

Troubleshooting the Installation

Your router went through extensive testing and burn in before leaving the factory; however, if your system appears to have problems starting up, use the information in this chapter to help isolate the cause. Problems with the initial startup will most likely be caused by an interface processor or power supply that has become dislodged from the backplane or chassis power connector. Although overtemperature conditions rarely occur at initial startup, the environmental monitoring functions are included because they also monitor DC line voltages.

This manual covers the system hardware installation only. At the initial system boot, you should verify the following:

- The power supplies are installed properly and are supplying power to the system.
- The system blower is operating.
- The system software boots successfully.
- The RSP and all interface processors are properly installed in their slots and each is initialized without problems.

When each of these conditions is met, the hardware installation is complete, and you should proceed to the *Router Products Getting Started Guide* to configure the interfaces. If the startup sequence fails before these conditions are met, use the procedures in this chapter to isolate and, if possible, resolve the problem.

If you are unable to easily solve the problem, contact a customer service representative for assistance and further instructions. Before you call, have the following information ready to help your service provider assist you as quickly as possible:

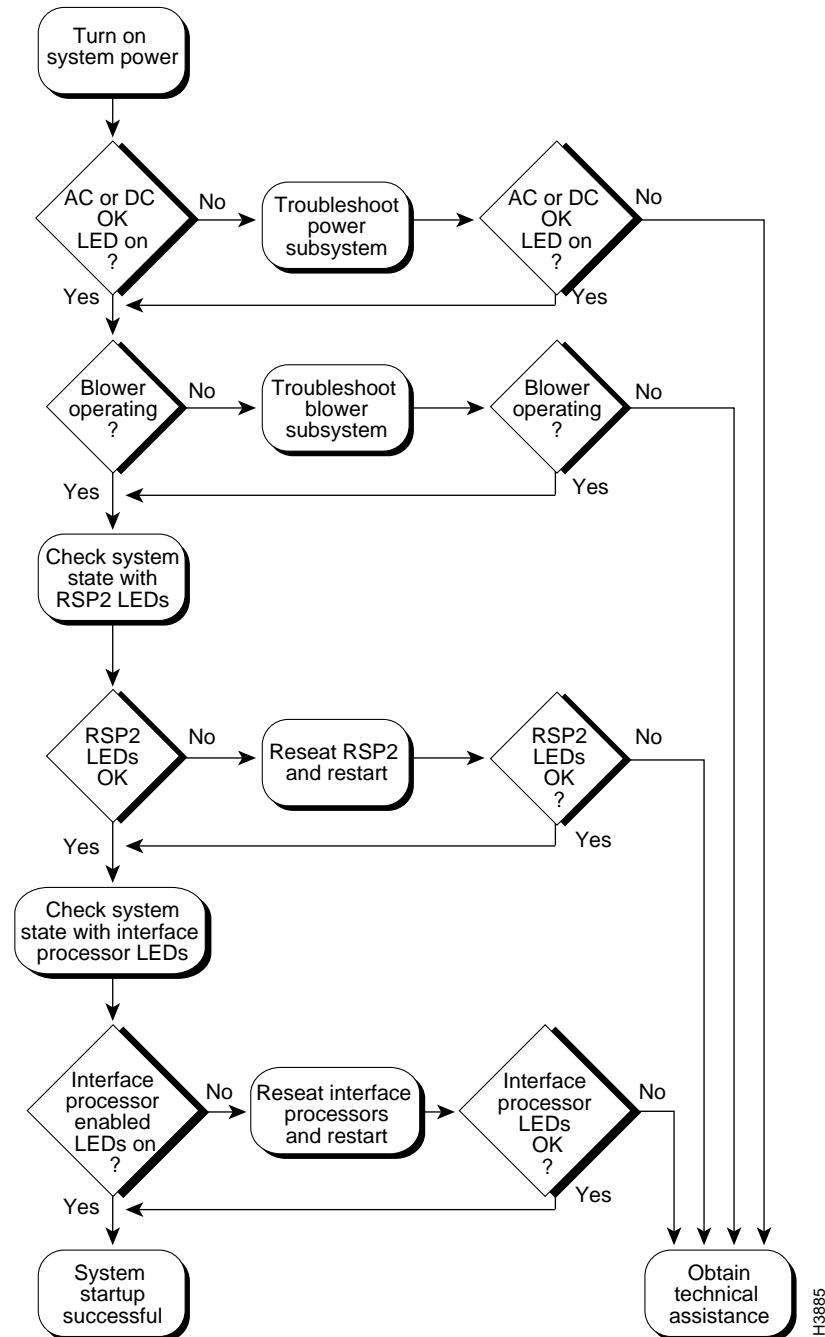
- Date you received the router
- Chassis serial number (located on a label on the right rear deck of the chassis)
- Type of software and release number
- Brief description of the problem you are having
- Brief explanation of the steps you have already taken to isolate and resolve the problem
- Maintenance agreement or warranty information

Troubleshooting Overview

This section describes the troubleshooting methods used in this chapter and defines how the router is divided into subsystems for more efficient problem solving.

