Upgrading Software in Catalyst 2900XL and 3500XL Switches Using the Command Line Interface

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Introduction

This is a step−by−step guide to the software upgrade process for the Catalyst fixed configuration switches 2900XL and 3500XL that use the Command Line Interface (CLI). This document explains the Trivial File Transfer Protocol (TFTP) upgrade and Xmodem download procedure for the Catalyst fixed configuration switches 2900XL and 3500XL only. See the XL Models, Memory, and Supported Images section for a complete list of switches. This document also lists Common Problems/Error messages and their solutions.

This document does not cover the upgrade procedure that uses the web interface, Cisco Visual Switch Manager [VSM] 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. Refer to the *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 for 8 MB DRAM Catalyst 2900XL switches and Catalyst 3500 Series XL switches.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

See the XL Models, Memory, and Supported Images section of this document for a detailed list of necessary components.

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 Cisco Technical Tips Conventions for more information on document conventions.

Important Notes

Before you perform the software upgrade on the XL switches, the first and most important thing is to determine the correct software image required for your switch. This is dependent on the memory configuration of the XL switch.

If you upgrade a 2900XL switch, then there are two possible memory configurations:

- 4 MB DRAM switch with 2 MB of Flash
- 8 MB DRAM switch with 4 MB of Flash

There is only one memory configuration for a 3500XL, which is 8 MB DRAM switches with 4 MB of Flash.

In this document, the XL Models, Memory, and Supported Images section 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, they are called 4 MB and 8 MB switches. This refers to the amount of Dynamic Random Access Memory (DRAM). 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 in order to allow for more functionality, which includes VLAN trunking, in the 8 MB switches. No amount of software upgrades nor memory upgrades allow the older 4 MB switches to achieve 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.

Cisco IOS® Software Release 11.2(8)SAx 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 Cisco IOS Software Releases 11.2(8)SA1, 11.2(8)SA2, and 11.2(8)SA3. 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 in order 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, it was no longer possible to run all versions of software 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. It is important to note 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)WC8 or later at the present time.

This table summarizes the information previously explained:

Platform/Memory Configuration	Cisco IOS Software Releases: • 11.2(8)SA • 11.2(8)SA3 • 11.2(8)SA4	Cisco IOS Software Release 11.2(8)SA4	Cisco IOS Software Release 11.2(8)SA5	Cisco IOS Software Release 11.2(8)SA6	Cisco IOS Software Release 12.0(5)XP	All other releases of Cisco IOS Software 12.0(5)
Catalyst 2900XL/4 MB DRAM	Standard image Enterprise image	Standard image Enterprise image	Original image	Original image	Not Available	Not Available
Catalyst 2900XL/8 MB DRAM	Not Available	Standard image Enterprise image	Standard image Enterprise image	Standard image Enterprise image	Standard image Enterprise image	All Images
Catalyst 3500XL	Not Available	Not Available	Not Available	Standard image Enterprise image	Standard image Enterprise image	All Images

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

XL Models, Memory, and Supported Images

Standard and Enterprise editions of Cisco IOS software previously supported the 8 MB Catalyst 2900XL and 3500XL switches. With Cisco IOS Software Release 12.0(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 Cisco IOS Software Release 12.0(5.x)XU and the final release for 4 MB Catalyst 2900 series XL switches is Cisco IOS Software Release 11.2(8.6)SA6.

- See Table 1 for 4 MB 2900XL switches.

- See Table 2 for 8 MB 2900XL switches.
- See Table 3 for 3500XL switches.

Table 1 – 4 MB Catalyst 2900XL Models, Memory, and Supported Images	
4 MB Catalyst 2900XL Models, Memory, and Supported Images Original Edition XLs (2MB Flash, 4 MB DRAM)	Catalyst XL Series Switch
Upgrade these switches to either: Original 2900XL Cisco IOS Software Release 11.2(8)SA6 Software (registered customers only) OR Earlier 2900XL Original Software (registered customers only)	WS−C2908−XL WS−C2916M−XL WS−C2924−XL WS−C2924C−XL

Table 2 – 8 MB Catalyst 2900XL Models, Memory, and Supported Images	
Standard/Enterprise Edition XLs (4 MB Flash, 8 MB DRAM)	Catalyst XL Series Switch
Upgrade these switches to either: 2900XL Cisco IOS Software Release 12.0 (registered customers only) OR Earlier 2900XL Standard/Enterprise Software (registered customers only)	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 (registered customers only) OR Earlier 2900XL Enterprise Software (registered customers only)	WS−C2912MF−XL
2900XL Cisco IOS Software Release 12.0 (registered customers only)	WS−C2924M−XL−EN−DC

Table 3 – Catalyst 3500XL Models, Memory, and Supported Images	
Standard/Enterprise Edition XLs (4 MB Flash, 8 MB DRAM)	Catalyst XL Series Switch
Upgrade these switches to either:	WS−C3508G−XL−A

3500XL Cisco IOS Software Release 12.0 (registered customers only) OR Earlier 3500XL Standard/Enterprise Software (registered customers only)	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 (registered customers only)	
	WS–C3524–PWR–XL–EN

Meaning of Flash Files

Issue this command in order to view the Flash directory information on the switch:

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

  2  -rwx     1803565   Mar 01 1993 00:22:42  c2900xl-c3h2s-mz.120-5.WC8.bin

!--- Current image

 17  -r--         108   Mar 01 1993 00:04:46  info

!--- Created during upgrade

  4  dr--       13888   Mar 01 1993 00:06:39  html\

!--- Web browser files

227  -r--         341   Mar 01 1993 00:10:55  env_vars

!--- Boot variables

 18  -r--         108   Mar 01 1993 00:06:39  info.ver

!--- Created during upgrade

 19  -r--        1204   Mar 01 1993 00:11:21  config.text

!--- Config file, show running-configuration


3612672 bytes total (1088512 bytes free)
```

The previous files contain this 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 directory 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 if you use a combined .tar file that contains the HTML files and the Cisco IOS image.

Table 4 – Possible Extensions for Cisco 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 Cisco 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 Cisco IOS Software Release. From the CLI, you can upgrade the switch software with this HTML file and the Cisco IOS image file.
.bin	The Cisco IOS image file that does not have any HTML files, can be copied to the switch through TFTP.

Note: Since Cisco IOS Software Release 12.0(5)WC5, the file with **.tar** extension also has **tar** in the filename itself, for example, c2900xl−c3h2s−**tar.**120−5.WC5**.tar**.

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

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

Tip: If you are at the **boot loader/ROMMON** (switch: prompt), run the **dir flash:** command and add the values for **bytes available** and **bytes used**. These either add to approximately 2 MB or 4 MB. If the total number of bytes on the Flash adds up to approximately 2 MB then it is a 4 MB switch. If the number adds up to approximately 4 MB then it is an 8 MB switch.

This is the output of the **show version** and **dir flash:** commands.

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)WC8, RELEASE
 SOFTWARE (fc1)
Copyright (c) 1986-2003 by Cisco Systems, Inc.
Compiled Thu 19-Jun-03 13:09 by antonino
Image text-base: 0x00003000, data-base: 0x0034E2F4

ROM: Bootstrap program is C2900XL boot loader

switch uptime is 1 minute
System returned to ROM by reload
System image file is "flash:c2900xl-c3h2s-mz.120-5.WC8.bin"


cisco WS-C2924-XL (PowerPC403GA) processor (revision 0x11) with 8192K/1024K
 bytes of memory.
Processor board ID FAB0409T0H6, with hardware revision 0x01
Last reset from warm-reset

Processor is running Enterprise Edition Software
```

Note: The output shows 8192K of memory, which indicates the DRAM present on the switch. This value is equivalent to 8 MB.

Note: If you are at the `switch:` prompt, issue the **dir flash:** command in order to determine amount of Flash.

```
switch:dir flash:
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)
```

The output indicates that there is approximately 3.6 MB of Flash (1.96MB+1.64 MB), which indicates that this is a 8 MB DRAM/4 MB Flash Switch.

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: The output shows 4096K of memory, which indicates the DRAM present on the switch. This value is equivalent to 4 MB.

If you are at the `switch:` prompt, issue the **dir flash:** command in order to determine amount of Flash.

```
switch: dir 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)
```

The output indicates that there is approximately 2.6MB (1.00MB+1.62MB) of Flash, which indicates that this is a 4 MB DRAM/2MB Flash Switch.

Note: When you run these commands on 3500XL switches, it always correctly indicates that 3500XL has 4 MB of Flash and 8 MB of DRAM.

TFTP Upgrade

Before you begin the TFTP upgrade procedure with the use of CLI on the switch, verify and perform these six major steps:

1. Download the combined **.tar** file from Cisco.com.

   This file contains the Cisco IOS image and the HTML files.

   The **tar** command extracts the Cisco IOS image and the HTML files from the combined **.tar** file during the TFTP copy to the switch. Use sections XL Models, Memory, and Supported Images and Software Image Naming of this document in order to identify the files you want to download.
2. TFTP might be used in order to transfer software image files from a PC to your device.

   This document was written with the use of the output from the Cisco TFTP Server application. Cisco has discontinued this application and no longer supports it. If you do not have a TFTP server, obtain any third−party TFTP server application from another source.

   Note: Make sure that you install/run the TFTP Server on the same machine on which you have downloaded the Cisco IOS image from the Software Center.
3. Verify the IP connectivity between the switch and the machine on which you run the TFTP Server.

   See the Getting Basic IP Connectivity to the Switch section of this document if needed.
4. Double−click the Cisco TFTP Server icon from the desktop or from the Start menu in order to start the TFTP Server. Then choose **Programs > Cisco TFTP Server**.

   Note: When you use Windows NT with a NTFS partition, ensure that the required TFTP root directory and files have the permissions marked as everyone. Otherwise, the TFTP transfer might fail

if these permissions are not set. Refer to Microsoft NT Documentation for details on how to set the permissions.

5. If you use Cisco TFTP Server, disable the Logging Function in order to prevent excessive logging that can disrupt the TFTP process.

   Choose **Options** from the View menu in order to disable logging on the Cisco TFTP Server. Uncheck **Enable Logging** and click **OK**.

6. Start a Telnet session or connect to the switch console port through the RS−232 connector on the PC in order to access the Switch CLI.

   It is recommended that you access the CLI with the use of the switch console in order to prevent loss of connectivity to the switch when it is reset during the upgrade. If you must access the switch through Telnet, enter this command on the your PC or workstation:

   ```
   server% telnet switch_ip_address
   ```

Once these six steps are completed, proceed with the TFTP upgrade mentioned in this section.

Common TFTP Procedure

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

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

1. Type **enable** at the `switch>` prompt in order to enter the privileged EXEC mode.

   ```
   switch>enable
   switch#
   ```

2. If you upgrade a 2900XL switch, issue the **show version** command in order to confirm the amount of memory present on the switch.

   See the How to Determine the Amount of Memory on the Switch Using Command Line Interface section of this document for the details on how to verify the amount of memory present on the 2900XL switch.

