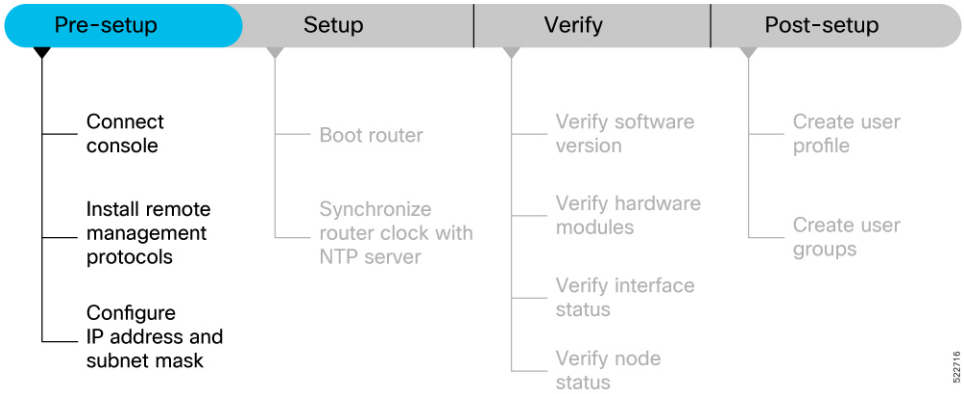
Setup the Router

By following the guidelines provided on this page, you can set up the Cisco 8000 series routers quickly and efficiently.

Prerequisites to Setup Router

Complete the following prerequisite tasks to prepare the router for seamless setup.

Figure 1: Pre-setup Workflow for the Cisco 8000 Series Routers



This section contains the following topics:

Connect Console Port to Terminal

The console port on the router is used to log into a router directly without a network connection using a terminal emulation program like HyperTerminal.

Step 1 Connect the router to a terminal.

a) Locate the console port on the router.

Figure 2: Connect the Router to a Terminal

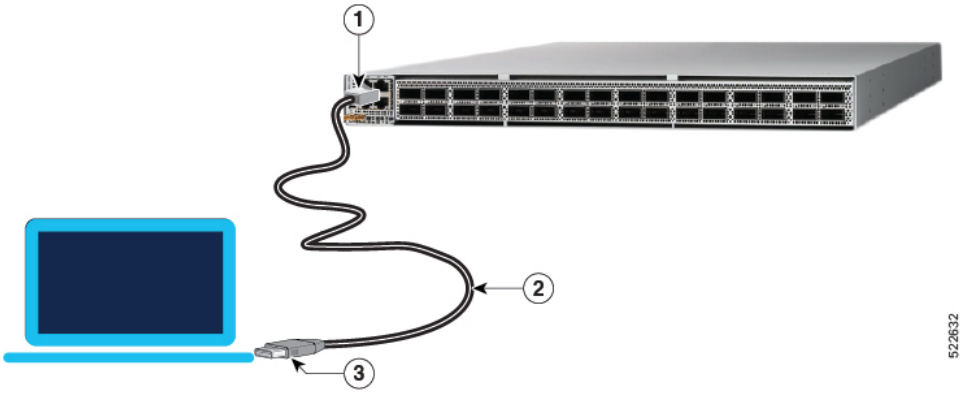


Table 1: Console Port and Cable Specifications

1	Routers console port
2	RJ-45 Rollover cable
3	• RJ-45/DSUB R/P adapter • RJ-45F/DB9F adapter • RJ-45/DSUB F/F adapter

b) Connect the console (or rollover) cable to the console port on the router.
c) Use the correct adapter to connect the other end of the cable to your terminal or PC.

Step 2 Configure the console port to match the following default port characteristics.

a) Launch the terminal session.
b) In the **COM1 Properties** window, select **Port Settings** tab, and enter the following settings:

- Speed – 115200
- Data Bits – 8
- Parity – none
- Stop bits – 1
- Flow Control – none

Step 3 Click **OK**.

You should see a blinking cursor in the HyperTerminal window indicating successful connection to the console port.

Install Remote Management Protocols

The router can be accessed using remote management protocols, such as SSH, SCP, FTP, and Telnet. The SSH, SCP, and FTP management protocols are included in the ISO image by default. Telnet is an optional package.

Install the remote management protocols.

