

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

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Related Information

Introduction

This document explains the step-by-step procedure to upgrade the software image on Cisco Catalyst 2950 and 2955 series switches through the Command Line Interface (CLI).

This document does not cover the upgrade procedure through 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.

You need a software image upgrade 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 the current software version does not support.
- A known bug affects your switch, and that bug is resolved in the next software release.

Prerequisites

Requirements

Ensure that you meet these requirements before you attempt this configuration:

- Read the Preparing to Upgrade section of this document 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 back up your configuration.
- If you are familiar with these topics, 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 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, make sure that you understand the potential impact of any command.

Conventions

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

Prepare to Upgrade

Understand File Extensions: bin vs tar files

There are two types of files or file extensions you come across when you download 2950 or 2955 software from the **LAN Switching Software** section of the Downloads (registered customers only) page:

- The **.bin** file is the Cisco IOS Software image. If you want to use only the CLI to manage the switch, this is the only file you 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, archive utility is installed on your PC saves the file. The archive utility can be WinZip or some other third-party software. The files are automatically extracted during the upgrade process.

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

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

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).

Two software image feature sets are 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).

You must understand that images that begin with **c2950-i6q4l2** have both SI and EI feature sets integrated. The model of 2950 that you use determines the feature set that gets activated. When downloaded, the image recognizes the hardware and enables the appropriate set of features, as listed here:

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

Issue the **show version** command to verify which version of software you use, where the image is installed, the feature set, and the model of 2950/2955 you use. Here is a sample command output:

```
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 currently run 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 run the Standard Image(SI) feature set.
!--- If the switch can run the Enhanced Image(EI) feature set,
!--- you 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#
```

Understand 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) resides in the upper level **flash:** directory. The CMS files reside in a directory of **flash:** called the **html** directory.

You can view the 2950/2955 Flash file system with the **dir flash:** command. Here is a sample command output:

```
2950#dir flash:
Directory of flash:/
   2  -rwx      2664051   Mar 01 1993 00:03:18  c2950-i6q412-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, which indicates that html is a directory.

!--- This is the directory where the current CMS image files reside.

Issue the **copy tftp** command to upgrade with only the Cisco IOS Software image (.bin file). See the Step-by-Step Procedure for the 2950 using only the IOS image (.bin file) section of this document for details.

Issue the **archive tar** command to upgrade with only the CMS image (.tar file). See the Step-by-Step Procedure for the 2950 using the CMS image (.tar file) section of this document for details.

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 you upgrade 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. You cannot upgrade the Flash memory.

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 section of the Downloads (registered customers only) page before you upgrade software. Compare the size of this image with the free space in Flash with the **dir flash:** command. Here is a sample command output:

```
2950#dir flash:
Directory of flash:/
```

```
2  -rwx      2664051   Mar 01 1993 00:03:18  c2950-i6q412-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-i6q412-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 upgrade with the CMS image (.tar file), you also need to delete the files in the **html** directory through the **delete flash:html/*** command.

See the Software Upgrade Procedure for 2950/2955 Series Switches section of this document for details on the **delete** command and the **delete flash:html/*** command.

Change the Config-Register and Setting Boot Statements

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

The 2950/2955 automatically searches for a valid software image to boot from, even if a boot system statement is not set. Cisco recommends that you set the boot statement as a precaution. The command to set a boot system statement is **boot system flash:***<filename>* .

In order to specify multiple images in the boot statement, separate them with a semicolon. For example, **boot system flash:***<file1;file2>*

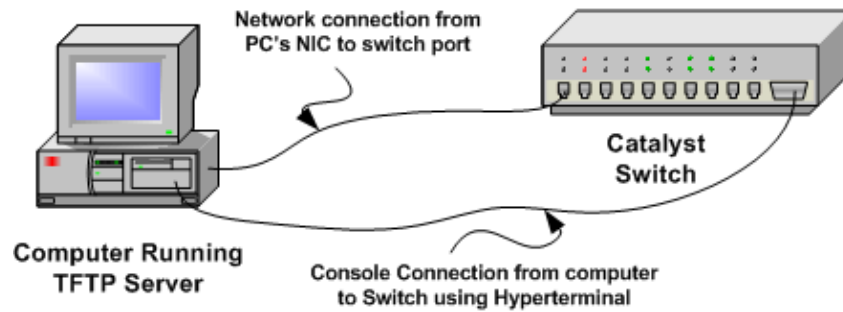
See the Software Upgrade Procedure for 2950/2955 Series Switches section of this document for details on the **boot system** command.

Download the Software Image

Download the 2950/2955 software image onto the PC that acts as the TFTP server prior to actual image upgrade. Download the software image from the **LAN Switching Software** section of the Downloads (registered customers only) page. If you are not sure of which image to download, review the Preparing to Upgrade section of this document.

