Recover Legacy Catalyst Fixed Switches from Corrupt Images

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Introduction

This document describes how to recover Cisco Legacy Catalyst Fixed switches from a corrupt system image or an incorrectly set boot variable.

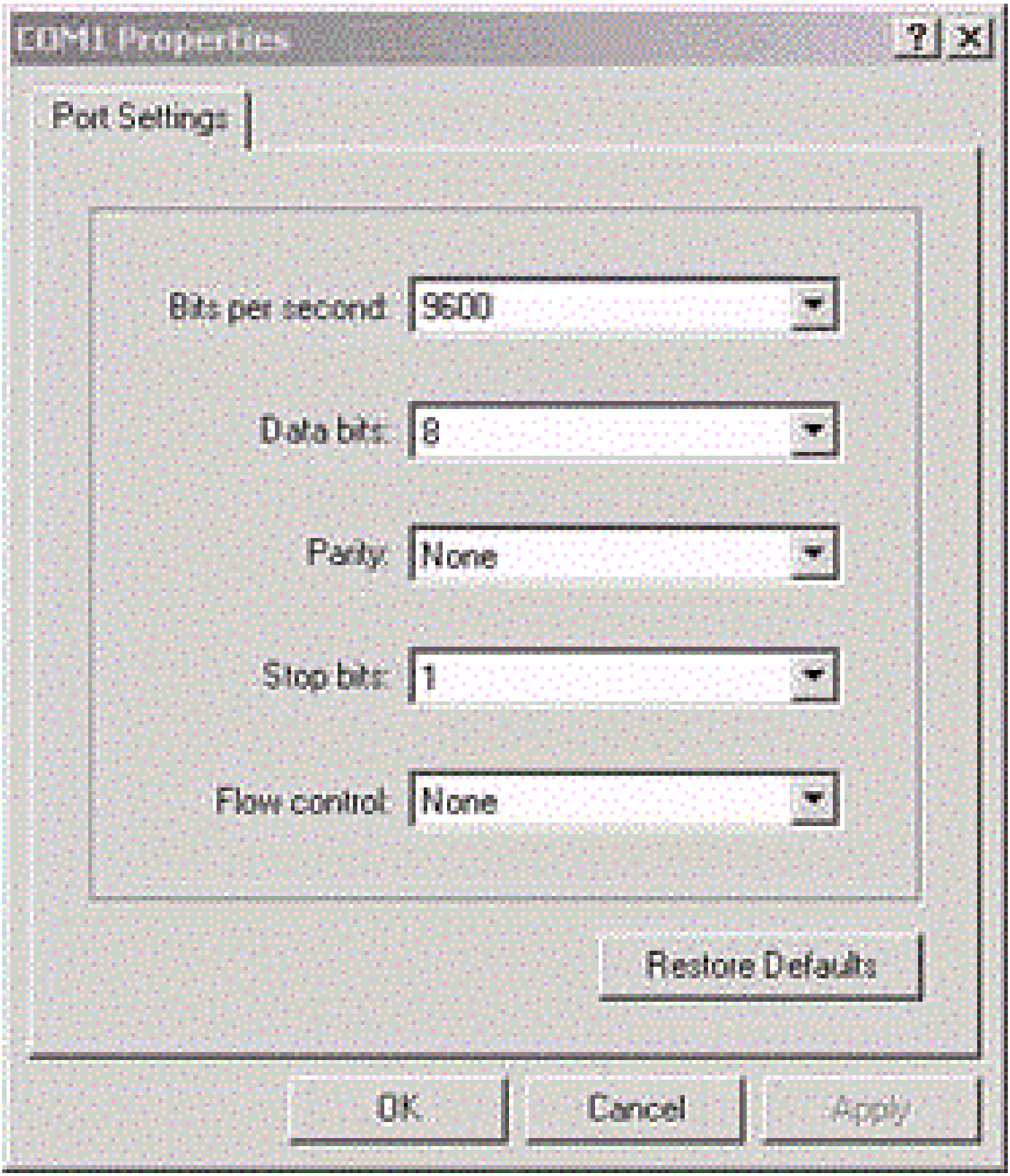
Prerequisites

Requirements

If you have not already done so, connect a PC to the console port of the switch. For information on how to connect a terminal to a Catalyst fixed configuration switch, refer to Connecting a Terminal to the Console Port on Catalyst Switches. Use a terminal emulation program such as Microsoft Windows HyperTerminal in order to establish the console session.