To install Telnet, you can use either of the following options:

- Install telnet package from the local directory of your router. The path to the local directory must be under `/harddisk:/` location. The following example shows how you can install the `xr-telnet-7.0.11v1.0.1-1.x86_64.rpm` optional package:

  ```
  Router#install source /harddisk:/files xr-telnet-7.0.11v1.0.1-1.x86_64.rpm
  ```

- Install telnet package from a configured repository.

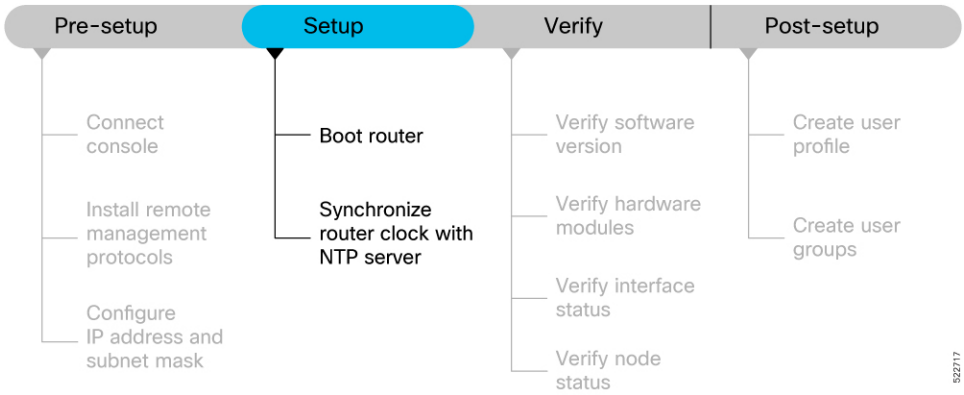
  ```
  Router#install source install-repo xr-telnet
  ```

  For information on creating and accessing an external or local repository, see Create Repository to Access Install Files.

Setup the Router

Complete the following tasks to bring up your router for further configurations.

Figure 3: Setup Workflow for the Cisco 8000 Series Router



Boot the Router

After installing the hardware and connecting the console port to the terminal, boot the Cisco 8000 series router. The router completes the boot process using the pre-installed operating system image.

Before you begin

Ensure that you have completed the Prerequisites to Setup Router, on page 1.

Step 1 Power ON the router.

The router completes the boot process using the pre-installed operating system image. If the router is not pre-installed with an image, you can boot the router using PXE boot an externally bootable USB drive or PXE boot.

Step 2 After booting is complete, follow the prompt to create a username and password. This credential is used to log on to the IOS XR console and get to the router prompt. The following prompt appears:

```
!!!!!!!!!!!!!!!!!!!! NO root-system username is configured. Need to configure root-system username.
 !!!!!!!!!!!!!!!!!!!!

--- Administrative User Dialog ---


Enter root-system username:
% Entry must not be null.

Enter root-system username: cisco
Enter secret:
Use the 'configure' command to modify this configuration.
User Access Verification

Username: cisco
Password:
```

See the Recover Router From Boot Failure topic to resolve any boot failure issues.

Configure IP Address and Subnet Mask

Configure the IP address and subnet mask. The IP address and subnet mask for the Management Ethernet interface is used by the router for system management and remote communication.

Consult your network administrator or system planner to procure IP addresses and a subnet mask for the management interface.

Note We recommend that you use a Virtual Private Network (VPN) routing and VPN Routing and Forwarding (VRF) on the Management Ethernet interface.

Step 1 Configure the IP address and a subnet mask for the Management Ethernet interface.

a) Configure the VRF.

Example:

```
Router(config)#vrf vrf1
Router(config-vrf)#exit
```

b) Configure the Management Ethernet Interface and set the VRF and IP address.

Example:

```
Router(config)#interface MgmtEth0/RSP0/CPU0/0
Router(config)#vrf vrf1
Router(config-if)#ipv4 address 10.10.0.1 255.0.0.0
Router(config-if)#ipv4 virtual address vrf vrf1 10.10.0.1/8
```

Configure multiple interfaces in a similar way.

c) Ensure that all available interfaces are discovered, and they in UP state.

Example:

```
Router(config-if)#no shutdown
Router(config-if)#exit
```

d) Configure a static route for communications with devices on other networks. Specify the IP address of the default gateway.

