APPENDIX A

Maintaining the Cisco AS5200 Universal Access Server

This appendix contains information about maintenance procedures that you might need to perform on the Cisco AS5200 as your internetworking needs change.

This appendix contains the following sections:

- Installing Feature Cards
- Installing a 12-Port Modem Card
- Opening the Chassis
- Removing Feature Cards
- Upgrading the DRAM SIMM
- Replacing System-Code SIMMs
- Closing the Chassis
- Recovering Lost Passwords
- Changing the Virtual Configuration Register Settings
- Copying a Cisco IOS Image to Flash Memory
- Disaster Recovery Copy of a Cisco Boot Image to Boot Flash Memory
- Upgrading the 12-Port Modem Firmware



Caution Before opening the chassis, ensure that you have discharged all static electricity from your body and be sure that the power is off. Before performing any procedures described in this appendix, review the sections "Safety Recommendations," "Maintaining Safety with Electricity," "Preventing Electrostatic Discharge Damage," and "General Site Requirements" in the chapter "Preparing for the Cisco AS5200 Universal Access Server."



Warning Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

Installing Feature Cards

You can install feature cards in the Cisco AS5200 without removing the chassis cover. Each Cisco AS5200 chassis can accommodate up to three feature cards. The choice of feature cards is as follows:

- Dual T1 Primary Rate Interface (PRI) with integrated channel service unit (CSU) card
- Modem carrier card containing up to two 12-port modem cards

A blank slot cover must be installed over unused slots.

Perform the following steps to install a Cisco AS5200 feature card:

Step 1 Turn off power to the Cisco AS5200.



Caution Unlike some other Cisco access servers, the feature cards are not hot-swappable (that is, you cannot remove or install them when the power to the Cisco AS5200 is on). Be sure to turn off the power to the Cisco AS5200 before installing or removing feature cards. *Failure to do so may damage the Cisco AS5200*.

- **Step 2** Remove the feature card from the electrostatic discharge (ESD) protective shipping material.
- **Step 3** Slide the feature card into the appropriate slot along the card guides until it is completely seated in the connector inside the Cisco AS5200. (See Figure A-1).

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Step 4 Tighten the two captive screws on the card to secure it to the chassis.

Step 5 If the Cisco AS5200 is configured with fewer than three feature cards, make sure that a blank slot cover is installed over each open slot to ensure proper airflow inside the chassis.

Installing a 12-Port Modem Card

You can add a 12-port modem card to a carrier card installed in the Cisco AS5200. The modem card can be installed in the carrier card without removing the carrier card from the chassis.

Required Tools

You need the following tools to install the 12-port modem card:

- Medium-size flat-blade screwdriver (1/4 inch [0.625 cm])
- ESD-sensitive wrist strap



Caution Unlike some other Cisco access servers, the feature cards are not hot-swappable (that is, you cannot remove or install them when the power to the Cisco AS5200 is on). Be sure to turn off the power to the Cisco AS5200 before installing or removing feature cards. *Failure to do so may damage the Cisco AS5200*.

The installation of the 12-port modem card is shown in Figure A-2. The carrier card is shown removed from the Cisco AS5200 to show the installation of the 12-port modem card in the carrier card.



Perform the following steps to install a 12-port modem card:

- **Step 1** Turn off the Cisco AS5200.
- **Step 2** Remove all interface cables from the back panel of the Cisco AS5200.
- **Step 3** Place the Cisco AS5200 so that the back panel is closest to you.
- **Step 4** Put on an ESD-sensitive wrist strap.
- **Step 5** Remove the blank cover on the carrier card.
- **Step 6** Remove the 12-port modem card from the ESD protective shipping material.

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- **Step 7** Slide the modem card into the carrier card slot until it is completely seated in the carrier card.
- Step 8 Tighten the two captive screws on the modem card to secure it to the carrier card.

Opening the Chassis

This section describes the procedure for opening the chassis by removing the chassis cover.

Required Tools

You need the following tool to open the chassis:

Medium-size flat-blade screwdriver (1/4 inch [0.625 cm])

Removing the Chassis Cover

You must open the Cisco AS5200 chassis to gain access to its interior components: the system card, system-code single in-line memory modules (SIMMs), dynamic random access memory (DRAM) SIMMs, and boot ROM. When you replace the Boot ROMs, you must also remove of all feature cards in the chassis.

