

System Software Conversion Procedure from CatOS to Cisco IOS for Cisco Catalyst 6500 Series Switches

1 Introduction

This document explains how to convert the system software on Cisco Catalyst 6500 series switches from Catalyst OS (CatOS) on the Supervisor Engine with Cisco IOS Software on the Multilayer Switch Feature Card (MSFC) to Cisco IOS on both the Supervisor Engine and MSFC.

2 Audience

This document is intended for customers and enterprise systems engineers who are required to convert the system software on Cisco Catalyst 6500 Series Switches from CatOS to Cisco IOS Software.

3 Document Objectives

This document presents a step-by-step conversion procedure for converting the system software from CatOS to Cisco IOS Software on Cisco Catalyst 6500 Series Switch having Sup720-3B & MSFC3 installed.

4 Document Boundary

The document scope is limited to converting the system software from CatOS to Cisco IOS Software on Cisco 6500 Series Switch with MSFC3 and Sup720-3B installed. This document does not describe how to convert the system software from Cisco IOS Software to CatOS.

5 Minimum Requirements & Architecture Comparison

To run Cisco IOS Software Release **12.2(33)SXH** the system requirements are:

5.1. DRAM Requirements

512 MB. Refer to the [Catalyst 6500 Series Release Notes](#) for your version of CatOS or Cisco IOS Software for information on DRAM and Boot ROM (ROMmon) requirements. Issue the show version command in order to verify the DRAM and ROMmon (system bootstrap) version.

If you find that you need a physical DRAM or Boot ROM upgrade, refer to the upgrade instructions for your hardware. Refer to the Module Upgrade Notes section of [Catalyst 6500 Series Configuration Notes](#) for the instructions.

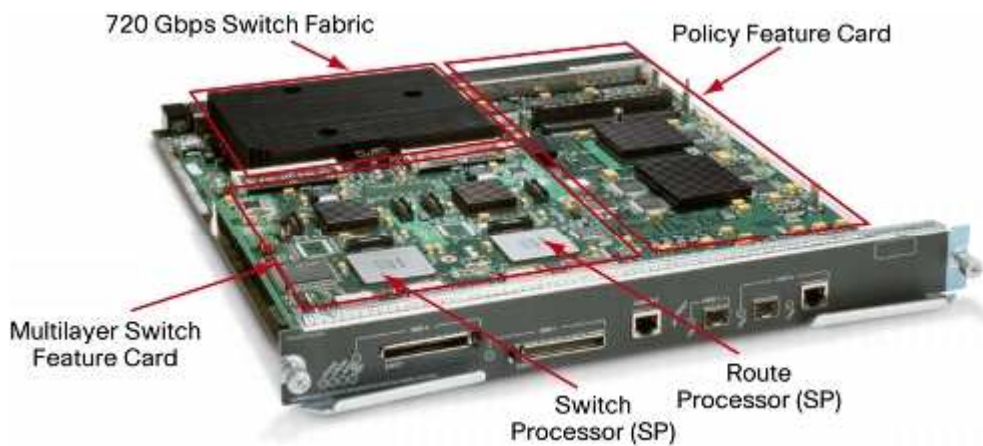
5.2. FLASH Requirements

512 MB. The Supervisor Engine 720 ships with 64 MB of Supervisor Engine bootflash and 64 MB of MSFC bootflash. There are two slots that are available for CompactFlash Type II cards (Disk 0 and Disk 1) which provide additional storage. CompactFlash cards for the Supervisor Engine 720 are available in 64, 128, 256 and 512 MB sizes. A 1 GB MicroDrive is also available.

5.3. Architecture Comparison

The Cisco Catalyst 6500 Series offers a high-performance blend of Layer2/3/4+ technology. Independent of the software model chosen, the forwarding intelligence of the system is handled in the following hardware: the supervisor engine baseboard, the policy feature card (PFC) daughter card and the MSFC (route processor) daughter card (Figure 1).

Figure 1. Cisco Catalyst 6500 Series Supervisor Engine 720 Components



The MSFC daughter card is composed of two CPU complexes: the switch processor and the route processor. The primary difference when deploying a hybrid software model versus a native software model is where the different software images reside. Figure 2 and Figure 3 illustrates this difference.

Figure 2. Hybrid Software Model



Figure 3. Native Software Model

6 Step-by-Step Procedure to Convert from CatOS to Cisco IOS System Software

** The below procedure has been developed based on the results obtained from the test conducted in the private lab.*

6.1. Conversion on Supervisor Engine with MSFC3

This section describes the steps to convert the system software that runs on a Catalyst 6500 Series Switch from CatOS to Cisco IOS Software when there is an MSFC3 on the Supervisor Engine.