Example:

```
Router(config)#router static vrf vrf1 address-family ipv4 unicast 0.0.0.0/0 10.10.0.1
Router(config)#commit
```

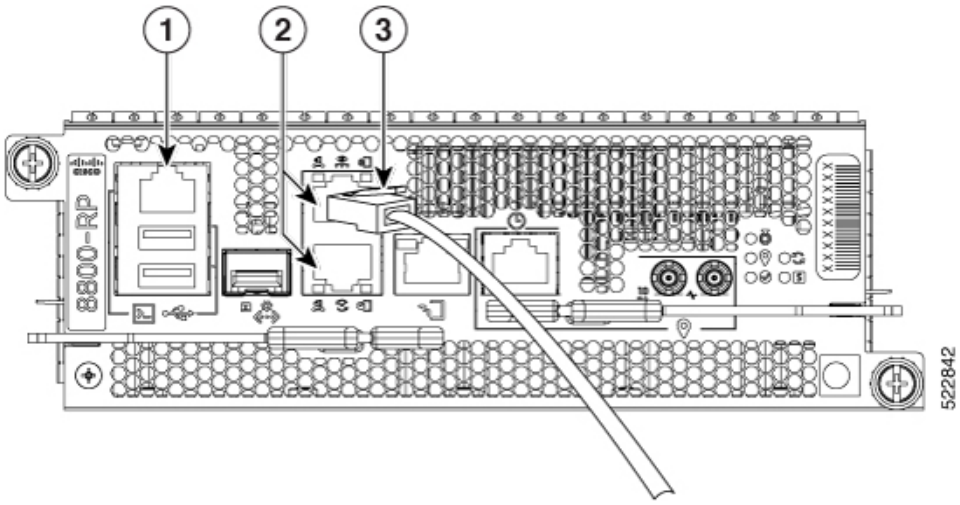
e) SSH into the management port.

Example:

```
Router#conf t
Router(config)#ssh server v2
Router(config)#commit
```

Step 2 Connect the management port to the Ethernet network. The physical port **Ethernet 0** on route processor is the management port.

Figure 4: Console Port and Management Ethernet Port



1	Console RS-232 Serial Port RJ-45
2	Management Ethernet Port (10/100/1000-Mbps) RJ-45 (Copper) port
3	Management Port connected to the Ethernet network

Example:

```
Server# ssh root@10.10.0.1
/etc/ssh/ssh_config line 18: Unsupported option "rhostsrsaauthentication"
/etc/ssh/ssh_config line 19: Unsupported option "rsaauthentication"
Warning: Permanently added 'x.xx.xx.xxx' (ECDSA) to the list of known hosts.
Password:
```

Synchronize Router Clock with NTP Server

You must synchronize the IOS XR clock with the Network Time Protocol (NTP) server to avoid a deviation from true time.

NTP uses the concept of a stratum to describe how many NTP hops away a machine is from an authoritative time source. A stratum 1 time server typically has an authoritative time source (such as a radio or atomic clock, or a GPS time source) directly attached to the server. A stratum 2-time server receives its time through NTP from a stratum 1 time server, and so on.

Note Cisco's implementation of NTP does not support stratum 1 service, and it is not possible to connect to a radio or atomic clock. We recommend that you obtain the time service for your network from the public NTP servers available on the IP Internet.

Step 1 Synchronize the IOS XR clock with NTP server by going through the following example.

Example:

The NTP source is an IP address

```
Router(config)#ntp server NTP-source-IP-address
```

Example of NTP source is an IPv4 address:

```
Router(config)#ntp server 192.0.2.0
```

Example of NTP source is an IPv6 address:

```
Router(config)#ntp server 2001:DB8::1
```

Step 2 Commit the configuration.

Example:

```
Router(config-ntp)#commit
```

Step 3 Verify that the clock is synchronised with the NTP server.

