

This article describes how to identify and resolve problems that might occur when upgrading or restarting.

Guide Contents

Troubleshooting Overview
Troubleshooting Installs, Upgrades, and Reboots (this section)
Troubleshooting Licensing
Troubleshooting VDCs
Troubleshooting CFS
Troubleshooting Ports
Troubleshooting vPCs
Troubleshooting VLANs
Troubleshooting STP
Troubleshooting Routing
Troubleshooting Unicast Traffic
Troubleshooting WCCP
Troubleshooting Memory
Troubleshooting Packet Flow Issues
Troubleshooting FCoE
Before Contacting Technical Support
Troubleshooting Tools and Methodology


Contents

- [1 Information About Upgrades and Reboots](#)
- [2 Upgrades and Reboot Checklist](#)
- [3 Verifying Software Upgrades](#)
- [4 Verifying a Nondisruptive Upgrade](#)
 - ◆ [4.1 Using ROM Monitor Mode](#)
- [5 Troubleshooting Software Upgrades and Downgrades](#)
 - ◆ [5.1 Software Upgrade Ends with Error](#)
 - ◆ [5.2 Upgrading Cisco NX-OS Software](#)
- [6 Troubleshooting Software System Reboots](#)
 - ◆ [6.1 Power-On or Switch Reboot Hangs](#)
 - ◆ [6.2 Corrupted Bootflash Recovery](#)
 - ◆ [6.3 Recovery from the loader> Prompt on Supervisor Modules](#)
 - ◆ [6.4 Recovery from the loader> Prompt](#)
 - ◆ [6.5 Recovery from the switch\(boot\)# Prompt](#)
 - ◆ [6.6 Recovery for Systems with Dual Supervisor Modules](#)
 - ◇ [6.6.1 Recovering One Supervisor Module With Corrupted Bootflash](#)
 - ◇ [6.6.2 Recovering Both Supervisor Modules with Corrupted Bootflash](#)
 - ◆ [6.7 System or Process Resets](#)
 - ◆ [6.8 Recoverable System Restarts](#)
 - ◆ [6.9 Unrecoverable System Restarts](#)
 - ◆ [6.10 Standby Supervisor Fails to Boot](#)
 - ◆ [6.11 Recovering the Administrator Password](#)
- [7 See Also](#)
- [8 Further Reading](#)
- [9 External Links](#)

Information About Upgrades and Reboots

Cisco NX-OS consists of two images--the kickstart image and the system image. In order to bring up the system, both images should have the same image version.

Upgrades and reboots are ongoing network maintenance activities. You should try to minimize the risk of disrupting the network when performing these operations in production environments and to know how to recover quickly when something does go wrong.


 **Note:** This publication used the term upgrade to refer to both Cisco NX-OS upgrades and downgrades.


Upgrades and Reboot Checklist

Use the following checklist to prepare for an upgrade:

Checklist	Check off
Read the Release Notes for the release that you are upgrading or downgrading to.	
Ensure that an FTP or TFTP server is available to download the software images.	
Copy the new image onto your supervisor modules in bootflash: or slot0:.	
Use the show install all impact command to verify that the new image is healthy and the impact that the new load will have on any hardware with regards to compatibility. Check for compatibility.	
Copy the startup-config file to a snapshot configuration in NVRAM. This step creates a backup copy of the startup-config file (see the Rollback chapter in the Cisco NX-OS System Management Configuration Guide).	
Save your running configuration to the startup configuration.	
Back up a copy of your configuration to a remote TFTP server.	
Schedule your upgrade during an appropriate maintenance window for your network.	

After you have completed the checklist, you are ready to upgrade the systems in your network.

 **Note:** It is normal for the active supervisor to become the standby supervisor during an upgrade.

 **Note:** Log messages are not saved across system reboots. However, a maximum of 100 log messages with a severity level of critical and below (levels 0, 1, and 2) are saved in NVRAM. You can view this log at any time by entering the **show logging nvram** command.

Verifying Software Upgrades

You can use the **show install all status** command to watch the progress of your software upgrade or to view the ongoing **install all** command or the log of the last installed **install all** command from a console, SSH, or Telnet session. This command shows the **install all** output on both the active and standby supervisor module even if you are not connected to the console terminal.

```
switch# show install all status
There is an on-going installation... <----- in progress installation
Enter Ctrl-C to go back to the prompt.
Verifying image bootflash:/b-4.0.0.104
-- SUCCESS
Verifying image bootflash:/i-4.0.0.104
```

```
-- SUCCESS
Extracting system version from image bootflash:/i-4.0.0.104.
-- SUCCESS
Extracting kickstart version from image bootflash:/b-4.0.0.104.
-- SUCCESS
Extracting loader version from image bootflash:/b-4.0.0.104.
-- SUCCESS
```

```
switch# show install all status
This is the log of last installation. <----- log of last install
Verifying image bootflash:/b-4.0.0.104
-- SUCCESS
Verifying image bootflash:/i-4.0.0.104
-- SUCCESS
Extracting system version from image bootflash:/i-4.0.0.104.
-- SUCCESS
Extracting kickstart version from image bootflash:/b-4.0.0.104.
-- SUCCESS
Extracting loader version from image bootflash:/b-4.0.0.104.
-- SUCCESS
```

Verifying a Nondisruptive Upgrade

When you initiate a nondisruptive upgrade, Cisco NX-OS notifies all services that an upgrade is about to start and finds out whether or not the upgrade can proceed. If a service cannot allow the upgrade to proceed at this time, then the service aborts the upgrade and you are prompted to enter the **show install all failure-reason** command to determine the reason why the upgrade cannot proceed.

```
Do you want to continue with the installation (y/n)? [n] y
Install is in progress, please wait.
Notifying services about the upgrade.
>[#          ] 0% -- FAIL. Return code 0x401E0066 (request timed out).
Please issue "show install all failure-reason" to find the cause of the failure.<---prompt failure
Install has failed. Return code 0x401E0066 (request timed out).
Please identify the cause of the failure, and try 'install all' again.
```

```
switch# show install all failure-reason
Service: "cfs" failed to respond within the given time period.
switch#
```

If a failure occurs for whatever reason (such as a save runtime state failure or module upgrade failure) after the upgrade is in progress, then the device reboots disruptively because the changes cannot be rolled back. In such cases, the upgrade has failed.

