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Upgrading Software Images on Catalyst 2950 and 2955 Series Switches using the Command Line Interface

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Introduction

This document explains the step-by-step procedure for upgrading the software image on Catalyst 2950 and 2955 series switches using the Command Line Interface (CLI).

This document does not cover the upgrade procedure using the Cluster Management Suite (CMS). For detailed instructions on this procedure, launch the CMS application, select **Administration > Software Upgrade**, and select **Help** from the menu bar.

A software image upgrade may be necessary for several reasons:

- To implement new features in your network that are available in the new software release.
- To install a new line card that is not supported by the current software version.
- Your switch has been affected by a known bug that is resolved in the next software release.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

If you are not already familiar with 2950/2955 naming conventions, feature sets, file systems and boot parameters, or how to setup a TFTP server and backup your configuration, it is recommended that you read the Preparing to Upgrade section of this document before attempting the software upgrade.

Otherwise, you can skip any or all of these topics and go directly to the Software Upgrade Procedure for Catalyst 2950/2955 Series Switches section of this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Preparing to Upgrade

Understanding File Extensions: bin vs tar files

There are two types of files or file extensions you will see when downloading 2950 or 2955 software from the **LAN Switching Software** page of the Software Center (registered customers only) :

- The **.bin** file is the IOS image. If you only want to use the CLI to manage the switch, this is the only file you will need to download.
- The **.tar** file is an archive file from which both the IOS image and the CMS files are extracted during the upgrade process. If you want to manage switches or clusters of switches through a web interface (HTML), this is the only file you need to download.

Note: When you download a **.tar** image, the file will be saved by whatever archive utility is installed on your PC. This could be WinZip or some other third-party software. The files will be automatically extracted during the upgrade process.

Note: For more information on the CMS, refer to the Multimedia Presentation .

Understanding 2950/2955 Software Image Naming Conventions: SI vs EI

The 2950 and 2955 are Layer 2 (L2) only switches, although they run a version of Cisco IOS®.

Previously, the naming convention for 2950 images began with either **c2950-c3h2s** or **c2950-html-plus**. These images are now archived.

The new naming convention for 2950 and 2955 images begins with **c2950-i6q4l2** or **c2950-i6k2l2q4** (for 3DES Cryptographic images)

There are two software image feature sets available for the 2950 series:

- The **Standard Image (SI)** feature set
- The **Enhanced Image (EI)** feature set

The 2955 series runs only the EI feature set.

The difference between the two is that the EI feature set offers more features including Access Control Lists (ACLs), enhanced Quality of Service (QoS) features, extended-range VLANs, the IEEE 802.1W Rapid Spanning Tree Protocol (RSTP), and the IEEE 802.1S Multiple STP (MSTP). The enhanced crypto software image supports the Secure Shell (SSH) protocol. Only EI capable switches can run cryptographic images (images which begin with c2950-i6k2l2q4).

It is important to understand that images which begin with **c2950-i6q4l2** have both SI and EI feature sets integrated. The feature set that gets activated, however, is determined by the model of 2950 you have. When downloaded, the image will recognize the hardware and enable the appropriate set of features, as follows:

- SI features for WS-C2950-12 and WS-C2950-24 and WS-C2950SX-24 models
- EI features for WS-C2950C-24, WS-C2950T-24, WS-C2950G-12-EI, WS-C2950G-24-EI, WS-C2950G-24-EI-DC and WS-C2950G-48-EI models and all 2955 models

Note: For more information on SI and EI features, please refer to the **Catalyst 2950 and 2955 Switch Software Configuration Guide** under the Release Notes for your version of 2950/2955 software.

