

The Purpose and Use of the Configuration Register on All Cisco Routers

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Introduction

This document provides a description of the configuration register (config register).

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

The Purpose of the Configuration Register

The configuration register can be used to change router behavior in several ways, such as:

- how the router boots (into ROMmon, NetBoot)
- options while booting (ignore configuration, disable boot messages)
- console speed (baud rate for a terminal emulation session)

The configuration register can be set from configuration mode using the **config-register** command. From ROMmon, use the **confreg** command. Issue the **show version** command to view the current setting of the configuration register:

```
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-JS-L), Version 12.1(5), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Wed 25-Oct-00 05:18 by cmong
Image text-base: 0x03071DB0, data-base: 0x00001000
ROM: System Bootstrap, Version 5.2(8a), RELEASE SOFTWARE
BOOTFLASH: 3000 Bootstrap Software (IGS-RXBOOT), Version 10.2(8a), RELEASE SOFTWARE (fc1)
Router uptime is 7 minutes
System returned to ROM by reload
System image file is "flash:c2500-js-l_121-5.bin"
cisco 2500 (68030) processor (revision D) with 16384K/2048K bytes of memory.
Processor board ID 03867477, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
1 Token Ring/IEEE 802.5 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read ONLY)
Configuration register is 0x2102
```

The factory-default setting for the configuration register is 0x2102. This indicates that the router should attempt to load a Cisco IOS® software image from Flash memory and load the startup configuration with a console speed of 9600 baud.

Configuration Register Values and their Meaning

If you know the value of your configuration register, you can determine its meaning. For information on the meaning of your configuration register setting, including potential issues and fixes, collect the output of the **show version** command, or the **show tech-support** command, and input into the Output Interpreter (registered customers only) tool. In order to use Output Interpreter (registered customers only), you must be a registered customer, be logged in, and have JavaScript enabled.

This table contains some common settings which are valid on most platforms.

Note: Check the appropriate hardware installation guide to verify that the configuration register can be used before you change the configuration register on your router to one of the values in this table.

Configuration Register Setting	Router Behavior
0x102	<ul style="list-style-type: none"> • Ignores break • 9600 console baud
0x1202	<ul style="list-style-type: none"> • 1200 baud rate
0x2101	<ul style="list-style-type: none"> • Boots into bootstrap • Ignores break • Boots into ROM if initial boot fails

	<ul style="list-style-type: none"> • 9600 console baud rate
0x2102	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate default value for most platforms
0x2120	<ul style="list-style-type: none"> • Boots into ROMmon • 19200 console speed
0x2122	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 19200 console baud rate
0x2124	<ul style="list-style-type: none"> • NetBoot • Ignores break • Boots into ROM if initial boot fails • 19200 console speed
0x2142	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate • Ignores the contents of Non-Volatile RAM (NVRAM) (ignores configuration)
0x2902	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 4800 console baud rate
0x2922	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 38400 console baud rate
0x3122	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 57600 console baud rate
0x3902	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 2400 console baud rate

0x3922	<ul style="list-style-type: none"> • Ignores break • Boots into ROM if initial boot fails • 115200 console baud rate
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If the value you have for the configuration register is not in the table, then determine which bits are set in order to compute the value:

Bit Number	Hex	Meaning
00–03	0x0000–0x000F	<ul style="list-style-type: none"> • Boots Field Parameters 0x0000 • Stays at the system bootstrap prompt 0x0001 • Boots system image on EPROM 0x0002–0x000F • Specifies a default netboot filename
06	0x0040	<ul style="list-style-type: none"> • Ignore NVRAM contents
07	0x0080	<ul style="list-style-type: none"> • Disable boot messages
08	0x0100	<ul style="list-style-type: none"> • Break disabled
10	0x0400	<ul style="list-style-type: none"> • IP broadcast with all zeros
5,11,12	0x0020, 0x0800, 0x1000	<ul style="list-style-type: none"> • Console line speed
13	0x2000	<ul style="list-style-type: none"> • Boots default ROM software if network boot fails
14	0x4000	<ul style="list-style-type: none"> • IP broadcasts do not have net numbers
15	0x8000	<ul style="list-style-type: none"> • Enables diagnostic messages • Ignores NVRAM contents

Troubleshoot Configuration Register Issues

An inappropriately set configuration register can cause many problems, such as:

- The configuration file is ignored.
- There is no output or garbage output from the console.
- Booting into ROMmon.