If you need further assistance to determine why an upgrade is unsuccessful, you should collect the details from the **show tech-support** command output and the console output from the installation, if available, before you contact your technical support representative.

Using ROM Monitor Mode

If your device does not find a valid system image to load, the system will start in ROM monitor mode. ROM monitor mode can also be accessed by interrupting the boot sequence during startup. From ROM monitor mode, you can boot the device or perform diagnostic tests.

On most systems, you can enter ROM monitor mode by entering the **reload EXEC** command and then pressing the Break key on your keyboard or by using the Break key-combination (the default Break key combination is Ctrl-C) during the first 60 seconds of startup.

Troubleshooting Software Upgrades and Downgrades

This section describes how to troubleshoot a software installation upgrade or downgrade failure.

Software Upgrade Ends with Error

Problem	Possible Cause	Solution
The upgrade ends with an error.	The standby supervisor module bootflash: file system does not have sufficient space to accept the updated image.	Use the delete command to remove unnecessary files from the file system.
	The specified system and kickstart images are not compatible.	Check the output of the installation process for details on the incompatibility. Possibly update the kickstart image before updating the system image.
	The install all command is entered on the standby supervisor module.	Enter the command on the active supervisor module only.
	A module was inserted while the upgrade was in progress.	<u>Restart the installation.</u>
	The system experienced a power disruption while the upgrade was in progress.	<u>Restart the installation.</u>
	An incorrect software image path was specified.	Specify the entire path for the remote location accurately.
	Another upgrade is already in progress.	Verify the state of the system at every stage and restart the upgrade after 10 seconds. If you restart the upgrade within 10 seconds, the command is rejected. An error message displays, indicating that an upgrade is currently in progress.
Module failed to upgrade.	<u>Restart the upgrade</u> or use the install module command to upgrade the failed module.	

Upgrading Cisco NX-OS Software

To perform an automated software upgrade on any system from the CLI, follow these steps:

1. Log into the system through the console, Telnet, or SSH port of the active supervisor.
2. Create a backup of your existing configuration file, if required.

3. Perform the upgrade by entering the **install all** command.
4. Exit the system console and open a new terminal session to view the upgraded supervisor module by using the **show module** command.

Tip: Always carefully read the output of the **install all compatibility check** command. This compatibility check tells you exactly what needs to be upgraded (such as the BIOS, loader, or firmware) and what modules will experience a disruptive upgrade. If there are any questions or concerns about the results of the output, type **n** to stop the installation and contact the next level of support.

The following example shows an upgrade using the **install all** command with the source images located on an SCP server.

```
switch# install all system scp://testuser@tftp-server1/tftpboot/rel/qa/4.0/final/m95 00-sf1ek9-mz.4.0.bin
kickstart scp://testuser@tftp-server1/tftpboot/rel/qa/4.0/final/n7000-s1-kickstart-mz.4.0.bin
```

```
For scp://testuser@tftp-server1, please enter password:
For scp://testuser@tftp-server1, please enter password:
```

```
Copying image from scp://testuser@pal/tftpboot/rel/qa/4.0/final/n7000-s1-kickstart-mz.4.0.bin to bootflash:///n7000-s1-kickstart-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Copying image from scp://testuser@pal/tftpboot/rel/qa/4.0/final/n7000-s1-mz.4.0.bin to bootflash:///n7000-s1-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Verifying image bootflash:///n7000-s1-kickstart-mz.4.0.bin
[#####] 100% -- SUCCESS
```

```
Verifying image bootflash:///n7000-s1-mz.4.0.bin
[#####] 100% -- SUCCESS
```

```
Extracting "slc" version from image bootflash:///n7000-s1-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Extracting "ips" version from image bootflash:///n7000-s1-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Extracting "svclc" version from image bootflash:///n7000-s1-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Extracting "system" version from image bootflash:///n7000-s1-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Extracting "kickstart" version from image bootflash:///n7000-s1-kickstart-mz.4.0.bin.
[#####] 100% -- SUCCESS
```

```
Extracting "loader" version from image bootflash:///n7000-s1-kickstart-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS
```

Compatibility check is done:

Module	bootable	Impact	Install-type	Reason
1	yes	non-disruptive	rolling	
2	yes	non-disruptive	rolling	
3	yes	disruptive	rolling	Hitless upgrade is not supported
4	yes	disruptive	rolling	Hitless upgrade is not supported
5	yes	non-disruptive	reset	

```
6          yes non-disruptive          reset
```

Images will be upgraded according to following table:

Module	Image	Running-Version	New-Version	Upg-Required
1	slc	2.0(2b)	2.1(1a)	yes
1	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
2	slc	2.0(2b)	2.1(1a)	yes
2	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
3	ips	2.0(2b)	2.1(1a)	yes
3	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
4	svclc	2.0(2b)	2.1(1a)	yes
4	svcsb	1.3(5m)	1.3(5m)	no
4	svcsb	1.3(5m)	1.3(5m)	no
4	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
5	system	2.0(2b)	2.1(1a)	yes
5	kickstart	2.0(2b)	2.1(1a)	yes
5	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
5	loader	1.2(2)	1.2(2)	no
6	system	2.0(2b)	2.1(1a)	yes
6	kickstart	2.0(2b)	2.1(1a)	yes
6	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
6	loader	1.2(2)	1.2(2)	no

```
Do you want to continue with the installation (y/n)? [n] ''y''
Install is in progress, please wait.
```

```
Syncing image bootflash:///n7000-s1-kickstart-mz.4.0.bin to standby.
[#####] 100% -- SUCCESS
```

```
Syncing image bootflash:///n7000-s1-mz.4.0.bin to standby.
[#####] 100% -- SUCCESS
```

```
Setting boot variables.
[#####] 100% -- SUCCESS
```

```
Performing configuration copy.
[#####] 100% -- SUCCESS
```

```
Module 5: Waiting for module online.
2005 May 20 15:46:03 ca-9506 %KERN-2-SYSTEM_MSG: mts: HA communication with standby terminated. P
-- SUCCESS
```

```
"Switching over onto standby".
```

If the configuration meets all guidelines when the **install all** command is used, all modules (supervisor and switching) are upgraded.

Troubleshooting Software System Reboots

This section describes how to troubleshoot software reboots.

Power-On or Switch Reboot Hangs

Problem	Possible Cause	Solution
A power-on or switch reboot hangs for a dual	The bootflash is corrupted.	Use the Recovery for Systems with Dual Supervisor Modules procedure.

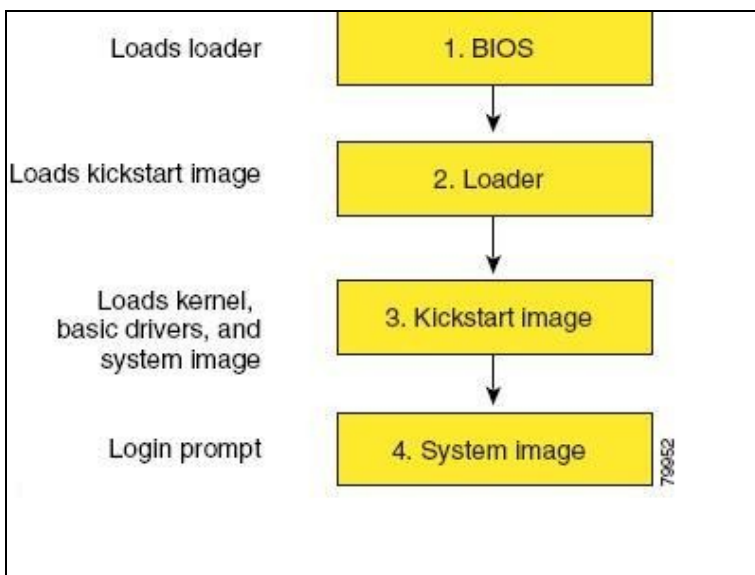
supervisor configuration.	The BIOS is corrupted.	Replace this module. Contact your customer support representative to return the failed module.
	The kickstart image is corrupted.	Power cycle the switch if required and enter CTRL-C when the switch says "Loading Boot Loader" to interrupt the boot process at the >loader prompt. Use the Recovery from the loader> Prompt on Supervisor Modules procedure to update the kickstart image.
	Boot parameters are incorrect.	Verify and correct the boot parameters and reboot.
	The system image is corrupted.	Power cycle the switch if required and enter CTRL-] when the switch says "Checking all filesystems....r. done." to interrupt the boot process at the switch#boot prompt. Use the Recovery from the switch(boot)# Prompt procedure to update the system image..

Corrupted Bootflash Recovery


All device configurations reside in the internal bootflash. If you have a corrupted internal bootflash, you could potentially lose your configuration. Be sure to save and back up your configuration files periodically. The regular system boot goes through the following sequence (see Figure 1):

1. The basic input/output system (BIOS) loads the loader.
2. The loader loads the kickstart image into RAM and starts the kickstart image.
3. The kickstart image loads and starts the system image.
4. The system image reads the startup-configuration file.

Figure 1 Regular Boot Sequence



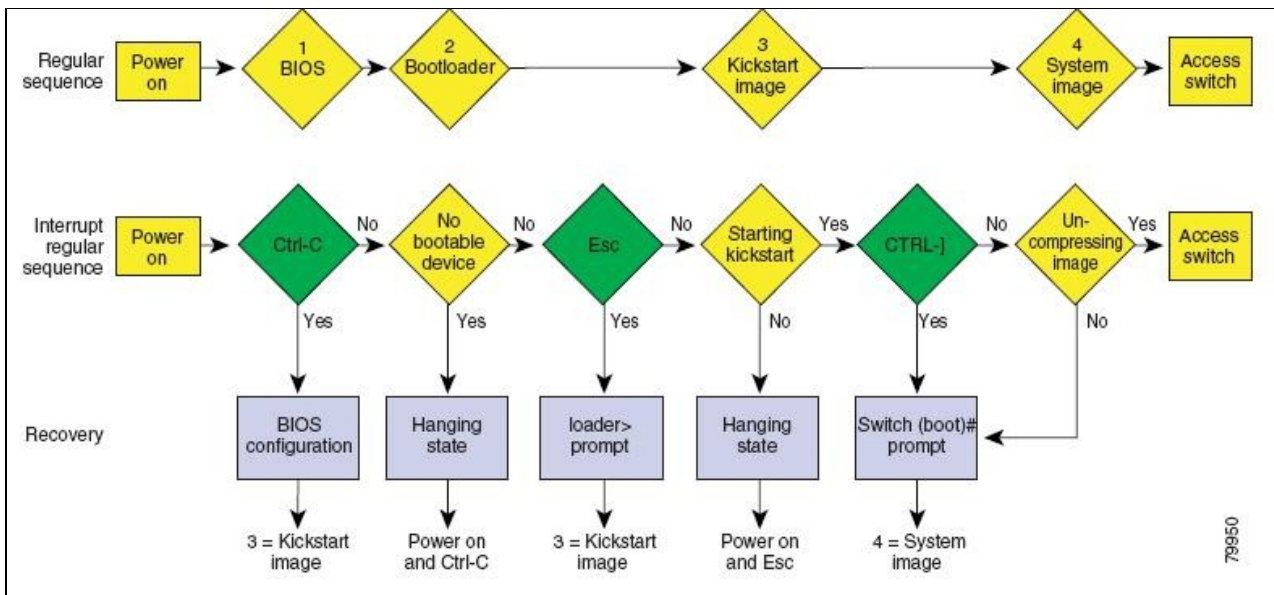
If the images on your system are corrupted and you cannot proceed (error state), you can interrupt the system boot sequence and recover the image by entering the BIOS configuration utility described in the following section. Access this utility only when needed to recover a corrupted internal disk.

