

# HP ProLiant 100 Series Servers User Guide

for HP ProLiant DL140 and DL145 Generation 2 Servers



March 2005 (First Edition)  
Part Number 384049-001

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# Server operations

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## Powering up the server

To power up the server, press the Power On/Standby button.

## Powering down the server



**WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

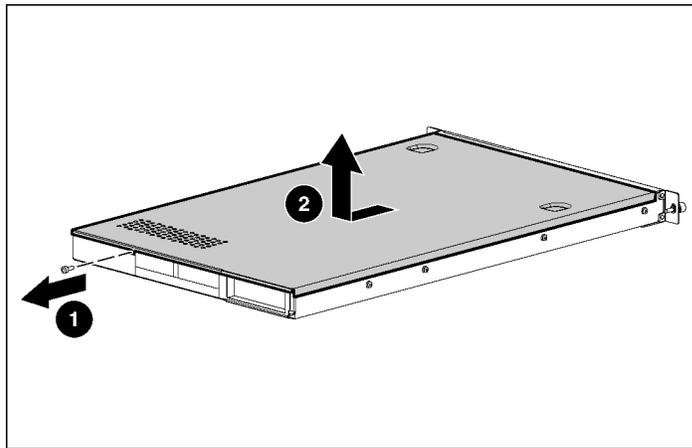
**IMPORTANT:** If installing a hot-plug device, it is not necessary to power down the server.

1. Shut down the operating system as directed by the operating system documentation.
2. Press the Power On/Standby button to place the server in standby mode. When the server activates standby power mode, the system power LED changes from green to off.
3. Disconnect the power cords.

The system is now without power.

## Access Panel

1. Power down the server ("Powering down the server" on page [7](#)).
2. Loosen the thumbscrew located on the server rear panel.
3. Slide the access panel back about 1.5 cm (0.5 in).
4. Lift and remove the access panel.



To replace the component, reverse the removal procedure.

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## Server setup

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## Optional installation services

Delivered by experienced, certified engineers, HP Care Pack services help you keep your servers up and running with support packages tailored specifically for HP ProLiant systems. HP Care Packs let you integrate both hardware and software support into a single package. A number of service level options are available to meet your needs.

HP Care Pack Services offer upgraded service levels to expand the standard product warranty with easy-to-buy, easy-to-use support packages that help you make the most of your server investments. Some of the Care Pack services are:

- Hardware support
  - 6-hour call-to-repair
  - 4-hour 24x7 same day
  - 4-hour same business day
- Software support
  - Microsoft®
  - Linux
- Integrated hardware and software support

- Critical Service
- Proactive 24
- Support Plus
- Support Plus 24
- Startup and implementation services for both hardware and software

For more information on Care Packs, refer to the HP website ([http://www.hp.com/hps/carepack/servers/cp\\_proliant.html](http://www.hp.com/hps/carepack/servers/cp_proliant.html)).

## Optimum environment

When installing the server, select a location that meets the environmental standards described in this section.

## Space and Airflow Requirements

To allow for servicing and adequate airflow, observe the following space and airflow requirements when deciding where to install a rack:

- Leave a minimum clearance of 76.2 cm (30 in) in front of the rack.
- Leave a minimum clearance of 76.2 cm (30 in) behind the rack.
- Leave a minimum clearance of 121.9 cm (48 in) from the back of the rack to the back of another rack or row of racks.

HP servers draw in cool air through the front and expel warm air through the rear. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to enter, and allow the warm air to escape from the cabinet.



**CAUTION:** To prevent improper cooling and damage to the equipment, do not block the ventilation openings.

The 9000 and 10000 Series racks provide proper server cooling from flow-through perforations in the front and rear doors that provide 64 percent open area for ventilation.



**CAUTION:** When using a Compaq branded 7000 Series rack, you must install the high airflow rack door insert [P/N 327281-B21 (42U) or P/N 157847-B21 (22U)] to provide proper front-to-back airflow and cooling.



**CAUTION:** If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors—If the 42U rack includes closing front and rear doors, you must allow 5,350 sq cm (830 sq in) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side—The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 in).

When vertical space in the rack is not filled by a server or rack component, the gaps between the components cause changes in airflow through the rack and across the servers. Cover all gaps with blanking panels to maintain proper airflow.