Use the **show version** command to verify which version of software you are running, where the image is installed, the feature set, and the model of 2950/2955 you have. A sample command output is below.

```
2950#sh ver
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(11)EA1, RELEASE SOFTWARE
(fc1)

!--- The version of software you are currently running is 121-11.EA1.

Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Wed 28-Aug-02 10:25 by antonino
Image text-base: 0x80010000, data-base: 0x80528000
ROM: Bootstrap program is CALHOUN boot loader
2950 uptime is 1 week, 4 days, 23 hours, 39 minutes
System returned to ROM by power-on
System image file is "flash:/c2950-i6q4l2-mz.121-11.EA1.bin"

!--- The image is installed in the flash: directory.

cisco WS-C2950-24 (RC32300) processor (revision G0) with 20402K bytes of memory.
Processor board ID FHK0650X0QY
Last reset from system-reset
Running Standard Image
24 FastEthernet/IEEE 802.3 interface(s)

!--- You are running the Standard Image(SI) feature set.
!--- If the switch were capable of running the Enhanced Image(EI) feature set,
!--- you would see Running Enhanced Image instead.

32K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address: 00:0B:BE:52:89:00
Motherboard assembly number: 73-5781-11
Power supply part number: 34-0965-01
Motherboard serial number: FOC065007UK
Power supply serial number: PHI06460CAD
Model revision number: G0
```

Motherboard revision number: A0
Model number: WS-C2950-24

!--- This is a WS-C2950-24.

System serial number: FHK0650X0QY
Configuration register is 0xF
2950#

Understanding the 2950/2955 Flash File System and Memory Requirements

2950/2955 Flash File System

The 2950/2955 ships from the factory with a CMS image (.tar file) installed. The IOS image (.bin file) is stored in the upper level **flash:** directory. The CMS files are stored in a directory of **flash:** called the **html** directory.

You can view the 2950/2955 Flash file system by issuing the **dir flash:** command. A sample command output is shown below.

```
2950#dir flash:
Directory of flash:/
  2  -rwx      2664051   Mar 01 1993 00:03:18  c2950-i6q4l2-mz.121-11.EA1.bin
```

!--- This is the software(IOS)image.

```
  3  -rwx         269   Jan 01 1970 00:01:51  env_vars
  4  -rwx        1355   Mar 12 1993 01:49:50  config.text
  5  -rwx          5   Mar 12 1993 01:49:50  private-config.text
  7  drwx         704   Mar 01 1993 00:03:55  html
```

--- output suppressed ---

*!--- Notice the d in the permissions indicating that html is a directory.
!--- This is the directory where the current CMS image files are stored.*

Issue the **copy tftp** command to upgrade using only the IOS image (.bin file). This is fully explained in the Step-by-Step Procedure for the 2950 using only the IOS image (.bin file) section of this document.

Issue the **archive tar** command to upgrade using only the CMS image (.tar file). This is fully explained in the Step-by-Step Procedure for the 2950 using the CMS image (.tar file) section of this document.

2950/2955 Memory requirements

DRAM Memory

All 2950 and 2955 series switches can have up to 32 MB of SDRAM, however, there are no minimum DRAM requirements to consider before upgrading software on these switches.

FLASH Memory

All 2950 series switches have 8 MB of internal Flash memory. All 2955 series switches can have up to 16 MB of Flash memory. The Flash memory is not upgradeable.

You can only store a limited number of images in Flash. Always check the size (in bytes) of the image on the LAN Switching software page of the Software Center (registered customers only) before upgrading software. Compare the size of this image with the free space in Flash by issuing the **dir flash:** command. A sample command output is shown below.

```
2950#dir flash:
Directory of flash:/
 2  -rwx      2664051   Mar 01 1993 00:03:18  c2950-i6q4l2-mz.121-11.EA1.bin
 3  -rwx          5   Mar 01 1993 00:16:08  private-config.text
 4  -rwx         916   Mar 01 1993 03:31:05  vlan.dat
22  -rwx      2888547   Mar 01 1993 00:08:19  c2950-i6q4l2-mz.121-13.EA1.bin

--- output suppressed ---

7741440 bytes total (203776 bytes free)

!--- This is the free memory in Flash.
```

If necessary, you can issue the **delete <filename>** command to free up space in the Flash directory.