3. Display the name of the running image file.

   ```
   switch#show boot
   BOOT path-list:        flash:c2900XL-c3h2-mz-112.8.5-SA6.bin
   Config file:           flash:config.text
   Enable Break:          no
   Manual Boot:           no
   HELPER path-list:
   NVRAM/Config file
         buffer size:     32768

   !--- In this case, an upgrade from the Cisco IOS Software
   !--- Release 11.2(8)SA6 image to a newer release takes place.
   ```

4. If there is no file defined in the BOOT path−list, enter the **dir flash:** command in order to display the contents of Flash memory.

   The file with the **.bin** extension is your image file.

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

      2  -rwx     1162890   Mar 01 1993 00:33:22  c2900XL-c3h2-mz-112.8.5-
   ```

```
      SA6.bin
  17  -r--         108    Mar 01 1993 00:32:28   info
   4  dr--       13888    Mar 01 1993 00:35:23   html
 226  -r--         341    Jan 01 1970 00:03:16   env_vars
 227  -rwx        1203    Mar 01 1993 00:24:07   config.text
   6  -r--        8192    Mar 08 1993 00:00:23   e2rb.bin
  18  -r--         108    Mar 01 1993 00:35:24   info.ver

3612672 bytes total (1729024 bytes free)

!--- The switch only has 1.7 MB Flash available. Since this is not enough
!--- to load a new image, delete files in Flash in order to
!--- first free up some space.
```

5. If the size of the file to be loaded is larger than the available capacity, delete the image that exists in Flash in order to make space for a new image:

   a. Issue the **delete flash:** *filename* command.

   ```
   Switch#delete flash:current_image.bin
   Delete filename [current_image.bin]?
   Delete flash:current_image.bin? [confirm]
   ```
   b. Choose **Enter** in order to confirm the deletion of the file.

   Note: Once the image in Flash is deleted, do not reboot the switch for any reason until the new image is loaded. If you attempt to reload the switch now, it fails to boot up since there is no image in Flash.
6. If you upgrade a 4 MB DRAM Catalyst 2900XL Switch and a file that starts with the character string c2900XL−diag−mz appears in the Flash directory, you should remove it in order to make room for the new image.

   This is a **diagnostics** file used at the factory in order to run certain tests on the switch and is never used by the customer. If you upgrade an 8 MB DRAM Catalyst 2900XL Switch or Catalyst 3500XL Switch you do not have to delete this file since you have sufficient Flash memory for the new image, 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 run.

   Note: Sometimes this file, might or might not be displayed when you issue the **dir flash:** command. In this case, issue the **dir flash:c2900XL−diag−mz*** command.

   For Example:

   On the 2900XL switch, issue this command in order to display the diagnostics filename:

   ```
   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#
   ```
7. Enter global configuration mode:

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

8. Disable access to the switch HTML pages:

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

9. Return to privileged EXEC mode:

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

10. Remove the HTML files, if any:

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

Choose **Enter** or **y** in order to confirm the deletion of each file.

Note: You might or might not have an HTML directory in Flash. The HTML directory is only installed during an upgrade that uses a .tar file.

Since HTML is a directory that contains all the HTML and GIF files used for the web interface, you have to choose **Enter** or **y** many times before all the files in the HTML directory are deleted.

Note: Do not press any other keys during this process. If you press any other key, it aborts the deletion of that particular file and go to the next file. You have to issue the **delete flash:html/*** command again in order to delete the aborted file.

11. If you upgrade from Cisco IOS Software 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.

Choose **Enter** or **y** in order to confirm the deletion of each file.

Note: Do not press any other keys during this process. If you press any other key, it aborts the deletion of that particular file and goes to the next file. You have to run the **delete flash:html/*** command again in order to delete the aborted file.

12. If you run Cisco IOS Software Release 11.2(8)SA2 or earlier 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 that run Cisco IOS Software Release 11.2(8)SA2 or earlier.

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

Make sure the S in Snmp is uppercase.

13. Use the **tar** command in order to copy the combined *.tar* file to the switch.

Note: DO NOT copy the *.tar* file with the words html in the filename, available in Cisco IOS Software Release 11.2, that uses this procedure as the *.tar* file includes both the image and the HTML files into a single compressed file.

This command copies and automatically extracts the image .bin file as well as the necessary HTML files.

Note: If the switch is unable to connect to the TFTP server, verify that you have IP connectivity to the

server and check in order to make sure that the TFTP server software is setup correctly.

```
switch#tar /x tftp://10.1.1.1/c2900xl-c3h2s-tar.120-5.WC8.tar flash:
Loading c2900xl-c3h2s-tar.120-5.WC8.tar from 10.1.1.1 (via VLAN1): !
extracting c2900xl-c3h2s-mz.120-5.WC8.bin (1803565
bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
extracting e2rb.bin (8192 bytes)!!
html/ (directory)
extracting html/homepage.htm (3988 bytes)!
extracting html/not_supported.html (1392 bytes)
. . .

!--- Output suppressed.

[OK - 2723840 bytes]

!--- The OK message means that the TFTP process passed successfully
!--- and both .bin and html files were extracted successfully.
```

Note: Dependent on the TFTP Server used, you might need to enter only one slash (/) after the *server_ip_address* in the **tar** command.

Note: Since Cisco IOS Software Release 12.0(5)WC5, the file with **.tar** extension also has **tar** in the filename itself. For example, c2900xl–c3h2s–**tar.**120–5.WC5**.tar**.

14. Enter the **dir flash:** command in order to determine the filename of the new image in Flash.

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

  2  -rwx     1803565   Mar 01 1993 00:49:55  c2900xl-c3h2s-mz.120-5.
WC8.bin
 17  -r--         108   Mar 01 1993 00:50:55  info
  4  dr--         832   Mar 01 1993 00:50:53  html
226  -r--         341   Jan 01 1970 00:03:16  env_vars
227  -rwx        1203   Mar 01 1993 00:24:07  config.text
  6  -r--        8192   Mar 01 1993 00:49:56  e2rb.bin
 18  -r--         108   Mar 01 1993 00:50:55  info.ver

3612672 bytes total (683520 bytes free)
```

Make note of the filename, it is used in the next few steps.