These are the settings:

- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None



Port Settings

Components Used

The Catalyst fixed configuration switches that this document describes include the 2940, 2950/2955, 2970, 3550, 3560, 3750 and the 3750 Metro series switches.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure

that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Problem

When Catalyst fixed configuration switches experience boot errors, these conditions can apply:

- The switch is in a continuous reboot.
- The switch displays the `switch:` prompt.
- The **error loading flash:** message appears.

Switch Displays the Switch: Prompt or "Error Loading Flash:"

- The `switch:` prompt indicates that the switch has not booted completely and requires the user to complete the boot process.
- The error loading flash:<image> message indicates that the switch failed to load an image because of a corrupt or lost image.

  The corrupt or lost image can be the result of a failed download. In this case, the image has a bad **checksum** or a failed software upgrade, and the upgrade procedure was not followed properly. There is the possibility that the user deleted the image but did not replace the image. A boot variable can have been set incorrectly.

With a console session open, you see an error message that is similar to this:

```
Error loading "flash:c2950-i6q4l2-mz.121-12c.EA1.bin"
```

Normally, the switch attempts to automatically boot the next valid image in the Flash file system. Here is an example:

```
Error loading "flash:c2950-i6q4l2-mz.121-12c.EA1.bin"
Interrupt within 5 seconds to abort boot process.
Loading "flash:/c2950-i6q4l2-mz.121-13.EA1.bin"...######
##########################################################

!--- Output suppressed.
```

If there is no valid backup image from which to boot, the boot process fails completely. Here is an example:

```
Error loading "flash:c2950-i6q4l2-mz.121-12c.EA1.bin"
```

```
Interrupt within 5 seconds to abort boot process.
Boot process failed...
```

Solution

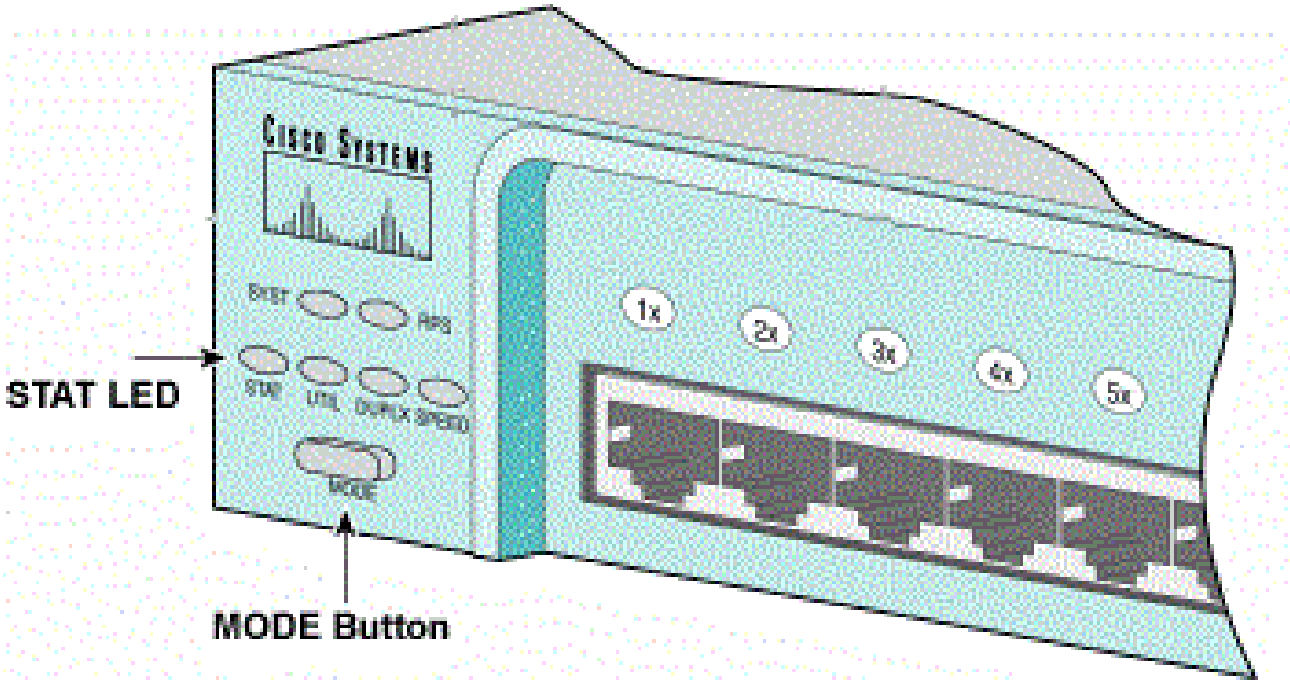
Step-by-Step Recovery Procedure

Note: A PC must be attached to the console port of the switch.