If you are upgrading using the CMS image (.tar file), you will also need to delete the files in the **html** directory by issuing the **delete flash:html/*** command.

Issuing the **delete** command and the **delete flash:html/*** command is covered in detail in the Software Upgrade Procedure for 2950/2955 Series Switches section of this document.

Changing the Config-Register and Setting Boot Statements

Unlike other Catalyst switches, there is no **config-register** command on the 2950 or 2955. The configuration register value cannot be changed from the default.

The 2950/2955 will automatically search for a valid software image to boot from, even if a boot system statement is not set. It is still recommended, however, to set the boot statement as a precaution. The command to set a boot system statement is **boot system flash:<filename>** .

Multiple images can be specified in the boot statement by separating them with a semicolon, for example **boot system flash:<file1;file2>**

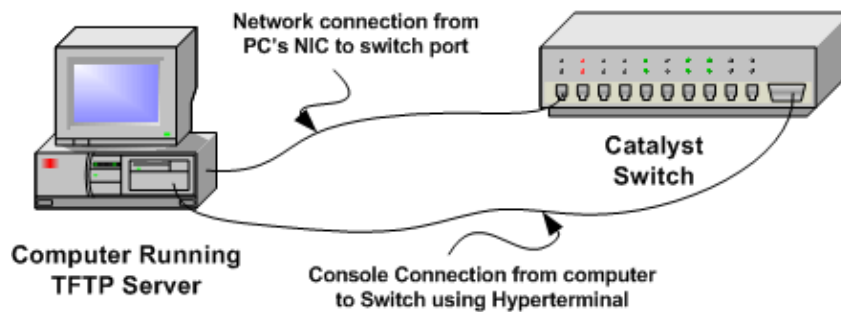
Issuing the **boot system** command is covered in detail in the Software Upgrade Procedure for 2950/2955 Series Switches section of this document.

Download Software Image

The 2950/2955 software image must be downloaded onto the PC that will act as the TFTP server prior to actual image upgrade. Download the software image from the **LAN Switching Software** section of the Software Center (registered customers only) . To download the software image, you must be a registered user and you must be logged in. If you do not understand which image to download, review the Preparing to Upgrade section of this document.

Install TFTP Server

To view sample output for this document, a third-party TFTP server is installed on a PC running Microsoft Windows 2000 Professional. You can use any TFTP server installed on any platform. It is not necessary that you use a PC with a Windows OS.



1. Download and install any shareware TFTP software from the Internet on the PC that you will be using to copy the 2950/2955 software image to the switch. The TFTP server root directory must be the directory in which the software image is downloaded. You can download the images to the default root directory of the TFTP server or change the root directory path to the directory in which the software image is stored.
2. Access the switch CLI by connecting a console cable between the switch console port and the PC. Refer to Connecting a Terminal to the Console Port on Catalyst Switches to access the CLI using the hyperterminal.

Note: The switch can be upgraded using remote Telnet access. You will, however, lose Telnet connectivity when the switch is reloaded during the software upgrade. The Telnet can be re-established once it is loaded with the new image, however, to troubleshoot in case of failure, it is essential to have local console access. A switch upgrade using console access is preferred.

3. For best results, configure a VLAN interface on the switch to be in the same VLAN (subnet) as your directly connected TFTP server. If it is not possible to have your TFTP server directly connected to the switch, issue either the **ip default-gateway** or the **ip route** command to set a default gateway to reach the TFTP server.

```
2950#conf t
2950(config)#int vlan 1

!--- In this case, we are using a FastEthernet
!--- interface in management VLAN 1.

2950(config-if)#ip address 10.10.10.1 255.255.255.0

!--- This IP address should ideally be in the
!--- same subnet as the TFTP server.
!--- In this example, the 2950 and the TFTP server are on a
!--- different subnet.

2950(config-if)#no shut
2950(config-if)#exit
2950(config)#ip default-gateway 10.10.10.129

!--- Issue this command as one way to establish
!--- connectivity to a TFTP server on a different subnet or network.
```

```
2950(config)#end
2950#
2950#ping 20.20.20.2
```

```
!--- Ping the IP address of the TFTP server
!--- from the switch to verify connectivity.
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 20.20.20.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms
2950#
```

Backup Configuration and Software Image

Perform a backup of the switch configuration to the PC running TFTP server. If you lose the switch configuration for any reason, you can always restore it from the TFTP server.

