default** | **mode-full**}

The **no** format of the above command is not available. To move back to default mode, use the **hw-module processor location** *node-id* **mode mode-default** command form.

### Syntax Description

<b>location</b> <i>node-id</i>	Specifies the node whose hardware attributes you want to configure. (The <i>node-id</i> is expressed in the rack/slot/module notation, such as <b>0/8/CPU0</b> ).
<b>mode-default</b>	Specifies that processor array clusters are used as defined in the (default) line card profile setting.
<b>mode-full</b>	Specifies that all processor array clusters are fully utilized.

### Command Default

The processor array clusters are used as per the line card profile setting (the mode is set to **mode-default**).

### Command Modes

Global configuration

### Command History

Release	Modification
Release 6.6.2	This command was introduced.

### Usage Guidelines

- The **hw-module processor location mode** command is only supported on the Cisco ASR 9900 Series 16-Port 100 Gigabit Ethernet Service Edge Line Card (whose part number is A99-16X100GE-X-SE).
- The command is only applicable for IOS XR 64 Bit version on ASR 9000 Enhanced XR (eXR).
- To change the cluster setting to **mode-full**, use the **hw-module processor location** *node-id* **modemode-full** command form.
- To change the cluster setting from **mode-full** to **mode-default**, use the **hw-module processor location** *node-id* **mode mode-default** command form, and not the **no** form of the command.
- You must reload the line card XR VM after setting the new mode. You cannot enable it when the line card is in use. Any traffic on the line card is impacted until the line card becomes operational with the new mode.

### Example

This example shows how to set the clusters' usage setting on the A99-16X100GE-X-SE line card to **mode-full**:

```
RP/0/RP1/CPU0:ios(config)# hw-module processor location 0/8/CPU0 mode mode-full
RP/0/RP1/CPU0:ios(config)# commit
RP/0/RP1/CPU0:ios(config)# exit
RP/0/RP1/CPU0:ios# reload location 0/8/CPU0
```

```
Proceed with reload? [confirm]
Reloading node 0/8/CPU0
```

This example shows how to set the clusters' usage setting on the A99-16X100GE-X-SE line card from **mode-full** to **mode-default**:

```
RP/0/RP1/CPU0:ios(config)# hw-module processor location 0/8/CPU0 mode mode-default
RP/0/RP1/CPU0:ios(config)# commit
RP/0/RP1/CPU0:ios(config)# exit
RP/0/RP1/CPU0:ios# reload location 0/8/CPU0
Proceed with reload? [confirm]
Reloading node 0/8/CPU0
```

**Related Commands**

Command	Description
<b>show platform</b>	Displays information and status for each node in the system.

# hw-module profile itcam

To configure internal tcam profile partition for line cards on a Global Configuration level, use the **hw-module profile itcam** command in the Admin Configuration mode.

**hw-module profile itcam** {**to-profile-se1** | **to-default**} **location** *location*

**Table 1: Syntax Description**

<b>to-profile-se1</b>	Sets the internal tcam partitions for service edge, that is, L2 limit is increased to 4K entries in the L2 table and V6 limit is increased to 3.5K entries in the V6 table by adjusting 24K V4 entries in the V4 table.
<b>to-default</b>	Sets the default internal tcam partitions where L2 limit is 1K in the L2 table, V4 limit is 24K in the V4 table, and V6 limit is 1.75K entries in the V6 table).
<b>location</b> <i>location</i>	Sets the location.

## Command Mode

Admin Configuration mode on 32-bit IOS-XR

Global Configuration mode on 64-bit IOS-XR

## Command History

Release	Modification
Release 6.6.2	This command was introduced.

## Usage Guidelines

This profile configuration can be applied only on A99-12X100GE or A99-4X100GE line cards. To enable this profile configuration, you have to reload the linecards after the configuration. To return to the default profile mode use the **to-default** option.

Task ID	Operation
root-lr	read, write
system	read, write

## Example

This example shows how to configure **hw-module profile itcam to-profile-se1** command:

```
Router# config
Router(config)#hw-module profile itcam to-profile-se1 location 0/0/CPU0
Sun Mar 3 07:44:23.066 UTC
In order to activate this new internal tcam partition profile, you must manually reload the
line card.
Router(config)#
```

This example shows how to configure **hw-module profile itcam to-default** command:

```
Router# config
Router(config)#hw-module profile itcam to-default location 0/0/CPU0
Sun Mar  3 07:45:22.198 UTC
In order to activate this new internal tcam partition profile, you must manually reload the
line card.
Router(config)#
```

#### Related Commands

Command	Description
<b>show prm server tcam summary all all detail all location 0/0/CPU0</b>	This command output shows modified tcam entries with increased limits for L2 and V6 entries.

## 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*

<b>Syntax Description</b>	<b>location</b> <i>node-id</i> Interface details.
---------------------------	---

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.3.0	This command was introduced.

<b>Usage Guidelines</b>	The <b>hw-module port-control license</b> 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 <b>show license entitlement</b> 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.

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	execute

### Example

This example shows how to use the **hw-module port-control license** command:

```
RP/0/RSP0/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*

<b>Syntax Description</b>	<b>location</b> <i>linecard-slot</i> The interface and slot details.
---------------------------	--

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.3.0	This command was introduced.

<b>Usage Guidelines</b>	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.

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	execute

## Example

This example shows how to use the **hw-module port-control non-combo-mode** command:

```
RP/0/RSP0/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

<b>disable</b>	Disables the node reset feature on the specified node.
<b>location node-id</b>	Identifies the node you want to reload. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

### Command Default

The node reset feature is enabled for all nodes.

### Command Modes

Administration configuration

### Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

### Usage Guidelines

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

The **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/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/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 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**

<b>Syntax Description</b>	<i>subslot-id</i> Specifies the subslot to be restarted. The <i>subslot-id</i> argument is entered in the <i>rack/slot/subslot</i> notation.				
<b>Command Default</b>	No default behavior or values				
<b>Command Modes</b>	EXEC				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 3.9.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 3.9.0	This command was introduced.
Release	Modification				
Release 3.9.0	This command was introduced.				
<b>Usage Guidelines</b>	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p> <p>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.</p>				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>root-lr</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	root-lr	read, write
Task ID	Operations				
root-lr	read, write				

The following example shows how to restart the SPA in slot 2, subslot 1:

```
RP/0/RSP0/CPU0:router# hw-module subslot 0/2/1 reload
```

## 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/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# isolation enable
RP/0/RSP0/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**

<b>Syntax Description</b>	This command has no keywords or arguments.				
<b>Command Default</b>	If the <b>isolation multiple</b> command is not configured and the failover is triggered by multiple protocols, the <b>isolation enable</b> command enables a failed RP to collect the required debug information of only the first failed protocol.				
<b>Command Modes</b>	Global configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 4.2.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 4.2.1	This command was introduced.
Release	Modification				
Release 4.2.1	This command was introduced.				
<b>Usage Guidelines</b>	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p> <p>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.</p> <p>The <b>isolation enable</b> command enables NSR to trigger RP switchover without protocol flap and collect the required debug information to identify the cause of the failure.</p> <p>If multiple protocols trigger NSR, the <b>isolation enable</b> command does not enable the RP to collect the required debug information. Use the <b>isolation multiple</b> command to enable the active RP to collect debug information even if the failure is caused by multiple protocols.</p>				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>transport</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	transport	read, write
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/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router(config)#isolation multiple
RP/0/RSP0/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/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/CPU0:router(admin-config)# led mode default unlock STBY_RP location 0/rp0/cpu0
RP/0/RSP0/CPU0:router(admin-config)# end
```

Uncommitted changes found, commit them? [yes]:

```
RP/0/RSP0/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

## power single-feed location

To configure single-feed mode, where the system supports the operating of one or all power modules (V1 DC, V2 DC, V3 AC and V3 DC) with only one feed, without raising an error message or an alarm for any missing feeds, use the **power single-feed location** command in administration configuration mode. To disable the single-feed mode, use the **no** form of this command.