Change the configuration register to an appropriate setting, such as the factory default 0x2102, in order to solve these problems.

Troubleshooting when the Configuration Register Value is Not Known

If the configuration register value is not known, try to establish a Telnet or console session with the router. You can then check the **show version** output to determine the value of the configuration register:

```
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-JS-L), Version 12.1(5), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Wed 25-Oct-00 05:18 by cmong
Image text-base: 0x03071DB0, data-base: 0x00001000
ROM: System Bootstrap, Version 5.2(8a), RELEASE SOFTWARE
BOOTFLASH: 3000 Bootstrap Software (IGS-RXBOOT), Version 10.2(8a), RELEASE SOFTWARE (fc1)
Router uptime is 7 minutes
System returned to ROM by reload
System image file is "flash:c2500-js-l_121-5.bin"
cisco 2500 (68030) processor (revision D) with 16384K/2048K bytes of memory.
Processor board ID 03867477, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
1 Token Ring/IEEE 802.5 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read ONLY)
Configuration register is 0x2142
```

If you cannot establish a console session, or if you see only garbage characters, a speed mismatch between the router and the terminal emulation software could be the cause. Try to change the baud rate of your terminal emulation software. Possible settings include 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200. Once you establish a session, you can issue the **show version** command to determine the setting. If the router is in ROMmon mode, you can try to issue the **boot** command to boot the operating system manually. For information on the meaning of your configuration register setting, including potential issues and fixes, collect the output of the **show version** command, or the **show tech-support** command, and input into the Output Interpreter (registered customers only) tool. In order to use Output Interpreter (registered customers only) , you must be a registered customer, be logged in, and have JavaScript enabled.

Troubleshooting when the Configuration Register Value is Known

If you know the value of your configuration register, use the table in Configuration Register Settings and their Meaning to determine the behavior. For information on the meaning of your configuration register setting, including potential issues and fixes, collect the output of the **show version** command, or the **show tech-support** command, and input into the Output Interpreter (registered customers only) tool. In order to use Output Interpreter (registered customers only) , you must be a registered customer, be logged in, and have JavaScript enabled. If you can access the router through Telnet, establish a session with the router. If not, set

your terminal emulation program to the baud rate indicated by the configuration register setting to establish a console session.

Set the Configuration Register

Use the table in Configuration Register Settings and their Meaning to determine the desired configuration register setting (usually 0x2102).

Set the Configuration Register from Configuration Mode

Issue the **config-register** command to set the configuration register:

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#config
Router(config)#config-register 0x2102
Router(config)#end
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-JS-L), Version 12.1(5), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Wed 25-Oct-00 05:18 by cmong
Image text-base: 0x03071DB0, data-base: 0x00001000
ROM: System Bootstrap, Version 5.2(8a), RELEASE SOFTWARE
BOOTFLASH: 3000 Bootstrap Software (IGS-RXBOOT), Version 10.2(8a), RELEASE SOFTWARE (fc1)
Router uptime is 11 minutes
System returned to ROM by reload
System image file is "flash:c2500-js-l_121-5.bin"
cisco 2500 (68030) processor (revision D) with 16384K/2048K bytes of memory.
Processor board ID 03867477, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
1 Token Ring/IEEE 802.5 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read ONLY)
Configuration register is 0x2142 (will be 0x2102 at next reload)
```

The new configuration register setting becomes active once the router reloads.

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

Set the Configuration Register from ROMmon

Set the configuration register with the **confreg** command if the router is in ROMmon mode:

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

You must reset or power-cycle for the new configuration register to take effect.

Related Information

- [Why Does My Router Lose Its Configuration During Reboot?](#)
 - [Password Recovery Procedures](#)
 - [Software Configuration Register](#)
 - [Technical Support & Documentation – Cisco Systems](#)
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