Overview: Troubleshooting the Cisco 4000 Series Integrated Services Routers

Your Cisco 4000 Series Integrated Services Routers (ISRs) went through extensive testing before leaving the factory. However, if you encounter problems starting the router, use the information in this chapter to help isolate the cause of the problems. This chapter contains the following sections:

This document contains the following sections:

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Note The procedures in this chapter assume that you are troubleshooting the initial system startup and that your router is in the original factory configuration.

If you have removed or replaced components or changed any default settings, the recommendations in this chapter might not apply. Make sure to review the safety warnings listed in the *Regulatory Compliance and Safety Information for the Cisco 4000 Series Integrated Services Routers* publication that accompanied your Cisco 4000 Series Integrated Services Routers before using the troubleshooting procedures in this chapter.

Troubleshooting Overview

This section describes the methods used in troubleshooting the router. The troubleshooting methods are organized according to the major subsystems in the router.

If you are unable to solve a problem on your own, you can contact a Cisco customer service representative for assistance. When you call, have the following information ready:

- Date you received the router and the chassis serial number (label located on the chassis, see the Labels on the Cisco 4000 Series ISR section in the *Hardware Installation Guide for the Cisco 4000 Series Integrated Services Router.*

- Installed SPAs.

  – Use the **show platform** command to determine which SPAs are installed if possible.

- Cisco software release number.

  – Use the **show version** command to determine this information if possible.

- Brief description of the symptoms and steps you have taken to isolate and solve the issue.

- Maintenance agreement or warranty information.

Note   To troubleshoot interface cards, refer to the documentation for the particular card on *Cisco.com*.

If you cannot locate the source of the problem, contact a Cisco customer service representative for information on how to proceed. For technical support information, refer to "Obtaining Documentation and Submitting a Service Request". Before you call, have the following information ready:

- Chassis type and serial number

- Maintenance agreement or warranty information

- Type of software and version number

- Date you received the router

- Brief description of the problem

- Brief explanation of the steps you have taken to isolate the problem

Problem Solving

The key to problem solving is to isolate the problem to a specific subsystem by comparing what the router is doing to what it should be doing.

The LEDs on the router aid you in determining router performance and operation. The LEDs are described in the LED Indicators section in the *Hardware Installation Guide for the Cisco 4451-X Integrated Services Router.*

When solving problems, consider the following router subsystems:

- Power and cooling systems—External power source, power cable, router power supply, circuit breaker, and router fan. Also check for inadequate ventilation or air circulation.

- Interface cards—LEDs on the interface cards help identify a failure.

- Cables—External cables that connect the router to the network.

Reading LEDs

The LEDs enable you to determine router performance and operation. See the LED section in the *Hardware Installation Guide for the Cisco 4451-X Integrated Services Router* for detailed LED indications.

System Messages

This section describes system error and recovery messages that may appear when a Cisco 4000 Series Integrated Services Routers is operated. The Cisco IOS XE software displays system error and recovery messages on an external device console terminal screen.

The terminal should display one of the following prompts:

`Router>` (indicates the user EXEC command mode)

or

`Router#` (indicates the privileged EXEC command mode)

Table 1-1 describes some of the most common system error and recovery messages.

Table 1-1   System Messages

Error Message	Explanation
`%ENVMON-3-FAN_OK: Fan <fan-number> functional now`	Explanation: The cooling fan within the chassis is working.
`%ENVMON-3-FAN_FAIL: Fan <fan-number> is malfunctioning`	Explanation: The cooling fan within the chassis is not working.
`%CFG-3-CARD_NOT_SUPPORTED: Slot <n>. <Card identification from cookie, including at least card type, version, revision, and serial number>`	Explanation: The card found is not recognized or is not supported in the specified slot. Check the feature license to be sure it is enabled.

Guidelines

Follow these general guidelines for troubleshooting the router:

1. Verify that your configuration is correct for your network application.

2. Make any required changes to the running-config file, and then test the configuration. If it is satisfactory, save it to the startup-config file using the copy running-config startup-config command.

