Perform Preliminary Checks with Cisco 8000 Series Router

After successfully logging into the console, you must perform some preliminary checks to verify the correctness of the default setup. Correct any issues that arise before proceeding with further configurations.

Verify Software Version on Cisco 8000 Series Router

The router is shipped with the Cisco IOS XR software pre-installed. Verify that the latest version of the software is installed. If a newer version is available, perform a system upgrade. Installing the newer version of the software provides the latest feature set on the router.

You can view the overview of the running software. This includes the following information:

- Image name and version
- User who built the image
- Time the image was built
- Build workspace
- Build host
- ISO label

Note If any modifications are made to the running software on the booted ISO, only the IOS XR version is displayed in the label field and not the label included in the ISO.

- Copyright information
- Hardware information

Display the version of the Cisco IOS XR software, and its various software components that are installed on the router.

```
Router#show version
Cisco IOS XR Software, Version 7.0.11 LNT
Copyright (c) 2013-2019 by Cisco Systems, Inc.

Build Information:
 Built By     : xyz
 Built On     : Sat Jun 29 22:45:27 2019
 Build Host   : iox-lnx-064
 Workspace    : ../7.0.11/8000/ws/
 Version      : 7.0.11
 Label        : 7.0.11

cisco 8000
System uptime is 41 minutes
```

Verify Status of Hardware Modules on Cisco 8000 Series Router

Hardware modules such as RPs, LCs, fan trays, and power modules are installed on the router. The firmware on various hardware components of the router must be compatible with the Cisco IOS XR image installed. Incompatibility may cause the router to malfunction. Verify that all hardware and firmware modules are installed correctly and are operational.

Before you begin

Ensure that all required hardware modules are installed on the router.

Procedure

Step 1 View the status of the system.

Example:

```
Router#show platform
Node               Type                 State                Config state
--------------------------------------------------------------------------------
0/RP0/CPU0         8201-SYS(Active)     IOS XR RUN            NSHUT
0/RP0              8201-SYS             OPERATIONAL           NSHUT
0/PM0              PSU2KW-ACPE          OPERATIONAL           NSHUT
0/PM1              PSU2KW-ACPE          OPERATIONAL           NSHUT
0/FT0              FAN-1RU-PE           OPERATIONAL           NSHUT
0/FT1              FAN-1RU-PE           OPERATIONAL           NSHUT
0/FT2              FAN-1RU-PE           OPERATIONAL           NSHUT
0/FT3              FAN-1RU-PE           OPERATIONAL           NSHUT
0/FT4              FAN-1RU-PE           OPERATIONAL           NSHUT
```

Step 2 View the list of hardware and firmware modules detected on the router.

Example:

```
Router#show hw-module fpd
                                                                      FPD Versions
                                                                     =================
Location       Card type   HWver    FPD device        ATR  Status     Running   Programd
-------------------------------------------------------------------------------------------
0/RP0/CPU0     8800-RP     0.51     Bios              S    CURRENT    1.15      1.15
```

```
0/RP0/CPU0      8800-RP     0.51     BiosGolden         BS    CURRENT     1.15

0/RP0/CPU0      8800-RP     0.51     EthSwitch                CURRENT     0.07      0.07
0/RP0/CPU0      8800-RP     0.51     EthSwitchGolden    BP    CURRENT     0.07
0/RP0/CPU0      8800-RP     0.51     TimingFpga               CURRENT     0.11      0.11
0/RP0/CPU0      8800-RP     0.51     TimingFpgaGolden   B     CURRENT     0.11
0/RP0/CPU0      8800-RP     0.51     x86Fpga            S     NEED UPGD   0.23      0.23
0/RP0/CPU0      8800-RP     0.51     x86FpgaGolden      BS    CURRENT     0.24
0/RP0/CPU0      8800-RP     0.51     x86TamFw           S     CURRENT     5.05      5.05
0/RP0/CPU0      8800-RP     0.51     x86TamFwGolden     BS    CURRENT     5.05
```

From the result, verify that all hardware modules that are installed on the chassis are listed. If a module is not listed, it indicates that the module is malfunctioning, or is not installed properly. Remove and reinstall that hardware module.

In the preceding output, some of the significant fields are:

- FPD Device—Name of the hardware component, such as IO FPGA, IM FPGA, or BIOS

  Note
  Golden FPDs are not field upgradable.

- Status—Upgrade status of the firmware. The different states are:

Status	Description
CURRENT	The firmware version is the latest version.
READY	The firmware of the FPD is ready for an upgrade.
NOT READY	The firmware of the FPD is not ready for an upgrade.
NEED UPGD	A newer firmware version is available in the installed image. We recommend that you to perform an upgrade of the firmware version.
RLOAD REQ	The upgrade is complete, and the ISO image requires a reload.
UPGD DONE	The firmware upgrade is successful.
UPGD FAIL	The firmware upgrade has failed.
UPGD PREP	The FPD firmware is preparing for upgrade.
BACK IMG	The firmware is corrupt. Reinstall the firmware.
UPGD SKIP	The upgrade is skipped because the installed firmware version is higher than the one available in the image.