Figure 4-1 shows the general troubleshooting strategy described in this chapter. Refer to this chart as necessary to follow the steps to isolate problems to a specific subsystem, and resolve the problem if possible.

Figure 4-1 Troubleshooting Strategy for Startup Problems



Problem Solving with Subsystems

The key to problem solving the system is to try to isolate 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. Since a startup problem is usually attributable to a single component, it is more efficient to first isolate the problem to a subsystem rather than troubleshoot each separate 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 backplane.
- **Cooling subsystem**—The chassis blower is the single component in this subsystem. The blower should be operating whenever system power is on and will usually continue to operate even when the environmental monitor shuts down the system because of an overtemperature or overvoltage condition (although it will shut down in the event of a power supply shutdown). Since the blower generates a noise level of 60 dBA, it is easy to determine whether or not it is operating. If you determine that the blower is not operating, the only recourse is to immediately contact a customer service representative. The blower is located in the interior of the chassis, and there are no installation adjustments that you should make if it does not function properly at initial startup.
- **Processors subsystem**—This subsystem includes the RSP2 and all interface processors. The RSP2 contains the system operating software (in an onboard Flash memory SIMM or on a Flash memory card), and the enabled LED on each interface processor indicates whether or not the RSP2 was able to initialize it. Remember that an interface processor that is partially installed in the backplane might cause the system to hang and crash.

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

Identifying Startup Problems

When you start up the router for the first time, you should observe the startup sequence described in the chapter “Installing the Router.” 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 system blower, 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, then proceed to the appropriate sections (indicated in each description) to try to resolve the problem.

When you start up the system by turning on the power supply switches, the following should occur:

- You should immediately hear the system blower operating (it generates an operating noise level of about 60 dBA). If not, proceed to the following section “Troubleshooting the Power Subsystem.” If you determine that the power supplies are functioning normally and that the blower is faulty, contact a customer service representative. If the system blower does not function properly at initial startup, there are no installation adjustments that you should make.

- The power supply LEDs located on each power supply in the rear of the chassis, and the upper power and lower power LEDs on the front of the chassis, should come on as follows:
 - The green AC power LED, on the AC-input power supply (or the green input power LED on the DC-input power supply) should come on immediately when you turn the power supply switch to on (I), and should remain on during normal system operation. On the front of the chassis, the LED for the corresponding power supply bay (upper power or lower power) should also come on.
 - The DC fail LED on the AC-input power supply (or the out fail LED on the DC-input power supply) should remain off. This LED comes on only when the power supply loses input power or when it is shutting itself down because it detected an out-of-tolerance power or temperature condition within the power supply.

If the LEDs for AC power (or input power), upper power, or lower power do not come on, or if the DC fail (or out fail) LED on any power supply *does* come on, proceed to the section “Troubleshooting the Power Subsystem” following.

- The LEDs on the RSP and the normal LED on the front of the chassis should come on as follows:
 - The RSP CPU halt LED flashes when the system boot sequence is initialized, but it should otherwise remain off. If the system software is unable to start up, this LED will come on and remain on.
 - The RSP normal and front panel normal LEDs come on after the system has completed a successful boot to indicate normal system operation. Once these LEDs come on they should remain on.
 - The CPU halt LED should always remain off. This LED comes on only if the system detects a processor hardware failure.

If the normal LEDs on the RSP and chassis front panel do not come on, or if the CPU halt LED comes on and remains on, proceed to the section “Troubleshooting the RSP2” later in this chapter.

- The enabled LED on each interface processor comes on when the RSP has completed initialization of the interface processor for operation. This LED indicates that the interface processor is receiving power and has been recognized by the RSP; it does not indicate the state of the individual interfaces on the interface processors. It does, however, indicate that an interface processor contains a valid microcode version. If an enabled LED fails to come on, proceed to the section “Troubleshooting the Interface Processors” later in this chapter.
 - 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, refer to the section “Connecting the Console Terminal” in the chapter “Installing the Router” to verify that the terminal is set correctly and that it is properly connected to the RSP console port.

Troubleshooting the Power Subsystem

Check the following to help isolate the problem:

- On the lower power supply, is the AC power or input power LED on?
 - If yes, the power source is good, and the power supply is functional.
 - If no, first suspect the power/interlock switch. Loosen the captive installation screw, turn the power switch fully counterclockwise to the off (O) position, pull the supply out of the bay a few inches, then push it firmly back into the bay, and ensure that the front of the power supply is flush with the back of the chassis.