Perform the following steps to remove the chassis cover:



Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

Step 1 Turn off the power; however, to channel electrostatic discharge (ESD) voltages to ground, do not unplug the power cable.



Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

- Step 2 Remove all interface cables from the rear panel of the Cisco AS5200.
- **Step 3** Place the Cisco AS5200 so that the front panel is closest to you. Note that the chassis is comprised of two sections: top and bottom. The chassis top is secured to the bottom by three screws and metal tabs on the top cover and chassis.
- **Step 4** Remove the three screws located on the top cover of the chassis, as shown in Figure A-3.

Figure A-3 Removing the Chassis Cover



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- **Step 5** Place each hand on the front corner of the top cover.
- **Step 6** Lift the front edge of the top cover one inch (2.54 cm) over the bottom chassis, as shown in Figure A-4.





Step 7 Pull the top cover toward you until the metal tabs on the top cover separate from the chassis bottom, as shown in Figure A-5.

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Figure A-5 Separating the Top Cover from the Chassis Bottom

Step 8 Lift the top cover until it separates from the chassis bottom and set it aside.

Removing Feature Cards

Feature cards must be removed from the Cisco AS5200 to access the system card or to upgrade the feature cards.

Required Tools

You need the following tools to remove the feature cards:

- Medium-size flat-blade screwdriver (1/4 inch [0.625 cm])
- ESD-sensitive mat

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Perform the following steps to remove the feature cards:



Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

Step 1 Turn off the Cisco AS5200.



Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

- Step 2 Remove all interface cables from the rear panel of the Cisco AS5200.
- **Step 3** Place the Cisco AS5200 so that the rear panel is closest to you. Note that the feature cards are secured to the chassis by a captive mounting screw at each end of the feature card, as shown in Figure A-6.

Replacing Boot ROMs



- Mounting screws
 - Step 4 Put on an ESD-sensitive wrist strap.
 - **Step 5** Loosen the two captive screws that secure the feature card to the chassis until each screw is free of the chassis.
 - Step 6 Hold a captive screw in each hand, and pull until the card slides free of the chassis.
 - **Step 7** Pull the feature card toward you until it is separated from the card slot. Set the card aside on an ESD-sensitive mat.

Repeat the procedure to remove additional feature cards.

Replacing Boot ROMs

To upgrade the boot read-only memory (ROM) software to a new software image, the existing boot ROMs must be replaced.

Required Tools and Equipment

The following tools and equipment are required to replace the boot PROMs:

- Read-only memory (ROM) extraction tool or a small flat-blade screwdriver
- Two boot ROMs
- ESO-preventive wrist strap

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Perform the following steps to replace the boot ROMs:

- **Step 1** Turn off the Cisco AS5200.
- **Step 2** Attach an ESD-preventive wrist strap.
- **Step 3** Open the cover. (See the instructions in the section "Opening the Chassis" in this appendix.)
- **Step 4** Remove all feature cards to access the system card. (See the instructions in the section "Removing Feature Cards" in this appendix.)

ROMs (FW1 and FW2) on the system card are exposed, as shown in Figure A-7.



Figure A-7 System Card Layout

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- Step 5 Locate the boot ROMs, FW1 and FW2, on the system board.
- **Step 6** Gently extract the old ROM with an ROM extraction tool or a small flat-blade screwdriver, and set the old boot ROM on a nonconductive surface.



Caution The notch in the ROM must match the notch in the socket on the card. Installing the components backward damages them.

Step 7 Insert the new boot ROMs in their respective sockets as shown in Figure A-7. Be careful not to bend or crush any of the bottom pins. To straighten out a bent pin, use needlenose pliers. Align the notch in the new ROM with the notch in the ROM socket, ignoring the orientation of the label.

Upgrading the DRAM SIMM

This section describes how to upgrade the DRAM SIMM on the system card. You might need to upgrade the DRAM SIMM for the following reasons:

- You have upgraded to a new Cisco IOS feature set or release.
- You are using very large routing tables or many protocols (for example, when the Cisco AS5200 is set up as a connection device between large external networks and your internal network).

There are two areas of removable DRAM SIMM in the Cisco AS5200 (see Figure A-7). This first area is the main memory DRAM SIMM (labeled MM). Main memory is used by the CPU to store the operating configuration, routing tables, caches, and queues.

Upgrading the DRAM SIMM

The second area is the packet memory DRAM SIMM (labeled PKT). Packet memory is used to store incoming and outgoing packets.

