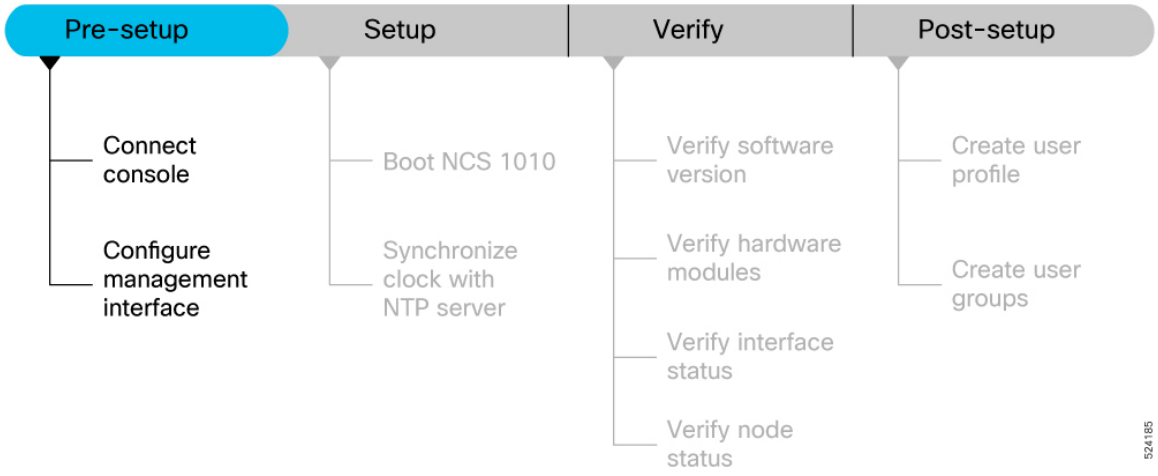
Setup Procedures

Prerequisites to Setup NCS 1010

Complete the following prerequisite tasks to prepare the NCS 1010 for seamless setup.

Figure 1: Pre-setup Workflow for the Cisco NCS 1010



This section contains the following topics:

Connect Console Port to Terminal

The console port on the NCS 1010 is used to log into a NCS 1010 directly without a network connection using a terminal emulation program like HyperTerminal.

Procedure

Step 1 Connect the NCS 1010 to a terminal.

a) Connect the console (or rollover) cable to the console port on the NCS 1010.
b) 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 – 9600
- 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.

Configure Management Interface

The management interface can be used for system management and remote communication. To use the management interface for system management, you must configure an IP address and subnet mask. To use the management interface for remote communication, you must configure a static route. Use this procedure when NCS 1010 chassis is not booted using ZTP.

Before you begin

- Consult your network administrator to procure IP addresses and a subnet mask for the management interface.
- Ensure that the management interface is connected to the management network.

Procedure

Step 1 **configure**

Example:

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

Enters IOS XR configuration mode.

Step 2 **interface mgmtEth** *rack/slot/instance/port*

Example:

```
RP/0/RP0/CPU0:ios(config)#interface mgmtEth 0/RP0/CPU0/0
```

Enters interface configuration mode for the management interface.

Step 3 **ipv4 address** *ipv4-address subnet-mask*

Example:

```
RP/0/RP0/CPU0:ios(config-if)#ipv4 address 192.0.2.254 255.255.255.0
```

Assigns an IP address and a subnet mask to the management interface.

Step 4 **no shutdown**

Example:

```
RP/0/RP0/CPU0:ios(config-if)#no shutdown
```

Places the management interface in an "up" state.

Step 5 **exit**

Example:

```
RP/0/RP0/CPU0:ios(config-if)#exit
```

Exits the management interface configuration mode.

Step 6 **ncs1010 static address-family ipv4 unicast** *0.0.0.0/0 default-gateway*

Example:

```
RP/0/RP0/CPU0:ios(config)#ncs1010 static address-family ipv4 unicast 0.0.0.0/0 198.51.100.4
```

Specifies the IP address of the default gateway to configure a static route. This IP address must be used for communication with devices on other networks.

Step 7 Use the **commit** or **end** command.

commit-Saves the configuration changes and remains within the configuration session.

end-Prompts user to take one of these actions:

- **Yes**-Saves configuration changes and exits the configuration session.
- **No**-Exits the configuration session without committing the configuration changes.
- **Cancel**-Remains in the configuration session without committing the configuration changes.

What to do next

Connect the management interface to the Ethernet network. Establish a Configure SSH or Configure Telnet connection to the management interface using its IP address.

Link Layer Discovery Protocol Support on Management Interface

The Link Layer Discovery Protocol (LLDP) support on management interface feature requires a system to form LLDP neighbor relationship over the system management interface, through which it advertises and

learns LLDP neighbor information. This information about neighbors used to learn about the neighbors and in turn the topology of the devices for Operations, Administration, and Maintenance (OAM) purposes.

Advantages of LLDP

- Provides support on non-Cisco devices.
- Enables neighbor discovery between non-Cisco devices.

Limitation

- When you disable LLDP globally, the LLDP gets disabled on all the interfaces.

Note By default, LLDP is enabled for NCS 1010. But when you enable and disable LLDP in the global configuration mode, LLDP gets disabled on all the interfaces.

Workaround: You must enable LLDP globally or reload the NCS1010.

Cisco Discovery Protocol (CDP) vs LLDP

The CDP is a device discovery protocol that runs over Layer 2. Layer 2 is also known as the data link layer that runs on all Cisco devices, such as routers, bridges, access servers, and switches. This protocol allows the network management applications to automatically discover and learn about other Cisco devices that connect to the network.

The LLDP is also a device discovery protocol that runs over Layer 2. This protocol allows the network management applications to automatically discover and learn about other non-Cisco devices that connect to the network.

Interoperability between non-Cisco devices using LLDP

LLDP is also a neighbor discovery protocol that is used by network devices to advertise information about themselves to other devices on the network. This protocol runs over the data link layer, which allows two systems running different network layer protocols to learn about each other.

With LLDP, you can also access the information about a particular physical network connection. If you use a non-Cisco monitoring tool (through SNMP), LLDP helps you identify the Object Identifiers (OIDs) that the system supports. The following OIDs are supported:

- 1.0.8802.1.1.2.1.4.1.1.4
- 1.0.8802.1.1.2.1.4.1.1.5
- 1.0.8802.1.1.2.1.4.1.1.6
- 1.0.8802.1.1.2.1.4.1.1.7
- 1.0.8802.1.1.2.1.4.1.1.8
- 1.0.8802.1.1.2.1.4.1.1.9
- 1.0.8802.1.1.2.1.4.1.1.10
- 1.0.8802.1.1.2.1.4.1.1.11
- 1.0.8802.1.1.2.1.4.1.1.12

Neighbor Discovery

System advertises the LLDP TLV (Type Length Value) details over the management network using which other devices in the management network can learn about this device.

Configuring LLDP

- LLDP full stack functionality is supported on all three management interfaces that are supported in NCS 1010.
- You can selectively enable or disable LLDP on any of the management interfaces on demand.
- You can selectively enable or disable LLDP transmit or receive functionality at the management interface level.
- Information gathered using LLDP can be stored in the device Management Information Database (MIB) and queried with the Simple Network Management protocol (SNMP).
- LLDP operational data is available in both CLI and netconf-yang interface.

Enabling LLDP Globally

When you enable LLDP globally, all interfaces that support LLDP are automatically enabled for both transmit and receive operations.

Note You can override this default operation at the interface to disable receive or transmit operations.

The following table describes the global LLDP attributes that you can configure:

Table 1:

Attribute	Default	Range	Description
Holdtime	120	0–65535	Specifies the holdtime (in sec). Holdtime refers to the time or duration that an LLDP device maintains the neighbor information before discarding.
Reinit	2	2–5	Delay (in sec) for LLDP initialization on any interface
Timer	30	5–65534	Specifies the rate at which LLDP packets are sent (in sec)

The following example shows the commands to configure LLDP globally. The global LLDP configuration enables LLDP on all the three management interfaces.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#lldp management enable
RP/0/RP0/CPU0:ios(config)#lldp holdtime 30
```

```
RP/0/RP0/CPU0:ios(config)#lldp reinit 2
RP/0/RP0/CPU0:ios(config)#commit
```

Verification

You can verify the LLDP configuration using the **show running-config lldp** command.

The output of **show running-config lldp** command is as follows:

```
RP/0/RP0/CPU0:ios#show running-config lldp
Tue Dec 10 10:36:11.567 UTC
lldp
timer 30
reinit 2
holdtime 120
management enable
!
```

You can verify the LLDP data using the **show lldp interface** and **show lldp neighbors** commands.

The output of **show lldp interface** command is as follows:

```
RP/0/RP0/CPU0:ios#show lldp interface
Mon Nov 11 14:33:58.982 IST


MgmtEth0/RP0/CPU0/0:
        Tx: enabled
        Rx: enabled
        Tx state: IDLE
        Rx state: WAIT FOR FRAME


MgmtEth0/RP0/CPU0/2:
        Tx: enabled
        Rx: enabled
        Tx state: IDLE
        Rx state: WAIT FOR FRAME


GigabitEthernet0/0/0/0:
        Tx: enabled
        Rx: enabled
        Tx state: IDLE
        Rx state: WAIT FOR FRAME
```

The output of **show lldp neighbors** command is as follows:

```
RP/0/RP0/CPU0ios:M-131#show lldp neighbors
Mon Dec 9 14:57:55.915 IST
Capability codes:
(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

Device ID Local Intf Hold-time Capability Port ID
P1C_DT_01.cisco.com GigabitEthernet0/0/0/0 120 R GigabitEthernet0/0/0/0
NCS1004-HH-10 MgmtEth0/RP0/CPU0/2 60 R MgmtEth0/RP0/CPU0/2

Total entries displayed: 2
```

where [DISABLED] shows that the LLDP is disabled on the interface MgmtEth0/RP0/CPU0/0.

Enabling LLDP per Management Interface

The following example shows the commands to configure LLDP at the management interface level.

