



# Cisco IOS Upgrades

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This document describes Cisco IOS upgrade procedures for the AS5800. The following tasks are detailed.

- Installing a TFTP (Trivial File Transfer Protocol) server for telnet purposes.
- Determining memory requirements.
- Obtaining a new Cisco IOS software version.
- Backing up existing IOS software images and configurations.
- Upgrading the Cisco IOS image for the Cisco 5814 Dial Shelf (DS).
- Upgrading the Cisco IOS image for the Cisco 7206 Router Shelf (RS).
- Upgrading the Bootflash boot image for the Cisco 7206 Router Shelf (RS).

An AS5800 Cisco IOS upgrade requires a compatible Cisco IOS image upgrade on both the Dial Shelf Controller (DSC) cards and Router Shelf (RS) components of the system. Two distinct upgrade procedures are necessary, one for each component.



**Note**

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Sufficient memory (available bytes) is required to accommodate any new image file size on the RS and DSC. Contact your Cisco Sales Representative for memory upgrades.

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**Note**

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Cisco IOS software is feature specific and licensed on an “as is” basis without warranty of any kind, either expressed or implied. The version of Cisco IOS software used in this manual varies depending on configuration requisites for presentation purposes, and should not be construed as the Cisco IOS software version of choice for your system or internetwork environment. Consult your Cisco Sales Representative regarding your Cisco IOS requirements.

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## Software Upgrade Requisites

To upgrade a Cisco IOS software image you need the following:

- an established network connection between the PC you are designating as your TFTP server, and your Access Server
- access to the Cisco website (CCO) for downloading the Cisco IOS software

## Installing TFTP Server

If you need a TFTP server, download the free Cisco TFTP Server for Windows 95/98/NT.

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- Step 1** Go to the following URL: <http://www.cisco.com/cgi-bin/tablebuild.pl/tftp>.
- Step 2** Follow the instructions provided for downloading and using the Cisco TFTP Server.

## Memory Requirements

Before installing new software, first determine the amount of available memory in RAM and Flash.



### Note

You must have sufficient memory available on your Access Server to accommodate the file size memory requirements for new software you want to load.

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- Step 1** Determine the amount of available random access memory (RAM) for processing purposes.

```
AS5800#sh version
Cisco Internetwork Operating System Software
IOS (tm) 5800 Software (C5800-P4-M), Version 12.0(4)XL1
...
ROM: System Bootstrap, Version 12.0(19990210:195103) [12.0XE 105]
BOOTFLASH: 7200 Software (C7200-BOOT-M), Version 12.0(4)XE
...
cisco 7206VXR (NPE300) processor with 253952K/40960K bytes of memory.
...
16384K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
4096K bytes of Flash internal SIMM (Sector size 256K).
...
AS5800#
```

- Step 2** Determine the amount of available flash memory for storage purposes.

```
AS5800# sh flash
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image AAD4004B 719C50 25 7314384 May 02 2000 13:55:04
c5800-p4-mz_120-4_XL1.bin
9069488 bytes available (7314512 bytes used)
```

- Step 3** Record this memory values for future reference.

## Obtaining a New Cisco IOS Version

To obtain a recent version of the Cisco IOS software you need access to the Cisco Connection Online (CCO) on Cisco's web site.

Cisco IOS software is version specific bundled software that includes the following compatible components:

- router-shelf (or system) image (c5800-p4-mz.XXX)
- dial-shelf controller (DSC) image (dsc-c5800-mz.XXX)
- boot image (c7200-boot-mz.XXX)

- Step 1** Log onto the Cisco (CCO) web site at the following URL to enter your AS5800 image selection criteria.  
<http://www.cisco.com/kobayashi/sw-center/index.shtml>



**Note** Images much match the specific version of IOS being installed. Example: If attempting to run 12.0.7T, you must run the 12.0.7T dial-shelf (DSC) image (dsc-c5800-mz.XXX) and the 12.0.7T router-shelf image (C5800-p4-mz.XXX) to secure proper system functionality.