Step 1. If the switch is in a continuous reboot, complete one of the procedures in this step, which depends on your switch model.

Note: If the switch is not in a continuous reboot, but is already at the `switch:` prompt, proceed directly to Step 2.

- **Catalyst 2940 and 2950 series switches**



STAT LED and Mode Button

a. Unplug the power cord.

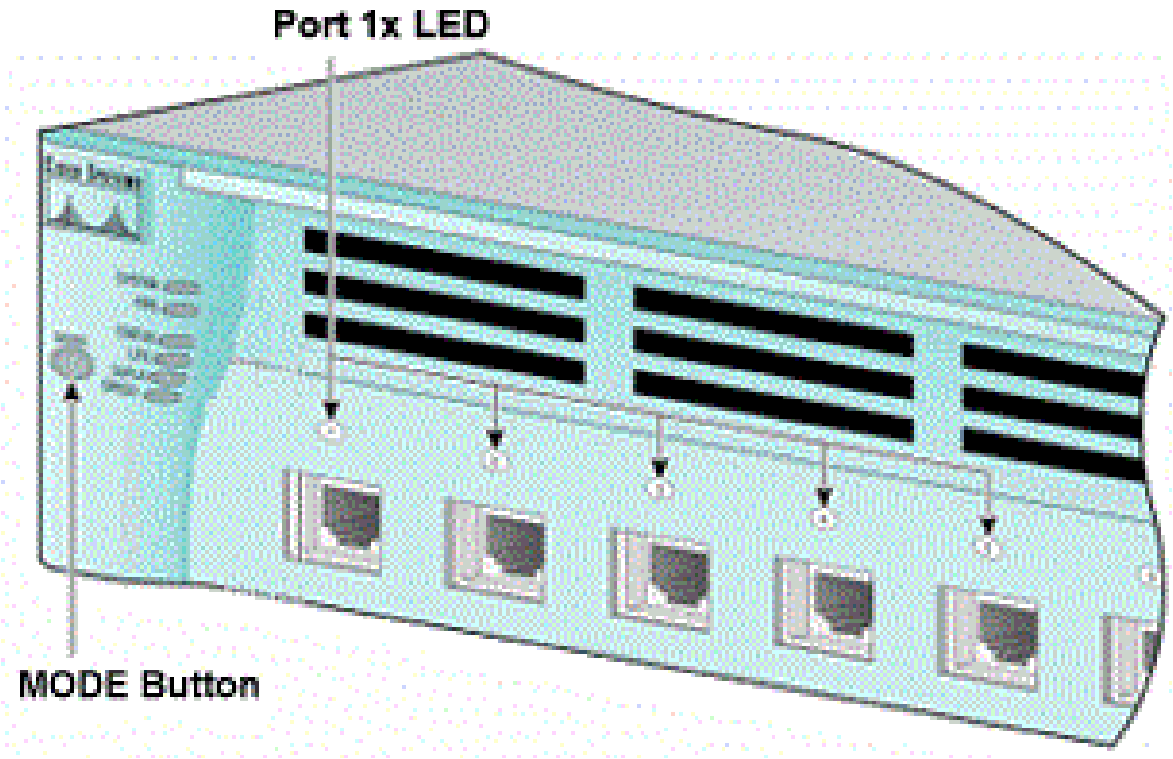
b. Hold down the MODE button while you reconnect the power cable to the switch. The MODE button is on the left side of the front panel.

c. Release the MODE button after the STAT LED goes out.

Note: The LED position can vary slightly, which depends on the model.

d. You are now at the `switch:` prompt. Proceed to Step 2.

- **Catalyst 2970, 3550, 3560 and 3750 series switches**



Port 1x LED

a. Unplug the power cord.

b. Hold down the MODE button while you reconnect the power cable to the switch. The MODE button is on the left side of the front panel.

c. Release the MODE button after the previous LED Port 1x goes out.

Note: The LED position can vary slightly, which depends on the model.

---

d. You are now at the `switch:` prompt. Proceed to Step 2.

