



## Troubleshooting a Cisco 7500 Series Router

Your Cisco 7500 series router went through extensive testing and burn-in before leaving the factory; however, if you encounter problems starting up the router, use the information in this chapter to help isolate the cause. Problems with the initial startup will most likely be caused by the source power or a processor module that has become dislodged from the backplane.

Although an overtemperature or overvoltage condition is unlikely at initial startup, a discussion of environmental temperature and voltage monitoring functions is provided in the [“Environmental Monitoring and Reporting Overview for the Cisco 7500 Series”](#) section on page 2-22.



### Note

The procedures in this chapter assume that you are troubleshooting the initial Cisco 7500 series system startup, and that the 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.

The Cisco 7505 uses a single RSP2 main system processor. It is also compatible with an RSP4 and RSP8 as an upgrade option.

The Cisco 7507, Cisco 7507-MX, Cisco 7513, and Cisco 7513-MX use up to two RSP2s, RSP4s, or RSP8s, or one of each. Two RSPs in any combination are required in these routers *only* when you have the high system availability (HSA) feature enabled; otherwise, only one RSP2, RSP4, or RSP8 is allowed.



### Note

The Cisco 7576 does not support HSA. Each of the two independent routers within the Cisco 7576 chassis operates with only one RSP (RSP4). When an RSP8 is used as the master device, the HSA feature functions only with another RSP8 as the slave device. Throughout this chapter, the RSP2, RSP4, and RSP8 are referred to as *RSP* and *RSPs*; where appropriate, specific differences are clearly noted.

The following sections contain Cisco 7500 series troubleshooting information:

- [Troubleshooting Overview, page 8-2](#)
- [Problem Solving with Cisco 7500 Series Subsystems, page 8-3](#)

After reading the preceding sections, choose the specific section or sections that apply to your Cisco 7500 series router:

- [Troubleshooting Guidelines for the Cisco 7505, page 8-4](#)
- [Troubleshooting Guidelines for the Cisco 7507 and Cisco 7507-MX, page 8-8](#)
- [Troubleshooting Guidelines for the Cisco 7513, Cisco 7513-MX, and Cisco 7576, page 8-12](#)

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The following sections pertain to all of the Cisco 7500 series routers.

- [Troubleshooting Blower Operation, page 8-17](#)
- [Troubleshooting the Cisco 7500 Series Processor Subsystem, page 8-18](#)
- [Using Cisco 7500 Series System LEDs, page 8-19](#)
- [Additional Reference Information for Troubleshooting, page 8-26](#)

# Troubleshooting Overview

At the initial system boot, you should verify the following:

- External power cables are connected, and the proper source power is being supplied.
- The system fan or blower is operating.
- The system software boots successfully.
- The RSP and all interface processors are properly installed in their slots, and each initializes (is enabled by the system software) without problems.



### Note

If after initialization your system indicates that particular interfaces cannot be found, or that your interface processor is not recognized, verify that your loaded and running Cisco IOS software is compatible with the Cisco 7500 series router in which your interface processor is installed. To do this, first determine the Cisco 7500 series router you have, and then refer to the appropriate specification tables in [Chapter 1, “Cisco 7500 Series Product Overview.”](#)

If you determine that your loaded and running Cisco IOS software is not compatible with your Cisco 7500 series router, or you suspect it might not be compatible with your interface processor, see the “Preface” chapter for instructions on how to obtain technical assistance.

When each of these conditions is met, the hardware installation is complete, and you should proceed to [Chapter 4, “Performing a Basic Configuration of the System,”](#) to perform a basic system configuration. You should also refer to the appropriate companion software-configuration documentation to fully configure the Cisco IOS software, protocols, and individual interfaces in your system. 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 and the chassis serial number (located on a label on the right rear deck of the chassis)
- Interface processor configuration (which interface processors you have installed)
- Type of Cisco IOS software running and its release number
- Brief description of the problem you are having and the steps you have already taken to isolate and resolve the problem
- Maintenance agreement or warranty information

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## Problem Solving with Cisco 7500 Series Subsystems

The key to solving problems in 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*. Because 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 component in the system.

For the troubleshooting procedures in this chapter, the Cisco 7500 series consists of the following subsystems:

- Power subsystem—Comprises the power supplies, external power cable, and system backplane.
- Cooling subsystem—Comprises the fan or blower, which includes the fan/blower, any blower speed control board that might be present, any front-panel LEDs that might be present, and the fan tray (Cisco 7505) or blower module (Cisco 7507, Cisco 7507-MX, Cisco 7513, Cisco 7513-MX, and Cisco 7576) assembly itself. The fan or blower should be operating whenever the system power is on.

The variable speed feature in the Cisco 7513, Cisco 7513-MX, and Cisco 7576 allows the blower to operate at a slower speed and provide quieter operation when the internal chassis temperature is within the normal operating range. If the internal temperature exceeds a specified temperature, the blower speed increases to move more cooling air through the chassis. As a result, it may be difficult to determine whether or not the blower is operating in noisy, air-conditioned rooms. If you determine that the blower is not operating, contact a service representative immediately; there are no installation adjustments that you should make.

- Processor subsystem—Includes the RSP (or RSPs) and all interface processors. Each RSP runs the system operating software (contained 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 RSP 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 in a Cisco 7500 series router and one of its subsystems, and will direct you to the appropriate troubleshooting information:

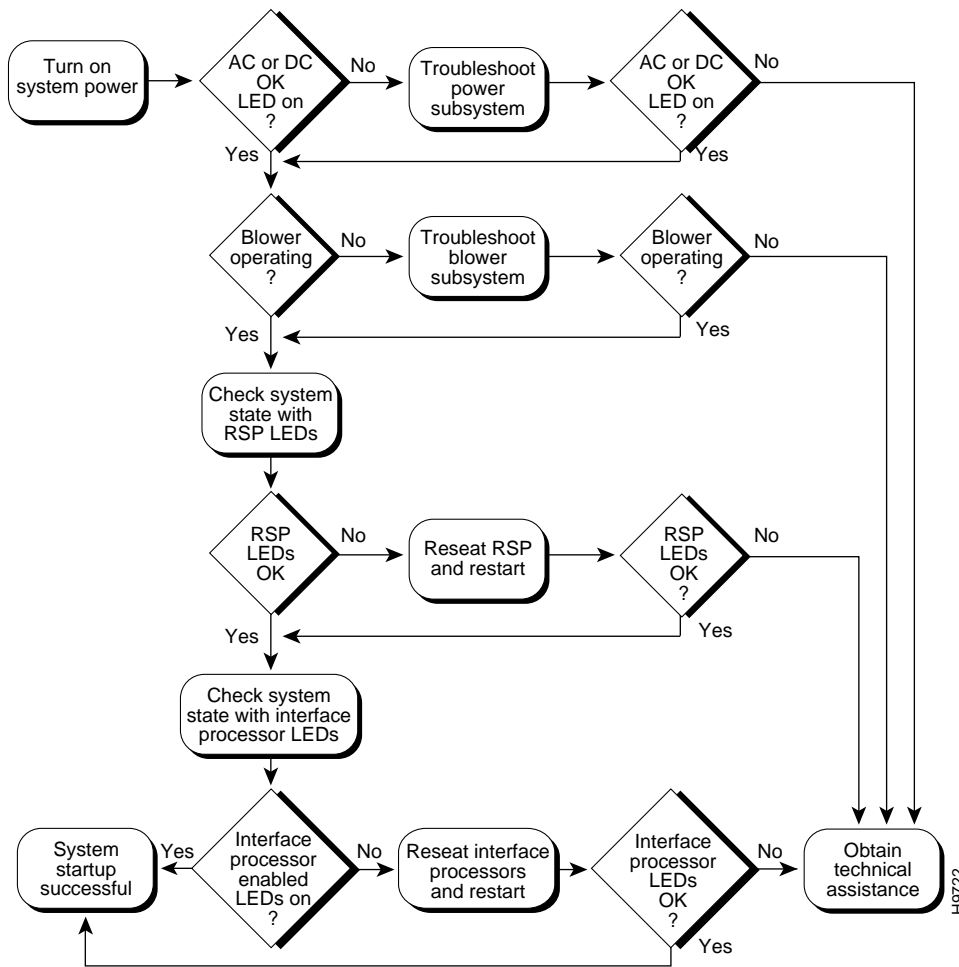
- [Troubleshooting Guidelines for the Cisco 7505, page 8-4](#)
- [Troubleshooting Guidelines for the Cisco 7507 and Cisco 7507-MX, page 8-8](#)
- [Troubleshooting Guidelines for the Cisco 7513, Cisco 7513-MX, and Cisco 7576, page 8-12](#)
- [Troubleshooting Blower Operation, page 8-17](#)

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# Troubleshooting Guidelines for the Cisco 7505

Figure 8-1 shows the general troubleshooting strategy for the Cisco 7505. Refer to this chart to isolate problems and resolve a problem, if possible.