Install the TFTP Server

In order to view sample output for this document, install a third-party TFTP server on a PC that runs Microsoft Windows 2000 Professional. You can use any TFTP server installed on any platform. You do not need to use a PC with a Windows OS.



Complete these steps to install the TFTP server:

1. Download and install any shareware TFTP software from the Internet on the PC that you will use to copy the 2950/2955 software image to the switch. The TFTP server root directory must be the directory in which you downloaded the software image. 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 resides.
2. Connect a console cable between the switch console port and the PC to access the switch CLI. Refer to Connecting a Terminal to the Console Port on Catalyst Switches to access the CLI through the hyperterminal.

Note: You can upgrade the switch through remote Telnet access. However, you lose Telnet connectivity when the switch reloads during the software upgrade. You can re-establish the Telnet connection after the switch loads with the new image. However, to troubleshoot in case of failure, you must have local console access. A switch upgrade through console access is preferable.

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 you cannot connect your TFTP server directly 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

!--- This example uses a FastEthernet interface in management VLAN 1.

    2950(config-if)#ip address 10.10.10.1 255.255.255.0

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

    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#

```

Back Up the Configuration and Software Image

Perform a backup of the switch configuration to the PC that runs TFTP server. If you lose the switch configuration for any reason, you can always restore the configuration 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. Here is a sample command output:

```
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-confg is 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

Here 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 with 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 with the CMS image (.tar file).

Note: It is not possible to back up the IOS image to a TFTP server on a weekly basis using the CLI. Automate backups of the IOS to a TFTP server can be done using Ciscoworks.

Step-by-Step Procedure for the 2950/2955 with 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** with 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 run. Here is a sample command output:

```
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 Downloads (registered customers only) page.

Select **Catalyst 2950 or 2955** software and locate the image you want to download. Note the size of the image in bytes. This example uses the **c2950-i6q4l2-mz.12.1(13)EA1.bin** file. 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. Here is a sample command output:

```
2950#dir flash:
Directory of flash:/
 2  -rwx  2774747  Mar 02 1993 00:11:42  c2950-i6q4l2-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-i6q4l2-mz.121-11.EA1a.bin

!--- Notice that two images are 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 less than 1 MB of memory free out of the total of
!--- 8 MB, which is not enough. Delete the old image
!--- 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. Here is a sample command output:

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

!--- Press RETURN or ENTER.

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

!--- You can leave one old image 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 through the **copy tftp flash:** command. Here is a sample command output:

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



```

!--- Type your TFTP server IP address.
!--- 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
!--- whether the image checksum is correct.

```

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

```

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 does not show up in the configuration.
!--- Issue the show boot command to verify whether the new image
!--- boots on the next reload of the switch.

```

7. Issue the **wr mem** command to save your changes and reload the switch. Here is a sample command output:

```

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 whether you run the new image through the **show version** command. Here is a sample command output:

```
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 with the CMS image (.tar file)

In this example, the software on a 2950 is upgraded from version **12.1(12c)EA1** to version **12.1(13)EA1** with 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 run. Here is a sample command output:

```
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 Downloads (registered customers only) page.

Select **Catalyst 2950** software and locate the image you want to download. Note the size of the image in bytes. This example uses the **c2950-i6q4l2-mz.12.1(13)EA1.tar** file. 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. Here is a sample command output:

```
2950#dir flash:
Directory of flash:/
 2  -rwx   2774747  Mar 01 1993 17:52:14  c2950-i6q4l2-mz.12.1(12c)EA1.bin
21  -rwx   2665985  Mar 01 1993 18:02:04  c2950-i6q4l2-mz.12.1(11)EA1a.bin
```

```
!--- Two images are 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, which indicates that html is a
!--- directory that contains the CMS files extracted from the .tar image
!--- during the upgrade.
```

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

```
!--- There is less than 1 MB of free memory in Flash, which is not enough
!--- for the upgrade. Delete one of the old IOS images (.bin files).
```

```
2950#
```

4. Issue the **delete** command to remove one of the old IOS images in order to make room for the upgrade. Here is a sample command output:

```
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 there is still not
!--- enough free memory for the upgrade. Delete the files in the
!--- html directory.
```

```
2950#
```

- The **html** directory is where the CMS files are extracted from the **.tar** image and installed during the upgrade. Issue the **dir html** command to view these files. Here is a sample command output:

```
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 before the upgrade. Here is a sample command output:

- Note:** Deletion of these files disables access to the HTML pages during the upgrade. After the upgrade, access becomes available again.

```
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:**. Here is a sample command output:

Note: If you want to upgrade 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 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 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. Here is a sample command output:

```
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 does not show up in the config.