Required Tools and Equipment

You need the following tools to remove and replace the DRAM SIMM on the Cisco AS5200:

- ESD-preventive wrist strap
- The appropriate DRAM SIMM for your Cisco AS5200

Main Memory DRAM SIMM Installation

Perform the following steps to install the main memory DRAM SIMMs:

- **Step 1** Turn off the Cisco AS5200.
- **Step 2** Put on an ESD-preventive wrist strap.
- **Step 3** Open the chassis cover. (See the instructions in the section "Opening the Chassis" in this appendix.)
- **Step 4** Place the chassis with the main-memory DRAM SIMM socket (labeled MM) toward you, as shown in Figure A-7.
- **Step 5** Remove the existing DRAM SIMM by pulling outward on the connector holders to unlatch them, as shown in Figure A-8. The connector holds the SIMM tightly, so be careful not to break the holders on the SIMM connector.



Caution To prevent damage, do not press on the center of the SIMM. Handle the SIMM carefully.



Figure A-8 Removing and Replacing the CPU DRAM SIMM

- **Step 6** Position the new SIMM so that the polarization notch is located at the right end of the SIMM socket.
- Step 7 Insert the new DRAM SIMM by sliding the end with the metal fingers into the SIMM connector socket at approximately a 45-degree angle to the system card. Gently rotate the SIMM toward you until the latch on either side snaps into place. Do not use excessive force, because the connector might break.
- **Step 8** Replace the Cisco AS5200 chassis cover. (See the instructions in the section "Closing the Chassis" in this appendix.)
- **Step 9** Connect the Cisco AS5200 to a console terminal.
- **Step 10** Turn on the Cisco AS5200. If error messages relating to memory are displayed, remove the DRAM SIMM and reinstall it, taking care to seat the SIMM firmly in its socket.

Replacing System-Code SIMMs

The system code (software) is stored in Flash memory SIMMs. The 80-pin Flash memory SIMMs must be purchased from Cisco Systems, Inc. Contact a customer service representative for more information.

The system code for the Cisco AS5200 is contained on two 80-pin Flash memory SIMMs. Flash memory must be installed in both system-code SIMMs (labeled FSIM0 and FSIM1).

Required Tools and Equipment

You need the following tools to remove and replace the system-code SIMMs on the Cisco AS5200:

- ESD-preventive wrist strap
- The appropriate system-code SIMM(s) for your Cisco AS5200

System-Code SIMM Replacement

Perform the following steps to upgrade the system-code Flash memory SIMMs:

- **Step 1** Turn off the Cisco AS5200.
- **Step 2** Put on an ESD-preventive wrist strap.
- **Step 3** Open the chassis cover. (See the previous procedure in the section "Opening the Chassis" in this appendix.)
- **Step 4** Place the chassis so that the system card is shown in Figure A-7, with the system-code SIMMs toward you. The SIMM sockets are labeled FSIM0 and FSIM1. (See Figure A-7.)
- Step 5 Remove the existing system-code SIMM by pulling outward on the connector holders to unlatch them. The connector holds the SIMM tightly, so be careful not to break the holders on the SIMM connector. (See Figure A-9.)



Caution To prevent damage, do not press on the center of the SIMMs. Handle each SIMM carefully.

Step 6 Repeat these steps for all the system-code SIMMs that you need to replace.



Figure A-9 Removing and Replacing the System-Code SIMM

Step 7 Place the system card as shown in Figure A-9. Position the new SIMM so that the polarization notch is located at the right end of the SIMM socket.



Caution Some Flash memory SIMMs have the components mounted on the rear side. To prevent damage when you insert the SIMM, always use the polarization notch as a reference, *not* the position of the components on the SIMM.

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- **Step 8** Insert the new SIMM by sliding the end with the metal fingers into the appropriate SIMM connector socket (labeled FSIM0 or FSIM1 in Figure A-7) at approximately a 45-degree angle to the system card. Gently rotate the SIMM toward you until the latch on either side snaps into place. Do not use excessive force, because the connector might break.
- Step 9 Replace the Cisco AS5200 chassis cover. (See the instructions in the following section, "Closing the Chassis.")
- Step 10 Connect the Cisco AS5200 to a console terminal.
- Step 11 Turn on the Cisco AS5200. If any error messages relating to memory are displayed, remove the system-code SIMM and reinstall it, taking care to seat the SIMM firmly in the socket.