Figure 8-1 Troubleshooting Strategy for Cisco 7505 Startup Problems



## Identifying Cisco 7505 Startup Problems

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. 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.

By checking the state of the LEDs on the power supply and processor modules (the RSP and interface processors), 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.

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When you start up the system by turning on the main system power switch on the interface processor end of the power supply, the following should occur:

- The DC OK LED should go on immediately and should remain on as long as the system is receiving source power and the power switch is in the on (I) position. If this LED does not go on, or if it goes off while the power switch is still on, there could be a problem with either the source power, the internal DC power that the power supply distributes to the internal components, or the cooling subsystem.

The green DC OK LED indicates the status of the power supply and internal DC voltages. The DC OK LED stays on when all of the following conditions are met:

- The power supply is on and the power source is providing either 100 to 240 VAC, 50 to 60 Hz or –40 to –52 VDC in North America, or –56 to –72 VDC in the European Union.
- The power supply is providing the +5, +12, –12, and +24 VDC to internal components.
- All internal DC voltages are within tolerance.

If the AC or DC source power or any of the internal DC voltages exceeds allowable tolerances, the DC OK LED will not go on or will go off shortly after you turn on the power. Because both the RSP (which uses +5, +12, –12 VDC) and the fan tray (which uses +24 VDC) are required for operation, a problem with any of the internal DC lines can prevent the system from starting up or continuing operation.

For example, if there is a problem with the +24 VDC line that supplies the fan tray, the system will start up but also recognize that the fans are not operating. The system will initiate a fan failure shutdown sequence, display the appropriate warning messages, and then shut down after 2 minutes. If there is a problem with any of the other DC lines, the RSP will not be able to initialize the system software, so the system might attempt to start up and fail during the boot sequence.

Depending on when the DC OK LED goes off, proceed as follows:

- If the DC OK LED stays off (if it never goes on) when you turn on the power switch, there is a problem with either the DC source power or the DC power that is distributed to the internal components. Proceed to the [“Troubleshooting the Cisco 7505 Power Subsystem”](#) section on page 8-7.
  - If the DC OK LED goes on temporarily and then goes off within 30 seconds, the system is most likely shutting itself down because it detected an out-of-tolerance power or temperature condition within the power supply. Proceed to the [“Troubleshooting the Cisco 7505 Power Subsystem”](#) section on page 8-7.
  - If the DC OK LED goes on and the system starts up as expected but then displays the following message and shuts down after 2 minutes, there is a problem with the fan tray. Proceed to the [“Troubleshooting the Cisco 7505 Cooling Subsystem”](#) section on page 8-7.  

```
%ENVM-2-FAN: Fan array has failed, shutdown in 2 minutes
```
  - If the DC OK LED stays off yet the system starts up correctly, displays the preceding message, and shuts down after about 2 minutes, there is a problem with the +24 VDC line to the fan tray. Proceed to the [“Troubleshooting the Cisco 7505 Power Subsystem”](#) section on page 8-7.
- Immediately after you turn on the power switch, you should hear the fans operating. If you are in an unusually noisy environment, such as an air-conditioned wiring closet with other equipment noise, it might be difficult to hear the fans. In that case, place your hand near the left side of the chassis (when facing the interface processor end); you should feel the exhaust air that is being forced out the side of the chassis.

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- If the DC OK LED is on but the fans are not operating, there is a problem with the fan tray or with one of the fans. (The system will shut itself down if it detects that any of the fans are not functioning properly.) Proceed to the [“Troubleshooting the Cisco 7505 Cooling Subsystem” section on page 8-7](#).
- If the DC OK LED is on at startup and fans are operating, but the system shuts down after 2 minutes, there is a problem with the fan tray. Proceed to the [“Troubleshooting the Cisco 7505 Cooling Subsystem” section on page 8-7](#).
- When you turn on the system power, the LEDs on the RSP (see [Figure 1-2](#)) should operate as indicated in the RSP installation and configuration note. The Cisco 7505 is compatible with an RSP2, RSP4, and RSP8. See the installation and configuration note for the RSP model that is installed in your Cisco 7505 for detailed operating information.
- The enabled LED on each interface processor goes 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. It does, however, indicate that an interface processor contains a valid microcode version. If an enabled LED fails to go on, refer to the companion publication *Interface Processor Installation and Configuration Guide* to use the interface processor LEDs to further troubleshoot the problem.



Note

While the system is starting up and initializing the individual interface processors, the status LEDs on the interface processors will flash on and off or light intermittently; this is normal behavior. The LEDs do not indicate the true status of the interfaces until the system has initialized the interface processors and you have enabled the individual interfaces.

When the LEDs indicate that the system has initialized successfully, the system banner (similar to the following example) should be displayed on the console screen. If it is not displayed, see the [“Connecting a Console Terminal to the RSP” section on page 3-32](#) to verify that the terminal is set correctly and that it is properly connected to the RSP console port.

```
System Bootstrap, Version 4.6(5), SOFTWARE
Copyright (c) 1986-1995 by cisco Systems
RSP2 processor with 16384 Kbytes of memory
(display text omitted)
F3: 2012356+47852+194864 at 0x1000
      Restricted Rights Legend
```

```
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
```

```
cisco Systems, Inc.
170 Tasman Drive
San Jose, CA 95134
```

```
GS Software (GS7), Version 10.3(3) [fc3], RELEASE SOFTWARE
Copyright (c) 1986-1995 by cisco Systems, Inc.
```

```
(display text omitted)
```

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

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## Troubleshooting the Cisco 7505 Power Subsystem

This section provides information on troubleshooting the Cisco 7505 power subsystem.

Check the following to help isolate the problem: On the interface processor end of the power supply, is the DC OK LED on?

- If yes, the AC or DC source is good, and the power supply is functional.
- If no but the fans are operating *and* LEDs on the processor modules are on, suspect a faulty power supply LED. The RSP uses +5, +12, -12 VDC, and the fan tray uses +24 VDC; therefore, if both the RSP and the fans are operating, all internal DC lines are within tolerance.
- If no and there is not other obvious activity, first suspect that the power switch is not fully in the on (I) position. Push the right side of the switch and ensure that it is completely pushed into the on (I) position. (See the “[Starting the System and Observing Initial Conditions](#)” section on page 4-2.)
- If the system power switch is set correctly and the DC OK LED remains off, suspect the AC or DC source or the power cable. Turn the power switch off, connect the power cable to another power source if one is available, and turn the switch back on. If the LED then goes on, the problem is the first power source.
  - If the DC OK LED fails to go on after you connect the power supply to a new power source, swap the power cable with a replacement if one is available and turn the switch back on. If the DC OK LED then goes on, return the first power cable for replacement. (AC-input and DC-input power cables for the Cisco 7010 power supplies are compatible with the Cisco 7505 power supplies.)
  - If the DC OK LED still fails to go on when connected to a different power source with a new power cable, the power supply is probably faulty. If a spare power supply is available, replace the existing power supply with the spare and restart the system. (See the “[Removing and Replacing the Cisco 7505 Power Harness Cover](#)” section on page 5-7.) If the DC OK LED then goes on, return the faulty power supply for replacement.