- **Catalyst 2955 series switches**

a. Issue a break sequence from the keyboard in order to break into `switch:` mode.

The terminal application and operating system that you use determine the break sequence to use. For more information, refer to Standard Break Key Sequence Combinations During Password Recovery.

This example uses HyperTerminal to break into `switch:` mode on a 2955:

```
C2955 Boot Loader (C2955-HBOOT-M) Version 12.1(0.508)EA1, BETA TEST SOFTWARE
Compiled Wed 30-Oct-02 15:24 by antonino
WS-C2955T-12 starting...
Base ethernet MAC Address: 00:03:fd:62:7c:00
```

```
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 19 files, 2 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 7741440
flashfs[0]: Bytes used: 4628480
flashfs[0]: Bytes available: 3112960
flashfs[0]: flashfs fsck took 7 seconds.
...done initializing flash.
Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4
*** The system will autoboot in 15 seconds ***
Send break character to prevent autobooting.

!--- Wait until you see this message before
!--- you issue the break sequence.
!--- Enter Ctrl-Break with the use of HyperTerminal.

The system has been interrupted prior to initializing the
flash filesystem.  The following commands will initialize
the flash filesystem, and finish loading the operating
system software:
flash_init
load_helper
boot
switch:
```

b. Proceed to Step 2.

Step 2. Run the **flash_init** command and the **load_helper** command.

If the Flash has already initialized, you see this:

```
<#root>

switch:

flash_init

  Initializing Flash...
  ...The flash is already initialized.
  switch:
```

If the Flash has not initialized, you see this:

```
<#root>

switch:

flash_init

Initializing Flash...
flashfs[0]: 21 files, 2 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 7741440
flashfs[0]: Bytes used: 4499456
```

```
flashfs[0]: Bytes available: 3241984
flashfs[0]: flashfs fsck took 7 seconds.
...done initializing flash.
Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4
```

Run the **load_helper** command in order to load any boot helper images. Here is an example:

```
<#root>

switch:

load_helper

switch:
```

Step 3. Run the **dir flash:** command in order to view the contents of the Flash file system.

Determine if there are any Cisco IOS® image files or image directories in flash:. The Cisco IOS image files are **.bin** files, and the image directories are named with the image filename, excluding the **.bin** extension. If no Cisco IOS image files or image directories exist, you see this:

```
<#root>

switch:

dir flash:

Directory of flash:/
2    -rwx  5         <date>              private-config.text
3    -rwx  110        <date>              info
4    -rwx  976        <date>              vlan.dat
6    -rwx  286        <date>              env_vars
26   -rwx  1592       <date>              config.text
8    drwx  1088       <date>              html
19   -rwx  110        <date>              info.ver
4393472 bytes available (3347968 bytes used)
switch:
!--- No Cisco IOS images or image directories exist in Flash.
```

If your Flash directory looks like this, proceed directly to Step 5. Step 5 recovers the switch with an Xmodem file transfer.

If there is still an image in Flash, run the **boot** command (Step 4) in order to try to recover the switch. Before you run the **boot** command, verify where the Cisco IOS image is stored in the Flash directory. The location in which the image is stored can differ, which depends on your switch model.

- **Catalyst 2940, 2950, and 2955 Flash file system**

The Cisco IOS image file (.bin file) always resides in the flash: directory on Catalyst 2940, 2950 and 2955 series switches. Here is an example:

```
<#root>

switch:

dir flash:

Directory of flash:/
3    -rwx  2888547   <date>              c2950-i6q4l2-mz.121-13.EA1.bin

!--- The Cisco IOS image file (.bin file) is stored in
!--- the flash: directory on Catalyst 2940, 2950, and 2955 series switches.

4    -rwx  976       <date>              vlan.dat
6    drwx  832       <date>              html
22   -rwx  110       <date>              info
23   -rwx  110       <date>              info.ver
25   -rwx  38        <date>              env_vars

3132928 bytes available (4608512 bytes used)

!--- This output is from a Catalyst 2950 switch. Output from a
!--- Catalyst 2940 or 2955 varies slightly.
```