Closing the Chassis

This section describes the procedure for closing the chassis.

Required Tools

You need the following tools for replacing the chassis cover:

Medium-size flat-blade screwdriver (1/4 inch [0.625 cm])

Replacing the Cover

After you finish the maintenance for your system, perform the following steps to replace the cover:

- **Step 1** Place the chassis bottom so that the front panel is closest to you.
- **Step 2** Hold the top cover over the chassis bottom, and align the chassis and top cover tabs at the top rear of the chassis, as shown in Figure A-10.

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Step 3 Push the top cover toward the chassis back panel, and ensure the following:

- The top cover tabs fit under the chassis back panel so that they are not exposed.
- The chassis tabs on the top of the chassis back panel fit under the top cover so that they are not exposed.

Chassis cover tabs Chassis cover tabs Cover

Figure A-10 Replacing the Chassis Cover

Step 4 Lower the front of the top cover to close the chassis, and ensure the following:

- The top cover side tabs fit under the chassis side panels so that they are not exposed.
- The chassis tabs fit under the top cover side panels so that they are not exposed.

Step 5 Secure the chassis cover with three screws.

- Step 6 Reinstall the chassis on a rack, desktop, or table.
- Step 7 Reinstall all interface cables.

Recovering Lost Passwords

This section explains how to recover a lost password. There are three types of passwords:

- An enable secret password— a very secure, encrypted password. The enable secret password is used on access servers running Cisco IOS Release 10.3(2) or later.
- An enable password— a less secure, nonencrypted password. The enable password is used if you are using Cisco IOS Release 10.3(1) or earlier.
- A virtual terminal password. The virtual terminal password is used to prevent unauthorized users from attempting to change the Cisco AS5200 configuration. When a virtual terminal password is set, you must provide a password to log in to the console and access user EXEC mode.

To recover a lost enable password you must set the configuration register to (0x142) so that the contents of nonvolatile random–access memory (NVRAM) are ignored. This allows you to see your password. The enable secret password is encrypted and cannot be recovered; it must be replaced. The enable and virtual terminal passwords can be encrypted or clear text.

Perform the following steps to recover a lost password:

- **Step 1** Connect a terminal to the console port on the rear panel of the Cisco AS5200.
- **Step 2** Configure the terminal to operate at 9600 baud, 8 data bits, no parity, and 2 stop bits.
- **Step 3** Enter the **show version** command to display the existing configuration register value and note its value. The configuration register value is on the last line of the display. Note whether the configuration register is set to enable or disable Break.

The factory-default configuration register value is 0x2102—disable Break. Note that the third digit from the left in 0x2102 is 1, which disables Break. If the third digit is *not* 1, Break is enabled.

- **Step 4** If the configuration register is set to disable Break, power cycle the access server. (Turn off the Cisco AS5200, wait five seconds, and then turn the Cisco AS5200 on again.)
- **Step 5** If the configuration register is set to enable Break, press the Break key or send a Break signal to the Cisco AS5200. Then proceed to Step 7.

Note If your keyboard does not have a Break key, refer to your operating system documentation for information about how to send a Break signal to the terminal.

- **Step 6** Within 60 seconds of turning on the Cisco AS5200, press the Break key or send a Break signal. The ROM monitor prompt (rommon>) appears.
- **Step 7** Enter the **o**/**r** command to reset the configuration register to boot from the boot ROMs and ignore NVRAM:

rommon 1> o/r 0x142

Step 8 Enter the **initialize** command to initialize the Cisco AS5200:

rommon 2> initialize

The Cisco AS5200 power cycles, and the configuration register is set to 0x142. The Cisco AS5200 boots the system image in Flash memory, and the System Configuration Dialog appears:

--- System Configuration Dialog ---

Step 9 Enter **no** in response to the System Configuration Dialog prompts until the following message appears:

Press RETURN to get started!

Step 10 Press Return.

Step 11 Enter privileged EXEC mode, and then enter the **show startup-config** command to display the passwords in the configuration file:

access server > enable
access server # show startup-config

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Step 12 Scan the configuration file displayed for the passwords (the enable and enable secret passwords are usually near the beginning of the file, and the virtual terminal password is near the end of the file). An example display follows:

```
enable secret 5 $1$ORPP$s9syZt4uKn3SnpuLDrhuei
enable password sand
.
.
line con 0
password seashells
```

Proceed to Step 13 to replace an enable secret, virtual terminal, or enable password.