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

## Troubleshooting the Cisco 7505 Cooling Subsystem

This section provides information on troubleshooting the Cisco 7505 cooling subsystem.

Check the following to help isolate the problem:

- When you start up the system, do the fans go on?

To determine whether the fans are operating, listen for the fan motors. In noisy environments, place your hand next to the left side of the chassis (when facing the interface processor end of the router) to feel for air being forced out the side vents.

  - If yes, the +24 VDC line to the fan tray is good, but there might be a problem with the software or an individual fan.
  - If no, there is a problem with the fan tray or the +24 VDC power. Ensure that the DC OK LED is on. If the LED is off, there could be a problem with the +24 VDC supply to the fan tray. Proceed to the “[Troubleshooting the Cisco 7505 Power Subsystem](#)” section on page 8-7.

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- If no and the DC OK LED is on, ensure that the fan tray is seated properly. See the [“Removing and Replacing the Cisco 7505 Fan Tray” section on page 5-5](#) to remove and reseal the fan tray. Ensure that the fan control board edge connector is inserted fully in the backplane socket. After you replace the chassis cover panel, try starting the system again.
- Do the system and the fans start up but shut down after about 2 minutes?
  - If you have changed the configuration register boot field settings or altered the configuration file boot instructions, the system could be booting a software image (earlier than Cisco IOS Release 9.17[6]) that does not recognize the signals from the fan control board (and therefore assumes that the cooling subsystem is not operating). Make certain that you are booting a software image appropriate for the Cisco 7505 and RSP.
  - If the following message is displayed, it indicates that one or more fans has failed or is operating out of tolerance:
 

```
%ENVM-2-FAN: Fan array has failed, shutdown in 2 minutes
```

If one or more fans or the fan control board fails, you must replace the fan tray.

- If the following message is displayed, it indicates that the system has detected an overtemperature condition or out-of-tolerance power 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 DC OK LED will go off before the system shuts down. (See the [“Troubleshooting the Cisco 7505 Power Subsystem” section on page 8-7.](#))

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. See the guidelines in [Chapter 2, “Preparing for Installation,”](#) for preventive site preparation information.

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. (For detailed descriptions of **show** commands, see the [“Cisco 7505 Environmental show Command Examples” section on page 2-27.](#))

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

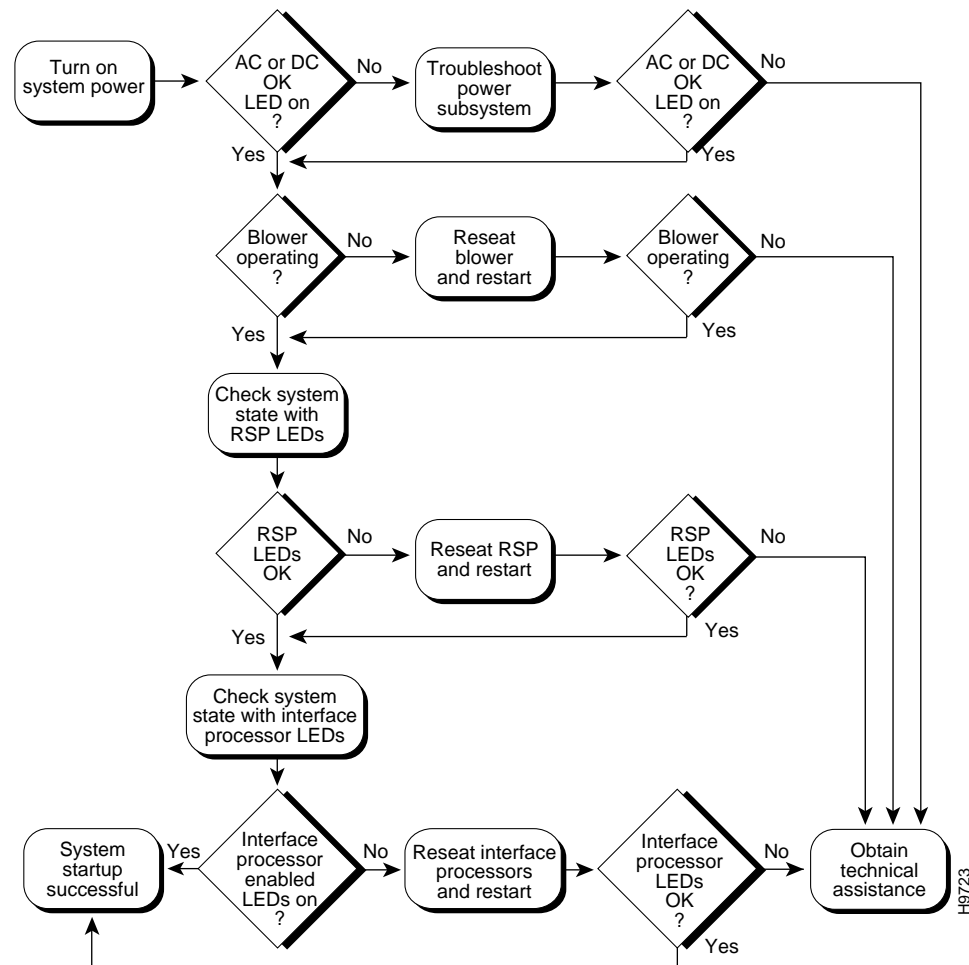
## Troubleshooting Guidelines for the Cisco 7507 and Cisco 7507-MX

[Figure 8-2](#) shows the general troubleshooting strategy for the Cisco 7507 and Cisco 7507-MX. Refer to this chart to isolate problems to a specific subsystem and resolve the problem, if possible.



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Figure 8-2 Troubleshooting Strategy for Cisco 7507 and Cisco 7507-MX Startup Problems



## Identifying Cisco 7507 and Cisco 7507-MX Startup Problems

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. 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, and 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 “Troubleshooting the Cisco 7507 and Cisco 7507-MX Power Subsystem” section on page 8-10. 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.

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- 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 [“Troubleshooting the Cisco 7507 and Cisco 7507-MX Power Subsystem” section on page 8-10.](#)
- When you turn on the system power, the LEDs on the RSP (see [Figure 1-5](#) for the Cisco 7507 and [Figure 1-8](#) for the Cisco 7507-MX) should operate as indicated in the RSP installation and configuration note. The Cisco 7507 and Cisco 7507-MX are compatible with an RSP2, RSP4, and RSP8. See the installation and configuration note for the RSP model that is installed in your Cisco 7507 or Cisco 7507-MX for detailed operating information.
- 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 [“Troubleshooting the Interface Processors” section on page 8-19.](#)

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 the [“Connecting a Console Terminal to the RSP” section on page 3-32](#) to verify that the terminal is set correctly and that it is properly connected to the RSP console port.

## Troubleshooting the Cisco 7507 and Cisco 7507-MX Power Subsystem

This section provides information on troubleshooting the Cisco 7507 and Cisco 7507-MX 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 or 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, and 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. (See the [“Installing Cisco 7507 and Cisco 7507-MX Power Supplies” section on page 3-14.](#))

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- 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; 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 a chassis connector is faulty, contact a service representative for instructions.

