

Perform Disaster Recovery

This chapters covers details on performing disaster recovery using hard disk recovery partition and USB boot process.

- Create a Bootable USB Drive, on page 1
- Boot the Router Using USB, on page 4
- Perform System Upgrade Using USB, on page 6

Create a Bootable USB Drive

The bootable USB drive is used to re-image the router for the purpose of system upgrade or for booting the router in case of boot failure. The bootable USB drive can be created in two ways:

Create a Bootable USB Drive Using Compressed Boot File

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.

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

Before you begin

- Have access to a USB drive with a storage capacity that is between 2GB (min) and 32 GB (max). USB 2.0 and USB 3.0 are supported.
- Copy the compressed boot file from the software download page at cisco.com to your local machine. The file name for the compressed boot file is in the format *ncs4k-usb-boot-<release_number>.zip*. For example, *ncs4k-usb-boot-5.2.3.zip*.

SUMMARY STEPS

1. Connect the USB drive to your local machine and format it with FAT32 file system.
2. Copy the compressed boot file to the USB drive.
3. Unzip the compressed boot file inside the USB drive.

4. The contents of the compressed boot file ("EFI" and "Boot" directories) should be extracted to the root of the USB drive. If they are extracted to a separate folder, move them to the root of the USB drive.

DETAILED STEPS

Procedure

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

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

Step 3 Unzip the compressed boot file inside the USB drive.

Step 4 The contents of the compressed boot file ("EFI" and "Boot" directories) should be extracted to the root of the USB drive. If they are extracted to a separate folder, move them to the root of the USB drive.

USB drive is bootable when the "EFI" and "Boot" directories are in the root of the USB drive.

What to do next

Use the bootable USB drive to boot the router or upgrade its image. See:

- Boot the Router Using USB, on page 4
- Perform System Upgrade Using USB, on page 6

Create Bootable USB Drive Using Shell Script

To create the bootable USB drive using shell script, you need an ISO image file and the shell script that creates the boot device. The shell script is already available on the router. Create the bootable USB drive as an preemptive measure when the router is operational. If the router is already unusable, create the bootable USB drive on another active router.



Note The contents of the USB drive is erased during the process of creating the bootable drive.

Before you begin

- Have access to a USB drive with a storage capacity that is between 2GB (min) and 32 GB (max). USB 2.0 and USB 3.0 are supported.
- The ISO image must be present on a network server.

SUMMARY STEPS

1. **copy tftp:***source* **disk1:***destination*
2. **dir /disk1:**
3. **run ls /usr/bin/usb-install.sh**

4. Connect the USB drive.
5. **run**
6. **tail /var/log/messages**
7. **cd** *directory path*
8. *<shell_script_file_name> <location_of_iso_image> <mount_location_of_USB_device>*

DETAILED STEPS

Procedure

Step 1 **copy tftp:***source* **disk1:***destination*

Example:

```
RP/0/RP0:hostname# copy tftp://223.255.254.254/image/ncs4k-mini-x.iso disk1\:/ncs4k-mini-x.iso
```

Copy the ISO image from a network server to the router hard disk.

Step 2 **dir /disk1:**

Example:

```
RP/0/RP0:hostname#dir /disk1:
```

Verify that the image is copied. The result of this command displays the ISO file name.

```
Directory of /disk1:/

    12 -rw-r--r-- 1  7864320 Jun 27 20:30 ncs4k-mini-x.iso
```

Step 3 **run ls /usr/bin/usb-install.sh**

Example:

```
RP/0/RP0:hostname# run ls /usr/bin/usb-install.sh
```

Verify that the shell script is available on the router. The *usb-install.sh* script must be present in the command output.

```
run ls /usr/bin/usb*.sh

430 -rwx------ 1 8456 Jun 20 23:30 /usr/bin/usb-install.sh
```

Step 4 Connect the USB drive.

The USB drive must be connected to the USB port on the RP to which the *iso* image has been copied. The USB port is shown in this figure.