This section uses this terminology:

- **Switch Processor (SP)**—Refers to the switch component of the system or Supervisor Engine.
- **Route Processor (RP)**—Refers to the router component of the system or MSFC3.

Note: The images that this document uses are suitable for test environment. Replace the images with the images that you use in your switch environment. Make sure to refer to the [Catalyst 6500 Series Release Notes](#) for memory and ROMmon requirements.

Step1

Establish a console connection to the SP.

Log your console session as a best practice. This log enables you to capture a record of the session and compare the log to the steps in this document, if you need to troubleshoot. For example, in HyperTerminal, choose **Transfer > Capture Text** in order to log a console session.

Step2

Back up the CatOS configuration from the Supervisor Engine and the Cisco IOS Software configuration from the MSFC3.

You need to reconfigure the switch after you convert to Cisco IOS Software as the system software because the conversion process loses the configuration. If you back up the files, they can serve as a reference after the conversion or as a backup if you decide to convert back to CatOS. Issue the **copy config tftp** command on the Supervisor Engine and the **copy start tftp** command on the MSFC3 in order to back up the configurations.

Step3

Issue the **show module** command in order to confirm that thePFC3 and the MSFC3 are installed in the switch.

Note: You cannot run a Cisco IOS Software image without a PFC and an MSFC.

Router> **show module**

Mod	Slot	Ports	Module-Type	Model	Sub	Status
5	5	2	1000BaseX Supervisor	WS-SUP720-3B	yes	ok
15	5	1	Multilayer Switch Feature	WS-SUP720	no	ok

5 5 2 1000BaseX Supervisor WS-SUP720-3B yes ok
15 5 1 Multilayer Switch Feature WS-SUP720 no ok

!-- In this case, the SP in Slot 5 is the Supervisor Engine 3

Mod	Module-Name	Serial-Num
5	SAL1005C5HV	
15	SAL10360ET2	

5 SAL1005C5HV
15 SAL10360ET2

Mod	MAC-Address(es)	Hw	Fw	Sw
5	00-13-c4-3a-76-7c to 00-13-c4-3a-76-7f	4.6	8.5(2)	8.5(8)
15	00-d0-03-f3-74-00 to 00-d0-03-f3-77-ff	2.8	12.2(17d)S	12.2(17d)SXB11a

5 00-13-c4-3a-76-7c to 00-13-c4-3a-76-7f 4.6 8.5(2) 8.5(8)

!-- This is the current CatOS software version that runs on the SP

00-d0-03-f3-74-00 to 00-d0-03-f3-77-ff

15 00-d0-03-f3-77-fc to 00-d0-03-f3-77-fd 2.8 12.2(17d)S 12.2(17d)SXB11a

!-- This is the current Cisco IOS software version that runs on the RP

Mod	Sub-Type	Sub-Model	Sub-Serial	Sub-Hw	Sub-Sw
5	L3 Switching Engine III	WS-F6K-PFC3B	SAL1005C85R	2.4	

5 L3 Switching Engine III WS-F6K-PFC3B SAL1005C85R 2.4

!--A PFC3 is installed in the switch in this case

Step4

Verify that the Cisco IOS Software image is available on the SP bootflash or on the PC card in slot0.

Note: Where you choose to store the Cisco IOS Software image depends on the Supervisor Engine flash device capacity and image size.

Use the **dir** command in order to verify the location of the Cisco IOS Software image.

```
Router> (enable)> dir disk0:
```

```
3 -rw- 80298020 Nov 17 2010 12:36:26 s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
431390720 bytes available (80314368 bytes used)
```

Step5

In order to access the RP, issue either the **switch console** command or the **session module** command.

```
Console> (enable) switch console
```

```
Trying Router-15...
```

```
Connected to Router-15.
```

```
Type ^C^C^C to switch back...
```

```
Router>
```

*!-- Issue the **enable** command in order to enter privileged EXEC mode.*

```
Router>enable
```

```
Router#
```

Step6

Issue the **show boot** command in order to check the current configuration register setting.

```
Router#show boot
```

```
BOOT variable = bootflash:/c6msfc3-pk9sv-mz.122-17d.SXB11a.bin,1
```

```
CONFIG_FILE variable does not exist
```

```
BOOTLDR variable does not exist
```

```
Configuration register is 0x2102
```

!--This is the current configuration register value.

