Managing Router Hardware

This chapter describes the command-line interface (CLI) techniques and commands used to manage and configure the hardware components of a router running the Cisco IOS XR software.

For complete descriptions of the commands listed in this module, see Additional References, on page 59. To locate documentation for other commands that might appear in the course of performing a configuration task, search online in *Cisco IOS XR Commands Master List for the Cisco CRS Router*.

Table 1: Feature History for Managing Router Hardware with Cisco IOS XR Software

Release	Modification
Release 2.0	This feature was introduced.
Release 3.2	Logical router (LR) was first supported.
Release 3.3.0	The term logical router (LR) was changed to secure domain router (SDR).
Release 3.5.0	Flash disk recovery was implemented.

This module contains the following topics:

- Prerequisites for Managing Router Hardware, on page 2
- Displaying Hardware Status, on page 2
- RP Redundancy and Switchover, on page 21
- CPAK, on page 25
- Reloading, Shutting Down, or Power Cycling a Node, on page 27
- Flash Disk Recovery, on page 29
- Using Controller Commands to Manage Hardware Components, on page 29
- Formatting Hard Drives, Flash Drives, and Other Storage Devices, on page 30
- Removing and Replacing Cards, on page 30
- Upgrading the CPU Controller Bits, on page 58
- Additional References, on page 59

Prerequisites for Managing Router Hardware

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.

Displaying Hardware Status

This section describes how to display different types of hardware status information.

Displaying SDR Hardware Version Information

To display hardware version information for the components assigned to a secure domain router (SDR), connect to the appropriate designated secure domain router shelf controller (DSDRSC) and enter the **show diag** command in EXEC mode. The displayed information includes the card serial number and the ROMMON software version.

The syntax for the **show diag** command in EXEC mode is:

show diag [*node-id* | **details** | **summary**]

In the following example, the **show diag** command displays information for all nodes in the SDR:

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

  PLIM 0/1/CPU0 : JACKET CARD
    MAIN:  board type 580070
           800-23819-03 rev C0
           dev N/A
           S/N SAD094401CR
    PCA:   73-8982-06 rev C0
    PID:   CRS1-SIP-800
    VID:   V01
    CLEI:  COUIAAMCAA
    ECI:   134912
    Board State : IOS XR RUN
    PLD:   Motherboard: 0x0025, Processor: 0xda13, Power: N/A
    MONLIB: QNXFFS Monlib Version 3.0
    ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]
    Interface port config:  0 Ports
    Optical reach type:  Unknown
    Connector type:  MT-P

  NODE 0/1/0 : 4xOC3 POS SPA
    MAIN:  board type 0440
           68-2169-01 rev C0
           dev N/A
           S/N JAB093309PA
    PCA:   73-9313-04 rev B0
    PID:   SPA-4XOC3-POS
    VID:   V01
    CLEI:  IPUIAFNRAA

  NODE 0/1/5 : 8xGE SPA
```

```
  MAIN:  board type 044f
         68-2239-01 rev A0
         dev N/A
         S/N SAD0937022J
  PCA:   73-8557-03 rev A0
  PID:   SPA-8X1GE
  VID:   V01
  CLEI:  CNUIAH6AAA

PLIM 0/6/CPU0 : JACKET CARD
  MAIN:  board type 580070
         800-23819-03 rev C0
         dev N/A
         S/N SAD094203W2
  PCA:   73-8982-06 rev C0
  PID:   CRS1-SIP-800
  VID:   V01
  CLEI:  COUIAAMCAA
  ECI:   134912
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x0025, Processor: 0xda13, Power: N/A
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]
  Interface port config:  0 Ports
  Optical reach type:  Unknown
  Connector type:  MT-P

NODE 0/6/0 : 4xOC3 POS SPA
  MAIN:  board type 0440
         68-2169-01 rev C0
         dev N/A
         S/N JAB093309MG
  PCA:   73-9313-04 rev B0
  PID:   SPA-4XOC3-POS
  VID:   V01
  CLEI:  IPUIAFNRAA

NODE 0/6/4 : 8xOC3/OC12 POS SPA
  MAIN:  board type 0404
         68-2164-01 rev 34
         dev N/A
         S/N JAB094706L9
  PCA:   73-9941-02 rev 04
  PID:   SPA-8XOC12-POS
  VID:   V01
  CLEI:  SOUIAA8BAA

NODE 0/6/5 : 8xGE SPA
  MAIN:  board type 044f
         68-2239-01 rev A0
         dev N/A
         S/N SAD093909GM
  PCA:   73-8557-03 rev A0
  PID:   SPA-8X1GE
  VID:   V01
  CLEI:  CNUIAH6AAA

NODE 0/RP0/CPU0 : RP
  MAIN:  board type 100002
         800-22921-10 rev B0
         dev 080366, 080181
         S/N SAD093507J8
  PCA:   73-8564-10 rev B0
  PID:   CRS-8-RP
```

```
    VID:   V01
    CLEI:  IPUCABWBAA
    ECI:   129507
    Board State : IOS XR RUN
    PLD:   Motherboard: 0x0038, Processor: 0x0038, Power: 0x0000
    MONLIB: QNXFFS Monlib Version 3.0
    ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]

  NODE 0/RP1/CPU0 : RP
    MAIN:  board type 100002
           800-22921-10 rev B0
           dev 080366, 080181
           S/N SAD093507JP
    PCA:   73-8564-10 rev B0
    PID:   CRS-8-RP
    VID:   V01
    CLEI:  IPUCABWBAA
    ECI:   129507
    Board State : IOS XR RUN
    PLD:   Motherboard: 0x0038, Processor: 0x0038, Power: 0x0000
    MONLIB: QNXFFS Monlib Version 3.0
    ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]
```

In the following example, the **show diag** command displays information for a single node:

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

  NODE 0/RP0/CPU0 : RP
    MAIN:  board type 100002
           800-22921-10 rev B0
           dev 080366, 080181
           S/N SAD093507J8
    PCA:   73-8564-10 rev B0
    PID:   CRS-8-RP
    VID:   V01
    CLEI:  IPUCABWBAA
    ECI:   129507
    Board State : IOS XR RUN
    PLD:   Motherboard: 0x0038, Processor: 0x0038, Power: 0x0000
    MONLIB: QNXFFS Monlib Version 3.0
    ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]
```

Displaying System Hardware Version Information

To display hardware version information for all or some of the components assigned in a system, connect to the designated shelf controller (DSC) and enter the **show diag** command in administration EXEC mode. When this command is entered in administration EXEC mode, you can display information on RPs, MSCs or line cards, fabric cards, and system components such as the chassis, fan trays, and power supplies.

Note If you enter the **show diag** command in EXEC mode, the software displays only the hardware assigned to the SDR to which you are connected.

The syntax for the **show diag** command in administration EXEC mode is:

show diag [*node-id* | **chassis** | **details** | **fans** | **memory** | **power-supply** | **summary**]

Tip For information on the software version, use the **show version** command.

In the following example, the **show diag** command displays information for all nodes in the system:

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

  NODE 0/1/SP : MSC(SP)
    MAIN:  board type 500060
           800-25021-05 rev B0
           dev 079239
           S/N SAD09280BS9
    PCA:   73-7648-08 rev B0
    PID:   CRS-MSC
    VID:   V02
    CLEI:  IPUCAC1BAA
    ECI:   132502
    Board State : IOS XR RUN
    PLD:   Motherboard: 0x0025, Processor: 0xda13, Power: N/A
    MONLIB: QNXFFS Monlib Version 3.0
    ROMMON: Version 1.40(20050525:193402)  [CRS-1 ROMMON]

  PLIM 0/1/CPU0 : JACKET CARD
    MAIN:  board type 580070
           800-23819-03 rev C0
           dev N/A
           S/N SAD094401CR
    PCA:   73-8982-06 rev C0
    PID:   CRS1-SIP-800
    VID:   V01
    CLEI:  COUIAAMCAA
    ECI:   134912
    Board State : IOS XR RUN
    PLD:   Motherboard: 0x0025, Processor: 0xda13, Power: N/A
    MONLIB: QNXFFS Monlib Version 3.0
    ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]
    Interface port config:  0 Ports
    Optical reach type:  Unknown
    Connector type:  MT-P

  NODE 0/1/0 : 4xOC3 POS SPA
    MAIN:  board type 0440
           68-2169-01 rev C0
           dev N/A
           S/N JAB093309PA
    PCA:   73-9313-04 rev B0
    PID:   SPA-4XOC3-POS
    VID:   V01
    CLEI:  IPUIAFNRAA

  NODE 0/1/5 : 8xGE SPA
    MAIN:  board type 044f
           68-2239-01 rev A0
           dev N/A
           S/N SAD0937022J
    PCA:   73-8557-03 rev A0
    PID:   SPA-8X1GE
    VID:   V01
    CLEI:  CNUIAH6AAA
```

```
NODE 0/RP0/CPU0 : RP
  MAIN:  board type 100002
         800-22921-10 rev B0
         dev 080366, 080181
         S/N SAD093507J8
  PCA:   73-8564-10 rev B0
  PID:   CRS-8-RP
  VID:   V01
  CLEI:  IPUCABWBAA
  ECI:   129507
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x0038, Processor: 0x0038, Power: 0x0000
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]

NODE 0/RP1/CPU0 : RP
  MAIN:  board type 100002
         800-22921-10 rev B0
         dev 080366, 080181
         S/N SAD093507JP
  PCA:   73-8564-10 rev B0
  PID:   CRS-8-RP
  VID:   V01
  CLEI:  IPUCABWBAA
  ECI:   129507
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x0038, Processor: 0x0038, Power: 0x0000
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193559)  [CRS-1 ROMMON]

NODE 0/SM0/SP : FC/S
  MAIN:  board type 400035
         800-23168-05 rev B0
         dev N/A
         S/N SAD0933081S
  PCA:   73-8682-05 rev B0
  PID:   CRS-8-FC/S
  VID:   V01
  CLEI:  IPUCABXBAA
  ECI:   129510
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x001e, Processor: 0x0000, Power: N/A
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193402)  [CRS-1 ROMMON]

NODE 0/SM1/SP : FC/S
  MAIN:  board type 400035
         800-23168-05 rev B0
         dev N/A
         S/N SAD09300492
  PCA:   73-8682-05 rev B0
  PID:   CRS-8-FC/S
  VID:   V01
  CLEI:  IPUCABXBAA
  ECI:   129510
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x001e, Processor: 0x0000, Power: N/A
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193402)  [CRS-1 ROMMON]

NODE 0/SM2/SP : FC/S
  MAIN:  board type 400035
         800-23168-05 rev B0
         dev N/A
```

```
        S/N SAD09330830
  PCA:   73-8682-05 rev B0
  PID:   CRS-8-FC/S
  VID:   V01
  CLEI:  IPUCABXBAA
  ECI:   129510
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x001e, Processor: 0x0000, Power: N/A
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193402)  [CRS-1 ROMMON]

NODE 0/SM3/SP : FC/S
  MAIN:  board type 400035
         800-23168-05 rev B0
         dev N/A
         S/N SAD0933081W
  PCA:   73-8682-05 rev B0
  PID:   CRS-8-FC/S
  VID:   V01
  CLEI:  IPUCABXBAA
  ECI:   129510
  Board State : IOS XR RUN
  PLD:   Motherboard: 0x001e, Processor: 0x0000, Power: N/A
  MONLIB: QNXFFS Monlib Version 3.0
  ROMMON: Version 1.40(20050525:193402)  [CRS-1 ROMMON]

Rack 0:

Fan Tray 0 : Fan Tray Upper
  MAIN:  board type 900160
         800-23275-05 rev A0
         dev N/A
         S/N TBA09370056
  PCA:   0-0-00 rev 00
  PID:   CRS-8-LCC-FAN-TR
  VID:   V01
  CLEI:  IPPQAGWJAB
  ECI:   133434

Fan Tray 1 : Fan Tray Lower
  MAIN:  board type 900160
         800-23275-05 rev A0
         dev N/A
         S/N TBA09370055
  PCA:   0-0-00 rev 00
  PID:   CRS-8-LCC-FAN-TR
  VID:   V01
  CLEI:  IPPQAGWJAB
  ECI:   133434

Rack 0:

Power Supply A :
  MAIN:  board type b00181
         341-112-01 rev C0
         dev N/A
         S/N TD109320008
  PCA:   0-0-00 rev 00
  PID:   CRS-8-AC-RECT
  VID:   V01
  CLEI:  IPP1D0WAAA
  ECI:   129500

Power Supply B :
```

```
  MAIN:  board type b00181
         341-112-01 rev C0
         dev N/A
         S/N TD10931000X
  PCA:   0-0-00 rev 00
  PID:   CRS-8-AC-RECT
  VID:   V01
  CLEI:  IPP1D0WAAA
  ECI:   129500

RACK   0 :
  MAIN:  board type 0001e4
         800-23271-04 rev F0
         dev 076763
         S/N TBA09370035
  PCA:   73-8696-03 rev A0
  PID:   CRS-8-LCC
  VID:   V01
  CLEI:  IPMEZ10BRA
  ECI:   446387
  RACK NUM: 0
```

Note Line cards are called modular services cards (MSCs).

In the following example, the **show diag** command displays information for a single system component:

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

  RACK   0 :
    MAIN:  board type 0001e4
           800-23271-04 rev F0
           dev 076763
           S/N TBA09370035
    PCA:   73-8696-03 rev A0
    PID:   CRS-8-LCC
    VID:   V01
    CLEI:  IPMEZ10BRA
    ECI:   446387
    RACK NUM: 0
```

Displaying the Chassis Serial Numbers

Each chassis serial number must be defined during the configuration of multishelf routers. To view the actual serial number for each chassis in the system, enter the command **show diag chassis** in administration EXEC mode.