- Step 2** After verifying you have sufficient memory, download the router shelf, dial shelf, and boot image to your TFTP server.



**Note** By default, files are copied to and from the Cisco TFTP root directory.

## Backing Up Your AS5800 Configuration

Cisco recommends backing up all existing IOS images and configurations from privileged exec mode.



**Note** Backup current IOS images (boot, router-shelf, dial-shelf), and configurations, to a TFTP server prior to upgrading. By default, files are copied to and from the Cisco TFTP root directory.

- Step 1** Backup your existing startup configuration. Use a distinct file name for the startup configuration. This makes it easy to distinguish from other startup configurations previously saved on your TFTP Server.

```
AS5800# copy startup-config tftp
Address or name of remote host []? 171.71.219.167
Destination filename [startup-config]? AS5800-startup
!!
3449 bytes copied in 0.136 secs
```

- Step 2** Backup your existing running configuration. Use a distinct file name for the running configuration. This makes it easy to distinguish from other running configurations previously saved on your TFTP Server.

```
AS5800# copy running-config tftp
Address or name of remote host []? 171.71.219.167
Destination filename [running-config]? AS5800-running-config
!!
3312 bytes copied in 0.140 secs
```

- Step 3** Save your running-configuration to your startup configuration in NVRAM .

```
Router# copy running-configuration start-up configuration
```



**Note** Do not modify your running configuration during the IOS upgrade process.

- Step 4** Determine the current boot image.

```
AS5800# sh bootflash:
#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image AC05EDDF 37A6B8 22 3384888 Dec 31 1999 18:08:09 c7200-boot-mz.120-4.XE
```

- Step 5** Backup the boot image (c7200-boot-mz.XXX) from bootflash to the TFTP server. Use the file name obtained in Step 4.

```
AS5800# copy bootflash: tftp
Source filename [c]? c7200-boot-mz.120-4.XE
Address or name of remote host []? 171.71.219.167
Destination filename [c7200-boot-mz.120-4.XE]?
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
3384888 bytes copied in 89.920 secs (38032 bytes/sec)
```

- Step 6** Determine the router shelf's current flash image.

```
AS5800# sh flash
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image AAD4004B 719C50 25 7314384 May 02 2000 13:55:04
c5800-p4-mz_120-4_XL1.bin
```

- Step 7** Backup the current router shelf IOS image (C5800-p4-mz.XXX) stored in flash memory. Use the file name obtained in Step 6.

```
AS5800# copy flash tftp
Source filename []? c5800-p4-mz_120-4_XL1.bin
Address or name of remote host []? 171.71.219.167
Destination filename [c5800-p4-mz_120-4_XL1.bin]?
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
7314384 bytes copied in 218.684 secs (33552 bytes/sec)
```

- Step 8** On your TFTP Server, verify that files were copied (backed up).




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**Note** By default, files are copied to and from the Cisco TFTP root directory.

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## Installing New IOS Software

An AS5800 Cisco IOS upgrade requires a compatible Cisco IOS image upgrade on both the Dial Shelf Controller (DSC) cards and Router Shelf (RS) components of the system. Two distinct upgrade procedures are necessary, one for each component.




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**Note** Cisco recommends upgrading the dial-shelf controller(s) first, since all upgrades are performed through the router shelf. Once DSC(s) are upgraded, the router shelf will not be able to communicate with the DSC(s) until a compatible IOS image is installed on the RS.

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**Note** Do not modify your running configuration during the IOS upgrade process.

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**Note** Upgrade verifications are performed after all necessary upgrades are complete, and all system components are reloaded.

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## Upgrading the DSC Software

The following procedure outlines commands used to perform a Cisco 5814 Dial Shelf Controller (DSC) software upgrade from the Router Shelf.