Issue the **copy startup-config tftp** command on the 2950/2955 to back up your current configuration to a TFTP server. A sample command output is shown below.

```
2950#copy startup-config tftp
Address or name of remote host []? 20.20.20.2

!--- Type your TFTP server IP.
!--- Press Return or Enter.

Destination filename [2950-config]?

!--- Press Return or Enter.
!--- The file 2950-config will be saved in the
!--- TFTP server root directory.

!!
1536 bytes copied in 1.860 secs (826 bytes/sec)
2950#
```

Software Upgrade Procedure for 2950/2955 Series Switches

The following are two upgrade procedures available for the 2950:

1. If you want to use the CLI only and do not intend to use Cisco's CMS software, follow the Step-by-Step Procedure for the 2950/2955 using only the IOS image (.bin file).
2. If you want to use the latest version of Cisco's CMS software, follow the Step-by-Step Procedure for the 2950/2955 using the CMS image (.tar file).

Note: For more information on the CMS, refer to the Multimedia Presentation.

Step-by-Step Procedure for the 2950/2955 using only the IOS image (.bin file)

For this example, the software on a 2950 is upgraded from version **12.1(12c)EA1** to version **12.1(13)EA1** using only the IOS image (.bin file). The procedure is the same no matter which version of software you use,

including the 2955.

1. Issue the **show version** command to view the current version of software that you are running. A sample command output is shown below.

```
2950#sh ver
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(12c)EA1, RELEASE SOFTWARE
(fc1)

!--- The current software version is 12.1(12c)EA1.
```

2. Go to the **LAN Switching Software** section of the Software Center (registered customers only) .

Select **Catalyst 2950 or 2955** software and find the image you want to download. Note the size of the image in bytes. In this example, the **c2950-i6q412-mz.121-13.EA1.bin** file is used. The image size is 2888547 bytes or approximately **3 MB**. Download the image you want.

3. Issue the **dir flash:** command on the 2950/2955 to verify how much free memory you have for the upgrade. A sample command output is shown below.

```
2950#dir flash:
Directory of flash:/
 2  -rwx      2774747   Mar 02 1993 00:11:42  c2950-i6q412-mz.121-12c.EA1.bin
 3  -rwx           5   Mar 01 1993 00:16:08  private-config.text
 4  -rwx          916   Mar 01 1993 03:31:05  vlan.dat
22  -rwx      2665985   Mar 02 1993 00:20:15  c2950-i6q412-mz.121-11.EA1a.bin

!--- Notice there are two images installed already.

 6  -rwx          1459   Mar 01 1993 00:16:08  config.text
 7  drwx           832   Mar 02 1993 00:14:18  html

--- output suppressed ---

7741440 bytes total (578048 bytes free)

!--- There is under 1 MB of memory left out of
!--- 8 MB total, which is not enough.
!--- The old image will have to be deleted in order to upgrade.

2950#
```

- Note:** If you already have enough room in Flash for the upgrade, you can proceed directly to **Step 5**.
4. Issue the **delete** command to remove the old image in order to make room for the upgrade. A sample command output is shown below.

```
2950#delete flash:c2950-i6q412-mz.121-11.EA1a.bin
Delete filename [c2950-i6q412-mz.121-11.EA1a.bin]?

!--- Press Return or Enter.

Delete flash:c2950-i6q412-mz.121-11.EA1a.bin? [confirm]

!--- Press Return or Enter.
```

```

2950#
2950#dir flash:
Directory of flash:/
   2  -rwx      2774747   Mar 02 1993 00:11:42  c2950-i6q412-mz.121-12c.EA1.bin

!--- You can leave one old image to leave as a backup if you prefer.

   3  -rwx         5     Mar 01 1993 00:16:08  private-config.text
   4  -rwx        916    Mar 01 1993 03:31:05  vlan.dat
   6  -rwx       1459   Mar 01 1993 00:16:08  config.text
   7  drwx        832   Mar 02 1993 00:14:18  html

--- output suppressed ---

7741440 bytes total (3244544 bytes free)

!--- There is now over 3 MB of free Flash memory,
!--- which is enough for the upgrade.