**power single-feed location** {allname}  
**no power single-feed location** {allname}

### Syntax Description

<b>all</b>	Enables single-feed mode for all the power modules.
<b>name</b>	Specifies the power module node name in the <i>Rack/PSx/My/SP</i> format. Explanation of each component of the naming notation is as follows: <ul style="list-style-type: none"> <li>• <i>Rack</i>- Chassis number of the rack. In a single-shelf system, the rack number is 0. In a multi-shelf system, the LCC rack number range is 0 to 255 and the FCC rack number range is F0 to F7.</li> <li>• <i>PSx</i>- Power Slot.</li> <li>• <i>My</i>- Power Module.</li> <li>• <i>SP</i>- Service Processor node type. This is used for fan trays, power modules and any other node that is not an RSP/RP or an LC.</li> </ul>

### Command Default

Both the power feeds are enabled.

### Command Modes

Administration Configuration

### Command History

Release	Modification
Release 5.3.0	This command was introduced.

### Usage Guidelines

- The power feed configuration is verified by the software at the boot-up time prior to generating any warning messages.
- For a V2 AC power module, configuring the single-feed mode is not possible and an error message is displayed.
- A syslog message is displayed at the boot-up time when the single-feed mode configuration is enabled. The syslog message indicates that notifications are disabled for loss of one feed of each power module.

### Task ID

Task ID	Operation
root-system	read, write

The following example enables the single power feed mode for the 0/PS2/M0/SP power module:



```
RP/0/RSP0/CPU0:router#admin
RP/0/RSP0/CPU0:router(admin)#config
RP/0/RSP0/CPU0:router(admin-config)#power single-feed location 0/PS2/M0/SP
```

## power-mgmt action

To disable the power budget control, use the **power-mgmt action disable** command in the System Admin Config mode.

**power-mgmt action disable**

<b>Syntax Description</b>	<b>disable</b>	Disables the power budget control.
---------------------------	----------------	------------------------------------

<b>Command Default</b>	Power budget control is set to (N+1) and enabled by default.
------------------------	--

### Command Modes

Command History	Release	Modification
	Release 6.5.1	This command was introduced.

### Usage Guidelines

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

Power-management action is done at the chassis level.

To use this command, you must be in a user group associated with a task 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 power manager automatically calculates power required for each card. The system will only power up line cards if there is sufficient power. Use the **power-mgmt action disable** command to disable enforcement of power budgeting line card boot requests. This is not recommended, allowing for situations where chassis can overdraw current, causing instability or immediate chassis reset.

Use the **show environment** command with the **power** option to display power related information.

Use show power budge profile to view power requirements for each card type.

Before a card powers up its basic or upper layers, it must request budget. If that budget is not available, the boot request is denied.

If **power-mgmt action** command is enabled, it only prevents previously unpowered line cards from coming up in the event of low power budget scenarios. Reloading an operational line card cannot release its reserved budget. Therefore, a line card can be reloaded, even in low power budget scenarios, and allowed to return to operational. If configured with **power-mgmt action disable** command, line cards can always be given an allocated power budget and allowed to boot, regardless of available power.

This example shows you how to disable the chassis power management control:

```
sysadmin-vm:0_RP0# config
sysadmin-vm:0_RP0(config)# power-mgmt action disable
```

## power-mgmt redundancy

To control the power budget so as to not exceed the power capacity, use the **power-mgmt redundancy-num-pms** command. To restore default (N+1) power module redundancy, use the **no** form of this command.

By default, power module redundancy is set to (N+1). There is no power tray level redundancy.

**power-mgmt redundancy-num-pms** [*integer*]  
**no power-mgmt redundancy-num-pms** [*integer*]

### Syntax Description

*integer* Number of redundant power modules that the user wants to configure. The total number of functioning power modules in the system is at least *integer* number more than the number of power modules needed to support the power required for all the cards in the system. Range of *integer* is from 0 to 8. 0 means no power redundancy is required.

### Command Default

The Cisco ASR9000 router family has one logical power shelf consisting of one or more power trays, where each power tray contains three or four power modules.

### Command Modes

### Command History

Release	Modification
Release 6.5.1	This command was introduced.

### Usage Guidelines

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

If the system is planned to have power module redundancy (N+x), then this command can be used to set the number of power modules required for power redundancy.

This example shows how to configure power module level redundancy:

```
sysadmin-vm:0_RP0#config
sysadmin-vm:0_RP0(config)#power-mgmt redundancy-num-pms 2
sysadmin-vm:0_RP0(config)#commit
Tue Sep 3 12:17:53.891 UTC
Commit complete.
```

# 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*]

<b>Syntax Description</b>	<b>location</b> <i>node-id</i> (Optional) Specifies the primary RP on which to force a switchover. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
---------------------------	--

<b>Command Default</b>	No default behavior or values
------------------------	-------------------------------

<b>Command Modes</b>	EXEC Administration EXEC
----------------------	-----------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that 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.



<b>Note</b>	The <b>redundancy switchover</b> command can be used only if the standby RP is in the ready state. Use the <b>show redundancy</b> command to view the status of the RPs.
-------------	--

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	root-lr	read, write

The following example shows partial output for a successful redundancy switchover operation:

```

RP/0/RSP0/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/RSP0/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/RSP0/CPU0:router# show redundancy

This node (0/RP0/CPU0) is in ACTIVE role
Partner node (0/RP1/CPU0) is in UNKNOWN role

RP/0/RSP0/CPU0:router# redundancy switchover

Standby card not running; failover disallowed.

```

# show apm psa status

To display the PSA status for APM, use the **show apm psa status** command in EXEC mode.

**show apm psa status location** *node-id*

<b>Syntax Description</b>	<b>location</b> <i>node-id</i> The interface details.
---------------------------	---

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	Admin EXEC
----------------------	------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.3.0	This command was introduced.

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

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	read

## Example

This example shows how to use the **show apm psa status** command:

```
RP/0/RSP0/CPU0:router (admin) # show apm psa status location 0/0/CPU0
```

```
0/0/CPU0
```

```
PSA Client Status
```

```
DIAG          ENVMON          INVMGR          FIA          PCIE          LDA  \
              PRM
Registered    Registered    Registered    Registered    Registered    \
Registered    Registered
```

```
PSA Slice Status
```

```
Slice 0: Power On    Completed    1: Power On    Completed    2: Power On    \
Completed    3: Power Saving Completed
DIAG    Completed    Completed    Completed    Completed    \
              Completed
ENVMON    Completed    Completed    Completed    Completed    \
              Completed
INVMGR    Completed    Completed    Completed    Completed    \
              Completed
FIA    Completed    Completed    Completed    Completed    \
              Completed
PCIE    Completed    Completed    Completed    Completed    \
              Completed
```

```
LDA      Completed          Completed          Completed  \  
          Completed  
PRM      Completed          Completed          Completed  \  
          Completed
```

## show apm psm status

To display the PSM status for APM, use the **show apm psm status** command in EXEC mode.

**show apm psa status location** *node-id*

<b>Syntax Description</b>	<b>location</b> <i>node-id</i> The interface details.
---------------------------	---

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	Admin EXEC
----------------------	------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.3.0	This command was introduced.

