



## Bring-up the Cisco NCS 6008 Router

After installing the hardware, boot the Cisco NCS 6008 Series Router . Connect to the XR VM console port and power on the router. The routersystem completes the boot process using the pre-installed operating system (OS) image. If no image is available within the router, the router can be booted using an external bootable USB drive.

After booting is complete, create the root username and password, and then use it to log on to the XR VM console and get the router prompt. From the XR VM console, access the System Admin VM console to configure system administration settings.

For more information about completing the hardware installation, see [Cisco Network Convergence System 6000 Series Routers Hardware Installation Guide](#).

The topics covered in this chapter are:

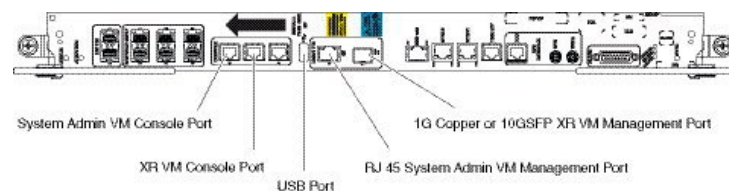
- [Connect to the XR VM Console Port and Power the Router, on page 1](#)
- [Setup Root User Credentials and Login to XR VM Console, on page 2](#)
- [Configure the XR VM Management Port, on page 4](#)
- [Connecting to the XR VM Management Port, on page 6](#)
- [Provision Breakout Interfaces, on page 7](#)
- [Shut Down Unused Linecard Slices, on page 8](#)
- [Perform Clock Synchronization with NTP Server, on page 9](#)

## Connect to the XR VM Console Port and Power the Router

Use the XR VM console port on the Route Processor (RP) to connect to a new router . If required, subsequent connections can be established through the management port, after it is configured.

There are the three console ports on the RP. Console port 2 is for the XR VM.

**Figure 1: XR VM console port of the RP**



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- Step 1** Connect a terminal to the XR VM console port of the RP.
- Step 2** Start the terminal emulation program on your workstation.
- The console settings are 115200 bps, 8 data bits, 1 stop bit and no parity.
- Step 3** Power on the router.
- Press the power switch up to turn on the power shelves. As the router boots up, you will see boot process details on the console screen of the terminal emulation program.
- Step 4** Press **Enter**.
- When the system prompts you to enter the root-system username, it indicates that the boot process is complete. If the prompt does not appear, wait for a while to give the router more time to complete the initial boot procedure, then press **Enter**.
- Important** If the boot process fails, it may be because the pre-installed image on the router is corrupt. In this case, the router can be booted using an external bootable USB drive. For details see, [Create Bootable USB Drive Using Shell Script](#) and [Boot the Router Using USB](#).
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#### What to do next

Specify the root username and password.

## Setup Root User Credentials and Login to XR VM Console

When the router boots for the first time, the system prompts the user to configure root credentials (username and password). These credentials are configured as the root user on the XR VM (root-lr), the System Admin VM (root-system), and as disaster-recovery credentials. In addition to the XR VM console, the System Admin VM console and the XR VM management port can be accessed using these credentials.

#### Before you begin

The boot process must be complete. For details on how to initiate the boot process, see *Connect to the XR VM Console Port and Power the Router System* topic.

#### SUMMARY STEPS

1. **Enter root-system username:** *username*
2. **Enter secret:** *password*
3. **Enter secret again:** *password*
4. **Username:** *username*
5. **Password:** *password*
6. (Optional) **show run username**

## DETAILED STEPS

### Step 1 Enter root-system username: *username*

**Example:**

```
Enter root-system username: root
```

Enter the username of the root user. The character limit is 1023. In this example, the name of the root user is "root".

**Important** The specified username is mapped to the "root-lr" group on the XR VM. It is also mapped as the "root-system" user on the System Admin VM.

When starting the router for the first time, or after a re-image, the router does not have any user configuration. In such cases, the router prompts you to specify the "root-system username". However, if the router has been configured previously, the router prompts you to enter the "username", as described in [Step 4](#).

