



CHAPTER 5

Troubleshooting the Installation

Your Cisco 7200 VXR router 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:

- [Troubleshooting Overview, page 5-1](#)
- [Troubleshooting the Power Subsystem, page 5-6](#)
- [Troubleshooting the Processor Subsystem, page 5-7](#)
- [Troubleshooting the Cooling Subsystem, page 5-10](#)
- [Fiber-Optic Cleaning Information, page 5-10](#)

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 publication *Regulatory Compliance and Safety Information for the Cisco 7200 Series Routers* that accompanied your Cisco 7200 VXR router before using the troubleshooting procedures in this chapter.

Troubleshooting Overview

This section describes the troubleshooting methods used in this chapter and describes how the Cisco 7200 VXR routers are divided into subsystems for more efficient problem solving. If you are unable to easily solve the problem, contact a customer service representative for assistance and further instructions. Provide the representative with the following information:

- Date you received the router
- Chassis serial number
- Type of software and release number
- Brief description of the problem you are having
- Brief explanation of the steps you have taken to isolate and resolve the problem
- Maintenance agreement or warranty information

[Table 5-1](#) shows the general troubleshooting strategy described in this chapter. Refer to this table, as necessary, to follow the steps to isolate problems to a specific subsystem; resolve the problem if possible.

Table 5-1 General Troubleshooting Strategy

	Action	Yes	No
Step 1	Turn power on. Go to Step 2.	—	—
Step 2	PWR OK LED on?	Go to Step 3.	Troubleshoot power subsystem.
Step 3	Fans operating?	Go to Step 5.	Troubleshoot cooling subsystem.
Step 4	Fans operating?	Go to Step 5.	Obtain technical assistance.
Step 5	Check system state with I/O controller LEDs. I/O controller LEDs OK?	Go to Step 7.	Reseat the NPE-G1 or NPE-G2 and restart or reseat I/O controller and restart. Then go to Step 6.
Step 6	NPE-G1, NPE-G2, or I/O controller LEDs OK?	Go to Step 7.	Obtain technical assistance
Step 7	Check system state with port adapter LEDs. Port adapter enabled LEDs on?	System startup successful.	Reseat the port adapters and restart. Go to Step 9. If a Port Adapter Jacket Card is installed with an NPE-G1 or NPE-G2, remove the port adapter from it and reseat. Go to Step 8.
Step 8	If installed, check Port Adapter Jacket Card power and enabled LEDs. LEDs on?	Go to Step 9.	Remove the port adapter, then the Port Adapter Jacket Card, and then reseat the Port Adapter Jacket Card and port adapter. Go to Step 9.
Step 9	Port adapter enabled LEDs on?	System startup successful.	Obtain technical assistance.

Problem Solving Using a Subsystems Approach

The key to solving problems with the system is isolating the problem to a specific subsystem. The first step in solving startup problems is to compare what the system *is doing* to what it *should be doing*. Because a startup problem is usually caused by a single component, it is more efficient to first isolate the problem to a subsystem rather than troubleshoot each component in the system. For these troubleshooting procedures, consider the following subsystems:

- Power subsystem—This subsystem comprises the power supplies, the external power cable, and the midplane.

- Cooling subsystem—The chassis fan tray is the single component in this subsystem. The fans should be operating whenever system power is on. Replace the fan tray if you determine a fan is not functioning properly.
- Processor subsystem—This subsystem includes the I/O controller, network processing engine (NPE) or network services engine (NSE), the Port Adapter Jacket Card, and all port or service adapters. The system memory and management functions reside on the I/O controller and the network processing engine or network services engine. The enabled LED on each port adapter indicates if the port adapter is initialized. A port adapter that is partially installed in the midplane can cause the system to hang and crash.

The following sections help you isolate a problem to one of these subsystems and direct you to the appropriate troubleshooting section.

Identifying Startup Problems



Note

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

Startup problems are commonly due to the source power or to a board (network processing engine or network services engine, I/O controller, or port or service adapter) that is dislodged from the midplane. Although an overtemperature condition is unlikely at initial startup, the environmental monitoring functions are included in this chapter because they also monitor internal voltages.

When you start up the router for the first time, you should observe the startup sequence described in the [“Starting the System and Observing Initial Conditions”](#) section on page 4-2 in Chapter 4, [“Observing System Startup and Performing a Basic Configuration.”](#) This section contains a more detailed description of the normal startup sequence and describes the steps to take if the system does *not* perform that sequence as expected.