If there is no enable secret password, note the enable and virtual terminal passwords, if they are not encrypted, and proceed to Step 17.



Caution Only perform the next step if you must change or replace the enable, enable secret, or virtual terminal passwords. Failure to follow the steps as shown can erase the Cisco AS5200 configuration file.

Step 13 Enter the configure memory command to modify or replace passwords in NVRAM:

access server # configure memory

Step 14 Enter the configure terminal command to enter configuration mode:

access server # configure terminal

Step 15 Change only the passwords that are necessary for your configuration. The following example shows how to change all three password types. The first two lines show how to change the enable secret and enable passwords. The last two lines show how to change the virtual terminal password.

access server (config)# enable secret pail access server (config)# enable password shovel access server (config)# line con 0 access server (config-line)# password vterm1

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For maximum security, make sure that the enable secret and enable passwords are different.

You can remove individual passwords by using the **no** form of these commands. For example, enter the **no enable secret** command to remove the enable secret password.

Step 16 Configure all interfaces to be administratively up. In the following example, the Ethernet 0 port is configured to be administratively up:

access server (config-line)# interface ethernet 0
access server (config-if)# no shutdown

Enter the equivalent commands for all interfaces that were originally configured.

Note If this step is omitted, all interfaces are administratively shut down and unavailable when the Cisco AS5200 is rebooted.

Step 17 Set the configuration register to the original value that you noted in Step 3, or to the factory-default value (0x2102). The following example shows how to set the configuration register to the factory-default value:

access server (config-if)# config-register 0x2102
access server (config)#

Step 18 Press Ctrl-Z to exit configuration mode.



Caution Only perform the next step if you have changed or replaced a password; otherwise, you might erase your Cisco AS5200 configuration file. If there is no enable secret password (or if you skipped Step 13 through Step 16), proceed to Step 22 and log in.

Step 19 Enter the **copy running-config startup-config** command to save the new configuration to NVRAM. This command copies the changes you just made in the running configuration to the startup configuration. The following message appears:

access server # copy running-config startup-config Building configuration... [OK] access server #

Step 20 Reboot the Cisco AS5200:

access server # **reload** Proceed with reload? [confirm]

- **Step 21** Press **Return** to confirm. When the Cisco AS5200 reboots, it uses the new configuration register value that you set in Step 17.
- Step 22 Log in to the Cisco AS5200 with the new or recovered passwords.

Changing the Virtual Configuration Register Settings

The Cisco AS5200 has a 16-bit virtual configuration register, which is written into NVRAM. You might want to change the virtual configuration register settings for the following reasons:

- To set and display the configuration register value
- To force the system into the ROM monitor or boot ROM
- To select a boot source and default boot filename
- To enable or disable the Break function
- To control broadcast addresses
- To set the console terminal baud rate
- To recover a lost password—ignore the configuration file in NVRAM
- To enable Trivial File Transfer Protocol (TFTP) server boot

Table A-1 lists the meaning of each virtual configuration memory bit and defines the boot field names.



Caution To avoid confusion and possibly shutting down the Cisco AS5200, remember that valid configuration register settings can be combinations of settings, not just the individual settings listed in Table A-1. For example, the factory-default value of 0x2102 is a combination of settings.

Table A-1	Virtual Configuration	Register Bit	Meanings

Bit No. ¹	Hexadecimal	Meaning
00–03	0x0000-0x000F	Boot field
06	0x0040	Causes system software to ignore the contents of NVRAM (startup-config)
07	0x0080	OEM bit is enabled
08	0x0100	Break is disabled
10	0x0400	IP broadcast with all zeros
11–12	0x0800–0x1000	Console line speed
13	0x2000	Loads the boot ROM software if a Flash boot fails five times
14	0x4000	IP broadcasts do not have network numbers
15	0x8000	Enables diagnostic messages and ignores the contents of NVRAM

1. The factory-default value for the configuration register is 0x2102. This value is a combination of the following: bit 13 = 0x2000, bit 8 = 0x0100, and bits 00 through 03 = 0x0002.