Step7

Change the configuration register setting in order to put the switch into ROMmon on reload.

```
Router#  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#config-register 0x0  
!-- This changes the configuration register value of the router.  
  
Router(config)#end  
Router#
```

Step8

Verify the new configuration register setting.

```
Router#show boot  
BOOT variable = bootflash:/c6msfc3-pk9sv-mz.122-17d.SXB11a.bin,1  
CONFIG_FILE variable does not exist  
BOOTLDR variable does not exist  
Configuration register is 0x2102(will be 0x0 at next reload)  
Router#
```

Step9

Reload the router.

```
Router#reload  
!-- Press Enter or Return  
!-- This reloads the router
```

```
System configuration has been modified. Save? [yes/no]: no  
!-- Press Enter or Return
```

```
Proceed with reload? [confirm]  
!-- Press Enter or Return
```

```
System Bootstrap, Version 12.2(17r)S2, RELEASE SOFTWARE (fc1)  
TAC Support: http://www.cisco.com/tac  
Copyright (c) 2004 by cisco Systems, Inc.  
Cat6k-Sup720/RP platform with 524288 Kbytes of main memory  
!-- After this step is complete; the switch enters into RP ROMmon
```

```
rommon 1 >
```

Step10

Erase NVRAM for the CatOS system software region in order to prevent any corrupted files from passing during this conversion. Then, change the configuration register back to the default.

```
rommon 1 > priv
```

!--- Press Enter or Return.

!--- You have entered ROMmon privileged mode.

!--- This output displays:

You now have access to the full set of monitor commands.

Warning: some commands will allow you to destroy your configuration and/or system images and could render the machine unbootable.

!--- Issue the fill command from ROMmon privileged mode.

```
rommon 2 > fill
```

!--- Press Enter or Return.

!--- Be sure to enter these parameters exactly as they appear here:

Enter in hex the start address [0x0]: **be000000**

!--- Press Enter or Return.

Enter in hex the test size or length in bytes [0x0]: **80000**

!--- Press Enter or Return.

Enter in hex the pattern to be written [0x0]: **ffff**

!--- Press Enter or Return.

Enter the operation size 'l'ong, 'w'ord, or 'b'yte []: **l**

!--- Press Enter or Return.

!--- After the NVRAM erase has completed, issue the reset command.

```
rommon 3 > reset
```

!--- Press Enter or Return.

```
rommon 1 > confreg 0x2102
```

!--- Press Enter or Return.

Step11

In order to go back to the SP, press Ctrl-C three times.

!-- Press Ctrl-C three times.

```
rommon 2 > ^C
rommon 2 > ^C
rommon 2 > ^C
Console> (enable)
```

!-- This is the SP console prompt.

Step12

Change the configuration register setting on the SP so that the switch does not boot the CatOS image and goes to ROMmon.

```
Console> (enable) set boot config-register 0x0
Configuration register is 0x0
ignore-config: disabled
auto-config: non-recurring, overwrite, sync disabled
console baud: 9600
boot: the ROM monitor
Console> (enable)
```

Step13

Verify the configuration register setting using **show boot** command.

```
Console> (enable) show boot
BOOT variable = bootflash:cat6000-sup720cvk9.8-5-8.bin,1;
CONFIG_FILE variable = bootflash:switch.cfg
Configuration register is 0x0
ignore-config: disabled
auto-config: non-recurring, overwrite, sync disabled
console baud: 9600
boot: the ROM monitor
Console> (enable)
```

Step14

Reset the switch so that it goes into ROMmon.

```
Console> (enable) reset
This command will reset the system.
Do you want to continue (y/n) [n]? y
```

```
2003 Nov 01 16:08:31 %SYS-5-SYS_RESET:System reset from Console//
Powering OFF all existing linecards
2003 Nov 01 16:08:31 %ETHC-5-PORTFROMSTP:Port 1/1 left bridge port 1/1
Console> (enable)
System Bootstrap, Version 8.5(2)
```

!--- This is the SP ROMmon image version.

Copyright (c) 1994-2003 by cisco Systems, Inc.