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

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	read

### Example

This example shows how to use the **show apm psa status** command:

```
RP/0/RSP0/CPU0:router (admin) # show apm psm status location 0/0/CPU0
PSM Status
-----
PSM Client Status
  ENVMON:      Registered
  DIAG0:      Registered
  DIAG1:      Registered
  INVMGR:      Registered
  0/0/CPU0 PSA: Registered

LC Status
-----
Line Card      Slice  Config  Status      ENVMON      DIAG0      \
DIAG1          INVMGR  PSA
0/0/CPU0      0      On      Completed   Completed   Completed   \
Completed     Completed  Completed
1              On      Completed   Completed   Completed   \
Completed     Completed  Completed   Completed   Completed   \
Completed     Completed  Completed   Completed   Completed   \
Completed     Completed  Saving  Completed   Completed   Completed   \
Completed     Completed  Completed
```



# show canbus

To display statistics regarding the CAN bus, use the **show canbus** command in administration EXEC mode.

**show canbus** {**client-stats** | **controller-stats** | **server-stats**} **location** {**all** | *node-id*}

Syntax Description		
<b>client-stats</b>		Displays CAN bus client statistics.
<b>controller-stats</b>		Displays CAN bus controller statistics.
<b>server-stats</b>		Displays CAN bus server statistics.
<b>location</b> { <b>all</b>   <i>node-id</i> }		Displays the status of the CAN bus for a specific node or all nodes.

**Command Default** None

**Command Modes** Administration EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification

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

Use the **show canbus** command with the **server-stats** keyword to determine if the revised backplane ID board (BPID-02) is installed in the router.

Task ID	Task ID	Operation
	sysmgr	read

## Example

The following example illustrates sample output from the **show canbus** command with the **server-stats** keyword:

```
RP/0/RSP0/CPU0:router(admin)# show canbus server-stats location all

      Slot   State Partition-A Rev Partition-B Rev Active-Partition
0/0/CPU0 Online           2.01           2.02           Partition B
0/1/CPU0 Online           2.01           2.02           Partition B
0/2/CPU0 Offline -----
0/3/CPU0 Offline -----
```

show canbus

```

0/RSP0/CPU0 Online      1.01      1.02      Partition B
0/RSP1/CPU0 Online      1.01      1.02      Partition B
... snip ...
0/FT0/SP Online        4.00      4.00      Partition A
0/FT1/SP Online        4.00      4.00      Partition B
0/BPID0/SP Online      7.00      7.00      Partition B

```

**Related Commands**

Command	Description
<a href="#">clear plugin slot counts</a>	Clears the running counts of the backplane connector slot plugins.
<a href="#">show plugin slot counts</a>	Displays cumulative and running counts of card insertions per slot.

# 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**

**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 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

For more information about identifying and selecting a DSC on your router, see *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide*.

Task ID	Task ID	Operations
	system	read

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

```
RP/0/RSP0/CPU0:PE44_ASR-9010 (admin) # show dsc
Thu Jul 30 02:51:59.628 DST
NODE          ROLE
=====
0/RSP0/CPU0  DSC
```

# 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** | **table** | **temperatures** | **voltages**}] [*node-id*]

Administration EXEC Mode:

**show environment** [{**all** | **fans** | **last** | **leds** | **power-supply** | **table** | **temperatures** | **trace** | **voltages**}] [*node-id*]

Syntax Description		
	<b>all</b>	(Optional) Displays information for all environmental monitor parameters.
	<b>fans</b>	(Optional) Displays information about the fans.
	<b>last</b>	(Optional) Displays the environmental statistics at the time of the last shutdown.
	<b>leds</b>	(Optional) Displays monitor parameters for LEDs on all cards in the node.
	<b>power-supply</b>	(Optional) Displays power supply voltage and current information.
	<b>table</b>	(Optional) Displays environmental parameter ranges.
	<b>temperatures</b>	(Optional) Displays system temperature information.
	<b>voltages</b>	(Optional) Displays system voltage information.
	<i>node-id</i>	(Optional) Node whose information you want to display. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.

**Command Default** All environmental monitor parameters are displayed.

**Command Modes** EXEC

Administration EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.
	Release 6.3.3	<b>power-supply</b> field descriptions modified to include Power Budget Mode and N+1 mode related details

**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 Operations ID
	system read

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

```
RP/0/RSP0/CPU0:router# show env temperatures

Sun Aug  8 23:18:15.153 ABC

R/S/I  Modules           Inlet           Hotspot
      Temperature      Temperature
      (deg C)          (deg C)

0/RSP0/*
      host              21.2           30.8
0/RSP1/*
      host              20.5           30.3
0/5/*
      host              23.2           30.9
```

[Table 2: show environment temperatures Field Descriptions, on page 53](#) 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 <i>rack/slot/module</i> .
Modules	Module for which temperature information is displayed.
Inlet Temperature (deg C)	Current temperature of the inlet sensor, in degrees Celsius. <b>Note</b> The inlet temperature corresponds to the room air temperature entering the router.

Field	Description
Exhaust Temperature (deg C)	Current temperature of the exhaust sensor, in degrees Celsius.  <b>Note</b> The exhaust temperature corresponds to the air being exhausted from the router.
Hotspot Temperature (deg C)	Current temperature of the hotspot, in degrees Celsius.

```
RP/0/RSP0/CPU0:router# show env leds

Sun Aug  8 23:18:19.416 ABC
R/S/I  Modules LED                Status
0/RSP0/*
      host    Critical-Alarm  Off
      host    Major-Alarm   Off
      host    Minor-Alarm   Off
      host    ACO            Off
      host    Fail           Off
0/RSP1/*
      host    Critical-Alarm  On
      host    Major-Alarm   Off
      host    Minor-Alarm   Off
      host    ACO            Off
      host    Fail           Off
```

[Table 3: show environment leds Field Descriptions, on page 54](#) describes the significant fields shown in the display.

**Table 3: show environment leds Field Descriptions**

Field	Description
<i>rack_num/slot_num/*:</i>	Rack number and slot number where the node resides.
Module (host) LED status says:	Current LED status of the specified node.

The following example shows sample output from the **show environment** command with the **power-supply** keyword:

```
RP/0/RSP0/CPU0:router (admin) # show environment power-supply

Wed Aug  4 23:38:25.033 DST
R/S/I  Modules          Capacity      Status
              (W)
0/PM0/*
      host    PM          3000        Ok
0/PM1/*
      host    PM          3000        Ok
0/PM2/*
      host    PM          3000        Ok

R/S/I  Power Draw      Voltage      Current
              (W)          (V)          (A)
0/PM0/* 494.9             53.8         9.2
0/PM1/* 581.0             53.8        10.8
0/PM2/*  0.0              54.1         0.0
```

```

-----
Total: 1075.9

Power Shelves Type: AC

Total Power Capacity:          9000W
Usable Power Capacity:        9000W
Supply Failure Protected Capacity: 6000W
Feed Failure Protected Capacity: 3000W
Worst Case Power Used:        2720W

Slot                               Max Watts
----                               -
0/1/CPU0                            350
0/RSP0/CPU0                          235
0/RSP1/CPU0                          235 (default)
0/4/CPU0                              350
0/6/CPU0                              350
0/FT0/SP                              600
0/FT1/SP                              600

Worst Case Power Available:        6280W
Supply Protected Capacity Available: 3280W
Feed Protected Capacity Available:  280W

```

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).