## Troubleshooting the Cisco 7507 and Cisco 7507-MX Cooling Subsystem

This section provides information on troubleshooting the Cisco 7507 and Cisco 7507-MX 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 the blower is on, the +24 VDC line to the blower is good.
- If the blower is not on, 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. See the [“Troubleshooting Blower Operation”](#) section on page 8-17.
- If the blower is not on but the DC OK LED is on (which means the +24VDC power is present), the blower connector might not be seated properly. To check the blower power connection, see the [“Removing and Replacing the Cisco 7507 and Cisco 7507-MX Blower Assembly”](#) section on page 6-15. Ensure that the blower connector is inserted fully in the backplane socket. After you replace the chassis cover panel, try starting the system again.
- If the following message is displayed, it indicates that the system has detected an overtemperature condition or out-of-tolerance power 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 DC OK LED will go off before the system shuts down. (See the [“Troubleshooting the Cisco 7507 and Cisco 7507-MX Power Subsystem”](#) section on page 8-10.) Although an overtemperature condition is

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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. See the “Cisco 7507 and Cisco 7507-MX Airflow Considerations” section on page 2-14 for preventive site configurations.

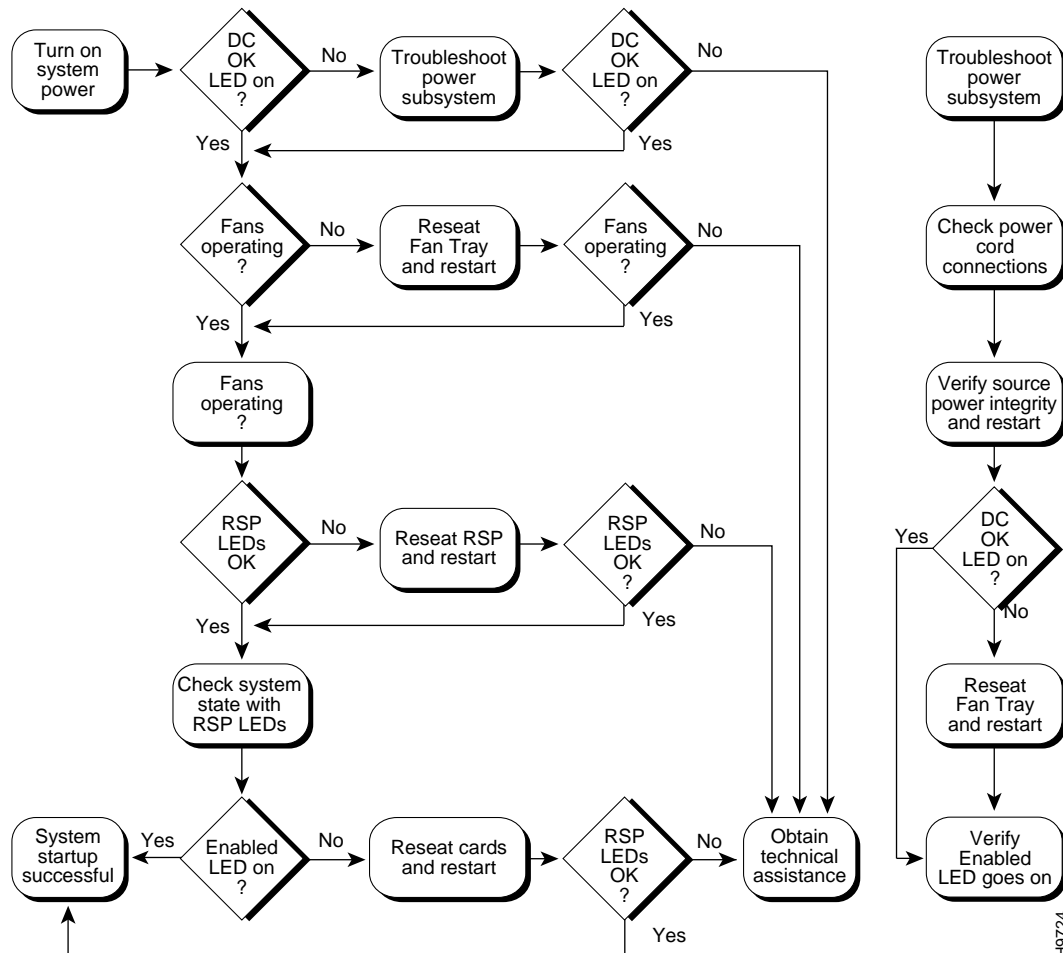
This message could also indicate a faulty component or temperature sensor. Before the system shuts down, use the **show environment** or **show environment table** command to display the internal chassis environment. (For detailed descriptions of **show** commands, see the “Cisco 7507 and Cisco 7507-MX Environmental show Command Examples” section on page 2-29.)

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

# Troubleshooting Guidelines for the Cisco 7513, Cisco 7513-MX, and Cisco 7576

Figure 8-3 shows the general troubleshooting strategy for the Cisco 7513, Cisco 7513-MX, and Cisco 7576. Refer to this chart to isolate problems to a specific subsystem and resolve the problem, if possible.

Figure 8-3 Troubleshooting Strategy for Cisco 7513, Cisco 7513-MX, and Cisco 7576 Startup Problems



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## Identifying Cisco 7513, Cisco 7513-MX, and Cisco 7576 Startup Problems

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. 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.

By checking the state of the LEDs on the power supplies and processor modules (the RSP and interface processors), 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 (indicated in each description) to try to resolve the problem.

When you start up the system by turning on the main system power switch on the interface processor end of the power supplies, the following should occur:

- The AC (or DC) OK LED should go on immediately, and it should remain on as long as the system is receiving source power and the power switch is in the on (I) position. If this LED does not go on, or if it goes off while the power switch is still on, there could be a problem with the source power, the internal DC power that the power supplies distribute to the internal components, or the cooling subsystem.

The green AC (or DC) OK LED indicates the status of the power supplies and internal DC voltages. The AC (or DC) OK LED stays on when all of the following conditions are met:

- The power supplies are on and receiving 100 to 240 VAC, 50 to 60 Hz (or –48 VDC to –60 VDC) source power.
- The power supplies are providing +5, +12, –12, and +24 VDC to internal components.
- All internal DC voltages are within tolerance.

If the AC (or DC) source power or any of the internal DC voltages exceed allowable tolerances, the AC (or DC) OK LED will not go on or will go off shortly after you turn on the power. Because both the RSPs (which use +5, +12, and –12 VDC) and the blower module (which uses +24 VDC) are required for operation, a problem with any of the internal DC lines can prevent the system from starting up or continuing operation.

For example, if there is a problem with the +24 VDC line that supplies the blower module, the system will start up but also recognize that the blower is not operating. The system will initiate a blower failure shutdown sequence, display the appropriate warning messages, and then shut down after 2 minutes. If there is a problem with any of the other DC lines, the RSPs will not be able to initialize the system software, so the system might attempt to start up and fail during the boot sequence.

Depending upon when the DC OK LED goes off, proceed as follows:

- If the AC (or DC) OK LED stays off (if it never goes on) when you turn on the power switch, there is a problem with either the AC (or DC) source power or the DC power that is distributed to the internal components. Proceed to the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Subsystem”](#) section on page 8-15.
- If the AC (or DC) OK LED goes on temporarily and then goes off within 30 seconds, the system is most likely shutting itself down because it detected an out-of-tolerance power or temperature condition within the power supplies. Proceed to the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Subsystem”](#) section on page 8-15.

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- If the AC (or DC) OK LED goes on and the system starts up as expected but then displays the following message and shuts down after 2 minutes, there is a problem with the blower. Proceed to the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Cooling Subsystem”](#) section on page 8-16.

```
%ENVM-2-FAN: Fan has failed, shutdown in 2 minutes
```

- If the AC (or DC) OK LED stays off yet the system starts up correctly, displays the preceding message, and shuts down after about 2 minutes, there is a problem with the +24 VDC line to the blower module. Proceed to the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Subsystem”](#) section on page 8-15.
- As soon as you turn on the power switch, you should immediately hear the blower operating. If you are in an unusually noisy environment, such as an air-conditioned wiring closet with other equipment noise, place your hand near the middle of the plastic panel on front of the chassis (opposite the interface processor end of the chassis); you should feel the exhaust air that is being forced out of the chassis.