Changing Configuration Register Settings

Perform the following steps to change the configuration register while running the Cisco IOS software:

Step 1 Enter the enable command and your password to enter privileged mode:

access server > enable
password: <password>
access server #

Step 2 Enter the **configure terminal** command at the privileged-level system prompt (access server #):

access server # configure terminal

Step 3 To set the contents of the configuration register, enter the **config-register** *value* command, where *value* is a hexadecimal number preceded by 0x. (See Table A-1 and Table A-2.)

access server # config-register 0xvalue

(The virtual configuration register is stored in NVRAM.)

Boot Field	Boot Process	
0x0	Stops the boot process in the ROM monitor.	
0x1	Stops the boot process in the boot ROM monitor.	
0x3–0xF	Specifies a default filename for booting over the network from a TFTP server.	
	Enables boot system commands that override the default filename for booting over the network from a TFTP server.	
0x2	Full boot process, which loads the Cisco boot image in Boot Flash memory.	

Table A-2 Explanation of Boot Field (Configuration Register Bits 00 to 03)

Step 4 Press **Ctrl-Z** to exit configuration mode. The new settings are saved to memory; however, the new settings do not take effect until the system software is reloaded by rebooting the access server.

To display the configuration register value currently in effect and the value that will be used at the next reload, enter the **show version** EXEC command. The value appears on the last line of the screen display:

Configuration register is 0x142 (will be 0x102 at next reload)

Step 5 Reboot the access server. The new value takes effect. Configuration register changes take effect only when the Cisco AS5200 restarts, which occurs when you switch the power off and on or when you enter the reload command.

Virtual Configuration Register Bit Meanings

The lowest four bits of the virtual configuration register (bits 3, 2, 1, and 0) form the boot field. (See Table A-2.) The boot field specifies a number in binary form. If you set the boot field value to 0, you must boot the operating system manually by entering the **b** command at the bootstrap prompt, as follows:

rommon 1> b [tftp] flash filename

The **b** command options are as follows:

- **b**—Boots the default system software from boot Flash.
- **b flash:**—Boots the first file in system Flash memory.
- **b** *filename* [*host*]—Boots from the network using a TFTP server.
- **b flash:** *[filename]*—Boots the file *filename* from system Flash memory.

Note For more information about the **b** [**fftp**] **flash** *filename* command, refer to the Cisco IOS configuration guides and command references.

If you set the boot field value to a value of 0x2 through 0xF, and a valid system boot command is stored in the configuration file, the Cisco AS5200 boots the system software as directed by that value. If you set the boot field to any other bit pattern, the Cisco AS5200 uses the resulting number to form a default boot filename for booting from the network using a TFTP server. (See Table A-3.)

Table A-3	Defa	efault Boot Filenames			
Action or Filen	ame	Bit 3	Bit 2	Bit 1	Bit 0
bootstrap mode		0	0	0	0
ROM software		0	0	0	1
cisco2-as5200		0	0	1	0
cisco3-as5200		0	0	1	1
cisco4-as5200		0	1	0	0
cisco5-as5200		0	1	0	1
cisco6-as5200		0	1	1	0
cisco7-as5200		0	1	1	1
cisco10-as5200		1	0	0	0
cisco11-as5200		1	0	0	1
cisco12-as5200		1	0	1	0
cisco13-as5200		1	0	1	1
cisco14-as5200		1	1	0	0
cisco15-as5200		1	1	0	1
cisco16-as5200		1	1	1	0
cisco17-as5200		1	1	1	1

Changing the Virtual Configuration Register Settings

In the following example, the virtual configuration register is set to boot the Cisco AS5200 from Flash memory and to ignore Break at the next reboot of the access server:

```
access server > enable
password: <enablepassword>
access server # conf term
Enter configuration commands, one per line.
Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z
config-register 0x102
boot system flash [filename]
^z
access server #
```

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The Cisco AS5200 creates a default boot filename as part of the automatic configuration processes. The boot filename consists of *cisco*, plus the octal equivalent of the boot field number, a hyphen, and the processor type.

Note A **boot system** configuration command in the Cisco AS5200 configuration in NVRAM overrides the default boot filename.

Bit 8 controls the console Break key. Setting bit 8 (the factory default) causes the processor to ignore the console Break key. Clearing bit 8 causes the processor to interpret the Break key as a command to force the system into the bootstrap monitor, which halts normal operation. A break command can be sent in the first 60 seconds while the system reboots, regardless of the configuration settings.