Field	Description
Feed Failure Protected Capacity	Feed protected power capacity. This value applies to the ASR 9010 AC system only.
Worst Case Power Used	Sum of the estimated power draw of each of the load modules in the chassis. Load modules can be fan trays, RSPs and line cards.
Worst Case Power Available	Usable power capacity minus the worst case power used.
Supply Protected Capacity Available	Supply failure protected capacity minus the worst case power used.
Feed Protected Capacity Available	Feed failure protected capacity minus the worst case power used.
Power Budget Enforcement	This field displays the Power Budget Enforcement status as Enabled or Disabled.
Power Budget Mode	This field displays the power redundancy mode used (for example, N+1).
N+1 Supply Failure Protected Capacity	This field represents the Supply Protected Power capacity of the chassis with power module redundancy in N+1 mode.



## show 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 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

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

Task ID	Task Operations ID
	sysmgr read

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

```
show fpd package
Tue Jan 22 13:56:00.212 UTC

=====
                          Field Programmable Device Package
=====
Card Type                FPD Description                Req  SW   Min Req  Min Req
Reload  Ver              SW Ver  Board Ver
=====
NC55-1200W-ACFW          LIT-PrimMCU-ACFW (A)          NO   2.09  2.09    0.0
-----
NC55-900W-ACFW-I         LIT-PrimMCU-ACFW-I (A)       NO   1.04  1.04    0.0
-----
NC55-900W-DCFW-I         LIT-PrimMCU-DCFW-I (A)       NO   2.260 2.260  0.0
-----
NC55-930W-DCFW-C         LIT-PrimMCU-DCFW-C (A)       NO   2.259 2.259  0.0
-----
```

## show fpd package

NC55-MPA-12T-S	MPAFPGA	YES	0.27	0.27	0.0
-----					
NC55-MPA-1TH2H-S	-WDM-D-1HL_DCO_2	NO	38.518	38.518	0.1
	MPAFPGA	YES	0.53	0.53	0.0
	WDM-DE-1HL_DCO_2	NO	38.518	38.518	0.1
	WDM-DS-1HL_DCO_2	NO	38.268	38.268	0.1
-----					
NC55-MPA-2TH-HX-S	<b>-WDM-D-1HL_DCO_0</b>	NO	38.518	38.518	0.1
	<b>-WDM-D-1HL_DCO_1</b>	NO	38.518	38.518	0.1
	MPAFPGA	YES	0.53	0.53	0.0
	WDM-DE-1HL_DCO_0	NO	38.518	38.518	0.1
	WDM-DE-1HL_DCO_1	NO	38.518	38.518	0.1
	WDM-DS-1HL_DCO_0	NO	38.268	38.268	0.1
	WDM-DS-1HL_DCO_1	NO	38.268	38.268	0.1
-----					
NC55-MPA-2TH-S	-WDM-D-1HL_DCO_0	NO	38.518	38.518	0.1
	-WDM-D-1HL_DCO_1	NO	38.518	38.518	0.1
	MPAFPGA	YES	0.53	0.53	0.0
	WDM-DE-1HL_DCO_0	NO	38.518	38.518	0.1
	WDM-DE-1HL_DCO_1	NO	38.518	38.518	0.1
	WDM-DS-1HL_DCO_0	NO	38.268	38.268	0.1
	WDM-DS-1HL_DCO_1	NO	38.268	38.268	0.1
-----					
NC55-MPA-4H-HD-S	MPAFPGA	YES	0.53	0.53	0.0
-----					
NC55-MPA-4H-HX-S	MPAFPGA	YES	0.53	0.53	0.0
-----					
NC55-MPA-4H-S	MPAFPGA	YES	0.53	0.53	0.0
-----					
NC55A2-MOD-SE-H-S	Bootloader (A)	YES	1.11	1.11	0.0
	CPU-IOFPGA (A)	YES	1.18	1.18	0.1
	MB-IOFPGA (A)	YES	0.18	0.18	0.1
	MB-MIFPGA	YES	0.19	0.19	0.0
	SATA (A)	NO	5.00	5.00	0.0
-----					
NCS-55A2-MOD-HD-S	Bootloader (A)	YES	1.11	1.11	0.0
	CPU-IOFPGA (A)	YES	1.18	1.18	0.1
	MB-IOFPGA (A)	YES	0.18	0.18	0.1
	MB-MIFPGA	YES	0.19	0.19	0.0
	SATA (A)	NO	5.00	5.00	0.0
-----					
NCS-55A2-MOD-HX-S	Bootloader (A)	YES	1.11	1.11	0.0
	CPU-IOFPGA (A)	YES	1.18	1.18	0.1
	MB-IOFPGA (A)	YES	0.18	0.18	0.1
	MB-MIFPGA	YES	0.19	0.19	0.0
	SATA (A)	NO	5.00	5.00	0.0
-----					
NCS-55A2-MOD-S	Bootloader (A)	YES	1.11	1.11	0.0
	CPU-IOFPGA (A)	YES	1.18	1.18	0.1
	MB-IOFPGA (A)	YES	0.18	0.18	0.1
	MB-MIFPGA	YES	0.19	0.19	0.0
	SATA (A)	NO	5.00	5.00	0.0
-----					
NCS-55A2-MOD-SE-S	Bootloader (A)	YES	1.11	1.11	0.0
	CPU-IOFPGA (A)	YES	1.18	1.18	0.1
	MB-IOFPGA (A)	YES	0.18	0.18	0.1
	MB-MIFPGA	YES	0.19	0.19	0.0
	SATA (A)	NO	5.00	5.00	0.0
	STATSFPGA	YES	0.01	0.01	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: <ul style="list-style-type: none"> <li>• spa—Shared port adapter</li> <li>• lc—Line card</li> </ul>
Subtype	FPD subtype. These values are used in the <b>upgrade hw-module fpd</b> 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/RSP0/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 3.7.2	This command was introduced.
Release 3.9.0	Support was added for the 2-port channelized OC-12/DS0 SPA.
Release 4.3.2	Support for Back-plane identification (BPID) nodes.

### Usage Guidelines

To use this command, you must be in a user group associated with a task 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 Operations ID**

sysmgr read

root-lr read

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

```
RP/0/RSP0/CPU0:router# ios#show hw-module fpd
Tue Jan 22 13:56:55.082 UTC
```

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0	NCS-55A2-MOD-S	0.3	MB-MIFPGA	CURRENT	0.19	0.19
0/RP0	NCS-55A2-MOD-S	0.3	Bootloader	CURRENT	1.10	1.10
0/RP0	NCS-55A2-MOD-S	0.3	CPU-IOFPGA	CURRENT	1.18	1.18
0/RP0	NCS-55A2-MOD-S	0.3	MB-IOFPGA	CURRENT	0.18	0.18
0/PM0	NC55-1200W-ACFW	1.0	LIT-PrimCU-ACFW	NEED UPGD	2.08	2.08
0/PM1	NC55-1200W-ACFW	1.0	LIT-PrimCU-ACFW	NEED UPGD	2.08	2.08

```
RP/0/RP0/CPU0:ios#.
```



**Note** After Release 5.3.x, Upg/Dng? will display Yes only for upgrade.

The following example shows the FPD for which upgrade will be skipped.

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

```
===== Existing Field Programmable Devices =====
Location      Card Type      HW      Current SW Upg/
Version Type  Subtype Inst  Version  Dng?
-----
0/SM1/SP      140G-4-S1S2S3  0.1   lc   rommonA  0    2.08    Yes
-----
                                1c   rommon  0    2.08    Yes
-----
                                1c   fpqa1  0    6.04^   No
-----
                                1c   fpga2  0    4.01    No
-----
```

**NOTES:**

1. ^ One or more FPD will be intentionally skipped from upgrade using CLI with option "all" or during "Auto fpd".

It can be upgraded only using the "admin> upgrade hw-module fpd <fpd> location <loc>" CLI with exact location.