### Step 2 Enter secret: *password*

**Example:**

```
Enter secret:
```

Enter the password for the root user. The character limit is 253. The password you type is not displayed on the CLI for security reasons.

The root username and password must be safeguarded as it has the superuser privileges. It is used to access the complete router configuration.

### Step 3 Enter secret again: *password*

**Example:**

```
Enter secret again:
```

Re-enter the password for the root user. The password is not accepted if it does not match the password entered in the previous step. The password you type is not displayed on the CLI for security reasons.

### Step 4 Username: *username*

**Example:**

```
Username: root
```

Enter the root-system username to login to the XR VM console.

### Step 5 Password: *password*

**Example:**

```
Password:
```

Enter the password of the root user. The correct password displays the XR VM router prompt.

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

You are now logged into the XR VM console.

### Step 6 (Optional) show run username

**Example:**

```
RP/0/RP0/CPU0:router#show run username
```

Displays user details.

```
username root
group root-lr
group cisco-support
secret 5 $1$NBg7$fHs1inKPZVvzqxMv775UE/
!
```

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### What to do next

- Configure routing functions from the XR VM.
- Configure system administration settings from the System Admin prompt. The System Admin prompt is displayed on accessing the System Admin VM console. For details on how to get the System Admin prompt, see *Access the System Admin VM Console* topic.

## Configure the XR VM Management Port

To use the XR VM Management port for system management and remote communication, you must configure an IP address and a subnet mask for the management ethernet interface. To communicate with devices on other networks (such as remote management stations or TFTP servers), you need to configure a default (static) route for the router .

### Before you begin

- Consult your network administrator or system planner to procure IP addresses and a subnet mask for the management interface.
- Physical port Ethernet 0 on RP is the management port. Ensure that the port is connected to management network.

### SUMMARY STEPS

1. **configure**
2. **interface MgmtEth** *rack/slot/CPU0/port*
3. **ipv4 address** *ipv4-address subnet-mask*
4. **ipv4 address** *ipv4 virtual address subnet-mask*
5. **no shutdown**
6. **exit**
7. **router static address-family ipv4 unicast** *0.0.0.0/0 default-gateway*
8. Use the **commit** or **end** command.

### DETAILED STEPS

---

#### Step 1 **configure**

##### Example:

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

Enters XR Config mode.

**Step 2**     **interface MgmtEth** *rack/slot/CPU0/port*

**Example:**

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

Enters interface configuration mode for the management interface of the primary RP.

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

**Example:**

```
RP/0/RP0/CPU0:router(config-if)#ipv4 address 10.1.1.1 255.0.0.0
```

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

**Step 4**     **ipv4 address** *ipv4 virtual address subnet-mask*

**Example:**

```
RP/0/RP0/CPU0:router(config-if)#ipv4 address 1.70.31.160 255.255.0.0
```

Assigns a virtual IP address and a subnet mask to the interface.

**Step 5**     **no shutdown**

**Example:**

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

Places the interface in an "up" state.

**Step 6**     **exit**

**Example:**

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

Exits the Management interface configuration mode.

**Step 7**     **router static address-family ipv4 unicast** *0.0.0.0/0 default-gateway*

**Example:**

```
RP/0/RP0/CPU0:router(config)#router static address-family ipv4 unicast 0.0.0.0/0 12.25.0.1
```

Specifies the IP address of the default-gateway to configure a static route; this is to be used for communications with devices on other networks.

**Step 8**     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 to the management port to the ethernet network. See [Connecting to the XR VM Management Port, on page 6](#).