3. Enable system message logging. See the "Enable System Logging" section.

4. Run the diagnostic tool to verify device functionality and connectivity. See the "Running Diagnostics" section.

5. If the system appears to be having hardware or disk problems, see the section Troubleshooting Hardware.

6. After you have determined that your troubleshooting attempts have not resolved the problem, contact the Cisco Technical Assistance Center (TAC) or your technical support representative. See the "Contacting Cisco Technical Support" section.

Contacting Cisco Technical Support

If you are unable to resolve a problem after using the troubleshooting suggestions in the articles in this wiki, contact the Cisco Technical Assistance Center (TAC) for assistance and further instructions. Before you call, have the following information ready to help your TAC engineer assist you as quickly as possible:

- Date that you received the router hardware
- Chassis serial number
- Type of software and release number (if possible, enter the show version command)
- Maintenance agreement or warranty information
- Problem description including:
  - What is the problem and what are the user visible symptoms?
  - Where and when it occurs
  - Error messages, alerts, and alarms seen
  - Steps to duplicate the problem
- Explanation of the steps that you have already taken to isolate and resolve the problem
- Diagnostic test output--see the "Running Diagnostics" and "Collecting Troubleshooting Information" sections.
- Other evidence of the problem such as packet captures, log files, core files, and other output from the router.

Cisco.com Technical Support Web Site

The Cisco Technical Support Web site (www.cisco.com/techsupport) provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The Cisco Technical Support Web site is available 24 hours per day, 365 days per year.

For a complete overview of services go to:

http://www.cisco.com/web/services/ts/access/index.html

In addition to the overview, you may wish to learn more about using the Technical Support and Documentation web site by viewing online presentations:

http://www.cisco.com/web/learning/le31/le47/learning_tac_e-learning_tool_launch.html

Network Professionals Connection (Net Pro)

Access Net Pro or Cisco Community Support Page on Cisco.com to exchange your questions, suggestions, and information with other networking professionals about networking solutions, products, and technologies. If you do not have a Cisco.com account or have forgotten your username or password, click **Register** to create a free account.

Create your own personalized technical support portal with technical alerts, notifications, and technical information at https://supportforums.cisco.com/index.jspa.

Technical Notes

Use the following technical notes in Table 1-2 to troubleshoot system issues.

Table 1-2   Technical Notes on Cisco.com

Topic	URL on Cisco.com
Password Recovery	http://www.cisco.com/en/US/customer/products/sw/iosswrel/ps1831/products_tech_note09186a00801746e6.shtml
Router Crashes	http://www.cisco.com/en/US/products/hw/iad/ps397/products_tech_note09186a00800b4447.shtml
Router Hangs	http://www.cisco.com/en/US/products/hw/routers/ps359/products_tech_note09186a0080106fd7.shtml
Memory Problems	http://www.cisco.com/en/US/products/sw/iosswrel/ps1831/products_tech_note09186a00800a6f3a.shtml
High CPU Utilization	http://www.cisco.com/en/US/products/hw/routers/ps133/products_tech_note09186a00800a70f2.shtml

Troubleshooting Toolkit

Use your account on Cisco.com to access the following tools in Table 1-3. If you do not have an account or have forgotten your username or password, click **Register** to create a free account.

Table 1-3 *Troubleshooting Toolkit*

Tool	Function	URL on Cisco.com
Error Message Decoder	Research and identify error messages	http://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi
Output Interpreter	Generate output analysis of show commands	https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl
Bug Toolkit	Search known caveats by software version, feature set, and keyword	http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl
Software Adviser	Choose appropriate software for your network device by matching software features to Cisco IOS and CatOS releases, comparing Cisco IOS releases, or determining which software releases support your hardware.	http://tools.cisco.com/Support/Fusion/FusionHome.do
Command Lookup Tool	Look up a detailed description for a particular Cisco IOS, Catalyst, or PIX/ASA command.	http://tools.cisco.com/Support/CLILookup/cltSearchAction.do