The following example shows how to display FPD compatibility for a specific module in the router:

**Table 6: show hw-module fpd Field Descriptions**

Field	Description
Location	Location of the module in the <i>rack/slot/module</i> notation.
Card Type	Module part number.
HW Version	Hardware model version for the module.
Type	Hardware type. Can be one of the following types: <ul style="list-style-type: none"> <li>• spa—Shared port adapter</li> <li>• lc—Line card</li> </ul>
Subtype	FPD type. Can be one of the following types: <ul style="list-style-type: none"> <li>• fabldr—Fabric downloader</li> <li>• fpga1—Field-programmable gate array</li> <li>• fpga2—Field-programmable gate array 2</li> <li>• fpga3—Field-programmable gate array 3</li> <li>• fpga4—Field-programmable gate array 4</li> <li>• fpga5—Field-programmable gate array 5</li> <li>• rommonA—Read-only memory monitor A</li> <li>• rommon—Read-only memory monitor B</li> </ul>

**show hw-module fpd**

<b>Field</b>	<b>Description</b>
Inst	FPD instance. The FPD instance uniquely identifies an FPD and is used by the FPD process to register an FPD.
Current SW Version	Currently running FPD image version.
Upg/Dng?	Specifies whether an FPD upgrade or downgrade is required. A downgrade 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	
<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: <ul style="list-style-type: none"> <li>• <b>analog-digital-converter</b>—Displays analog-to-digital converter information.</li> <li>• <b>c2w</b>—Displays Cisco-to-wire bus device information.</li> <li>• <b>fpga</b>—Displays SPA field-programmable gate array information.</li> <li>• <b>framer</b>—Displays SONET framer information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>hdlc</b>—Displays SPA hdlc information, where applicable.</li> <li>• <b>l2-tcam</b>—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.)</li> <li>• <b>mac</b>—Displays SPA MAC information. (Not applicable to POS SPAs.)</li> <li>• <b>pluggable-optics</b>—Displays pluggable-optics module information.</li> <li>• <b>power-margining</b>—Displays power-margining device information.</li> <li>• <b>sar</b>—Displays SPA ATM SAR information.</li> <li>• <b>sdcc</b>—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>serdes</b>—Displays SPA serializer/deserializer information.</li> <li>• <b>spi4</b>—Displays system packet interface level 4.2 bus device information.</li> <li>• <b>temperature-sensor</b>—Displays temperature sensor information.</li> </ul>
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.
<b>Command Default</b>	No default behavior or values
<b>Command Modes</b>	EXEC

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

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

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/RSP0/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	
<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: <ul style="list-style-type: none"> <li>• <b>analog-digital-converter</b>—Displays analog-to-digital converter information.</li> <li>• <b>c2w</b>—Displays Cisco-to-wire bus device information.</li> <li>• <b>fpga</b>—Displays SPA field-programmable gate array information.</li> <li>• <b>framer</b>—Displays SONET framer information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>hdlc</b>—Displays SPA hdlc information, where applicable.</li> <li>• <b>l2-tcam</b>—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.)</li> <li>• <b>mac</b>—Displays SPA MAC information. (Not applicable to POS SPAs.)</li> <li>• <b>pluggable-optics</b>—Displays pluggable-optics module information.</li> <li>• <b>power-margining</b>—Displays power-margining device information.</li> <li>• <b>sar</b>—Displays SPA ATM SAR information.</li> <li>• <b>sdcc</b>—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>serdes</b>—Displays SPA serializer/deserializer information.</li> <li>• <b>spi4</b>—Displays system packet interface level 4.2 bus device information.</li> <li>• <b>temperature-sensor</b>—Displays temperature sensor information.</li> </ul>
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.
<b>Command Default</b>	No default behavior or values
<b>Command Modes</b>	EXEC
	Release 5.0.0

## show hw-module subslot config

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

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

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/RSP0/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
<b>show controllers</b>	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 3.9.0	This command was introduced.

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

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/RSP0/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/RSP0/CPU0:router# show hw-module subslot counters framer

SPA device framer index 0 subindex 0 info:

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

## show hw-module subslot errors

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

EXEC

mode.

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

Syntax Description	
<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: <ul style="list-style-type: none"> <li>• <b>analog-digital-converter</b>—Displays analog-to-digital converter information.</li> <li>• <b>c2w</b>—Displays Cisco-to-wire bus device information.</li> <li>• <b>fpga</b>—Displays SPA field-programmable gate array information.</li> <li>• <b>framer</b>—Displays SONET framer information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>hdlc</b>—Displays SPA hdlc information, where applicable.</li> <li>• <b>l2-tcam</b>—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.)</li> <li>• <b>mac</b>—Displays SPA MAC information. (Not applicable to POS SPAs.)</li> <li>• <b>pluggable-optics</b>—Displays pluggable-optics module information.</li> <li>• <b>power-margining</b>—Displays power-margining device information.</li> <li>• <b>sar</b>—Displays SPA ATM SAR information.</li> <li>• <b>sdcc</b>—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>serdes</b>—Displays SPA serializer/deserializer information.</li> <li>• <b>spi4</b>—Displays system packet interface level 4.2 bus device information.</li> <li>• <b>temperature-sensor</b>—Displays temperature sensor information.</li> </ul>
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.
<b>Command Default</b>	No default behavior or values
<b>Command Modes</b>	EXEC

## show hw-module subslot errors

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

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

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/RSP0/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 <i>rack / slot / module</i> notation.
SPA inserted	Indication if a SPA is currently detected in the subslot.
SPA type	Description of SPA including the technology type, number of ports, height of SPA (HHSPA—single-height, FHSPA—double-height), and optics type.
SPA operational state	Current operational state of the SPA module.
SPA last reset reason	Reason for the most recent reset of this SPA.
SPA last failure reason	Reason for the last failure on this SPA.

#### Related Commands

Command	Description
<b>show controllers</b>	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**

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

<b>Command Default</b>	No default behavior or values
------------------------	-------------------------------

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.9.0	This command was introduced.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that 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.

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	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	
<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack / slot / module</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: <ul style="list-style-type: none"> <li>• <b>analog-digital-converter</b>—Displays analog-to-digital converter information.</li> <li>• <b>c2w</b>—Displays Cisco-to-wire bus device information.</li> <li>• <b>fpga</b>—Displays SPA field-programmable gate array information.</li> <li>• <b>framer</b>—Displays SONET framer information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>hdlc</b>—Displays SPA hdlc information, where applicable.</li> <li>• <b>l2-tcam</b>—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.)</li> <li>• <b>mac</b>—Displays SPA MAC information. (Not applicable to POS SPAs.)</li> <li>• <b>pluggable-optics</b>—Displays pluggable-optics module information.</li> <li>• <b>power-margining</b>—Displays power-margining device information.</li> <li>• <b>sar</b>—Displays SPA ATM SAR information.</li> <li>• <b>sdcc</b>—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>serdes</b>—Displays SPA serializer/deserializer information.</li> <li>• <b>spi4</b>—Displays system packet interface level 4.2 bus device information.</li> <li>• <b>temperature-sensor</b>—Displays temperature sensor information.</li> </ul>
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.
<b>Command Default</b>	No default behavior or values
<b>Command Modes</b>	EXEC

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

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

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/RSP0/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
<b>show controllers</b>	Displays the controller type and other information.

## show hw-module subslot status

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

mode.