15. Enter global configuration mode:

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

16. Set the boot parameters so that when the switch is reloaded after the upgrade, it boots with the new_image.

Issue this command in order to set the boot parameter to the new image. This command overwrites any previous boot image settings.

```
switch(config)#boot system flash:
c2900xl-c3h2s-mz.120-5.WC8.bin
```

17. Reenable access to the switch HTTP pages:

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

18. Return to privileged EXEC mode:

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

19. Reload the new software with this command:

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

20. Choose **Return** in order to confirm the reload.

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

Xmodem Upgrade

Under normal circumstances, the preferred way to upgrade the XL switch is through TFTP. If you are in a situation where the TFTP does not work or cannot be done, such as when someone has accidently deleted the .bin file from the Flash and rebooted the switch, you must use the Xmodem process in order to load the Cisco IOS image to the XL switches.

1. If you find that switch is stuck in ROMMON, verify that the there is no image in Flash to use the **dir flash:** command.

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

17    -rwx  108        (date>              info
4     drwx  128        (date>              html
20    ---x  341        (date>              env_vars
166   ---x  1203       (date>              config.text
6     -rwx  8192       (date>              e2rb.bin
18    -rwx  108        (date>              info.ver

3599360 bytes available (13312 bytes used)
```

Note: In this example, the **dir flash:** output indicates that there are no images in Flash to boot from. You must use Xmodem in order to transfer a valid image to Flash. But, if there is a valid image in Flash, use the **boot flash:** *image.bin* command in order to boot to use the image in Flash.

2. Run the **flash_init** command in order to make sure that the Flash is properly initialized.

   If you run this command, it does not delete any files from the Flash. It only makes 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), it is because the Flash is not properly initialized and is not useable (read or write). Hence, it is always advisable to run the **flash_init** command in order to make sure that you can use the Flash.

This is an example of such failed output:

```
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 that now you 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
```

!--- Output suppressed.

```
928256 bytes available (2684416 bytes used)
```

Note: If the Flash is already initialized, then run the **flash_init** command indicates that.

For Example:

```
switch: flash_init
Initializing Flash...
...The flash is already initialized.
```
3. Issue the **dir flash:** command in order to check the memory capacity that remains.

```
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)
```

4. Setup your PC to do Xmodem:

   a. On the Hyper Terminal Menu bar, click on **Transfer** and choose **Send File**.

   This brings up a Send File popup window.
   b. Choose the Protocol to be **Xmodem** from the pull down button.
   c. Click **Close**.
5. Set up the switch so it is ready to receive the image:

   Run the **copy xmodem:***new_file.bin* **flash:***new_file.bin* command on the switch in order to copy the image to the Flash with the use of Xmodem, 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:c2900xl-c3h2s-mz-
    120-5.WC8.bin flash:c2900xl-c3h2s-mz-120-5.WC8.bin

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

   Substitute your particular Cisco IOS image name for the name previously used.
6. Perform these steps on the PC in order to start the transfer of the file:

   a. On the Hyper Terminal Menu bar, click **Transfer** and choose **Send File**.

   This brings up a Send File popup window.
   b. Use the **Browse** button in order to fill in the Filename.
   c. Verify the Protocol to be **Xmodem**.

   If it is other than Xmodem, choose **Xmodem** from the pull−down button.
   d. Click **Send**, and this starts the transfer of the file.

   Note: Make sure that you start the transfer of the file immediately after you receive the Begin the Xmodem or Xmodem−1K transfer now.. message, approximately within three to five seconds, otherwise the switch times out the XMODEM copy.

   ```
   !--- These dots represent the image progress.
   !--- Sometimes the letter "C" may appear (CCCCCCCCC).

   ......................................................................................
   .....................................................................................
   .....................................................................................
   ......................
   File "xmodem:c2900xl-c3h2s-mz-120-5.WC8.bin" successfully copied to
    "flash:c2900xl-c3h2s-mz-120-5.WC8.bin"
   ```

   Note: Xmodem transfer can take between 25 to 35 minutes, which depends upon the switch and the size of the image.
7. Issue the **dir flash:** command in order to verify the successful copy of the file to the Flash:

   ```
   switch: dir flash:
   Directory of flash:/
   3  -rwx     1803565   Mar 01 1993 01:17:06  c2900xl-c3h2s-mz.120-5.WC8.bin

   1965568 bytes available (1647104 bytes used)
   ```
8. Set the BOOT parameters so that the switch boots with the downloaded image when reloaded:

For Example:

```
(a) switch: set BOOT flash:c2900xl-c3h2s-mz.120-5.WC8.bin
```

Substitute the previous image name for the Cisco IOS image name you loaded to Flash.

Note: BOOT must be in capital letters.

If you had previously manually set the MANUAL_BOOT variable in this Xmodem upgrade procedure, then issue this command in order to tell the switch to boot automatically.

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

9. Boot the switch:

```
switch:boot

Loading "flash:c2900xl-c3h2s-mz.120-5.WC8.bin"...################################
################################################################
File "flash:c2900xl-c3h2s-mz.120-5.WC8.bin" uncompressed and installed,
entry point: 0x3000 executing...
```

The switch should now go through self–tests and boot with the new image.

10. Choose enable mode and run the **show boot** command in order to verify the BOOT parameters.

