Changing the Configuration Register Settings

This document describes the 16-bit configuration register in NVRAM and includes the following sections:

Platforms Supported by This Document

Use this document with the following platforms:

- Cisco 1800 series routers
- Cisco 2800 series routers
- Cisco 3800 series routers

About the Configuration Register

The router has a 16-bit configuration register in NVRAM. Each bit has value 1 (on or set) or value 0 (off or clear), and each bit setting affects the router behavior upon the next reload power cycle.

You can use the configuration register to

- Force the router to boot into the ROM monitor (bootstrap program)
- Select a boot source and default boot filename
- Enable or disable the Break function
- Control broadcast addresses
- Recover a lost password
- Change the console line speed

CISCO SYSTEMS

Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Table 1 describes the configuration register bits.

Table 1   Configuration Register Bit Descriptions

Bit Number	Hexadecimal	Meaning
00–03	0x0000–0x000F	Boot field. The boot field setting determines whether the router loads an operating system and where it obtains the system image. See Table 2 for details.
06	0x0040	Causes the system software to ignore the contents of NVRAM.
07	0x0080	Original Equipment Manufacturer (OEM) bit enabled.
08	0x0100	Controls the console Break key: • (Factory default) Setting bit 8 causes the processor to ignore the console Break key. • Clearing bit 8 causes the processor to interpret Break as a command to force the router into the ROM monitor mode, halting normal operation. Break can always be sent in the first 60 seconds while the router is rebooting, regardless of the configuration register settings.
09	0x0200	This bit controls the system boot: • Setting bit 9 causes the system to use the secondary bootstrap. • (Factory default) Clearing bit 9 causes the system to boot from flash memory. This bit is typically not modified.
10	0x0400	Controls the host portion of the IP broadcast address: • Setting bit 10 causes the processer to use all zeros. • (Factory default) Clearing bit 10 causes the processor to use all ones. Bit 10 interacts with bit 14, which controls the network and subnet portions of the IP broadcast address. See Table 3 for the combined effects of bits 10 and 14.
05, 11, 12	0x0020, 0x0800, 0x1000	Controls the console line speed. See Table 4 for the eight available bit combinations and console line speeds. Factory default is 9600 baud, where bits 5, 11, and 12 are all zero (clear). **Note** You cannot change the console line speed configuration register bits from the Cisco IOS command-line interface (CLI). You can, however, change these bits from the ROM monitor (see "Using the ROM Monitor"). Or, instead of changing the configuration register settings, you can set the console line speed through other Cisco IOS commands..
13	0x2000	Determines how the router responds to a network boot failure: • Setting bit 13 causes the router to boot the default ROM software after 6 unsuccessful network boot attempts. • (Factory default) Clearing bit 13 causes the router to indefinitely continue network boot attempts.

Table 1   Configuration Register Bit Descriptions (continued)

Bit Number	Hexadecimal	Meaning
14	0x4000	Controls the network and subnet portions of the IP broadcast address: • Setting bit 10 causes the processor to use all zeros. • (Factory default) Clearing bit 10 causes the processor to use all ones. Bit 14 interacts with bit 10, which controls the host portion of the IP broadcast address. See Table 3 for the combined effect of bits 10 and 14.
15	0x8000	Enables diagnostic messages and ignores the contents of NVRAM.

Table 2 describes the boot field, which is the lowest four bits of the configuration register (bits 3, 2, 1, and 0). The boot field setting determines whether the router loads an operating system and where the router obtains the system image.

