o IOS Software in Catalyst 2900−XL/3500−XL Switches Using th

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Upgrading Software in Catalyst 2900−XL/3500−XL Switches Using the Command Line Interface (CLI)

Introduction

This is a step−by−step guide to the software upgrade process for Catalyst 2900−XL/3500−XL switches using the Command Line Interface (CLI). This document explains the TFTP upgrade and X−modem download procedure for Catalyst 2900−XL and Catalyst 3500−XL switches only. For a complete list of switches, refer to section titled XL Models, Memory, and Supported Images. This document also lists Common Problems/Error messages and their solutions.

This document does not cover the upgrade procedure using the web interface (Cisco Visual Switch Manager or Cluster Manager). Refer to the Managing Your Switches section of the Cisco IOS Desktop Switching Software Configuration Guide, for 4 MB DRAM Catalyst 2900XL Switches and *Upgrading Switch Software by Using VSM* section of Release Notes for the Catalyst 2900 Series XL and 3500 Series XL Cisco IOS Release 12.0(5)XU.

Note: Trivial File Transfer Protocol (TFTP) may be used to transfer software image files from a PC to your device. Cisco TFTP Server software is freely available at the following location:

http://www.cisco.com/cgi−bin/tablebuild.pl/tftp

Important Notes

Before you perform the software upgrade on the XL switches, the first and most important thing to find out is the correct software image for your switch. If you are upgrading a 2900XL switch, then there are two possibilities: either it is a "4 MB" DRAM switch with "2 MB" of Flash or an "8 MB" DRAM switch with "4 MB" of Flash. 3500XL are "8 MB" DRAM switches with "4 MB" of Flash. XL Models, Memory, and Supported Images shows how to find the amount of memory on the switch and then look for the correct software version.

In general, when speaking about 2900XL switches, we refer to them as "4 MB" and "8 MB" switches. This refers to the amount of DRAM (Dynamic Random Access Memory) present on the switches as shown in a **show version** command. The actual differences in these switches are *not only DRAM and Flash*. The physical chipset for the Ethernet PHY has been changed between these switches to allow for more functionality (including VLAN trunking) in the 8 MB switches. No amount of software upgrades nor "memory upgrades" will allow the older 4 MB switches the newer functionality (memory on the XLs is NOT upgradable). With that in mind, a brief history of upgrades on the 2900XLs is in order.

The Cisco IOS Software Release 11.2(8)SAx software was created for the 2900XL with the first shipment of the 4 MB switches. Improvements were made on the original Cisco IOS Software Release 11.2(8)SA in the Cisco IOS Software Release 11.2(8)SA1, 11.2(8)SA2, and 11.2(8)SA3 software. Note that additional features were included in an "Enterprise" version in addition to the features found with the "Standard" version. All of these images were only developed for the XL switches with 4 MB DRAM.

With the introduction of 8 MB XL switches, Cisco IOS Software Release 11.2(8)SA4 was released to support these new switches, and to support new modules that had been made for the 2900XL (WS−X2922−XL−V, WS−X2914−XL−V) which *are* trunking capable. Cisco IOS Software Release 11.2(8)SA4 came in two versions again: "Standard" and "Enterprise". Both versions ran on both types of switches.

In Cisco IOS Software Release 11.2(8)SA5, a break was made. Software was added to take full advantage of the features made available by the hardware changes in the 8 MB switches; now, all versions of software did *not* run on all switches. The "Original" version of SA5 ran on the 4 MB switches. The "Standard" and "Enterprise" versions ran on the 8 MB switches (once again, with minor feature additions in the "Enterprise" version).

Cisco IOS Software Release 11.2(8)SA6 continued this behavior as well. Important to note is that Cisco IOS Software Release 11.2(8)SA6 is the *final* version of software for the 4 MB switches.

The 8 MB switches can go up to Cisco IOS Software Release 12.0(5.x)XU or later at the present time.

On the 2900XLs (and the 3500XLs), the philosophy for software upgrades is to always be at the latest that a particular switch will support, when possible. New features and vital bug fixes are incorporated at each step.

XL Models, Memory, and Supported Images

The 8 MB Catalyst 2900XL and 3500XL switches were previously supported by Standard and Enterprise editions of IOS software. With Release12.0(5)XU, the standard and enterprise edition features were included

in one release. The 4 MB Catalyst 2900 series XL switches do not have sufficient memory to be upgraded to 12.0(5.x)XU and the final release for 4 MB Catalyst 2900 series XL switches is 11.2(8.6)SA6.

For 4 MB 2900XL switches, see Table 1
For 8 MB 2900XL switches, see Table 2
For 3500XL switches, see Table 3

Table 1

4 MB Catalyst 2900−XL Models, Memory, and Supported Images

Original Edition XLs (2MB Flash, 4MB DRAM)	**Catalyst XL Series Switch**
Upgrade these switches to either: Original 2900XL Cisco IOS Software Release 11.2.SA6 Software **OR** Earlier 2900XL Original Software	WS−C2908−XL
	WS−C2916M−XL
	WS−C2924−XL
	WS−C2924C−XL

Table 2

8 MB Catalyst 2900−XL Models, Memory, and Supported Images

Standard/Enterprise Edition XLs (4MB Flash, 8MB DRAM)	**Catalyst XL Series Switch**
Upgrade these switches to either: 2900XL Cisco IOS Software Release 12.0 **OR** Earlier 2900XL Standard/Enterprise Software	WS−C2912−XL−A WS−C2912−XL−EN
	WS−C2924−XL−A
	WS−C2924−XL−EN
	WS−C2924C−XL−A
	WS−C2924C−XL−EN
	WS−C2924M−XL−A
	WS−C2924M−XL−EN
2900XL Cisco IOS Software Release 12.0 **OR** Earlier 2900XL Enterprise Software	WS−C2912MF−XL
	WS−C2924M−XL−EN−DC

2900XL Cisco IOS Software Release 12.0	

Table 3

Catalyst 3500−XL Models, Memory, and Supported Images

Standard/Enterprise Edition XLs (4MB flash, 8MB DRAM)	**Catalyst XL Series Switch**
Upgrade these switches to either: 3500XL Cisco IOS Software Release 12.0 **OR** Earlier 3500XL Standard/Enterprise Software	WS−C3508G−XL−A
	WS−C3508G−XL−EN
	WS−C3512−XL−A
	WS−C3512−XL−EN
	WS−C3524−XL−A
	WS−C3524−XL−EN
	WS−C3548−XL−A
	WS−C3548−XL−EN
3500XL Cisco IOS Software Release 12.0	WS−C3524−PWR−XL−EN

Meaning of Flash Files

Enter the following command to view the Flash directory information on the switch:

```
3512XL−84.24#dir flash:
Directory of flash:

2  −rwx   1273530  Mar 01 1993 00:11:21  c3500XL−c3h2s−mz−112.8.2−SA6.bin
< image
3  −rwx     82465   Apr 27 1999 03:31:29  c3500XL−diag−mz−112.0.68−SA
<<diag image
4  drwx     13888   Mar 01 1993 00:12:42  html
<<<< Web browser files
236  −rwx    109   Mar 01 1993 00:12:42  info.ver
<<<< Created during upgrade
224  −rwx    721   Mar 13 1993 08:43:59  placement.txt
<<<<Cluster Bldr arrangement
225  −rwx    109   Mar 01 1993 00:10:25  info
<<< Created during upgrade
226  −rwx     96   Mar 01 1993 00:10:14  env_vars
<<<< boot variable
227  −rwx     1220   Mar 13 1993 21:22:28  config.text
<<<< Config file (sh config)
237  −rwx     660   Mar 01 1993 00:08:32  vlan.dat
<<<< VTP information
238  −rwx     19   Mar 13 1993 08:43:45  prefs.text
<<<< Cluster Web
```

```
Display preferences
```

The files above contain the following Flash information:

```
3524XL−84.26#more flash:info
Display filename [info]?
image_name: c3500XL−c3h2s−mz−112.8.2−SA6.bin
image_file_size: 1273530
image_min_dram: 8
tar_file_size_k: 690

3524XL−84.26#more flash:info.ver
Display filename [info.ver]?
image_name: c3500XL−c3h2s−mz−112.8.2−SA6.bin
image_file_size: 1273530
image_min_dram: 8
tar_file_size_k: 690

3524XL−84.26#more flash:env_vars
Display filename [env_vars]?
BAUD=9600
BOOT=flash:c3500XL−c3h2s−mz−112.8.2−SA6.bin
MAC_ADDR=00:d0:58:68:ce:40
```

The config.text is your config file. The rest of the files are binary except for HTML, which is actually a directory. The files in this diectory are used for the Web Management interface.

Software Image Naming

Table 4 describes the file extensions and what they mean for the upgrade procedure. It is easier to upgrade the switch software by using a combined ***.tar*** file that contains the HTML files and the IOS image.