**CAUTION:** Always use blanking panels to fill empty vertical spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

## Temperature requirements

To ensure continued safe and reliable equipment operation, install or position the system in a well-ventilated, climate-controlled environment.

The maximum recommended ambient operating temperature (TMRA) for most server products is 35°C (95°F). The temperature in the room where the rack is located must not exceed 35°C (95°F).



**CAUTION:** To reduce the risk of damage to the equipment when installing third-party options:

- Do not permit optional equipment to impede airflow around the server or to increase the internal rack temperature beyond the maximum allowable limits.
- Do not exceed the manufacturer's TMRA.

## Power requirements

Installation of this equipment must comply with local and regional electrical regulations governing the installation of information technology equipment by licensed electricians. This equipment is designed to operate in installations covered by NFPA 70, 1999 Edition (National Electric Code) and NFPA-75, 1992 (code for Protection of Electronic Computer/Data Processing Equipment). For electrical power ratings on options, refer to the product rating label or the user documentation supplied with that option.



**WARNING:** To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack. Consult the electrical authority having jurisdiction over wiring and installation requirements of your facility.



**CAUTION:** Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

When installing more than one server, you may need to use additional power distribution devices to safely provide power to all devices. Observe the following guidelines:

- Balance the server power load between available AC supply branch circuits.
- Do not allow the overall system AC current load to exceed 80 percent of the branch circuit AC current rating.
- Do not use common power outlet strips for this equipment.
- Provide a separate electrical circuit for the server.

## Electrical grounding requirements

The server must be grounded properly for proper operation and safety. In the United States, you must install the equipment in accordance with NFPA 70, 1999 Edition (National Electric Code), Article 250, as well as any local and regional building codes. In Canada, you must install the equipment in accordance with Canadian Standards Association, CSA C22.1, Canadian Electrical Code. In all other countries, you must install the equipment in accordance with any regional or national electrical wiring codes, such as the International Electrotechnical Commission (IEC) Code 364, parts 1 through 7. Furthermore, you must be sure that all power distribution devices used in the installation, such as branch wiring and receptacles, are listed or certified grounding-type devices.

Because of the high ground-leakage currents associated with multiple servers connected to the same power source, HP recommends the use of a PDU that is either permanently wired to the building's branch circuit or includes a nondetachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or those complying with IEC 60309 are considered suitable for this purpose. Using common power outlet strips for the server is not recommended.

## Rack warnings



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.



**WARNING:** To reduce the risk of personal injury or equipment damage when unloading a rack:

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115 kg (253 lb), can stand more than 2.1 m (7 ft) tall, and may become unstable when being moved on its casters.
- Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.

## Installing hardware options

Install any hardware options before initializing the server. For options installation information, refer to the option documentation. For server-specific information, refer to "Hardware options installation (on page [17](#))."

## Installing the server into the rack

Refer to the installation instructions that ship with the rack kit to install the server into the rack.

## Powering up and configuring the server

To power up the server, press the Power On/Standby button.

Refer to the server installation sheet for detailed information on configuring the server.

## Installing the operating system

To operate properly, the server must have a supported operating system. For the latest information on supported operating systems, refer to the HP website (<http://www.hp.com/go/supportos>).

To install an operating system on the server, insert the operating system CD into the optional CD-ROM drive and reboot the server. This process may require you to obtain additional drivers from the Support CD shipped with the server or the CD that shipped with the option. Any drivers that require a diskette for installation will require an optional USB diskette drive. The drivers may have updates that are available on the HP website (<http://www.hp.com/support>).

Follow the on-screen instructions to begin the installation process.

## Registering the server

To register the server, refer to the HP Registration website (<http://register.hp.com>).



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# Hardware options installation

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## Introduction

If more than one option is being installed, read the installation instructions for all the hardware options and identify similar steps to streamline the installation process.

For HP-supported options, refer to the Quickspecs on the HP website (<http://www.hp.com/servers/proliant>).



**WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



**CAUTION:** To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.



**CAUTION:** Before installing any options, power down the server to prevent damage to the server and the equipment ("Powering down the server" on page [7](#)).

## Processor option

For server-specific processor installation instructions, refer to the installation instructions included with the processor option kit.



**CAUTION:** To prevent possible server malfunction and damage to the equipment, do not mix processors of different types or speeds.