Example:

```
Router#show ntp status
Clock is synchronized, stratum 3, reference is 192.0.2.0 nominal freq is 1000000000.0000 Hz,
actual freq is 1000000000.0000 Hz, precision is 2**24 reference time is E12B1B02.8BB13A2F
(08:42:42.545 UTC Tue Sep 17 2019) clock offset is -3.194 msec, root delay is 4.949 msec
root dispersion is 105.85 msec, peer dispersion is 2.84 msec loopfilter state is 'FREQ'
(Drift being measured), drift is 0.0000000000 s/s system poll interval is 64, last update
was 124 sec ago authenticate is disabled
```

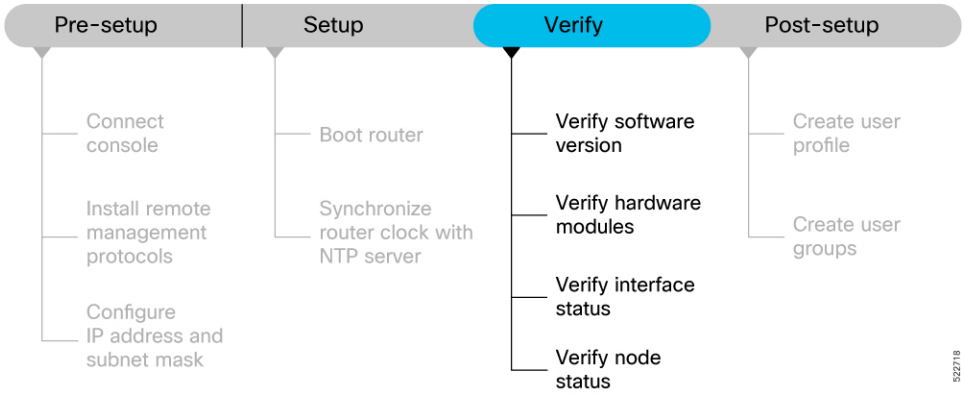
What to do next

Your router is now setup sucessfully. Perform prelimiary checks on the router to verify that the hardware and software components are functional.

Verify the Software and Hardware Status

After logging into the console, perform preliminary checks to verify the default setup.

Figure 5: Verification Workflow for the Cisco 8000 Series Router Setup



Ensure that you have completed the procedures in Setup the Router, on page 3 section before proceeding with the following verification tasks:

Verify Software Version

View the software version installed on the router.

Verify the latest version of the Cisco IOS XR software installed on the router.

Example:

```
Router#show version
Build Information:
Built By : user1
Built On : Thu Feb 02 10:06:56 UTC 2023
Build Host : host
Workspace : /ws
Version : 7.8.1
Label : 7.8.1
```

Note You must upgrade the system if a new version of the system is available to avail the latest features on the router.

For more information about upgrading the software version, see Upgrade the Router.

Verify Hardware Modules

Cisco 8000 series routers have various hardware modules such as route processors, line cards, fan trays, and power modules installed on the router. Ensure that the firmware on various hardware components of the router is compatible with the installed Cisco IOS XR image. You also must verify that all the installed hardware and firmware modules are operational.

Step 1 Verify the status of the hardware modules using the **show platform** command.

Example:

```
Router#show platform
Node Type State Config state
--------------------------------------------------------------
0/RP0/CPU0 8201-SYS(Active) IOS XR RUN NSHUT
Provision Network Devices using Zero Touch Provisioning
24
0/RP0/BMC0        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 that are detected on the router using the **show hw-module fpd** command.

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       BmcFitPrimary   S       NEED UPGD    0.240        0.240
0/RP0/CPU0       8800-RP        0.51       BmcFpga         S       NEED UPGD    0.18         0.18
0/RP0/CPU0       8800-RP        0.51       BmcFpgaGolden   BS      CURRENT      0.19
0/RP0/CPU0       8800-RP        0.51       BmcTamFw        S       CURRENT      5.05         5.05
0/RP0/CPU0       8800-RP        0.51       BmcTamFwGolden  BS      CURRENT      5.05
0/RP0/CPU0       8800-RP        0.51       BmcUbootPrimary S       CURRENT      0.15         0.15
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 **show hw-module fpd** output, verify that all hardware modules that are installed on the chassis are listed. An unlisted module indicates that the module is either malfunctioning, or has not been installed properly. You must remove and reinstall the hardware module.

The fields in the **show hw-module fpd** output are:

- **FPD Device**: Name of the hardware component, such as IO FPGA, IM FPGA, or BIOS. The Golden FPDs are not field upgradable.

- **Running**: Current version of the firmware running on the FPD.
- **Programd**: Version of the FPD programmed on the module
- **Status**: Upgrade status of the firmware. The different states are:

Table 2: Status and Description of the Firmware Upgrade

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 new 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.
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.

Step 3 Upgrade the required firmware as required, using the **upgrade hw-module location all fpd all** command.

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 The BIOS and IOFPGA upgrades require a restart of the router for the new version to take effect.

Step 4 Verify status of the modules after upgrade using the **show hw-module fpd** command.

Example:

```
Router#show hw-module fpd
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       BmcFitPrimary     S          RLOAD REQ  0.240      0.241
0/RP0/CPU0    8800-RP       0.51       BmcFpga           S          RLOAD REQ  0.18       0.19
0/RP0/CPU0    8800-RP       0.51       BmcFpgaGolden     BS         CURRENT    0.19
0/RP0/CPU0    8800-RP       0.51       BmcTamFw          S          CURRENT    5.05       5.05
0/RP0/CPU0    8800-RP       0.51       BmcTamFwGolden    BS         CURRENT    5.05
0/RP0/CPU0    8800-RP       0.51       BmcUbootPrimary   S          CURRENT    0.15       0.15
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 shows that a reload is required.

Step 5 Reload the individual nodes that require an upgrade.

Example:

```
Router#reload location node-location
```

Step 6 Verify that all nodes that had required an upgrade now shows 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      BmcFitPrimary    S         CURRENT      0.241        0.241
0/RP0/CPU0    8800-RP      0.51      BmcFpga          S         CURRENT      0.19         0.19
0/RP0/CPU0    8800-RP      0.51      BmcFpgaGolden    BS        CURRENT      0.19
0/RP0/CPU0    8800-RP      0.51      BmcTamFw         S         CURRENT      5.05         5.05
0/RP0/CPU0    8800-RP      0.51      BmcTamFwGolden   BS        CURRENT      5.05
0/RP0/CPU0    8800-RP      0.51      BmcUbootPrimary  S         CURRENT      0.15         0.15
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         CURRENT      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
```

Note For more information on upgrading FPDs, see the Upgrading Field-Programable Device chapter.

Verify Interface Status

All available interfaces must be discovered by the system after booting the Cisco 8000 Series Router. Interfaces not discovered might indicate a malfunction in the unit.

Use the **show ipv4 interfaces brief** or **show ipv6 interfaces brief** command to 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.

Ensure that the total number of interfaces that are 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 line cards displayed in **show platform** command.

Verify Node Status

A node can be a specified location, or the complete hardware module in the system. You must verify that the software state of all route processors, line cards, and the hardware state of fabric cards, fan trays, and power modules are listed, and their state is OPERATIONAL. This indicates that the IOS XR console is operational on the cards.

Verify the operational status of the node using the **show platform** command.

Example:

```
Router#show platform
Node          Type                 State          Config state
-------------------------------------------------------------
0/RP0/CPU0    8800-RP(Active)      IOS XR RUN     NSHUT
0/RP0/BMC0    8800-RP              OPERATIONAL    NSHUT
0/RP1/CPU0    8800-RP(Standby)     IOS XR RUN     NSHUT
0/RP1/BMC0    8800-RP              OPERATIONAL    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
```

Table 3: Card Type, Node Status, and Description

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
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

Card Type	State	Description
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
RP (standby only), LC	BOOT HOLD	In a multinode system, any node reloads that occur during a transaction that are not initiated as part of the installation shows a BOOT HOLD state. The node continues to be in this state until the transaction is either committed or cancelled

What to do next

This completes verification of the basic router setup. You can now complete the post-setup tasks where you manage user profiles and groups.

Complete Post-setup Tasks

You must create user profiles and user groups to manage your system, install software packages, and configure your network.

Note Users created in the System Admin VM are different from the ones created in XR VM. As a result, the username and password of a System Admin VM user cannot be used to access the XR VM, and vice versa.

Every user is authenticated using a username and a password. The authentication, authorization, and accounting (AAA) commands help with these services:

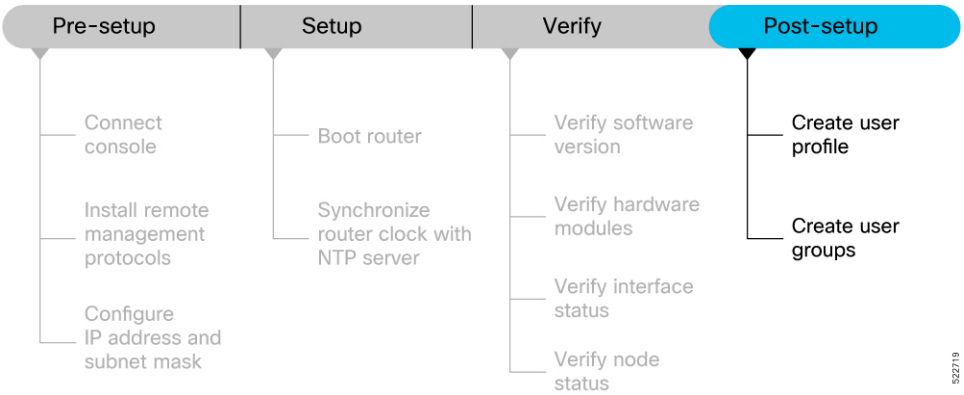
- Create users, groups, command rules, or data rules
- Change the disaster-recovery password

IOS-XR and Linux have separate AAA services and IOS XR AAA is the primary AAA system. A user who is created through IOS-XR can log in directly to the EXEC prompt when connected to the router, while a user created through Linux can connect to the router, but can log in to the bash prompt. The user must log in to IOS XR explicitly, to access the IOS-XR EXEC prompt.

You must configure the IOS-XR AAA authorization to restrict users from uncontrolled access. If AAA is not configured, the command and data rules associated to the groups that are assigned to the user are ignored. A user can have full read/write access to IOS XR configuration through Network Configuration Protocol (NETCONF), google-defined Remote Procedure Calls (gRPC), or any YANG-based agents. To avoid granting uncontrolled access, enable AAA before setting up any configuration. To gain an understanding about AAA, and to explore the AAA services, see the *Configuring AAA Services* chapter in the *System Security Configuration Guide for Cisco 8000 Series Routers*.

The following image provides you an overview of the various tasks that are involved in the Cisco 8000 Series Routers post-setup procedure.

Figure 6: Post-setup Workflow for the Cisco 8000 Series Router



Ensure that you have completed the Setup the Router, on page 3 and Verify the Software and Hardware Status, on page 7 tasks before you perform the following tasks:

Create User Profile

You can create new users and include the user in a user group with certain privileges. The router supports a maximum of 1024 user profiles.

Perform the following steps to create a user profile:

Step 1 Create a user, provide a password and assign the user to a group. For example, **user1** is the user, password is **pw123**, and the group is **root-lr**.

Example:

```
Router#config

/* Create a new user */
Router(config)#username user1

/* Set a password for the new user */
Router(config-un)#password pw123

/* Assign the user to group root-lr */
Router(config-un)#group root-lr
```

All users have read privileges. The **root-lr** users inherit write privileges where users can create configurations, create new users, and so on.

Enable display of login banner: The US Department of Defense (DOD)-approved login banner provides information such as number of successful and unsuccessful login attempts, time stamp, login method, and so on. The banner is displayed before granting access to devices. The banner also ensures privacy and security that is consistent with applicable federal laws. In addition, the system keeps track of logins, right from the system boot, or as soon as the user profile is created.

You can enable or diable the login login banner by using the **login-history enable** and **login-history disable** commands.

Note Login notifications get reset during a router reload.

Step 2 Run the **show running-config username user1** command to verify the state of login banner.

Example:

```
Router(config-un)#show running-config username NAME1
 Fri Jan 29 13:55:28.261 UTC
 username NAME1
 group UG1
 secret * **********
 password * ******
 login-history enable
```

Step 3 Commit the configuration.

Example:

```
Router(config-un)#commit
```

The user profile is created and allowed access to the router based on the configured privileges.

Create User Groups

You can create a new user group to associate command rules and data rules with it. The command rules and data rules are enforced on all users that are part of the user group. The router supports a maximum of 32 user groups.

Before you begin

Ensure that you have created a user profile. See Create User Profile, on page 14.

Step 1 Create a new user group.

Example:

```
Router#config

/* Create a new user group, group1 */
Router#(config)#group group1

/* Specify the name of the user, user1 to assign to this user group */
Router#(config-GRP)#username user1
```

Step 2 Commit the configuration.

Example:

```
Router(config-GRP)#commit
```

What to do next

This completes the router setup and verification process. You can now proceed with upgrading the software, installing RPMs, SMUs and bug fixes based on your requirement.