Bit 10 controls the host portion of the IP broadcast address. Setting bit 10 causes the processor to use all zeros. Clearing bit 10 (the factory default) causes the processor to use all ones. Bit 10 interacts with bit 14, which controls the network and subnet portions of the broadcast address. (See Table A-4.)

Table A-4 Configuration Register Settings for Broadcast Address Destination

Bit 14	Bit 10	Address (<net> <host>)</host></net>
Off	Off	<ones> <ones></ones></ones>
Off	On	<zeros> <zeros></zeros></zeros>
On	On	<net> <zeros></zeros></net>
On	Off	<net> <ones></ones></net>

Bits 11 and 12 in the configuration register determine the baud rate of the console terminal. Table A-5 shows the bit settings for the four available baud rates. (The factory-set default baud rate is 9600.)

Baud	Bit 12	Bit 11
9600	0	0
4800	0	1
1200	1	0
2400	1	1

Table A-5 System Console Terminal Baud Rate Settings

Bit 13 determines the Cisco AS5200 response to a bootload failure. Setting bit 13 (the factory default) causes the Cisco AS5200 to load operating software from ROM after five unsuccessful attempts to load a boot file from the network. Clearing bit 13 causes the Cisco AS5200 to continue attempting to load a boot file from the network indefinitely.

Enabling Booting from Flash Memory

To disable Break and enable the **boot system flash** command, enter the **config-register** command with the value shown in the following example:

```
access server > enable
Password: <enablepassword>
access server # config term
Enter configuration commands, one per line.
Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z
config-reg 0x2102
^z
access server #
```

Copying a Cisco IOS Image to Flash Memory

You might need to copy a new Cisco IOS image to Flash memory whenever a new image or maintenance release becomes available.

Perform the following steps to copy a new image to Flash memory:

- **Step 1** Enter the **show flash** command to make sure that there is enough space available before copying a file to Flash memory. Compare the size of the file you want to copy to the amount of available Flash memory displayed.
- **Step 2** Make a backup copy of the current image.
- **Step 3** Enter enable mode, and then enter the **copy tftp flash** command to copy the new image into Flash memory:

access server > **enable** Password: <*enablepassword>* access server # **copy tftp flash**

The following messages are displayed:

Partition	Size	Used	Free	Bank-Size	State	Copy Mode
1	8192K	3562K	4629K	8192K	Read/Write	Direct
2	8192K	3394K	4797K	8192K	Read/Write	Direct

[Type ?<no> for partition directory; ? for full directory; q to abort] Which partition? [default = 1]

System flash directory, partition 1: File Length Name/status 1 3647600 as5200-im-1 [3647664 bytes used, 4740944 available, 8388608 total]

Step 4 Press Return to confirm. If there already is an image in Flash memory, the Cisco AS5200 displays the name and size of the file and prompts you for the IP address or name of the remote host:

Address or name of remote host [255.255.255.255]?

The remote host can be a server or another access server or router with a valid Flash system software image.

Step 5 Enter the IP address or name of the remote host. The Cisco AS5200 then prompts you for the name of the source file:

Source file name?

Step 6 Enter the name of the source file. The following prompt displays:

Destination file name [filename]?

Step 7 Press Return to accept the default filename, or enter a different filename. Messages similar to the following display:

> Accessing file 'as5200-jm-l' on your_tftpserver... Loading as5200-jm-l from 1.1.1.1 (via Ethernet0): ! [OK]

Erase flash device before writing? [confirm]

Step 8 Enter **yes** to erase the contents of Flash memory. The following message displays:

Flash contains files. Are you sure you want to erase? [confirm] yes

Step 9 Enter **yes** to confirm that you want to erase the contents of Flash memory. Messages similar to the following display:

Copy 'as5200-jm-l' from server as 'as5200-jm-l' into Flash WITH erase? [yes/no]yes Loading as5200-jm-1 from 1.1.1.1 (via Ethernet0): 11111 [OK - 6645904/8388608 bytes] Verifying checksum... OK (0xB8F4) Flash copy took 00:02:22 [hh:mm:ss]

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Step 10 The system image has been copied to Flash memory. Change to configuration mode to reboot the access server:

access server(boot)# conf terminal Enter configuration commands, one per line. End with CNTL/Z.