**Step 1** Login to the AS5800 Router Shelf and enter Enable (privileged exec) mode.

**Step 2** Identify IOS images in the DSC bootflash.

```
AS5800# execute-on slot 12 sh bootflash:
DA-Slot12#
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image BC8CA85F 251C60 26 2169824 Nov 18 1999 22:12:15
dsc-c5800-mz.120-4.XL1.bin
```

**Step 3** Delete the current IOS image(s) from bootflash.

```
AS5800# execute-on slot 12 del bootflash:dsc-c5800-mz.120-4.XL1.bin
DA-Slot12#
Delete filename [dsc-c5800-mz.120-4.XL1.bin]?
Delete bootflash:dsc-c5800-mz.120-4.XL1.bin? [confirm]
AS5800#
```

**Step 4** Squeeze the DSC bootflash.

```
AS5800# execute-on slot 12 squeeze bootflash

DA-Slot12#
All deleted files will be removed. Continue? [confirm]
Squeeze operation may take a while. Continue? [confirm]

Squeeze of bootflash complete
```

**Step 5** Identify IOS images in the DSC flash.

```
AS5800# execute-on slot 12 sh flash

DA-Slot12#
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image BC8CA85F 231C60 26 2169824 Sep 16 1999 18:10:32
dsc-c5800-mz.120-4.XL1.bin
2 .D image 8FDE1F61 45FEC8 18 2286056 Jan 25 2000 18:28:57 dsc-c5800-mz.Jan21
```



**Note** Remember, sufficient memory (available bytes) is required to accommodate any new image file size on the RS and DSC. Compare memory size obtained in “Memory Requirements”.

**Step 6** Delete images or files no longer required.

```
AS5800# execute-on slot 12 delete flash:dsc-c5800-mz.120-4.XL1.bin
DA-Slot12#
Delete filename [dsc-c5800-mz.120-4.XL1.bin]?
Delete slot0:dsc-c5800-mz.120-4.XL1.bin? [confirm]
AS5800#
```

**Step 7** Squeeze the DSC flash to remove deleted files.

```
AS5800# execute-on slot 12 squeeze flash:
DA-Slot12#
All deleted files will be removed. Continue? [confirm]
Squeeze operation may take a while. Continue? [confirm]
Writing sector: 1
Squeeze of slot0 complete
```

**Step 8** Download the new DSC image from your TFTP server to the DSC flash.




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**Note** By default, files are copied to and from the Cisco TFTP root directory.

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```
AS5800# copy tftp:dsc-c5800-mz.120-7.T.bin dsc12-slot0
Address or name of remote host [171.71.219.167]?
Source filename [dsc-c5800-mz.120-7.T.bin ]?
Destination filename [dsc12-slot0]?
Accessing tftp://171.71.219.167/dsc-c5800-mz.120-7.T.bin ...
%Warning: File not a valid executable for this system
Abort Copy? [confirm]n
Loading dsc-c5800-mz.120-7.T.bin from 171.71.219.167 (via FastEthernet0/0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

The following Warning message appears.

```
%Warning: File not a valid executable for this system
Abort Copy? [confirm]
```




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**Note** **Do not abort the copy process.** This message implies that the file being downloaded is not router shelf compatible, which is true. However, the router assumes the file being downloaded will be executed on the router shelf, when, in fact, the file is a dial shelf controller file, being downloaded to the dial shelf through the router, that will ultimately be executed on the dial shelf.

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**Step 9** Enter “n” to proceed with the download.

**Step 10** Copy the new DSC image to the DSC bootflash:

```
AS5800# execute-on slot 12 copy slot0:dsc-c5800-mz.120-7.T.bin
bootflash:
DA-Slot12#
Destination filename [dsc-c5800-mz.120-7.T.bin ]?
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
2169824 bytes copied in 24.464 secs (90409 bytes/sec)
```

**Step 11** Reload the DSC to load the new image.

```
Router# execute-on slot 12 reload
```

**Step 12** Repeat this procedure if you have a second DSC card to ensure both cards are running the same software release. The only change to the commands will be the slot number (“13” instead of “12”).




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**Note** At this juncture, the DSC(s) and Router Shelf are not running the same IOS image, so you will not be able to communicate with the DSC through the Router Shelf.