## DVD-ROM/CD-ROM option

For server-specific DVD-ROM/CD-ROM installation instructions, refer to the installation sheet included with the option kit.

## Memory options

For server-specific memory installation guidelines, refer to the installation sheet included with the server.

## PCI Express riser board option

The HP ProLiant DL140 and DL145 Generation 2 Series servers support one PCI Express riser board. For server-specific riser board installation instructions, refer to the installation instructions included with the riser board option kit.

## PCI expansion board option

The HP ProLiant DL140 and DL145 Generation 2 Series servers can be configured with up to two PCI expansion boards. For server-specific expansion board installation instructions, refer to the installation sheet included with the server.

## Hard drive options

For server-specific hard drive installation instructions, refer to the installation sheet included with the server.



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## Server software and configuration utilities

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### ROMPaq Utility

Flash ROM enables you to upgrade the firmware (BIOS) with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into the diskette drive and boot the system.

The ROMPaq utility checks the system and provides a choice (if more than one exists) of available ROM revisions. This procedure is the same for both system and option ROMPaq utilities.

For more information about the ROMPaq utility, refer to the HP website (<http://www.hp.com/servers/manage>).

To flash the ROM using ROMPaq:

1. Download the system ROMPaq utility diskette for each target server or option for which a ROM flash is planned. ROMPaq downloads are available on the HP website (<http://www.hp.com/support>).
2. Shut down each server where the system or option ROM images are to be upgraded and reboot using the correct ROMPaq diskette for that server.
3. Follow the interactive session in the ROMPaq utility, which enables you to select the devices to be flashed.
4. After the ROMPaq utility flashes the ROM for the selected devices, cycle power manually to reboot the system back into the operating system.

## Lights-Out 100i Remote Management

The HP ProLiant DL140 and DL145 Generation 2 Series servers support Lights-Out 100i Remote Management functionality. For more detailed information, refer to the server-specific information on the HP website (<http://www.hp.com/servers/proliant>).

## Diagnostic tools

### List of Tools:

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## HP Insight Diagnostics

The HP Insight Diagnostics utility displays information about the server hardware and tests the system to be sure it is operating properly. The utility has online help and can be accessed using the Insight Diagnostics CD or at the HP website (<http://www.hp.com/support>).

## Keeping the system current

### List of Tools:

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## Drivers

HP drivers and utilities can be found on the Support CD. For the latest drivers and information on supported operating systems, refer to the HP website (<http://www.hp.com/support>).

**IMPORTANT:** Always perform a backup before installing or updating device drivers.

# Troubleshooting

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## Common problem resolution

Loose connections (on page [23](#))

Service notifications (on page [24](#))

### Loose connections

#### Action:

- Be sure all power cords are securely connected.
- Be sure all cables are properly aligned and securely connected for all external and internal components.
- Remove and check all data and power cables for damage. Be sure no cables have bent pins or damaged connectors.
- If a fixed cable tray is available for the server, be sure the cords and cables connected to the server are correctly routed through the tray.
- Be sure each device is properly seated.
- If a device has latches, be sure they are completely closed and locked.
- Check any interlock or interconnect LEDs that may indicate a component is not connected properly.
- If problems continue to occur, remove and reinstall each device, checking the connectors and sockets for bent pins or other damage.

## Service notifications

To find out the latest service notifications, refer to the HP website (<http://www.hp.com/products/servers/platforms>). Select the appropriate server model, and then click the **Documentation** link on the product page.

## Problem diagnosis

This section covers the steps to take in order to diagnose a problem quickly.

To effectively troubleshoot a problem, HP recommends that you start with the first flowchart in this section, "Start diagnosis flowchart (on page 30)," and follow the appropriate diagnostic path. If the other flowcharts do not provide a troubleshooting solution, follow the diagnostic steps in "General diagnosis flowchart (on page 32)." The General Diagnosis flowchart is a generic troubleshooting process to be used when the problem is not server-specific or is not easily categorized into the other flowcharts.

**IMPORTANT:** This guide provides information for multiple servers. Some information may not apply to the server you are troubleshooting. Refer to the server documentation for information on procedures, hardware options, software tools, and operating systems supported by the server.



**WARNING:** To avoid potential problems, **ALWAYS** read the warnings and cautionary information in the server documentation before removing, replacing, reseating, or modifying system components.