Table 4

Possible Extensions for IOS Software Files

Extension	Description
.tar	A compacted file from which you can extract files by using the tar command. There are two types of *.tar* files: • A *combined* ***.tar*** file that contains both the IOS image file and the HTML files. • An *HTML* ***.tar*** file that has the letters HTML in its name and contains just the HTML files (used for the web interface), for the IOS release. From the CLI, you can upgrade the switch software with this HTML file and the IOS image file.
.bin	The IOS image file that does not have any HTML files, can be copied to the switch through TFTP.

How to Determine the Amount of Memory on the Switch Using Command Line Interface

On the 2900XL Switch, issue the **show version** command to find out if it's a 4 MB or an 8 MB switch. This refers to the amount of DRAM present on the switches.

If you are at the **boot loader/ROMMON** (**switch:** prompt), then the best way to find out is to run the **dir flash:** command and then see what the number of **"bytes available"** and **"bytes used"**, adds up to. These will either add to approximately 2 MB or 4 MB DRAM. If the total number of bytes on the Flash adds up to approximately 2 MB then its a 4 MB switch. If the number adds up to approximately 4 MB then it's an 8 MB switch.

The output of the **show version** and **dir flash** commands are as follows.

Output from an **8 MB** 2900XL switch:

```
Switch#show version
Cisco Internetwork Operating System Software
IOS (TM) C2900XL Software (C2900XL−C3H2S−M), Version 12.0(5)XU, RELEASE SOFTWARE)
Copyright (c) 1986−2000 by cisco Systems, Inc.
Compiled Mon 03−Apr−00 16:37 by swati
Image text−base: 0x00003000, database: 0x00301398

ROM: Bootstrap program is C2900XL boot loader

2900XL_84.3 uptime is 27 minutes
System returned to ROM by reload
System image file is "flash:c2900XL−c3h2s−mz−120_5−XU.bin"

cisco WS−C2924M−XL (PowerPC403GA) processor (revision 0x11) with 8192K/1024K bytes of memory.
Processor board ID 0x10, with hardware revision 0x03
Last reset from warm−reset
...(output suppressed)
```

Note: the output shows **8192K** which indicates the DRAM or the amount of memory present on the switch, which in this case is 8 MB.

```
switch:dir flash:
(This command is only run if you are at the switch: prompt and want to determine how big the flas
Directory of flash:/

2 −r−− 2535 <date> config.text
4 −rwx 1644160 <date> c2900XL−c3h2s−mz−120_5−XU.bin
5 −r−− 960 <date> vlan.dat
6 −r−− 19 <date> env_vars

1963008 bytes available (1649664 bytes used)
```

Output from a **4 MB** 2900XL switch:

```
Switch#show version
Cisco Internetwork Operating System Software
IOS (TM) C2900XL Software (C2900XL−HS−M), Version 11.2(8.2)SA6, MAINTENANCE INTE
Copyright (c) 1986−1999 by cisco Systems, Inc.
Compiled Fri 25−Jun−99 15:25 by boba
Image text−base: 0x00003000, database: 0x0020DE64
```

```
ROM: Bootstrap program is C2900XL boot loader

Switch uptime is 9 weeks, 6 days, 8 hours, 9 minutes
System restarted by reload
System image file is "flash:c2900XL-hs-mz-112.8.2-SA6.bin", booted via console

cisco WS-C2916M-XL (PowerPC403GA) processor (revision 0x11) with 4096K/640K bytes
of memory.
Processor board ID 0x06, with hardware revision 0x00
Last reset from warm-reset
...(output suppressed)
```

*Note that the output shows **4096K** which indicates the DRAM or the amount of memory present on the switch, which in this case is 4 MB)*

```
switch: dir flash:
(This command is only run if you are at the switch:prompt and want to determine how big the flash
Directory of flash:/

2 -rwx 1117595 <date> c2900XL-hs-mz-112.8.2-SA6.bin
3 -rwx 720 <date> vlan.dat
4 -rwx 106 <date> info
5 -rwx 1048 <date> config.text
6 drwx 10752 <date> html
176 -rwx 106 <date> info.ver
177 -rwx 246 <date> env_vars

100352 bytes available (1627648 bytes used)
```

Note: Running the above commands on 3500XL switches will always correctly indicate that 3500XL has 4 MB of flash and 8 MB of DRAM.

TFTP Upgrade

Before you begin the TFTP upgrade procedure using Command Line Interface(CLI) on the switch, verify and perform the following 6 major steps:

Step 1 Downloading the combined ***.tar*** file from CCO. This file contains the IOS image and the HTML files. The ***tar*** command extracts the IOS image and the HTML files from the combined .***tar*** file during the TFTP copy to the switch. Use section XL Models, Memory, and Supported Images and Software Image Naming to identify the files you want to download.

Step 2 If you do not have a TFTP server, then download the free Cisco TFTP Server for Windows or the shareware Walusoft TFTP Suite software on the PC that you will be using to copy the IOS Image to the Flash of the switch. Install the TFTP server by running the downloaded self−extracting executable and following the installation instructions.

Note: Make sure that you install/run the TFTP server on the same machine on which you have downloaded the IOS Image from the CCO.

Step 3 Verify the IP connectivity between the switch and the machine on which you will be running the TFTP server. Refer to Getting Basic IP Connectivity to the Switch if needed.

Step 4 Start the TFTP server by double clicking on the "Cisco TFTP Server" icon from the desktop or from the Start menu, choose **Programs−>Cisco TFTP Server**. For **Walusoft** TFTP server, from the Start menu, choose **Programs−>TFTPSuitePro2000−>TFTPServer32**.

Note: When using Windows NT with a NTFS partition, please ensure that the required TFTP root directory and files have the permissions marked as "everyone." Otherwise, the TFTP transfer may fail if these permissions are not set. For details on how to set the permissions, refer to Microsoft NT Documentation.

Step 5 If using Cisco TFTP server, disable Logging Function to prevent excessive logging that can disrupt the TFTP process. To Disable logging on the Cisco TFTP server, from the View **Menu−>Options, uncheck Enable Logging** and click Ok.

Step 6 Access the CLI by starting a Telnet session or by connecting to the switch console port through the RS−232 connector. It is better to access the CLI using the switch console. That way, switch access is not lost once the switch is reset after the upgrade. To access the switch through Telnet, enter the following command on the your PC or workstation,

server% **telnet** *switch_ip_address*

Once the above 6 steps are done, proceed with the TFTP upgrade mentioned in the following section.

Common TFTP Procedure

This section lists the steps for the TFTP upgrade procedure on the XL switches.

Note: All the following commands are run from the privileged EXEC mode.

Step 1 Enter the privileged EXEC mode by typing **enable** at the switch> prompt

```
switch> enable
switch#
```

Step 2 If you are upgrading a 2900−XL switch, issue the **show version** command to confirm the amount of memory present on the switch. Click here for the details on how to verify the amount of memory present on the 2900XL switch.

Step 3 Display the name of the running image file.

```
switch# show boot
BOOT path-list:    flash:current_image
Config file:       flash:config.text
Enable Break:      1
Manual Boot:       no
HELPER path-list:
NVRAM/Config file
buffer size: 32768
```

Step 4 If there is no file defined in the BOOT path−list, enter **dir flash:** to display the contents of Flash memory. The file with the ***.bin*** extension is your image file.

```
Switch# dir flash:
Directory of flash:
3 ---x 80971 <date> current_image.bin
```

```
4 d--x 14144 <date> html
7 -rwx 84 <date> env_vars
5 ---x 111 <date> info
258 ---x 111 <date> info.ver
230 -rwx 1470 <date> config.text

3612672 bytes total (1229312 bytes free)
```

Step 5 Using the exact, case−sensitive name of the combined ***tar*** file that you downloaded from Cisco.com to the TFTP server, rename the running image file to that name, and replace the ***.tar*** extension with a ***.bin*** extension. The image file name is then the same as the downloaded file name but with a ***.bin*** extension. This step does not affect the operation of the switch.

```
Switch# rename flash:current_image flash:new_image
Source filename [current_image]?
Destination filename [new_image]?
```

For example:

Upgrading an 8 MB 2900XL switch, the current image on the switch is c2900XL−c3h2−mz−112.8.5−SA6.bin, and you have downloaded c2900XL−c3h2s−mz−120.5.2−XU.tar file from Cisco.com to your TFTP server. The following command will rename the current image to c2900XL−c3h2s−mz−120.5.2−XU.bin. Note that the renaming step requires one to use the exact name of the .***tar*** file with the ***.tar*** extension replaced with a ***.bin***.

```
switch# rename flash:c2900XL-c3h2-mz-112.8.5-SA6.bin flash:c2900XL-c3h2s-mz-120.5.2-XU.bin
Source filename [c2900XL-c3h2-mz-112.8.5-SA6.bin]?
Destination filename [c2900XL-c3h2s-mz-120.5.2-XU.bin]?
```

Note: Renaming the current image does not mean that the switch is running the new image; it is still running the old image, which is only renamed for the proper TFTP process.