```
RP/0/RP0/CPU0:ios(config)#interface mgmtEth 0/RP0/CPU0/X
RP/0/RP0/CPU0:ios(config-if)#lldp enable
RP/0/RP0/CPU0:ios(config-if)#commit
```

Disabling LLDP Transmit and Receive Operations

The following example shows the commands to disable the LLDP transmit operations at the specified management interface.

```
RP/0/RP0/CPU0:ios(config)#interface mgmtEth 0/RP0/CPU0/X
RP/0/RP0/CPU0:ios(config-if)#lldp transmit disable
RP/0/RP0/CPU0:ios(config-if)#commit
```

The following example shows the commands to disable the LLDP receive operations at the specified management interface.

```
RP/0/RP0/CPU0:ios(config)#interface mgmtEth 0/RP0/CPU0/X
RP/0/RP0/CPU0:ios(config-if)#lldp receive disable
RP/0/RP0/CPU0:ios(config-if)#commit
```

Debugging LLDP Issues

The following commands are used for debugging issues in the LLDP functionality.

- **show lldp traffic**
- **debug lldp all**
- **debug lldp errors**
- **debug lldp events**
- **debug lldp packets**
- **debug lldp tlvs**
- **debug lldp trace**
- **debug lldp verbose**

Configure Telnet

This procedure allows you to establish a telnet session to the management interface using its IP address. Use this procedure when NCS 1010 chassis is not booted using ZTP.

Before you begin

Ensure that two xr-telnet-* rpms are installed. .

Procedure

Step 1 **configure**

Example:

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

Enters the configuration mode.

Step 2 **telnet {ipv4 | ipv6} server max-servers** *limit*

Example:

```
RP/0/RP0/CPU0:ios(config)#telnet ipv4 server max-servers 10
```

Specifies the number of allowable telnet servers (up to 100). By default, telnet servers are not allowed. You must configure this command to enable the use of telnet servers.

Step 3 Use the **commit** or **end** command.

commit-Saves the configuration changes and remains within the configuration session.

end-Prompts user to take one of these actions:

- **Yes**-Saves configuration changes and exits the configuration session.
- **No**-Exits the configuration session without committing the configuration changes.
- **Cancel**-Remains in the configuration session without committing the configuration changes.

Configure SSH

This procedure allows you to establish an SSH session to the management interface using its IP address. Use this procedure when NCS 1010 chassis is not booted using ZTP.

Before you begin

- Generate the crypto key for SSH using the **crypto key generate dsa** command.

Procedure

Step 1 **configure**

Example:

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

Enters the configuration mode.

Step 2 **ssh server v2**

Example:

```
RP/0/RP0/CPU0:ios(config)# ssh server v2
```

Enables the SSH server to accept only SSHv2 client connections.

Step 3 Use the **commit** or **end** command.

commit-Saves the configuration changes and remains within the configuration session.

end-Prompts the user to take one of these actions:

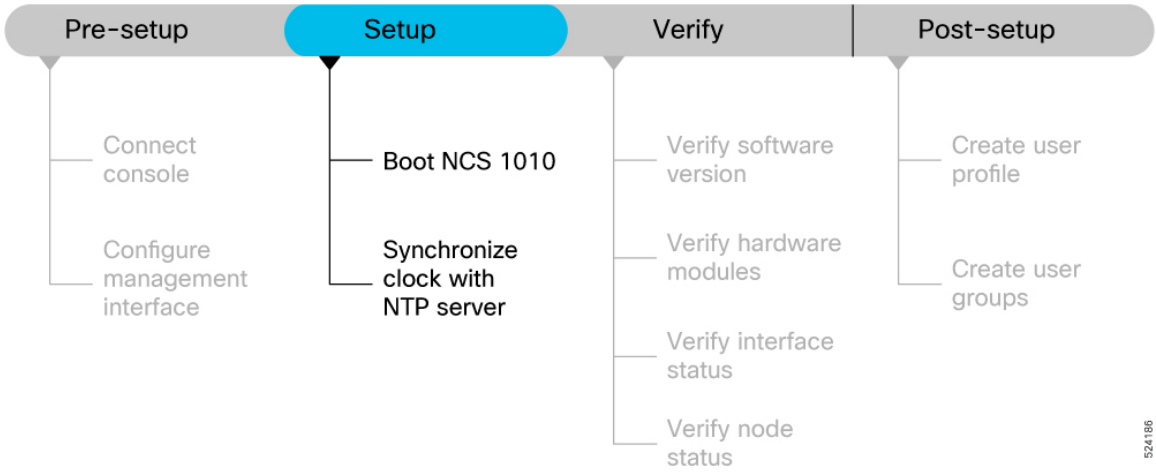
- **Yes**-Saves configuration changes and exits the configuration session.
- **No**-Exits the configuration session without committing the configuration changes.

- **Cancel**-Remains in the configuration session without committing the configuration changes.

Setup NCS 1010

Complete the following tasks to bring up your NCS 1010 for further configurations.

Figure 2: Setup Workflow for the Cisco NCS 1010



Boot NCS 1010

Use the console port to connect to NCS 1010. By default, the console port connects to the XR mode. If necessary, you can establish subsequent connections through the management port, after it is configured.

Procedure

Step 1 Connect a terminal to the console port of the RP.

Step 2 Start the terminal emulation program on your workstation.

The console settings are 9600 bps, 8 data bits, 1 stop bit and no parity.

Step 3 Power on NCS 1010.

To power on the shelves, install the AC or DC power supplies and cables. As NCS 1010 boots up, you can view the boot process details at the console of the terminal emulation program.

Step 4 Press **Enter**.

The boot process is complete when the system prompts you to enter the root-system username. If the prompt does not appear, wait for a while to give NCS 1010 more time to complete the initial boot procedure; then press **Enter**.

Important

If the boot process fails, it may be because the preinstalled image on the NCS 1010 is corrupt. In this case, you can boot NCS 1010 using an external bootable USB drive.

Boot NCS 1010 Using USB Drive

The bootable USB drive is used to reimage NCS 1010 for system upgrade or to boot the NCS 1010 in case of boot failure. A bootable USB drive is created by copying a compressed boot file into a USB drive. The USB drive becomes bootable after the contents of the compressed file are extracted.

You can complete this task using the Windows, Linux, or MAC operating systems available on your local machine. The exact operation to be performed for each generic step that is outlined here depends on the operating system in use.

Use this task to boot the NCS 1010 using the USB drive.

Before you begin

- You need a USB drive with a storage capacity of at least 4 GB.
- The USB drive should have a single partition.
- NCS 1010 software image can be downloaded from Software Download page on Cisco.com.
- Copy the compressed boot file from the software download page at Cisco.com to your local machine. The filename for the compressed boot file is in the format *ncs1010-usb-boot-<release_number>.zip*.

Procedure

Step 1 Connect the USB drive to your local machine and format it with the FAT32 file system.

Step 2 Copy the compressed boot file to the USB drive.

Step 3 Verify that the copy operation is successful. To verify, compare the file size at source and destination. Also, verify the MD5 checksum value.

Step 4 Extract the content of the compressed boot file by unzipping it in the USB drive. This makes the USB drive a bootable drive.

Note
You must extract the contents of the zipped file ("EFI" and "boot" directories) directly in the root folder of the USB drive. If the unzipping application places the extracted files in a new folder, move the "EFI" and "boot" directories to the root folder of the USB drive.

Step 5 Insert the USB drive in one of the USB ports of NCS 1010 line card/controller card.

Step 6 Reboot NCS 1010 using power cycle or console.

Note
Use the **reload bootmedia usb noprompt** command to boot the NCS 1010 from the USB. If you are using the **reload bootmedia usb noprompt** command, then you can skip the remaining steps.

Step 7 Press **Esc** to enter BIOS.

Step 8 Select the **Save & Exit** tab of BIOS.

Step 9 Choose **IOS -XR Install**.

The BIOS UI displays the USB drive vendor in the brackets, in this case, SMART USB 1084.

The system detects USB and boots the image from USB.