## Connecting to the XR VM Management Port

The XR VM management port supports 10/100G optical small form-factor pluggable (SFP) units to provide high speed network connectivity. The SFPs that can be connected to the XR VM management port are:

SFP module	Datasheet
Cisco SFP-10G-SR	<a href="http://www.cisco.com/en/US/prod/collateral/modules/ps5455/data_sheet_c78-455693.html">http://www.cisco.com/en/US/prod/collateral/modules/ps5455/data_sheet_c78-455693.html</a>
Cisco SFP-10G-LR	
1000BASE-SX SFP	<a href="http://www.cisco.com/en/US/prod/collateral/modules/ps5455/ps6577/product_data_sheet0900aecd8033f885.html">http://www.cisco.com/en/US/prod/collateral/modules/ps5455/ps6577/product_data_sheet0900aecd8033f885.html</a>
1000BASE-LX/LH SFP	
1000BASE-T SFP	

**Before you begin**

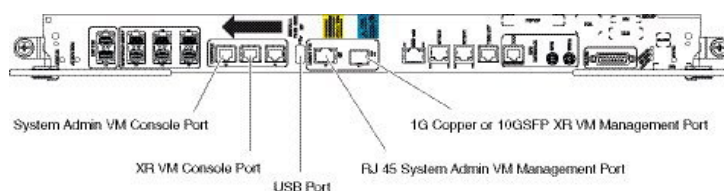
Configure the management port. See [Configure the XR VM Management Port, on page 4](#).

**Step 1** Connect the SFP module to the XR VM management port.

The XR VM management port on the RP is shown in this figure.

**Note** RJ-45 port is disabled by default. Do not use the RJ-45 port. Use only the 1G copper SFP port as shown in the image below.

*Figure 2: XR VM console port of the RP*



**Step 2** Depending on the SFP module type, connect either a optical fiber or an ethernet cable to the SFP.

**What to do next**

With a terminal emulation program, establish a SSH or telnet connection to the management interface port using its IP address. For details on configuring the IP address of the management port, see [Configure the XR VM Management Port, on page 4](#).

Before establishing a telnet session, use the **telnet ipv4|ipv6 server max-servers** command in the XR Config mode, to set number of allowable telnet sessions to the router.



**Note** Telnet supports a maximum of 100 (including both IPv4 and IPv6) sessions.

For a SSH connection, the *ncs6k-k9sec* package must be installed on the router. For details about package installation, see the Install Packages section.

## Provision Breakout Interfaces

The NCS 6000 line cards have multi-slice architecture. On a 10X100G line card, each slice has two 100 GE ports that can be configured to operate at 100 GE or 10X10 GE. Breakout cables are connected to the 10X10GE interfaces. The 100G ports are mapped to each slice as:

Ports	Slice
0 and 1	0
2 and 3	1
4 and 5	2
6 and 7	3
8 and 9	4

### SUMMARY STEPS

1. **configure**
2. **hw-module location** *rack/slot/CPU slice slice\_number* **breakout 10G**
3. Use the **commit** or **end** command.

### DETAILED STEPS

#### Step 1 **configure**

**Example:**

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

Enters XR Config mode.

#### Step 2 **hw-module location** *rack/slot/CPU slice slice\_number* **breakout 10G**

**Example:**

```
RP/0/RP0/CPU0:router(config)#hw-module location 0/1/CPU0 slice 1 breakout 10G
```

Provisions the interfaces on the specified slice in the 10G breakout mode.

#### 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.

### What to do next

Run the **show ipv4 interface brief** command in the XR EXEC mode to view breakout interfaces. Each 10 GE interface is represented as