```

- 2950#
5. Perform the upgrade by issuing the **copy tftp flash:** command. A sample command output is shown below.

```

2950#copy tftp flash:
Address or name of remote host []? 20.20.20.2

!--- Type your TFTP server IP.
!--- Press Return or Enter.

Source filename []? c2950-i6q412-mz.121-13.EA1.bin

!--- Press Return or Enter.

Destination filename [c2950-i6q412-mz.121-13.EA1.bin]?

!--- Press Return or Enter.

Accessing tftp://20.20.20.2/c2950-i6q412-mz.121-13.EA1.bin...
Loading c2950-i6q412-mz.121-13.EA1.bin from 20.20.20.2 (via Vlan1): !!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 2888547 bytes]
2888547 bytes copied in 96.188 secs (30030 bytes/sec)
2950#dir flash:
Directory of flash:/
   2  -rwx      2774747   Mar 02 1993 00:11:42  c2950-i6q412-mz.121-12c.EA1.bin
   3  -rwx         5     Mar 01 1993 00:16:08  private-config.text
   4  -rwx        916    Mar 01 1993 03:31:05  vlan.dat
  22  -rwx       2888547   Mar 01 1993 00:42:03  c2950-i6q412-mz.121-13.EA1.bin

!--- The new image is installed in the flash: directory.

   6  -rwx       1459   Mar 01 1993 00:16:08  config.text
   7  drwx        832   Mar 02 1993 00:14:18  html

```

```

    --- output suppressed ---

7741440 bytes total (355840 bytes free)
2950#verify flash:c2950-i6q412-mz.121-13.EA1.bin
Verified flash:c2950-i6q412-mz.121-13.EA1.bin

!--- Issue the verify command to verify
!--- that the image checksum is correct.

```

6. Set a **boot system** statement so the new image boots on the next reload. A sample command output is shown below.

```

2950#conf t
2950(config)#boot system flash:c2950-i6q412-mz.121-13.EA1.bin
2950(config)#end
2950#
2950#sh boot
BOOT path-list:  flash:c2950-i6q412-mz.121-13.EA1.bin

--- output suppressed ---
!--- The boot system statement will not show up in the configuration.
!--- Issue the show boot command to verify that
!--- the new image will boot on the next reload of the switch.

```

7. Issue the **wr mem** command to save your changes and reload the switch. A sample command output is shown below.

```

2950#wr mem
Building configuration...
[OK]
2950#reload
Proceed with reload? [confirm]

!--- Press Return or Enter.

00:05:05: %SYS-5-RELOAD: Reload requested

--- output suppressed ---

Press RETURN to get started!

!--- Press Return or Enter.

--- output suppressed ---

```

8. Verify that you are running the new image by issuing the **show version** command. A sample command output is shown below.

```

2950#sh ver
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(13)EA1, RELEASE SOFTWARE
(fc1)

```

This completes the upgrade procedure for a 2950/2955 using only the IOS image (.bin file).

Step-by-Step Procedure for the 2950/2955 using the CMS image (.tar file)

For this example, the software on a 2950 is upgraded from version **12.1(12c)EA1** to version **12.1(13)EA1** using the CMS image (.tar file). The procedure is the same for a 2955.

1. Issue the **show version** command to view the current version of software that you are running. A sample command output is shown below.

```
2950#sh ver
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(12c)EA1, RELEASE SOFTWARE
(fc1)
```

!--- The current software version is 12.1(12c)EA1.