Step 6 Enter the **dir flash:** command again to make sure that the old image is renamed properly with the name of the new image.

```
Switch# dir flash:
Directory of flash:
3 ---x 80971 <date> new_image.bin
4 d--x 14144 <date> html
7 -rwx 84 <date> env_vars
5 ---x 111 <date> info
258 ---x 111 <date> info.ver
230 -rwx 1470 <date> config.text

3612672 bytes total (1229312 bytes free)
```

Step 7 If you are upgrading a 4 MB DRAM Catalyst 2900XL Switch and a file starting with the character string *c2900XL−diag−mz* appears in the Flash directory, you should remove it to make room for the new image. This is a **diagnostics** file used at the factory to run certain tests on the switch and is never used by the customer. If you are upgrading an 8 MB DRAM Catalyst 2900XL Switch or Catalyst 3500XL Switch you do not have to delete this file, but since this file is useless for you, it is advisable to delete it during the upgrade. The diagnostics file has a name in the format: *c2900XL−diag−mz−version_name* or *c3500XL−diag−mz−version_name*. The string *version_name* depends on the switch and software you are running.

Note: This file, may or may not be displayed when you issue the **dir flash:** command.

For Example:

On the 2900XL switch, display the diagnostics filename by issuing the following command:

```
switch# dir flash:c2900XL-diag-mz*
Directory of flash:

-rwx 80971 Sep 14 1998 03:10:38 c2900XL-diag-mz-112.0.0.11-SA2
```

And delete it:

```
Switch# delete flash:c2900XL-diag-mz-112.0.0.11-SA2
Delete filename [c2900XL-diag-mz-112.0.0.11-SA2]?
Delete flash:c2900XL-diag-mz-112.0.0.11-SA2? [confirm]
Switch#
```

Step 8 Enter global configuration mode:

```
switch# config terminal
Enter configuration commands, one per line. End with CNTL/Z.

switch(config)#
```

Step 9 Disable access to the switch HTML pages:

```
switch(config)# no IP http server
```

Step 10 Set the **boot** parameters so that when the switch is reloaded after the upgrade, it boots with the new_image. Use the following command to set the boot parameter to the new_image. This command will over write any previous boot image settings.

```
Switch(config)# boot system flash:new_image
```

Step 11 Return to privileged EXEC mode:

```
switch(config)# end
```

Step 12 Remove the HTML files:

```
switch# delete flash:html/*
```

Press *"enter"* or *"y"* to confirm the deletion of each file. Since HTML is a directory that contains all the HTML and GIF files used for the web interface, you have to press *"enter"* or *"y"* several times before all the files in the HTML directory are deleted.

Do not press any other keys during this process. If you press any other key, it will abort the deletion of that particular file and go to the next file. You have to run the command again, to delete the aborted file.

Step 13 If upgrading from Release 11.2(8)SA5 or earlier, remove the files in the SNMP directory:

```
switch# delete flash:html/Snmp/*
```

Make sure the 'S' in 'SNMP' is uppercase.

Press *"enter"* or *"y"* to confirm the deletion of each file. Do not press any other keys during this process. If you press any other key, it will abort the deletion of that particular file and go to the next file. You have to run

the command again, to delete the aborted file.

Step 14 If you are running Cisco IOS Release 11.2(8)SA2 or previous releases on a 4 MB DRAM Catalyst 2900XL Switch, create a directory on the switch Flash memory to be used for the HTML files:

Note: This step is only for 4 MB DRAM Catalyst 2900XL Switches running IOS Release 11.2(8)SA2 or previous releases

```
switch# mkdir flash:html/Snmp
```

Make sure the "S" in "SNMP" is uppercase.

Step 15 Use the **tar** command to copy the combined ***.tar*** file to the switch. DO NOT copy the HTML ***.tar*** file in this procedure as the ***.tar*** file combines both the image and the HTML files into a single compressed file.

```
Switch#tar /x tftp://server_ip_address//path/filename.tar flash:
Loading /path/filename.tar from server_ip_address (via VLAN1):!)
extracting info (111 bytes)
extracting filename.bin (1557286 bytes)!!!!!!!!!!!!!!!!!!!!
html/ (directory)
extracting html/Detective.html.gz (1139 bytes)!
extracting html/ieGraph.html.gz (553 bytes)
extracting html/DrawGraph.html.gz (787 bytes)!
. . .(output Suppressed)

[OK − 2723840 bytes]
(This message means that the TFTP process has passed successfully and both .bin and html files ha
been extracted successfully)
```

Note: Depending on the TFTP server being used, you might need to enter only one slash (/) after the server_ip_address in the **tar** command. When using Cisco TFTP server, enter only one slash (/) after the server_ip_address. When using Walusoft TFTP server enter two slashes (//) after the server_ip_address.

Step 16 Enter global configuration mode:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

Step 17 Re−enable access to the switch HTTP pages:

```
switch(config)# IP http server
```

Step 18 Return to privileged EXEC mode:

```
switch(config)# end
```

Step 19 Reload the new software with the following command:

```
switch# reload
System configuration has been modified. Save? [yes/no]:y
Proceed with reload? [confirm]
```

Step 20 Press Return to confirm the reload.

Step 21 After the switch reboots, access the switch using Telnet or Console login and enter the privileged EXEC mode **show version** command to verify the upgrade procedure.

X−Modem Upgrade

Under normal circumstances, the preferred way to upgrade the XL switch is via TFTP. If you?re in a situation where the TFTP won?t work or can?t be done, like someone has accidently deleted the ***.bin*** file from the Flash and rebooted the switch, here is a walk−through for the X−modem process of loading the IOS to the XL switches.

Step 1 After reading the XL Models, Memory, and Supported Images and Software Image Naming sections, download the IOS Image from the Cisco.com onto the PC or workstation that you will be using for the X−modem copy.

Note: In the X−modem download, only the **.bin** file is used. DO NOT try to copy the combined **.tar** file using this method.

Step 2 X−Modem upgrade can only be done through the switch console port and cannot be done through Telnet. Access the CLI by connecting to the console port via the RS232 connector. For details on how to connect to the console port, see Console Access.

Step 3 X−Modem upgrade is always done from the Boot Loader or ROM Monitor (**switch:** Prompt) mode. After connecting to the console, if you see the regular **switch>** prompt, follow Steps 4−9 to go to the **switch:** prompt. If you are already at the ROM Monitor mode (**switch:** prompt), then go to Step 10.

Step 4 Enter the privileged EXEC mode by typing **enable** at the switch> prompt:

```
switch> enable
switch#
```

Step 5 Enter the Global Configuration Mode:

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
```

Step 6 Type **boot manual** to tell the switch to go to the ROM Monitor mode (**switch:** prompt), when the switch is reloaded next time:

```
Switch(config)#boot manual
```

Step 7 Type **end** to go back to the privileged EXEC mode and save the configuration with **write memory** command:

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

Step 8 Verify the boot parameters by typing **show boot**. Verify that Manual Boot is set to **Yes**:

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

Step 9 Reload the switch, so that the switch goes to the ROM Monitor or Boot Loader Mode (**switch:** prompt):

```
Switch#reload Proceed with reload? [confirm]

20:54:25: %SYS-5-RELOAD: Reload requested

C3500XL Boot Loader (C3500-HBOOT-M) Version 11.2(0.68)SA6, BETA TEST SOFTWARE
Compiled Mon 26-Apr-99 20:27 by jchristy
starting...
Base ethernet MAC Address: 00:d0:58:68:f1:80
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 119 files, 4 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 2695680
flashfs[0]: Bytes available: 916992
flashfs[0]: flashfs fsck took 3 seconds.
...done Initializing Flash.
Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

The system is not configured to boot automatically. The
following command will finish loading the operating system
software:

boot

switch:

(You?ll now be at the boot switch: prompt. You can now proceed)
```

Step 10 Make sure that the Flash is properly initialized by running the **flash_init** command. Running this command will not delete any files from the Flash. It will only make the Flash useable.

switch: **flash_init**

Initializing Flash...

...(output suppressed)

Note: In some cases, when the switch does not properly boot to the regular prompt and goes to the ROMMON (switch: prompt), the Flash is not properly initialized and is not useable(read or write). It is always advisable to run the **flash_init** command to make sure that you can use the Flash.

An example of such failed output is as follows:

```
C3500XL Boot Loader (C3500−HBOOT−M) Version 11.2(0.68)SA6, BETA TEST SOFTWARE
Compiled Mon 26−Apr−99 20:27 by jchristy
starting...

Base ethernet MAC Address: 00:d0:58:68:db:80
Xmodem file system is available.

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: dir flash:
unable to stat flash:/: invalid argument(Note that the command failed)

switch: flash_init
Initializing Flash...

flashfs[0]: 116 files, 4 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 2684416
flashfs[0]: Bytes available: 928256
flashfs[0]: flashfs fsck took 4 seconds.

...done Initializing Flash.

Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

switch: dir flash:
(Note below, that now we are able to use the flash and issue commands)
Directory of flash:/

2 −r−− 1644045 <date> c3500XL−c3h2s−mz−120.5−XU.bin
231 −r−− 106 <date> info.ver
4 drwx 6848 <date> html
232 −r−− 22 <date> prefs.text
...(ouput suppressed)

928256 bytes available (2684416 bytes used)
```

Note: If the Flash is already initialized, then running the **flash_init** command will indicate it.

For Example:

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

Step 11 Check the memory capacity remaining by typing **dir flash:**.