Podcasts

Table 1-4 *Cisco Podcasts*

Podcast	Language	Podcast URL
Unified Communications Podcasts - Contact Center Solutions—audio	English	http://www.cisco.com/en/US/prod/voicesw/product_generic_contact_center_solutions_podcasts.html
Products and Services Technology (audio)	English	http://www.cisco.com/en/US/products/products_technology_podcast_listing.html
Government Podcasts—audio	English	http://www.cisco.com/web/strategy/us_government/podcast.html
SSL VPN Podcast Series—audio	English	http://www.cisco.com/en/US/prod/vpndevc/networking_solutions_products_genericcontent0900aecd8058815a.html
Cisco Security Podcast Series—audio	English	http://www.cisco.com/en/US/solutions/ns170/sml_podcast.html
Cisco Network Management Podcast Series—audio	English	http://www.cisco.com/en/US/products/ps5931/index.html

Text Messaging

Stay current with Cisco field notices, product updates, security advisories, security news, security responses, and more. Get a text message as soon as new content is posted. US and Canadian short code is 24726. Outside the US our code is 447797801642. These codes allow you to validate that a text message is from Cisco and not a third party. You can also send a text message to 24726 with the word "stop" and you will be unsubscribed from the service.

To register, go to: http://www.cisco.com/web/about/facts_info/sms_reg_info.html

RSS Feeds

Product launches, field notices, security advisories, product documentation

http://www.cisco.com/en/US/support/tsd_technical_support_rss_feeds.html

Cisco Press

http://www.ciscopress.com/rss/

Social Networking

Blogs

Select from popular tags, or choose your own tag to search for specific blog posts that may help you.

http://blogs.cisco.com/

Support Wiki

A dynamic knowledge base where you can collaborate, create and access the latest technical content. Solve real-world IT problems in real time.

Watch a video overview of the Support Wiki here:

http://www.cisco.com/web/tsweb/flash/wiki/promo/cisco_wiki_promo.html

Technical Services

Support services designed to meet your business needs:

http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/serv_category_home.html

Troubleshooting the Cisco 4000 Series Integrated Services Routers Power and Cooling Systems

This chapter describes how to troubleshoot the Cisco 4000 Series Integrated Services Routers (ISRs) power and cooling systems.

Both the system LED and the fans can help you troubleshoot a power problem. Check the following items to help isolate the problem:

- Normal Indications
- Fault Indications
- Environmental Reporting Features

Normal Indications

With the power switch on, the normal indications are:

- SYS LED on, green, and continuous
- Fan operating

Fault Indications

This is a condensed listing of LED states. For the complete listing see "LED Indicators".

Check the following symptoms to locate or eliminate faults in the power and cooling systems:

- With the power switch on, is the STAT on green?
    - If the LED is solid green and continuous, the router has booted and the software is functional.
    - If the LED is blinking amber, the system BIOS/ROMMON is in the process of booting. If it continues blinking for longer than 2 minutes, there might be a problem loading ROMMON.
    - If the LED is off, the system is not out of reset or the BIOS image is not loadbale.
    - If the LED is amber, BIOS/ROMMON has completed booting and system is at ROMMON prompt or booting platform software. If it is there for a very long time, it indicates that the router is sitting at a ROMMON prompt which could mean a problem loading the Cisco IOS-XE image.
- With the power switch on and the STAT on and green, does the fan operate?
    - If no, check the fan.
    - If yes, the power system is functioning.

- With the power switch on and the STAT off, does the fan operate?
    - If yes, the router is receiving power. The fan is connected directly to the DC outputs of the power supply.
    - If no, check the power source and power cable.
- Does the router shut down after being on a short time?
    - Check for an environmentally induced shutdown.
    - Check the environmental site requirements in "General Site Requirements".
- Router partially boots
    - Check for a power supply failure by inspecting the PWR LED on the front panel of the router. If the PWR LED is blinking or continuously green, the power supply is functional.
    - If the PWR LED is not on, refer to "Obtaining Documentation and Submitting a Service Request" for warranty information, or contact customer service.

Environmental Reporting Features

If the router is operating at an abnormally high temperature, consider the following causes:

- Fan failure
- Air conditioner failure in the room
- Air blockage to cooling vents.

Take steps to correct the problem. Refer to the Preparing for Router Installation chapter in the H*ardware Installation Guide for the Cisco 4451-X Integrated Servcies Router.*.