 **Caution:** The BIOS changes explained in this section are required only to recover a corrupted bootflash.

Recovery procedures require the regular sequence to be interrupted. The internal sequence goes through four phases between the time that you turn on the system and the time that the system prompt appears on your terminal--BIOS, boot loader, kickstart, and system.

Recovery Interruption			
Phase	Normal Prompt --appears at the end of each phase.	Recovery Prompt --appears when the system cannot progress to the next phase.	Description
BIOS	loader>	No bootable device	The BIOS begins the power-on self test, memory test, and other operating system applications. While the test is in progress, press Ctrl-C to enter the BIOS configuration utility and use the netboot option.
Boot loader	Starting kickstart	loader>	The boot loader uncompresses the loaded software to boot an image using its filename as a reference. These images are made available through bootflash. When the memory test is over, press Esc to enter the boot loader prompt.
Kickstart	Uncompressing system	switch(boot)#	When the boot loader phase is over, press Ctrl-] (Control key plus right bracket key) to enter the switch(boot)# prompt. Depending on your Telnet client, these keys may be reserved, and you may need to remap the keystroke. See the documentation provided by your Telnet client. If the corruption causes the console to stop at this prompt, copy the system image and reboot the system.
System	Login:	--	The system image loads the configuration file of the last saved running configuration and returns a switch login prompt.

Figure 2 Regular and Recovery Sequence



Recovery from the loader> Prompt on Supervisor Modules

Caution: This procedure uses the **init system** command, which reformats the file system of the device. Be sure that you have made a backup of the configuration files before you begin this procedure. The loader> prompt is different from the regular switch# prompt. The CLI command completion feature does not work at the loader> prompt and may result in undesired errors. You must type the command exactly as you want the command to appear.

Note: If you boot over TFTP from the loader> prompt, you must supply the full path to the image on the remote server.

Note: The TFTP boot method is available only as a backup for diagnostics and for repairing bootflash corruption. The TFTP boot method is not intended to bring up the system to a fully operational state. Reloading the system is mandatory after all diagnostics and repairs have been completed.

Use the **help** command at the loader> prompt to display a list of commands available at this prompt or to obtain more information about a specific command in that list.

To recover a corrupted kickstart image (system error state) for a system with a single supervisor module, follow these steps:

1. Enter the local IP address and subnet mask for the system at the loader> prompt, and press **Enter**.

```
loader> set ip 172.16.1.2 255.255.255.0
```

2. Specify the IP address of the default gateway.

```
loader> set gw 172.16.1.1
```

3. Boot the kickstart image file from the required server.


```
loader> boot tftp://172.16.10.100/tftpboot/n7000-s1-kickstart-4.0.bin
```

In this example, 172.16.10.100 is the IP address of the TFTP server, and n7000-s1-kickstart-4.0.bin is the name of the kickstart image file that exists on that server.


The switch(boot)# prompt indicates that you have a usable Kickstart image.


4. Enter the **init system** command at the switch(boot) # prompt.


```
switch(boot) # init system
```

 **Caution:** Be sure that you have made a backup of the configuration files before you enter this command.
5. Follow the procedure specified in the [Recovery from the switch\(boot\)# Prompt](#) procedure.

Recovery from the loader> Prompt

 **Caution:** This procedure uses the **init system** command, which reformats the file system of the device. Be sure that you have made a backup of the configuration files before you begin this procedure.

 **Note:** The loader>prompt is different from the regular switch# or switch(boot)# prompt. The CLI command completion feature does not work at the loader> prompt and may result in undesired errors. You must type the command exactly as you want the command to appear.

 **Note:** If you boot over TFTP from the loader> prompt, you must supply the full path to the image on the remote server.

Tip: Use the **help** command at the loader> prompt to display a list of commands available at this prompt or to obtain more information about a specific command in that list.

To recover a corrupted kickstart image (system error state) for a system with a single supervisor module, follow these steps:

1. Specify the local IP address and the subnet mask for the system.

```
loader> set ip 172.21.55.213 255.255.255.224
set ip 172.21.55.213 255.255.255.224
Correct - ip addr is 172.21.55.213, mask is 255.255.255.224
Found Intel 82546GB [2:9.0] at 0xe040, ROM address 0xf980
Probing... [Intel 82546GB]
Management interface
Link UP in 1000/full mode
Ethernet addr: 00:1B:54:C1:28:60
Address: 172.21.55.213
Netmask: 255.255.255.224
Server: 0.0.0.0
Gateway: 172.21.55.193
```

2. Specify the IP address of the default gateway.

```
loader> set gw 172.21.55.193
Correct gateway addr 172.21.55.193
Address: 172.21.55.213
Netmask: 255.255.255.224
Server: 0.0.0.0
Gateway: 172.21.55.193
```