- **Catalyst 2970, 3550, 3560, and 3750 Flash file system**

The organization of the Flash file system on a Catalyst 2970, 3550, 3560, and 3750 is a little different. You can store the Cisco IOS image file in the **flash:** directory. However, if you use the Cluster Management Suite (CMS) image in order to manage switches with a web interface, you can store the Cisco IOS image file in its own directory. Run the **flash:** directory command in order to display the image file in this case.

```
<#root>

switch:

dir flash:

Directory of flash:/
2    -rwx  976       <date>              vlan.dat
3    -rwx  386       <date>              system_env_vars
4    -rwx  5         <date>              private-config.text
6    -rwx  1554      <date>              config.text
24   drwx  192       <date>              c3550-i5q3l2-mz.121-13.EA1

!--- You can store the Cisco IOS image file in its own directory.
!--- Name the directory with the image name, but exclude the .bin extension.

42   -rwx  33        <date>              env_vars

!--- Output suppressed.

switch: dir flash:c3550-i5q3l2-mz.121-13.EA1

!--- Issue the dir flash:<directory>
!--- command in order to view the Cisco IOS image file.

Directory of flash:c3550-i5q3l2-mz.121-13.EA1/
```

```
25   drwx  832       <date>              html
40   -rwx  3993612   <date>              c3550-i5q3l2-mz.121-13.EA1.bin

!--- This is where the Cisco IOS image file is stored for a CMS image.

41   -rwx  252       <date>              info

9992192 bytes available (6006784 bytes used)

!--- This output is from a Catalyst 3550 switch. Output from a
!--- Catalyst 2970, 3560, or 3750 varies slightly.

switch:
```

Attempt to Boot the Image

Step 4. After you have verified where the Cisco IOS image file resides, try to boot the image. Run either the **boot flash:<filename>** command or the **boot flash:<directory/filename>** command.

- Catalyst 2950

<#root>

```
switch:

boot flash:c2950-i6q4l2-mz.121-13.EA1.bin



!--- This example uses the boot flash:<filename> !--- command on a 2950.

 Loading "flash:c2950-i6q4l2-mz.121-13.EA1.bin"...###########
 ############################################################

!--- Output suppressed.
!--- This command syntax is the same for Catalyst 2940 and 2955 series
!--- switches.
```

- Catalyst 3550

<#root>

```
switch:

boot flash:c3550-i5q3l2-mz.121-13.EA1/c3550-i5q3l2-mz.121-13.EA1.bin



!--- This example uses the boot flash:<filename>/<directory>
!--- command on a 3550.

Loading "flash:c3550-i5q3l2-mz.121-13.EA1/c3550-i5q3l2-mz.121-13.EA1.bin"...####
################################################################################

!--- Output suppressed.
```

```
!--- This command syntax is the same for Catalyst 2970, 3560, and 3750
!--- series switches.
```

If you run the boot command and the result is in a successful boot up, either the default `switch:` prompt or the `hostname:` prompt displays.

```
Press RETURN to get started!
Switch>

!--- The boot up was successful.
```

Be sure to verify that you have configured the correct boot statement on the switch. See the Verify section.

If you run the boot command and the command does not result in a successful boot up, either the `switch:` prompt displays or you are stuck in a continuous reboot again. The only option to recover the switch is an Xmodem file transfer. Step 5 covers this file transfer.

Step 5. If the boot command has failed or there is no valid image from which to boot in Flash, perform an Xmodem file transfer.

A typical Xmodem file transfer can take up to 2 hours, which depends on the image size.

Download the Cisco IOS image (**.bin** file) to which you want to upgrade from the Cisco Technical Support & Downloads.

Note: All of the tools mentioned in this article can only be accessed by Cisco registered clients.

Note: Do not use a CMS image (**.tar** file). This image is a larger image and takes longer to transfer.

Run the **dir flash:** command in order to compare the size of the image in bytes to the free space that remains in Flash. Here is an example:

```
<#root>

switch:

dir flash:

Directory of flash:/

!--- Output suppressed.

3132928 bytes available (4608512 bytes used)

!--- There are approximately 3 MB of Flash space available for a new image.
```

If necessary, run the **delete** command in order to delete any corrupt images that remain. Here is an example:

```
<#root>

switch:

delete flash:c2950-i6q4l2-mz.121-12c.EA1.bin



!--- Issue the delete flash:<filename>
!--- command in order to delete a Cisco IOS image.

Are you sure you want to delete "flash:c2950-i6q4l2-mz.121-12c.EA1.bin" (y/n)? y

!--- Enter y for yes if you want to delete the image.

File "flash:c2950-i6q4l2-mz.121-12c.EA1.bin" deleted
switch:
```