With the exception of the fan tray and network processing engine or network services engine, LEDs indicate all system states in the startup sequence. By checking the state of the LEDs, you can determine when and where the system failed in the startup sequence. Use the following descriptions to isolate the problem to a subsystem, and then proceed to the appropriate sections to try to resolve the problem.

Fans Operating

You should immediately hear the fans operating. If not, proceed to the [“Troubleshooting the Cooling Subsystem”](#) section on page 5-10. If you determine that the power supply is functioning normally and that a fan is faulty, contact a customer service representative. If a fan does not function properly at initial startup, there are no installation adjustments that you should make.

Power LEDs

The green power OK LED (at the rear of the chassis) should come on immediately when you place the power supply switch in the on (I) position, and remain on during normal system operation.

If the green power OK LED *does not* come on, proceed to the [“Troubleshooting the Processor Subsystem”](#) section on page 5-7.

I/O Controller LEDs

The LEDs on the I/O controller should come on as follows:



Note

If you have an NPE-G1 or NPE-G2 installed without an I/O controller, go to the [“NPE-G1 or NPE-G2 LEDs” section on page 5-5](#).

If you have an NPE-G1 or NPE-G2 installed with an I/O controller, the I/O controller works with the NPE-G1, but continues its I/O controller functionality. That is, the information in this I/O controller section is valid. Only the Gigabit Ethernet interface LEDs are active when in use. For information about the Gigabit Ethernet LEDs on the NPE-G1 or NPE-G2, see the [“NPE-G1 or NPE-G2 LEDs” section on page 5-5](#).

- The IO PWR OK LED comes on immediately and indicates that the I/O controller is receiving DC power from the router midplane. This LED comes on during a successful router boot and remains on during normal operation of the router.
- If this LED remains off when you start the router, either there is a problem with the power supply (it is damaged or not connected to the router midplane) or the network processing engine or network services engine, the Port Adapter Jacket Card, or the I/O controller is not connected to the router midplane. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).
- The ENABLED LED comes on after the IO PWR OK LED and indicates that the network processing engine or network services engine and the I/O controller are enabled for operation by the system; however, it does not mean that the Fast Ethernet port on the I/O controller is functional or enabled. This LED comes on during a successful router boot and remains on during normal operation of the router.

If this LED remains off when you start the router, it is probably a problem with the network processing engine or network services engine or the I/O controller (they are damaged or not connected to the router midplane). Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).

- The FE ENABLE LED comes on after the ENABLED LED and indicates that the Fast Ethernet port on the I/O controller is initialized and enabled for operation by the system. This LED comes on during a successful router boot and remains on during normal operation of the router.

If this LED remains off when you start the router, it is probably a problem with the Fast Ethernet port on the I/O controller. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).



Note

The I/O controller without the Fast Ethernet port does not have the FE ENABLE LED and the FE LINK LED. The I/O controller without the Fast Ethernet port and the I/O controller that is equipped with a single MII port do not have the MII EN, RJ-45 EN, and RJ-45 LINK LEDs.

- The FE LINK LED comes on only when the Fast Ethernet port on the I/O controller is receiving a carrier signal from the network. This LED remains off during normal operation of the router unless there is an incoming carrier signal, and does not indicate startup problems.

If this LED remains off when you start the router, it is probably a problem with the Fast Ethernet port on the I/O controller. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).

- The MII EN LED comes on after the ENABLED LED and indicates that the Fast Ethernet port's MII port is initialized and enabled for operation by the system, and configured for operation. This LED comes on during a successful router boot and after the MII port has been configured as the media type for the Fast Ethernet port (the RJ-45 port is the default media type for the Fast Ethernet port). This LED remains on during normal operation of the router.

If this LED remains off when you start the router, it is probably a problem with the Fast Ethernet port on the I/O controller. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).

- The RJ-45 EN LED comes on after the ENABLED LED and indicates that the Fast Ethernet port's RJ-45 port (the default media type for the Fast Ethernet port) is initialized and enabled for operation by the system. This LED comes on during a successful router boot and remains on during normal operation of the router.

If this LED remains off when you start the router, it is probably a problem with the Fast Ethernet port on the I/O controller. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).

- The RJ-45 LINK LED comes on only when the Fast Ethernet RJ-45 port is receiving a carrier signal from the network. This LED remains off during normal operation of the router unless there is an incoming carrier signal, and does not indicate startup problems.

If this LED remains off when you start the router, it is probably a problem with the Fast Ethernet port on the I/O controller. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).