Cat6k-Sup720/SP processor with 524288 Kbytes of main memory

!--- After this message, the router goes into SP ROMmon.

```
rommon 1 >
```

Step15

Issue the `dir bootflash:` command, or the **dir disk0:** command, or the `dir disk1:` command. The command you issue depends on the device to which you previously downloaded the Cisco IOS Software image (s720xy*).

```
rommon 1 > dir disk0:
```

```
Directory of disk0:
```

```
 3 80298020 -rw- s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
```

!--- The Cisco IOS Software image (s720xy) is on disk0: in this case.*

!--- This is the device from which the image boots in this procedure.

Step16

Boot the switch with the Cisco IOS Software image (s720xy*).

Issue the `boot bootflash:` command, or the **boot disk0:filename** command, or the `boot disk1:filename` command in order to start the bootup sequence.

```
rommon 2 > boot disk0: s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
```

```
Self decompressing the image : #####
#####
#####
##### [OK]
```

!--- Output suppressed.

```
System Bootstrap, Version 12.2(17r)S2, RELEASE SOFTWARE (fc1)
```

```
TAC Support: http://www.cisco.com/tac
```

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

```
Cat6k-Sup720/RP platform with 524288 Kbytes of main memory
```

```
Download Start
```

!!
!!
!!
!!

Download Completed! Booting the image.

Self decompressing the image : #####
[OK]

!--- Output suppressed.

Cisco IOS Software, s72033_rp Software (s72033_rp-ADVENTERPRISEK9_WAN-M), Version
12.2(33)SXH5, RELEASE SOFTWARE (fc1)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2009 by Cisco Systems, Inc.

!--- Output suppressed.

Press RETURN to get started!

!--- Output suppressed.

Router>

Step17

At this point, the Cisco IOS Software image (s720xy*) has successfully booted, but the Supervisor Engine Flash devices are still formatted with the previous CatOS algorithm. Therefore, Cisco IOS Software cannot correctly write to sup-bootflash:, disk0:, or disk1:. You need to reformat these Flash devices and replace the images that are on the Flash devices.

Issue the **format** command in order to format the Flash devices.

Router#**format disk0:**

!--- Format the CompactFlash card in disk1: as well, if you have one.

Format operation may take a while. Continue? [confirm]

!--- Press Enter or Return.

Format operation will destroy all data in "disk0:". Continue? [confirm]

!--- Press Enter or Return.

Format: Drive communication & 1st Sector Write OK...
Writing Monlib sectors.....
.....

Monlib write complete
Format: All system sectors written. OK...
Format: Total sectors in formatted partition: 251616
Format: Total bytes in formatted partition: 128827392
Format: Operation completed successfully.
Format of disk0 complete

Router#

Step18

When you format the Supervisor Engine Flash devices in 17, the Cisco IOS Software image (s720xy*) that is used to boot the Supervisor Engine, as well as all data on the device, is erased. You need to re-copy the Cisco IOS Software image (s720xy*).

Note: Remember that the conversion lost the configuration. You need to configure an IP address and possibly a static or dynamic routing in order to reestablish connectivity to your TFTP server. Verify that you can ping your TFTP server from the switch.

Issue the **copy tftp** command in order to copy the Cisco IOS Software image (s720xy*) to either the sup-bootflash: or the disk0: or disk1: Flash devices.

Router#**copy tftp: disk0:**

```
Address or name of remote host []? 192.168.1.10
Source filename []? s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
Destination filename [s72033-adventerprisek9_wan-mz.122-33.SXH5.bin]?
Accessing tftp://192.168.1.10/s72033-adventerprisek9_wan-mz.122-33.SXH5.bin...
Loading s72033-adventerprisek9_wan-mz.122-33.SXH5.bin from 192.168.1.10 (via Vlan1):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 80298020 bytes]
80298020 bytes copied in 158.904 secs (505324 bytes/sec)
```

Router#

Step19

Issue the dir bootflash: command, or the **dir disk0:** command, or the dir disk1: command. The command you issue depends on the device to which you previously downloaded the Cisco IOS Software image (s720xy*).

```
Router#dir disk0:
Directory of disk0:/
 1 -rw- 80298020 Nov 17 2010 14:26:24 +00:00 s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
512106496 bytes total (431800320 bytes free)
```

Router#

Step20

Verify the MD5 with using **verify /md5 disk0:/ s72033-adventerprisek9_wan-mz.122- 33.SXH5.bin**

```
Router# verify /md5 disk0:/ s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
```

```
.....  
.....  
.....  
.....  
.....  
.....
```

....Done!

```
verify /md5 (disk0:/s72033-adventerprisek9_wan-mz.122-33.SXH5.bin) =  
1dbe2d8200f4fb5bed368862da237b95
```

Step21

Check the current boot variable settings

```
Router#show bootvar  
BOOT variable =  
CONFIG_FILE variable does not exist  
BOOTLDR variable does not exist  
Configuration register is 0x2102  
Standby is not present  
Router#
```

Step22

Set the boot variable to boot the Cisco IOS Software Image (s720xy*) and save the changes

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#boot system flash disk0:s72033-adventerprisek9_wan-mz.122-33.SXH5.bin
```

```
Router(config)#end
```

!-- Save the changes.