## Important Safety Information

Familiarize yourself with the safety information in the following sections before troubleshooting the server.



### Important Safety Information

Before servicing this product, read the *Important Safety Information* document provided with the server.

## Symbols on equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

**WARNING:** To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.



This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

**WARNING:** To reduce the risk of injury from electric shock hazards, do not open this enclosure.



This symbol on an RJ-45 receptacle indicates a network interface connection.

**WARNING:** To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

**WARNING:** To reduce the risk of injury from a hot component, allow the surface to cool before touching.



11.33 - 15.87 kg

25 - 35 lb

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

**WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.



These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

**WARNING:** To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

### Warnings and cautions



**WARNING:** Only authorized technicians trained by HP should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling feet are extended to the floor.
- The full weight of the rack rests on the leveling feet.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.



**WARNING:** To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.



11.33 - 15.87 kg

25 - 35 lb

**WARNING:** To reduce the risk of personal injury or damage to the equipment:

- **Observe local occupation health and safety requirements and guidelines for manual handling.**
- **Obtain adequate assistance to lift and stabilize the chassis during installation or removal.**
- **The server is unstable when not fastened to the rails.**
- **When mounting the server in a rack, remove the power supplies and any other removable module to reduce the overall weight of the product.**



**CAUTION:** To properly ventilate the system, you must provide at least 7.6 cm (3.0 in) of clearance at the front and back of the server.



**CAUTION:** The server is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

## Preparing the server for diagnosis

1. Be sure the server is in the proper operating environment with adequate power, air conditioning, and humidity control. Refer to the server documentation for required environmental conditions.
2. Record any error messages displayed by the system.
3. Remove all diskettes and CDs from the media drives.
4. Power down the server and peripheral devices if you will be diagnosing the server offline. Always perform an orderly shutdown, if possible. This means you must:
  - a. Exit any applications.
  - b. Exit the operating system.
  - c. Power down the server ("Powering down the server" on page [7](#)).
5. Disconnect any peripheral devices not required for testing (any devices not necessary to power up the server). Do not disconnect the printer if you want to use it to print error messages.

6. Collect all tools and utilities, such as a Torx screwdriver, loopback adapters, ESD wrist strap, and software utilities, necessary to troubleshoot the problem.

HP recommends you have access to the server documentation for server-specific information.

## Symptom information

Before troubleshooting a server problem, collect the following information:

- What events preceded the failure? After which steps does the problem occur?
- What has been changed between the time the server was working and now?
- Did you recently add or remove hardware or software? If so, did you remember to change the appropriate settings in the server setup utility, if necessary?
- Has the server exhibited problem symptoms for a period of time?
- If the problem occurs randomly, what is the duration or frequency?

To answer these questions, the following information may be useful:

- Run HP Insight Diagnostics (on page [22](#)) and use the survey page to view the current configuration or to compare it to previous configurations.
- Refer to your hardware and software records for information.

## Diagnostic steps

To effectively troubleshoot a problem, HP recommends that you start with the first flowchart in this section, "Start diagnosis flowchart (on page [30](#))," and follow the appropriate diagnostic path. If the other flowcharts do not provide a troubleshooting solution, follow the diagnostic steps in "General diagnosis flowchart (on page [32](#))." The General Diagnosis flowchart is a generic troubleshooting process to be used when the problem is not server-specific or is not easily categorized into the other flowcharts.

The available flowcharts include:

- Start diagnosis flowchart (on page [30](#))