Note

An MII link LED is not provided on the I/O controller because the LED is provided on external transceivers that are required for connecting to the MII port on the I/O controller. See the [“Connecting to the I/O Controller Ethernet and Fast Ethernet Ports” section on page 3-30](#) in [Chapter 3, “Installing a Cisco 7200 VXR Router”](#) for Fast Ethernet MII connection requirements.

- The slot 1 and slot 2 LEDs only come on when either PC card or Flash Disk slot is being accessed by the system. These LEDs remain off during normal operation of the router and do not indicate startup problems.

NPE-G1 or NPE-G2 LEDs

These LEDs function on the NPE-G1 or NPE-G2 when no I/O controller is installed:

- The POWER ON LED on the NPE-G1 or the PWK OK LED on the NPE-G2 comes on immediately—and stays on—and indicates that the NPE-G1 is receiving DC power from the router midplane. This LED comes on during a successful router boot and remains on during normal operation of the router.

If these LEDs remain off when you start the router, either there is a problem with the power supply (it is damaged or not connected to the router midplane) or the network processing engine is not connected to the router midplane. Proceed to the [“Troubleshooting the I/O Controller” section on page 5-7](#).

- The EN (enabled) LED comes on for the three Gigabit Ethernet interfaces only if the RJ-45 media are selected. The EN LED remains off, when operating, if the GBIC media are selected.
- The LINK LED comes on only when any of the Gigabit Ethernet media in use are receiving a carrier signal from the network. This LED remains off during normal operation of the router unless there is an incoming carrier signal, and does not indicate startup problems.
- The SLOT ACTIVE LED on the NPE-G2 comes on when the CompactFlash Disk slot is being used.
- The SYS STAT LED is solid green when Cisco IOS has successfully booted.

- The USB port LEDs on the NPE-G2 are off when there is no activity.
- The FE LINK LED on the NPE-G2 is solid green when there is no activity on the management port.
- The CF ACTV LED on the NPE-G2 is off when there is no activity on the CompactFlash Disk.

Also see the [“NPE-G2 LEDs” section on page 1-41](#).

Port Adapter Jacket Card LEDs

The Port Adapter Jacket Card has two LEDs. The Port Adapter Jacket Card functions only with an NPE-G1 installed. These LEDs function when the Port Adapter Jacket Card is installed in the I/O controller slot with a port adapter installed in the Port Adapter Jacket Card:

- The ENABLE LED comes on when the Port Adapter Jacket Card is enabled for operation.
- The PWR (power) LED comes on when the Port Adapter Jacket Card is receiving power.

Port Adapter LEDs

The ENABLED LED on each port adapter or service adapter comes on when the network processing engine or network services engine completes its initialization of the adapter for operation. The ENABLED LED indicates that the adapter is receiving power and has been recognized by the network processing engine or network services engine; it does not indicate the state of the individual interfaces on the adapters. If an ENABLED LED fails to come on, proceed to the [“Troubleshooting the Port Adapters or Service Adapters” section on page 5-9](#).

System Bootup Banner

When all LEDs come on to indicate that the system has booted successfully, the initial system banner should be displayed on the console screen. If it is not displayed, see [Chapter 3, “Installing a Cisco 7200 VXR Router,”](#) the [“Connecting to the Console and Auxiliary Ports” section on page 3-34](#) to verify that the terminal is set correctly and that it is properly connected to the I/O controller’s console port.

Troubleshooting the Power Subsystem

Check the following to help isolate a problem with the power subsystem:

- On the first power supply, is the PWR OK LED on?
 - If yes, the power source is good, and the power supply is functional.
 - If no, make sure the AC power supply power cable is connected at both ends.
 - If no, make sure the circuit breaker is switched to the on position for DC power supply leads.
 - If the PWR OK LED remains off, and the power switch is set correctly, suspect the power source or the power cable. Turn the switch off, connect the power cable to another power source, if available, and turn the switch back on. If the LED comes on, the problem is the first power source.
 - If the PWR OK LED fails to come on after you connect the power supply to a new power source, replace the power cord, and turn the switch back on. If the AC power (or input power) LED then comes on, return the first power cable for replacement.

- If the LED still fails to come on when the power supply is connected to a different power source with a new power cable, the power supply is probably faulty. If a second power supply is available, install it in the other power supply bay and contact a service representative for further instructions.
- Is the PWR OK LED on for the second (redundant) power supply?
 - If yes, proceed to the “[Troubleshooting the Processor Subsystem](#)” section.
 - If not, repeat each of the preceding procedures for the second power supply.

If you are unable to resolve the problem or you determine that either a power supply or chassis connector is faulty, contact a service representative for instructions.