The next example shows an Xmodem procedure on a 2955 with the use of HyperTerminal. The procedure is the same for any of the Catalyst fixed configuration switches that this document covers.

a. Run the **copy xmodem: flash:<filename>** command on the switch. Here is an example:

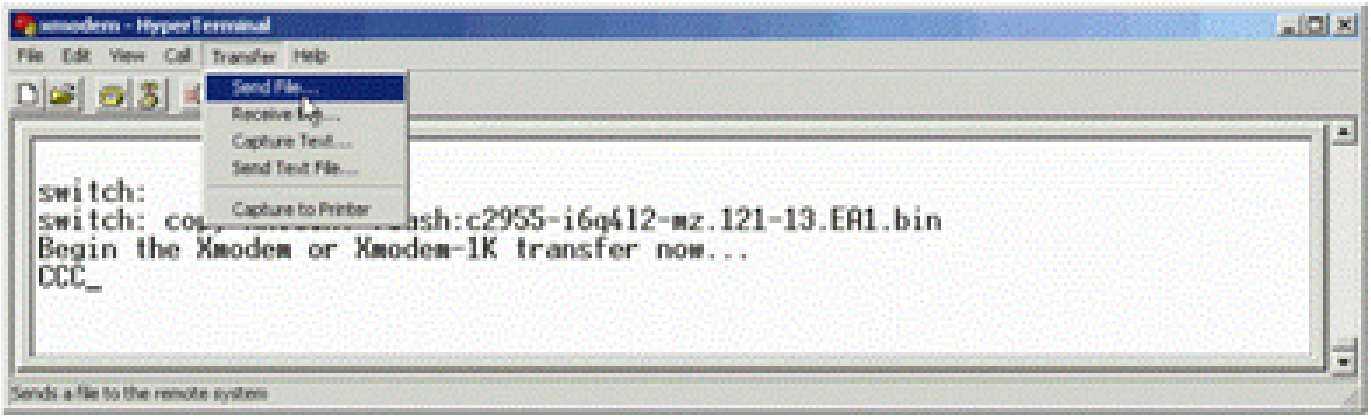
```
<#root>

switch:

copy xmodem: flash:c2955-i6q4l2-mz.121-13.EA1.bin

Begin the Xmodem or Xmodem-1K transfer now...
CCC
```

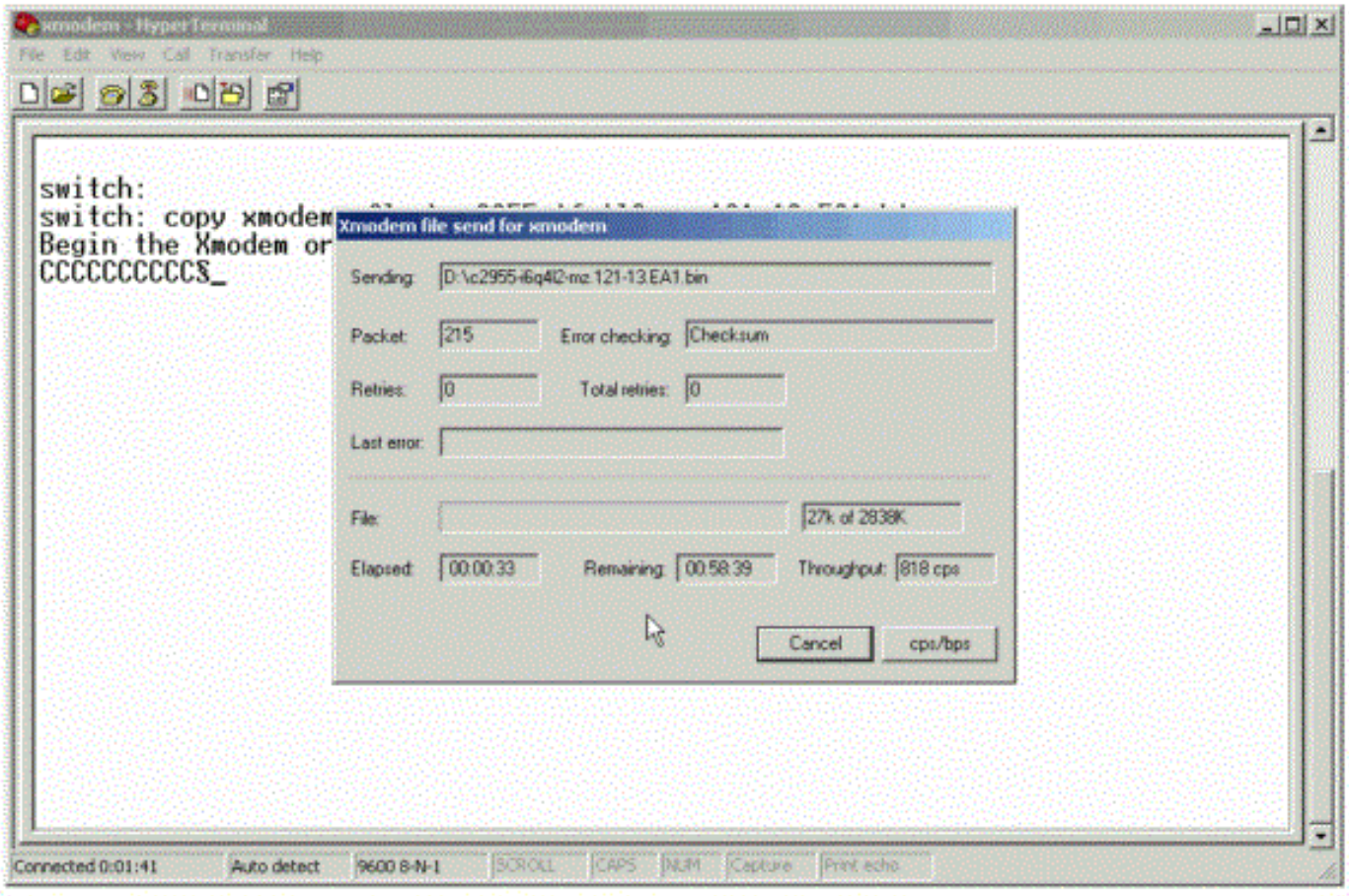
b. From the top of the HyperTerminal window, choose **Transfer > Send File**.