```
switch: dir flash:
Directory of flash:/
```

```
2 −rwx 1644045 <date> current_image.bin
3 −r−− 1777 <date> config.text
4 drwx 6848 <date> html
223 −rwx 106 <date> info
6 −r−− 97 <date> env_vars
238 −rwx 106 <date> info.ver

916992 bytes available (2695680 bytes used)
```

Step 12 If the size of the file to be loaded is larger than the available capacity, delete the existing image in Flash to make space for a new image. Use the **delete flash:**<*current_filename*> command, where current_filename is the name of the file to be deleted.

For Example:

```
switch: delete flash:c3500XL−c3h2−mz−120.5−XP.bin
```

Step 13 Setup your PC to do X−modem:

- On the Hyper Terminal Menu bar, Click on **Transfer** and select **Send File** (Transfer−>Send File)
- This will bring up a "Send File" Pop Up window
- Select the Protocol to be **X−modem** from the pull down button
- Click Close

Step 14 Set up the switch so it is ready to receive X−modem file:

Run the **copy xmodem:**<*new_file.bin*> **flash:**<*new_file.bin*>command on the switch to copy the image to the Flash using X−modem, where new_file.bin is the file that you downloaded from the Cisco.com on your PC or workstation in Step 1.

For Example:

```
switch: copy xmodem:c3500XL−c3h2s−mz−120.5.2−XU.bin flash:c3500XL−c3h2s−mz−120.5.2−XU.bin
Begin the Xmodem or Xmodem−1K transfer now..

(Substitute your particular IOS image name for the name used above)
```

Step 15 Start the transfer of the file by doing the following steps on the PC:

- On the Hyper Terminal Menu bar, Click on **Transfer** and select **Send File** (Transfer−>Send File)
- This will bring up a "Send File" Pop Up window
- Fill in the Filename by using the **Browse** button
- Verify the Protocol to be **X−modem.** If its other than X−modem, select X−modem from the pull down button.
- Click on **Send** and this will start the transfer of the file

Note: Make sure that you start the transfer of the file immediately after receiving the *"Begin the Xmodem or Xmodem−1K transfer now.."* message (approximately within 3 to 5 seconds), otherwise the switch will timeout the XMODEM copy.

```
(The dots below represent the image progress.))
..............................................................................
..............................................................................
..............................................................................
.......................
File "xmodem:c3500XL−c3h2s−mz−120.5.2−XU.bin" successfully copied to "flash:c3500XL−c3h2s−mz−120.
```

Note: X−modem transfer can take between 25 to 35 minutes approximately , depending upon the switch and the size of the image.

Step 16 Verify the successful copy of the file to the Flash by typing **dir flash:** command:

```
switch: dir flash:
Directory of flash:/
2 −rwx 1645824 <date> c3500XL−c3h2s−mz−120.5.2−XU.bin

1965568 bytes available (1647104 bytes used)
```

Step 17 Set the BOOT parameters so that the switch boots up with the downloaded image when reloaded:

For Example:

```
(a) switch: set BOOT flash:c3500XL−c3h2s−mz−120.5.2−XU.bin
(substitute the image name above for the IOS name you loaded to flash)
```

Note: BOOT must be in capital letters.

During the download if you have performed Step 6, then type the following command to tell the switch to boot automatically.

```
(b) switch: unset MANUAL_BOOT
```

Step 18 Boot the switch:

```
switch: boot

Loading "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin"...##################################
###################################################################
File "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin" uncompressed and installed,
entry point: 0x3000 executing...
```

(The switch should now go through self−tests & boot with the new image)

Step 19 Go to the enable mode and run the **show boot** command to verify the BOOT parameters set in step 17:

```
Switch>enable
Switch# show boot

BOOT path−list: flash:c3500XL−c3h2s−mz−120.5.2−XU.bin
(substitute the image name for the IOS name you loaded to flash)
Config file: flash:config.text
Enable Break: no
Manual Boot: no
HELPER path−list:
NVRAM/Config file
buffer size: 32768
```

Note: If you notice that the BOOT parameters are not set properly, refer to the section Setting BOOT Parameters .

Step 20 Reload the switch to make sure that that the switch boots up properly:

```
Switch#reload
Proceed with reload? [confirm]
00:01:10: %SYS-5-RELOAD: Reload requested
C3500XL Boot Loader (C3500-HBOOT-M) Version 12.0(0.52)XU, BETA TEST SOFTWARE
Compiled Mon 06-Mar-00 12:12 by swati
starting...
Base ethernet MAC Address: 00:01:42:5b:42:00
Xmodem file system is available.
Initializing Flash...

flashfs[0]: 2 files, 1 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 1647616
flashfs[0]: Bytes available: 1965056
flashfs[0]: flashfs fsck took 3 seconds.

Done Initializing Flash.

Boot Sector Filesystem (Bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

Loading "flash:c3500XL-c3h2s-mz-120.5.2-XU.bin"...###################################
#################################################################
File "flash:c3500XL-c3h2s-mz-120.5.2-XU.bin" uncompressed and installed,    entry point: 0x3000
executing...
```

Note: If there is no previous configuration on the switch, then you will be prompted to enter the Initial Configuration Dialog.
For Example:

```
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.

Use ctrl-c to abort configuration dialog at any prompt.

Default settings are in square brackets '[]'.

Continue with configuration dialog? [yes/no]:
```

(Depending on your answer above, if you type "yes" then switch will take you to the initial configuration procedure. If you type "no", then it will go to the switch> prompt., For details on how to use the initial System configuration dialog, refer to ***Setting Up the Catalyst 2900 XL Initial Configuration*** *chapter of Release Notes for the Catalyst 2900 Series XL and 3500 Series XL Cisco IOS Release 12.0(5)XU and* ***First Time Setup*** *of Quick Start Guide Catalyst 3500 Series XL Switches).*

Step 21 Once the X−modem process is complete, download the combined ***.tar*** file using the TFTP process. For help with the TFTP download process, refer to TFTP Upgrade section.

Examples

TFTP Upgrade Using Combined *.tar* file

```
Switch>enable

Switch#sh boot
BOOT path-list: flash:c3500XL-c3h2-mz-120.5-XP.bin
Config file: flash:config.text
Enable Break: no
Manual Boot: no
HELPER path-list:
NVRAM/Config file
buffer size: 32768
Switch#rename flash:c3500XL-c3h2-mz-120.5-XP.bin flash:c3500XL-c3h2s-mz-120.5.2-XU.bin
Source filename [c3500XL-c3h2-mz-120.5-XP.bin]?
Destination filename [c3500XL-c3h2s-mz-120.5.2-XU.bin]?

Switch#dir flash:
Directory of flash:/

4 d--x 19008 Feb 28 1993 19:08:12 html
236 ---x 105 Feb 28 1993 19:08:12 info.ver
225 ---x 105 Feb 28 1993 19:06:02 info
226 ---x 20 Jan 11 2000 17:01:49 prefs.text
112 -rwx 1140 Mar 22 1993 12:09:32 vlan.dat
2 -rwx 1436203 Feb 28 1993 19:07:24 c3500XL-c3h2s-mz-120.5.2-XU.bin
111 -rwx 92 Feb 28 1993 19:05:07 env_vars
318 -rwx 2712 Feb 28 1993 19:08:33 config.text

3612672 bytes total (479232 bytes free)

Switch#config terminal
Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#no ip http server

Switch(config)#boot system flash:c3500XL-c3h2s-mz-120.5.2-XU.bin

Switch(config)#end

Switch#delete flash:html/*
Delete filename [html/*]?
Delete flash:html/Snmp? [confirm]
%Error deleting flash:html/Snmp (Is a directory)
Delete flash:html/ClusterBuilder.html.gz? [confirm]
Delete flash:html/ClusterManager.html.gz? [confirm]
...(output suppressed)

Switch#tar /x tftp://171.68.206.171//tftp/c3500XL-c3h2s-mz-120.5.2-XU.tar flash:
Loading /tftp/c3500XL-c3h2s-mz-120.5.2-XU.tar from 171.68.206.171 (via VLAN1):    !
extracting info (108 bytes)
extracting c3500XL-c3h2s-mz-120.5.2-XU.bin (1645807 bytes)!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
...(output suppressed)
html/ (directory)
extracting html/ClusterBuilder.html.gz (656 bytes)
extracting html/ClusterManager.html.gz (613 bytes)
extracting html/Graph.html.gz (1413 bytes)!
extracting html/back.html.gz (211 bytes)
extracting html/basiccfg.html.gz (253 bytes)
...(output suppressed)
```

```
[OK − 2723840 bytes]

Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#ip http server

Switch(config)#end

Switch#reload

System configuration has been modified. Save? [yes/no]: y
Building configuration...