Online Troubleshooting Resources

In addition to following the subsystems approach to troubleshooting, a variety of online troubleshooting resources are available.

Cisco.com registered users can access various troubleshooting tools such as Software Advisor, Cisco IOS Error Message Decoder Tool, and Output Interpreter Tool after logging in at http://www.cisco.com/en/US/support/tsd_most_requested_tools.html.

General Troubleshooting Tips

Table 2-1 lists general troubleshooting tips.

Table 2-1   General Startup Troubleshooting Tips

Symptom	Corrective Action
System fails to power on	Check that: • All power cords are properly connected to the Cisco 4000 Series Integrated Services Routers and at the power connection end. • The power switch is in the | ON position.
System fails to boot up properly	If your system has power, check the status LED on the Cisco 4000 Series Integrated Services Routers route processor and make certain all connections are secure.
Power problems	The Power Supply Units have their own LEDs. If the two power supplies are both showing GREEN on their Output LEDs, then a failure of one power supply will not result in a system failure. Only one operating power supply is required for the Cisco 4000 Series Integrated Services Routers system to operate. Having only one supply powered is a supported configuration. If both supplies have the LED off, the the system will fail..

Troubleshooting Using a Subsystem Approach

To solve a system problem, try to isolate the problem to a specific subsystem. Compare current router behavior with expected router behavior. Because a startup issue is usually attributable to one component, it is most efficient to examine each subsystem, rather than trying to troubleshoot each router component.

For troubleshooting purposes in this chapter, the router consists of the following subsystems:

• Power subsystem—Includes the following components:

AC input power supplies, also called power supply units (PSUs). The Cisco 4000 Series Integrated Services Routers is shipped with fully redundant PSUs installed in the chassis.

• Processor subsystem—The Cisco 4000 Series Integrated Services Routers has onboard processors. The LED is blinking yellow until the ROMMON hass booted. If the board has booted ROMMON successfully, the LED is yellow. If operation software (IOS) has downloaded successfully, the LED is green.

• Cooling system—Consists of four fans in the Cisco 4000 Series Integrated Services Routers system board. Each PSU has its own fans.

Normal Router Startup Sequence

You can generally determine when and where the power supply failed during the startup sequence by checking the status LEDs on the power supply modules.

In a normal router startup sequence, the following sequence of events and conditions occur:

1. The fan in each PEM receives power and begins drawing air through the power supply. The power supply PWR OK indicator is on and reflects power supply status.

2. As the power on and boot process progresses for the Cisco 4000 Series Integrated Services Routers, the status is indicated by LEDs.

Troubleshooting the Power Subsystem

Use the information in Table 2-2 to isolate problems with the power system.

Table 2-2   **Troubleshooting the Power System**

Symptom	Possible Cause	Possible Solution
System begins power on and then stops.	System has failed to boot.	There is a power fault in the chassis. Note that the The system status LEDs are located on the Cisco 4000 Series Integrated Services Routers front panel. The LEDs stay amber during the entire IOS boot process and then turn green when IOS has completely booted.
System does not power on.	AC power cable not fully seated at system or at the wall outlet (power source).	Turn the router power switch to the standby position (I) and reseat the AC power cable at the system or at the wall outlet (power source).
	AC internal power cables are not fully seated from the power supply	Turn the router power switch to the standby position (I) and remove and reinsert the power supply cable.
System does not power on.	Power source is faulty.	Turn the power source switch off, connect the power cable to another power source, if available, and turn the router power switch back on.
	Faulty power cable.	Turn the router power switch to the standby position (I), remove the cable and replace it.
	Faulty power supply.	If the system still fails to come up when the power supply is connected to a different power source with a new power cable, the power supply is probably faulty. Contact a service representative.
System powers off, no STATUS LED, and no operating fans.	Power supply failure.	If the system is operating with only one power supply, it powers off after five minutes.

If you remove a power supply, the system can run for a maximum of five minutes before the system shuts down. The fans and power elements are independent within the power supply. Therefore, it is not required that the replacement power supply be energized within five minutes. The only requirement is that the power supply be installed in the chassis, which energizes the fans and maintains proper system cooling.

Troubleshooting the Cooling Subsystem

Use the information in Table 2-3 to isolate problems with the cooling subsystem.