Table 2   Boot Field Configuration Register Bit Descriptions

Boot Field (Bits 3, 2, 1, and 0)	Meaning
0000 (0x0)	At the next power cycle or reload, the router boots to the ROM monitor (bootstrap program). To use the ROM monitor, you must use a terminal or PC that is connected to the router console port. For information about connecting the router to a PC or terminal, see the hardware installation guide for your router. In ROM monitor mode, you must manually boot the system image or any other image by using the **boot** ROM monitor command. See the section "Booting an Image (boot)" in "Using the ROM Monitor."
0001 (0x01)	Boots the first image in flash memory as a system image.
0010 - 1111 (0x02 - 0xF)	At the next power cycle or reload, the router sequentially processes each **boot system** command in global configuration mode that is stored in the configuration file until the system boots successfully. If no **boot system** commands are stored in the configuration file, or if executing those commands is unsuccessful, then the router attempts to boot the first image file in flash memory.

Table 3 shows how each setting combination of bits 10 and 14 affects the IP broadcast address.

Table 3   Broadcast Address Configuration Register Bit Combinations

Bit 10	Bit 14	Broadcast Address (<net> <host>)
0	0	<ones> <ones>
1	0	<ones> <zeros>
1	1	<zeros> <zeros>
0	1	<zeros> <ones>

Table 4 shows the console line speed for each setting combination of bits 5, 11, and 12.

Table 4   Console Line Speed Configuration Register Bit Combinations

Bit 5	Bit 11	Bit 12	Console Line Speed (baud)
1	1	1	115200
1	0	1	57600
1	1	0	38400
1	0	0	19200
0	0	0	9600
0	1	0	4800
0	1	1	2400
0	0	1	1200

Changing the Configuration Register Settings

You can change the configuration register settings from either the ROM monitor or the Cisco IOS CLI. This section describes how to modify the configuration register settings from the Cisco IOS CLI. To change the configuration register from the ROM monitor, see " Using the ROM Monitor."

To change the configuration register settings from the Cisco IOS CLI, complete the following steps:

Step 1 Connect a terminal or PC to the router console port. If you need help, see the hardware installation guide for your router.

Step 2 Configure your terminal or terminal emulation software for 9600 baud (default), 8 data bits, no parity, and 2 stop bits.

Step 3 Power on the router.

Step 4 If you are asked whether you would like to enter the initial dialog, answer **no**:

```
Would you like to enter the initial dialog? [yes]: no
```

After a few seconds, the user EXEC prompt (Router>) appears.

Step 5 Enter privileged EXEC mode by typing **enable** and, if prompted, enter your password:

```
Router> enable
Password: password
Router#
```

Step 6 Enter global configuration mode:

```
Router# configure terminal

Enter configuration commands, one per line.
Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z
```

Step 7 To change the configuration register settings, enter the **config-register** *value* command, where *value* is a hexadecimal number preceded by **0x**:

```
Router(config)# config-register 0xvalue
```

✎

Note The Cisco IOS software does not allow you to change the console speed bits directly with the **config-register** command. To change the console speed from the Cisco IOS CLI, see the "Configuring the Console Line Speed (Cisco IOS CLI)" section on page 5.

Step 8 Exit global configuration mode:

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

Step 9 Save the configuration changes to NVRAM:

```
Router# copy run start
```

The new configuration register settings are saved to NVRAM, but they do not take effect until the next router reload or power cycle.

Displaying the Configuration Register Settings

To display the configuration register settings that are currently in effect and the settings that will be used at the next router reload, enter the **show version** command in privileged EXEC mode.

The configuration register settings are displayed in the last line of the **show version** command output:

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

Configuring the Console Line Speed (Cisco IOS CLI)

The combined setting of bits 5, 11, and 12 determines the console line speed. You can modify these particular configuration register bits only from the ROM monitor. See " Using the ROM Monitor."

To configure the console line speed from the Cisco IOS command-line interface, complete the following steps:

	Command or Action	Purpose
Step 1	Router> **enable** Password: *password* Router#	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	Router# **configure terminal** Router(config)#	Enters global configuration mode.
Step 3	Router(config)# **line console 0** Router(config-line)#	Specifies the console line and enters line configuration mode.
Step 4	Router(config-line)# **speed** *baud*	Specifies the console line speed. Possible values (in baud): 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.