- Chassis serial numbers are displayed in the “Main” category for each chassis.
- “Rack Num” field displays the rack number assigned to that serial number.

For example:

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

  RACK   0 :
```

```
  MAIN:  board type 0001e0
         800-24872
         dev 075078
         S/N TBA00000001
  PCA:   73-7640-05 rev 20
  PID:   CRS-16-LCC
  VID:   V01
  CLEI:  IPM6700DRA
  ECI:   445022
  RACK NUM: 0

RACK   1 :
  MAIN:  board type 0001e0
         800-24872-01 rev 20
         dev 075078
         S/N TBA00000002
  PCA:   73-7640-05 rev 20
  PID:   CRS-16-LCC
  VID:   V01
  CLEI:  IPM6700DRA
  ECI:   445022
  RACK NUM: 1

--MORE--
```

Displaying the Configured Chassis Serial Numbers

Enter the command **show running-config | include dsc** in administration EXEC mode to display the serial number configured for each rack number.

This command is used to verify that the configuration is correct. The serial numbers displayed are those entered by an operator. If this number is wrong because of an entry error, the number is still displayed, but the DSC does not recognize the chassis.

Note This command can also be entered in administration configuration mode.

For example:

```
RP/0/RP0/CPU0:router# admin
  RP/0/RP0/CPU0:router(admin)# show running-config | include dsc

  Building configuration...
  dsc serial TBA00000003 rack F0
  dsc serial TBA00000001 rack 0
  dsc serial TBA00000002 rack 1
  RP/0/RP0/CPU0:router(admin)#
```

Displaying Software and Hardware Information

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

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

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

  Cisco IOS XR Software, Version 3.4.0[2I]
  Copyright (c) 2006 by cisco Systems, Inc.

  ROM: System Bootstrap, Version 1.40(20050525:193559) [CRS-1 ROMMON],

  router uptime is 1 week, 1 day, 17 hours, 1 minute
  System image file is "disk0:hfr-os-mbi-3.4.0/mbihfr-rp.vm"

  cisco CRS-8/S (7457) processor with 4194304K bytes of memory.
  7457 processor at 1197Mhz, Revision 1.2

  16 Packet over SONET/SDH network interface(s)
  16 SONET/SDH Port controller(s)
  2 Ethernet/IEEE 802.3 interface(s)
  16 GigabitEthernet/IEEE 802.3 interface(s)
  2043k bytes of non-volatile configuration memory.
  38079M bytes of hard disk.
  1000592k bytes of ATA PCMCIA card at disk 0 (Sector size 512 bytes).
  1000640k bytes of ATA PCMCIA card at disk 1 (Sector size 512 bytes).

  Package active on node 0/1/SP:
  hfr-diags, V 3.4.0[2I], Cisco Systems, at disk0:hfr-diags-3.4.0
      Built on Mon Mar 13 12:58:02 UTC 2006
      By iox8.cisco.com in /auto/ioxws48/production/3.4.0.2I/hfr/workspace for c8

  hfr-admin, V 3.4.0[2I], Cisco Systems, at disk0:hfr-admin-3.4.0
      Built on Mon Mar 13 11:46:36 UTC 2006
      By iox8.cisco.com in /auto/ioxws48/production/3.4.0.2I/hfr/workspace for c8

  hfr-base, V 3.4.0[2I], Cisco Systems, at disk0:hfr-base-3.4.0
      Built on Mon Mar 13 11:43:22 UTC 2006
      By iox8.cisco.com in /auto/ioxws48/production/3.4.0.2I/hfr/workspace for c8

  hfr-os-mbi, V 3.4.0[2I], Cisco Systems, at disk0:hfr-os-mbi-3.4.0
      Built on Mon Mar 13 11:27:02 UTC 2006
      By iox8.cisco.com in /auto/ioxws48/production/3.4.0.2I/hfr/workspace for c8

   --More--
```

Displaying Router Power Consumption

With the introduction of PLIMs and MSCs that consume higher power than before, and given the modular power available on a configurable number of power modules, it is possible that a fully loaded chassis can consume more power than available to the system. For this reason it is important to monitor your router power consumption and pay attention to any warnings or alarms regarding power.

Your router monitors the power necessary to run all cards in the system, and if the power requirements exceed the available power, syslog messages or alarms are displayed. Syslog messages can be displayed following two possible events:

- A board is powered up and a shortage of available power is detected.
- Available power becomes lower than the power consumed by inserted cards, for example because a power module is removed.

The following considerations are used when calculating the power consumption:

- Powering on an MSC or DRP adds to the power requirements of the chassis.
- Inserting or removing power modules affects the calculation of available power.
- Line cards are allowed to power up, before their power consumption is calculated.
- The power consumption of a SIP or SPA is calculated as though it is fully populated.
- RP, Switch Fabric, Fan tray, Fan controller and Alarm module power consumption is always added to the total chassis power usage regardless of whether they are physically present or not.
- The power of one power module is reserved for redundancy against a module failure (redundancy threshold), and thus subtracted from the calculation of available power.

Note For systems with modular power supplies, the total power availability is the sum of all power modules in both shelves *minus* one. This one power module is reserved to guard against a single module failure.

Note In a 4-Slot line card chassis, the total power available is the sum of all the power modules present (maximum of four).

Alarms and Messages

The following alarms can be raised:

- A major alarm is raised when the power consumption exceeds the power budget, and the alpha display on the alarm module is set to “PWR CRITICAL.”
- A minor alarm is raised when the redundancy threshold is crossed, and the alpha display is set to “PWR LOW.”
- A critical alarm is raised when there is a zone failure, and the alpha display is set to “ZONEX PWR FAIL,” where “X” is the zone number.

Syslog messages are displayed when a power event is registered.

Table 2: Syslog Messages Displayed on Systems with Modular Power Supplies

Event	Message
Power budget is exceeded	Power allotted to cards in this rack has exceeded the available rack power budget. Please check the 'show power' command to resolve this situation.
Power budget is restored	Power budget is now sufficient for rack power.
Power consumption exceeds the capacity of both shelves minus the capacity of one power module	Rack power is now being allotted from all power modules. Power module redundancy is no longer available, a single power module failure might result in card power loss.

Event	Message
Power consumption drops below the capacity of both shelves minus the capacity of one power module	Power allotment in this rack is now normal. Power module redundancy restored.

Table 3: Syslog Messages Displayed on Systems with Fixed Power Supplies

Event	Message
Zone power budget is exceeded	Power allotted in zone X has exceeded the available zone power budget. Please check the 'show power' command to resolve this situation.
Zone power budget is restored	Power budget for zone X is now sufficient for zone power.
Zone failure	Zone X has lost power. Check that power modules Ax and Bx are providing power.
Zone restoration	Zone X is now receiving power.

show power command Sample Output

Use the **show power** commands to display the total power available and the total power being consumed.

The **show power allotted** command displays the power allotted to the cards in the chassis. This example is from a system using modular power supplies:

```
RP/0/RP0/CPU0:router(admin)# show power allotted location 0/0/*

Sun Nov 18 22:00:51.176 UTC
nodeid = 0x2a00000f
Node              Card Type         State             PID               Power Allotted
----------------- ----------------- ----------------- ----------------- ------------------
0/0/*             FP-140G           POWERED UP        CRS-MSC-FP140       450.0W
0/0/PL0           14-10GbE          POWERED UP        14X10GBE-WL-XF      150.0W
```

The **show power capacity** command displays the power supplied to a rack. This example is from a system using fixed power supplies:

```
RP/0/RP1/CPU0:router(admin)# show power capacity rack 0

Tue Nov 20 19:43:30.458 OST
------------------------------------------------------------------------------
Rack 0: Cisco CRS Fixed AC Power System
------------------------------------------------------------------------------
Zone              Power Module      State             Zone Power Capacity
----------------- ----------------- ----------------- ---------------------
 Zone 1:           A[0]               NOT PRESENT        2500.0W
                   B[0]               OK
 Zone 2:           A[0]               NOT PRESENT        2500.0W
                   B[0]               OK
 Zone 3:           A[0]               NOT PRESENT        2500.0W
                   B[0]               OK
------------------------------------------------------------------------------
Total Rack Power Capacity:                                7500.0W
```

The **show power summary** displays a summary of the power consumption and availability for a rack. This example is from a system using modular power supplies:

```
RP/0/RP0/CPU0:router(admin)# show power summary rack 0

Sun Nov 18 22:02:40.434 UTC
Location          Power Capacity    Power Allotted    Power Available
----------------- ----------------- ----------------- ------------------
Rack :  0            7600.0W           1285.0W            6315.0W
```

Displaying SDR Node IDs and Status

In EXEC mode, the **show platform** command displays information for all nodes assigned to a secure domain router (SDR) . For each node, this information includes the host card type, the operational state, and the configuration state. To display information on a single node, enter the command with a node ID.

The syntax for the **show platform** command is:

show platform [*node-id*]

The following example displays the status for all nodes in the SDR to which you are connected:

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

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/0/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/2/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP0/CPU0      RP(Standby)     N/A             IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
```

Note Line cards are called modular services cards (MSCs).

The *node-id* appears in the *rack*/*slot*/*module* notation, and the *node-id* components are as follows:

- *rack* —In a single-shelf system the rack number is always “0.” In a multishelf system, the LCC rack number range is 0 to 255 and the FCC rack number range is F0 to F7.
- *slot* —Number of the physical slot in which the card is installed.
- *module* —Subslot number of a system hardware component.

Table 4: Node ID Components, on page 13 summarizes the *node-id* for each type of card.

Table 4: Node ID Components

Card Type (the card to which your are issuing commands)	Rack (always “0” in a single-shelf system)	Slot (the physical slot in which the card is installed)	Module (the entity on the card that is the target of the command)
Route processor	0–255	RP0 and RP1	CPU0

Card Type (the card to which your are issuing commands)	Rack (always "0" in a single-shelf system)	Slot (the physical slot in which the card is installed)	Module (the entity on the card that is the target of the command)
DRP	0-255	0–7 (8-slot chassis) 0–15 (16-slot chassis)	CPU0 or CPU1
MSC	0–255	0-3 (4-slot chassis) 0–7 (8-slot chassis) 0–15 (16-slot chassis)	Service processor (SP)
PLIM	0–255	0-3 (4-slot chassis) 0–7 (8-slot chassis) 0–15 (16-slot chassis)	CPU0
Cisco CRS-1 SPA Interface Processor (SIP)-800	0–255	0–7 (8-slot chassis) 0–15 (16-slot chassis)	CPU0
1-Port OC-192c/STM-64c Packet-over-SONET/SDH (POS) XFP SPA 4-Port OC-3c/STM-1 POS SPA 8-Port Gigabit Ethernet SPA	0–255	0–7 (8-slot chassis) 0–15 (16-slot chassis)	0–5 (SPA module number on the Cisco CRS-1 SIP-800)
Switch fabric module	0–255	SM0–SM3 (4-slot chassis) SM0–SM3 (8-slot chassis) SM0–SM7 (16-slot chassis)	SP
Alarm cards	0–255	AM0–AM1 (16-slot chassis)	SP
Fan controller cards	0–255	FC0–FC1 (16-slot chassis)	SP

Displaying Router Node IDs and Status

In administration EXEC mode, the **show platform** command displays information for all router nodes, which include nodes in all chassis and SDRs. In administration EXEC mode, the command display also includes additional node IDs such as those for fabric cards, alarm modules, and fan controllers. For each node, this information includes the host card type, the operational state, and the configuration state. To display information on a single node, enter the command with a node ID.

The syntax for the **show platform** command is:

show platform [*node-id*]

The following example displays the status for all nodes in a Cisco CRS-1 Multishelf System:

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

Node            Type            PLIM            State           Config State
--------------------------------------------------------------------------------
0/5/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
0/5/CPU0        MSC             4OC192-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
0/7/SP          DRP(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
0/7/CPU0        DRP(Active)     DRP-ACC         IOS XR RUN      PWR,NSHUT,MON
0/7/CPU1        DRP(Active)     DRP-ACC         IOS XR RUN      PWR,NSHUT,MON
0/14/SP         MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
0/14/CPU0       MSC             8-10GbE         IOS XR RUN      PWR,NSHUT,MON
0/RP0/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
0/RP1/CPU0      RP(Standby)     N/A             IOS XR RUN      PWR,NSHUT,MON
0/FC0/SP        LCC-FAN-CT(SP)  N/A             IOS XR RUN      PWR,NSHUT,MON
0/FC1/SP        LCC-FAN-CT(SP)  N/A             IOS XR RUN      PWR,NSHUT,MON
0/AM0/SP        ALARM(SP)       N/A             IOS XR RUN      PWR,NSHUT,MON
0/AM1/SP        ALARM(SP)       N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM0/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM1/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM2/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM3/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM4/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM5/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM6/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
0/SM7/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/4/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
1/4/CPU0        MSC             4OC192-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
1/RP0/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
1/RP1/CPU0      RP(Standby)     N/A             IOS XR RUN      PWR,NSHUT,MON
1/FC0/SP        LCC-FAN-CT(SP)  N/A             IOS XR RUN      PWR,NSHUT,MON
1/FC1/SP        LCC-FAN-CT(SP)  N/A             IOS XR RUN      PWR,NSHUT,MON
1/AM0/SP        ALARM(SP)       N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM0/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM1/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM3/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM4/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM5/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM6/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
1/SM7/SP        FC/M(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
F0/SM4/SP       FCC-SFC(SP)     FCC-FM-1S       IOS XR RUN      PWR,NSHUT,MON
F0/SM5/SP       FCC-SFC(SP)     FCC-FM-1S       IOS XR RUN      PWR,NSHUT,MON
F0/SM6/SP       FCC-SFC(SP)     FCC-FM-1S       IOS XR RUN      PWR,NSHUT,MON
F0/SM7/SP       FCC-SFC(SP)     FCC-FM-1S       IOS XR RUN      PWR,NSHUT,MON
F0/SC0/CPU0     FCC-SC(Active)  N/A             IOS XR RUN      PWR,NSHUT,MON
F0/SC1/CPU0     FCC-SC(Standby) N/A             IOS XR RUN      PWR,NSHUT,MON
F0/AM0/SP       ALARM(SP)       N/A             IOS XR RUN      PWR,NSHUT,MON
F0/AM1/SP       ALARM(SP)       N/A             IOS XR RUN      PWR,NSHUT,MON
F0/LM0/SP       FCC-LED(SP)     N/A             IOS XR RUN      PWR,NSHUT,MON
F0/LM1/SP       UNKNOWN(SP)     N/A             IN-RESET        PWR,NSHUT,MON
```

Note Line cards are called modular services cards (MSCs).

The *node-id* appears in the *rack*/*slot*/*module* notation, and the *node-id* components are as follows:

- *rack* —In a single-shelf system the rack number is always “0.” In a multishelf system, the LCC rack number range is 0 to 255 and the FCC rack number range is F0 to F7.
- *slot* —Number of the physical slot in which the card is installed.
- *module* —Subslot number of a system hardware component.

Table 4: Node ID Components, on page 13 summarizes the *node-id* argument for each type of card.

Displaying Router Environment Information

The **show environment** command displays hardware information for the system, including fan speeds, LED indications, power supply voltage and current information, and temperatures.

The syntax for the **show environment** command is:

show environment [*options*]

You can use the **show environment** command options to limit the detail in the command display. To view the command options, enter the **show environment ?** command. The following example shows the full environment status report:

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

  Temperature Information
  ----------------------------------------------

  R/S/I   Modules Sensor          Temp. (deg C)

  0/0/*     host  Inlet              23.0
            host  Hot                23.0
  0/3/*     host  Inlet              24.0
            host  Hot                33.0
  0/4/*     host  Inlet              24.5
            host  Hot                31.5
  0/5/*     host  Inlet              23.5
            host  Hot                30.5
  0/6/*     host  Hot                31.5
            host  Inlet              22.5
  0/7/*     host  Inlet              20.0
            host  Hot                29.5
  0/8/*     host  Inlet              20.5
            host  Hot                32.0

  Threshold Information
  ----------------------------------------------

  R/S/I   Modules Sensor          Minor           Major           Critical
                                  (Lo/Hi)         (Lo/Hi)         (Lo/Hi)

  0/0/*     host  InletTemp        --/  55         --/  60         --/  --
            host  HotTemp          --/  66         --/  69         --/  --
            host  PLIM_V4_1.6V     --/  --         --/  --         --/  --
            host  PLIM_V5_1.8V     --/  --         --/  --         --/  --
            host  PLIM_V3_2.5V     --/  --         --/  --         --/  --
            host  3.4V           2950/3500       2900/3600       --/  --
            host  5V             4800/5150       4700/5200       --/  --
            host  Mbus5V         4700/5300       4500/5500       --/  --
  0/3/*     host  InletTemp        --/  55         --/  60         --/  70
```

```
          host  HotTemp          --/  66          --/  69          --/  75
          host  PLIM_V3_1.5V     --/  --          --/  --          --/  --
          host  PLIM_V8_1.8V     --/  --          --/  --          --/  --
          host  PLIM_V7_2.5V     --/  --          --/  --          --/  --
          host  3.4V             --/  --          --/  --          --/  --
          host  5V             4800/5200        4700/5300        4600/5400
          host  Mbus5V         4700/5300        4600/5400        4500/5500
0/4/*     host  InletTemp        --/  55          --/  60          --/  70
          host  HotTemp          --/  66          --/  69          --/  75
          host  PLIM_V3_1.5V     --/  --          --/  --          --/  --
          host  PLIM_V8_1.8V     --/  --          --/  --          --/  --
          host  PLIM_V7_2.5V     --/  --          --/  --          --/  --
          host  PLIM_V6_1.5V     --/  --          --/  --          --/  --
          host  5V               --/  --          --/  --          --/  --
          host  3.4V             --/  --          --/  --          --/  --
          host  Mbus5V         4700/5300        4600/5400        4500/5500
0/5/*     host  InletTemp        --/  55          --/  60          --/  70
          host  HotTemp          --/  66          --/  69          --/  75
          host  PLIM_V3_1.5V     --/  --          --/  --          --/  --
          host  PLIM_V8_1.8V     --/  --          --/  --          --/  --
          host  PLIM_V7_2.5V     --/  --          --/  --          --/  --
          host  PLIM_V6_1.5V     --/  --          --/  --          --/  --
          host  5V               --/  --          --/  --          --/  --
          host  3.4V             --/  --          --/  --          --/  --
          host  Mbus5V         4700/5300        4600/5400        4500/5500
0/6/*     host  HotTemp          --/  66          --/  69          --/  75
          host  InletTemp        --/  55          --/  60          --/  70
          host  PLIM_V3_1.5V     --/  --          --/  --          --/  --
          host  PLIM_V8_1.8V     --/  --          --/  --          --/  --
          host  PLIM_V7_2.5V     --/  --          --/  --          --/  --
          host  3.4V             --/  --          --/  --          --/  --
          host  Mbus5V         4700/5300        4600/5400        4500/5500
0/7/*     host  InletTemp        --/  55          --/  60          --/  70
          host  HotTemp          --/  66          --/  69          --/  75
          host  PLIM_V3_1.5V     --/  --          --/  --          --/  --
          host  PLIM_V8_1.8V     --/  --          --/  --          --/  --
          host  PLIM_V7_2.5V     --/  --          --/  --          --/  --
          host  PLIM_V6_1.5V     --/  --          --/  --          --/  --
          host  5V               --/  --          --/  --          --/  --
          host  3.4V             --/  --          --/  --          --/  --
          host  Mbus5V         4700/5300        4600/5400        4500/5500
0/8/*     host  InletTemp        --/  55          --/  60          --/  70
          host  HotTemp          --/  66          --/  69          --/  75
          host  PLIM_V3_1.5V     --/  --          --/  --          --/  --
          host  PLIM_V8_1.8V     --/  --          --/  --          --/  --
          host  PLIM_V7_2.5V     --/  --          --/  --          --/  --
          host  3.4V             --/  --          --/  --          --/  --
          host  5V             4800/5200        4700/5300        4600/5400
          host  Mbus5V         4700/5300        4600/5400        4500/5500
Voltage Information
-------------------------------------------

R/S/I   Modules Sensor          Voltage (mV)    Margin

0/0/*     host  PLIM_V4_1.6V     1612           nominal
          host  PLIM_V5_1.8V     1804           nominal
          host  PLIM_V3_2.5V     2504           nominal
          host  3.4V             3296           nominal
          host  5V               5048           nominal
          host  Mbus5V           5048           n/a
0/3/*     host  PLIM_V3_1.5V     1496           nominal
          host  PLIM_V8_1.8V     1788           nominal
          host  PLIM_V7_2.5V     2492           nominal
          host  3.4V             3284           nominal
```

```
            host  5V               5000          nominal
            host  Mbus5V           5024          n/a
  0/4/*     host  PLIM_V3_1.5V     1500          nominal
            host  PLIM_V8_1.8V     1796          nominal
            host  PLIM_V7_2.5V     2488          nominal
            host  PLIM_V6_1.5V     1508          nominal
            host  5V               4976          nominal
            host  3.4V             3288          nominal
            host  Mbus5V           5048          n/a
  0/5/*     host  PLIM_V3_1.5V     1504          nominal
            host  PLIM_V8_1.8V     1792          nominal
            host  PLIM_V7_2.5V     2488          nominal
            host  PLIM_V6_1.5V     1504          nominal
            host  5V               4976          nominal
            host  3.4V             3284          nominal
            host  Mbus5V           4984          n/a
  0/6/*     host  PLIM_V3_1.5V     1496          nominal
            host  PLIM_V8_1.8V     1792          nominal
            host  PLIM_V7_2.5V     2476          nominal
            host  3.4V             3300          nominal
            host  Mbus5V           5016          n/a
  0/7/*     host  PLIM_V3_1.5V     1504          nominal
            host  PLIM_V8_1.8V     1796          nominal
            host  PLIM_V7_2.5V     2484          nominal
            host  PLIM_V6_1.5V     1504          nominal
            host  5V               4976          nominal
            host  3.4V             3276          nominal
            host  Mbus5V           4984          n/a
  0/8/*     host  PLIM_V3_1.5V     1496          nominal
            host  PLIM_V8_1.8V     1792          nominal
            host  PLIM_V7_2.5V     2492          nominal
            host  3.4V             3280          nominal
            host  5V               5000          nominal
            host  Mbus5V           5024          n/a
```

Displaying RP Redundancy Status

The **show redundancy** command displays the redundancy status of the route processors (RPs) . This command also displays the boot and switch-over history for the RPs.

The **show redundancy** operates in EXEC and administration EXEC mode.

In the following example, the **show redundancy** command displays the redundancy status for a redundant RP pair:

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

  This 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 Fri Apr  9 03:44:28 2004: 16 hours, 51 minutes ago
  This node booted Fri Apr  9 06:19:05 2004: 14 hours, 16 minutes ago
  Last switch-over Fri Apr  9 06:53:18 2004: 13 hours, 42 minutes ago
  Standby node boot Fri Apr  9 06:54:25 2004: 13 hours, 41 minutes ago
  Standby node last not ready Fri Apr  9 20:35:23 2004: 0 minutes ago
  Standby node last ready Fri Apr  9 20:35:23 2004: 0 minutes ago
```

```
  There have been 2 switch-overs since reload
```

Displaying Field-Programmable Device Compatibility

The **show hw-module fpd** command displays field-programmable device (FPD) compatibility for all modules or a specific module.

The syntax for the **show hw-module fpd** command is:

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

The **show hw-module fpd** operates in EXEC and administration EXEC mode.