3. Boot the kickstart image file from the required server.

```

loader> loader> '''boot tftp://172.28.255.18/tftpboot/n7000-s1-kickstart.4.0.3.gbin '''
Address: 172.21.55.213
Netmask: 255.255.255.224
Server: 172.28.255.18
Gateway: 172.21.55.193
Filesystem type is tftp, using whole disk
Booting: /tftpboot/n7000-s1-kickstart.4.0.3.gbin console=ttyS0,9600n8nn quiet loader
_ver="3.17.0"....
.....Im
age verification OK

Starting kernel...
INIT: version 2.85 booting
Checking all filesystems..r.r.r.. done.
Setting kernel variables: sysctlnet.ipv4.ip_forward = 0
net.ipv4.ip_default_ttl = 64
net.ipv4.ip_no_pmtu_disc = 1
.
Setting the System Clock using the Hardware Clock as reference...System Clock set. Local time: We
11:20:11 PST 2008
WARNING: image sync is going to be disabled after a loader netboot
Loading system software
No system image Unexporting directories for NFS kernel daemon...done.
INIT: Sending processes the KILL signal
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2008, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
switch(boot)#

```

The switch(boot)# prompt indicates that you have a usable kickstart image.

4. Enter the **init system** command at the switch(boot)# prompt.

```
switch(boot)# init system
```



Caution: Be sure that you have made a backup of the configuration files before you enter this command.

5. Follow the procedure specified in the [Recovery from the switch\(boot\)# Prompt](#).

Recovery from the switch(boot)# Prompt

To recover a system image using the kickstart image for a system with a single supervisor module, follow these steps:

1. Change to configuration mode and configure the IP address of the mgmt0 interface.

```
switch(boot)# config t
switch(boot) (config)# interface mgmt0
```

2. Follow this step if you entered an **init system** command. Otherwise, skip to Step 3.

- a. Enter the **ip address** command to configure the local IP address and the subnet mask for the system.

```
switch(boot) (config-mgmt0) # ip address 172.16.1.2 255.255.255.0
```

- b. Enter the **ip default-gateway** command to configure the IP address of the default gateway.

```
switch(boot) (config-mgmt0) # ip default-gateway 172.16.1.1
```

3. Enter the **no shutdown** command to enable the mgmt0 interface on the system.

```
switch(boot) (config-mgmt0) # no shutdown
```

4. Enter **end** to exit to EXEC mode.

```
switch(boot) (config-mgmt0) # end
```

5. If you believe there are file system problems, enter the **init system check-filesystem** command. This command checks all internal file systems and fixes any errors that are encountered. This command takes a few minutes to complete.

```
switch(boot) # init system check-filesystem
```

6. Copy the system image from the required TFTP server.

```
switch(boot) # copy tftp://172.16.10.100/system-image1 bootflash:system-image1
```

7. Copy the kickstart image from the required TFTP server.

```
switch(boot) # copy tftp://172.16.10.100/kickstart-image1 bootflash:kickstart-image1
```

8. Verify that the system and kickstart image files are copied to your bootflash: file system.


```
switch(boot) #''' dir bootflash: '''
12456448      Jul 30 23:05:28 1980  kickstart-image1
12288        Jun 23 14:58:44 1980  lost+found/
27602159     Jul 30 23:05:16 1980  system-image1
```

```
Usage for bootflash://sup-local
 135404544 bytes used
  49155072 bytes free
 184559616 bytes total
```

9. Load the system image from the bootflash: files system.

```
switch(boot) # '''load bootflash:system-image1'''
Uncompressing system image: bootflash:/system-image1
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
```

```
Would you like to enter the initial configuration mode? (yes/no): yes
```

 **Note:** If you enter **no**, you will return to the switch# login prompt, and you must manually configure the system.

Recovery for Systems with Dual Supervisor Modules


This section describes how to recover when one or both supervisor modules in a dual supervisor system have corrupted bootflash.

Recovering One Supervisor Module With Corrupted Bootflash

If one supervisor module has a functioning bootflash and the other has a corrupted bootflash, follow these steps:

1. Boot the functioning supervisor module and log on to the system.
2. At the switch# prompt on the booted supervisor module, enter the **reload module slot force-dnld** command, where *slot* is the slot number of the supervisor module with the corrupted bootflash.


The supervisor module with the corrupted bootflash performs a netboot and checks the bootflash for corruption. When the bootup scripts discover that the bootflash is corrupted, it generates an **init system** command, which fixes the corrupt bootflash. The supervisor boots as the HA Standby.

 **Caution:** If your system has an active supervisor module currently running, you must enter the **system standby manual-boot** command in EXEC mode on the active supervisor module before entering the **init system** command on the standby supervisor module to avoid corrupting the internal bootflash. After the **init system** command completes on the standby supervisor module, enter the **system no standby manual-boot** command in EXEC mode on the active supervisor module.


Recovering Both Supervisor Modules with Corrupted Bootflash

If both supervisor modules have corrupted bootflash, follow these steps:

1. Boot the system and press the **Esc** key after the BIOS memory test to interrupt the boot loader.

 **Note:** Press **Esc** immediately after you see the following message: 00000589K Low Memory Passed00000000K Ext Memory PassedHit ^C if you want to run SETUP....Wait....If you wait too long, you will skip the boot loader phase and enter the kickstart phase.

You see the loader> prompt.

 **Caution:** The loader> prompt is different from the regular switch# or switch(boot)# prompt. The CLI command completion feature does not work at the loader> prompt and may result in undesired errors. You must type the command exactly as you want the command to appear.

Tip: Use the **help** command at the loader> prompt to display a list of commands available at this prompt or to obtain more information about a specific command in that list.