Table 2-3   Troubleshooting the Cooling Subsystem

Symptom	Possible Cause	Possible Solution

System shuts down, some fans may or may not continue to rotate, and this error message is displayed:
 	
`Queued messages:`
`%ENVM-1-SHUTDOWN: Environmental`
`Monitor initiated shutdown`
 	
This error message indicates that the system has detected an overtemperature condition or out-of-tolerance power condition inside the chassis.
	• One or more fans are not operating.
	
	• The fans are operating too slowly.
	
	• The power supply is not operating.
	
	To determine if the fans are operating, listen for them. In noisy environments, place your hand on the plastic bezel side of the chassis to feel if air is being forced out of the vents.
		Contact a service representative.

Multiple fan failure Amber indicates that one fan has stopped working. Blinking Amber indicates that two or more fans have stopped working, or the fan tray has been removed.	Fan speed dropped below its fan fail speed	• Identify and log the failed fan PEM location. • Recommend immediate replacement of PEM.
	Heated exhaust air from other equipment is entering the routers inlet vents.	Move other equipment or the router to ensure proper airflow.

System shuts down and this error message is displayed:
 	
`Queued messages:`
`%ENVM-1-SHUTDOWN: Environmental`
`Monitor initiated shutdown`
 	
This error message indicates that the system has detected an over-temperature condition or out-of-tolerance power condition inside the chassis.
 	
Note   The system fans may continue to operate although the system shuts down.
	The error message could indicate a faulty component or temperature sensor. Before the system shuts down, use the **show env all** command to display the internal chassis environment.	Contact a service representative.

	If an environmental shutdown results from an out-of-tolerance power condition, the system shuts down.	If the system still fails to come up when the power supply is connected to a different power source with a new power cable, the power supply is probably faulty. Contact a service representative.

Troubleshooting Upgrade-Related Problems

See Table 2-4 below for troubleshooting tips during an upgrade:

Table 2-4

Symptom	Cause	Corrective Action

An error message similar to the following example is displayed after you start the upgrade:
 	
`validate_package: SHA-1 hash:`
`        calculated 9526c1bf:10341089:84ecbb0d:c b12a344:b696af14`
`        expected 93315a74:57061354:d514ff0c:8 b25f8f8:842afb4b`
`SHA-1hashdoesn'tmatch application image failed to run`
	There is a mismatch in the size of the image file that you are using and the expected size of the image file. Note that this error may occur, regardless of the file system to which you copy the image file.	Ensure that the size of the image file that you are using is the same as the expected file size. If required, download the image file again and retry the upgrade.

Table 2-4

Symptom	Cause	Corrective Action

Autoboot has been enabled by using the **config-register 0x2102** command. The following error message is displayed when the router restarts automatically:
 	
`no valid BOOT image found`
`Final autoboot attempt from`
`default boot device...`
`Located l2tp_rmcd_alg`
`Image size 10271 inode num`
`12, bks cnt 3 blk size 8*512`
`#`
`Boot image size = 10271`
`(0x281f) bytes`
`.`
`.`
`.`
`Boot image size = 11262`
`(0x2bfe) bytes`
`Unknown image structure`
`Located test`
`Image size 11506 inode num`
`63, bks cnt 3 blk size 8*512`
	The **boot system** command has not been configured by running a command similar to the following example:
	
	`boot system`
	`bootflash:isr4400rp1-ipbas`
	`ek9.03.05.01.S.152-1.S1.bi`
	`n`
		Perform the following steps:
		
		1. Press the Break key, or run the **break** command from the console terminal. If Break is enabled, the router enters the rommon mode. Proceed to the last step. If Break is disabled, power cycle the router (turn the router off or unplug the power cord, and then restore power after waiting for 30 seconds). Then, proceed to the next step.
		
		2. Within 60 seconds of restoring the power to the router, press the Break key or run the **break** command. This action causes the router to enter the rommon mode and display the rommon prompt.
		
		3. Install a previously working version of the image from bootflash: or harddisk:. Alternatively, copy onto a USB stick the image to which you want to upgrade the router and then install that image on the router.
		