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

```
RP/0/RSP0/CPU0:router# show hw-module fpd location all

==================================== ========================================
                                     Existing Field Programmable Devices
                                     ========================================
                                       HW                          Current SW Upg/
Location     Card Type               Version Type Subtype Inst   Version   Dng?
============ ======================= ======= ==== ======= ==== =========== ====
0/RSP0/CPU0  CRS1-SIP-800             1.0     lc   fpga3    0      1.23     Yes
                                                  fpga1    0      1.05      No
                                                  fpga2    0      3.08^     No
------------------------------------------------------------------------------
0/0/0        SPA-2XCHOC12/DS0          1.0     spa  rommon   0      2.02      No
                                               spa   fpga     0      1.36+     No
                                               spa   fpga2    0      1.00*     No
------------------------------------------------------------------------------
NOTES:
1.  One or more FPD needs an upgrade or a downgrade.  This can be accomplished
    using the "admin upgrade hw-module fpd" CLI.
2.  * One or more FPD is running minimum software version supported.
     It can be upgraded using the "admin> upgrade hw-module fpd <fpd> force location <loc>"
 CLI.
3.  + One or more FPD is running up-rev FPGA version. Downgrade is "OPTIONAL" in this case.

      It can be downgraded using the "admin> upgrade hw-module fpd <fpd> force location
<loc>" CLI.
4.  ^ 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.
```

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

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

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

==================================== ========================================
                                     Existing Field Programmable Devices
```

```
                                      ========================================
                                        HW                        Current SW Upg/
Location     Card Type                Version Type Subtype Inst    Version   Dng?
============ ======================== ======= ==== ======= ==== =========== ====
0/SM1/SP     140G-4-S1S2S3              0.1  lc   rommonA   0    2.08        Yes
--------------------------------------------------------------------------------
                                           lc    rommon    0    2.08        Yes
--------------------------------------------------------------------------------
                                           lc    fpqa1     0    6.04^       No
--------------------------------------------------------------------------------
                                           lc    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.


RP/0/RP0/CPU0:router# show hw-module fpd location 0/6/cpu0

Sun Apr 18 03:18:24.903 DST

==================================== ========================================
                                      Existing Field Programmable Devices
                                      ========================================
                                        HW                        Current SW Upg/
Location     Card Type                Version Type Subtype Inst    Version   Dng?
============ ======================== ======= ==== ======= ==== =========== ====
0/6/CPU0     CRS1-SIP-800               0.96  lc   fpga1   0       6.00     No
                                           lc   rommonA 0       2.100    No
                                           lc   rommon  0       2.100    No
--------------------------------------------------------------------------------
```

If the cards in the system do not meet the minimum requirements, the output contains a “NOTES” section that states how to upgrade the FPD image.

Table 5: show hw-module fpd Field Descriptions

Field	Description
Location	Location of the module in the *rack*/*slot*/*module* notation.
Card Type	Module part number.
HW Version	Hardware model version for the module.
Type	Hardware type. Can be one of the following types: • spa—Shared port adapter • lc—Line card

Field	Description
Subtype	FPD type. Can be one of the following types: • fabldr—Fabric downloader • fpga1—Field-programmable gate array • fpga2—Field-programmable gate array 2 • fpga3—Field-programmable gate array 3 • fpga4—Field-programmable gate array 4 • fpga5—Field-programmable gate array 5 • rommonA—Read-only memory monitor A • rommon—Read-only memory monitor B
Inst	FPD instance. The FPD instance uniquely identifies an FPD and is used by the FPD process to register an FPD.
Current SW Version	Currently running FPD image version.
Upg/Dng?	Specifies whether an FPD upgrade or downgrade is required. A downgrade 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.

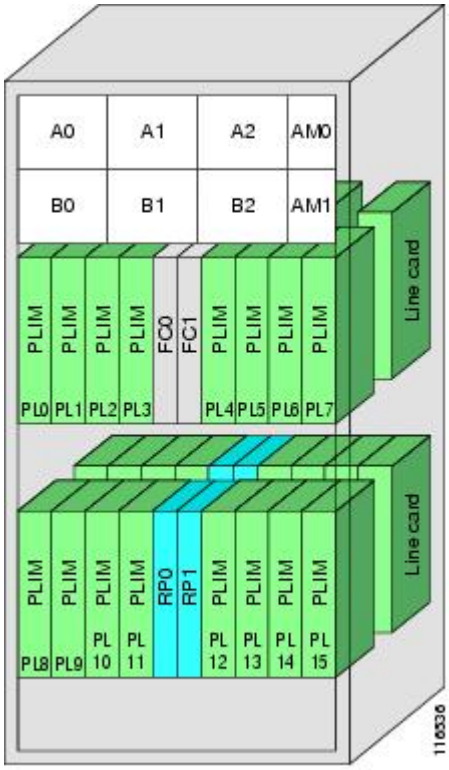
RP Redundancy and Switchover

This section describes RP redundancy and switchover commands and issues.

Establishing RP Redundancy

Your router has two slots for RPs: RP0 and RP1 (see Figure 1: Redundant Set of RPs Installed in Slots RP0 and RP1 in an 8-Slot Chassis, on page 22). These slots are configured for redundancy by default, and the redundancy cannot be eliminated. To establish RP redundancy, install RPs into both slots.

Figure 1: Redundant Set of RPs Installed in Slots RP0 and RP1 in an 8-Slot Chassis



Note: Illustration not to scale

Determining the Active RP in a Redundant Pair

During system startup, one RP in each redundant pair becomes the active RP. You can tell which RP is the active RP in the following ways:

- The active RP can be identified by the green Primary LED on the faceplate of the card. The active RP is indicated when the Primary LED is on. The alphanumeric LED display on the RP displays ACTV RP.
- The slot of the active RP is indicated in the CLI prompt. For example:

```
RP/0/RP1/CPU0:router#
```

  In this example, the prompt indicates that you are communicating with the active RP in slot RP1. See *Cisco IOS XR Getting Started Guide for the Cisco CRS Router* for a complete description of the CLI prompt.

- Enter the **show redundancy** command in EXEC mode to display a summary of the active and standby RP status. For example:

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

  This 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 Fri Apr  9 03:44:28 2004: 16 hours, 51 minutes ago
This node booted Fri Apr  9 06:19:05 2004: 14 hours, 16 minutes ago
Last switch-over Fri Apr  9 06:53:18 2004: 13 hours, 42 minutes ago
Standby node boot Fri Apr  9 06:54:25 2004: 13 hours, 41 minutes ago
Standby node last not ready Fri Apr  9 20:35:23 2004: 0 minutes ago
Standby node last ready Fri Apr  9 20:35:23 2004: 0 minutes ago
There have been 2 switch-overs since reload
```

Role of the Standby RP

The second RP to boot in a redundant pair automatically becomes the standby RP. While the active RP manages the system and communicates with the user interface, the standby RP maintains a complete backup of the software and configurations for all cards in the system. If the active RP fails or goes off line for any reason, the standby RP immediately takes control of the system.

Summary of Redundancy Commands

RP redundancy is enabled by default in the Cisco IOS XR software, but you can use the commands described in Table 6: RP Redundancy Commands, on page 23 to display the redundancy status of the cards or force a manual switchover.

Table 6: RP Redundancy Commands

Command	Description
show redundancy	Displays the redundancy status of the RPs. This command also displays the boot and switch-over history for the RPs.
redundancy switchover	Forces a manual switchover to the standby RP. This command works only if the standby RP is installed and in the “ready” state.
show platform	Displays the status for node, including the redundancy status of the RP cards. In EXEC mode, this command displays status for the nodes assigned to the SDR. In administration EXEC mode, this command displays status for all nodes in the system.

Automatic Switchover

Automatic switchover from the active RP to the standby RP occurs only if the active RP encounters a serious system error, such as the loss of a mandatory process or a hardware failure. When an automatic switchover occurs, the RPs respond as follows:

- If a standby RP is installed and “ready” for switchover, the standby RP becomes the active RP. The original active RP attempts to reboot.
- If the standby RP is not in “ready” state, then both RPs reboot. The first RP to boot successfully assumes the role of active RP.

RP Redundancy During RP Reload

The **reload** command causes the active RP to reload the Cisco IOS XR software. When an RP reload occurs, the RPs respond as follows:

- If a standby RP is installed and "ready" for switchover, the standby RP becomes the active RP. The original active RP reboots and becomes the standby RP.
- If the standby RP is not in the "ready" state, then both RPs reboot. The first RP to boot successfully assumes the role of active RP.

Caution You should not use the **reload** command to force an RP switchover because the result could be a significant loss of router operations. Instead, use the **redundancy switchover** command to fail over to the standby RP, then use the **hw-module location** *node-id* **reload** command to reload the new standby RP.

Related Topics

Reloading, Shutting Down, or Power Cycling a Node, on page 27

Manual Switchover

You can force a manual switchover from the active RP to the standby RP using the **redundancy switchover** command.

If a standby RP is installed and ready for switchover, the standby RP becomes the active RP. The original active RP becomes the standby RP. In the following example, partial output for a successful redundancy switchover operation is shown:

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

  This 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

  RP/0/RP0/CPU0:router# redundancy switchover
  Updating Commit Database.  Please wait...[OK]
  Proceed with switchover 0/RP0/CPU0 -> 0/RP1/CPU0? [confirm]
  Initiating switch-over.
  RP/0/RP0/CPU0:router#

  <Your 'TELNET' connection has terminated>
```

In the preceding example, the Telnet connection is lost when the previously active RP resets. To continue management of the router, you must connect to the newly activated RP as shown in the following example:

```
User Access Verification

  Username: xxxxx
  Password: xxxxx
  Last switch-over Sat Apr 15 12:26:47 2009: 1 minute ago


RP/0/RP1/CPU0:router#
```

If the standby RP is not in “ready” state, the switchover operation is not allowed. In the following example, partial output for a failed redundancy switchover attempt is shown:

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

  Redundancy information for node 0/RP1/CPU0:
  ==========================================
  Node 0/RP0/CPU0 is in ACTIVE role
  Partner node (0/RP1/CPU0) is in UNKNOWN role

  Reload and boot info
  ----------------------
  RP reloaded Wed Mar 29 17:22:08 2009: 2 weeks, 2 days, 19 hours, 14 minutes ago
  Active node booted Sat Apr 15 12:27:58 2009: 8 minutes ago
  Last switch-over Sat Apr 15 12:35:42 2009: 1 minute ago
  There have been 4 switch-overs since reload

  RP/0/RP0/CPU0:router# redundancy switchover

  Switchover disallowed: Standby node is not ready.
```

Communicating with a Standby RP

The active RP automatically synchronizes all system software, settings, and configurations with the standby RP.

If you connect to the standby RP through the console port, you can view the status messages for the standby RP. The standby RP does not display a CLI prompt, so you cannot manage the standby card while it is in standby mode.

If you connect to the standby RP through the management Ethernet port, the prompt that appears is for the active RP, and you can manage the router the same as if you had connected through the management Ethernet port on the active RP.

CPAK

CPAKs are the Cisco's innovation for 100G pluggable optics, which is built with the industry leading smallest form factor, in full compliant with IEEE802.3ae specification for 100GE-SR10, -LR4, and can interoperate with all IEEE 802.3ba compliant CFP-SR10 or CFP-LR4 100G optics.

Modes Supported on CPAKs

This table clearly lists the modes supported with the relevant PID:

CPAK (PID)	Modes Supported
CPAK-100G-SR10	100 GE, 10 GE, 40 GE
CPAK-100G-LR	100 GE

CPAK (PID)	Modes Supported
CPAK-10X10G-LR	100 GE

Power saving mode

8x100GE Line card consists of 4 Slices (0,1,2,3). Each slice has two physical ports. Slice-1, 2 and 3 can be configured into power save mode. Power save option is not applicable to Slice-0. Use the **hw-module power saving** command to configure the required slice to power saving mode.

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.

Table 7: Slice-Port mapping table

Slice 1	Ports 2,3
Slice 2	Ports 4,5
Slice 3	Ports 6,7

To configure the power save option

This task enables the user to configure the power save option.

SUMMARY STEPS

1. **admin**
2. **configure**
3. **hw-module power saving location** *location* **slice** *number*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 2	**configure**	
Step 3	**hw-module power saving location** *location* **slice** *number* **Example:** `RP/0/RP0/CPU0:router (admin-config) #` **`hw-module power saving location 0/1/CPU0 slice 3`**	Configures the power saving option for the specified slice. The available options are Slice1, 2, 3. **Note** Power save option is not applicable for Slice 0.