```
Booting from USB..
Loading Kernel..
Verifying (loop)/boot/bzImage...
(loop)/boot/bzImage verified using attached signature.
Loading initrd..
Verifying (loop)/boot/initrd.img...
```

Step 10 Remove the USB drive after the `Rebooting the system after installation` message is displayed. The NCS 1010 reboots automatically.

Note
The USB must be removed only after the image is loaded successfully.

Synchronize Clock with NTP Server

There is an independent system clock for IOS XR. To ensure that this clock does not deviate from true time, it must be synchronized with the clock of an NTP server.

Before you begin

- Configure Management Interface

Procedure

Step 1 **configure**

Example:

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

Enters the configuration mode.

Step 2 **ntp**

Example:

```
RP/0/RP0/CPU0:ios(config)#ntp
```

Enters NTP configuration mode.

Step 3 **server** [**ipv4** | **ipv6**] *ntp-server-ip-address* [**version** *version-number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*] [**prefer**] [**burst**] [**iburst**]

Example:

IPv4:

```
RP/0/RP0/CPU0:ios(config-ntp)#server 198.51.100.1 version 4 prefer iburst
```

IPv6:

```
RP/0/RP0/CPU0:ios(config-ntp)#server 2001:DB8::1 version 4 prefer iburst
```

Synchronizes the console clock with the specified NTP server.

Note
The NTP server can also be reached through a VRF if the management interface is in a VRF.

Step 4 Use one of the following commands:

- **end**
- **commit**

Example:

```
RP/0/RP0/CPU0:ios(config-ntp)#end
```

or

```
RP/0/RP0/CPU0:ncs1010(config-ntp)#commit
```

Saves configuration changes.

- When you issue the **end** command, the system prompts you to commit changes:

```
Uncommitted changes found, commit them before
  exiting(yes/no/cancel)?
[cancel]:
```

  - Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns to EXEC mode.
  - Entering **no** exits the configuration session and returns to EXEC mode without committing the configuration changes.
  - Entering **cancel** leaves the system in the current configuration session without exiting or committing the configuration changes.

- Use the **commit** command to save the configuration changes to the running configuration file and remain within the configuration session.

Step 5 **show running-config ntp**

Example:

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

Sun Nov  5 15:14:24.969 UTC

ntp

 server 4.33.0.51 burst iburst

!
```

Displays the running configuration.

Verify the Status of the External Reference Clock

This task explains how to verify the status of NTP components.

Note The commands can be entered in any order.

Procedure

Step 1 **show ntp associations [detail] [location** *node-id***]**

Example:

```
RP/0/RP0/CPU0:ios#show ntp associations
Sun Nov 5 15:14:44.128 UTC

address ref clock st when poll reach delay offset disp
*~192.0.2.1 198.51.100.1 2 81 128 377 1.84 7.802 2.129
* sys_peer, # selected, + candidate, - outlayer, x falseticker, ~ configured
```

Displays the status of NTP associations.

Example:

```
RP/0/RP0/CPU0:ios#show ntp associations detail
Sun Nov 5 15:14:48.763 UTC

192.0.2.1 configured, our_master, stratum 2
ref ID 198.51.100.1, time E8F22BB9.79D4A841 (14:56:57.475 UTC Sun Nov 5 2023)
our mode client, peer mode server, our poll intvl 128, peer poll intvl 128
root delay 0.6866 msec, root disp 1.04, reach 377, sync dist 6.2590
delay 1.84 msec, offset 7.802 msec, dispersion 2.129
precision 2**23, version 4
org time E8F22F92.B647E8FC (15:13:22.712 UTC Sun Nov 5 2023)
rcv time E8F22F92.B88F303C (15:13:22.720 UTC Sun Nov 5 2023)
xmt time E8F22F92.B88F303C (15:13:22.720 UTC Sun Nov 5 2023)
filtdelay = 1.844 1.772 1.983 1.954 1.945 2.000 1.902 1.778
filtoffset = 7.857 7.802 8.065 8.063 8.332 8.397 8.664 8.684
filterror = 0.000 0.060 1.995 2.055 4.050 4.110 6.060 6.120
```

Example:

```
RP/0/RP0/CPU0:ios#show ntp associations detail location 0/RP0/CPU0
Sun Nov 5 15:38:15.744 UTC

192.0.2.1 configured, our_master, stratum 2
ref ID 198.51.100.1, time E8F233C0.5606A159 (15:31:12.336 UTC Sun Nov 5 2023)
our mode client, peer mode server, our poll intvl 128, peer poll intvl 128
root delay 0.7019 msec, root disp 0.47, reach 377, sync dist 5.6762
delay 2.01 msec, offset 7.226 msec, dispersion 3.856
precision 2**23, version 4
org time E8F23563.DE5D42D5 (15:38:11.868 UTC Sun Nov 5 2023)
rcv time E8F23563.E07C296D (15:38:11.876 UTC Sun Nov 5 2023)
xmt time E8F23563.E07C296D (15:38:11.876 UTC Sun Nov 5 2023)
filtdelay = 2.006 1.865 1.936 1.762 1.932 1.875 1.881 2.011
filtoffset = 7.210 7.305 7.372 7.226 7.298 7.258 7.251 7.224
filterror = 0.000 2.025 2.085 4.035 4.095 6.060 6.120 8.070
```

Step 2 **show ntp status [location** *node-id***]**

Example:

```
RP/0/RP0/CPU0:ios#show ntp status
Sun Nov 5 15:14:36.949 UTC

Clock is synchronized, stratum 3, reference is 192.0.2.1
nominal freq is 1000000000.0000 Hz, actual freq is 44881851.3383 Hz, precision is 2**24
reference time is E8F22D7A.AB020D97 (15:04:26.668 UTC Sun Nov 5 2023)
clock offset is 9.690 msec, root delay is 2.553 msec
root dispersion is 24.15 msec, peer dispersion is 2.13 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is 0.0000212807 s/s
system poll interval is 128, last update was 610 sec ago
authenticate is disabled, panic handling is disabled,
hostname resolution retry interval is 1440 minutes.
```

Verifies that the clock is synchronized with the NTP server.

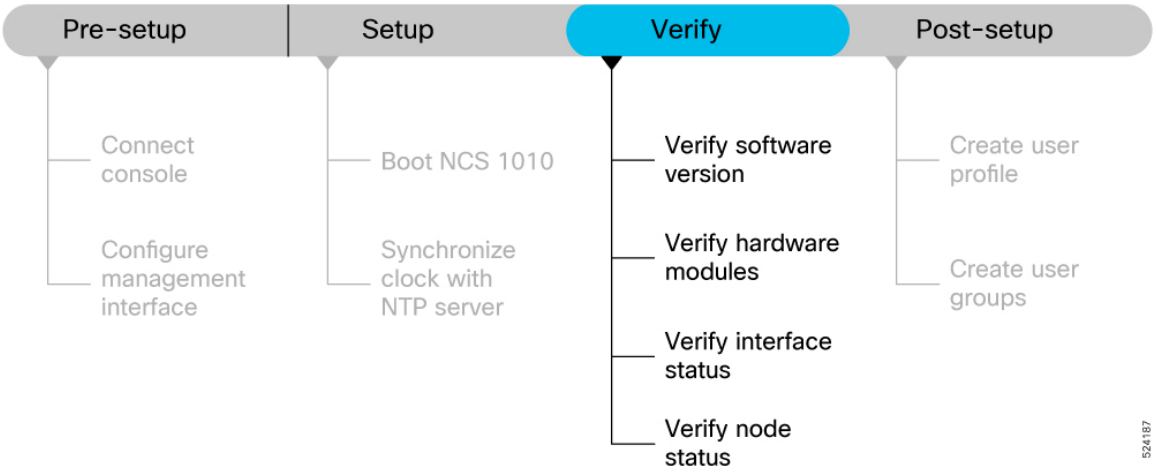
Troubleshoot NTP Issues

For NTP troubleshooting information, see here.

Verify the Software and Hardware Status

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

Figure 3: Verification Workflow for the Cisco NCS 1010 Setup



Ensure that you have completed the procedures in Setup NCS 1010, on page 9 section before proceeding with the following verification tasks:

Note The output of the examples in the procedures is not from the latest software release. The output will change for any explicit references to the current release.

Verify Software Version

View the software version installed on the NCS 1010.

Procedure

Verify the latest version of the Cisco IOS XR software installed on the NCS 1010.

Example:

```
RP/0/RP0/CPU0:ios#show version
Sat Mar 25 11:38:23.614 IST
Cisco IOS XR Software, Version 24.3.1
Copyright (c) 2013-2023 by Cisco Systems, Inc.
Build Information:
Built By : ingunawa
Built On : Tue Mar 07 02:22:55 UTC 2023
Build Host : iox-ucs-063
Workspace : /auto/iox-ucs-063-san2/prod/203.0.113.1I.SIT_IMAGE/ncs1010/ws
Version : 24.3.1
Label : 24.3.1
cisco NCS1010 (C3758 @ 2.20GHz)
cisco NCS1010-SA (C3758 @ 2.20GHz) processor with 32GB of memory
OLT-C-R-SITE-1 uptime is 2 weeks, 12 hours, 59 minutes
NCS 1010 - Chassis
```

Note
You must upgrade the system if a new version of the system is available to avail the latest features on the NCS 1010.