2. Go to the **LAN Switching Software** section of the Software Center (registered customers only).

Select **Catalyst 2950** software and find the image you want to download. Note the size of the image in bytes. In this example, the **c2950-i6q4l2-mz.121-13.EA1.tar** file is used. The image size is 4877312 bytes, or approximately **5 MB**. Download the image you want.

3. Issue the **dir flash:** command on the 2950/2955 to verify how much free memory you have for the upgrade. A sample command output is shown below.

```
2950#dir flash:
Directory of flash:/
  2  -rwx      2774747   Mar 01 1993 17:52:14  c2950-i6q4l2-mz.121-12c.EA1.bin
 21  -rwx      2665985   Mar 01 1993 18:02:04  c2950-i6q4l2-mz.121-11.EA1a.bin
```

!--- There are two images installed.

```
  4  -rwx          916   Mar 01 1993 03:31:05  vlan.dat
 22  -rwx          312   Mar 01 1993 18:03:19  env_vars
  7  drwx          832   Mar 01 1993 17:53:20  html
```

--- output suppressed ---

*!--- Notice the d in the permissions indicating that html is a directory.
!--- The html directory contains the CMS files extracted from the .tar image
!--- during the upgrade.*

```
7741440 bytes total (578048 bytes free)
```

*!--- There is under 1 MB of free memory in Flash, which is not enough
!--- for the upgrade. One of the old IOS images (.bin files)
!--- will have to be deleted.*

```
2950#
```

4. Issue the **delete** command to remove one of the old IOS images in order to make room for the upgrade. A sample command output is shown below.

```
2950#delete flash:c2950-i6q4l2-mz.121-11.EA1a.bin
Delete filename [c2950-i6q4l2-mz.121-11.EA1a.bin]?
```

```

Delete flash:c2950-i6q4l2-mz.121-11.EA1a.bin? [confirm]
2950#
2950#dir flash:
Directory of flash:/
   2  -rwx      2774747   Mar 01 1993 17:52:14  c2950-i6q4l2-mz.121-12c.EA1.bin

!--- You can leave one old image as a backup if you prefer.

   4  -rwx      916      Mar 01 1993 03:31:05  vlan.dat
  22  -rwx      312      Mar 01 1993 18:03:19  env_vars
   7  drwx      832      Mar 01 1993 17:53:20  html

--- output suppressed ---

7741440 bytes total (3244544 bytes free)

!--- Even though you freed up additional memory by deleting an old IOS
!--- image (.bin file), there is still not enough free
!--- memory for the upgrade. You will need to delete
!--- the files in the html directory.

2950#

```

The **html** directory is where the CMS files will be extracted from the **.tar** image and installed during the upgrade. Issue the **dir html** command to see these files. A sample command output is shown below.

```

2950#dir html
Directory of flash:/html/
   3  -rwx      4010   Mar 01 1993 17:52:14  homepage.htm
   5  -rwx      1392   Mar 01 1993 17:52:14  not_supported.html
   8  -rwx      9448   Mar 01 1993 17:52:15  common.js
   9  -rwx     22152   Mar 01 1993 17:52:15  cms_splash.gif
  10  -rwx      1211   Mar 01 1993 17:52:15  cms_13.html
  11  -rwx      2823   Mar 01 1993 17:52:15  cluster.html

--- output suppressed ---

!--- These are the files used by the CMS software.

```

Issue the **delete flash:html/*** command to delete all of these files at once before upgrading. A sample command output is shown below.