---

**Note** Do not mistake the power supply exhaust air coming from the bottom front panel.

---

- If the AC (or DC) OK LED is on but the blower is not operating, there is a problem with the blower. (The system will shut itself down if it detects that the blower is not functioning properly.) Proceed to the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Cooling Subsystem”](#) section on page 8-16.
- If the AC (or DC) OK LED is on at startup and the blower is operating but the system shuts down after 2 minutes, there might be a problem with the blower control board. Proceed to the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Cooling Subsystem”](#) section on page 8-16.
- When you turn on the system power, the LEDs on the RSP (see [Figure 1-11](#) for the Cisco 7513 and [Figure 1-14](#) for the Cisco 7513-MX) should operate as indicated in the RSP installation and configuration note. The Cisco 7513 and Cisco 7513-MX are compatible with an RSP2, RSP4, and RSP8. See the installation and configuration note for the RSP model that is installed in your Cisco 7513 or Cisco 7513-MX for detailed operating information.
- The enabled LED on each interface processor goes on when the RSPs have completed initialization of the interface processor for operation. This LED indicates that the interface processor is receiving power and has been recognized by the RSPs; it does not indicate the state of the individual interfaces. It does, however, indicate that an interface processor contains a valid microcode version. If an enabled LED fails to go on, proceed to the [“Troubleshooting the Interface Processors”](#) section on page 8-19.




---

**Note** While the system is starting up and initializing the individual interface processors, the status LEDs on the interface processors will flash on and off or light intermittently; this is normal behavior. The LEDs do not indicate the true status of the interfaces until the system has initialized the interface processors and you have enabled the individual interfaces.

---

When the LEDs indicate that the system has initialized successfully, the system banner (similar to the following example) should be displayed on the console screen. If it is not displayed, refer to the [“Connecting a Console Terminal to the RSP”](#) section on page 3-32 to verify that the terminal is set correctly and that it is properly connected to the RSP’s console port.

```
System Bootstrap, Version 4.6(5), SOFTWARE  
Copyright (c) 1986-1995 by cisco Systems
```

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RSP2 processor with 16384 Kbytes of memory

(additional text omitted from this example)

F3: 2012356+47852+194864 at 0x1000

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cisco Systems, Inc.  
170 Tasman Drive  
San Jose, CA 95134

GS Software (RSP-K), Version 10.3(571) [fc3], RELEASE SOFTWARE  
Copyright (c) 1986-1995 by cisco Systems, Inc.

(additional text omitted from this example)

Press RETURN to get started!

## Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Subsystem

This section provides information on troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 power subsystem.

Check the following to help isolate the problem: On the interface processor end of the power supplies, are the AC (or DC) OK LEDs on?

- If yes, the AC (or DC) source is good, and the power supplies are functional.
- If no, but the blower is operating *and* LEDs on the processor modules are on, suspect a faulty power supply LED. The RSPs use +5 VDC, and the blower uses +24 VDC; therefore, if both the RSPs and blower are operating, all internal DC lines are within tolerance.
- If no and there is no other obvious activity, first suspect that the power switch is not fully in the on (I) position. Rotate the power switch clockwise and ensure that it is set completely in the on (I) position. See the [“Starting the System and Observing Initial Conditions”](#) section on page 4-2.
  - If the system power switch is set correctly and the AC (or DC) OK LED remains off, suspect the AC (or DC) source or the power cable. Turn the power switch off, connect the power cable to another power source if one is available, and turn the switch back on. If the LED then goes on, the problem is the first power source.
  - If the LED fails to go on after you connect the power supply to a new power source, swap the power cable with a replacement if one is available and turn the switch back on. If the AC (or DC) OK LED then goes on, return the first power cable for replacement.
  - If the LED still fails to go on when connected to a different power source with a new power cable, the power supply is probably faulty. If a spare power supply is available, replace the existing power supply with the spare and restart the system. See the [“Removing Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Supplies”](#) section on page 7-3 and the [“Installing Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Supplies”](#) section on page 3-27.

If the AC (or DC) OK LED then goes on, return the faulty power supply for replacement.

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

## Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Cooling Subsystem

This section provides information on troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 cooling subsystem.

Check the following to help isolate the problem:

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

To determine if the blower is operating, listen for the blower motor. In noisy environments, place your hand near the middle of the plastic panel on the front of the chassis (opposite the interface processor end of the chassis) to feel for air being forced out the exhaust vent.

- If yes, the +24 VDC line to the blower is good, but there might be a problem with the software.
- If no, there is a problem with the blower or the +24 VDC power. If the output fail LED is on, there could be a problem with the +24VDC supply to the blower either at the power supply or the blower control board.
- If no and the output fail LED is off, ensure that the blower module is seated properly. To remove and reseat the blower module, see the [“Removing and Replacing the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Blower Module”](#) section on page 7-10. Ensure that the blower control board edge connector is inserted fully in the backplane socket. After you replace the chassis cover panel, try starting the system again.

- Do the system and blower start up but shut down after about 2 minutes?

- If you have changed the software configuration register boot field settings or altered the configuration file boot instructions, the system could be booting a software image that does not recognize the signals from the blower control board, and therefore assumes that the cooling subsystem is not operating.
- If the following message is displayed, it indicates that the blower has failed or is operating out of tolerance:

```
%ENVM-2-FAN: Fan has failed, shutdown in 2 minutes
```

If the blower or the blower control board fails, you must replace the blower module.

- If the following message is displayed, it indicates that the system has detected an overtemperature condition or out-of-tolerance power 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 output fail LED will go on before the system shuts down. See the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Subsystem”](#) section on page 8-15.

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 front and rear of the chassis to allow cooling air to flow. Refer to the guidelines in [Chapter 2, “Preparing for Installation,”](#) for preventive site preparation recommendations.



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This message could also indicate a faulty component or temperature sensor. Before the system shuts down, use the **show environment** or **show environment table** commands to display the internal chassis environment. (For detailed descriptions of **show** commands, see the “Cisco 7513 and Cisco 7513-MX Environmental show Command Examples” section on page 2-31.)

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

## Troubleshooting Blower Operation

If you suspect your blower has failed, check the following to help isolate the problem:

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

To determine whether the blower is operating, listen for the blower motor. In noisy environments, place your hand next to the front of the chassis to feel for air being forced out the exhaust vent.

- If yes, the +24 VDC line to the blower is good, but there might be a problem with the software.
- If no, there is a problem with the blower or the +24 VDC power. If the output fail LED is on, there could be a problem with the +24 VDC power supply to the blower either at the power supply or at the blower control board.
- If no and the output fail LED is off, ensure that the blower module is seated properly. Try reseating the blower module and starting the system again.

- Do the system and blower start up but shut down after about 2 minutes?

- If you have changed the software configuration register boot field settings or altered the configuration file boot instructions, the system could be booting a software image that does not recognize the signals from the blower control board (and therefore assumes that the cooling subsystem is not operating).
- The following message, if displayed, indicates that the blower has failed or is operating out of tolerance.

```
%ENVM-2-FAN: Fan has failed, shutdown in 2 minutes
```

If the blower or the blower control board fails, you must replace the blower module assembly.

- The following message, if displayed, indicates that the system has detected an overtemperature condition or out-of-tolerance power 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 output fail LED will go on before the system shuts down.

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.

The preceding message could also indicate a faulty component or temperature sensor. Before the system shuts down, use the **show environment** or **show environment table** commands (See the “Cisco 7513 and Cisco 7513-MX Environmental show Command Examples” section on page 2-31 to display the internal chassis environment.)

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## Troubleshooting the Cisco 7500 Series Processor Subsystem

The Cisco 7500 series processor subsystem comprises the RSPs and interface processors. The RSPs are required system components in the Cisco 7500 series. The system cannot operate unless the RSPs are installed properly; however, 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 RSPs are installed properly and the system software has initialized successfully. Then, if necessary, you can troubleshoot individual interface processors.