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## Upgrading the Router Shelf Boot Image

The following procedure outlines commands used to perform a Cisco 7206 router shelf (RS) boot image software upgrade from the router shelf.



### Note

Unless you installed new port adapters in the router shelf, do not upgrade the boot image.

### Step 1 Identify the current bootflash image.

```
AS5800# sh bootflash
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image AC05EDDF 37A6B8 22 3384888 Dec 31 1999 18:08:09 c7200-boot-mz.120-4.XE

1 bytes available (3407872 bytes used)
```

### Step 2 Delete the current boot image from bootflash.

```
AS5800# del bootflash:
Delete filename []? c7200-boot-mz.120-4.XE
Delete bootflash:c7200-boot-mz.120-4.XE? [confirm]
```

### Step 3 Squeeze the bootflash to remove all deleted files.

```
AS5800# squeeze bootflash:
All deleted files will be removed. Continue? [confirm]
Squeeze operation may take a while. Continue? [confirm]

Squeeze of bootflash complete
```

### Step 4 Copy the boot image from the TFTP server (c7200-boot-mz.XXX) to bootflash.

```
AS5800# copy tftp bootflash:
Address or name of remote host []? 171.71.219.167
Source filename []? c7200-boot-mz.120-7.T.bin
Destination filename [c7200-boot-mz.120-7.T.bin]?
Accessing tftp://171.71.219.167/c7200-boot-mz.120-7.T.bin...
Loading c7200-boot-mz.120-7.T.bin from 171.71.219.167 (via FastEthernet0/0/0):!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 3384888/6769664 bytes]

3384888 bytes copied in 65.112 secs (52075 bytes/sec)
```

## Software Upgrade Verification

Perform the following steps to verify the Router Shelf and DSC(s) are running new IOS images, and the Bootflash is running a new boot image.

**Step 1** Check the Dial Shelf Controller(s) for a new IOS image.

```
AS5800# execute-on slot 12 show version

DA-Slot12>
Cisco Internetwork Operating System Software
IOS (tm) 5800 Software (C5800-DSC-M), Version 12.0(7)T
TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Thu 12-Aug-99 18:48 by ayeh
Image text-base: 0x600088F0, data-base: 0x60520000

ROM: System Bootstrap, Version 11.3(1)AA, ROM: 5800 Software (C5800-DSC-M),Version
12.0(7)T

DA-Slot12 uptime is 41 minutes
System returned to ROM by reload
System image file is "slot0:dsc-c5800-mz.120-7.T.bin "

Router# execute-on slot 13 show version (IF APPLICABLE)
```

**Step 2** Check the Router Shelf for a new IOS image.

```
AS5800# sh version
Cisco Internetwork Operating System Software
IOS (tm) 5800 Software (C5800-P4-M), Version 12.0(7)T, TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Thu 12-Aug-99 13:16 by ayeh
Image text-base: 0x60008900, data-base: 0x611A6000

ROM: System Bootstrap, Version 12.0(19990210:195103) [12.7T 105], DEVELOPMENT SOFTWARE
BOOTFLASH: 7200 Software (C7200-BOOT-M), Version 12.0(7)T

doc-rtr58-01 uptime is 9 minutes
System returned to ROM by reload at 16:04:24 CST Fri Jun 9 2000
System restarted at 16:05:39 CST Fri Jun 9 2000
System image file is "slot0:c5800-p4-mz.120-7.T.bin"
```

**Step 3** Check the Bootflash for a new boot image.

```
AS5800#sh bootflash:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image AC05EDDF 37A6B8 22 3384888 Jun 12 200014:00:23
c7200-boot-mz.120-7.T.bin

22856 bytes available (3385016 bytes used)
```

## Modem Upgrading

Compatible modem firmware is included in each Cisco IOS bundled software version and upgraded as part of the installation process.