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

Syntax Description	
<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<i>device</i>	(Optional) Internal hardware device for which to display the specified information. Valid devices include: <ul style="list-style-type: none"> <li>• <b>analog-digital-converter</b>—Displays analog-to-digital converter information.</li> <li>• <b>c2w</b>—Displays Cisco-to-wire bus device information.</li> <li>• <b>fpga</b>—Displays SPA field-programmable gate array information.</li> <li>• <b>framer</b>—Displays SONET framer information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>hdlc</b>—Displays SPA hdlc information, where applicable.</li> <li>• <b>l2-tcam</b>—Displays SPA Layer 2 ternary content addressable memory information. (Not applicable to POS SPAs.)</li> <li>• <b>mac</b>—Displays SPA MAC information. (Not applicable to POS SPAs.)</li> <li>• <b>pluggable-optics</b>—Displays pluggable-optics module information.</li> <li>• <b>power-margining</b>—Displays power-margining device information.</li> <li>• <b>sar</b>—Displays SPA ATM SAR information.</li> <li>• <b>sdcc</b>—Displays section data communications channel device information. (Not applicable to Ethernet SPAs.)</li> <li>• <b>serdes</b>—Displays SPA serializer/deserializer information.</li> <li>• <b>spi4</b>—Displays system packet interface level 4.2 bus device information.</li> <li>• <b>temperature-sensor</b>—Displays temperature sensor information.</li> </ul>
<i>device-index</i>	(Optional) Index of the specific device if there are multiple devices of the same type.
<i>device-subindex</i>	(Optional) Subindex of the specific device if there are multiple devices of the same device index.
<b>Command Default</b>	No default behavior or values
<b>Command Modes</b>	EXEC

**show hw-module subslot status**

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

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

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/RSP0/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
	<b>show controllers</b>	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

<i>node-id</i>	(Optional) Location for which to display the specified information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<b>all</b>	(Optional) Displays inventory information for all the physical entities in the chassis.
<b>location</b> { <i>node-id</i>   <b>all</b> }	(Optional) Displays inventory information for a specific node, or for all nodes in the chassis.
<b>raw</b>	(Optional) Displays raw information about the chassis for diagnostic purposes.
<b>chassis</b>	(Optional) Displays inventory information for the entire chassis.
<b>fans</b>	(Optional) Displays inventory information for the fans.
<b>power-supply</b>	(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 3.7.2	This command was introduced.
Release 3.9.0	Support was added for the 2-port channelized OC-12/DS0 SPA.

## 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/RSP0/CPU0:router# show inventory raw

Tue Jul 28 08:49:14.080 DST
NAME: "module 0/RSP0/CPU0", DESCR: "A2K-RSP-4G-HDD="
PID: A2K-RSP-4G-HDD= , VID: VP4, SN: FOC1230803H

NAME: "module 0/RSP0/CPU0", DESCR: "RSP Card host "
PID: , VID: N/A, SN:

NAME: "temperature 0/RSP0/CPU0", DESCR: "Inlet Temperature Sensor"
PID: , VID: N/A, SN:

NAME: "temperature 0/RSP0/CPU0", DESCR: "Hot Temperature Sensor"
PID: , VID: N/A, SN:

NAME: "voltage 0/RSP0/CPU0", DESCR: "Voltage Sensor - 0.75VTT"
PID: , VID: N/A, SN:

NAME: "voltage 0/RSP0/CPU0", DESCR: "Voltage Sensor - 0.9VTT_A"
PID: , VID: N/A, SN:

NAME: "voltage 0/RSP0/CPU0", DESCR: "Voltage Sensor - 0.9VTT_B"
PID: , VID: N/A, SN:

NAME: "voltage 0/RSP0/CPU0", DESCR: "Voltage Sensor - IBV"
PID: , VID: N/A, SN:

NAME: "voltage 0/RSP0/CPU0", DESCR: "Voltage Sensor - 5.0V"
PID: , VID: N/A, SN:

NAME: "module 0/1/CPU0", DESCR: "Cisco ASR 9000 Series SPA Interface Processor-700"
PID: A9K-SIP-700 , VID: P3A, SN: FHH132800F6

NAME: "module 0/1/0" , DESCR: "10-port 1 GbE Shared Port Adapter V2"
PID: SPA-2XOC12C , VID: V02, SN: JAE1239W2AI
--More--
```

[Table 13: show inventory Field Descriptions, on page 83](#) 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 <i>rack/slot/module</i> notation.
DESCR	Describes the chassis or the node.  Chassis descriptions provide the name of the chassis and its Gbps. Node descriptions provide the type of node and its software version.
PID	Physical model name of the chassis or node.
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}]
```

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** Enter the **show platform** command to see the location of all nodes installed in the router.

<b>Task ID</b>	<b>Task Operations ID</b>
	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
Thu Jul 30 05:26:24.896 DST
  Location          Message      Mode      Status
  =====
  0/RSP0/*          ACTV        DEFAULT  UNLOCKED
```

**Table 14: show led location Field Descriptions**

<b>Field</b>	<b>Description</b>
LOCATION	Location of the node. LOCATION is expressed in the <i>rack/slot/module</i> notation.
MESSAGE	Current message displayed by the LED.

<b>Field</b>	<b>Description</b>
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 3.7.2	This command was introduced.
Release 3.9.0	Support was added for the 2-Port Channelized OC-12/DS0 SPA.

## Usage Guidelines

To use this command, you must be in a user group associated with a task 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/RSP0/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/RSP0/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

```

**show operational**

```
Name: 0/0/* - host - Inlet1
CompositeClassCode: 720898
EnvironmentalMonitorPath: /admin/oper/inventory/
  rack/0/entity/0/entity/0/entity/0/entity/1/attrib/
Sensor/Number=2
BasicAttributes
  BasicInfo
    Description: Temperature Sensor
    VendorType: 1.3.6.1.4.1.9.12.3.1.8.42
    Name: 0/0/* - host - Exhaust0
    CompositeClassCode: 720898
```

--More--



# show platform

To display information and status for each node in the system, use the **show platform** command in EXEC or administration EXEC mode.

**show platform** [*node-id*]

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

**Command Default** Status and information are displayed for all nodes in the system.

**Command Modes** Administration EXEC  
EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.7.2	This command was introduced.
	Release 3.9.0	Support was added for the 2-Port Channelized OC-12/DS0 SPA.

**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 ASR-9001-S, EP1 will be displayed as, **Not allowed online**, until the required license is bought.

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	system	read (in EXEC mode)
	root-system	read (in administration EXEC mode)

This example shows the sample display output for ASR9912 and ASR9922:

```
RP/0/RSP0/CPU0:router:router (admin) # show platform
Wed Jul  3 11:34:18.487 UTC
Node                Type                               State           Config State
-----
0/RP0/CPU0          ASR-9922-RP-SE (Active)            IOS XR RUN     PWR, NSHUT, MON
0/RP1/CPU0          ASR-9922-RP-TR (Standby)           IOS XR RUN     PWR, NSHUT, MON
0/FT0/SP            FAN TRAY                            READY
0/FT1/SP            FAN TRAY                            READY
0/0/CPU0            A9K-36x10GE-TR                     IOS XR RUN     PWR, NSHUT, MON
0/1/CPU0            A9K-36x10GE-SE                     IOS XR RUN     PWR, NSHUT, MON
0/2/CPU0            A9K-36x10GE-TR                     IOS XR RUN     PWR, NSHUT, MON
0/3/CPU0            A9K-36x10GE-SE                     IOS XR RUN     PWR, NSHUT, MON
0/4/CPU0            A9K-36x10GE-SE                     IOS XR RUN     PWR, NSHUT, MON
0/5/CPU0            A9K-36x10GE-SE                     IOS XR RUN     PWR, NSHUT, MON
0/6/CPU0            A9K-36x10GE-SE                     IOS XR RUN     PWR, NSHUT, MON
```