Troubleshooting the Processor Subsystem

The processor subsystem comprises the I/O controller, network processing engine or network services engine, and all port adapters. The I/O controller and network processing engine or network services engine are required system components. The system cannot operate unless the I/O controller and network processing engine or network services engine are installed properly; however, the system can operate without any port adapters installed as long as none are in *partial* contact with the midplane pins. A port adapter or Port Adapter Jacket Card that is partially connected to the midplane sends incomplete signals to the processor, which faults the PCI bus and causes the system to hang. Therefore, first ensure that the I/O controller and the network processing engine or network services engine are installed properly and the system software has initialized successfully. Then, if necessary, you can troubleshoot individual port adapters.

Troubleshooting the I/O Controller

The procedures in this section assume that the I/O controller, network processing engine or network services engine, and router itself are in the original factory configuration, and that you have not made changes to your configuration file.

If the I/O controller LEDs do not go on as expected (see the “[Identifying Startup Problems](#)” section on [page 5-3](#)), check the following items to help isolate the problem.

- Do all of the I/O controller LEDs remain off when the system power switch is turned on?
 - If the LEDs stay off, first see the “[Troubleshooting the Power Subsystem](#)” section on [page 5-6](#) and the “[Troubleshooting the Cooling Subsystem](#)” section on [page 5-10](#) to ensure that both the fans and the power supply are functioning properly.
 - If the power supply and fans appear operational but none of the I/O controller LEDs are on, suspect that an improperly connected I/O controller or port adapter has hung the system. Tighten all captive installation screws, and then restart the system.
 - With the power supply turned off, reseal the I/O controller in its slot and restart the router.
- Is the I/O controller ENABLED LED on?
 - If yes, the system software has initialized successfully, and the system is operational.
 - If the ENABLED LED remains off, the system detected a processor hardware failure. (This LED should be on in normal operation.) Contact a service representative for instructions.

- If the auxiliary port is not functioning properly, check the baud rate. The auxiliary port will not function at baud rates higher than 19.2k. If the baud rate on the connecting device is set higher than 19.2k, either garbled text or nothing will be displayed on the screen.

Troubleshooting the NPE-G1 or NPE-G2

The procedures in this section assume that the NPE-G1 or NPE-G2 and the router itself are in the original factory configuration, and that you have not made changes to your configuration file.

- If the NPE-G1 POWER ON LED or the NPE-G2 PWR OK LED does not go on as expected, make sure the power to the router is turned off, reseal the NPE-G1 or NPE-G2 in its slot, and restart the router.

If the POWER ON LED or PWR OK LED remains off, the system detected a processor hardware failure. (The LED should be on in normal operation.) Contact an authorized service representative for instructions.

- If the NPE-G1 or NPE-G2 Gigabit Ethernet media LEDs do not come on check the cable connections, clean the fiber-optic cable connectors (see [“Fiber-Optic Cleaning Information” section on page 5-10](#)), try a different GBIC module or SFP module, and check the software to be sure the optical fiber media is selected. See the [“Configuring the Native Gigabit Ethernet Interfaces” section on page 4-8](#).
- If the EN (enabled) LED does not come on when the a Gigabit Ethernet RJ-45 port is selected, try using a different cable. If the EN LED does not come on, check the software to be sure the RJ-45 media is selected. See the [“Configuring the Native Gigabit Ethernet Interfaces” section on page 4-8](#).

If the EN LED remains off when the GBIC or SFP media are selected, the LED is functioning properly.

If any of these actions do not produce a functioning LED, contact an authorized service representative.

- If the LINK LED does not come on only when any of the Gigabit Ethernet media are in use:
 - Check that the router is receiving power.
 - Check that the correct media type is selected in software. See the [“Configuring the Native Gigabit Ethernet Interfaces” section on page 4-8](#).
 - Check that the media cables are functioning and are completely connected to the NPE-G1 or NPE-G2.
 - If GBIC modules are being used, check to be sure they are connected to the NPE-G1.
 - If SFP modules are being used, check to be sure they are connected to the NPE-G2.

If any of these actions do not produce a functioning LED, contact an authorized service representative.

- If the SLOT ACTIVE LED or the CF ACTV LED on the NPE-G2 does not come on when the CompactFlash Disk slot is being used, try inserting a different CompactFlash Disk. If the SLOT ACTIVE LED or the CF ACTV LED still does not come on, contact an authorized service representative.