Proceed with reload? [confirm]
%SYS−5−RELOAD: Reload requested

C3500XL Boot Loader (C3500−HBOOT−M) Version 11.2(0.68)SA6, BETA TEST SOFTWARE
Compiled Mon 26−APR−99 20:27 by jchristy
starting...
Base ethernet MAC Address: 00:d0:58:68:e4:c0
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 123 files, 4 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 2690560
flashfs[0]: Bytes available: 922112
flashfs[0]: flashfs fsck took 3 seconds.
Done Initializing Flash.
Boot Sector Filesystem (Bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4
Loading "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin"...##############################
#########################################################################
#########################################################
...(output suppressed)

C3500XL INIT: Complete

Switch#show version
Cisco Internetwork Operating System Software
IOS (TM) C3500XL Software (C3500XL−C3H2S−M), Version 12.0(5.2)XU, MAINTENANCE    IN
TERIM SOFTWARE
Copyright (c) 1986−2000 by cisco Systems, Inc.
Compiled Mon 17−Jul−00 18:29 by ayounes
Image text−base: 0x00003000, database: 0x00301F3C

ROM: Bootstrap program is C3500XL boot loader

3512XL−84 uptime is 2 minutes
System returned to ROM by reload
System image file is "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin"

cisco WS−C3512−XL (PowerPC403) processor (revision 0x01) with 8192K/1024K    bytes of memory.
Processor board ID , with hardware revision 0x00
Last reset from warm−reset

Processor is running Enterprise Edition Software
Cluster command switch capable
Cluster member switch capable
12 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

32K bytes of flash−simulated nonvolatile configuration memory.
```

```
Base ethernet MAC Address: 00:D0:58:68:E4:C0
Configuration register is 0xF
```

TFTP Upgrade of *.bin* and *html* Files Separately

The preferred way to upgrade via TFTP is to download a combined ***.tar*** file. If you want to copy just the ***.bin*** file using TFTP procedure, see the following example. It shows how to download the ***.bin*** and then ***html*** files separately. For details on the difference between ***.tar*** and ***.bin*** files, refer to Software Image Naming section.

```
switch>en

switch#sh boot
BOOT path-list: flash:c2900XL-hs-mz-112.8-SA5.bin
Config file: flash:config.text
Enable Break: 1
Manual Boot: no
HELPER path-list:
NVRAM/Config file
buffer size: 32768

switch#rename flash:c2900XL-hs-mz-112.8-SA5.bin flash:c2900XL-hs-mz-112.8.6-SA6.bin
Source filename [c2900XL-hs-mz-112.8-SA5.bin]?
Destination filename [c2900XL-hs-mz-112.8.6-SA6.bin]?

switch#dir flash:
Directory of flash:/

2 -rwx 4388 Mar 01 1993 00:00:13 vlan.dat
3 -rwx 1077215 Mar 01 1993 14:22:41 c2900XL-hs-mz-112.8.6-SA6.bin
4 -rwx 106 Mar 01 1993 03:35:39 info
5 drwx 11072 Mar 01 1993 14:27:05 html
184 -rwx 877 Mar 01 1993 14:27:28 config.text
178 -rwx 106 Mar 01 1993 03:38:16 info.ver
7 -rwx 230 Mar 01 1993 14:18:07 env_vars

1728000 bytes total (201728 bytes free)


switch(config)#boot system flash:c2900XL-hs-mz-112.8.6-SA6.bin

switch(config)#end

switch#copy tftp://tftp/c2900XL-hs-mz-112.8.6-SA6.bin flash:c2900XL-hs-mz-112.8.6-SA6.bin
Source IP address or hostname [171.68.206.171]?
Source filename [tftp/c2900XL-hs-mz-112.8.6-SA6.bin]?
Destination filename [c2900XL-hs-mz-112.8.6-SA6.bin]?
Loading tftp/c2900XL-hs-mz-112.8.6-SA6.bin from 171.68.206.171 (via VLAN1):    !!!!
!!!!!!!!!!
[OK - 1125001 bytes]

1125001 bytes copied in 71.576 secs (15845 bytes/sec)

switch#tar /x tftp://171.68.206.171/tftp/c2900XL-html.112.8.6-SA6.tar flash:html
Loading tftp/c2900XL-html.112.8.6-SA6.tar from 171.68.206.171 (via VLAN1):    !
extracting Detective.html.gz (1139 bytes)
extracting ieGraph.html.gz (553 bytes)
extracting DrawGraph.html.gz (787 bytes)!
extracting GraphFrame.html.gz (802 bytes)
extracting GraphFrameIE.html.gz (686 bytes)
...(output Suppressed)
[OK - 583168 bytes]
```

```
switch#reload

System configuration has been modified. Save? [yes/no]: y
Building configuration...
[OK]
Proceed with reload? [confirm]
%SYS-5-RELOAD: Reload requested

C2900XL Boot Loader (C2900-HBOOT-M) Version 11.2(8)SA2, RELEASE SOFTWARE (fc1)
Compiled Fri 24-Apr-98 10:51 by rheaton
starting...
Base ethernet MAC Address: 00:e0:1e:9f:50:c0
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 176 files, 3 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 1728000
flashfs[0]: Bytes used: 1640960
flashfs[0]: Bytes available: 87040
flashfs[0]: flashfs fsck took 4 seconds.
Done Initializing Flash.
Loading "flash:c2900XL-hs-mz-112.8.6-SA6.bin"...#################################
##################
...(output suppressed)

Cisco Internetwork Operating System Software
IOS (TM) C2900XL Software (C2900XL-HS-M), Version 11.2(8.6)SA6, MAINTENANCE INTERIM SOFTWARE
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Fri 10-Dec-99 14:47 by cchang
C2900XL INIT: Complete
```

X-Modem download of *.bin* file

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

switch: dir flash:
Directory of flash:/

3 -rwx 106 <date> info
4 drwx 14144 <date> html
7 -r-- 94 <date> env_vars
224 -rwx 17 <date> prefs.text
30 -r-- 1217 <date> config.text
6 -rwx 1557418 <date> c3500XL-c3h2s-mz-120.5-XP.bin
227 -rwx 106 <date> info.ver
229 -rwx 189 <date> placement.txt

1308160 bytes available (2304512 bytes used)


switch: delete flash:c3500XL-c3h2s-mz-120.5-XP.bin
Are you sure you want to delete "flash:c3500XL-c3h2s-mz-120.5-XP.bin"  (y/n)?y
File "flash:c3500XL-c3h2s-mz-120.5-XP.bin" deleted

switch: dir flash:
Directory of flash:/

3 -rwx 106 <date> info
4 drwx 14144 <date> html
```

```
7 −r−− 94 <date> env_vars
224 −rwx 17 <date> prefs.text
30 −r−− 1217 <date> config.text
227 −rwx 106 <date> info.ver
229 −rwx 189 <date> placement.txt

2865664 bytes available (747008 bytes used)


switch: copy xmodem:c3500XL−c3h2s−mz−120.5.2−XU.bin flash:c3500XL−c3h2s−mz−120.5.2−XU.bin
Begin the Xmodem or Xmodem−1K transfer now...
CCCCCCC.....................................................................
.....................................................................
.....................................................................
.....................................................................
.....................................................................
.........
File "xmodem:c3500XL−c3h2s−mz−120.5.2−XU.bin" successfully copied to "flash:c3500XL−c3h2s−mz−120.

switch: dir flash:
Directory of flash:/

3 −rwx 106 <date> info
4 drwx 14144 <date> html
7 −rwx 1645824 <date> c3500XL−c3h2s−mz−120.5.2−XU.bin
224 −rwx 17 <date> prefs.text
30 −r−− 1217 <date> config.text
6 −rwx 94 <date> env_vars
227 −rwx 106 <date> info.ver
229 −rwx 189 <date> placement.txt

1219584 bytes available (2393088 bytes used)


switch: set BOOT flash:c3500XL−c3h2s−mz−120.5.2−XU.bin


switch: boot
Loading "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin"...##############################
###############################################################################
############################################

File "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin" uncompressed and installed, entry point: 0x3000
executing...

...(ouput suppressed)

Cisco Internetwork Operating System Software
IOS (TM) C3500XL Software (C3500XL−C3H2S−M), Version 12.0(5.2)XU, MAINTENANCE INTERIM SOFTWARE
Copyright (c) 1986−2000 by cisco Systems, Inc.
Compiled Mon 17−Jul−00 18:29 by ayounes
Image text−base: 0x00003000, database: 0x00301F3C

Initializing C3500XL flash...
flashfs[1]: 228 files, 4 directories
flashfs[1]: 0 orphaned files, 0 orphaned directories
flashfs[1]: Total bytes: 3612672
flashfs[1]: Bytes used: 2393088
flashfs[1]: Bytes available: 1219584
flashfs[1]: flashfs fsck took 4 seconds.
flashfs[1]: Initialization complete.
Done Initializing C3500XL flash.
C3500XL POST: System Board Test: Passed
C3500XL POST: Daughter Card Test: Passed
```

```
C3500XL POST: CPU Buffer Test: Passed
C3500XL POST: CPU Notify RAM Test: Passed
C3500XL POST: CPU Interface Test: Passed
C3500XL POST: Testing Switch Core: Passed
C3500XL POST: Testing Buffer Table: Passed
C3500XL POST: Data Buffer Test: Passed
C3500XL POST: Configuring Switch Parameters: Passed
C3500XL POST: Ethernet Controller Test: Passed
C3500XL POST: MII Test: Passed
cisco WS−C3524−XL (PowerPC403) processor (revision 0x01) with 8192K/1024K bytes
of memory.
Processor board ID , with hardware revision 0x00
Last reset from warm−reset

Processor is running Enterprise Edition Software
Cluster command switch capable
Cluster member switch capable
24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

32K bytes of flash−simulated nonvolatile configuration memory.
Base ethernet MAC Address: 00:D0:58:68:CE:40

Press RETURN to get started!

C3500XL INIT: Complete

00:00:18: %SYS−5−CONFIG: Configured from NVRAM by console
00:00:18: %SYS−5−RESTART: System restarted −−
Cisco Internetwork Operating System Software
IOS (TM) C3500XL Software (C3500XL−C3H2S−M), Version 12.0(5.2)XU, MAINTENANCE INTERIM SOFTWARE
Copyright (c) 1986−2000 by cisco Systems, Inc.
Compiled Mon 17−Jul−00 18:29 by ayounes


Switch>enable

Switch#sh version
Cisco Internetwork Operating System Software
IOS (TM) C3500XL Software (C3500XL−C3H2S−M), Version 12.0(5.2)XU, MAINTENANCE INTERIM SOFTWARE
Copyright (c) 1986−2000 by cisco Systems, Inc.
Compiled Mon 17−Jul−00 18:29 by ayounes
Image text−base: 0x00003000, database: 0x00301F3C

ROM: Bootstrap program is C3500XL boot loader

Switch uptime is 0 minutes
System returned to ROM by reload
System image file is "flash:c3500XL−c3h2s−mz−120.5.2−XU.bin"

cisco WS−C3524−XL (PowerPC403) processor (revision 0x01) with 8192K/1024K bytes
of memory.
Processor board ID , with hardware revision 0x00
Last reset from warm−reset

Processor is running Enterprise Edition Software
Cluster command switch capable
Cluster member switch capable
24 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)

32K bytes of flash−simulated nonvolatile configuration memory.
Base ethernet MAC Address: 00:D0:58:68:CE:40
Configuration register is 0xF
```