- Running—Current version of the firmware running on the FPD
- Programd—Version of the FPD programmed on the module

Step 3 If necessary, upgrade the required firmware.

Example:

```
Router#upgrade hw-module location all fpd all
```

Alarms are created showing all modules that needs to be upgraded.

```
Active Alarms
------------------------------------------------------------------------------------------------------------------
Location      Severity     Group        Set Time                    Description
------------------------------------------------------------------------------------------------------------------

0/6/CPU0      Major       FPD_Infra    09/16/2019 12:34:59 UTC     One Or More FPDs Need Upgrade Or
 Not In Current State
0/10/CPU0     Major       FPD_Infra    09/16/2019 12:34:59 UTC     One Or More FPDs Need Upgrade Or
 Not In Current State
0/RP0/CPU0    Major       FPD_Infra    09/16/2019 12:34:59 UTC     One Or More FPDs Need Upgrade Or
 Not In Current State
0/RP1/CPU0    Major       FPD_Infra    09/16/2019 12:34:59 UTC     One Or More FPDs Need Upgrade Or
 Not In Current State
0/FC0         Major       FPD_Infra    09/16/2019 12:34:59 UTC     One Or More FPDs Need Upgrade Or
 Not In Current State
0/FC1         Major       FPD_Infra    09/16/2019 12:34:59 UTC     One Or More FPDs Need Upgrade Or
 Not In Current State
```

Note
BIOS and IOFPGA upgrades require a power cycle of the router for the new version to take effect.

Step 4 After the modules are upgraded verify the status of the modules.

Example:

```
Router#show hw-module fpd
                                                                          FPD Versions
                                                                          ================
Location       Card type   HWver    FPD device         ATR  Status       Running   Programd
-------------------------------------------------------------------------------------------
0/RP0/CPU0     8800-RP     0.51     Bios               S    CURRENT      1.15      1.15
0/RP0/CPU0     8800-RP     0.51     BiosGolden         BS   CURRENT      1.15
0/RP0/CPU0     8800-RP     0.51     EthSwitch               CURRENT      0.07      0.07
0/RP0/CPU0     8800-RP     0.51     EthSwitchGolden    BP   CURRENT      0.07
0/RP0/CPU0     8800-RP     0.51     TimingFpga              CURRENT      0.11      0.11
0/RP0/CPU0     8800-RP     0.51     TimingFpgaGolden   B    CURRENT      0.11
0/RP0/CPU0     8800-RP     0.51     x86Fpga            S    RLOAD REQ    0.23      0.24
0/RP0/CPU0     8800-RP     0.51     x86FpgaGolden      BS   CURRENT      0.24
0/RP0/CPU0     8800-RP     0.51     x86TamFw           S    CURRENT      5.05      5.05
0/RP0/CPU0     8800-RP     0.51     x86TamFwGolden     BS   CURRENT      5.05
```

The status of the upgraded nodes show that a reload is required.

Step 5 Reload the individual nodes that required an upgrade.

Example:

```
Router#reload location <node-location>
```

Note
Use the **force** option to perform an ungraceful reload of the specified location or hardware module. When **force** option is used along with the **all** location, the chassis undergoes an ungraceful reload. Use the **noprompt** option to avoid the prompt to confirm the operation. The **force** option is not recommended, and should not be used during regular operations.

By default the system requests recovery reload, when the system detects fault. However, if you want to prevent the recovery reload for debugging, use the **hw-module reset auto disable** command to disable an auto reset mechanism.

```
Router(config)#hw-module reset auto disable location 0/RP1/CPU0
```

If you want to re-enable the recovery reload, use the **no hw-module reset auto disable location 0/RP1/CPU0** command.

Step 6 Verify that all nodes that required an upgrade show an updated status of `CURRENT` with an updated FPD version.

Example:

```
Router#show hw-module fpd
                                                                                FPD Versions
                                                                                ================
Location       Card type   HWver    FPD device         ATR  Status     Running   Programd
-------------------------------------------------------------------------------------------
0/RP0/CPU0     8800-RP     0.51     Bios               S    CURRENT    1.15      1.15
0/RP0/CPU0     8800-RP     0.51     BiosGolden         BS   CURRENT    1.15
0/RP0/CPU0     8800-RP     0.51     EthSwitch               CURRENT    0.07      0.07
0/RP0/CPU0     8800-RP     0.51     EthSwitchGolden    BP   CURRENT    0.07
0/RP0/CPU0     8800-RP     0.51     TimingFpga              CURRENT    0.11      0.11
0/RP0/CPU0     8800-RP     0.51     TimingFpgaGolden   B    CURRENT    0.11
0/RP0/CPU0     8800-RP     0.51     x86Fpga            S    RLOAD REQ  0.24      0.24
0/RP0/CPU0     8800-RP     0.51     x86FpgaGolden      BS   CURRENT    0.24
0/RP0/CPU0     8800-RP     0.51     x86TamFw           S    CURRENT    5.05      5.05
0/RP0/CPU0     8800-RP     0.51     x86TamFwGolden     BS   CURRENT    5.05
```

Verify Interface Status on the Cisco 8000 Series Router

After the router has booted, all available interfaces must be discovered by the system. If interfaces are not discovered, it might indicate a malfunction in the unit.