# Modem Upgrades

This section describes basic debugging and modem commands used for upgrading modem module firmware as well as modem activation considerations. Cisco IOS upgrades include compatible modem firmware that is upgraded as part of the installation process. The **show modem version** command output is displayed to verify a successful download.



## Note

Do not install a separate version of modem firmware independent of the Cisco IOS software it accompanies.

## Debugging a Modem

Use the following commands for debugging a modem or group of modems.

From the Cisco IOS privileged mode `AS5800-1#` .

- Debug a modem's out-of-band port that is used to poll modem events.

```
debug modem oob shelf/slot/port group group_number
```

- Debug a call-switching module that is used to connect calls.

```
debug csm shelf/slot/port group group_number
```

- Debug the call trace, which determines why calls are terminated. Use this keyword only with manageable modems. Upload the call trace on **normal**, **abnormal**, or **all** call terminations.

```
debug modem trace {normal | abnormal | all} shelf/slot/port group group_number
```

## Upgrading Modem Firmware

Each modem card installed in your Cisco AS5800 access server contains 12 MICA modems, each with six modem SIMMs. This allows you to upgrade firmware for each group of six modem SIMMs.

The default firmware image is loaded on the modem card during system boot-up. Normally, you do not need to change the firmware image; however, you can override the default image with another firmware image.

A valid pool range must exist (that is, the **pool-range** modem pool configuration command must have been configured) for modem overrides to occur. Modem pooling allows you to define, select, and use separate modem pools within a single access server or router to enable different dial-in services for different customers. In this case, the modem pool specifies which modems are loaded with the new firmware image.

The specified firmware image is loaded on every modem for every slot specified in the pool range. If the modem is busy, the firmware change is deferred until the modem is available. When the modem is available, the firmware change takes place immediately. If you specify a firmware image that does not exist, the information is stored so that, in the event that the modem card is updated with that firmware image, it will be loaded when the modem card image boots.

At boot-up time, the default firmware image is loaded first. If there is a firmware image specified by the **firmware** command, it is then loaded onto the modem card.

Table 1 lists modem firmware upgrade commands to override the default modem firmware image with another specified firmware image.

**Table 1 Modem Firmware Upgrade Commands**

Step	Command	Description
1.	AS5800-1> <b>enable</b> Password: <i>password</i> AS5800-1#	Enter the <b>enable</b> command.  Enter your password.  You are in privileged EXEC mode when the prompt changes to AS5800-1#.
2.	AS5800-1# show modem version	Determine the firmware version currently running on the modem card.
3.	AS5800-1# show modem bundled-firmware	Determine the available bundled modem firmware images per slot.
4.	AS5800-1# <b>configure terminal</b> Enter configuration commands, one per line. End with CNTL/Z. AS5800-1(config)#	Enter global configuration mode by entering the <b>configure</b> command. The example is using the terminal configuration option.  You are in global configuration mode when the prompt changes to AS5800-1(config)#.
5.	AS5800-1(config)# <b>modem-pool</b> <i>pool-name</i>	Create a modem pool and enter modem pool configuration mode.
6.	AS5800-1(config-modem-pool)# <b>pool-range</b> <i>shelf/slot/port shelf/slot/port</i>	Create the range of modems on which you want to override the modem firmware. Modem range must allow for all six modems on a modem SIMM. Thus, numbering range examples include <i>shelf/slot/0 shelf/slot/5; shelf/slot/0 shelf/slot/11; shelf/slot/6 shelf/slot/23</i> ; etc.
7.	AS5800-1(config-modem-pool)# <b>firmwareversion</b>	Enter the firmware version you want the modem pool to use. Currently, the default version is <b>2.2.2.2</b>
8.	AS5800-1(config-modem-pool)# <b>exit</b> AS5800-1(config)# [or] AS5800-1(config)# <b>Ctrl-Z</b> AS5800-1# %SYS-5-CONFIG_I: Configured from console by console	Type <b>exit</b> to exit out of modem-pool configuration mode [or]  Press <b>Return</b> to verify your command registers, then type <b>Ctrl-Z</b> to return to privileged EXEC mode.  This message is normal and does not indicate an error
9.	AS5800-1# <b>copy running-config startup-config</b>	Save your configuration when ready.