Transfer Send File

c. Choose the Xmodem protocol in the **Send File** dialog box and click **Browse** in order to select the Cisco IOS image (.bin file) that you downloaded previously.

d. Click **Send** in order to begin the Xmodem transfer.



Begin Xmodem Transfer

The Xmodem file transfer begins. This transfer can take up to 2 hours, which depends on the size of the image.

```
CCCCCC.....................................................................
.....................................................................
.....................................................................
.....................................................................
.....................................................................
.....................................................................
.....................................................................
.....................................................................
.....................................................................
File "xmodem:" successfully copied to "flash:c2955-i6q4l2-mz.121-13.EA1.bin"

!--- If the Xmodem file transfer fails for some reason, restart the process.
!--- If the Xmodem file transfer is successful, you return to the
!--- switch: prompt.

switch:
```

Step 6. Boot the new image that you just copied over with the Xmodem procedure.

Run the **boot flash:<filename>** command, as this example shows:

```
<#root>

switch:

boot flash:c2955-i6q4l2-mz.121-13.EA1.bin

Loading "flash:c2955-i6q4l2-mz.121-13.EA1.bin"...##############################
################################################################################

!--- Output suppressed.

Press RETURN to get started!
Switch>

!--- The boot up was successful.
```

Be sure to verify that your boot statements are set correctly.

Speed Up Xmodem Recovery

When a user tries to recover the switch from a corrupted or lost Cisco IOS, the **copy xmodem: flash:[Cisco IOS filename]** command is not displayed under the `switch:` prompt. The **copy** command is displayed under the `switch:` prompt, but the **copy xmodem:** command is not.

Complete these steps in order to speed up the Xmodem recovery:

1. Set the baud rate to 115200 on the `switch:` prompt.

```
<#root>

switch:

set BAUD 115200

!--- The screen goes blank after you enter this command.
```

2. Restart HyperTerminal.
3. Under COM PORT properties, select the bits per second as 115200. The `switch:` prompt is displayed.
4. Start the Xmodem recovery.
5. After the Xmodem recovery, set the BAUD rate back to 9600. If the set BAUD 9600 command does not bring the baud rate to 9600, run the **unset BAUD** command in order to bring the baud rate to a default value of 9600 bps.