Common Problems

Getting "Error Loading Flash" Error Messages

The error loading Flash message indicates that there was a problem loading the current image in Flash. The image may be corrupt, an incorrect image, or the image in Flash may be missing. If the system is unable to load a software image in Flash, the system will load the boot helper and bring up a **switch:** prompt.

The following is an example output from a failed bootup:

```
C2900XL Boot Loader (C2900−HBOOT−M) Version 11.2(0.28)SA4, BETA TEST SOFTWARE
Compiled Fri 06−Nov−98 00:15 by paulines
starting...
Base ethernet MAC Address: 00:50:80:39:f8:80
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 175 files, 4 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 3113472
flashfs[0]: Bytes available: 499200
flashfs[0]: flashfs fsck took 85 seconds.
Done Initializing Flash.
Boot Sector Filesystem (Bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4
Loading "flash:c2900XL−h2s−mz−120.5−XP.bin"...flash:c2900XL−h2s−mz−120.5−XP.bin:
no such file or directory

Error loading "flash:c2900XL−h2s−mz−120.5−XP.bin"

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

Solution:

Step 1 Issue the **dir flash:** command to verify if there is any bootable image on the Flash. The file with ***.bin*** extension is the bootable image on the Flash.

For Example:

```
switch: dir flash:
Directory of flash:/

2 −rwx 1644045 <date> c3500XL−c3h2s−mz−120.5−XU.bin(This is the bootable image in the flash)
111 −rwx 106 <date> info.ver
4 drwx 6848 <date> html
1 114 −rwx 2504 <date> vlan.dat
116 −rwx 86 <date> env_vars
```

```
6 −rwx 106 <date> info
117 −rwx 5225 <date> config.text

927232 bytes available (2685440 bytes used)
```

If you see a bootable image on the Flash, then go to step 2. If you don't see any bootable image in the Flash, then proceed to X−Modem Upgrade section to download the Cisco IOS image file using the X−Modem download procedure.

Step 2 Type **set BOOT flash:** ***name of IOS file*** to set the boot variable to the file name displayed in step 1. Note that BOOT must be capitalized and make sure to include **flash:** before the file name.

For Example:

```
switch: set BOOT flash:c3500XL−c3h2s−mz−120.5−XU.bin
switch:
```

Step 3 Boot the switch by typing the **boot** command:

For Example:

```
switch:boot
Loading "flash:c3500XL−c3h2s−mz−120.5−XU.bin"...#################################
##############################################################################
##########################################

File "flash:c3500XL−c3h2s−mz−120.5−XU.bin" uncompressed and installed, entry point: 0x3000
executing...
```

Note: If the switch boots up properly, then go to Setting BOOT Parameters at Global Configuration Mode to verify and set the BOOT parameters (if needed) and proceed to step 4. If the switch fails to boot properly, then proceed to X−Modem Upgrade section to download the IOS image file using the X−Modem download procedure.

Step 4 After setting the BOOT Parameters, reload the switch by typing **reload** at the privileged EXEC mode. The switch should bootup automatically, with the correct image.

Getting "Address Range" Error Message and Bootup Failing

This error message is seen when a 4 MB 2900XL switch is upgraded to a wrong image that is not supported on this hardware. The switch in this case tries to load the image, but since this switch is not capable of loading this image, the bootup process fails. This happens in cases when a 4 MB 2900XL switch is upgraded to a 12.0 image.

The following is an example output from a failed bootup:

```
Loading "flash:c2900XL−h2s−mz−120.5.1−XP.bin"...Bootable image segment 12288 add
ress range [0x4008f0, 0x3000] not in range [0x300000, 0x7f].
```

```
Error loading "flash:c2900XL−h2s−mz−120.5.1−XP.bin"

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

Solution:

Go to X−Modem Upgrade section to download the IOS Image File using the X−Modem download procedure.

Getting "No Such File or Directory" Error Message During the Bootup

This error message is seen when bootable file and the actual file name in the Flash differ. This usually happens due to a miss−typed file name when setting the boot parameters, during or after the upgrade.

The following is an example output from a failed bootup:

```
Loading "flash:c3500X1−c3h2s−mz−120.5−XU.bin"Flash:c3500X1−c3h2s−mz−120.5−XU.
bin : no such file or directory

Error loading "flash:c3500X1−c3h2s−mz−120.5−XU.bin"

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

It can be verified by typing **dir flash.** The output is as follows:

```
switch: dir flash:
Directory of flash:/

2 −rwx 1644045 <date> c3500XL−c3h2s−mz−120.5−XU.bin
```

Notice that the file name in the flash and the file that the switch is trying to load differ: there is "1" after "X" in the first case, while the flash shows the file has "L" after "X".

Solution:

Step 1 Go to Setting BOOT Parameters at ROMMON (Switch: Prompt) , to verify and set the BOOT parameters correctly.

Step 2 If setting the BOOT Parameters to the correct file name does not resolve the issue, perform X−Modem Upgrade , as the file present on the Flash could be corrupted and/or invalid.

Getting "Permission Denied" Error Message During the Bootup

This error message is seen in cases where the boot parameters are not set correctly. In most of the cases, when setting the boot parameters during or after the upgrade, the word **flash:** is mistyped or completely missed.

The following is an example output from a failed bootup:

```
Loading "c2900XL−c3h2s−mz−120_XU.bin"...c2900XL−c3h2s−mz−120_XU.bin: permission denied

Error loading "c2900XL−c3h2s−mz−120_XU.bin"

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

It can be seen in the above output that the switch is trying to load ***c2900XL−c3h2s−mz−120_XU.bin***. In normal cases it should show the word ***flash*** in the name: ***flash:c2900XL−c3h2s−mz−120_XU.bin***.

Solution:

Step 1 Go to Setting BOOT Parameters at ROMMON (Switch: Prompt) to verify and set the BOOT parameters correctly.

Step 2 If setting the BOOT Parameters does not resolve the issue, perform X−Modem Upgrade , as the file present on the Flash could be corrupted and/or invalid.

Failed Software Upgrade, Switch is Resetting Continuously

This may be due to a corrupt image, an incorrect image, or the image in Flash may be missing. The following steps can be performed to try to recover if the switch is in a reset loop after or during the upgrade.

Solution:

Step 1 Connect the PC to the switch console port. Go to Accessing the Switch Using Console Port for details.

Step 2 Press the "*enter*" key a few times. Are you seeing a switch: prompt? If not, then proceed to Step 3. Otherwise, go to Step 4

Step 3 Pull the power cord. Hold down the mode button on the front of the switch and plug the power cord back in. All lights above all ports should come on green. Continue to hold down the mode button until the light above port 1 goes out, then release the mode button. The prompt should be **switch:**

Step 4 Perform the X−modem download .

After the Upgrade, the Switch still Boots up with the Old Image

This happens in the case when either the BOOT parameters are not correct and the switch is still set to boot from the old image, or the upgrade did not go through properly.

Solution:

Step 1 Go to section Setting BOOT Parameters at Global Configuration Mode . Verify the BOOT parameters, and correct them if needed.