To deactivate a modem command, type **no** before the command:

```
AS5800-1(config)# modem-pool test
AS5800-1(config-modem-pool)# no firmware 2.2.2.2
```

To verify a download has succeeded, use the **show modem version** command.

```
AS5800-1> show modem version
```

Modem Range	Module	Firmware Rev
1/6/00 1/6/05	0	2.2.2.2
1/6/06 1/6/11	1	2.2.2.2
1/6/12 1/6/17	2	2.2.2.2
1/6/18 1/6/23	3	2.2.2.2
1/6/24 1/6/29	4	2.2.2.2
1/6/30 1/6/35	5	2.2.2.2
1/6/36 1/6/41	6	2.2.1.7
1/6/42 1/6/47	7	2.2.1.7
1/6/48 1/6/53	8	2.2.1.7
1/6/54 1/6/59	9	2.2.1.7
1/6/60 1/6/65	10	2.2.1.7
1/6/66 1/6/71	11	2.2.1.7

Modem board HW version info:

```
Modem Range:      1/6/00 1/6/05          Modem Module:  0
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298557,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/06 1/6/11          Modem Module:  1
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298553,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/12 1/6/17          Modem Module:  2
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298017,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/18 1/6/23          Modem Module:  3
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298019,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/24 1/6/29          Modem Module:  4
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298200,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/30 1/6/35          Modem Module:  5
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298590,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/36 1/6/41          Modem Module:  6
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
```

```
Board Hardware Version 1.0, Item Number 73-2522-2,  
Board Revision 051, Serial Number 06298446,  
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/42 1/6/47      Modem Module:  7  
Manufacture Cookie Info:  
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,  
Board Hardware Version 1.0, Item Number 73-2522-2,  
Board Revision 051, Serial Number 06298593,  
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/48 1/6/53      Modem Module:  8  
Manufacture Cookie Info:  
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,  
Board Hardware Version 1.0, Item Number 73-2522-2,  
Board Revision 051, Serial Number 06298233,  
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/54 1/6/59      Modem Module:  9  
Manufacture Cookie Info:  
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,  
Board Hardware Version 1.0, Item Number 73-2522-2,  
Board Revision 051, Serial Number 06298309,  
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/60 1/6/65      Modem Module: 10  
Manufacture Cookie Info:  
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,  
Board Hardware Version 1.0, Item Number 73-2522-2,  
Board Revision 051, Serial Number 06297954,  
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
```

```
Modem Range:      1/6/66 1/6/71      Modem Module: 11  
Manufacture Cookie Info:  
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,  
Board Hardware Version 1.0, Item Number 73-2522-2,  
Board Revision 051, Serial Number 06298008,  
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
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## Modem Operation at Bootup

When the Cisco 7206 router shelf boots up and parses its NVRAM, the modem cards will not be up. As a result, the override firmware name is stored in the modem pool structures and no action is taken.

When a modem card becomes active, it sends a startup message to the router shelf. The router shelf then triggers a search in the various modem pools to see if any modem modules on the modem card have a specified firmware override. If yes, the firmware override request is relayed to the modem card, which will load the specified override firmware image on the indicated modem modules.

As a result, the modem modules that are destined to run an override firmware image will experience two firmware downloads at bootup time. The default modem firmware image is loaded first, followed by the override modem firmware image.

Error messages result if the following circumstances exist:

- If you issue a firmware command on a modem pool that has no pool range already specified, an error message will result.
- If you issue a firmware command on a modem pool that is neither constrained nor constraint-capable, an error message will result.

- If the firmware specified is not part of the firmware list, a message is printed to the console. The firmware name is stored in the modem pool structures until that modem card is updated with the specified firmware image. The firmware upgrade then occurs when that modem card is rebooted.
- If any modem module has an active call on it, the firmware upgrade request is queued and deferred until the modem module becomes free.