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

The **show version** only displays the IOS XR version in the label field if modific ations are made to the running software on the booted ISO image during installation of a newer version.

Verify Hardware Modules

Cisco NCS 1010 have various hardware modules such as processors, line cards, fan trays, and power modules installed on the NCS 1010. Ensure that the firmware on various hardware components of the NCS 1010 is compatible with the installed Cisco IOS XR image. You also must verify that all the installed hardware and firmware modules are operational.

Procedure

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

Example:

```
RP/0/RP0/CPU0:ios#show platform
Wed Apr 27 08:43:40.130 UTC
Node              Type                      State                     Config state
--------------------------------------------------------------------------------
0/RP0/CPU0        NCS1010-CNTLR-K9(Active)  IOS XR RUN                NSHUT,NMON
```

```
0/PM0             NCS1010-AC-PSU          OFFLINE                 NSHUT,NMON
0/PM1             NCS1010-AC-PSU          OPERATIONAL             NSHUT,NMON
0/FT0             NCS1010-FAN             OPERATIONAL             NSHUT,NMON
0/FT1             NCS1010-FAN             OPERATIONAL             NSHUT,NMON
0/0/NXR0          NCS1K-OLT-C             OPERATIONAL             NSHUT,NMON
0/1               NCS1K-BRK-SA            OPERATIONAL             NSHUT,NMON
0/1/0             NCS1K-BRK-8             OPERATIONAL             NSHUT,NMON
0/1/1             NCS1K-BRK-8             OPERATIONAL             NSHUT,NMON
0/1/2             NCS1K-BRK-24            OPERATIONAL             NSHUT,NMON
0/1/3             NCS1K-BRK-24            OPERATIONAL             NSHUT,NMON
0/2               NCS1K-MD-32E-C          OPERATIONAL             NSHUT,NMON
0/3               NCS1K-MD-32O-C          OPERATIONAL             NSHUT,NMON
```

Step 2 View the list of hardware and firmware modules that are detected on the NCS 1010 using the **show hw-module fpd** command.

Example:

```
RP/0/RP0/CPU0:ios# show hw-module fpd

Fri Aug 30 05:59:44.248 IST

Auto-upgrade:Enabled,PM excluded
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                                                FPD Versions
                                                                               ==============
Location   Card type             HWver FPD device       ATR Status   Running Programd  Reload Loc
-------------------------------------------------------------------------------------------------
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  ADMConfig            CURRENT    3.40    3.40       NOT REQ
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  BIOS             S   CURRENT    4.80    4.80         0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  BIOS-Golden      BS  CURRENT            4.10         0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  CpuFpga          S   CURRENT    1.13    1.13         0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  CpuFpgaGolden    BS  CURRENT            1.01         0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  SsdMicron5300    S   CURRENT    0.01    0.01         0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  TamFw            S   CURRENT    6.13    6.13         0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  TamFwGolden      BS  CURRENT            6.11         0/RP0
0/PM0      NCS1010-AC-PSU        1.0   AP-PriMCU            CURRENT    1.03    1.03       NOT REQ
0/PM0      NCS1010-AC-PSU        1.0   AP-SecMCU            CURRENT    2.01    2.01       NOT REQ
0/PM1      NCS1010-AC-PSU        1.0   AP-PriMCU            CURRENT    1.03    1.03       NOT REQ
0/PM1      NCS1010-AC-PSU        1.0   AP-SecMCU            CURRENT    2.01    2.01       NOT REQ
0/0/NXR0   NCS1K-E-OLT-R-C       1.0   OLT              S   CURRENT    3.16    3.16       NOT REQ
0/0/NXR0   NCS1K-E-OLT-R-C       1.0   Raman-1          S   CURRENT    3.16    3.16       NOT REQ
0/Rack     NCS1010-SA            2.1   EITU-ADMConfig       CURRENT    2.10    2.10       NOT REQ
0/Rack     NCS1010-SA            2.1   IoFpga           S   CURRENT    1.19    1.19       NOT REQ
0/Rack     NCS1010-SA            2.1   IoFpgaGolden     BS  CURRENT            1.01       NOT REQ
0/Rack     NCS1010-SA            2.1   SsdMicron5300    S   CURRENT    0.01    0.01         0/Rack
```

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, 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:

```
RP/0/RP0/CPU0:ios#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 NCS 1010 for the new version to take effect.

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

Example:

```
RP/0/RP0/CPU0:ios#show hw-module fpd
                                                      REQ
Wed Jun 29 08:50:21.057 UTC

Auto-upgrade:Disabled
                                                                        FPD Versions
                                                                        ============
Location   Card type            HWver FPD device       ATR Status    Running   Programd  Reload Loc
```

```
--------------------------------------------------------------------------------------------------
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   ADMConfig             CURRENT    3.40    3.40        NOT REQ
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   BIOS                S CURRENT    4.10    4.10          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   BIOS-Golden        BS CURRENT            4.10          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   CpuFpga             S CURRENT    1.02    1.02          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   CpuFpgaGolden      BS CURRENT            1.01          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   SsdIntelS4510       S CURRENT   11.32   11.32          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   TamFw               S CURRENT    6.13    6.13          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.0   TamFwGolden        BS CURRENT            6.11          0/RP0
0/PM0      NCS1010-AC-PSU        0.0   AP-PriMCU             CURRENT    1.03    1.03        NOT REQ
0/PM0      NCS1010-AC-PSU        0.0   AP-SecMCU             CURRENT    2.01    2.01        NOT REQ
0/PM1      NCS1010-AC-PSU        0.0   AP-PriMCU             CURRENT    1.03    1.03        NOT REQ
0/PM1      NCS1010-AC-PSU        0.0   AP-SecMCU             CURRENT    2.01    2.01        NOT REQ
0/0/NXR0   NCS1K-ILA-C           1.0   ILA                 S CURRENT    1.00    1.00        NOT REQ
0/Rack     NCS1010-SA            1.0   EITU-ADMConfig        CURRENT    2.10    2.10        NOT REQ
0/Rack     NCS1010-SA            1.0   IoFpga              S CURRENT    1.04    1.04        NOT REQ
0/Rack     NCS1010-SA            1.0   IoFpgaGolden       BS CURRENT            1.01        NOT REQ
0/Rack     NCS1010-SA            1.0   SsdIntelS4510       S CURRENT   11.32   11.32          0/Rack
```

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

Step 5 Reload the individual nodes that require an upgrade.

Example:

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

```
Thu Mar  2 12:35:06.602 IST

Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                                 FPD Versions
                                                                ==============
Location   Card type             HWver FPD device       ATR Status   Running Programd  Reload Loc
----------------------------------------------------------------------------------------------
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  ADMConfig             CURRENT    3.40    3.40        NOT REQ
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  BIOS                S CURRENT    4.20    4.20          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  BIOS-Golden        BS CURRENT            4.10          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  CpuFpga             S CURRENT    1.11    1.11          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  CpuFpgaGolden      BS CURRENT            1.01          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  SsdIntelS4510       S CURRENT   11.32   11.32          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  TamFw               S CURRENT    6.13    6.13          0/RP0
0/RP0/CPU0 NCS1010-CNTLR-K9      1.11  TamFwGolden        BS CURRENT            6.11          0/RP0
0/PM0      NCS1010-AC-PSU        0.0   AP-PriMCU             CURRENT    1.03    1.03        NOT REQ
0/PM0      NCS1010-AC-PSU        0.0   AP-SecMCU             CURRENT    2.01    2.01        NOT REQ
0/PM1      NCS1010-AC-PSU        0.0   AP-PriMCU             CURRENT    1.03    1.03        NOT REQ
0/PM1      NCS1010-AC-PSU        0.0   AP-SecMCU             CURRENT    2.01    2.01        NOT REQ
0/0/NXR0   NCS1K-OLT-L           1.0   OLT                 S CURRENT    1.02    1.02        NOT REQ
0/Rack     NCS1010-SA            2.1   EITU-ADMConfig        CURRENT    2.10    2.10        NOT REQ
0/Rack     NCS1010-SA            2.1   IoFpga              S CURRENT    1.12    1.12        NOT REQ
0/Rack     NCS1010-SA            2.1   IoFpgaGolden       BS CURRENT            1.01        NOT REQ
0/Rack     NCS1010-SA            2.1   SsdIntelS4510       S CURRENT   11.32   11.32          0/Rack
```

Verify Interface Status

All available interfaces must be discovered by the system after booting the Cisco NCS 1010. Interfaces not discovered might indicate a malfunction in the unit.

Procedure

Use the **show ipv4 interfaces brief** or **show ipv6 interfaces brief** command to view the interfaces discovered by the system.

Example:

```
RP/0/RP0/CPU0:ios#show ipv4 interfaces brief
Wed May 25 11:50:28.438 UTC

               Intf     Intf        LineP              Encap         MTU        BW
               Name    State       State              Type         (byte)    (Kbps)
--------------------------------------------------------------------------------------------