**TenGigE**<rack\_num>/<slot\_id>/<card\_instance>/<port\_num>/<breakout\_num>.

Verify that ten TenGigE interfaces are created for every HundredGigE interface of the slice on which the breakout is configured.

```
RP/0/RP0/CPU0:router(config)#show ipv4 interface brief
Interface                               IP-Address      Status          Protocol Vrf-Name
Bundle-Ether1                           199.1.1.1       Up              Up       default
Loopback0                               100.100.100.100 Up              Up       default
Loopback10                              unassigned      Up              Up       default
Loopback11                              unassigned      Up              Up       default
Loopback12                              unassigned      Up              Up       default
Loopback13                              unassigned      Up              Up       default
....
MgmtEth0/RP1/CPU0/0                     4.15.10.145     Up              Up       default
HundredGigE0/0/0/0                      unassigned      Up              Up       default
HundredGigE0/0/0/1                      unassigned      Up              Up       default
HundredGigE0/0/0/2                      unassigned      Up              Up       default
HundredGigE0/0/0/3                      unassigned      Up              Up       default
HundredGigE0/0/0/4                      10.0.4.1        Up              Up       default
....
TenGigE0/1/0/0                           10.1.0.1        Up              Up       default
TenGigE0/1/0/1                           10.1.1.1        Up              Up       default
TenGigE0/1/0/2                           10.1.2.1        Up              Up       default
TenGigE0/1/0/3                           10.1.3.1        Up              Up       default
TenGigE0/1/0/4                           10.1.4.1        Up              Up       default
....
```

## Shut Down Unused Linecard Slices

The NCS 6000 linecards, namely, NCS 6000 10x100G Multi-Service CPAK, NCS 6000 10x100G Multi-Service CXP, and NCS 6000 60x10GE PAT, have multi-slice architecture. The 10X100G line cards has 5 slices, whereas the 60X10G line cards has 4 slices. Each slice can be individually shut down:

- To save power- Shutting down a slice will power down the slice. This will reduce the power consumption of that line card. The mode of operating line cards with one or more slices shut is called the green mode.



**Note** Shutting down a slice will also delete the Virtual Output Queue (VOQ) and this drops the ingress-traffic.

- For troubleshooting - If a slice is malfunctioning, shutting it down isolates the slice from the system, thus reducing its impact on the router. Also, troubleshooting can be done within the domain of the slice.

## SUMMARY STEPS

1. **configure**
2. **hw-module location** *rack/slot/CPU slice slice\_number shutdown*
3. Use the **commit** or **end** command.

## DETAILED STEPS

### Step 1 **configure**

#### Example:

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

Enters XR Config mode.

### Step 2 **hw-module location** *rack/slot/CPU slice slice\_number shutdown*

#### Example:

```
RP/0/RP0/CPU0:router(config)#hw-module location 0/1/CPU0 slice 3 shutdown
```

Shuts down the specified slice. The interfaces belonging to the slice that is shut down are deleted from the system and are not visible in the output of the **show interfaces brief** command.

### 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.

### What to do next

To make a shutdown slice operational, use the **no hw-module location** *rack/slot/CPU slice slice\_number shutdown* command.

Verify the slice shut down using **show platform** in XR VM or **show platform slices** in System Admin VM.

# Perform Clock Synchronization with NTP Server

There are independent system clocks for the XR VM and the System Admin VM. To ensure that these clocks do not deviate from true time, they need to be synchronized with the clock of a NTP server. In this task you

will configure a NTP server for the XR VM. After the XR VM clock is synchronized, the System Admin VM clock will automatically synchronize with the XR VM clock.

### Before you begin

Configure and connect to the XR VM management port.

## SUMMARY STEPS

1. **configure**
2. **ntp server** *server\_address*
3. **commit**
4. **exit**
5. **sh run ntp**

## DETAILED STEPS

### Step 1 **configure**

#### Example:

```
RP/0/RP0/CPU0:router# configure
Enters XR Config mode.
```

### Step 2 **ntp server** *server\_address*

#### Example:

The XR VM clock is configured to be synchronized with the specified sever.

```
RP/0/RP0/CPU0:router#ntp server 64.90.182.55
```

The System Admin VM clock is configured to be synchronized with the specified sever.

```
sysadmin-vm:0_RP0#ntp server 64.90.182.55
```

### Step 3 **commit**

### Step 4 **exit**

### Step 5 **sh run ntp**

#### Example:

```
RP/0/RP0/CPU0:router#sh run ntp

ntp
server 202.153.144.25
!
```