```
Switch>enable
Switch#show boot

BOOT path-list: flash:c2900xl-c3h2s-mz.120-5.WC8.bin
Config file: flash:config.text
Enable Break: no
Manual Boot: no
HELPER path-list:
NVRAM/Config file
buffer size: 32768
```

Note: See the *Setting BOOT Parameters* section of Managing Software Images and Working with Configuration Files on Catalyst Switches if you notice that the BOOT parameters are not set properly.

11. Reload the switch in order to make sure that the switch boots up properly:

```
switch#reload

Proceed with reload? [confirm]

*Mar  1 01:45:16.023: %SYS-5-RELOAD: Reload requested

C2900XL Boot Loader (C2900-HBOOT-M) Version 12.0(5.1)XP, MAINTENANCE
 INTERIM SOFTWARE
Compiled Fri 10-Dec-99 11:06 by cchang
 starting...
Base ethernet MAC Address: 00:01:42:80:e9:c0
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 7 files, 4 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 3612672
flashfs[0]: Bytes used: 1817088
flashfs[0]: Bytes available: 1795584
flashfs[0]: flashfs fsck took 4 seconds.
...done Initializing Flash.
Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4
Loading "flash:c2900xl-c3h2s-mz.120-5.WC8.bin"...
```

```
                  ###########################################################################
                  ###########################################################################

            File "flash:c2900xl-c3h2s-mz.120-5.WC8.bin" uncompressed and installed,
             entry point: 0x3000
            executing...
```

Note: If there is no previous configuration on the switch, then you are 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]:
```

If you type yes, which depends on your previous answer, the switch takes you to the initial configuration procedure. If you type no, then it goes to the switch> prompt. 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 for details on how to use the initial System configuration dialog.

12. Once the Xmodem process is complete, download the combined *.tar* file using the TFTP process. See the TFTP Upgrade section for help with the TFTP download process.

Examples

TFTP Upgrade Using Combined .tar File

```
switch>enable
Password:

switch#dir flash:
Directory of flash:

  2  -rwx     1162890   Mar 01 1993 00:33:22  c2900XL-c3h2-mz-112.8.5-SA6.bin
 17  -r--         108   Mar 01 1993 00:32:28  info
  4  dr--       13888   Mar 01 1993 00:35:23  html
226  -r--         341   Jan 01 1970 00:03:16  env_vars
227  -rwx        1203   Mar 01 1993 00:24:07  config.text
  6  -r--        8192   Mar 08 1993 00:00:23  e2rb.bin
 18  -r--         108   Mar 01 1993 00:35:24  info.ver

3612672 bytes total (1729024 bytes free)
switch#delete flash:c2900XL-c3h2-mz-112.8.5-SA6.bin
Delete filename [c2900XL-c3h2-mz-112.8.5-SA6.bin]?
Delete flash:c2900XL-c3h2-mz-112.8.5-SA6.bin? [confirm]

switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)#no ip http server
switch(config)#end
switch#
```

```
*Mar  1 00:45:54.871: %SYS-5-CONFIG_I: Configured from console by console
switch#delete flash:html/*
Delete filename [html/*]?
Delete flash:html/Snmp? [confirm]
%Error deleting flash:html/Snmp (Is a directory)
Delete flash:html/Detective.html.gz? [confirm]
Delete flash:html/ieGraph.html.gz? [confirm]
...
...
```

!--- Output suppressed.

```
switch#
```

```
switch#tar /x tftp://10.1.1.1/c2900xl-c3h2s-tar.120-5.WC8.tar flash:
Loading c2900xl-c3h2s-tar.120-5.WC8.tar from 10.1.1.1 (via VLAN1): !
extracting c2900xl-c3h2s-mz.120-5.WC8.bin (1803565 bytes)!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
extracting e2rb.bin (8192 bytes)!!
html/ (directory)
extracting html/homepage.htm (3988 bytes)!
...
...
```

!--- Output suppressed.

```
extracting info.ver (108 bytes)!
[OK - 2933760 bytes]
```

!--- OK indicates the transfer was successful.

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

  2  -rwx     1803565   Mar 01 1993 00:49:55  c2900xl-c3h2s-mz.120-5.WC8.bin
```

!--- Note the name of the new image in flash.

```
 17  -r--         108   Mar 01 1993 00:50:55  info
  4  dr--         832   Mar 01 1993 00:50:53  html
226  -r--         341   Jan 01 1970 00:03:16  env_vars
227  -rwx        1203   Mar 01 1993 00:24:07  config.text
  6  -r--        8192   Mar 01 1993 00:49:56  e2rb.bin
 18  -r--         108   Mar 01 1993 00:50:55  info.ver

3612672 bytes total (683520 bytes free)
switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)#boot system flash:c2900xl-c3h2s-mz.120-5.WC8.bin
```

!--- Specify the exact name of the new image to be loaded.

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

!--- Activate http server.