                Lo0       up          up             Loopback       1500          0
                Lo3       up          up             Loopback       1500          0
                Nu0       up          up              Null           1500          0
          Gi0/0/0/0       up          up              ARPA           1514    1000000
        Mg0/RP0/CPU0/0     up          up              ARPA           1514    1000000
       Mg0/RP0/CPU0/1    admin-down  admin-down       ARPA  1514     1000000
       Mg0/RP0/CPU0/2    admin-down  admin-down       ARPA  1514     1000000
       PT0/RP0/CPU0/0    admin-down  admin-down       ARPA  1514     1000000
       PT0/RP0/CPU0/1    admin-down  admin-down       ARPA  1514     1000000
```

Example:

```
RP/0/RP0/CPU0:ios#show ipv4 interfaces brief
Tue Jul 12 07:32:42.390 UTC

Interface                      IP-Address      Status          Protocol Vrf-Name
Loopback0                      198.51.100.1       Up            Up       default
Loopback3                      203.0.113.1        Up            Up       default
GigabitEthernet0/0/0/0         192.0.2.1          Up            Up       default
MgmtEth0/RP0/CPU0/0            192.0.2.255        Up            Up       default
PTP0/RP0/CPU0/0                unassigned      Shutdown        Down     default
MgmtEth0/RP0/CPU0/1            unassigned      Down            Down     default
PTP0/RP0/CPU0/1                unassigned      Shutdown        Down     default
MgmtEth0/RP0/CPU0/2            unassigned      Down            Down     default
```

When a NCS 1010 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 NCS 1010, 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.

Procedure

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

Example:

```
RP/0/RP0/CPU0:ios#show platform
Wed Apr 27 08:43:40.130 UTC
Node               Type                       State                 Config state
--------------------------------------------------------------------------------
0/RP0/CPU0         NCS1010-CNTLR-K9(Active)   IOS XR RUN            NSHUT,NMON
0/PM0              NCS1010-AC-PSU             OFFLINE               NSHUT,NMON
0/PM1              NCS1010-AC-PSU             OPERATIONAL           NSHUT,NMON
0/FT0              NCS1010-FAN                OPERATIONAL           NSHUT,NMON
0/FT1              NCS1010-FAN                OPERATIONAL           NSHUT,NMON
0/0/NXR0           NCS1K-OLT-C                OPERATIONAL           NSHUT,NMON
0/1                NCS1K-BRK-SA               OPERATIONAL           NSHUT,NMON
0/1/0              NCS1K-BRK-8                OPERATIONAL           NSHUT,NMON
0/1/1              NCS1K-BRK-8                OPERATIONAL           NSHUT,NMON
0/1/2              NCS1K-BRK-24               OPERATIONAL           NSHUT,NMON
0/1/3              NCS1K-BRK-24               OPERATIONAL           NSHUT,NMON
0/2                NCS1K-MD-32E-C             OPERATIONAL           NSHUT,NMON
0/3                NCS1K-MD-32O-C             OPERATIONAL           NSHUT,NMON
```

Example:

```
RP/0/RP0/CPU0:ios#show platform
Thu Mar  2 12:35:01.883 IST
Node               Type                       State                 Config state
--------------------------------------------------------------------------------
0/RP0/CPU0         NCS1010-CNTLR-K9(Active)   IOS XR RUN            NSHUT,NMON
0/PM0              NCS1010-AC-PSU             OPERATIONAL           NSHUT,NMON
0/PM1              NCS1010-AC-PSU             OFFLINE               NSHUT,NMON
0/FT0              NCS1010-FAN                OPERATIONAL           NSHUT,NMON
0/FT1              NCS1010-FAN                OPERATIONAL           NSHUT,NMON
0/0/NXR0           NCS1K-OLT-L                OPERATIONAL           NSHUT,NMON
0/3                NCS1K-BRK-24               OPERATIONAL           NSHUT,NMON
```

What to do next

This completes verification of the basic NCS 1010 setup. You can now complete the post-setup tasks where you manage user profiles and groups.

Verify Inventory

The **show inventory** command displays details of the hardware inventory of NCS 1010.

To verify the inventory information for all the physical entities, perform the following procedure.

Procedure

show inventory

Displays the details of the physical entities of NCS 1010 along with the details of SFPs.

Example:

```
RP/0/RP0/CPU0:ios#show inventory
Wed Apr 27 08:43:44.222 UTC

NAME: "Rack 0", DESCR: "NCS1010 - Shelf Assembly"
PID: NCS1010-SA        , VID: V00, SN: FCB2504B0X4

NAME: "0/RP0/CPU0", DESCR: "Network Convergence System 1010 Controller"
PID: NCS1010-CNTLR-K9  , VID: V00, SN: FCB2506B0NX

NAME: "0/1", DESCR: "NCS 1000 shelf for 4 passive modules"
PID: NCS1K-BRK-SA      , VID: V00 , SN: FCB2534B0GR

NAME: "0/1/0", DESCR: "NCS 1000 MTP/MPO to 8 port passive breakout module"
PID: NCS1K-BRK-8       , VID: V00 , SN: MPM25401005

NAME: "0/1/1", DESCR: "NCS 1000 MTP/MPO to 8 port passive breakout module"
PID: NCS1K-BRK-8       , VID: V00 , SN: MPM25401003

NAME: "0/1/2", DESCR: "NCS 1000 MTP/MPO to 24 colorless chs passive breakout module"
PID: NCS1K-BRK-24      , VID: V00 , SN: MPM25141004

NAME: "0/1/3", DESCR: "NCS 1000 MTP/MPO to 24 colorless chs passive breakout module"
PID: NCS1K-BRK-24      , VID: V00 , SN: MPM25371005

NAME: "0/2", DESCR: "NCS 1000 32 chs Even Mux/Demux Patch Panel - 150GHz - C-band"
PID: NCS1K-MD-32E-C    , VID: V00 , SN: ACW2529YE13

NAME: "0/3", DESCR: "NCS 1000 32 chs Odd  Mux/Demux Patch Panel - 150GHz - C-band"
PID: NCS1K-MD-32O-C    , VID: V00 , SN: ACW2529YA13

NAME: "0/FT0", DESCR: "NCS1010 - Shelf Fan"
PID: NCS1010-FAN       , VID: V00, SN: FCB2504B0W3

NAME: "0/FT1", DESCR: "NCS1010 - Shelf Fan"
PID: NCS1010-FAN       , VID: V00, SN: FCB2504B0U8

NAME: "0/PM0", DESCR: "NCS 1010 - AC Power Supply Unit"
PID: NCS1010-AC-PSU    , VID: V00, SN: APS244700D0

NAME: "0/PM1", DESCR: "NCS 1010 - AC Power Supply Unit"
PID: NCS1010-AC-PSU    , VID: V00, SN: APS244700BY
```

Verify Management Interface Status

To verify the management interface status, perform the following procedure.

Procedure

Step 1 **show interfaces MgmtEth 0/RP0/CPU0/0**

Displays the management interface configuration.

Example:

```
RP/0/RP0/CPU0:ios#show interfaces MgmtEth 0/RP0/CPU0/0
Wed May 25 11:49:18.118 UTC
```

```
MgmtEth0/RP0/CPU0/0 is up, line protocol is up
  Interface state transitions: 1
  Hardware is Management Ethernet, address is 38fd.f866.0964 (bia 38fd.f866.0964)
  Internet address is 192.0.2.254/16
  MTU 1514 bytes, BW 1000000 Kbit (Max: 1000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 1000Mb/s, CX, link type is autonegotiation
  loopback not set,
  Last link flapped 15:05:21
  ARP type ARPA, ARP timeout 04:00:00
  Last input never, output 00:00:00
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     53138 packets input, 6636701 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 12145 broadcast packets, 40082 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     217288 packets output, 60964220 bytes, 0 total output drops
     Output 1 broadcast packets, 15 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     1 carrier transitions
```

Step 2 **show interfaces summary** and **show interfaces brief**

Verifies the management interface status.

Example:

```
RP/0/RP0/CPU0:ios#show interfaces summary
Mon Nov  4 18:10:14.996 IST
Interface Type          Total    UP       Down     Admin Down
--------------          -----    --       ----     ----------
ALL TYPES               9        7        0        2
--------------
IFT_GETHERNET           1        1        0        0
IFT_LOOPBACK            1        1        0        0
IFT_ETHERNET            4        4        0        0
IFT_NULL                1        1        0        0
IFT_PTP_ETHERNET        2        0        0        2
```

Example:

```
RP/0/RP0/CPU0:ios#show interfaces brief
Mon Nov  4 18:11:37.222 IST

               Intf       Intf        LineP              Encap  MTU        BW
               Name       State       State               Type (byte)    (Kbps)
--------------------------------------------------------------------------------
                Lo0          up          up           Loopback  1500          0
                Nu0          up          up               Null  1500          0
          Gi0/0/0/0          up          up               ARPA  1514     100000
     Mg0/RP0/CPU0/0          up          up               ARPA  1514    1000000
     Mg0/RP0/CPU0/1          up          up               ARPA  1514    1000000
     Mg0/RP0/CPU0/2          up          up               ARPA  1514    1000000
     PT0/RP0/CPU0/0  admin-down  admin-down               ARPA  1514    1000000
     PT0/RP0/CPU0/1  admin-down  admin-down               ARPA  1514    1000000
    Mg0/RP0/RCOM0/0          up          up               ARPA  1514    1000000
```

Example:

```
RP/0/RP0/CPU0:ios#show ipv4 interfaces brief
Mon Nov  4 18:12:32.082 IST
```

```
Interface                      IP-Address      Status          Protocol Vrf-Name
Loopback0                      192.0.2.1        Up              Up       default
GigabitEthernet0/0/0/0         192.0.2.1        Up              Up       default
MgmtEth0/RP0/CPU0/0            192.0.2.254      Up              Up       default
PTP0/RP0/CPU0/0                unassigned      Shutdown        Down     default
MgmtEth0/RP0/CPU0/1            203.0.113.1      Up              Up       default
PTP0/RP0/CPU0/1                unassigned      Shutdown        Down     default
MgmtEth0/RP0/CPU0/2            192.0.2.255      Up              Up       default
MgmtEth0/RP0/RCOM0/0           unassigned       Up              Up       default
```

Verify Alarms

You can view the alarm information using the **show alarms** command.

Procedure

show alarms [**brief** [**card | rack | system**] [**location** *location*] [**active | history**] | **detail** [**card | rack | system**] [**location** *location*] [**active | clients | history | stats**]]

Displays alarms in brief or detail.

Example:

```
RP/0/RP0/CPU0:ios#show alarms brief system active

Thu Apr 28 06:16:50.524 UTC

------------------------------------------------------------------------------------
Active Alarms
------------------------------------------------------------------------------------
Location        Severity     Group           Set Time                  Description
------------------------------------------------------------------------------------
0/RP0/CPU0      Major        Ethernet        04/28/2022 06:03:39 UTC   RP-SW: SPI flash config is incorrect
0/PM0           Major        Environ         04/28/2022 06:03:50 UTC   Power Module Error (PM_VIN_VOLT_OOR)
0/PM0           Major        Environ         04/28/2022 06:03:50 UTC   Power Module Output Disabled
(PM_OUTPUT_DISABLED)
0               Major        Environ         04/28/2022 06:03:50 UTC   Power Group redundancy lost
0/PM0           Major        FPD_Infra       04/28/2022 06:04:08 UTC   One Or More FPDs Need Upgrade Or Not In
Current State
0/PM1           Major        FPD_Infra       04/28/2022 06:04:09 UTC   One Or More FPDs Need Upgrade Or Not In
Current State
0/0             Major        Controller      04/28/2022 06:05:12 UTC   Osc0/0/0/0 - Provisioning Failed
0/0             Major        Controller      04/28/2022 06:05:12 UTC   Osc0/0/0/2 - Provisioning Failed
0/0             Major        Controller      04/28/2022 06:05:12 UTC   Ots0/0/0/0 - Provisioning Failed
0/0             Major        Controller      04/28/2022 06:05:12 UTC   Ots0/0/0/2 - Provisioning Failed
```

Note
In the maintenance mode, all the alarms are moved from active to suppressed and the **show alarms** command does not display the alarms details.

Verify Environmental Parameters

The **show environment** command displays the environmental parameters of NCS 1010.

To verify that the environmental parameters are as expected, perform the following procedure.

Procedure

show environment [**alarm-contact** | **all** | **altitude** | **current** | **fan** | **humidity** | **power** | **voltages** [**location** | *location*] | **temperature** [**location** | *location*]]

Displays the environmental parameters of NCS 1010.

Example:

The following example shows a sample output of the **show environment** command with the **fan** keyword.

```
RP/0/RP0/CPU0:ios#show environment fan
Thu May 26 04:15:37.765 UTC
================================================================================
                                                Fan speed (rpm)
Location      FRU Type                          FAN_0    FAN_1   FAN_2
--------------------------------------------------------------------------------

0/PM0         NCS1010-AC-PSU                     5368
0/PM1         NCS1010-AC-PSU                     5336
0/FT0         NCS1010-FAN                       10020   10020   10020
0/FT1         NCS1010-FAN                       10020   10020    9960

================================================================================
```

The following example shows a sample output of the **show environment** command with the **temperatures** keyword for *0/RP0 location*.

```
RP/0/RP0/CPU0:ios#show environment temperature location 0/RP0

Thu May 26 04:16:39.832 UTC
=============================================================================================================================
Location  TEMPERATURE                          Value     Crit    Major    Minor    Minor    Major    Crit
          Sensor                             (deg C)     (Lo)     (Lo)     (Lo)     (Hi)     (Hi)     (Hi)
-----------------------------------------------------------------------------------------------------------------------------
0/RP0/CPU0
          RP_TEMP_PCB                           30      -10       -5        0       70       75       80
          RP_TEMP_HOT_SPOT                      33      -10       -5        0       70       75       80
          RP_TEMP_LTM4638                       49      -10       -5        0       80       85       90
          RP_TEMP_LTM4644_0                     36      -10       -5        0       80       85       90
          RP_TEMP_LTM4644_1                     39      -10       -5        0       80       85       90
          RP_JMAC_1V0_VCCP_TMON                 33      -10       -5        0       80       85       90
          RP_JMAC_1V0_VNN_TMON                  33      -10       -5        0       80       85       90
          RP_JMAC_1V0_VCC_RAM_TMON              32      -10       -5        0       80       85       90
          RP_JMAC_1V2_DDR_VDDQ_TMON             33      -10       -5        0       80       85       90
=============================================================================================================================
```

The following example shows a sample output of the **show environment** command with the **temperatures** keyword for *0/0/NXR0 location*.

```
RP/0/RP0/CPU0:ios#show environment temperature location 0/0/NXR0

Thu May 26 04:16:39.832 UTC
=============================================================================================================================
Location  TEMPERATURE                          Value     Crit    Major    Minor    Minor    Major    Crit
          Sensor                             (deg C)     (Lo)     (Lo)     (Lo)     (Hi)     (Hi)     (Hi)
-----------------------------------------------------------------------------------------------------------------------------
0/0/NXR0
          OLTC_LT_P0_iEDFA0                     24       18       19       20       30       31       32
          OLTC_LT_P0_iEDFA1                     25       18       19       20       30       31       32
          OLTC_LT_P0_iEDFA2                     24       18       19       20       30       31       32
          OLTC_LT_P2_iEDFA0                     25       18       19       20       30       31       32
```

```
          OLTC_LT_P3_iEDFA0                    25       18       19       20       30       31       32
          OLTC_LT_P0_eEDFA0                    24       18       19       20       30       31       32
          OLTC_CT_1                            32      -10       -7       -5       75       77       80
          OLTC_LT_P0_eEDFA1                    24       18       19       20       30       31       32
          OLTC_CT_2                            27      -10       -7       -5       70       73       75
          OLTC_CT_3                            30      -10       -7       -5       70       73       75
          OLTC_CT_4                            30      -10       -7       -5       70       73       75
          OLTC_FT_P0_iEDFA0                    60       55       57       58       62       64       65
          OLTC_FT_P2_iEDFA0                    60       55       57       58       62       64       65
          OLTC_FT_P3_iEDFA0                    60       55       57       58       62       64       65
          OLTC_FT_P0_eEDFA0                    60       55       57       58       62       64       65
==============================================================================================================
```

The following example shows a sample output of the **show environment** command with the **power** keyword.

```
RP/0/RP0/CPU0:ios#show environment power
Thu May 26 04:17:55.592 UTC
================================================================================
CHASSIS LEVEL POWER INFO: 0
================================================================================
   Total output power capacity (Group 0 + Group 1) :    1050W +     1050W
   Total output power required                     :     700W
   Total power input                               :     228W
   Total power output                              :     140W

Power Group 0:
================================================================================
   Power       Supply         ------Input----   ------Output---     Status
   Module      Type            Volts     Amps    Volts     Amps
================================================================================
   0/PM0       NCS1010-AC-PSU  228.5     0.5     12.1      5.6      OK

Total of Group 0:              114W/0.5A         67W/5.6A

Power Group 1:
================================================================================
   Power       Supply         ------Input----   ------Output---     Status
   Module      Type            Volts     Amps    Volts     Amps
================================================================================
   0/PM1       NCS1010-AC-PSU  228.5     0.5     12.1      6.1      OK

Total of Group 1:              114W/0.5A         73W/6.1A

================================================================================
   Location     Card Type               Power       Power        Status
                                        Allocated   Used
                                        Watts       Watts
================================================================================
   0/RP0/CPU0   NCS1010-CNTLR-K9        90          14           ON
   0/FT0        NCS1010-FAN             110         17           ON
   0/FT1        NCS1010-FAN             110         15           ON
   0/0/NXR0     NCS1K-OLT-C             350         61           ON
   0/Rack       NCS1010-SA              40          19           ON


================================================================================
```

The following example shows a sample output of the **show environment** command with the **voltages** keyword.