Step 2 If the BOOT Parameters are found to be correct by following Step 1, then go to TFTP Upgrade section and perform the upgrade again by following all the steps.

Step 3 If you have followed all the steps in the TFTP Upgrade section and if the switch still boots with the old image, then perform the X−modem download .

Switch Not Booting Automatically, Needs a Manual Boot at the ROMMON (Switch: Prompt)

The reason could be the switch boot parameter are set such that it is set for manual boot. It can be confirmed via the following methods,

1) At the **switch:** (ROMMON) prompt, type **"set"** and observe the output which can be similar to the output as follows,

For Example:

```
switch: set
BOOT=flash:c2900XL−h−mz−112.8−SA5.bin
MANUAL_BOOT=yes
```

2) At the regular switch# prompt, type **"sh boot"** and observe the output which can be similar to the output as follows,

For Example:

```
Switch#show boot
BOOT path−list: flash:c2900XL−h−mz−112.8−SA5.bin
Config file: flash:config.text
Enable Break: no
Manual Boot: yes
HELPER path−list:
NVRAM/Config file
buffer size: 32768
```

Note that in both cases the Manual Boot is set to yes.

Solution:

The switch can be set to boot automatically by doing the following steps:

Step 1 Access the switch by Telnetting into the switch or by connecting the PC to the switch console port.

Step 2 Enter the privileged EXEC mode by typing **enable** at the switch> prompt:

```
switch> enable
switch#
```

Step 3 Enter the Global Configuration Mode:

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
```

Step 4 Type **no boot manual** to tell the switch to boot automatically:

```
Switch(config)#no boot manual
```

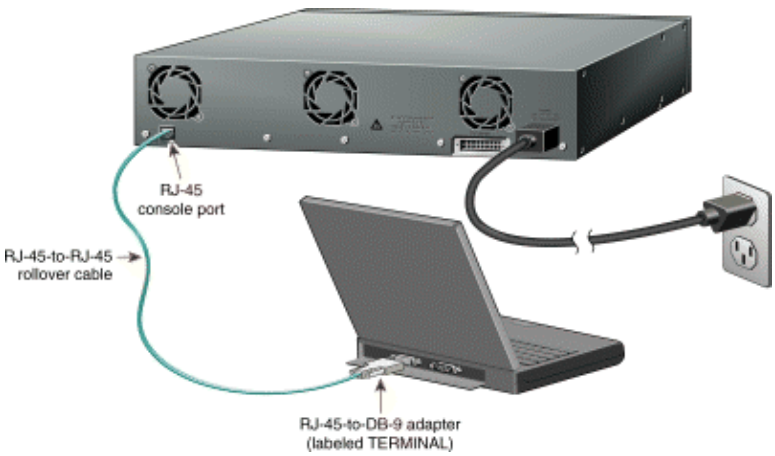
Step 5 Type **end** to go back to the privileged EXEC mode and save the configuration with the **write memory** command:

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

Step 6 Verify the boot parameters by typing **show boot**. Verify that 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:
..
Switch#
```

Accessing the Switch Using Console Port



Requirements:

1) Catalyst 2900XL/3500XL Switch
2) PC running terminal Emulation Software, such as Hyper Terminal or ProCom Plus
3) RJ−45−to−RJ−45 rollover cable (A Blue flat cable supplied with the switch)
4) RJ−45−to−DB−9 female DTE or appropriate adapter that connects to the PC COM Port

For further details on cables and connectors, refer to the Connector and Cable Specifications chapter of the Catalyst 3500 Series XL Hardware Installation Guide and the Connectors and Cables chapter of the Catalyst 2900 Series XL Installation Guide.

Step 1 Connect the rollover cable to the port marked CONSOLE on the rear panel of the switch.

Step 2 If needed, connect the appropriate Terminal DTE adapter to the COMM port on the back of the PC.

Step 3 Connect the other end of the rollover cable to the PC running the Terminal Emulation Software.

Step 4 Start the Terminal Emulation software.

For Example: To start Hyper Terminal Emulation Software on the PC follow these steps:

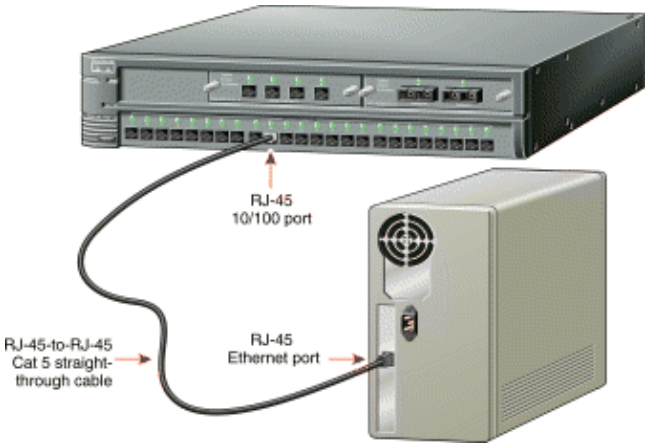
- From the Start Menu, select **Programs−>Accessories−>Hyper Terminal**
- This will open the Hyper Terminal folder in a new window
- Double Click on **Hypertrm.exe** file
- This will start the Hyper Terminal Software and a new window will appear
- Enter the Name of the Connection, under the **Name:** and click OK
- You will see a POP UP window showing "Country code", "Area code", "Phone number" and "Connect using"
- From the Pull Down button in front of "**Connect Using**", select "Direct to Com 1" or "Direct to Com 2", depending on the COM port on which you have connected the DTE Terminal Adapter and Click OK
- You will see another POP UP window labelled as "**COM1 Properties**", make the following selections from the pull down buttons,

    - ♦ Bits per second: 9600
    - ♦ Data Bits: 8
    - ♦ Parity: None
    - ♦ Stop bits: 1
    - ♦ Flow control: None
- After making the selections click OK.
- You will see a Blank White Screen with "Cursor" blinking on the Top Left Corner
- Press "*enter*" a couple of times and you will be connected to the Switch Console and you will see the prompt
- Once connected, if you want to save this session for your future use then, from the File Menu, select Save and this session will be saved in the Hyper Terminal folder in a file naming ***file_name.ht***(Where file_name is the name of the connection that you have save above)

Note: In the future, if you want to connect using the saved file, simply double click on the file

file_name.ht file in the Hyper Terminal folder.

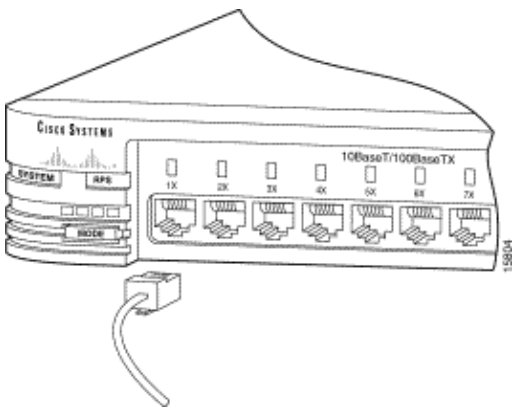
Getting Basic IP Connectivity to the Switch



Access to all switch management facilities is through the switch IP address, and the switch IP address always belongs to the management VLAN, VLAN 1, by default. Switches running a version of IOS software that is earlier than Cisco IOS 12.0(5)XP cannot change the management VLAN. If you are running Cisco IOS 12.0(5)XP or later and need to change the Management VLAN, refer to the *CLI Procedure for Configuring the Management VLAN Interface through a Console Connection* section of the Managing Your Switches chapter in the Cisco IOS Desktop Switching Software Configuration Guide.

This section explains the procedure on how to get the basic IP connectivity to the switch via management VLAN 1. The description below assumes that the workstation that is running the TFTP server is directly connected to one of the switch ports. By default all the ports are member of VLAN 1. For more complex configurations, refer to the Cisco IOS Desktop Switching Software Configuration Guide.

Step 1 Connect a Category 5 **straight−through** cable to a 10/100 port on the front panel of the switch as shown in the Figure below. Connect the other end of the cable to the RJ−45 port of the PC, workstation or server. Make sure that you see a link light on the port.



Step 2 Console into the switch.

Step 3 Use the **show interface** privileged EXEC command to display the administrative and operational status of the port that you used in step−1 to connect to the PC or workstation:

For example:

```
Switch#show interface fastEthernet 0/2
FastEthernet0/2 is up, line protocol is up
Hardware is Fast Ethernet, address is 00d0.5868.ce42 (bia 00d0.5868.ce42)
MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
...(output Suppressed)
```

Step 4 Beginning in privileged EXEC mode, follow these steps to enter the IP information:

a. Enter global configuration mode by typing **configure terminal**:

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config) #
```

b. Enter interface configuration mode, and enter the VLAN to which the IP information is assigned. VLAN 1 is the management VLAN in this case. Type **interface vlan 1**:

```
Switch(config)#interface vlan 1
Switch(config−if)#
```

c. Enter the IP address and subnet mask by typing **ip address** *ip_address subnet_mask*:

```
Switch(config−if)#ip address 172.16.84.26 255.255.255.0 (Use the IP address and mask acco
```

d. Run **no shutdown** command to make sure that VLAN 1 is up administratively:

```
Switch(config−if)#no shutdown
```

e. Exit from the interface configuration mode by typing **exit**, this will take you back to the Global Configuration Mode:

```
Switch(config−if)#exit
Switch(config)#
```

f. Enter the IP address of the default router by using **ip default−gateway** *ip_address* command. This is needed to access the Management IP of the switch if you are trying to reach it across the network:

```
Switch(config)#ip default−gateway 172.16.84.1 (Use the IP Address accordingly)
```

g. Exit out to the **privileged EXEC** mode by typing **end**:

```
Switch(config)#end
Switch#
```

h. Save the configuration by using the **write memory** command:

```
Switch#write memory
Building configuration...
```

```
Switch#
```

i. Use the **show running** command to verify your configuration:

```
Switch#show running
Building configuration...