Step 11 Enter the configuration register setting 0x2102 to boot the Cisco AS5200 from ROM:

access server(boot)(config)# config-register 0x2102

Step 12 Enter the **end** command to exit the configuration mode:

access server(boot)(config)# end

Step 13 Enter the reload command to reboot the operating system:

access server(boot)# **reload** %SYS-5-CONFIG_I: Configured from console by consolel

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

Step 14 Enter yes to reboot the operating system:

Proceed with reload? [confirm]

The system reboots using the new image in Flash memory.

Note For more information about the **copy tftp flash** command and other related commands, refer to the Cisco IOS configuration guides and command references.

Disaster Recovery Copy of a Cisco Boot Image to Boot Flash Memory

Use the following procedure to copy a Cisco boot image to boot flash if both the boot and system images have been erased from Flash memory and only the ROM monitor is available. The ROM monitor **xmodem** command can be used to copy a Cisco boot image from a PC. The PC can be directly connected to the Cisco AS5200 through the console port or remotely through a modem connected to the auxiliary console port.

Note Copying a Cisco boot image from the console is very slow. This procedure should be used only in an emergency and is not recommended for normal Cisco boot image upgrades.

Server Requirements

To use this procedure, the PC must have the following files and application software:

- A terminal emulation application program supporting one of the following file transfer protocols:
 - Xmodem
 - Xmodem-CRC
 - Xmodem-1K
 - Ymodem
- A Cisco boot image file

Modem Configuration Requirements

If the PC is connected through the auxiliary console port, the modems must use the following configuration settings:

- Set the serial port speed to 9600 bps.
- Override DTR (Data Terminal Ready).

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- Ignore hardware flow control.
- Ignore software flow control.
- Disable compression.
- Set to answer on first ring.
- Set DTE (Data Terminal Equipment) speed to 9600 bps.

The receiving modem must also have the following configuration settings:

- Turn off local command echo.
- Turn off result messages display.

Xmodem Command Options

The following xmodem command options can be used to download the boot image:

xmodem [-cy] filename

-c Use CRC-16 mode

-y Use ymodem batch protocol mode

Copying the Cisco BootImage

Perform the following steps to copy the Cisco boot image to Flash memory:

- Step 1 Connect the console to the Cisco AS5200. (See the instructions in the section "Connecting the Console Terminal and Modem" in the chapter "Installing the Cisco AS5200 Universal Access Server.")
- Step 2 Turn on the Cisco AS5200. The power-on self-test diagnostics are run, and the boot ROM searches for a valid boot image and Cisco boot image in Flash memory. If the boot image and the Cisco boot image are not found, the boot ROM monitor prompt is displayed.

rommon 1>

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Step 3 Enter the **xmodem** command and the name of the destination file to contain the Cisco boot image.

rommon 1> **xmodem** filename

Step 4 Messages similar to the following are displayed:

Do not start sending program yet... File size Checksum File name 2537948 bytes (0x26b9dc) as5200-boot-1

WARNING: All existing data in bootflash will be lost! Invoke this application only for disaster recovery.

Do you wish to continue? [yes/no]:

Step 5 Enter **yes** to copy the Cisco boot image into Flash memory. Messages similar to the following are displayed:

Ready to receive file prog ...

Step 6 Invoke the sending program on the PC to begin copying the boot image. Messages similar to the following are displayed:

Erasing flash at 0x3000000

program flash location 0x3000000

Download complete!

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Upgrading the 12-Port Modem Firmware

You might need to copy the modem firmware to one or more modems whenever a new or maintenance release becomes available. Use the following procedure to copy the modem firmware:

Step 1 Enter enable mode, and then enter the **copy tftp modem** command to copy the new firmware to the modems.

access server> **enable** Password: <*enablepassword>* access server # **copy tftp modem**

Step 2 Enter the slot and modem numbers at the following prompt. Enter **all** to copy the firmware to all modems.

Modem Firmware Download Modem Numbers? <slot/modem>

Step 3 Enter the IP address or name of the remote host with the firmware file.

Address or name of remote host [UNKNOWN]?

Step 4 Enter the firmware file or path name at the following prompt:

Source file name?

The source file is searched for and found. Messages similar to the following are displayed:

Accessing file 'filename on Modem_Server... Loading filename .from 1.1.1.1 (via Ethernet0): ! [OK]

Step 5 Press **Return** to confirm the file name and begin the copy. Messages similar to the following are displayed to indicate a successful copy:

%MODEM-5-DL_START: Modem firmware download started for modem
(slot/modem)

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Upgrading the 12-Port Modem Firmware

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