```
RP/0/RP0/CPU0:ios#show environment voltage location 0/RP0
Thu May 26 04:19:16.636 UTC
==============================================================================================
Location  VOLTAGE                              Value      Crit    Minor    Minor     Crit
          Sensor                               (mV)       (Lo)    (Lo)     (Hi)      (Hi)
----------------------------------------------------------------------------------------------
0/RP0/CPU0
          RP_ADM1266_12V0                     12094    10800    11280    12720    13200
```

```
          RP_ADM1266_1V8_CPU                  1806     1670     1750     1850     1930
          RP_ADM1266_1V24_VCCREF              1238     1150     1200     1280     1330
          RP_ADM1266_1V05_CPU                 1047      980     1020     1080     1120
          RP_ADM1266_1V2_DDR_VDDQ             1204     1120     1160     1240     1280
          RP_ADM1266_1V0_VCC_RAM               988      650      700     1250     1300
          RP_ADM1266_1V0_VNN                   869      550      600     1250     1300
          RP_ADM1266_1V0_VCCP                 1018      450      500     1250     1300
          RP_ADM1266_0V6_DDR_VTT               599      560      580      620      640
          RP_ADM1266_3V3_STAND_BY             3301     3070     3200     3400     3530
          RP_ADM1266_5V0                      5004     4650     4850     5150     5350
          RP_ADM1266_3V3                      3325     3070     3200     3400     3530
          RP_ADM1266_2V5_PLL                  2489     2330     2430     2580     2680
          RP_ADM1266_2V5_FPGA                 2502     2330     2430     2580     2680
          RP_ADM1266_1V2_FPGA                 1202     1120     1160     1240     1280
          RP_ADM1266_3V3_CPU                  3332     3070     3200     3400     3530
          RP_ADM1266_2V5_CPU                  2498     2330     2430     2580     2680

==============================================================================================
```

The following example shows a sample output of the **show environment** command with the **current** keyword.

```
RP/0/RP0/CPU0:P2C_DT_02#show environment current
Tue Jul  5 08:36:22.132 UTC
=============================================================================================
Location  CURRENT                                 Value
          Sensor                                  (mA)
---------------------------------------------------------------------------------------------
0/RP0/CPU0
          RP_CURRMON_LTM4638                     395
          RP_CURRMON_LTM4644_0                   179
          RP_CURRMON_LTM4644_1                   307
          RP_JMAC_1V0_VCCP_IMON                  187
          RP_JMAC_1V0_VNN_IMON                    62
          RP_JMAC_1V0_VCC_RAM_IMON                 0
          RP_JMAC_1V2_DDR_VDDQ_IMON              187
0/Rack
          SA_ADM1275_12V_MOD0_IMON              4154
          SA_ADM1275_12V_MOD1_IMON                43
          SA_ADM1275_12V_MOD2_IMON                18
          SA_ADM1275_12V_FAN0_IMON              1356
          SA_ADM1275_12V_FAN1_IMON              1517
          SA_INA230_5V0_IMON                     129
          SA_INA230_3V3_IMON                    2998
          SA_INA230_1V0_XGE_CORE_IMON           2464
          SA_INA230_1V0_FPGA_CORE_IMON           787
          SA_ADM1275_12V_SA_IMON                1668
          SA_ADM1275_12V_CPU_IMON               1147
```

The following example shows a sample output of the **show environment** command with the **altitude** keyword.

```
RP/0/RP0/CPU0:P2C_DT_02#show environment altitude
Tue Jul  5 08:36:51.710 UTC
=============================================================================
Location     Altitude Value (Meters)    Source
-----------------------------------------------------------------------------
0            760                     sensor
```

The following example shows a sample output of the **show environment** command with the **all** keyword.

```
RP/0/RP0/CPU0:P2C_DT_02#show environment all

Tue Jul  5 08:37:28.412 UTC
=============================================================================================================================
Location  TEMPERATURE                          Value     Crit    Major    Minor    Minor    Major    Crit
          Sensor                             (deg C)     (Lo)     (Lo)     (Lo)     (Hi)     (Hi)     (Hi)
-----------------------------------------------------------------------------------------------------------------------------
```

```
0/RP0/CPU0
          RP_TEMP_PCB                          29      -10       -5        0       70       75       80
          RP_TEMP_HOT_SPOT                     32      -10       -5        0       70       75       80
          RP_TEMP_LTM4638                      45      -10       -5        0       80       85       90
          RP_TEMP_LTM4644_0                    35      -10       -5        0       80       85       90
          RP_TEMP_LTM4644_1                    38      -10       -5        0       80       85       90
          RP_JMAC_1V0_VCCP_TMON                30      -10       -5        0       80       85       90
          RP_JMAC_1V0_VNN_TMON                 29      -10       -5        0       80       85       90
          RP_JMAC_1V0_VCC_RAM_TMON             30      -10       -5        0       80       85       90
          RP_JMAC_1V2_DDR_VDDQ_TMON            31      -10       -5        0       80       85       90
0/PM0
          Ambient Temp                         29      -10       -5        0       55       60       65
          Secondary HotSpot Temp               50      -10       -5        0       85       90       95
          Primary HotSpot Temp                 41      -10       -5        0       65       70       75
0/0/NXR0
          ILAC_LT_P0_eEDFA0                    25       18       19       20       30       31       32
          ILAC_LT_P0_eEDFA1                    25       18       19       20       30       31       32
          ILAC_LT_P0_eEDFA2                    25       18       19       20       30       31       32
          ILAC_LT_P2_eEDFA0                    25       18       19       20       30       31       32
          ILAC_LT_P2_eEDFA1                    25       18       19       20       30       31       32
          ILAC_LT_P2_eEDFA2                    25       18       19       20       30       31       32
          ILAC_CT_1                            29      -10       -7       -5       75       77       80
          ILAC_CT_2                            26      -10       -7       -5       70       73       75
          ILAC_CT_3                            28      -10       -7       -5       70       73       75
          ILAC_CT_4                            28      -10       -7       -5       70       73       75
          ILAC_FT_P0_eEDFA0                    59       55       57       58       62       64       65
          ILAC_FT_P0_eEDFA1                    59       55       57       58       62       64       65
0/Rack
          SA_TEMP_AIR_INLET0                   25      -10       -5        0       45       55       60
          SA_TEMP_AIR_INLET1                   25      -10       -5        0       45       55       60
          SA_TEMP_AIR_EXAUST0                  27      -10       -5        0       75       85       90
          SA_TEMP_AIR_EXAUST1                  26      -10       -5        0       75       85       90
          SA_TEMP_PCB_HOT_SPOT0                28      -10       -5        0       80       85       90
          SA_TEMP_PCB_HOT_SPOT1                32      -10       -5        0       80       85       90
          SA_TEMP_PCB_HOT_SPOT2                28      -10       -5        0       80       85       90
          SA_TEMP_PCB_HOT_SPOT3                30      -10       -5        0       80       85       90

==============================================================================================================
Location  VOLTAGE                              Value      Crit     Minor     Minor      Crit
          Sensor                               (mV)       (Lo)     (Lo)      (Hi)       (Hi)
--------------------------------------------------------------------------------------------------------------
0/RP0/CPU0
          RP_ADM1266_12V0                    12094     10800     11280     12720     13200
          RP_ADM1266_1V8_CPU                  1801      1670      1750      1850      1930
          RP_ADM1266_1V24_VCCREF              1238      1150      1200      1280      1330
          RP_ADM1266_1V05_CPU                 1054       980      1020      1080      1120
          RP_ADM1266_1V2_DDR_VDDQ             1207      1120      1160      1240      1280
          RP_ADM1266_1V0_VCC_RAM               988       650       700      1250      1300
          RP_ADM1266_1V0_VNN                   858       550       600      1250      1300
          RP_ADM1266_1V0_VCCP                 1008       450       500      1250      1300
          RP_ADM1266_0V6_DDR_VTT               603       560       580       620       640
          RP_ADM1266_3V3_STAND_BY             3310      3070      3200      3400      3530
          RP_ADM1266_5V0                      4996      4650      4850      5150      5350
          RP_ADM1266_3V3                      3328      3070      3200      3400      3530
          RP_ADM1266_2V5_PLL                  2489      2330      2430      2580      2680
          RP_ADM1266_2V5_FPGA                 2500      2330      2430      2580      2680
          RP_ADM1266_1V2_FPGA                 1197      1120      1160      1240      1280
          RP_ADM1266_3V3_CPU                  3332      3070      3200      3400      3530
          RP_ADM1266_2V5_CPU                  2502      2330      2430      2580      2680
0/Rack
          SA_ADM1266_12V_BUS_EITU            12057     10800     11280     12720     13200
          SA_ADM1266_5V0                      5022      4650      4800      5200      5350
          SA_ADM1266_1V8_ZARLINK_DPLL         1806      1670      1730      1870      1930
          SA_ADM1266_1V0_PHY                  1009       930       960      1040      1070
          SA_ADM1266_1V0_ALDRIN_CORE           982       910       930      1070      1090
          SA_ADM1266_1V0_ALDRIN_SERDES        1007       930       960      1040      1070
          SA_ADM1266_1V0_FPGA                 1008       930       960      1040      1070
          SA_ADM1266_1V2_FPGA                 1205      1120      1150      1250      1280
```