Current configuration:
!
version 12.0
...(output suppressed)

!
hostname Switch
!
!
...(output suppressed)

!
interface VLAN1
ip address 172.16.84.26 255.255.255.0
no ip directed-broadcast
no ip route-cache
!
ip default-gateway 172.16.84.1
!
line con 0
transport input none
stopbits 1
line vty 0 4
login
line vty 5 15
login
!
end

Switch#
```

Step 5 Verify the IP connectivity between the switch and the TFTP server by using the **ping x.x.x.x** command on the switch, where x.x.x.x is the IP address of the workstation or PC running the TFTP server application. If this step does not work, DO NOT proceed to the next steps.

For Example:

```
Switch#ping 171.68.206.172

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 171.68.206.172, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/13 ms
Switch#
```

Setting BOOT Parameters

Setting BOOT Parameters at ROMMON (Switch: Prompt)
Setting BOOT Parameters at Global Configuration Mode

Setting BOOT Parameters at the ROMMON(Switch: Prompt)

Step 1 Connect the PC to the switch console port. Go to Accessing the Switch Using Console Port for details.

Step 2 Press the "*enter*" key a few times. Are you seeing a switch: prompt? If not, then proceed to step 3. Otherwise, go to Step 4.

Step 3 Pull the power cord. Hold down the mode button on the front of the switch and plug the power cord back in. All lights above all ports should come on green. Continue to hold down the mode button until the light above port 1 goes out, then release the mode button. The prompt should be **switch:**

Step 4 Make sure that the Flash is properly initialized by running the **flash_init** command. Running this command will not delete any files from the Flash. It will just make the Flash useable.

```
switch: flash_init
Initializing Flash...
...(output suppressed)

switch:
```

Note: In some cases, when the switch does not bootup properly to the regular prompt and goes to the ROMMON (switch: prompt), the Flash is not properly initialized and is not useable(read or write). It is always advisable to issue the **flash_init** command to make sure that you can use the Flash.

An example of such failed output is as follows,

```
C3500XL Boot Loader (C3500−HBOOT−M) Version 11.2(0.68)SA6, BETA TEST SOFTWARE
Compiled Mon 26−Apr−99 20:27 by jchristy
starting...

Base ethernet MAC Address: 00:d0:58:68:db:80
Xmodem file system is available.

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: dir flash:
unable to stat flash:/: invalid argument(Note that the command failed)

switch: flash_init
Initializing Flash...

flashfs[0]: 116 files, 4 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 2684416
flashfs[0]: Bytes available: 928256
flashfs[0]: flashfs fsck took 4 seconds.
```

```
...done Initializing Flash.

Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

switch: dir flash:
(Note below, that now we are able to use the flash and issue commands)
Directory of flash:/

2 -r-- 1644045 <date> c3500XL-c3h2s-mz-120.5-XU.bin
231 -r-- 106 <date> info.ver
4 drwx 6848 <date> html
232 -r-- 22 <date> prefs.text
...(ouput suppressed)

928256 bytes available (2684416 bytes used)
```

Note: If the Flash is already initialized, then issuing the **flash_init** command will indicate it.

For Example:

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

Step 5 Type the **dir flash:** command. Write down the exact (it is case sensitive) name of the IOS file. It is the file that starts with C2900XL or C3500XL and usually ends with **.bin**

For Example:

```
switch: dir flash:
Directory of flash:

2 -rwx 1644045 <date> c3500XL-c3h2s-mz-120.5-XU.bin
4 drwx 6848 <date> html
223 -rwx 106 <date> info
6 -r-- 960 <date> vlan.dat
238 -rwx 106 <date> info.ver
239 -r-- 607 <date> placement.txt
112 -rwx 95 <date> env_vars

910848 bytes available (2701824 bytes used)
switch:
```

Note: If you don not see any file with **.bin** extension in the list, then it means that the bootable image is missing. Follow the steps listed in the X−Modem Upgrade section to download the Image file. DO NOT proceed to Step 6. If you do see the .bin file, then proceed to Step 6.

Step 6 Type **set**. Observe what the "BOOT =" variable is set to. If this filename does not EXACTLY match the IOS file seen in the output of **dir flash:** command in Step 5, go to Step 7.

```
switch: set
?=
BAUD=9600
BOOT=flash:c3500XL-c3h2-mz-120.5-XP.bin(Note that the file name differ from step 6)
MAC_ADDR=00:d0:58:68:f1:80
MANUAL_BOOT=no
switch:
```

Step 7 Type **set BOOT flash:***name of IOS file* to set the boot variable to the correct file name. Note that BOOT must be capitalized and make sure to include flash: before the file name.

For Example:

```
switch: set BOOT flash:c3500XL−c3h2s−mz−120.5−XU.bin
switch:
```

Step 8 Type **set** again to make sure that the boot parameter reflect the change that you made in Step 7.

For Example:

```
switch: set
?=
BAUD=9600
BOOT=flash:c3500XL−c3h2s−mz−120.5−XU.bin
MAC_ADDR=00:d0:58:68:f1:80
MANUAL_BOOT=no
switch:
```

Step 9 Type **boot** to load the switch. The switch should boot up with the correct Image.

For Example:

```
switch: boot
Loading "flash:c3500XL−c3h2s−mz−120.5−XU.bin"...################################
################################################################################
########################################

File "flash:c3500XL−c3h2s−mz−120.5−XU.bin" uncompressed and installed,    entry point: 0x3000
executing...
```

Setting BOOT Parameters at the Global Configuration Mode

Step 1 Connect the PC to the switch console port. Go to Accessing the Switch Using Console Port for details.

Step 2 Enter the privileged EXEC mode by typing **enable** at the switch> prompt:

```
switch> enable
switch#
```

Step 3 Display the boot configuration by entering the **show boot** command:

```
Switch#: show boot
BOOT path−list: flash:c3500XL−c3h2s−mz−120.5.1−XP.bin
Enable Break: no
Manual Boot: no
HELPER path−list:
NVRAM/Config file
buffer size: 32768
```

Step 4 Verify the boot configuration by typing **dir flash:**. Write down the exact (it is case sensitive) name of the IOS file. It is the file that starts with C2900XL or C3500XL and usually ends with **.bin**

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

```
2 ---x 1644045 Mar 01 1993 00:09:43 c3500XL-c3h2s-mz-120.5-XU.bin
3 d--x 6848 Mar 01 1993 00:10:28 html
223 ---x 106 Mar 01 1993 00:08:23 info
6 -rwx 960 Mar 01 1993 17:31:45 vlan.dat
238 ---x 106 Mar 01 1993 00:10:28 info.ver
114 ---x 96 Jan 01 1970 00:24:24 env_vars

3612672 bytes total (910848 bytes free)
```

Note: Make sure to verify that the image displayed in the **dir flash**: output is the correct image for your hardware. For details, refer to XL Models, Memory, and Supported Images and Software Image Naming sections.

Step 5 If the boot variable is not correct, and the name of the file does not match in Steps 3 and 4, enter the Global configuration mode and change the boot variable by entering the **boot system flash:<filename>** command, where filename is the name of the bootable image found in Step 4.

For Example:

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#boot system flash:c3500XL-c3h2s-mz-120.5-XU.bin
Switch(config)#
```

Step 6 Go back to the privileged EXEC mode by typing **end**. Save the configuration by issuing the command **write memory** and verify the boot parameter by issuing the command **show boot**.

For Example:

```
Switch(config)#end
Switch#
: %SYS-5-CONFIG_I: Configured from console by console
Switch#write memory
Building configuration...

Switch#show boot
BOOT path-list: flash:c3500XL-c3h2s-mz-120.5-XU.bin
Config file: flash:config.text
Enable Break: no
Manual Boot: no
HELPER path-list:
NVRAM/Config file
buffer size: 32768
Switch#
```

Related Information

- Overview of the 2900 XL Series Switches
- Catalyst 2900 and 3500 XL Switches, Rel. 12.0(5)XU
- Recovery From Corrupt or Missing Software Image − Cisco Catalyst 2900XL, 3500XL, and 2950 Series Switches
- Quick Start Guide: Catalyst 2900 Series XL Switches
- Quick Start Guide: Catalyst 3500 Series XL Switches
- Release Notes for the Catalyst 2900 Series XL and 3500 Series XL Cisco

Updated: Apr 09, 2002 Document ID: 5106