Two RSPs are required in the Cisco 7507, Cisco 7507-MX, Cisco 7513, or Cisco 7513-MX *only* when you have the high-system availability (HSA) feature enabled; otherwise, only one RSP is required. When using an RSP8 as the master device, the HSA feature functions only with another RSP8 as the slave device. The Cisco 7576 does not support HSA. Router A and router B in the Cisco 7576 operate with only one RSP.



### Caution

If you are only configuring one of the two routers that make up the Cisco 7576, make sure to configure router A instead of router B. To configure router A, install an RSP4 in slot 6, and install interface processors in slots 0 through 5.

## Troubleshooting the RSP

The procedures in this section assume that the RSPs 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, see the [“Configuring the Software Configuration Register”](#) section on page 4-4 to reselect default values.

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

- Do all of the RSP LEDs remain off when the system power switch is turned on?
  - If all RSP LEDs stay off, first see the [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Subsystem”](#) section on page 8-15 and [“Troubleshooting the Cisco 7513, Cisco 7513-MX, and Cisco 7576 Cooling Subsystem”](#) section on page 8-16 to ensure that both the blower and power supplies are functioning properly.
  - If the power supplies and blower appear operational but none of the RSP LEDs are on, suspect that an improperly connected RSP 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 reseat each board. (For a description and illustration of the ejector levers, see [Figure 3-12](#).) Tighten all captive installation screws, then restart the system.
  - With the power supplies turned off, reseat the RSP in its slot and restart the router.
- Is the RSP normal LED on?
 

If yes, the system software has initialized successfully, and the system is operational.
- Is the RSP 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.

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## Troubleshooting the Interface Processors

This section provides information on 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 each RSP normal LED, which will be on if the system booted the RSP 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 reseat the interface processor, and then tighten both of the captive installation screws. After the system reinitializes the interfaces, the enabled LED on the interface processor should go on.

**Note**

---

More specific interface processor troubleshooting information is discussed in the companion publication *Interface Processor Installation and Configuration Guide*, which shipped with your Cisco 7500 series router, and in the individual configuration notes that shipped with your interface processors.

---

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

## Using Cisco 7500 Series System LEDs

The RSPs and power supplies in all of the Cisco 7500 series routers have LEDs that indicate specific behavior. The Cisco 7507, Cisco 7507-MX, Cisco 7513, Cisco 7513-MX, and Cisco 7576 routers also have front-panel LEDs. (The Cisco 7505 does not have front-panel LEDs.)

Use the information in the following sections to interpret the LED indications for your system:

- [Using the Front-Panel System LEDs, page 8-19](#) (for Cisco 7507, Cisco 7507-MX, Cisco 7513, Cisco 7513-MX, and Cisco 7576 routers)
- [Using the RSP LEDs, page 8-21](#) (for all Cisco 7500 series RSPs)
- [Using the Power Supply LEDs, page 8-23](#) (for all Cisco 7500 series power supplies)

**Note**

---

Specific interface processor LED information is discussed in the companion publication *Interface Processor Installation and Configuration Guide*, which shipped with your Cisco 7500 series router, and in the individual configuration notes that shipped with your interface processors.

---

## Using the Front-Panel System LEDs

This section describes the indications for the front-panel LEDs on the Cisco 7507, Cisco 7507-MX, Cisco 7513, Cisco 7513-MX, and Cisco 7576. (The Cisco 7505 has no front-panel system LEDs.)

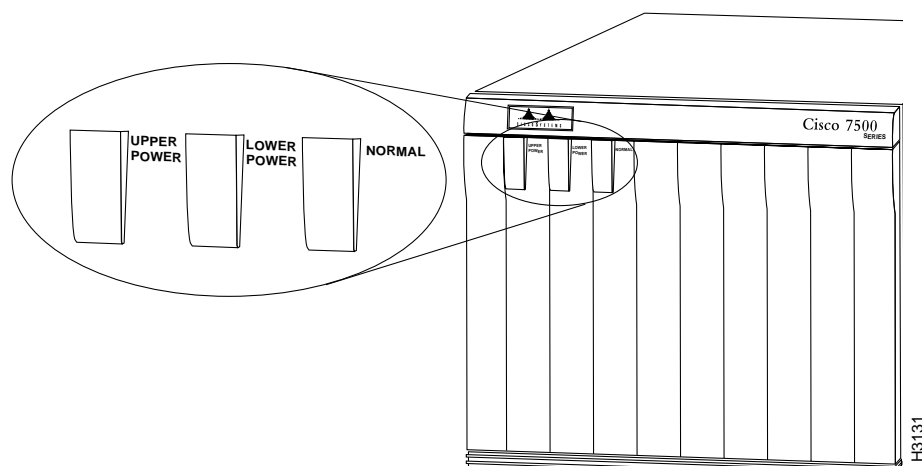
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## Cisco 7507 and Cisco 7507-MX LEDs

Three system status LEDs on the front of the Cisco 7507 and Cisco 7507-MX (see [Figure 8-4](#)) indicate the status of the system and the power supplies. The normal LED goes on to indicate that the system is in a normal operating state. The normal LED is controlled by the RSP2, which contains an identical normal LED that provides system status on the rear of the chassis.

The upper power and lower power LEDs go on to indicate that a power supply is installed in the indicated power supply bay and is providing power to the system. The power LEDs go out if the power supply in the corresponding bay reaches an out-of-tolerance temperature or voltage condition. (For detailed descriptions of the **show** commands that display temperature and voltage information, see the “[Cisco 7507 and Cisco 7507-MX Environmental show Command Examples](#)” section on page 2-29.)

*Figure 8-4 Front Panel LEDs (Cisco 7507 and Cisco 7507-MX)*



## Cisco 7513, Cisco 7513-MX, and Cisco 7576 LEDs

Three system status LEDs on the front of the Cisco 7513, Cisco 7513-MX, and Cisco 7576 (see [Figure 8-5](#)) indicate the status of the system and the power supplies. On the Cisco 7513 and Cisco 7513-MX the normal LED lights to indicate that the system is in a normal operating state. The normal LED is controlled by the RSP, which contains an identical normal LED that provides system status on the rear of the chassis.

**Note**

The Cisco 7576 front panel normal LED stays lit whenever there is a functioning RSP in either slot 6 or slot 7. This LED only goes out if there are no RSPs present, or if both RSPs are not functioning. If you need to troubleshoot the normal status of a Cisco 7576, view the normal LEDs on the RSPs instead of the normal LED on the front panel.

The power A and power B LEDs light to indicate that a power supply is installed in the indicated power supply bay and is providing power to the system. With the chassis oriented as shown in [Figure 1-11](#), the power A bay is on the left and the power B bay is on the right.

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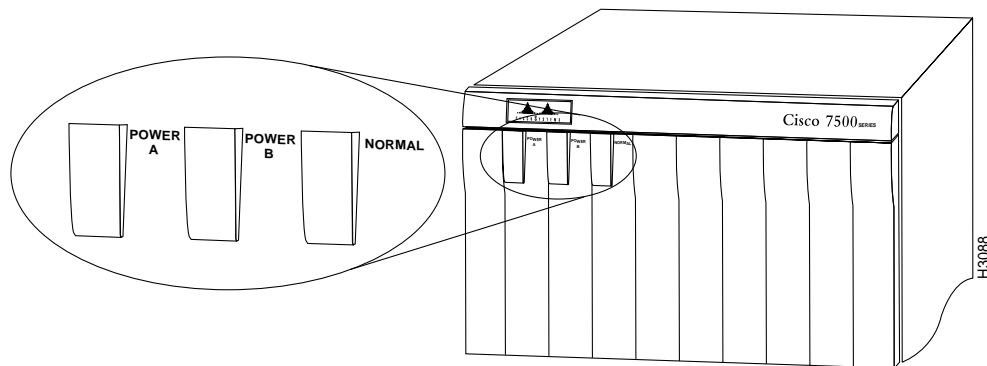


## Note

The Cisco 7576 features two routers on one backplane. These are identified as router A and router B. These designations have no relationship to the power bays that are identified as power A and power B.