```
          SA_ADM1266_1V8                      1804     1670     1730     1870     1930
          SA_ADM1266_2V5                      2505     2330     2400     2600     2680
          SA_ADM1266_3V3                      3323     3070     3170     3430     3530
          SA_ADM1275_12V_SA_BP               12058    10800    11280    12720    13200
          SA_ADM1275_12V_CPU_BP              12032    10800    11280    12720    13200
          SA_ADM1275_12V_MOD0_BP             12063    10800    11280    12720    13200
          SA_ADM1275_12V_MOD1_BP             12048    10800    11280    12720    13200
          SA_ADM1275_12V_MOD2_BP             12027    10800    11280    12720    13200
          SA_ADM1275_12V_FAN0_BP             12032    10800    11280    12720    13200
          SA_ADM1275_12V_FAN1_BP             12042    10800    11280    12720    13200
==============================================================================================================
Location  CURRENT                             Value
          Sensor                              (mA)
--------------------------------------------------------------------------------------------------------------
0/RP0/CPU0
          RP_CURRMON_LTM4638                   395
          RP_CURRMON_LTM4644_0                 179
          RP_CURRMON_LTM4644_1                 307
          RP_JMAC_1V0_VCCP_IMON                125
          RP_JMAC_1V0_VNN_IMON                  62
          RP_JMAC_1V0_VCC_RAM_IMON               0
          RP_JMAC_1V2_DDR_VDDQ_IMON            156
0/Rack
          SA_ADM1275_12V_MOD0_IMON            3412
          SA_ADM1275_12V_MOD1_IMON              30
          SA_ADM1275_12V_MOD2_IMON              43
          SA_ADM1275_12V_FAN0_IMON            1418
          SA_ADM1275_12V_FAN1_IMON            1394
          SA_INA230_5V0_IMON                   129
          SA_INA230_3V3_IMON                  3020
          SA_INA230_1V0_XGE_CORE_IMON         2464
          SA_INA230_1V0_FPGA_CORE_IMON         787
          SA_ADM1275_12V_SA_IMON              1640
          SA_ADM1275_12V_CPU_IMON             1157
==============================================================================
                                             Fan speed (rpm)
Location      FRU Type                       FAN_0    FAN_1   FAN_2
------------------------------------------------------------------------------

0/PM0        NCS1010-AC-PSU                   5424
0/FT0        NCS1010-FAN                      9960    9960    9960
0/FT1        NCS1010-FAN                     10020   10020   10020
==============================================================================
Location     Altitude Value (Meters)    Source
------------------------------------------------------------------------------
0            760                    sensor

==============================================================================
CHASSIS LEVEL POWER INFO: 0
==============================================================================
   Total output power capacity (Group 0 + Group 1) :    1050W +        0W
   Total output power required                     :     700W
   Total power input                               :     159W
   Total power output                              :     129W

Power Group 0:
==============================================================================
   Power       Supply         ------Input----   ------Output---     Status
   Module      Type            Volts     Amps    Volts     Amps
==============================================================================
   0/PM1       NCS1010-AC-PSU  0.0       0.0     0.0       0.0      OFFLINE

Total of Group 0:               0W/0.0A         0W/0.0A
```

```
Power Group 1:
================================================================================
   Power       Supply         ------Input----   ------Output---     Status
   Module      Type            Volts     Amps    Volts     Amps
================================================================================
   0/PM0       NCS1010-AC-PSU  228.5     0.7     12.1      10.7     OK

Total of Group 1:              159W/0.7A         129W/10.7A

================================================================================
   Location     Card Type                Power       Power        Status
                                         Allocated   Used
                                         Watts       Watts
================================================================================
   0/RP0/CPU0   NCS1010-CNTLR-K9         90          14           ON
   0/FT0        NCS1010-FAN              110         17           ON
   0/FT1        NCS1010-FAN              110         16           ON
   0/0/NXR0     NCS1K-ILA-C              350         54           ON
   0/Rack       NCS1010-SA               40          19           ON
```

Environment parameter anomalies are logged in the syslog. As a result, if an environment parameter that is displayed in the **show environment** command output is not as expected, check the syslog using the **show logging** and **show alarms brief system active** command. The syslog provides details on any logged problems.

Verify Context

The **show context** command displays core dump context information of NCS 1010. Core dump is a result of abnormal exit of any process running in the system.

Procedure

show context

Displays the core dump context information of NCS 1010.

Example:

```
RP/0/RP0/CPU0:ios# show context
Mon Sep 27 17:21:59.219 UTC

node: node0_RP0_CPU0
------------------------------------------------------------------
No context
```

The command output is empty during system upgrade.

Verify Core Files

Use the **run** command to go to the hard disk location and check for the core dumps of NCS 1010.

Procedure

run

Example:

```
RP/0/RP0/CPU0:ios# run
Mon Sep 27 17:29:11.163 UTC
[xr-vm_node0_RP0_CPU0:~]$cd /misc/disk1/
[xr-vm_node0_RP0_CPU0:/misc/disk1]$ls -lrt *.tgz
```

Verify Memory Information

You can view the memory information using the show watchdog memory-state command.

Procedure

show watchdog memory-state location all

Displays memory snapshot in brief.

Example:

```
RP/0/RP0/CPU0:ios#show watchdog memory-state location all
Thu Jun 16 08:36:44.436 UTC
---- node0_RP0_CPU0 ----
Memory information:
    Physical Memory     : 31935.167 MB
    Free Memory         : 29236.0   MB
    Memory State        :   Normal
```

Complete Post-setup Tasks

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

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

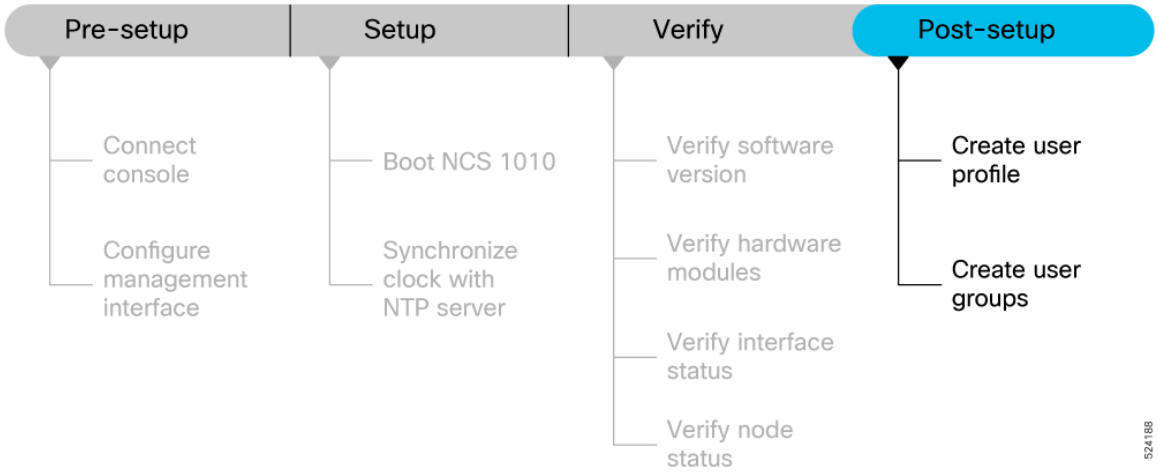
- Create users, groups, command rules, or data rules
- Change the disaster-recovery password

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 NCS 1010, while a user created through Linux can connect to the NCS 1010, 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 Configure AAA.

The following image provides you an overview of the various tasks that are involved in the Cisco NCS 1010 Series NCS 1010 post-setup procedure.

Figure 4: Post-setup Workflow for the Cisco NCS 1010



Ensure that you have completed the Setup NCS 1010, on page 9 and Verify the Software and Hardware Status, on page 14 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 NCS 1010 supports a maximum of 1024 user profiles.

Perform the following steps to create a user profile:

Procedure

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:

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

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

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

```
/* Assign the user to group root-lr */
RP/0/RP0/CPU0:ios(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 NCS 1010 reload.

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

Example:

```
RP/0/RP0/CPU0:ios(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:

```
RP/0/RP0/CPU0:ios(config-un)#commit
```

The user profile is created and allowed access to the NCS 1010 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 NCS 1010 supports a maximum of 32 user groups.

Before you begin

Ensure that you have created a user profile. See Create User Profile, on page 31.

Procedure

Step 1 Create a new user group.

Example:

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

/* Create a new user group, group1 */
```

```
ios#(config)#group group1

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

Step 2 Commit the configuration.

Example:

```
RP/0/RP0/CPU0:ios(config-GRP)#commit
```

What to do next

This completes the NCS 1010 setup and verification process. You can now proceed with upgrading the software, installing RPMs, SMUs and bug fixes based on your requirement.