What to do next

Use the **show plat slices** command to get the status of the slices.

Reloading, Shutting Down, or Power Cycling a Node

Use the commands described in this section to reload the Cisco IOS XR software on the active RP or on any specified node in the system. This section also describes the commands used to administratively shut down a node and power a node on or off.

Table 8: Commands to Reload, Shut Down, or Power Cycle a Node, on page 27 summarizes the commands described in this section.

Table 8: Commands to Reload, Shut Down, or Power Cycle a Node

Command	Description
hw-module location *node-id* **power disable**	This command administratively turns the power off for a node. It is entered in administration configuration mode. The changes do not take effect until you enter the **commit** command. To power on a node, use the **no** form of this command. **Note** This command cannot be used to disable power on the RP from which the command is entered.
hw-module location *node-id* **reload**	This command works in EXEC mode and reloads the Cisco IOS XR software on a specific node or all nodes. To specify all nodes, enter the **all** keyword in place of the *node-id* argument. The node reloads with the current running configuration and active software set for that node.

Reloading the Active RP

The **reload** command causes the active RP to reload the Cisco IOS XR software according to the configuration register setting. This setting determines how the active RP acts when reloaded.

This section contains instructions to reload the Cisco IOS XR software and return to EXEC mode. For instructions to use the **reload** command for entering ROM Monitor bootstrap mode, see *ROM Monitor Configuration Guide for Cisco CRS Routers*.

Caution Because the **reload** command causes the active RP to go off line and either reload the Cisco IOS XR software or enter ROM Monitor mode, the router experiences a loss of service unless a redundant standby RP is installed and in "ready" state. To display the status of the standby RP, use the **show redundancy** command in EXEC mode.

SUMMARY STEPS

1. **show redundancy**
2. **admin**
3. **show variables boot**
4. (Optional) **config-register** *register-value*
5. **admin**

6. **reload**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**show redundancy** **Example:** `RP/0/RP0/CPU0:router# show redundancy`	Displays the RP redundancy status. • If a standby RP is in "ready" redundancy state, the **reload** command also causes the router to gracefully fail over to the standby RP.
Step 2	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 3	**show variables boot** **Example:** `RP/0/RP0/CPU0:router(admin)# show variables boot`	Displays the configuration register setting. • Enter this command in administration EXEC mode. • For normal operations, the configuration register setting is 0x102 or 0x2102, which causes the active RP to reload the Cisco IOS XR software. • Verify that the configuration register setting is 0x102 or 0x2102. If it is not, complete Step 4, on page 28 to reset the configuration register to 0x102 or 0x2102. **Note** For instructions on how to enter ROM Monitor bootstrap mode, see *ROM Monitor Configuration Guide for Cisco CRS Routers*.
Step 4	(Optional) **config-register** *register-value* **Example:** `RP/0/RP0/CPU0:router(admin)# config-register 0x102`	Sets the configuration register to the respective value. This step is necessary only if the register is not set to the respective value (0x102 or 0x2102) in the running configuration. You can use either 0x102 or 0x2102. Both these values specify the same functionality, as bit 13 in 0x2102 is not significant for Cisco IOS XR software.
Step 5	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 6	**reload** **Example:** `RP/0/RP0/CPU0:router# reload`	Reloads the active RP according to the configuration register setting. • If the setting is 0x102 or 0x2102 , then the RP reloads the Cisco IOS XR software. • If the standby RP is in "ready" redundancy state, the router switches over to the standby RP. • If a standby RP is not installed or not in a "ready" state, the router experiences a loss of service while the active RP is reloading the Cisco IOS XR software.

Flash Disk Recovery

When an RP or DRP is power cycled or experiences an ungraceful reset, the boot disk (PCMCIA flash disk used to boot the card) may experience a file-system corruption. If this occurs, an error message is displayed and the RP or DRP fails to boot. The corrupted flash disk is automatically reformatted and the Cisco IOS XR software is restored from the designated system controller (DSC) for the system.

For example, if a flash disk for an RP or DRP is corrupted, the RP or DRP fails to boot and the following error message is displayed:

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

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

Cisco IOS XR Software for the Cisco XR Cisco CRS Router-mbirp,
Copyright (c) 2009 by Cisco Systems, Inc.
Unable to mount /disk0:, filesystem is corrupted.
Check fsck log at /tmp/chkfs_fd0.log
init: special_commands:wait for disk0: failed
```

If this occurs, then the flash disk is automatically reformatted and the Cisco IOS XR software is restored to the flash disk.

Note If the flash disk is badly damaged and cannot be reformatted, the disk must be replaced.

If the corrupted flash disk is the DSC, then the router fails over to the standby DSC. If no standby DSC is installed, then the system fails to boot.

Using Controller Commands to Manage Hardware Components

The **controller** , **controllers** , and **show controllers** commands are used to manage and display settings for various hardware components, including the switch fabric management, Ethernet control plane, and interface manager. These commands are primarily diagnostic and related to driver-level details. The information available with these commands varies widely and is hardware specific.

For information on the use of these commands, see *Interface and Hardware Component Command Reference for Cisco CRS Routers*.

Formatting Hard Drives, Flash Drives, and Other Storage Devices

To format a storage device on the router, use the **format** command in EXEC mode.

Caution Formatting a storage device deletes all data on that device.

The following command syntax is used:

format *filesystem:* [*options*]

Table 9: format command Syntax Description, on page 30 describes the **format** command syntax.

Table 9: format command Syntax Description

Variable	Description
filesystem	Specifies the memory device to format. The supported file systems are: • **bootflash:** • **compactflash:** • **flash:** • **harddisk:** • **harddiska:** • **disk0:** • **disk1:** Enter **format ?** to see the devices supported on your router.
options	Enter **format** *filesystem:* **?** to see the available options. For more information, see *System Management Command Reference for isco CRS Routers*.

In the following example, the **format** command is used to format the hard disk:

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

Removing and Replacing Cards

This section describes card replacement issues and procedures.

Removing Line Cards, MSCs, or PLIMs

Line cards, modular services cards (MSCs), and physical layer interface modules (PLIMs) are designed for online insertion and removal (OIR). The service processing functions are provided on the MSC, and the physical line interface is provided on a separate card that connects the physical lines to the MSC.

The OIR feature allows you to remove and replace cards without removing power to the card or chassis. Removing a card interrupts all traffic passing through the card, but it does not remove the card configuration.

When you remove a card, the configuration remains for all interfaces, but the interfaces do not appear in the output of the **show interfaces** command. You can view interface configurations by entering the **show running-config** command. The following example shows how the configuration appears when a card is removed:

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

  Building configuration...
  hostname router
  router ospf 3269
   area 0
    interface POS0/3/0/0
     cost 20
  !
  interface preconfigure POS0/3/0/0
   ipv4 address 10.10.50.1 255.255.255.0
  !
  interface preconfigure POS0/3/0/1
   description POS0/3/0/1
   shutdown
  !
  interface preconfigure POS0/3/0/2
   description POS0/3/0/2
   shutdown
  !
  interface preconfigure POS0/3/0/3
   description POS0/3/0/3
   shutdown
  !
```

In this example, the MSC in slot 3 is removed, and the interface configuration for all four interfaces changes to “interface preconfigure.” However, the “router ospf” reference to a slot 3 interface does not change. If you replace a PLIM with another PLIM that uses the same media type and port count, the configuration becomes active on the replacement card.

To remove the configuration for a slot after a card is removed, use the **no interface preconfigure** command to remove all interface configuration statements for that card in the running configuration. In addition, search the configuration for any references to the removed interfaces, such as the “router ospf” reference to slot 3 in the preceding example.

To remove the configuration for a slot when a card is installed, use the **no interface** command to remove all interface configuration statements for that card in the running configuration. In addition, search the configuration for any references to the removed interfaces.

Each PLIM supports a specific media type (Packet over SONET/SDH [POS] or Ethernet, for example) and port count. If you replace a PLIM with one that supports a different media type or port count, you should review the configuration and revise it to support the replacement PLIM .

Replacing an MSC

When you replace an MSC, the guidelines in the Removing Line Cards, MSCs, or PLIMs , on page 30 apply. Because only one type of MSC exists, no special procedures are required for card removal and replacement.

Replacing a Line Card or PLIM with the Same Media Type and Port Count

When you replace a line card or PLIM with a card that is of the same media type and has the same port count as the replaced card, the guidelines in the Removing Line Cards, MSCs, or PLIMs , on page 30 apply. Because the replacement card is of the same media type and port count, no special procedures are required for card removal and replacement.

Replacing a Line Card or PLIM with the Same Media Type and a Different Port Count

When you replace a line card or PLIM with a card that is of the same media type with a different port count, the guidelines in Removing Line Cards, MSCs, or PLIMs , on page 30 apply.

If the new card has a greater port count than the replaced card, the configuration applies to the corresponding lower port numbers, and the ports that did not exist on the replaced card have no configuration and come up in the shutdown state.

If the new card supports fewer ports, the existing configuration for the corresponding number of ports on the new card set is applied. The previous configuration for the removed ports remains in interface preconfigure state, as shown in the following example:

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

  Building configuration...
  hostname rtp-gsr1
  interface POS0/3/0/0
   ipv4 address 10.10.50.1 255.255.255.0
  !
  interface preconfigure POS0/3/0/1
   description POS0/3/0/1
   shutdown
  !
  interface preconfigure POS0/3/0/2
   description POS0/3/0/2
   shutdown
  !
  interface preconfigure POS0/3/0/3
   description POS0/3/0/3
   shutdown
  !
```

In the preceding example, a four-port card has been replaced with a single-port card. The configuration from port 1 on the four-port card is applied to the single port on the replacement card, and the remaining port configurations change to “interface preconfigure.” To remove the configuration for the missing interfaces, use the **no interface preconfigure** command. In addition, search for and remove any configuration references to the removed interfaces.

Whenever you replace a line card or PLIM with the same media type and a different port count, review the running configuration in the router and revise the configuration as necessary.

Replacing a Line Card or PLIM with a Different Media Type

When you replace a line card or PLIM with a card that is of a different media type (for example, if you replace a POS PLIM with an Ethernet PLIM), the guidelines in Removing Line Cards, MSCs, or PLIMs , on page 30 apply. Review the running configuration in the router and revise the configuration as necessary for the new media type.

Real Time Power Monitoring

Real Time Power monitoring feature consolidates the power consumption values into a common interface. The user can now know the real time power being consumed on the individual slots and the router as a whole.

Advantages

With real time power monitoring, power consumption is maintained at slot level granularity. The user can identify to which power consuming slab the system belongs to, and can take business decisions accordingly.

Card support

Real Time Power is supported on the following cards:

- Cisco CRS Modular Services card 400G
- Cisco CRS Modular Services card 200G
- Cisco CRS Series 16 Slots Fabric Card / Multi (400G)
- Cisco CRS Series 16 Slots Fabric Card / Multi (200G)
- Cisco CRS Series 16 Slots Fabric Card / Single (400G)
- Cisco CRS Series 8 Slots Fabric Card / Single (400G)
- Cisco CRS Series 40x10GE Interface Module
- Cisco CRS Series 4x100GE Interface Module
- Cisco CRS 2X100GE (CPAK) and 5X40GE (QSFP+) LAN/OTN Flexible Interface Module

Examples: Breakout and Power saving options

The following are the examples for the **power save** and **breakout** options:

Power saving mode

Configuring the power saving option:

```
admin
 config
  hw-module power saving location 0/0/CPU0 slice 3
 !

show platform slices
Line Card       Slice   Config          Status
0/0/CPU0        0       Power on        Completed
                1       Power on        Completed
                2       Power on        Completed
                3       Power saving    Completed
```

Breakout option

Configuring the breakout option:

```
config
 hw-module location 0/0/CPU0 port 0 breakout 10xTenGigE
!
```

show command output indicating the breakout ports:

```
RP/0/RSP0/CPU0:TD02#show ipv4 interface brief | include Hun
```

```
Sun Sep  7 15:59:33.446 PST
HundredGigE0/0/0/0             34.34.34.2      Down                Down
HundredGigE0/0/0/1             100.0.1.1       Up                  Up
HundredGigE0/0/0/2             unassigned      Up                  Up
HundredGigE0/0/0/3             unassigned      Up                  Up
HundredGigE0/0/0/4             unassigned      Shutdown            Down
HundredGigE0/0/0/5             unassigned      Shutdown            Down
HundredGigE0/0/0/6             unassigned      Shutdown            Down
HundredGigE0/0/0/7             unassigned      Shutdown            Down