		✎
		Note Using **break** can stop a boot in progress. However, if you are currently in Cisco IOS XE after a successful boot, using **break** will not drop you to a current ROMMON prompt.

Table 2-4

Symptom	Cause	Corrective Action

An error message similar to the following example is displayed when you try to boot the system, and then the router switches to the rommon prompt:
 	
`Directory an_image.bin not found`
`Unable to locate an_image.bin directory`
`Unable to load an_image.bin`
`boot: error executing "boot harddisk:an_image.bin"`
`autoboot: boot failed, restarting`
	The image file name specified in the boot command is invalid.	Perform the following steps:
		
		1. Verify that the image file is present in the bootflash:, or external USB device (usb0: or usb1:) by using the **dir** *file-system* command at the rommon prompt.
		
		2. When you run the **dir** *file-system* command, if a message similar to "Please reset before continuing" is displayed, reconfigure the configuration-register to 0x0 and then run the **reset** command to allow the router to enter the rommon prompt without reattempting to boot using an invalid image.
		
		3. Boot the router from the rommon prompt by using a command similar to the following example:
		
		`rommon>`
		`BOOT=bootflash:isr4400rp1-ipbasek9.03.05.01.S.`
		`152-1.S1.bin`
		
		4. To save the current environment variable setting, run the **sync** command as follows:
		
		`rommon>` **`sync`**
		
		5. Ensure that autoboot has been enabled by using the **confreg 0x2102** command at the rommon prompt, and then run the **reset** command at the same prompt.
		
		If there is no valid image in either the local file system or the external file system, you can run the **boot tftp:** command to install the image that is on the TFTP server. To do this, ensure that the management Ethernet interface is physically connected to the default gateway, configure the ROMmon variables with the appropriate values, and then run the **boot tftp:** command as shown in the following example:
		
		`rommon >`
		`IP_SUBNET_MASK=255.255.255.0`
		`TFTP_SERVER=192.0.2.2`
		`TFTP_FILE=isr4400rp1-package-name9.03.05.01.S.152-`
		`1.S1.bin`
		`DEFAULT_GATEWAY=192.0.2.1`
		`IP_ADDRESS=192.0.2.26`
		
		`rommon >` **`boot tftp:`**

Replacing or Recovering a Lost Password

This chapter describes how to recover a lost enable or console login password, and how to replace a lost enable secret password on your Cisco 4000 Series Integrated Services Routers (ISRs).

> **Note** It is possible to recover the enable or console login password. The enable secret password is encrypted, however, and must be replaced with a new enable secret password.

Overview of the Password Recovery Procedure

Following is an overview of the steps in the password recovery procedure:

Step 1 If you can log in to the router, enter the **show version** command to determine the existing configuration register value.

Step 2 To get to ROMMON, set the **confreg** to not auto boot (0x0 if your baud rate is 9600), and then reload the box.

> **Caution** If you are going to power cycle a Cisco 4000 Series Integrated Services Routers router, we recommend that you first perform a graceful reload on the router. Power cycling the router without first performing a graceful reload might cause a loss of data stored in the NVRAM. In other words, the configuration file might be lost. If there is a chance that the router might be power cycled without a graceful reload, we recommend that you use the **boot config** *file-system:configuration-file* **nvbypass** command to specify a file system other than the NVRAM for storing the configuration file. The following is an example:
> Router(config)# **boot config bootflash:configuration_data.cfg nvbypass**

Step 3 Change the configuration register so the following functions are enabled:

   a. Break

   b. Ignore startup configuration

   c. Boot from flash memory

> **Note** The key to recovering a lost password is to set the configuration register bit 6 (0x0040) so that the startup configuration (usually in NVRAM) is ignored. This allows you to log in without using a password and to display the startup configuration passwords.

Step 4 Power cycle the router by turning power off and then back on.

✎

Note   When powering off the router, wait 30 seconds before powering it on again.

Step 5   Log in to the router and enter the privileged EXEC mode.

Step 6   Enter the show startup-config command to display the passwords.

Step 7   Recover or replace the displayed passwords.

Step 8   Change the configuration register back to its original setting.