## show platform

```

0/7/CPU0      A9K-36x10GE-TR      IOS XR RUN      PWR, NSHUT, MON
0/8/CPU0      A9K-24x10GE-SE      IOS XR RUN      PWR, NSHUT, MON
0/9/CPU0      A9K-24x10GE-TR      IOS XR RUN      PWR, NSHUT, MON
0/PM0/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM1/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM2/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM3/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM4/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM5/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/FC0/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC1/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC2/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC3/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC4/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC5/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC6/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON

```

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

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

```

Thu Nov 19 21:44:49.274 UTC
Node          Type                               State          Config State
-----
0/RSP0/CPU0   A9K-RSP-4G (Active)               IOS XR RUN     PWR, NSHUT, MON
0/RSP1/CPU0   A9K-RSP-4G (Standby)              IN-RESET      PWR, NSHUT, MON
0/1/CPU0      A9K-SIP-700                        IOS XR RUN     PWR, NSHUT, NMON
0/1/0         SPA-10X1GE-V2                      OK             PWR, NSHUT, MON
0/1/1         SPA-1X10GE-L-V2                    OK             PWR, NSHUT, MON
0/3/CPU0      A9K-40GE-B                          IOS XR RUN     PWR, NSHUT, MON
0/4/CPU0      A9K-SIP-700                        IOS XR RUN     PWR, NSHUT, MON
0/4/1         SPA-2XCHOC12/DS0                   OK             PWR, NSHUT, MON

```

The following is sample output for the **show platform** command with the *node-id* argument:

```
RP/0/RSP0/CPU0:router# show platform 0/1/cpu0
```

```

Mon Jul 27 22:30:04.752 DST
Node          Type                               State          Config State
-----
0/1/CPU0      A9K-40GE-B                          IOS XR RUN     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 <i>rack / slot / module</i> notation.
Type	Type of node.
State	Current state of the specified node.
Config State	Current status of the specified node.

# 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*]

<b>Syntax Description</b>	<i>node-id</i>	(Optional) Node for which to display information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<b>Command Default</b>	Status and information are displayed for all nodes in the system.	
<b>Command Modes</b>	Administration EXEC EXEC	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.7.2	This command was introduced.
	Release 3.9.0	Support was added for the 2-Port Channelized OC-12/DS0 SPA.
<b>Usage Guidelines</b>	<p>The <b>show platform</b> command provides a summary of the nodes in the system, including node type and status.</p> <p>Enter the <b>show platform</b> command in administration EXEC mode to display output for the entire system.</p> <p>Enter the <b>show platform</b> command in EXEC mode to display output for only those nodes that belong to the SDR on which the command is executed.</p> <p>For ASR-9001-S, EP1 will be displayed as, <b>Not allowed online</b>, until the required license is bought.</p>	
<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	system	read (in EXEC mode)
	root-system	read (in administration EXEC mode)

This example shows the sample display output for ASR9912 and ASR9922:

```
RP/0/RSP0/CPU0:router:router (admin) # show platform
Wed Jul  3 11:34:18.487 UTC
Node                Type                               State           Config State
-----
0/RP0/CPU0          ASR-9922-RP-SE (Active)            IOS XR RUN      PWR, NSHUT, MON
0/RP1/CPU0          ASR-9922-RP-TR (Standby)           IOS XR RUN      PWR, NSHUT, MON
0/FT0/SP             FAN TRAY                            READY
0/FT1/SP             FAN TRAY                            READY
0/0/CPU0             A9K-36x10GE-TR                     IOS XR RUN      PWR, NSHUT, MON
0/1/CPU0             A9K-36x10GE-SE                     IOS XR RUN      PWR, NSHUT, MON
0/2/CPU0             A9K-36x10GE-TR                     IOS XR RUN      PWR, NSHUT, MON
0/3/CPU0             A9K-36x10GE-SE                     IOS XR RUN      PWR, NSHUT, MON
0/4/CPU0             A9K-36x10GE-SE                     IOS XR RUN      PWR, NSHUT, MON
0/5/CPU0             A9K-36x10GE-SE                     IOS XR RUN      PWR, NSHUT, MON
0/6/CPU0             A9K-36x10GE-SE                     IOS XR RUN      PWR, NSHUT, MON
```

## show platform

```

0/7/CPU0      A9K-36x10GE-TR      IOS XR RUN      PWR, NSHUT, MON
0/8/CPU0      A9K-24x10GE-SE      IOS XR RUN      PWR, NSHUT, MON
0/9/CPU0      A9K-24x10GE-TR      IOS XR RUN      PWR, NSHUT, MON
0/PM0/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM1/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM2/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM3/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM4/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/PM5/SP      PWR-3KW-AC-V2       READY           PWR, NSHUT, MON
0/FC0/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC1/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC2/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC3/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC4/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC5/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON
0/FC6/SP      ASR-9912-SFC110     OK              PWR, NSHUT, MON

```

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

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

```

Thu Nov 19 21:44:49.274 UTC
Node          Type                               State          Config State
-----
0/RSP0/CPU0   A9K-RSP-4G (Active)               IOS XR RUN     PWR, NSHUT, MON
0/RSP1/CPU0   A9K-RSP-4G (Standby)              IN-RESET      PWR, NSHUT, MON
0/1/CPU0      A9K-SIP-700                        IOS XR RUN     PWR, NSHUT, NMON
0/1/0         SPA-10X1GE-V2                       OK             PWR, NSHUT, MON
0/1/1         SPA-1X10GE-L-V2                     OK             PWR, NSHUT, MON
0/3/CPU0      A9K-40GE-B                          IOS XR RUN     PWR, NSHUT, MON
0/4/CPU0      A9K-SIP-700                          IOS XR RUN     PWR, NSHUT, MON
0/4/1         SPA-2XCHOC12/DS0                     OK             PWR, NSHUT, MON

```

The following is sample output for the **show platform** command with the *node-id* argument:

```
RP/0/RSP0/CPU0:router# show platform 0/1/cpu0
```

```

Mon Jul 27 22:30:04.752 DST
Node          Type                               State          Config State
-----
0/1/CPU0      A9K-40GE-B                          IOS XR RUN     PWR, NSHUT, MON

```

This table describes the significant fields shown in the display.

**Table 16: show platform Field Descriptions**

Field	Description
Node	Identifier of the node in the <i>rack / slot / module</i> notation.
Type	Type of node.
State	Current state of the specified node.
Config State	Current status of the specified node.

# show platform slices

To display the status of the slices for an interface, use the **show platform slices** command in the EXEC mode.