```
switch(config)#exit
switch#show boot
BOOT path-list:       flash:c2900xl-c3h2s-mz.120-5.WC8.bin
Config file:          flash:config.text
Enable Break:         no
Manual Boot:          no
HELPER path-list:
NVRAM/Config file
     buffer size:   32768
```

```
!--- Note that the switch loads the new image.


switch#reload

System configuration has been modified. Save? [yes/no]: yes
Building configuration...
[OK]
Proceed with reload? [confirm]
```

TFTP Upgrade of .bin and html Files Separately

The preferred way to upgrade via TFTP is to download a combined *.tar* file. If you do not intend to manage the switch through a web interface (CMS), then you do not need the .tar file, but instead just download the .bin file. See this example in order to copy just the *.bin* file. See the Software Image Naming section of this document for details on the difference between *.tar* and *.bin* files.

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

    2  -rwx     1162890   Mar 01 1993 00:32:00  c2900XL-c3h2-mz-112.8.5-SA6.bin
   17  -r--         108   Mar 01 1993 00:31:05  info
    4  dr--       13888   Mar 01 1993 00:06:39  html
  227  -rwx         341   Mar 01 1993 00:39:24  env_vars
    6  -r--        8192   Mar 01 1993 00:49:56  e2rb.bin
   18  -r--         108   Mar 01 1993 00:34:00  info.ver
   19  -r--        1204   Mar 01 1993 00:11:21  config.text

3612672 bytes total (1729024 bytes free)

!--- Note the file name of the image.
!--- It must be deleted to make room for the new image.

switch#delete flash:c2900XL-c3h2-mz-112.8.5-SA6.bin
Delete filename [c2900XL-c3h2-mz-112.8.5-SA6.bin]?
Delete flash:c2900XL-c3h2-mz-112.8.5-SA6.bin? [confirm]
switch#
switch#copy tftp://10.1.1.1/c2900xl-c3h2s-mz.120-5.WC8.bin flash:c2900xl-c3h2s-mz.120-5.WC8
Destination filename [c2900xl-c3h2s-mz.120-5.WC8.bin]?
Accessing tftp://10.1.1.1/c2900xl-c3h2s-mz.120-5.WC8.bin...
Loading c2900xl-c3h2s-mz.120-5.WC8.bin from 10.1.1.1 (via VLAN1): !!!!!

!--- Output suppressed.

[OK - 1803565 bytes]

1803565 bytes copied in 78.124 secs (23122 bytes/sec)

!--- OK indicates the transfer was successful.

switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)#exit
switch#dir flash:
Directory of flash:/

    2  -rwx         341   Jan 03 1970 17:42:50  env_vars
   17  -rwx         108   Mar 01 1993 00:31:05  info
    4  drwx         128   Mar 06 1993 15:37:42  html
    3  -rwx     1803565   Mar 01 1993 01:17:06  c2900xl-c3h2s-mz.120-5.WC8.bin
  166  ---x        1203   Mar 01 1993 00:50:20  config.text
    6  -rwx        8192   Mar 01 1993 00:49:56  e2rb.bin
   18  -rwx         108   Mar 01 1993 00:34:00  info.ver
```

```
3612672 bytes total (1795584 bytes free)


!--- Note the new image in Flash:

switch#

switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)##boot system flash:c2900xl-c3h2s-mz.120-5.WC8.bin

!--- Specify the name of the new image that is to be loaded.

switch(config)#exit
switch#
```

Xmodem 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-120.5.2-XU.bin"

switch: dir flash:
Directory of flash:/

3 -rwx 106 <date> info
4 drwx 14144 <date> html
7 -rwx 1645824 <> c3500XL-c3h2s-mz-120.5.2-XU.bin
224 -rwx 17 <date> prefs.text
30 -r-- 1217 <ate> 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...


!--- Output 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#show 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

Port moves to – errdisable state

If the switch runs an older version of Cisco IOS with an SFP interconnect cable (CAB–SFP–50CM) connected to its port, the `port can go into an "errdisable state"`.

Since the SFP interconnect cable (CAB−SFP−50CM) is supported starts with Cisco IOS Software Release 12.2(20)EX and is synchronized with Cisco IOS Software Release 12.2(25)SEA, the solution can be to upgrade to Cisco IOS Software Release 12.(20)EX or later.

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 might be corrupt, an incorrect image, or the image in Flash might be missing. If the system is unable to load a software image in Flash, the system loads the boot helper and brings up a `switch:` prompt.

This is an example of 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:

1. Issue the **dir flash:** command in order 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> 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 do not see any bootable image in the Flash, then proceed to Xmodem Upgrade section in order to download the Cisco IOS image file

with the use of the Xmodem download procedure.

2. Issue the **set BOOT flash:** *name of Cisco IOS file* command in order to set the boot variable to the file name displayed in step 1.

   Note: 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:
   ```

3. Type the **boot** command in order to boot the switch:

   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 see the *Setting BOOT Parameters* section of Managing Software Images and Working with Configuration Files on Catalyst Switches in order to verify and set the BOOT parameters, if needed, and proceed to step 4. If the switch fails to boot properly, then proceed to Xmodem Upgrade section in order to download the Cisco IOS image file with the use of the Xmodem download procedure.

4. After you set the BOOT Parameters,type the **reload** command at the privileged EXEC mode in order reload the switch.

   The switch should bootup automatically, with the correct image.

Getting address range Error Message and Bootup Failing

The `address range` 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 Cisco IOS Software Release 12.0 image.

This is an example output from a failed bootup:

```
Loading "flash:c2900XL-h2s-mz-120.5.1-XP.bin"...Bootable image segment 12288
address 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:

See the Xmodem Upgrade section in order to download the Cisco IOS image file with the use of the Xmodem download procedure.

Getting no such file or directory Error Message During the Bootup

The `no such file or directory` error message is seen when bootable file and the actual file name in the Flash differ. This usually happens due to a mistyped file name when setting the boot parameters, during or after the upgrade.

This 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...
```

Type **dir flash** in order to verify. This is the output:

```
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 tries to load differ: there is 1 after X in the first case, while the Flash shows the file has L after X.

Solution:

1. Issue the **set BOOT flash:** *name of Cisco IOS file* command in order to set the boot variable to the filename that should be loaded.