Tighten the captive installation screw, then turn the power switch clockwise until it is completely turned to the on (I) position, and the interlock tab is fully extended into the interlock slot in the chassis. (Refer to the section “Installing Power Supplies” in the chapter “Installing the Router.”)
 - If the AC power (or input power) and DC fail (or out fail) LEDs both remain off, and the switch is correctly set, 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 then comes on, the problem is the first power source.
 - If the 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 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 lower power supply bay and contact a service representative for further instructions.
- On the lower power supply, is the DC fail (or out fail) LED on?
 - If yes, suspect the power supply. Try installing the power supply in the upper bay. If a second power supply is present, move it to the lower bay. Turn both power supplies on to determine whether the power supply or the power connector in the chassis is faulty, and then contact a service representative with the results.
- Is the AC power (input power) LED on for the second (redundant) power supply?
 - If not, repeat each of the above procedures for the second power supply.

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

Troubleshooting the Cooling Subsystem

Check the following to help isolate the problem:

- When you start up the system, does the system blower go on?

To determine whether the blower is operating, listen for the motor. In noisy environments, place your hand above and to each side of the processor slots on the rear of the chassis (when facing the interface processor end of the router) to feel for air being forced out the vents.

- If yes, the +24 VDC line to the blower is good.
- If no, there is a problem with the blower or the +24 VDC power. Ensure that the DC fail LED is off. If the LED is off, there could be a problem with the +24 VDC supply to the blower. Proceed to the section “Troubleshooting the RSP2” in this chapter.
- If no, and the DC OK LED is on (which means the +24VDC power present), the blower connector might not be seated properly. Refer to the section “Replacing Internal Components” in the chapter “Maintaining the Router” to check the blower power connection. Ensure that the blower’s connector is inserted fully in the backplane socket. After you replace the chassis cover panel, try starting the system again.
- The following message, if displayed, indicates that the system has detected an overtemperature condition or out-of-tolerance power inside the chassis.

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Queued messages:
%ENVM-1-SHUTDOWN: Environmental Monitor initiated shutdown
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If an environmental shutdown results from an out-of-tolerance power condition, the DC OK LED will go off before the system shuts down. (Refer to the section “Troubleshooting the Power Subsystem” in this chapter.) Although an overtemperature condition is unlikely at initial startup, ensure that heated exhaust air from other equipment is not entering the inlet vents, and that there is sufficient clearance around the sides of the chassis to allow cooling air to flow. Refer to the section “Preventive Site Configuration: Maintaining Normal Operation” in the chapter “Preparing for Installation” for preventive site configurations.

This 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. (Refer to the chapter “Product Overview” for detailed descriptions.)

If you are still unable to resolve the problem, contact a service representative for further instructions.

Troubleshooting the Processor Subsystem

The processor subsystem comprises the RSP and interface processors. The RSP is a required system component. The system cannot operate unless the RSP is installed properly; however, because the CyBus interface processors support OIR, the system can operate without any interface processors installed as long as none are in *partial* contact with the backplane pins; an interface processor that is partially connected to the backplane will send incomplete signals to the processor, which will fault the bus and cause the system to hang. Therefore, first ensure that the RSP2 is installed properly and the system software has initialized successfully. Then, if necessary, you can troubleshoot individual interface processors.

Troubleshooting the RSP2

These procedures assume that the RSP2 and router are in the original factory configuration, and that you have not changed any configuration register settings or made changes to your configuration file. If you have made such changes, refer to the section “Configuring the RSP2” in the chapter “Maintaining the Router” to reselect default values.

If the RSP2 LEDs do not go on as expected, check the following items to help isolate the problem.

- Do all of the RSP2 LEDs remain off when the system power switch is turned on?
 - If all RSP2 LEDs stay off, first refer to the sections “Troubleshooting the Power Subsystem” and “Troubleshooting the Cooling Subsystem” in this chapter to ensure that both the blower and power supplies are functioning properly.
 - If the power supplies and blower appear operational but none of the RSP2 LEDs are on, suspect that an improperly connected RSP2 or interface processor has hung the bus. Turn the system power switch off and, on each processor module, loosen the captive installation screws and use the ejector levers to eject and reseal each board. (For a description and illustration of the ejector levers, refer to the section “Installing and Configuring Interface Processors” in the chapter “Maintaining the Router.”) Tighten all captive installation screws, then restart the system.
 - With the power supplies turned off, reseal the RSP2 in its slot and restart the router.
- Is the RSP2 normal LED on?

If yes, the system software has initialized successfully, and the system is operational.
- Is the RSP2 CPU halt LED on?

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

Troubleshooting the Interface Processors

Check the following to help isolate the problem:

- Are *all* interface processor-enabled LEDs on?

If yes, the system is operational. Proceed to the instructions for configuring the interfaces in the appropriate software documentation.
- Are *any* interface processor-enabled LEDs off?
 - If any of the enabled LEDs are off, first check the RSP2 normal LED, which will be on if the system booted successfully.
 - If the enabled LED on an individual interface processor is off, suspect that the interface processor has pulled away from the backplane. You do not have to turn off the system power to remove and replace an interface processor. Use the ejector levers to eject and then reseal the interface processor, then tighten both of the captive installation screws. (For a description and illustration of the ejector levers, refer to the section “Online Insertion and Removal (OIR)” in the chapter “Product Overview.”) After the system reinitializes the interfaces, the enabled LED on the interface processor should go on.

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