Note: Deleting these files will disable access to the HTML pages during the upgrade. After the upgrade, access will be reenabled

```

2950#delete flash:html/*
Delete filename [html/*]?

!--- Press Enter or Return for each file.

Delete flash:html/homepage.htm? [confirm]
Delete flash:html/not_supported.html? [confirm]

```

```
Delete flash:html/common.js? [confirm]
Delete flash:html/cms_splash.gif? [confirm]
Delete flash:html/cms_13.html? [confirm]
Delete flash:html/cluster.html? [confirm]
```

--- output suppressed ---

```
2950#dir flash:
Directory of flash:/
  2  -rwx      2774747   Mar 01 1993 17:52:14  c2950-i6q412-mz.121-12c.EA1.bin
  4  -rwx         916   Mar 01 1993 03:31:05  vlan.dat
 22  -rwx         312   Mar 01 1993 18:03:19  env_vars
  7  drwx          0   Mar 01 1993 01:13:31  html
```

--- output suppressed ---

```
7741440 bytes total (4960256 bytes free)
```

!--- There is now enough room to proceed with the upgrade.

5. Issue the **archive tar** command to copy over the **.tar** file and extract all the files. The full command syntax is **archive tar /xtract tftp://<tftp server ip>/<filename> flash:.** A sample command output is shown below.

Note: If you are upgrading from a release earlier than 12.1(6)EA2 on a 2950, issue the **tar** command instead of the **archive tar** command.

```
2950#archive tar /xtract tftp://20.20.20.2/c2950-i6q412-tar.121-13.EA1.tar flash:
Loading c2950-i6q412-tar.121-13.EA1.tar from 20.20.20.2 (via Vlan1): !
```

!--- The IOS image(.bin file) is being extracted into the flash: directory.

```
extracting c2950-i6q412-mz.121-13.EA1.bin (2888547 bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
html/ (directory)
```

!--- The CMS files are being extracted into the html directory.

```
extracting html/homepage.htm (3994 bytes)!
extracting html/not_supported.html (1392 bytes)
extracting html/common.js (9529 bytes)!!
extracting html/cms_splash.gif (22152 bytes)!!!!
extracting html/cms_13.html (1211 bytes)
extracting html/cluster.html (2823 bytes)!
extracting html/Redirect.jar (4195 bytes)!
extracting html/mono_disc.sgz (15899 bytes)!!!
extracting html/CMS.sgz (1344455 bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
extracting html/images.sgz (86918 bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!
extracting html/help.sgz (287994 bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!
extracting html/CiscoChartPanel.sgz (135599 bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
extracting html/cms_boot.jar (58864 bytes)!!!!!!!!!!!!!!!!!!!!
extracting info (109 bytes)
```

```
extracting info.ver (109 bytes)
[OK - 4877312 bytes]
```

!--- The archive tar operation was completed successfully.

```
2950#
2950#verify flash:c2950-i6q412-mz.121-13.EA1.bin
Verified flash:c2950-i6q412-tar.121-13.EA1.bin
```

*!--- Issue the **verify** command to verify
!--- the IOS image checksum.*

```
2950#
```

```
2950#dir flash:
Directory of flash:/
   2  -rwx      2774747   Mar 01 1993 17:52:14  c2950-i6q412-mz.121-12c.EA1.bin
   3  -rwx      2888547   Mar 01 1993 02:00:32  c2950-i6q412-mz.121-13.EA1.bin
```

!--- The new IOS image has been extracted and installed in flash:.

```
   4  -rwx         916   Mar 01 1993 03:31:05  vlan.dat
  22  -rwx         312   Mar 01 1993 18:03:19  env_vars
   7  drwx         832   Mar 01 1993 02:03:41  html
```

--- output suppressed ---

```
7741440 bytes total (93184 bytes free)
```

```
2950#
```

```
2950#dir html
Directory of flash:/html/
   5  -rwx         3994   Mar 01 1993 02:00:32  homepage.htm
   6  -rwx         1392   Mar 01 1993 02:00:32  not_supported.html
   8  -rwx         9529   Mar 01 1993 02:00:32  common.js
   9  -rwx        22152   Mar 01 1993 02:00:33  cms_splash.gif
  10  -rwx         1211   Mar 01 1993 02:00:33  cms_13.html
```

--- output suppressed ---

!--- The new CMS files have been extracted and installed.