2. Specify the local IP address and the subnet mask for the system.

```
loader> set ip 172.21.55.213 255.255.255.224
set ip 172.21.55.213 255.255.255.224
Correct - ip addr is 172.21.55.213, mask is 255.255.255.224
Found Intel 82546GB [2:9.0] at 0xe040, ROM address 0xf980
Probing...[Intel 82546GB]
Management interface
Link UP in 1000/full mode
```

```
Ethernet addr: 00:1B:54:C1:28:60
Address: 172.21.55.213
Netmask: 255.255.255.224
Server: 0.0.0.0
Gateway: 172.21.55.193
```

3. Specify the IP address of the default gateway.

```
loader> set gw 172.21.55.193
Correct gateway addr 172.21.55.193
Address: 172.21.55.213
Netmask: 255.255.255.224
Server: 0.0.0.0
Gateway: 172.21.55.193
```

4. Boot the kickstart image file from the required server.

```
loader> loader> '''boot tftp://172.28.255.18/tftpboot/n7000-s1-kickstart.4.0.3.gbin '''
Address: 172.21.55.213
Netmask: 255.255.255.224
Server: 172.28.255.18
Gateway: 172.21.55.193
Filesystem type is tftp, using whole disk
Booting: /tftpboot/n7000-s1-kickstart.4.0.3.gbin console=ttyS0,9600n8nn quiet loader
_ver="3.17.0"....
.....Im
age verification OK


Starting kernel...
INIT: version 2.85 booting
Checking all filesystems..r.r.r.. done.
Setting kernel variables: sysctlnet.ipv4.ip_forward = 0
net.ipv4.ip_default_ttl = 64
net.ipv4.ip_no_pmtu_disc = 1
.
Setting the System Clock using the Hardware Clock as reference...System Clock set. Local time: We
11:20:11 PST 2008
WARNING: image sync is going to be disabled after a loader netboot
Loading system software
No system image Unexporting directories for NFS kernel daemon...done.
INIT: Sending processes the KILL signal
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
switch(boot)#
```

The switch(boot)# prompt indicates that you have a usable kickstart image.

 **Note:** If you boot over TFTP from the loader> prompt, you must supply the full path to the image on the remote server.

5. Enter the **init-system** command to repartition and format the bootflash.

6. Perform the steps in the [Recovery from the switch\(boot\)# Prompt](#) procedure.
7. Perform the steps in the [Recovering One Supervisor Module With Corrupted Bootflash](#) procedure to recover the other supervisor module.

 **Note:** If you do not enter the **reload module** command when a boot failure has occurred, the active supervisor module automatically reloads the standby supervisor module within 3 to 6 minutes after the failure.

System or Process Resets

When a recoverable or nonrecoverable error occurs, the system or a process on the system may reset. See Table 2-4 for possible causes and solutions.

Problem	Possible Cause	Solution
The system or a process on the system resets.	A recoverable error occurred on the system or on a process in the system.	The system has automatically recovered from the problem. Use the Recoverable System Restarts procedure and the System or Process Resets procedure.
	A nonrecoverable error occurred on the system.	The system cannot recover automatically from the problem. Use the Recoverable System Restarts procedure to determine the cause.
	A clock module failed.	Verify that a clock module failed. Replace the failed clock module during the next maintenance window.

Recoverable System Restarts

Every process restart generates a syslog message and a Call Home event. Even if the event does not affect service, you should identify and resolve the condition immediately because future occurrences could cause a service interruption.

To respond to a recoverable system restart, follow these steps:

1. Check the syslog file to see which process restarted and why it restarted.

```
switch# show log logfile | include error
```

For information about the meaning of each message, see the [Cisco NX-OS System Messages Reference](#). The system output looks like the following example:

```
Sep 10 23:31:31 dot-6 % LOG_SYSMGR-3-SERVICE_TERMINATED: Service "sensor" (PID 704) has finished w
code SYSMGR_EXITCODE_SY.
switch# show logging logfile | include fail
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 0.0.0.0, in_classd=0 flags=1 fails: Address already in use
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 127.0.0.1, in_classd=0 flags=0 fails: Address already in use
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 127.1.1.1, in_classd=0 flags=1 fails: Address already in use
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 172.22.93.88, in_classd=0 flags=1 fails: Address already in use
Jan 27 23:18:59 88 % LOG_PORT-5-IF_DOWN: Interface fc1/13 is down (Link failure
or not-connected)
Jan 27 23:18:59 88 % LOG_PORT-5-IF_DOWN: Interface fc1/14 is down (Link failure
or not-connected)
Jan 28 00:55:12 88 % LOG_PORT-5-IF_DOWN: Interface fc1/1 is down (Link failure o
```

```

r not-connected)
Jan 28 00:58:06 88 % LOG_ZONE-2-ZS_MERGE_FAILED: Zone merge failure, Isolating p
ort fc1/1 (VSAN 100)
Jan 28 00:58:44 88 % LOG_ZONE-2-ZS_MERGE_FAILED: Zone merge failure, Isolating p
ort fc1/1 (VSAN 100)
Jan 28 03:26:38 88 % LOG_ZONE-2-ZS_MERGE_FAILED: Zone merge failure, Isolating p
ort fc1/1 (VSAN 100)
Jan 29 19:01:34 88 % LOG_PORT-5-IF_DOWN: Interface fc1/1 is down (Link failure o
r not-connected)
switch#


```

2. Identify the processes that are running and the status of each process.

```
switch# show processes
```

The following codes are used in the system output for the state (process state):

- D = uninterruptible sleep (usually I/O)
- R = runnable (on run queue)
- S = sleeping
- T = traced or stopped
- Z = defunct (zombie) process
- NR = notrunning
- ER = should be running but currently notrunning

 **Note:** ER usually is the state that a process enters if it has been restarted too many times and has been detected as faulty by the system and disabled.

The system output looks like the following example. (This output has been abbreviated to be more concise.)