Step 5 **run**

Example:

```
RP/0/RP0:hostname# run
```

Enters the XR VM Linux shell. The router prompt changes to:

```
[xr-vm_node0_RP0_CPU0:/]$
```

Step 6 **tail /var/log/messages**

Example:

```
[xr-vm_node0_RP0_CPU0:/]$ tail /var/log/messages
```

Identifies the device name to which the USB drive is been mapped. The USB drive is auto-discoverable on the XR VM shell.

```
...
...
Aug 16 18:56:07 xr-vm kernel: virtio-pci 0000:c0:08.0: setting latency timer to 64
Aug 16 18:56:07 xr-vm kernel: virtio-pci 0000:c0:08.0: irq 93 for MSI/MSI-X
Aug 16 18:56:07 xr-vm kernel: virtio-pci 0000:c0:08.0: irq 94 for MSI/MSI-X
Aug 16 18:56:07 xr-vm kernel:  vde: vde1
```

In this example, we identify from the last entry that the USB is mapped as "vde".

Step 7 **cd** *directory path*

Example:

[xr-vm_node0_RP0_CPU0:/]$ cd /usr/bin

Access the directory where the shell script is present.

Step 8 *<shell_script_file_name> <location_of_iso_image> <mount_location_of_USB_device>*

Example:

```
[xr-vm_node0_RP0_CPU0:/usr/bin]$ ./usb-install.sh /disk1:/ncs4k-mini-x.iso /dev/vde/
```

Runs the script to create the bootable USB drive. After the process is complete, this message is displayed:

```
USB stick set up for EFI boot!
```

What to do next

Use the bootable USB drive to boot the router or upgrade its image. See:

- Boot the Router Using USB, on page 4
- Perform System Upgrade Using USB, on page 6

Boot the Router Using USB

The router can be booted using an external bootable USB drive. This might be required when the router is unable to boot from the installed image. A boot failure may happen when the image gets corrupted. During the USB boot, process the router gets re-imaged with the version available on the USB drive.

The default boot sequence is USB disk, Sata disk, and PXE boot.

Note During the USB boot process, the router is completely re-imaged with the ISO image version present in the bootable USB drive. All existing configurations are deleted because the disk 0 content is erased. No optional packages are installed during the upgrade process; they need to be installed after the upgrade is complete.

When the USB boots to a new image, the second RP must be physically unplugged or must be powered off. Else, while reloading after installation of new image, the system will pickup the old image from the other card.

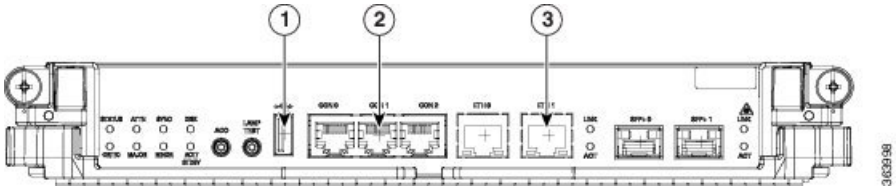
Before you begin

Create a bootable USB drive.

Procedure

Step 1 Connect the USB drive to an RP.

The USB port on the RP is shown in this figure.



1	External USB Port
2	XR VM Console Port
3	XR VM Management Port

Step 2 Connect to the console.

If it is not already connected, connect a terminal to the System Admin console port of the RP. If two RPs are installed on the router, connect to the System Admin console port of both RPs. Start the terminal emulation program on your workstation.

Step 3 Power on the router.

Step 4 Press F12 on the console of the RP to which the USB is not connected. This action displays the boot menu and pauses the boot process. The RP on which the USB is connected should boot normally.

Only the RP having the USB should boot. The booting of other RP is paused.

Step 5 Select the USB drive to boot from USB.

According to the default boot sequence, the USB drive is the first boot source. Because the USB device is already connected, the router automatically boots from it. During the boot process, the OS image is installed on the router so that in future the router boots without the USB.

