CHAPTER 1

Overview: Troubleshooting the Cisco 4451-X Integrated Services Routers

Your Cisco ISR 4451-X 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:

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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 4451-X Integrated Services Routers* publication that accompanied your Cisco ISR 4451-X 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 ISR 4451-X section in the *Hardware Installation Guide for the Cisco 4451 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 ISR 4451-X 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