PID	State	PC	Start_cnt	TTY	Process
1	S	2ab8e33e	1	-	init
2	S	0	1	-	keventd
3	S	0	1	-	ksoftirqd_CPU0
4	S	0	1	-	kswpd
5	S	0	1	-	bdf flush
6	S	0	1	-	kupdated
71	S	0	1	-	kjournald
136	S	0	1	-	kjournald
140	S	0	1	-	kjournald
431	S	2abe333e	1	-	httpd
443	S	2abfd33e	1	-	xinetd
446	S	2ac1e33e	1	-	sysmgr
452	S	2abe91a2	1	-	httpd
453	S	2abe91a2	1	-	httpd
456	S	2ac73419	1	S0	vsh
469	S	2abe91a2	1	-	httpd
470	S	2abe91a2	1	-	httpd

3. Show the processes that have had abnormal exits and to if there is a stack-trace or core dump.

```
switch# show process log
```

Process	PID	Normal-exit	Stack-trace	Core	Log-create-time
ntp	919	N	N	N	Jan 27 04:08
nsm	972	N	Y	N	Jan 24 20:50

4. Show detailed information about a specific process that has restarted.

```

switch# show processes log pid 898
Service: idehsd
Description: ide hotswap handler Daemon
Started at Mon Sep 16 14:56:04 2002 (390923 us)
Stopped at Thu Sep 19 14:18:42 2002 (639239 us)
Uptime: 2 days 23 hours 22 minutes 22 seconds
Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGTERM (3)
Exit code: signal 15 (no core)
CWD: /var/sysmgr/work
Virtual Memory:
CODE      08048000 - 0804D660
  DATA   0804E660 - 0804E824
  BRK     0804E9A0 - 08050000
  STACK   7FFFFFFD10
Register Set:
EBX 00000003      ECX 0804E994      EDX 00000008
  ESI 00000005      EDI 7FFFFFFC9C      EBP 7FFFFFFCAC
  EAX 00000008      XDS 0000002B      XES 0000002B
  EAX 00000003 (orig)  EIP 2ABF5EF4      XCS 00000023
  EFL 00000246      ESP 7FFFFFFC5C      XSS 0000002B
Stack: 128 bytes. ESP 7FFFFFFC5C, TOP 7FFFFFFD10
0x7FFFFFFC5C: 0804F990 0804C416 00000003 0804E994 .....
0x7FFFFFFC6C: 00000008 0804BF95 2AC451E0 2AAC24A4 .....Q.*.$.*
0x7FFFFFFC7C: 7FFFFFFD14 2AC2C581 0804E6BC 7FFFFFFCA8 .....*.....
0x7FFFFFFC8C: 7FFFFFFC94 00000003 00000001 00000003 .....
0x7FFFFFFC9C: 00000001 00000000 00000068 00000000 .....h.....
0x7FFFFFFCAC: 7FFFFFFCE8 2AB4F819 00000001 7FFFFFFD14 .....*.....
0x7FFFFFFCBC: 7FFFFFFD1C 0804C470 00000000 7FFFFFFCE8 ...p.....
0x7FFFFFFCCC: 2AB4F7E9 2AAC1F00 00000001 08048A2C ...*....*,...
PID: 898
SAP: 0
UUID: 0
switch#

```

5. Determine if the restart recently occurred.

```

switch# show system uptime
Start Time: Fri Sep 13 12:38:39 2002
Up Time:    0 days, 1 hours, 16 minutes, 22 seconds

```

To determine if the restart is repetitive or a one-time occurrence, compare the length of time that the system has been up with the time stamp of each restart.

6. View the core files.

```

switch# show cores
Module-num      Process-name      PID      Core-create-time
-----
5                fspf              1524     Jan 9 03:11
6                fcc               919      Jan 9 03:09
8                acltcam           285      Jan 9 03:09
8                fib               283      Jan 9 03:08

```

The output shows all cores that are presently available for upload from the active supervisor. The

module-num column shows the slot number on which the core was generated. In the previous example, an FSPF core was generated on the active supervisor module in slot 5. An FCC core was generated on the standby supervisory module in slot 6. Core dumps generated on the module in slot 8 include ACLTCAM and FIB.

Copy the FSPF core dump to a TFTP server with the IP address 1.1.1.1, as follows:

```
switch# copy core://5/1524 tftp://1.1.1.1/abcd
```

Display the file named zone_server_log.889 in the log directory as follows:

```
switch# '''show pro log pid 1473'''
=====
Service: ips
Description: IPS Manager

Started at Tue Jan  8 17:07:42 1980 (757583 us)
Stopped at Thu Jan 10 06:16:45 1980 (83451 us)
Uptime: 1 days 13 hours 9 minutes 9 seconds

Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGNAL (2)
Exit code: signal 6 (core dumped)
CWD: /var/sysmgr/work
```

Virtual Memory:

```
CODE      08048000 - 080FB060
DATA      080FC060 - 080FCBA8
BRK       081795C0 - 081EC000
STACK     7FFFFFFF0
TOTAL     20952 KB
```

Register Set:

```
EBX 000005C1      ECX 00000006      EDX 2AD721E0
ESI 2AD701A8      EDI 08109308      EBP 7FFFFFF2EC
EAX 00000000      XDS 0000002B      XES 0000002B
EAX 00000025 (orig) EIP 2AC8CC71      XCS 00000023
EFL 00000207      ESP 7FFFFFF2C0    XSS 0000002B
```