6. Set a **boot system** statement so the new image boots on the next reload. A sample command output is shown below.

```
2950#conf t
2950(config)#boot system flash:c2950-i6q412-mz.121-13.EA1.bin
2950(config)#end
2950#
2950#sh boot
BOOT path-list:  flash:c2950-i6q412-mz.121-13.EA1.bin
```

--- output suppressed ---

*!--- The boot system statement will not show up in the config.
!--- Issue the **show boot** command to verify the
!--- new image will boot on the next reload of the switch.*

You can set a boot system statement to boot a specific backup image if the new image fails for some reason. Otherwise, the 2950/2955 will automatically attempt to boot the next valid image in the event of a failure.

This sample command output to configure a **boot system** statement for **multiple images** is shown below.

```
2950#conf t
Enter configuration commands, one per line. End with CNTL/Z.
2950(config)#boot system flash:
    c2950-i6q4l2-mz.121-13.EA1.bin;c2950-i6q4l2-mz.121-12c.EA1.bin

!--- The two images - primary and backup - are separated by a semi-colon.

2950(config)#end
2950#

2950#sh boot
BOOT path-list: flash:
    c2950-i6q4l2-mz.121-13.EA1.bin;c2950-i6q4l2-mz.121-12c.EA1.bin

--- output suppressed ---
!--- The boot system statement will not show up in the config.
!--- Issue the show boot command to verify
!--- that the new image will boot
!--- on the next reload of the switch.
```

7. Issue the **wr mem** command to save your changes and reload the switch. A sample command output is shown below.

```
2950#wr mem
Building configuration...
[OK]
2950#reload
Proceed with reload? [confirm]

!--- Press Return or Enter.

02:53:37: Bootstrap Emulator called with code 45
02:53:37: %SYS-5-RELOAD: Reload requested

!--- Press Return or Enter.
```

8. Verify you are running the new image by issuing the **show version** command. A sample command output is shown below.

```
2950#sh ver
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(13)EA1, RELEASE SOFTWARE

!--- You are now running the new software.

(fc1)
Copyright (c) 1986-2003 by cisco Systems, Inc.
```

--- output suppressed ---

```
System image file is "flash:c2950-i6q4l2-mz.121-13.EA1.bin"  
cisco WS-C2950-24 (RC32300) processor (revision G0) with 20839K bytes of memory.  
Processor board ID FHK0650X0QY  
Last reset from system-reset  
Running Standard Image
```

--- output suppressed ---

```
!--- You are running the SI feature set.  
!--- If this model of switch was capable of running the EI,  
!--- you would see Running Enhanced Image.
```

This completes the upgrade procedure for a 2950 using the CMS image (.tar file).

Verify

The commands necessary to verify that your configuration is working properly are included in the Software Upgrade Procedure for 2950/2955 Series Switches section of this document.

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

Image Transfer from TFTP Server Failed

If you find that image transfer from TFTP server is failing continuously, refer to the following document for known issues with the TFTP server:

- [Common Problems in Installing Images Using TFTP or an RCP Server](#)

Software Upgrade Failed / Switch: Prompt is Displayed / Switch is Rebooting Continuously

Your software upgrade may fail due to reasons such as IP connectivity problems between the switch and TFTP server or incorrectly set boot statements. These issues may cause your switch to boot in the switch: mode. If your 2950 displays the switch: prompt or is continuously rebooting, please refer to the following document for software recovery procedures:

- [Recovering Catalyst 2950, 2955, and 3550 Series Switches from a Corrupted or Missing Image](#)

Related Information

- [Recovering Catalyst 2950, 2955, and 3550 Series Switches from a Corrupted or Missing Image](#)
 - [Upgrading Software in Catalyst 2900XL and 3500XL Switches Using the Command Line Interface](#)
 - [Upgrading Software Images on Catalyst 3550 Series Switches Using the Command Line Interface](#)
 - [Technical Support – Cisco Systems](#)
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