Details of the Password Recovery Procedure

Perform the following steps to recover or replace a lost enable, enable secret, or console login password:

Step 1   Attach an ASCII terminal to the console port on your router.

Step 2   Configure the terminal to operate at 9600 baud, 8 data bits, no parity, and 1 stop bit (9600 8N1).

Step 3   If you can log in to the router as a nonprivileged user, enter the show version command to display the existing configuration register value. Note the value for use later and proceed to Step 6. If you cannot log in to the router at all, go to the next step.

Step 4   Set the **confreg** to not auto boot (0x0 if your baud rate is 9600), and then reload the box. The router enters the ROM monitor, indicated by the ROM monitor prompt (rommon1>).

Step 5   Set the configuration register using the configuration register utility; enter the **confreg** command at the ROM monitor prompt as follows:

```
rommon1> confreg
```

Step 6   Answer yes to the enable *ignore system config info?* question, and note the current configuration register settings.

Step 7   Initialize the router by entering the reset command as follows:

```
rommon2> reset
```

The router initializes, the configuration register is set to 0x142, and the router boots the system image from flash memory and enters the System Configuration Dialog prompt as follows:

```
--- System Configuration Dialog --
```

Step 8   Enter no in response to the System Configuration Dialog prompts until the following message is displayed:

```
Press RETURN to get started!
```

Step 9   Press Return. The user EXEC prompt is displayed as follows:

```
Router>
```

Step 10   Enter the enable command to enter privileged EXEC mode. Then enter the show startup-config command to display the passwords in the configuration file as follows:

```
Router# show startup-config
```

Step 11   Scan the configuration file display looking for the passwords (the enable passwords are usually near the beginning of the file, and the console login or user EXEC password is near the end). The passwords displayed look something like this:

```
enable secret 5 $1$ORPP$s9syZt4uKn3SnpuLDrhuei
enable password 23skiddoo
.
.
.
line con 0
 password onramp
```

The enable secret password is encrypted and cannot be recovered; it must be replaced. The enable and console login passwords may be encrypted or clear text. Proceed to the next step to replace an enable secret, console login, or enable password. If there is no enable secret password, note the enable and console login passwords, if they are not encrypted, and proceed to Step 17.

⚠️

Caution   Do not execute the next step unless you have determined you must change or replace the enable, enable secret, or console login passwords. Failure to follow the steps as shown might cause you to erase your router configuration.

Step 12   Enter the configure memory command to load the startup configuration file into running memory. This action allows you to modify or replace passwords in the configuration.

```
Router# configure memory
```

Step 13   Enter the privileged EXEC configure terminal command to enter configuration mode:

```
Hostname# configure terminal
```

Step 14   Change all three passwords using the following commands:

```
Hostname(config)# enable secret newpassword1
Hostname(config)# enable password newpassword2
Hostname(config)# line con 0
Hostname(config-line)# password newpassword3
```

Change only the passwords necessary for your configuration. You can remove individual passwords by using the no form of the above commands. For example, entering the no enable secret command removes the enable secret password.

Step 15   You must configure all interfaces to be not administratively shut down as follows:

```
Hostname(config)# interface gigabitethernet 0/0
Hostname(config-int)# no shutdown
```

Enter the equivalent commands for all interfaces that were originally configured. If you omit this step, all interfaces are administratively shut down and unavailable when the router is restarted.

Step 16   Use the config-register command to set the configuration register to the original value noted in Step 3 or Step 8, or to the factory default value 0x2102 as follows:

> **Note**   Do not use 0x2012 if you have a baud rate other than 9600.

```
Hostname(config)# config-register 0x2102
```

Step 17   Press Ctrl-Z (hold down the Control key while you press Z) or enter end to exit configuration mode and return to the EXEC command interpreter.

> **Caution**   Do not execute the next step unless you have changed or replaced a password. If you skipped Step 13 through Step 16, skip to Step 20. Failure to observe this caution causes you to erase your router configuration file.

Step 18   Enter the copy running-config startup-config command to save the new configuration to NVRAM.

Step 19   Enter the reload command to reboot the router.

Step 20   Log in to the router with the new or recovered passwords.

This completes the steps for recovering or replacing a lost enable, enable secret, or console login password.