According to the default boot sequence, the Sata disk is the first boot source and the USB drive is the second boot source. During the boot process, the OS image is installed on the router so that in future the router boots without the USB.

Step 6 Remove the USB drive.

After the initial boot sequences are completed, this message is displayed:

```
Running install image: Please reboot the system
```

On receiving this message, remove the USB drive.

Note
The USB drive should not be left connected on the router during regular operation. If the router reloads when the USB drive is connected, all existing configurations are deleted, as the router gets re-imaged.

Step 7 Press **Enter** to get the host prompt.

Step 8 Login to the host using *root* and *lab* as username and password respectively.

Example:

```
host login: root
Password:
```

If there is no space in the RP, a prompt to either cancel the installation, or to continue with formatting the disk is displayed.

The prompt changes to:

```
[Install image, reboot required host:~]$
```

Step 9 Run the **reboot** command.

Example:

```
[Install image, reboot required host:~]$ reboot
```

The RP reboots with the new image. After the booting is completed, specify the root-system username and password.

Step 10 Access the System Admin EXEC mode and reload the RP for which the boot process was paused in Step 4.

Example:

```
sysadmin-vm:0_RP0#hw-module location 0/RP1 reload
```

The shut down RP is reloaded and gets synchronized with the other RP running the new image.

What to do next

- After the booting process is complete, specify the root username and password.
- Install the required optional packages.

Perform System Upgrade Using USB

The router image can be upgraded using an external bootable USB drive. This may be required when the router is to be re-imaged, but the ISO image cannot be accessed over the network. It may happen when the network connectivity is unavailable.

Note During an upgrade, all existing configurations are deleted because the disk 0 content is erased.

Before you begin

- Create a bootable USB drive.
- Ensure that the router BIOS version is , 14.xx or higher.
  - Verify the BIOS version using the **show fpd package** command in the System Admin EXEC mode.
  - Verify the actual state of all field-programmable gate array (FPGA) of the system and whether it requires an upgrade or not using the **show hw-module fpd** command in System Admin EXEC mode.
  - If required, upgrade the BIOS using the **upgrade hw-module location all fpd BIOS\ FPD** command in the System Admin EXEC mode.

Procedure

Step 1 **hw-module location** *node-id* **shutdown**

Example:

```
sysadmin-vm:0_RP0#hw-module location 0/RP1 shutdown
```

Shut down one RP. In this example, the RP1 is shut down. During the system upgrade, only one RP should be operational.

Step 2 Connect the USB drive.

The USB drive must be connected to the USB port on the operational RP.

Step 3 *hw-module* **location** *node-id* **reload**

Example:

```
sysadmin-vm:0_RP0#hw-module location 0/RP0 reload
```

Reload the RP on which the USB is connected. As the RP reloads, it boots from the USB drive and gets re-imaged.

Step 4 Remove the USB drive.

After the initial boot sequences are complete, this message is displayed:

```
Running install image: Please reboot the system
```

On receiving this message, remove the USB drive.

Note
The USB drive should not be left connected on the router during regular operation. If the router reloads when the USB drive is connected, all existing configurations are deleted as the router gets re-imaged.

Step 5 Press **Enter** to get the host prompt.

Step 6 Login to the host using *root* and *lab* as username and password respectively.

Example:

```
host login: root
Password:
```

The prompt changes to:

```
[Install image, reboot required host:~]$
```

Step 7 Run the **reboot** command.

Example:

```
[Install image, reboot required host:~]$ reboot
```

The RP reboots with the new image. After the booting is completed, specify the root-system username and password.

Step 8 Access the System Admin EXEC mode and reload the RP that was shut down in Step 1.

Example:

```
sysadmin-vm:0_RP0#hw-module location 0/RP1 reload
```

The shut down RP is reloaded and gets synchronized with the other RP running the new image.

What to do next

- Run the **show version** command in the XR EXEC mode to verify that the new image version is successfully installed.
- Install the required optional packages.