   Note that BOOT must be capitalized and make sure to include **flash:** before the file name. You might have to issue a **dir flash:** command in order to determine the exact filename to use.
2. If setting the BOOT Parameters does not resolve the issue, perform Xmodem Upgrade, as the file present on the Flash could be corrupted and invalid.

Failed Software Upgrade, Switch Is Resetting Continuously

This might be due to a corrupt image, an incorrect image, or the image in Flash might miss. These steps can be performed in order to try to recover if the switch is in a reset loop after or during the upgrade.

Solution:

1. Connect the PC to the switch console port.

   See Accessing the Switch Using Console Port for details.
2. Choose **Enter** a few times.

   If you do not see the `switch:` prompt, then proceed to step 3. Otherwise, go to step 4.
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:`.
4. Perform the Xmodem download.

After the Upgrade, the Switch Still Boots 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:

1. See the *Setting BOOT Parameters* section of Managing Software Images and Working with Configuration Files on Catalyst Switches, verify the BOOT parameters, and correct them if needed.
2. If the BOOT Parameters are found to be correct with the completion of step 1, then see the TFTP Upgrade section and complete all the steps in order to perform the upgrade again.
3. If you completed all the steps in the TFTP Upgrade section and if the switch still boots with the old image, then perform the Xmodem download.

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

The reason can be the switch boot parameter is set such that it is set for manual boot. It can be confirmed via these methods:

1. If you are at the `switch:` (ROMMON) prompt, issue the **set** command and observe the output, which is similar to this one:

   For Example:

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

2. If you are at the regular `switch#` prompt, issue the **show boot** command and observe the output, which is similar to the outputs.

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

Solution:

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

1. Telnet into the switch or connect the PC to the switch console port in order to access the switch.
2. Type **enable** at the `switch>` prompt in order to enter the privileged EXEC mode:

   ```
   switch>enable
   switch#
   ```

3. Enter the Global Configuration Mode:

   ```
   Switch#configure terminal
   ```

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

4. Issue the **no boot manual** in order to tell the switch to boot automatically.

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

5. Issue the **end** command in order 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]
```

6. Type **show boot** in order to verify the boot parameters, and 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#
```

7. Reload the router.

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

1. Connect the PC to the switch console port in order to access the switch.
2. Issue the **set MANUAL_BOOT no** command at the `switch:` prompt.

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

3. Issue the **set** command in order to verify that the MANUAL_BOOT variable has changed to **no.**
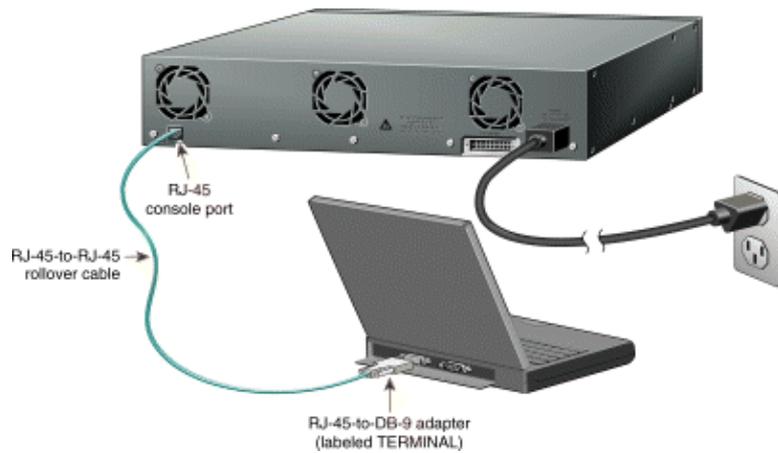
```
switch: set
BOOT=flash:c2900XL-h-mz-112.8-SA5.bin
MANUAL_BOOT=no
```

4. Use the **boot** command in order to reload the router.

```
switch: boot
Loading "flash:c2900XL-c3h2-mz-112.8.5-SA6.bin"...###############
...

!--- Output suppressed.
```

Access the Switch With the Use of Console Port

RJ-45
console port

RJ-45-to-RJ-45
rollover cable

RJ-45-to-DB-9 adapter
(labeled TERMINAL)

Requirements:

1. Catalyst 2900XL/3500XL Switch
2. PC that runs terminal Emulation Software, such as Hyper Terminal or ProCom Plus
3. RJ–45–to–RJ–45 rollover cable, a flat satin cable supplied with the switch
4. RJ–45–to–DB–9 female DTE or appropriate adapter that connects to the PC Serial/COM Port

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 for further details on cables and connectors.

1. Connect the rollover cable to the port marked CONSOLE on the rear panel of the switch.
2. If needed, connect the appropriate Terminal DTE adapter to the COMM port on the back of the PC.
3. Connect the other end of the rollover cable to the PC that runs the Terminal Emulation Software.
4. Start the Terminal Emulation software.

For example, complete these steps in order o start Hyper Terminal Emulation Software on the PC:

a. From the Start Menu, choose **Programs > Accessories > Hyper Terminal**.

This opens the Hyper Terminal folder in a new window.
b. Double–click on **Hypertrm.exe** file.

This starts the Hyper Terminal Software and a new window appears.
c. Enter the Name of the Connection, under Name, and click **OK**.

You see a popup window that shows Country code, Area code, Phone number, and Connect using.
d. From the pull–down button in front of Connect Using, choose **Direct to Com 1** or **Direct to Com 2**, which depends on the COM port on which you have connected the DTE Terminal Adapter, and click **OK**.

You see another popup window labeled as **COM1 Properties**.
e. Make these selections from the pull–down buttons:

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

f. After you make the selections, click **OK**.