Stack: 2608 bytes. ESP 7FFFFFF2C0, TOP 7FFFFFFCF0

```
0x7FFFFFF2C0: 2AC8C944 000005C1 00000006 2AC735E2 D..*.....5.*
0x7FFFFFF2D0: 2AC8C92C 2AD721E0 2AAB76F0 00000000 ,..*!.*.v.*....
0x7FFFFFF2E0: 7FFFFFF320 2AC8C920 2AC513F8 7FFFFFF42C ... ..*...*,...
0x7FFFFFF2F0: 2AC8E0BB 00000006 7FFFFFF320 00000000 ...*.... ..
0x7FFFFFF300: 2AC8DFF8 2AD721E0 08109308 2AC65AFC ...*!.*.....Z.*
0x7FFFFFF310: 00000393 2AC6A49C 2AC621CC 2AC513F8 .....*!.*...*
0x7FFFFFF320: 00000020 00000000 00000000 00000000 .....
0x7FFFFFF330: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF340: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF350: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF360: 00000000 00000000 00000000 00000000 .....
```

```

0x7FFFF370: 00000000 00000000 00000000 00000000 .....
0x7FFFF380: 00000000 00000000 00000000 00000000 .....
0x7FFFF390: 00000000 00000000 00000000 00000000 .....
0x7FFFF3A0: 00000002 7FFFF3F4 2AAB752D 2AC5154C .
... output abbreviated ...
Stack: 128 bytes. ESP 7FFFF830, TOP 7FFFFCD0

```

7. Enter the **system cores** `{[tftp://servername]/[path/] | scp://[username@]server[/path] | sftp://[username@]server[/path]} vrf {vrf-name | default | management} | slot0:[path]}` command to configure the system to use TFTP to send the core dump to a TFTP server.

This command causes the system to enable the automatic copy of core files to a TFTP server. For example, the following command sends the core files to the TFTP server with the IP address 10.1.1.1:

```
switch(config)# system cores tftp://10.1.1.1/cores
```

The following conditions apply:

- The core files are copied every 4 minutes. This time interval is not configurable.
- The copy of a specific core file to a TFTP server can be manually triggered, by using the command **copy core://module#/pid# tftp://tftp_ip_address/file_name**.
- The maximum number of times that a process can be restarted is part of the high-availability (HA) policy for any process. (This parameter is not configurable.) If the process restarts more than the maximum number of times, the older core files are overwritten.
- The maximum number of core files that can be saved for any process is part of the HA policy for any process. (This parameter is not configurable, and it is set to three.)

Note:

When using the **system cores** command with the **scp** or **sftp** option, you also need to generate a passwordless SSH using the following:

```
username admin keypair generate rsa force username admin keypair export bootflash:key_rsa rsa force copy
bootflash:key_rsa.pub scp://<userid>@<server>/<dir>/ vrf management
```

On the specified <server>, enter the following:

```
cat key_rsa.pub >> $HOME/.ssh/authorized_keys
```

8. Determine the cause and resolution for the restart condition by contacting your technical support representative and asking the representative to review your core dump.

See the [Cisco NX-OS High Availability and Redundancy Guide](#) for more information on high-availability policies.

Unrecoverable System Restarts

An unrecoverable system restart might occur in the following cases:

- A critical process fails and is not restartable.
- A process restarts more times than is allowed by the system configuration.
- A process restarts more frequently than is allowed by the system configuration.

The effect of a process reset is determined by the policy configured for each process. An unrecoverable reset may cause functionality loss, the active supervisor to restart, a supervisor switchover, or the system to restart.

To respond to an unrecoverable reset, see the [Troubleshooting Cisco NX-OS Software System Reboots](#) procedure.

The **show system reset-reason** command displays the following information:

- The last four reset-reason codes for the supervisor modules are displayed. If either supervisor module is absent, the reset-reason codes for that supervisor module are not displayed.
- The **show system reset-reason module number** command displays the last four reset-reason codes for a specific module in a given slot. If a module is absent, then the reset-reason codes for that module are not displayed.
- The overall history of when and why expected and unexpected reloads occur
- The time stamp of when the reset or reload occurred
- The reason for the reset or reload of a module
- The service that caused the reset or reload (not always available)
- The software version that was running at the time of the reset or reload

```
switch# show system reset-reason module 6
----- reset reason for Supervisor-module 6 (from Supervisor in slot 6) ---
1) At 281000 usecs after Wed Jun 25 20:16:34 2008
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 4.0(2.45)
2) At 791071 usecs after Wed Jun 25 20:04:50 2008
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 4.0(2.45)
3) At 70980 usecs after Wed Jun 25 19:55:52 2008
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 4.0(2)
4) At 891463 usecs after Wed Jun 18 23:44:48 2008
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 4.0(2)
```

Standby Supervisor Fails to Boot

The standby supervisor does not boot after an upgrade. You may see the following system message:

Error Message SYSMGR-2-STANDBY_BOOT_FAILED: Standby supervisor failed to boot up.

Explanation This message is printed if the standby supervisor doesn't complete its boot procedure (i.e. it doesn't reach the login prompt on the local console) 3 to 6 minutes after the loader has been loaded by the BIOS. This message is usually caused by boot variables not properly set for the standby supervisor. This message can also be caused by a user intentionally interrupting the boot procedure at the loader prompt (by means of pressing ESC).

Recommended Action Connect to the local console of the standby supervisor. If the supervisor is at the loader prompt, try to use the **boot** command to continue the boot procedure. Otherwise, issue a **reload** command for the standby supervisor from a vsh session on the active supervisor, specifying the **force-dnld** option. Once the standby is online, fix the problem by setting the boot variables appropriately.

Symptom	Possible Cause	Solution
Standby supervisor does not boot.	Active supervisor kickstart image booted from TFTP.	Reload the active supervisor from bootflash:.

Recovering the Administrator Password

You can access the system if you forget the administrator password.

Problem	Solution
You forgot the administrator password for accessing.	Use the Password Recovery procedure to recover the password using a local console connection.

See Also

[Cisco NX-OS/IOS Configuration Fundamentals Comparison](#)

Further Reading

The following links contain further information on this topic from Cisco.com:

[Cisco Nexus 7000 Series Upgrade/Downgrade Guides](#)

[Cisco Nexus 7000 Series Release Notes](#)

External Links

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[Nexus 7000 NX-OS Upgrade \(walkthru example\)](#)

[NX-OS Intro \(part 1\) \(video\)](#)