Verification

Complete these steps:

1. Run the **show version** command in order to verify the current version of software that you run.

   Here is an example:

```
<#root>

2955#

show version

 Cisco Internetwork Operating System Software
 Cisco IOS (tm) C2955 Software (C2955-I6Q4L2-M), Version 12.1(13)EA1, RELEASE SOFTWARE

!--- This is the current version of software.
```

2. Run the **dir flash:<directory>** command in order to display the Cisco IOS image **(.bin** file) on a Catalyst 2940, 2950 or 2955.

```
<#root>

2950#

dir flash:

Directory of flash:/
3  -rwx           5   Mar 01 1993 00:12:55  private-config.text
4  -rwx     2905856   Jan 01 1970 03:06:25  c2955-i6q4l2-mz.121-13.EA1.bin

!--- The Cisco IOS image (.bin file) is stored in flash:
!--- on a Catalyst 2940, 2950 or 2955.
!--- Output suppressed.
```

   If you run a CMS image on a Catalyst 2970, 3550, 3560, or 3750, you can store the Cisco IOS image in an image directory:

```
<#root>

3550#

dir flash:

Directory of flash:/
2  -rwx         976   Mar 01 1993 21:47:00  vlan.dat
4  -rwx           5   Mar 06 1993 23:32:04  private-config.text
6  -rwx        1554   Mar 06 1993 23:32:04  config.text
7  drwx         192   Mar 01 1993 00:14:02  c3550-i5q3l2-mz.121-13.EA1

!--- Notice the "d" for directory in the permission statement.
!--- This is an image directory that is installed when you upgrade the
!--- switch with a CMS image.
!--- The Cisco IOS image (.bin file) is inside this directory.
```

```
5  -rwx     3823261   Mar 01 1993 00:46:01  c3550-i5q3l2-mz.121-12c.EA1.bin

!--- This is another Cisco IOS image (.bin file).

8  -rwx          33   Mar 01 1993 00:14:06  env_vars
9  -rwx         384   Mar 01 1993 00:14:06  system_env_vars
15998976 bytes total (6168576 bytes free)

!--- This output is from a Catalyst 3550 switch. Output from a
!--- Catalyst 2970, 3560, or 3750 varies slightly.

3550#
```

You need to run the **dir flash:<directory>** command on a Catalyst 3550 to display the Cisco IOS image (**.bin** file).

```
<#root>

3550#

dir flash:c3550-i5q3l2-mz.121-13.EA1

Directory of flash:/c3550-i5q3l2-mz.121-13.EA1/
23  drwx         832   Mar 01 1993 00:12:00  html
40  -rwx     3993612   Mar 01 1993 00:14:02  c3550-i5q3l2-mz.121-13.EA1.bin
41  -rwx         252   Mar 01 1993 00:14:02  info
15998976 bytes total (6168576 bytes free)

!--- This output is from a Catalyst 3550 switch. Output from a
!--- Catalyst 2970, 3560, or 3750 varies slightly.

3550#
```

3. Run the **show boot** command in order to verify that the boot statement is set correctly:

```
<#root>

Switch#

show boot

BOOT path-list:

!--- No boot system statement is set in this case.
!--- Output suppressed.
```

Run the **show boot** command in order to display boot statements. If no boot statement is set or if the boot statement points to an old or lost version of software, configure the correct boot statement. Run the **boot system flash:<filename>** command.

```
<#root>
```

```
2955#

configure terminal

2955(config)#

boot system flash:c2955-i6q4l2-mz.121-13.EA1.bin


!--- This is how to set a boot system statement on a Catalyst 2940, 2950, or 2955.

2955(config)#end
2955#
2955#show boot
BOOT path-list:       flash:c2955-i6q4l2-mz.121-13.EA1.bin

!--- Output suppressed.
```

If you use a CMS image on a Catalyst 2970, 3550, 3560, or 3750, you can store the Cisco IOS image (**.bin** file) in its own image directory. Run the boot system flash:directory/filename command:

```
3550#configure terminal
3550(config)#boot system flash:c3550-i5q3l2-mz.121-13.
EA1/c3550-i5q3l2-mz.121-13.EA1.bin

!--- This command should be on one line.
!--- This is how to set a boot system statement on a Catalyst
!--- 3550 if the Cisco IOS image (.bin file) is in its own image directory.

3550#end
3550#
3550#show boot
BOOT path-list: flash:c3550-i5q3l2-mz.121-13.EA1/c3550-i5q3l2-mz.121-13.EA1.bin

!--- Output suppressed.
```

Related Information

- Cisco Catalyst 3500 XL Series Switches
- Cisco Technical Support & Downloads