Troubleshooting the Network Processing Engine or Network Services Engine

The procedures in this section assume that the I/O controller, network processing engine or network services engine, and router itself are in the original factory configuration, and that you have not made changes to your configuration file. Also see the troubleshooting chapter of the *Network Processing Engine and Network Services Engine Installation and Configuration* guide for the network services engine Parallel eXpress Forwarding (PXF) processor information.

If the I/O controller ENABLED LED does not go on as expected, make sure the power to the router is turned off, reseal the network processing engine or network services engine in its slot, and restart the router.

If the ENABLED LED remains off, the system detected a processor hardware failure. (This LED should be on in normal operation.) Contact a service representative for instructions.

Troubleshooting the Port Adapter Jacket Card

Check the following to help isolate a problem with the Port Adapter Jacket Card:

- Is the PWR (power) LED on?

If yes, the system is operational.

- If no, check to be sure that power is turned on to the system. For a DC-powered system, check to make sure that power has not been turned off at the power source. Then check to be sure that the Port Adapter Jacket Card has not pulled away from the backplane. Power down the system, and reseal the Port Adapter Jacket Card.
- If no, check to be sure that the Port Adapter Jacket Card is installed in a Cisco 7200 VXR router with an NPE-G1 installed. If not, remove the Port Adapter Jacket Card and install it in a Cisco 7200 VXR router with an NPE-G1. The Port Adapter Jacket Card does not work with any other network processing engine or network services engine.

- Is the ENABLED LED on?

If yes, the system is operational.

- If no, check to be sure that the Port Adapter Jacket Card is installed in a Cisco 7200 VXR router with an NPE-G1 installed. If not, remove the Port Adapter Jacket Card and install it in a Cisco 7200 VXR router with an NPE-G1. The Port Adapter Jacket Card does not work with any other network processing engine or network services engine.
- If no, suspect the Port Adapter Jacket Card is not properly seated. Power down the system, remove the Port Adapter Jacket Card, and reseal it. If the ENABLED LED remains off, contact a service representative for instructions.

Troubleshooting the Port Adapters or Service Adapters

Check the following to help isolate a problem with the port adapters or service adapters:

- Are *all* adapter ENABLED LEDs on?

If yes, the system is operational.

- Are *any* adapter ENABLED LEDs off?

- If the ENABLED LED on an individual adapter is off, suspect that the adapter has pulled away from the midplane. Reseat the adapter in its slot (you do not have to turn off the system power when removing or replacing port and service adapters). After the system reinitializes the interfaces, the ENABLED LED on the adapter should go on.
- If the ENABLED LED remains off, the system detected a processor hardware failure. (This LED should be on in normal operation.) Contact a service representative for instructions.

Troubleshooting the Cooling Subsystem

Check the following to help isolate a problem with the cooling system:

- When you start up the system, do the fans start operating?

To determine if the fans are operating, listen for them. In noisy environments, place your hand on the left side of the chassis (when viewing the chassis from the front) to feel for air being forced out the vents.

- If yes, the power to the fan tray is good.
- If no, there is a problem with the fan tray or power. See the [“Troubleshooting the Power Subsystem” section on page 5-6](#).

- The following message, if displayed, indicates that the system has detected an overtemperature condition or out-of-tolerance power condition inside the chassis.

```
Queued messages:
%ENVM-1-SHUTDOWN: Environmental Monitor initiated shutdown
```

If an environmental shutdown results from an out-of-tolerance power condition, the PWR OK LED goes off, and the system shuts down. (See the [“Troubleshooting the Power Subsystem” section on page 5-6](#).) Although an overtemperature condition is unlikely at initial startup, ensure that heated exhaust air from other equipment is not entering the router’s inlet vent, and that there is sufficient clearance around the sides of the chassis to allow cooling air to flow. See [Chapter 2, “Preparing for Installation,”](#) the [“Site Requirement Guidelines” section on page 2-3](#) for preventive site configurations.

The above message could also indicate a faulty component or temperature sensor. Before the system shuts down, use the **show environment** or **show environment table** command to display the internal chassis environment. (See [Chapter 1, “Cisco 7200 VXR Product Overview,”](#) the [“Functional Overview” section on page 1-53](#), for descriptions of the **show environment** and **show environment table** commands.)

If you experience trouble with the startup that is not resolved with these procedures, contact a service representative for assistance and further instructions.

Fiber-Optic Cleaning Information

We strongly recommend cleaning all optical connections before reconnecting any optical cables to equipment. For information about cleaning optical connectors, see the [Inspection and Cleaning Procedures for Fiber-Optic Connections](#) document and the [Compressed Air Cleaning Issues for Fiber-Optic Connections](#) document.