*!--- Issue the **show boot** command to verify whether the*

!--- new image boots 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 automatically attempts to boot the next valid image in the event of a failure.

Here is a sample command output to configure a **boot system** statement for **multiple images**:

```
2950#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
2950(config)#boot system flash:
      c2950-i6q412-mz.121-13.EA1.bin;c2950-i6q412-mz.121-12c.EA1.bin
```

!--- A semi-colon separates the two images - primary and backup.

```
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 does not show up in the config.
!--- Issue the show boot command to verify whether the new image
!--- boots on the next reload of the switch.
```

7. Issue the **wr mem** command to save your changes and reload the switch. Here is a sample command output:

```
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 run the new image with the **show version** command. Here is a sample command output:

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

!--- You now run 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 run the SI feature set. If this model of switch
!--- can run the EI, you see Running Enhanced Image.
```

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

Verify

Use this section to confirm that your configuration works properly.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

The Software Upgrade Procedure for 2950/2955 Series Switches section of this document includes the commands necessary to verify that your configuration works properly.

Troubleshoot

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

Image Transfer from TFTP Server Fails

Refer to Resolving Common Image Installation Problems for known issues with the TFTP server if you find that image transfer from TFTP server fails continuously.

Software Upgrade Failed or Switch: Prompt Appears, or the Switch Reboots Continuously

Your software upgrade can fail due to reasons such as IP connectivity problems between the switch and TFTP server or incorrectly set boot statements. These issues can cause your switch to boot in the `switch:` mode. If your 2950 displays the `switch:` prompt or continuously reboots, refer to Recovering Catalyst Fixed Configuration Switches from a Corrupted or Missing Image for software recovery procedures:

The Switch Goes to ROMmon Mode (switch: prompt) as Automatic Boot does not Occur

This problem can occur if the switch boot mode is set to manual. In order to confirm this setting, use these methods:

If you are at the ROMmon mode (`switch:` prompt), issue the `set` command and observe the output:

```
switch: set
BOOT=flash:c2950-i6q4l2-mz.121-13.EA1.bin
MANUAL_BOOT=yes
```

If you are at the regular `switch#` prompt, issue the `show boot` command and observe the output:

```
Switch#show boot
BOOT path-list: flash:c2950-i6q4l2-mz.121-13.EA1.bin
Config file: flash:config.text
Enable Break: no
Manual Boot: yes
HELPER path-list:
NVRAM/Config file
buffer size: 32768
```

Note: In both cases, the `Manual Boot` variable is set to **yes**.

Solution:

If you are at the `switch:` prompt, perform these steps to allow the switch to boot automatically:

1. Issue the `set MANUAL_BOOT no` command at the `switch:` prompt.

```
switch: set MANUAL_BOOT no
switch:
```

2. Issue the `set` command to confirm that the value for the `MANUAL_BOOT` variable is now **no**.

```
switch: set  
BOOT=flash:c2950-i6q4l2-mz.121-13.EA1.bin  
MANUAL_BOOT=no
```

3. Issue the **boot** command to reload the switch.

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

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

!--- Output suppressed ---

If you are at the switch# prompt, perform these steps to allow the switch to boot automatically.

1. Enter the Global Configuration Mode. Issue the **no boot manual** to inform the switch to boot automatically.

```
Switch#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#no boot manual
```

2. Go back to the privileged EXEC mode and save the configuration with the **write memory** command.

```
Switch(config)#end  
Switch#  
Switch#write memory  
Building configuration...  
[OK]
```

3. Verify the boot parameters with the **show boot** command, and verify whether Manual Boot is set to **no**.

```
Switch#show boot  
BOOT path-list: flash:c2900XL-h-mz-112.8-SA5.bin  
Config file: flash:config.text  
Enable Break: no  
Manual Boot: no  
HELPER path-list:
```

!--- Output suppressed ---

4. Reload the switch.

Bad mzip File, Unknown Zip Method

Switch software can become corrupt during an upgrade due to these reasons:

- If you download the wrong file to the switch
- If you upload a .tar file through X-modem
- If you delete the image file

In all these cases, the switch does not pass the power-on self-test (POST), and there is no connectivity.

Cisco recommends that you download a fresh copy of the Cisco IOS Software from the Downloads (registered customers only) page, and copy it to the flash memory of the switch.

In order to resolve the issue, upload only the .bin file to the switch through the X-modem. Refer to Step 4 of Step-by-Step Recovery Procedure section of Recovering Catalyst Fixed Configuration Switches from a Corrupted or Missing Image to copy the Cisco IOS Software to the switch.

Related Information

- **Recovering Catalyst Fixed Configuration 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 & Documentation – Cisco Systems**
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