Procedure

View the interfaces discovered by the system.

Example:

```
Router#show ipv4 interfaces brief
Interface                      IP-Address      Status          Protocol Vrf-Name
-------------------------------------------------------------------------------HundredGigE0/0/0/0
             unassigned      Shutdown        Down     default
HundredGigE0/0/0/1             unassigned      Shutdown        Down     default
HundredGigE0/0/0/2             unassigned      Shutdown        Down     default
HundredGigE0/0/0/3             unassigned      Shutdown        Down     default
HundredGigE0/0/0/4             unassigned      Shutdown        Down     default
HundredGigE0/0/0/5             unassigned      Shutdown        Down     default
HundredGigE0/0/0/6             unassigned      Shutdown        Down     default
HundredGigE0/0/0/7             unassigned      Shutdown        Down     default
------------------------ <snip> ---------------------------------TenGigE0/0/0/18/0
unassigned      Up              Up       default
TenGigE0/0/0/18/1              unassigned      Up              Up       default
TenGigE0/0/0/18/2              unassigned      Up              Up       default
TenGigE0/0/0/18/3              unassigned      Up              Up       default
MgmtEth0/RP0/CPU0/0            10.10.10.1      Up              Up       default
```

When a router is turned ON for the first time, all interfaces are in the `unassigned` state. Verify that the total number of interfaces displayed in the result matches with the actual number of interfaces present on the router, and that the interfaces are created according to the type of linecards displayed in **show platform** command.

Verify Node Status on Cisco 8000 Series Router

Each card on the router represents a node.

Procedure

Verify the operational status of the node.

Example:

```
Router#show platform
Node               Type                     State                    Config state
--------------------------------------------------------------------------------
0/RP0/CPU0         8800-RP(Active)          IOS XR RUN               NSHUT
0/RP1/CPU0         8800-RP(Standby)         IOS XR RUN               NSHUT
0/0/CPU0           8800-LC                  IOS XR RUN               NSHUT
0/11/CPU0          8800-LC                  IOS XR RUN               NSHUT
0/FC0              8800-FC                  OPERATIONAL              NSHUT
0/FC3              8800-FC                  OPERATIONAL              NSHUT
0/FT0              8800-FAN                 OPERATIONAL              NSHUT
0/FT1              8800-FAN                 OPERATIONAL              NSHUT
0/FT2              8800-FAN                 OPERATIONAL              NSHUT
0/FT3              8800-FAN                 OPERATIONAL              NSHUT
0/PT0              FAM7000-ACHV-TRAY        OPERATIONAL              NSHUT
```

Displays the status of nodes present in the chassis.

Verify that the software state of all RPs, LCs, and the hardware state of FCs, FTs, and power modules are listed, and their state is `OPERATIONAL`. This indicates that the XR console is operational on the cards.

The platform states are described in the following table:

Card Type	State	Description
All	UNKNOWN	Error – Internal card record is not available
All	IDLE	Error – Card state is not initialized
All	DISCOVERED	Card is detected
All	POWERED_ON	Card is powered on
RP, LC	BIOS_READY	Card BIOS is up
RP, LC	IMAGE_INSTALLING	Image is being downloaded or installed
RP, LC	BOOTING	Image is installed and the software is booting up
RP, LC	IOS_XR_RUN	Software is operating normally and is functional
RP, LC	IOS_XR_INITIALIZING	Software is initializing

Card Type	State	Description
FC, FT, PT, PM	OPERATIONAL	Card is operating normally and is functional
RP, LC, FC	RESET	Card is undergoing reset
RP, LC	REIMAGE	Card is pending reimage
RP, LC, FC	SHUTTING_DOWN	Card is shutting down as a result of a fault condition, user action or configuration
RP, LC, FC	SHUT_DOWN	Card is shutdown due to a fault condition, user action or configuration
FC	ONLINE	RP is able to access this remote card
LC	DATA_PATH_POWERED_ON	Forwarding complex is powered ON
RP (Active)	SHUTTING_REMOTE_CARDS	Active RP card is in the process of shutting down other cards as part of a chassis reset
RP (Standby), LC, FC	WAITING_FOR_CHASSIS_RESET	Card is shutdown and is waiting for the chassis to be reset
RP, LC	WDOG_STAGE1_TIMEOUT	Card CPU failed to reset the hardware watchdog
RP, LC	WDOG_STAGE2_TIMEOUT	Hardware watchdog has timed out waiting for the card CPU to reset itself
RP, LC, FC	FPD_UPGRADE	One or more FPD upgrades are in progress
FC	CARD_ACCESS_DOWN	RP is unable to access this remote card