```
Router#write memory
```

Building configuration...

[OK]

```
Router#
```

Step23

Check the configuration register value and it must be 0x2102. Otherwise, upon reload, the router ends up in ROMmon. Issue the **show bootvar** command:

```
Router#show bootvar  
BOOT variable = disk0: s72033-adventerprisek9_wan-mz.122-33.SXH5.bin, 1;  
CONFIG_FILE variable does not exist  
BOOTLDR variable does not exist  
Configuration register is 0x2102
```

If you reload the router at this point, you may end up in SP ROMmon. Check the configuration register value for the SP and it must be 0x2102.

Step24

Check the configuration register value in SP using **remote command switch show bootvar** command. The command displays the current environment variable settings on the SP.

```
Router#remote command switch show bootvar  
BOOT variable = disk0: s72033-adventerprisek9_wan-mz.122-33.SXH5.bin, 1;  
CONFIG_FILE variable =  
BOOTLDR variable =  
Configuration register is 0x2102
```

If configuration register is 0x0 means,

```
Router#remote command switch show bootvar  
BOOT variable = bootflash: s72033-adventerprisek9_wan-mz.122-33.SXH5.bin, 1;  
CONFIG_FILE variable =  
BOOTLDR variable =  
Configuration register is 0x0  
!-- Set the configuration register.
```

Issue this set of commands on the RP in order to change the configuration register settings on the SP.

```
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#config-register 0x2102  
Router(config)#end
```

!-- Save the changes.

```
Router#write memory  
Building configuration...  
[OK]
```

!--- Verify the settings on the SP.

Router#**remote command switch show bootvar**

BOOT variable = **bootflash:s72033-adventerprisek9_wan-mz.122-33.SXH5.bin, 1;**

CONFIG_FILE variable =

BOOTLDR variable =

Configuration register is 0x0 (will be 0x2102 at next reload)

Step25

Reload the switch.

Router#**reload**

Proceed with reload? [confirm]

!--- Output suppressed.

Step26

Check the boot image of the switch using **show version** and **show boot** commands

Router#**show version**

Cisco IOS Software, s72033_rp Software (s72033_rp-ADVENTERPRISEK9_WAN-M), **Version 12.2(33)SXH5**, RELEASE SOFTWARE (fc1)

Technical Support: <http://www.cisco.com/techsupport>

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Compiled Thu 16-Apr-09 18:49 by prod_rel_team

ROM: System Bootstrap, Version 12.2(17r)S2, RELEASE SOFTWARE (fc1)

System image file is "**disk0:s72033-adventerprisek9_wan-mz.122-33.SXH5.bin**"

!--- Output suppressed.

Router#**show boot**

BOOT variable = **disk0:s72033-adventerprisek9_wan-mz.122-33.SXH5.bin,1;**

CONFIG_FILE variable does not exist

BOOTLDR variable does not exist

Configuration register is 0x2102

Standby is not present.

Router#

Step27

Issue **show module** to in order to confirm the status of all the modules

```
Router#show mod
```

```
Mod Ports Card Type Model Serial No.
```

```
-----  
5 2 Supervisor Engine 720 (Active) WS-SUP720-3B SAL1424KDJ5
```

!--- In this case, the SP in Slot 5 is the Supervisor Engine 3.

```
Mod MAC addresses Hw Fw Sw Status
```

```
-----  
5 0022.559e.210c to 0022.559e.210f 5.10 8.5(3) 12.2(33)SXH5 Ok
```

!--- This is the current Cisco IOS software version that runs on the 6500 switch

```
Mod Sub-Module Model Serial Hw Status
```

```
-----  
5 Policy Feature Card 3 WS-F6K-PFC3B SAL1424KEWM 2.6 Ok
```

```
5 MSFC3 Daughterboard WS-SUP720 SAL1424KCMH 4.1 Ok
```

!---A PFC3 is installed in the switch in this case.

```
Mod Online Diag Status
```

```
-----  
5 Pass
```