The power LEDs go out if the power supply in the corresponding bay reaches an out-of-tolerance temperature or voltage condition. (For detailed descriptions of the **show** commands that display temperature and voltage information, see the “Cisco 7513 and Cisco 7513-MX Environmental show Command Examples” section on page 2-31.)

Figure 8-5 Front Panel LEDs (Cisco 7513, Cisco 7513-MX, and Cisco 7576)



## Using the RSP LEDs

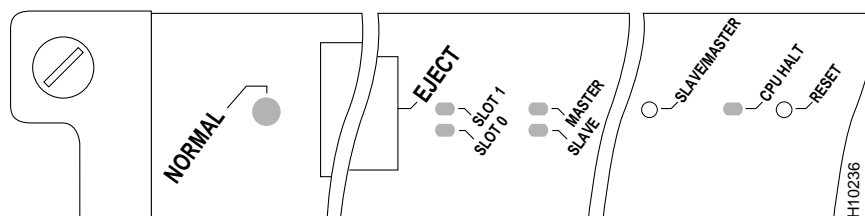
This section describes the indications for the LEDs on the RSPs.

### RSP2 LEDs—Cisco 7500 Series

The two LEDs on the RSP2—normal and CPU halt (see Figure 8-6)—indicate the system and RSP2 status. The normal LED goes on to indicate that the system is operational. During normal operation, the CPU halt LED on the RSP2 should be off and stay off unless the system detects a processor hardware failure. A successful boot is indicated when the normal LED comes on and stays on; however, this does not necessarily mean that the system has reached normal operation.

The slot 0 and slot 1 LEDs indicate which PC Card (Flash memory card) slot is in use and blink when either slot is being accessed by the system.

Figure 8-6 RSP2 LEDs (Partial Front Panel, Horizontal View)



*REVIEW DRAFT—CISCO CONFIDENTIAL***Caution**

The reset switch resets the RSP2 and the entire system. To prevent system errors and problems, use it only at the direction of your service representative.

**Note**

The function of the master/slave switch, not available with the first release of the RSP2, allows you to designate which RSP2 acts as the system master and which as the slave. This functionality is only relevant for systems using two RSP2 processor modules in slot 6 and slot 7. RSP2s as spares are shipped as system masters by default. If two RSP2s are installed, one must be the master and one must be the slave, regardless of the slot in which they are installed (slot 2 and slot 3 in the Cisco 7507 and Cisco 7507-MX; slot 6 or slot 7 in the Cisco 7513 and Cisco 7513-MX).

The Cisco 7576 does not support master/slave operation. Only one RSP is used per router; therefore, the RSP in slot 6 is automatically the system master for router A, and the RSP in slot 7 is automatically the system master for router B.

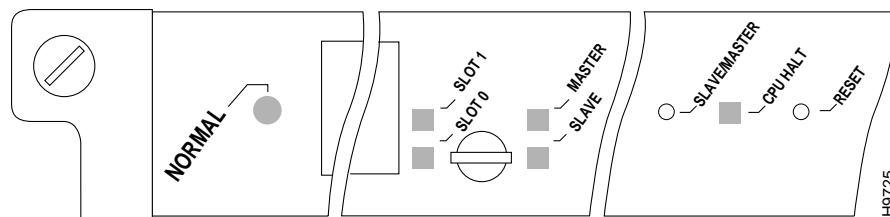
**RSP4 and RSP8 LEDs—Cisco 7500 Series**

Figure 8-7 shows the LEDs on the RSP4 and RSP8 faceplate. The LEDs on the RSP4 and RSP8 indicate the system and RSP4 or RSP8 status and which Flash memory card slot is active. The CPU halt LED, which goes on only if the system detects a processor hardware failure, should remain off. A successful boot is indicated when the normal LED goes on; however, this does not necessarily mean that the system has reached normal operation. During normal operation, the CPU halt LED should be off, and the normal LED should be on, indicating that the RSP4 or RSP8 is receiving +5V. The slot 0 and slot 1 LEDs indicate which PC Card (Flash memory) card slot is in use, and each LED blinks when the card is accessed by the system. The master and slave LEDs provide a visual indication of whether the RSP4 is designated as a master or a slave device.

**Note**

The Cisco 7576 does not support master/slave operation. Only one RSP is used per router, designated router A and router B within the chassis; therefore, the RSP in slot 6 is automatically the system master for router A, and the RSP in slot 7 is automatically the system master for router B.

**Figure 8-7** RSP4 and RSP8 LEDs (Partial Front Panel, Horizontal View)

**Caution**

The reset switch (see Figure 8-7) resets the RSP4 or RSP8 and the entire system. To prevent system errors and problems, use it *only* at the direction of your Cisco-certified service representative.

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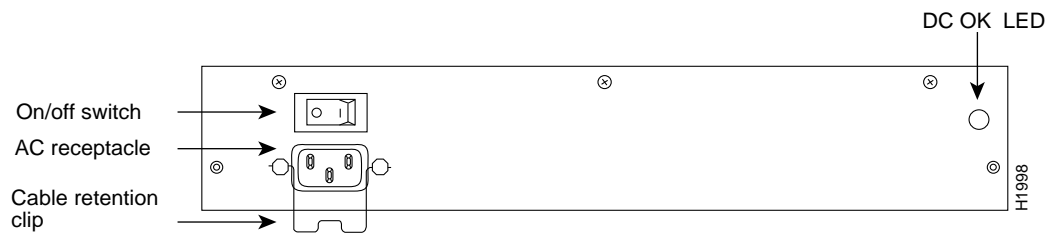
## Using the Power Supply LEDs

This section describes the indications of the LEDs on the Cisco 7500 series power supplies.

### Cisco 7505 Power Supply LED

The DC OK LED (see [Figure 8-8](#)) on the interface processor end of the Cisco 7505 AC-input and DC-input power supplies goes on when the power supply is receiving AC or DC source power and providing DC power to the internal chassis components. The power supply self-monitors its own temperature and internal voltages. (For detailed descriptions of the **show** commands that display temperature and voltage information, see the “[Cisco 7505 Environmental show Command Examples](#)” section on page 2-27.)

*Figure 8-8 Power Supply LED (AC-Input Power Supply Shown, Cisco 7505)*



### Cisco 7507 and Cisco 7507-MX Power Supply LEDs

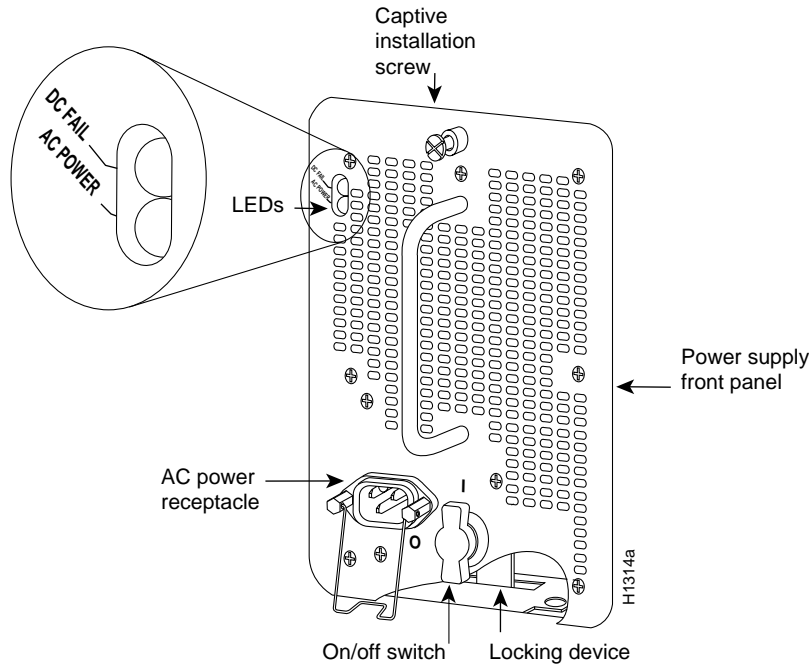
There are two types of power supplies for the Cisco 7507 and Cisco 7507-MX: AC-input and DC-input. Each AC-input power supply has AC power and DC fail LEDs and a power switch, as shown in [Figure 8-9](#). The green AC power LED indicates that the power supply is turned on and is receiving input AC power. The yellow DC fail LED is normally off, but goes on if the power supply shuts down for any of the following reasons:

- Power supply DC section failure, which could be caused by loss of source (AC or DC) power (input line failure or operator turned off system power) or an actual failure in the power supply
- Power supply shutdown initiated by the power supply because it detected an out-of-tolerance temperature or voltage condition in the power supply

In systems with a single AC-input power supply, and in systems with redundant power, when both AC-input power supplies are being shut down, the DC fail LED goes on momentarily as the system ramps down, but is off when the power supply has completely shut down. In systems with redundant power where one power supply is still active, the DC fail LED on the failed power supply will remain on (powered by the active supply).

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Figure 8-9 AC-Input Power Supply LEDs (Cisco 7507 and Cisco 7507-MX)

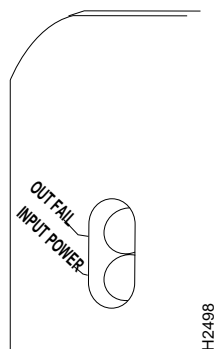


The DC-input power supply LEDs include the input power LED and the out fail LED. See Figure 8-10. The green input power LED is on when the input power is applied. The yellow out fail LED is normally off but flashes at power on for a lamp test.

The out fail LED goes on if the power supply shuts down for either of the following reasons:

- Power supply DC-output failure, which could be caused by loss of DC-input power (input line failure or operator turned off system power) or an actual failure in the DC-input power supply
- Power supply shutdown, initiated by the power supply because it detected an out-of-tolerance temperature or voltage condition in the power supply

Figure 8-10 DC-Input Power Supply LEDs, Cisco 7507 and Cisco 7507-MX (Same Location as AC-Input Power Supply)





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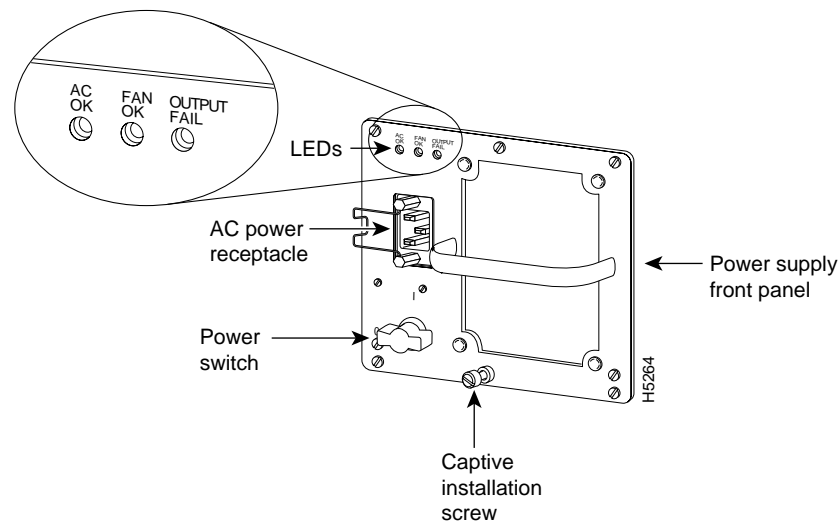
In systems with a single DC-input power supply, and in systems with redundant power, when both power supplies are shutting down, the out fail LED goes on momentarily as the system ramps down, but goes out when the power supply has completely shut down. In systems with redundant power where one power supply is still active, the out fail LED on the failed power supply will remain on (powered by the active supply).

The AC-input and DC-input power supplies are self-monitoring. Each supply monitors its own temperature and internal voltages. (For detailed descriptions of the **show** commands that display temperature and voltage information, see the “[Cisco 7507 and Cisco 7507-MX Environmental show Command Examples](#)” section on page 2-29.)

### Cisco 7513, Cisco 7513-MX, and Cisco 7576 Power Supply LEDs

There are two types of power supplies for the Cisco 7513, Cisco 7513-MX, and Cisco 7576: AC-input and DC-input. Each power supply contains the following LEDs: AC (or DC) OK, fan OK, and output fail. [Figure 8-11](#) shows the AC-input power LEDs, and [Figure 8-12](#) shows the DC-input power LEDs.

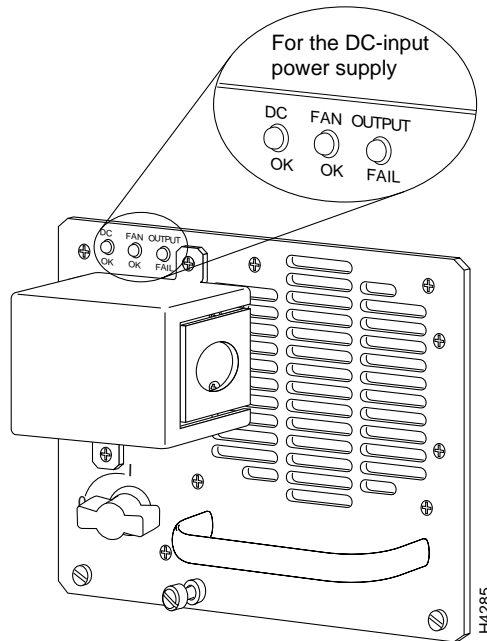
**Figure 8-11** AC-Input Power Supply LEDs (Cisco 7513, Cisco 7513-MX, and Cisco 7576)



The green AC (or DC) OK LED indicates that the power supply is turned on and is receiving input power. The red output fail LED is normally off but goes on if the power supply shuts down for any of the following reasons:

- Power supply DC-output section failure, which could be caused by loss of AC power (input line failure or operator turned off system power) or an actual failure in the power supply
- Power supply shutdown initiated by the power supply because it detected an out-of-tolerance temperature or voltage condition in the power supply

The green fan OK LED is on to indicate the fan in the power supply is operating properly. This LED is useful in noisy environments when you are troubleshooting a potential power supply problem and it is difficult to differentiate the sound of one power supply's fan from another.

*REVIEW DRAFT—CISCO CONFIDENTIAL***Figure 8-12** DC-Input Power Supply LEDs (Cisco 7513, Cisco 7513-MX, and Cisco 7576)

In systems with a single power supply, and in systems with redundant power when both power supplies are being shut down, the output fail LED lights momentarily as the system ramps down, but is off when the power supply has completely shut down.

The AC-input and DC-input power supplies are self-monitoring. Each supply monitors its own temperature and internal voltages. (For detailed descriptions of the **show** commands used to monitor environmental conditions, see the [“Cisco 7513 and Cisco 7513-MX Environmental show Command Examples”](#) section on page 2-31.)

## Additional Reference Information for Troubleshooting

This section provides additional Cisco reference material for troubleshooting your Cisco 7500 series router installation:

- *Interface Processor Installation and Configuration Guide* (along with the configuration notes for individual interface processors)
- *Second-Generation Versatile Interface Processor (VIP2) Installation and Configuration*
- The configuration notes for the individual VIP2-based port adapters
- *Troubleshooting Internetworking Systems*
- *Debug Command Reference*
- *System Error Messages*