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

RP/0/RSP0/CPU0:router#show ipv4 interface 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
```

Removing and Replacing Cisco 16-Slot Line Card Chassis Switch Fabric Cards

16-slot LCCs support two switch fabric cards: the CRS-16-FC/S and the CRS-16-FC/M. The CRS-16-FC/S switch fabric card provides the Stage 1, 2, and 3 switch fabric for one fabric plane in a standalone Cisco CRS-1 Carrier Routing System 16-Slot Line Card Chassis. The CRS-16-FC/M switch fabric card provides the Stage 1 and 3 switch fabric for one fabric plane in a Cisco CRS-1 LCC within a multishelf system.

The Cisco CRS-1 16-Slot LCC can support the maximum throughput with seven of the eight fabric planes. To prevent traffic loss, we recommend that you shut the power down on a fabric plane for a switch fabric card before you remove it. If a switch fabric card is removed with the power on, the card is not harmed, but some traffic may be lost. When the replacement card is inserted, you can restore the power to the fabric plane and bring up the replacement card. This section describes how to properly remove and replace Cisco CRS-16-FC/S and Cisco CRS-16-FC/M cards for upgrades or repairs.

Note The process of removing and replacing cards while the router power is on is called *online insertion and removal (OIR)*. This procedure removes power to a specific slot before the switch fabric card is replaced. The power remains on for all other slots.

Tip For more information about switch fabric cards, see *Related Topics*.

Note This procedure does not apply when starting the router for the first time or after a power cycle or reload.

Before you begin

- 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.
- You must log in as root-system before starting the procedure. To confirm your login status, use the **show user group** command:

```
RP/0/RP0/CPU0:router# show user group

  root-system, cisco-support
```

To confirm your login status including root, use the **show user all** | **include root** command:

```
RP/0/RP0/CPU0:router# show user all | include root

  Groups: root-system, cisco-support
  Task:              root-lr  : READ    WRITE    EXECUTE    DEBUG (reserved)
  Task:          root-system  : READ    WRITE    EXECUTE    DEBUG (reserved)
```

SUMMARY STEPS

1. **admin**
2. **show platform**
3. **show controllers fabric plane all**
4. **admin**
5. **controllers fabric plane** *plane_number* **shutdown**
6. **commit**
7. **end**
8. **show controllers fabric plane all**
9. **admin**
10. **hw-module power disable location** *node-id*
11. **show platform**
12. When the fabric card state changes to UNPOWERED, replace the fabric card.
13. **admin**
14. **no hw-module power disable location** *node-id*
15. **show platform**
16. **admin**
17. **no controllers fabric plane** *plane_number* **shutdown**
18. **show controllers fabric plane all**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**admin** **Example:**	Enters administration EXEC mode.

	Command or Action	Purpose
	`RP/0/RP0/CPU0:router# admin`	
Step 2	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays all cards on the router. • Allows you to identify a fabric card (identified with an SM prefix). • The number following the SM prefix identifies the corresponding fabric plane, as follows: • Slot SM0: fabric plane 0 • Slot SM1: fabric plane 1 • Slot SM2: fabric plane 2 • Slot SM3: fabric plane 3 • Slot SM4: fabric plane 4 • Slot SM5: fabric plane 5 • Slot SM6: fabric plane 6 • Slot SM7: fabric plane 7
Step 3	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the status of each fabric plane.
Step 4	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.

Step 5	**controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# controllers fabric`
	`plane 0 shutdown`
		Shuts down the fabric plane.

Step 6	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 7	**end** **Example:**	Exits administration configuration mode and returns to administration EXEC mode.

	Command or Action	Purpose
	`RP/0/RP0/CPU0:router(admin-config)# end`	
Step 8	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the status of each fabric plane. • The *Admin State* and *Oper State* columns should read DOWN.
Step 9	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 10	**hw-module power disable location** *node-id* **Example:** `RP/0/RP0/CPU0:router(admin-config)# hw-module power disable location 0/SM0/SP`	Sets the target configuration to remove power from the fabric card.
Step 11	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays the status of all cards on the router. • Check the *State* column for the status of the fabric card. • Do not continue to the next step until the status in the *State* column changes to UNPOWERED. • It takes some time for the card to shut down. Repeat the **show platform** command to check the card state.
Step 12	When the fabric card state changes to UNPOWERED, replace the fabric card.	Replaces the physical card.
Step 13	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 14	**no hw-module power disable location** *node-id* **Example:** `RP/0/RP0/CPU0:router(admin-config)# no hw-module power disable location 0/SM0/SP`	Sets the target configuration to restore power to the fabric card.
Step 15	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays the status of all cards on the router. • Check the *State* column for the status of the fabric card. • Do not continue to the next step until the status in the *State* column changes to IOS XR RUN.

	Command or Action	Purpose
		• It takes some time for the card to start up. Repeat the **show platform** command to check the card state.
Step 16	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.

Step 17	**no controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# no controllers fabric`
	`plane 0 shutdown`
		Sets the target configuration to bring up the fabric plane.

Step 18	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the fabric plane status. The *Admin State* and *Oper State* columns should read UP.

Related Topics

Additional References, on page 59

Examples

The following example shows the commands and command responses for replacing a a 16-slot LCC fabric card:

```
RP/0/RP1/CPU0:router# admin
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM4/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM5/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM6/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM7/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

    Flags: P - plane admin down,       p - plane oper down

           C - card admin down,        c - card  oper down
           L - link port admin down,   l - linkport oper down
           A - asic admin down,        a - asic oper down
           B - bundle port admin Down, b - bundle port oper down
```

```
          I - bundle admin down,      i - bundle oper down
          N - node admin down,        n - node down
          o - other end of link down  d - data down
          f - failed component downstream
          m - plane multicast down

   Plane  Admin   Oper

   Id     State   State
   --------------------
   0      UP      UP
   1      UP      UP
   2      UP      UP
   3      UP      UP
   4      UP      UP
   5      UP      UP
   6      UP      UP
   7      UP      UP

RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# controllers fabric plane 0 shutdown
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:15:09.265 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 0 state changed to DOWN:
  RP/0/RP1/CPU0:Oct  5 02:15:09.319 : config[65734]: %MGBL-LIBTARCFG-6-ADMIN_COMMI
  T : Administration configuration committed by user 'jim'.

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

    Flags: P - plane admin down,       p - plane oper down
           C - card admin down,        c - card  oper down
           L - link port admin down,   l - linkport oper down
           A - asic admin down,        a - asic oper down
           B - bundle port admin Down, b - bundle port oper down
           I - bundle admin down,      i - bundle oper down
           N - node admin down,        n - node down
           o - other end of link down  d - data down
           f - failed component downstream
           m - plane multicast down

   Plane  Admin   Oper
   Id     State   State
   --------------------
   0      DOWN    DOWN
   1      UP      UP
   2      UP      UP
   3      UP      UP
   4      UP      UP
   5      UP      UP
   6      UP      UP
   7      UP      UP

RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# hw-module power disable location 0/SM0/SP
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:18:24.774 : config[65734]: %MGBL-LIBTARCFG-6-COMMIT : Co
  nfiguration committed by user 'jim'.   Use 'show configuration commit changes 10
  00000142' to view the changes.
  RP/0/RP1/CPU0:router(config)#LC/0/1/CPU0:Oct  5 02:18:26.873 : fabricq_mgr[
  127]: %FABRIC-FABRICQ-3-FI_UNCORR_ERROR : fabricq: Major error in Fabric Interfa
  ce : RS Uncorrectable errors on Fabricq ASIC 0 link 3
```

```
  RP/0/RP1/CPU0:Oct  5 02:18:28.959 : shelfmgr[284]: %PLATFORM-SHELFMGR-3-POWERDOW
  N_RESET : Node 0/SM0/SP is powered off due to admin power off request

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             UNPOWERED       NPWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM4/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM5/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM6/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM7/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
```

When the state of the fabric card changes to UNPOWERED, replace the fabric card.

```
RP/0/RP1/CPU0:router# configure
RP/0/RP1/CPU0:router(admin-config)# no hw-module power disable location 0/SM0/SP
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:19:30.472 : config[65734]: %MGBL-LIBTARCFG-6-COMMIT : Co
  nfiguration committed by user 'jim'.   Use 'show configuration commit changes 10
  00000143' to view the changes.
  RP/0/RP1/CPU0:router(config)#RP/0/RP1/CPU0:Oct  5 02:19:42.747 : shelfmgr[2
  84]: %PLATFORM-MBIMGR-7-IMAGE_VALIDATED : 0/SM0/SP: MBI tftp:/hfr-os-mbi-3.4.0/
  sp/mbihfr-sp.vm validated

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             MBI-BOOTING     PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM4/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM5/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM6/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM7/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             MBI-RUNNING     PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM4/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM5/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
```

```
  0/SM6/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM7/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM4/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM5/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM6/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM7/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# configure

  SP/0/SM0/SP:Oct  5 02:20:19.102 : init[65541]: %OS-INIT-7-MBI_STARTED : total time
  7.678 seconds
  SP/0/SM0/SP:Oct  5 02:20:21.361 : insthelper[60]: %INSTALL-INSTHELPER-7-PKG_DOWN
  LOAD : MBI running; starting software download
  SP/0/SM0/SP:Oct  5 02:22:23.458 : init[65541]: %OS-INIT-7-INSTALL_READY : total
  time 132.060 seconds
  SP/0/SM0/SP:Oct  5 02:22:39.329 : sfe_drvr[108][120]: Board revision : 0x06.
  SP/0/SM0/SP:Oct  5 02:22:47.306 : sfe_drvr[108]: %FABRIC-FABRIC_DRVR-6-ASIC_IN
  ITIALIZED : Fabric ASICs initialized
  SP/0/SM0/SP:Oct  5 02:23:06.316 : alphadisplay[100]: %PLATFORM-ALPHA_DISPLAY-6-CHANGE :
  Alpha display on node 0/SM0/SP changed to IOS-XR   in state default

RP/0/RP1/CPU0:router(admin-config)# no controllers fabric plane 0 shutdown
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:25:15.736 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 0 state changed to UP:
  RP/0/RP1/CPU0:Oct  5 02:25:15.759 : config[65734]: %MGBL-LIBTARCFG-6-ADMIN_COMMI
  T : Administration configuration committed by user 'jim'.

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

    Flags: P - plane admin down,       p - plane oper down
           C - card admin down,        c - card  oper down

           L - link port admin down,   l - linkport oper down
           A - asic admin down,        a - asic oper down
           B - bundle port admin Down, b - bundle port oper down
           I - bundle admin down,      i - bundle oper down
           N - node admin down,        n - node down
           o - other end of link down  d - data down
           f - failed component downstream
           m - plane multicast down

   Plane  Admin   Oper
   Id     State   State
   --------------------
   0      UP      UP
   1      UP      UP
   2      UP      UP
   3      UP      UP
   4      UP      UP
```

```
5       UP      UP
6       UP      UP
7       UP      UP
```

Related Topics

Additional References, on page 59

Removing and Replacing 8-Slot Line Card Chassis Switch Fabric Cards

Each CRS-8-FC/S switch fabric card provides the Stage 1, 2, and 3 switch fabric for two fabric planes in a Cisco CRS-1 8-Slot Line Card Chassis.

The 8-Slot LCC can support the maximum throughput with seven of the eight fabric planes. However, because each CRS-8-FC/S switch fabric card hosts two fabric planes, replacing a fabric card does reduce the maximum throughput and impacts router traffic if the router is operating at maximum capacity. To minimize traffic loss, we recommend that you shut the power down for the switch fabric card before you remove it. If a switch fabric card is removed with power on, the card is not harmed, but the traffic impact may be greater than if the card power were removed. When the replacement card is inserted, you can restore the power and bring up the replacement card. This section describes how to properly remove and replace a Cisco CRS-8-FC/S switch fabric card for upgrades or repairs.

The process of removing and replacing cards while the router power is on is called *online insertion and removal (OIR)*. This procedure removes power to a specific slot before the switch fabric card is replaced. The power remains on for all other slots.

For more information about switch fabric cards, see *Related Topics*.

Note This procedure does not apply when starting the router for the first time or after a power cycle or reload.

Before you begin

- 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.
- You must log in as root-system before starting the procedure. To confirm your login status, use the **show user group** command:

```
RP/0/RP0/CPU0:router# show user group

  root-system, cisco-support
```

To confirm your login status including root, use the **show user all | include root** command:

```
RP/0/RP0/CPU0:router# show user all | include root

  Groups: root-system, cisco-support
  Task:              root-lr  : READ    WRITE    EXECUTE    DEBUG (reserved)
  Task:         root-system   : READ    WRITE    EXECUTE    DEBUG (reserved)
```

SUMMARY STEPS

1. **admin**
2. **show platform**
3. **show controllers fabric plane all**
4. **admin**
5. **controllers fabric plane** *plane_number* **shutdown**
6. **controllers fabric plane** *plane_number* **shutdown**
7. **commit**
8. **end**
9. **show controllers fabric plane all**
10. **admin**
11. **hw-module power disable location** *node-id*
12. **commit**
13. **end**
14. **show platform**
15. When the fabric card state changes to UNPOWERED, replace the fabric card.
16. **admin**
17. **no hw-module power disable location** *node-id*
18. **commit**
19. **end**
20. **show platform**
21. **admin**
22. **no controllers fabric plane** *plane_number* **shutdown**
23. **no controllers fabric plane** *plane_number* **shutdown**
24. **commit**
25. **end**
26. **show controllers fabric plane all**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.

Step 2	**show platform**
	Example:
	`RP/0/RP0/CPU0:router(admin)# show platform`
		Displays all cards on the router.
		• Allows you to identify a fabric card (identified with an SM prefix).
		• The number following the SM prefix identifies the corresponding fabric planes, as follows:
		  • Slot SM0: fabric planes 0 and 1
		  • Slot SM1: fabric planes 2 and 3
		  • Slot SM2: fabric planes 4 and 5

	Command or Action	Purpose
		• Slot SM3: fabric planes 6 and 7
Step 3	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the status of each fabric plane.
Step 4	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.

Step 5	**controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# controllers fabric plane 0`
	`shutdown`
		Shuts down one of the two fabric planes on a CRS-8-FC/S card.
		• Before removing a CRS-8-FC/S card, shut down both planes for the fabric card. The fabric planes are assigned to fabric cards as follows:
		• Slot SM0: fabric planes 0 and 1
		• Slot SM1: fabric planes 2 and 3
		• Slot SM2: fabric planes 4 and 5
		• Slot SM3: fabric planes 6 and 7

Step 6	**controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# controllers fabric plane 1`
	`shutdown`
		Shuts down one of the two fabric planes on a CRS-8-FC/S card.
		• Shut down the companion plane to the plane shut down in the previous step.

Step 7	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 8	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 9	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the status of each fabric plane. The *Admin State* and *Oper State* columns should read DOWN for both of the shutdown planes.

	Command or Action	Purpose
Step 10	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 11	**hw-module power disable location** *node-id* **Example:** `RP/0/RP0/CPU0:router(admin-config)# hw-module power disable location 0/SM0/SP`	Sets the target configuration to remove power from the fabric card.
Step 12	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 13	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 14	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays the status of all cards on the router. • Check the *State* column for the status of the fabric card. • Do not continue to the next step until the status in the *State* column changes to UNPOWERED. • It takes some time for the card to shut down. Repeat the **show platform** command to check the card state.
Step 15	When the fabric card state changes to UNPOWERED, replace the fabric card.	Replaces the physical card.
Step 16	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 17	**no hw-module power disable location** *node-id* **Example:** `RP/0/RP0/CPU0:router(admin-config)# no hw-module power disable location 0/SM0/SP`	Sets the target configuration to restore power to the fabric card.
Step 18	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.

	Command or Action	Purpose
Step 19	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 20	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays the status of all cards on the router. • Check the *State* column for the status of the fabric card. • Do not continue to the next step until the status in the *State* column changes to IOS XR RUN. • It takes some time for the card to start up. Repeat the **show platform** command to check the card state.
Step 21	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.

Step 22	**no controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# no controllers fabric`
	`plane 0 shut`
		Sets the target configuration to bring up one of the two fabric planes on the card.

Step 23	**no controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# no controllers fabric`
	`plane 1 shut`
		Sets the target configuration to bring up one of the two fabric planes on the card.

Step 24	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 25	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 26	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the fabric plane status. The *Admin State* and *Oper State* columns should read UP for both fabric planes on the fabric card.

Related Topics

Additional References, on page 59

Examples

The following example shows the commands and command responses for replacing an 8-slot LCC fabric card:

```
RP/0/RP1/CPU0:router# admin
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON


RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

  Flags: P - plane admin down,       p - plane oper down

         C - card admin down,        c - card  oper down
         L - link port admin down,   l - linkport oper down
         A - asic admin down,        a - asic oper down
         B - bundle port admin Down, b - bundle port oper down
         I - bundle admin down,      i - bundle oper down
         N - node admin down,        n - node down
         o - other end of link down  d - data down
         f - failed component downstream
         m - plane multicast down

   Plane  Admin   Oper

   Id     State   State
   --------------------
   0      UP      UP
   1      UP      UP
   2      UP      UP
   3      UP      UP
   4      UP      UP
   5      UP      UP
   6      UP      UP
   7      UP      UP

RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# controllers fabric plane 0 shutdown
RP/0/RP1/CPU0:router(admin-config)# controllers fabric plane 1 shutdown
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:15:09.265 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 0 state changed to DOWN:
  RP/0/RP1/CPU0:Oct  5 02:15:09.265 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 1 state changed to DOWN:
  RP/0/RP1/CPU0:Oct  5 02:15:09.319 : config[65734]: %MGBL-LIBTARCFG-6-ADMIN_COMMI
  T : Administration configuration committed by user 'jim'.

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

  Flags: P - plane admin down,       p - plane oper down
         C - card admin down,        c - card  oper down
```

```
        L - link port admin down,   l - linkport oper down
        A - asic admin down,        a - asic oper down
        B - bundle port admin Down, b - bundle port oper down
        I - bundle admin down,      i - bundle oper down
        N - node admin down,        n - node down
        o - other end of link down  d - data down
        f - failed component downstream
        m - plane multicast down

   Plane  Admin   Oper
   Id     State   State
   --------------------
   0      DOWN    DOWN
   1      DOWN    DOWN
   2      UP      UP
   3      UP      UP
   4      UP      UP
   5      UP      UP
   6      UP      UP
   7      UP      UP

RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# hw-module power disable location 0/SM0/SP
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:18:24.774 : config[65734]: %MGBL-LIBTARCFG-6-COMMIT : Co
  nfiguration committed by user 'jim'.   Use 'show configuration commit changes 10
  00000142' to view the changes.
  RP/0/RP1/CPU0:router(config)#LC/0/1/CPU0:Oct  5 02:18:26.873 : fabricq_mgr[
  127]: %FABRIC-FABRICQ-3-FI_UNCORR_ERROR : fabricq: Major error in Fabric Interfa
  ce : RS Uncorrectable errors on Fabricq ASIC 0 link 3
  RP/0/RP1/CPU0:Oct  5 02:18:28.959 : shelfmgr[284]: %PLATFORM-SHELFMGR-3-POWERDOW
  N_RESET : Node 0/SM0/SP is powered off due to admin power off request

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             UNPOWERED       NPWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
```

When the state for the fabric card changes to UNPOWERED, replace the fabric card.

```
RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# no hw-module power disable location 0/SM0/SP
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:19:30.472 : config[65734]: %MGBL-LIBTARCFG-6-COMMIT : Co
  nfiguration committed by user 'jim'.   Use 'show configuration commit changes 10
  00000143' to view the changes.
  RP/0/RP1/CPU0:router(config)#RP/0/RP1/CPU0:Oct  5 02:19:42.747 : shelfmgr[2
  84]: %PLATFORM-MBIMGR-7-IMAGE_VALIDATED : 0/SM0/SP: MBI tftp:/hfr-os-mbi-3.4.0/
  sp/mbihfr-sp.vm validated

RP/0/RP1/CPU0:router(admin-config)# end
```

```
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             MBI-BOOTING     PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             MBI-RUNNING     PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON


RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# configure

  RP/0/RP1/CPU0:router(admin-config)#SP/0/SM0/SP:Oct  5 02:20:19.102 : init[6
  5541]: %OS-INIT-7-MBI_STARTED : total time 7.678 seconds
  SP/0/SM0/SP:Oct  5 02:20:21.361 : insthelper[60]: %INSTALL-INSTHELPER-7-PKG_DOWN
  LOAD : MBI running; starting software download
  SP/0/SM0/SP:Oct  5 02:22:23.458 : init[65541]: %OS-INIT-7-INSTALL_READY : total
  time 132.060 seconds
  SP/0/SM0/SP:Oct  5 02:22:39.329 : sfe_drvr[108][120]: Board revision : 0x06.
  SP/0/SM0/SP:Oct  5 02:22:47.306 : sfe_drvr[108]: %FABRIC-FABRIC_DRVR-6-ASIC_IN
  ITIALIZED : Fabric ASICs initialized
  SP/0/SM0/SP:Oct  5 02:23:06.316 : alphadisplay[100]: %PLATFORM-ALPHA_DISPLAY-6-CHANGE :
  Alpha display on node 0/SM0/SP changed to IOS-XR   in state default

RP/0/RP1/CPU0:router(admin-config)# no controllers fabric plane 0 shutdown
RP/0/RP1/CPU0:router(admin-config)# no controllers fabric plane 1 shutdown
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:25:15.736 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 0 state changed to UP:
  RP/0/RP1/CPU0:Oct  5 02:25:15.736 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 1 state changed to UP:
  RP/0/RP1/CPU0:Oct  5 02:25:15.759 : config[65734]: %MGBL-LIBTARCFG-6-ADMIN_COMMI
  T : Administration configuration committed by user 'jim'.

RP/0/RP1/CPU0:router(admin-config)# end
```

```
  RP/0/RP1/CPU0:Oct  5 02:25:41.891 : config[65734]: %MGBL-SYS-5-CONFIG_I : Config
  ured from console by jim

RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

  Flags: P - plane admin down,       p - plane oper down
         C - card admin down,        c - card  oper down

         L - link port admin down,   l - linkport oper down
         A - asic admin down,        a - asic oper down
         B - bundle port admin Down, b - bundle port oper down
         I - bundle admin down,      i - bundle oper down
         N - node admin down,        n - node down
         o - other end of link down  d - data down
         f - failed component downstream
         m - plane multicast down

   Plane  Admin   Oper
   Id     State   State
   --------------------
   0      UP      UP
   1      UP      UP
   2      UP      UP
   3      UP      UP
   4      UP      UP
   5      UP      UP
   6      UP      UP
   7      UP      UP
```

Related Topics

Additional References, on page 59

Removing and Replacing Cisco 4-Slot Line Card Chassis Switch Fabric Cards

The Cisco CRS-4-FC switch fabric card provides the Stage 1, 2, and 3 switch fabric for one fabric plane in a Cisco CRS-1 4-Slot Line Card Chassis.

The Cisco CRS-1 4-Slot LCC can support the maximum throughput with three of the four fabric planes. To prevent traffic loss, we recommend that you shut the power down on a fabric plane for a switch fabric card before you remove it. If a switch fabric card is removed with the power on, the card is not harmed, but some traffic may be lost. When the replacement card is inserted, you can restore the power to the fabric plane and bring up the replacement card. This section describes how to properly remove and replace Cisco CRS-4-FC switch fabric cards for upgrades or repairs.

Note At least two planes of the switch fabric (an even plane and an odd plane) must be active at all times for the Cisco CRS-1 4-slot line card chassis to operate. Otherwise, the switch fabric fails, causing a system failure.

The process of removing and replacing cards while the router power is on is called *online insertion and removal (OIR)*. This procedure removes power to a specific slot before the switch fabric card is replaced. The power remains on for all other slots.

For more information about switch fabric cards, see the hardware documentation listed in the Related Documents, on page 59.

Note This procedure does not apply when starting the router for the first time or after a power cycle or reload.

Before you begin

- 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.
- You must log in as root-system before starting the procedure. To confirm your login status, use the **show user group** command:

```
RP/0/RP0/CPU0:router# show user group

  root-system, cisco-support
```

To confirm your login status including root, use the **show user all | include root** command:

```
RP/0/RP0/CPU0:router# show user all | include root

  Groups: root-system, cisco-support
  Task:              root-lr  : READ    WRITE    EXECUTE    DEBUG (reserved)
  Task:          root-system  : READ    WRITE    EXECUTE    DEBUG (reserved)
```

SUMMARY STEPS

1. **admin**
2. **show platform**
3. **show controllers fabric plane all**
4. **configure**
5. **controllers fabric plane** *plane_number* **shutdown**
6. **commit**
7. **end**
8. **show controllers fabric plane all**
9. **configure**
10. **hw-module power disable location** *node-id*
11. **commit**
12. **end**
13. **show platform**
14. When the fabric card state changes to UNPOWERED, replace the fabric card.
15. **configure**
16. **no hw-module power disable location** *node-id*
17. **commit**
18. **end**
19. **show platform**
20. **configure**
21. **no controllers fabric plane** *plane_number* **shutdown**

22. **commit**
23. **end**
24. **show controllers fabric plane all**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.

Step 2	**show platform**
	Example:
	`RP/0/RP0/CPU0:router(admin)# show platform`
		Displays all cards on the router.
		• Allows you to identify a fabric card (identified with an SM prefix).
		• The number following the SM prefix identifies the corresponding fabric plane, as follows:
		  • Slot SM0: fabric plane 0
		  • Slot SM1: fabric plane 1
		  • Slot SM2: fabric plane 2
		  • Slot SM3: fabric plane 3

Step 3	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the status of each fabric plane.
Step 4	**configure** **Example:** `RP/0/RP0/CPU0:router(admin)# configure`	Enters administration configuration mode.

Step 5	**controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# controllers fabric`
	`plane 0 shutdown`
		Shuts down the fabric plane.

Step 6	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 7	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.

	Command or Action	Purpose
Step 8	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the status of each fabric plane. • The *Admin State* and *Oper State* columns should read DOWN.
Step 9	**configure** **Example:** `RP/0/RP0/CPU0:router(admin)# configure`	Enters administration configuration mode.
Step 10	**hw-module power disable location** *node-id* **Example:** `RP/0/RP0/CPU0:router(admin-config)# hw-module power disable location 0/SM0/SP`	Sets the target configuration to remove power from the fabric card.
Step 11	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 12	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 13	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays the status of all cards on the router. • Check the *State* column for the status of the fabric card. • Do not continue to the next step until the status in the *State* column changes to UNPOWERED. • It takes some time for the card to shut down. Repeat the **show platform** command to check the card state.
Step 14	When the fabric card state changes to UNPOWERED, replace the fabric card.	Replaces the physical card.
Step 15	**configure** **Example:** `RP/0/RP0/CPU0:router(admin)# configure`	Enters administration configuration mode.
Step 16	**no hw-module power disable location** *node-id* **Example:** `RP/0/RP0/CPU0:router(admin-config)# no hw-module power disable location 0/SM0/SP`	Sets the target configuration to restore power to the fabric card.

	Command or Action	Purpose
Step 17	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 18	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 19	**show platform** **Example:** `RP/0/RP0/CPU0:router(admin)# show platform`	Displays the status of all cards on the router. • Check the *State* column for the status of the fabric card. • Do not continue to the next step until the status in the *State* column changes to IOS XR RUN. • It takes some time for the card to start up. Repeat the **show platform** command to check the card state.
Step 20	**configure** **Example:** `RP/0/RP0/CPU0:router(admin)# configure`	Enters administration configuration mode.

Step 21	**no controllers fabric plane** *plane_number* **shutdown**
	Example:
	`RP/0/RP0/CPU0:router(admin-config)# no controllers fabric`
	`plane 0 shutdown`
		Sets the target configuration to bring up the fabric plane.

Step 22	**commit** **Example:** `RP/0/RP0/CPU0:router(admin-config)# commit`	Commits the target configuration to the router running configuration.
Step 23	**end** **Example:** `RP/0/RP0/CPU0:router(admin-config)# end`	Exits administration configuration mode and returns to administration EXEC mode.
Step 24	**show controllers fabric plane all** **Example:** `RP/0/RP0/CPU0:router(admin)# show controllers fabric plane all`	Displays the fabric plane status. The *Admin State* and *Oper State* columns should read UP.

Examples

The following example shows the commands and command responses for replacing a 4-slot LCC switch fabric card:

```
RP/0/RP1/CPU0:router# admin
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

    Flags: P - plane admin down,       p - plane oper down

           C - card admin down,        c - card  oper down
           L - link port admin down,   l - linkport oper down
           A - asic admin down,        a - asic oper down
           B - bundle port admin Down, b - bundle port oper down
           I - bundle admin down,      i - bundle oper down
           N - node admin down,        n - node down
           o - other end of link down  d - data down
           f - failed component downstream
           m - plane multicast down

   Plane  Admin   Oper

   Id     State   State
   --------------------
   0      UP      UP
   1      UP      UP
   2      UP      UP
   3      UP      UP

RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# controllers fabric plane 0 shutdown
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:15:09.265 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 0 state changed to DOWN:
  RP/0/RP1/CPU0:Oct  5 02:15:09.319 : config[65734]: %MGBL-LIBTARCFG-6-ADMIN_COMMI
  T : Administration configuration committed by user 'jim'.

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

    Flags: P - plane admin down,       p - plane oper down
           C - card admin down,        c - card  oper down
           L - link port admin down,   l - linkport oper down
           A - asic admin down,        a - asic oper down
           B - bundle port admin Down, b - bundle port oper down
           I - bundle admin down,      i - bundle oper down
           N - node admin down,        n - node down
           o - other end of link down  d - data down
           f - failed component downstream
```

```
          m - plane multicast down

   Plane  Admin   Oper
   Id     State   State
   -------------------
   0      DOWN    DOWN
   1      UP      UP
   2      UP      UP
   3      UP      UP

RP/0/RP1/CPU0:router(admin)# configure
RP/0/RP1/CPU0:router(admin-config)# hw-module power disable location 0/SM0/SP
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:18:24.774 : config[65734]: %MGBL-LIBTARCFG-6-COMMIT : Co
  nfiguration committed by user 'jim'.   Use 'show configuration commit changes 10
  00000142' to view the changes.
  RP/0/RP1/CPU0:router(config)#LC/0/1/CPU0:Oct  5 02:18:26.873 : fabricq_mgr[
  127]: %FABRIC-FABRICQ-3-FI_UNCORR_ERROR : fabricq: Major error in Fabric Interfa
  ce : RS Uncorrectable errors on Fabricq ASIC 0 link 3
  RP/0/RP1/CPU0:Oct  5 02:18:28.959 : shelfmgr[284]: %PLATFORM-SHELFMGR-3-POWERDOW
  N_RESET : Node 0/SM0/SP is powered off due to admin power off request

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             UNPOWERED       NPWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
```

When the state of the fabric card changes to UNPOWERED, replace the fabric card.

```
RP/0/RP1/CPU0:router# configure
RP/0/RP1/CPU0:router(admin-config)# no hw-module power disable location 0/SM0/SP
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:19:30.472 : config[65734]: %MGBL-LIBTARCFG-6-COMMIT : Co
  nfiguration committed by user 'jim'.   Use 'show configuration commit changes 10
  00000143' to view the changes.
  RP/0/RP1/CPU0:router(config)#RP/0/RP1/CPU0:Oct  5 02:19:42.747 : shelfmgr[2
  84]: %PLATFORM-MBIMGR-7-IMAGE_VALIDATED : 0/SM0/SP: MBI tftp:/hfr-os-mbi-3.4.0/
  sp/mbihfr-sp.vm validated

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show platform

  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             MBI-BOOTING     PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
```

```
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

  RP/0/RP1/CPU0:router(admin)# show platform


 Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             MBI-RUNNING     PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON

RP/0/RP1/CPU0:router(admin)# show platform


  Node            Type            PLIM            State           Config State
  ------------------------------------------------------------------------------
  0/1/SP          MSC(SP)         N/A             IOS XR RUN      PWR,NSHUT,MON
  0/1/CPU0        MSC             16OC48-POS/DPT  IOS XR RUN      PWR,NSHUT,MON
  0/RP1/CPU0      RP(Active)      N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM0/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM1/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM2/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON
  0/SM3/SP        FC/S(SP)        N/A             IOS XR RUN      PWR,NSHUT,MON


RP/0/RP1/CPU0:router(admin)# configure

  SP/0/SM0/SP:Oct  5 02:20:19.102 : init[65541]: %OS-INIT-7-MBI_STARTED : total time
  7.678 seconds
  SP/0/SM0/SP:Oct  5 02:20:21.361 : insthelper[60]: %INSTALL-INSTHELPER-7-PKG_DOWN
  LOAD : MBI running; starting software download
  SP/0/SM0/SP:Oct  5 02:22:23.458 : init[65541]: %OS-INIT-7-INSTALL_READY : total
  time 132.060 seconds
  SP/0/SM0/SP:Oct  5 02:22:39.329 : sfe_drvr[108][120]: Board revision : 0x06.
  SP/0/SM0/SP:Oct  5 02:22:47.306 : sfe_drvr[108]: %FABRIC-FABRIC_DRVR-6-ASIC_IN
  ITIALIZED : Fabric ASICs initialized
  SP/0/SM0/SP:Oct  5 02:23:06.316 : alphadisplay[100]: %PLATFORM-ALPHA_DISPLAY-6-CHANGE :
  Alpha display on node 0/SM0/SP changed to IOS-XR   in state default

RP/0/RP1/CPU0:router(admin-config)# no controllers fabric plane 0 shutdown
RP/0/RP1/CPU0:router(admin-config)# commit

  RP/0/RP1/CPU0:Oct  5 02:25:15.736 : fsdb_aserver[173]: %FABRIC-FSDB-1-PLANE_UPDO
  WN : Plane 0 state changed to UP:
  RP/0/RP1/CPU0:Oct  5 02:25:15.759 : config[65734]: %MGBL-LIBTARCFG-6-ADMIN_COMMI
  T : Administration configuration committed by user 'jim'.

RP/0/RP1/CPU0:router(admin-config)# end
RP/0/RP1/CPU0:router(admin)# show controllers fabric plane all

    Flags: P - plane admin down,       p - plane oper down
           C - card admin down,        c - card  oper down

           L - link port admin down,   l - linkport oper down
           A - asic admin down,        a - asic oper down
           B - bundle port admin Down, b - bundle port oper down
           I - bundle admin down,      i - bundle oper down
           N - node admin down,        n - node down
           o - other end of link down  d - data down
```

```
        f - failed component downstream
        m - plane multicast down

Plane  Admin   Oper
Id     State   State
--------------------
0      UP      UP
1      UP      UP
2      UP      UP
3      UP      UP
```

Upgrading the CPU Controller Bits

Use this procedure to upgrade the CPU controller bits on all nodes that are installed in the router or on a specific node.

SUMMARY STEPS

1. **admin**
2. **upgrade cpuctrlbits** {**all** | **location** *node-id*}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**admin** **Example:** `RP/0/RP0/CPU0:router# admin`	Enters administration EXEC mode.
Step 2	**upgrade cpuctrlbits** {**all** | **location** *node-id*} **Example:** `RP/0/RP0/CPU0:router(admin)# upgrade cpuctrlbits all`	Upgrades the CPU controller bits on all nodes in the router. Use the **location** *node-id* keyword and argument to upgrade the CPU controller bits on a specific node.

Examples

The following example shows how to upgrade the CPU controller bits on all nodes in a router:

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

Please do not power cycle, reload the router or reset any nodes until all upgrades are
completed.
Please check the syslog to make sure that all nodes are upgraded successfully.
If you need to perform multiple upgrades, please wait for current upgrade to be completed
before proceeding to another upgrade. Failure to do so may render the cards under upgrade
to be unusable.
```

Additional References

The following sections provide references related to hardware management on Cisco IOS XR software.

Related Documents

Related Topic	Document Title
Cisco IOS XR hardware commands	Hardware Redundancy and Node Administration Commands on *the Cisco IOS XR Software* module of *System Management Command Reference for isco CRS Routers*
Cisco IOS XR hardware documentation	See Cisco Carrier Routing System Install and Upgrade Guides at: http://www.cisco.com/en/US/products/ps5763/prod_installation_guides_list.html
Information about getting started with Cisco IOS XR software	*Cisco IOS XR Getting Started Guide for the Cisco CRS Router*
ROM Monitor	*ROM Monitor Configuration Guide for Cisco CRS Routers*
Cisco IOS XR command master list	*Cisco IOS XR Commands Master List for the Cisco CRS Router*
Information about user groups and task IDs	*Configuring AAA Services on the Cisco IOS XR Software* module of *System Security Configuration Guide for Cisco CRS Routers*

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
—	To locate and download MIBs using Cisco IOS XR software, use the Cisco MIB Locator found at the following URL and choose a platform under the Cisco Access Products menu: http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/cisco/web/support/index.html