You see a blank, white screen with cursor that blinks on the top–left corner.

g. Once connected, if you want to save this session for your future use, from the File menu, choose **Save**.

This session is saved in the Hyper Terminal folder in a file that is named **file_name.ht**, where file_name is the name of the connection that you have previously saved.

Note: In the future, if you want to connect with the use of the saved file, simply double–click the **file_name.ht** file in the Hyper Terminal folder.

How to Get Basic IP Connectivity to the Switch
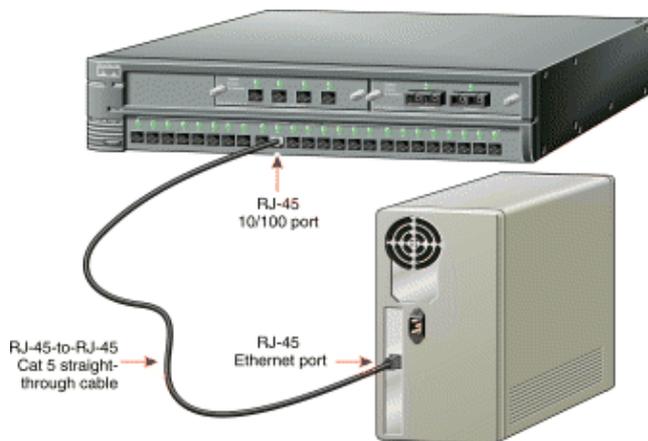
Access to all switch management facilities is through the switch IP address, and the switch IP address always belongs to the management VLAN, VLAN 1, by default. Switches that run a version of Cisco IOS Software that is earlier than Cisco IOS Software Release 12.0(5)XP cannot change the management VLAN. If you run Cisco IOS Software Release 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. This description assumes that the workstation that runs the TFTP Server is directly connected to one of the switch ports. By default all the ports are member of VLAN 1. Refer to the Cisco IOS Desktop Switching Software Configuration Guide for more complex configurations.

1. Connect a Category 5 **straight–through** cable to a 10/100 port on the front panel of the switch as shown in this figure.
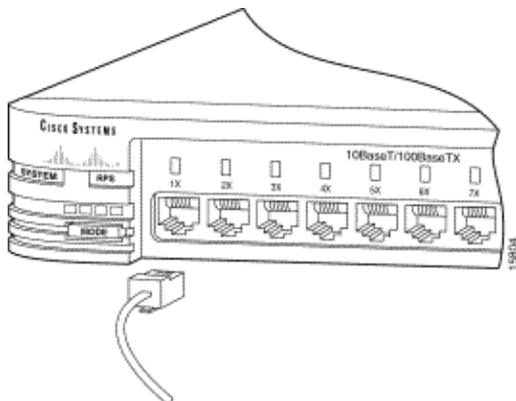
2. Connect the other end of the cable to the RJ–45 port of the PC, workstation or Server.

   Make sure that you see a link light on the port.
3. Console into the switch.
4. Use the **show interface** privileged EXEC command in order 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)
   ```
5. Begin in privileged EXEC mode and complete these steps in order to enter the IP information:

   a. Type **configure terminal** in order to enter global configuration mode:

   ```
   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.
   c. Issue the **interface vlan 1:** command.

   ```
   Switch(config)#interface vlan 1
   Switch(config-if)#
   ```
   d. Type **ip address** *ip_address subnet_mask:* in order to enter the IP address and subnet mask.

   ```
   Switch(config-if)#ip address 172.16.84.26 255.255.255.0

   !--- Set the IP address and mask as appropriate.
   ```

   e. Run the **no shutdown** command in order to make sure that VLAN 1 is up administratively:

   ```
   Switch(config-if)#no shutdown
   ```
   f. Type the **exit** command in order to exit from the interface configuration mode.

   This takes you back to the Global Configuration Mode.

   ```
   Switch(config-if)#exit
   Switch(config)#
   ```
   g. Use the **ip default–gateway** *ip_address* command in order to enter the IP address of the default router.

   This is needed to access the Management IP of the switch if you try to reach it across the network. Keep in mind that the default–gateway IP address must be in the same subnet as the IP address on the VLAN interface.

   ```
   Switch(config)#ip default-gateway 172.16.84.1


   !--- Assign the default gateway IP address.
   ```

   h. Type **end** in order to exit out to the **privileged EXEC** mode:

```
Switch(config)#end
Switch#
```
i. Use the **write memory** command in order to save the configuration:

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

Switch#
```
j. Use the **show running-config** command in order to verify your configuration:

```
Switch#show running-config
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#
```

6. Verify the IP connectivity between the switch and the TFTP Server. Use the **ping** *x.x.x.x* command on the switch, where *x.x.x.x* is the IP address of the workstation or PC that runs the TFTP Server application.

   If this step does not work, DO NOT proceed to the next steps.

   For Example:

```
Switch#ping 172.16.84.200


Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.84.200, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/13 ms
Switch#
```

Related Information

- **Overview of the 2900 XL Series Switches**
- **Catalyst 2900 and 3500 XL Switches, Rel. 12.0(5)WC5**

- **Recovery From Corrupt or Missing Software Image on Cisco Catalyst 2900XL and 3500XL Series Switches**
- **Quick Start Guide: Catalyst 2900 Series XL Switches**
- **Quick Start Guide: Catalyst 3500 Series XL Switches**
- **Release Notes for the Catalyst 2900 XL and Catalyst 3500 XL Switches, Cisco IOS Release 12.0(5)WC5a**
- **LAN Switching Technology Support**
- **Catalyst LAN and ATM Switches Product Support**
- **Technical Support & Documentation – Cisco Systems**

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