```
show platform slices [ locationnode-id ]
```

<b>Syntax Description</b>	<b>location</b> <i>node-id</i> Interface details.
---------------------------	---

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.3.0	

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

Use the **hw-module power saving** to power-off / on any of the slices (Slice 0 cannot be powered-off).

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	sysmgr	read

## Example

This example shows how to use the **show platform slices** command:

```
RP/0/RSP0/CPU0:router # sh plat slices
show_slice nodeid 0x0
```

Line Card	Slice	Config	Status
0/0/CPU0	0	Power on	Completed
	1	Power on	Completed
	2	Power on	Completed
	3	Power saving	Completed

# show plugin slot counts

To display cumulative and running counts of card inserts per slot, use the **show plugin slot counts** command in administration EXEC mode.

**show plugin slot counts location** {allnode-id}

<b>Syntax Description</b>	<b>location</b> {all node-id} Displays plugin slot counts on the designated node or all nodes. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
---------------------------	--

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	Administration EXEC
----------------------	---------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.9.1	This command was introduced.

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

Use the **show plugin slot counts** command to display the number of insertions that have been made to the router backplane for a specific line card or RSP. This command can be used only if the BPID-02 card is installed. If the BPID-02 card is not installed, the following error message is displayed:

```
Response error: 'ENVMON' detected the 'warning' condition 'Hardware not available'
```

<b>Task ID</b>	<b>Task</b>	<b>Operation</b>
	sysmgr	read

## Example

This example illustrates sample output from the **show plugin slot counts** command:

```
RP/0/RSP0/CPU0:router(admin)# show plugin slot counts location all
```

```
Tue Oct 6 13:37:15.706 pst
```

```
Backplane connector slot plugin counters
```

	Current	Cumulative
0/0/CPU0	176	176
0/1/CPU0	11	11
0/2/CPU0	0	0
0/3/CPU0	0	0
0/RSP0/CPU0	0	0
0/RSP1/CPU0	1	1

0/4/CPU0	9	9
0/5/CPU0	0	0
0/6/CPU0	12	12
0/7/CPU0	0	0
0/FT0/SP	4	4
0/FT1/SP	14	14

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">clear plugin slot counts</a>	Clears the running counts of the backplane connector slot plugins.
<a href="#">show canbus</a>	Displays the statistics regarding the CAN bus.

# 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		
<b>location</b> { <i>node-id</i>   <b>all</b> }	(Optional) Specifies the node for which to display LED information. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation. Use the <b>all</b> keyword to indicate all nodes.	
<b>statistics</b>	(Optional) Displays redundancy statistics information.	
<b>summary</b>	(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 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

Use the **show redundancy** command to display the redundancy status of the route switch processors (RSPs). The **show redundancy** command also displays the boot and switchover history for the RSPs. To view the nonstop routing (NSR) status of the standby RSPs in the system, use the **summary** keyword.

Task ID	Task ID	Operations
	system	read
	basic-services	read (for <b>statistics</b> keyword)

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

```
RP/0/RSP0/CPU0:router# show redundancy location 0/rsp0/cpu0
Thu Jul 30 05:47:12.155 DST
Node 0/RSP0/CPU0 is in ACTIVE role
Node 0/RSP0/CPU0 has no valid partner
```



```

Reload and boot info
-----
A9K-RSP-4G reloaded Tue Jul 14 15:21:30 2009: 2 weeks, 1 day,
14 hours, 25 minutes ago
Active node booted Tue Jul 14 15:21:30 2009: 2 weeks, 1 day,
14 hours, 25 minutes ago

Active node reload "Cause: User initiated forced reload all"

```

**Table 17: show redundancy Field Descriptions**

Field	Description
Node */*/* is in XXX role	<p>Current role of the primary route processor, where (*/*/*) is the route processor ID in the format <i>rack/slot/module</i>, and XXX is the role of the route processor (active or standby).</p> <p>In the example, this field shows that the node with the ID 0/RP0/CPU0 is in active role.</p>
Partner node (*/*/*) is in XXX role	<p>Current role of the secondary (or partner) route processor, where (*/*/*) is the route processor ID in the <i>rack/slot/module</i> format, and XXX is the role of the route processor (active or standby).</p> <p>In the example, this field shows that the node with the ID 0/RP1/CPU0 is in standby role.</p>
Standby node in (*/*/*) is ready	<p>Current state of the standby node, where (*/*/*) is the standby route processor ID.</p> <p>In the example, the standby node is ready.</p>
Standby node in (*/*/*) is NSR-ready	<p>Current state of the standby node regarding nonstop routing (NSR), where (*/*/*) is the standby route processor ID.</p> <p>In the example, the standby node is NSR-ready.</p>
Reload and boot info	<p>General overview of the active and standby route processors' reload and boot history.</p>

# 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 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

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

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

Task ID	Task ID	Operations
	basic-services	read

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

```
RP/0/RSP0/CPU0:router# show version

Tue Jul 28 05:14:13.670 DST

Cisco IOS XR Software, Version 3.9.0.14I
Copyright (c) 2009 by Cisco Systems, Inc.

ROM: System Bootstrap, Version 1.1(20090521:183759) [ASR9K ROMMON],

PE44_ASR-9010 uptime is 1 week, 6 days, 13 hours, 52 minutes
System image file is "bootflash:disk0/asr9k-os-mpi-3.9.0.14I/mbiasr9k-rp.vm"

cisco ASR9K Series (MPC8641D) processor with 4194304K bytes of memory.
MPC8641D processor at 1333MHz, Revision 2.2

2 Management Ethernet
12 TenGigE
40 GigabitEthernet
219k bytes of non-volatile configuration memory.
```

```

975M bytes of compact flash card.
33994M bytes of hard disk.
1605616k bytes of disk0: (Sector size 512 bytes).
1605616k bytes of disk1: (Sector size 512 bytes).

Configuration register on node 0/RSP0/CPU0 is 0x102
Boot device on node 0/RSP0/CPU0 is disk0:
Package active on node 0/RSP0/CPU0:
asr9k-scfclient, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-scfclient-3.9.0.14I
    Built on Mon Jul 13 08:28:45 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

asr9k-adv-video, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-adv-video-3.9.0.14I
    Built on Mon Jul 13 10:13:23 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

asr9k-fpd, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-fpd-3.9.0.14I
    Built on Mon Jul 13 08:44:47 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

asr9k-diags, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-diags-3.9.0.14I
    Built on Mon Jul 13 08:28:48 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

asr9k-k9sec, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-k9sec-3.9.0.14I
    Built on Mon Jul 13 08:43:40 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

asr9k-mgbl, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-mgbl-3.9.0.14I
    Built on Mon Jul 13 10:11:41 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

asr9k-mcast, V 3.9.0.14I, Cisco Systems, at disk0:asr9k-mcast-3.9.0.14I
    Built on Mon Jul 13 08:40:57 DST 2009
    By sjc-lds-208 in /auto/ioxbuid7/production/3.9.0.14I/asr9k/workspace for c4.2.1-p0

--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 <sup>1</sup> interfaces available on the current router.

Field	Description
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 <sup>2</sup> 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.

<sup>1</sup> SDH = Synchronous Digital Hierarchy

<sup>2</sup> ATA PCMCIA = AT Attachment Personal Computer Memory Card Industry Association

# upgrade hw-module fpd

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

```
upgrade hw-module fpd {all | fabldr/fpga-type | rommon} [ force ] location [{node-id | all}]
```

Syntax Description		
<b>all</b>		Upgrades all FPD images on the selected module.
<b>fabldr</b>		Upgrades the fabric-downloader FPD image on the module.
<i>fpga-type</i>		Upgrades a specific field-programmable gate array (FPGA) image on the module. Use the <b>show fpd package</b> command to view all available FPGA images available for a specific module.
<b>rommon</b>		Upgrades the ROMMON image on the module.
<b>force</b>		(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.
<b>location</b> { <i>node-id</i>   <b>all</b> }		Specifies the node for which to upgrade the FPD image. The <i>node-id</i> argument is expressed in the <i>rack/slot/subslot</i> notation. Use the <b>all</b> keyword to indicate all nodes.

**Command Default** None

**Command Modes** Admin EXEC mode

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

## 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.



**Note** It is recommended to upgrade all FPGAs on a given node using the **upgrade hw-module fpd all location {all | node-id}** command. Do not upgrade the FPGA on a node using the **upgrade hw-module fpd <individual-fpd> location {all | node-id}** as it may cause errors in booting the card.

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 Operations ID**


---

 sysmgr read,  
 write
 

---

The following example shows how to upgrade the default FPGA on a SPA:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/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/asr9k-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.
```

upgrade hw-module fpd