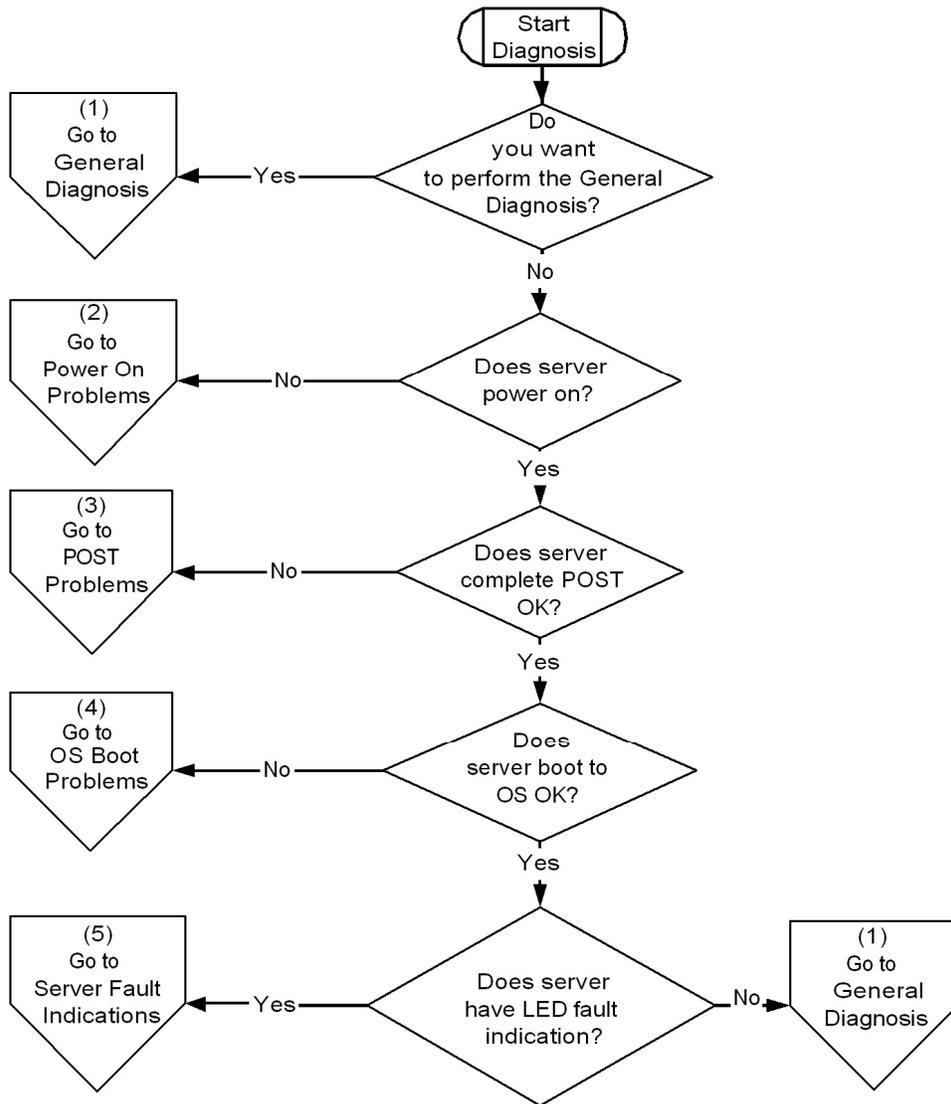
- General diagnosis flowchart (on page [32](#))
- Power-on problems flowchart (on page [34](#))
- POST problems flowchart (on page [35](#))
- OS boot problems flowchart (on page [38](#))
- Server fault indications flowchart (on page [40](#))

The number contained in parentheses in the flowchart boxes corresponds to a table with references to other detailed documents or troubleshooting instructions.

### Start diagnosis flowchart

Use the following flowchart and table to start the diagnostic process.

Item	Refer to
1	"General diagnosis flowchart (on page <a href="#">32</a> )"
2	"Power-on problems flowchart (on page <a href="#">34</a> )"
3	"POST problems flowchart (on page <a href="#">35</a> )"
4	"OS boot problems flowchart (on page <a href="#">38</a> )"
5	"Server fault indications flowchart (on page <a href="#">40</a> )"



## General diagnosis flowchart

The General Diagnosis flowchart provides a generic approach to troubleshooting. If you are unsure of the problem, or if the other flowcharts do not correct the problem, use the following flowchart.

Item	Refer to
1	"Symptom information (on page <a href="#">29</a> )"
2	"Loose connections (on page <a href="#">23</a> )"
3	"Service notifications (on page <a href="#">24</a> )"
4	Server maintenance and service guide, located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> )
5	Server user guide or setup and installation guide, located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> )
6	<ul style="list-style-type: none"><li>• Server maintenance and service guide, located on the Support CD or the HP website (<a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a>)</li><li>• "Hardware problems (on page <a href="#">41</a>)"</li></ul>
7	<ul style="list-style-type: none"><li>• "Server information you need (on page <a href="#">69</a>)"</li><li>• "Operating system information you need (on page <a href="#">70</a>)"</li></ul>
8	"Contacting HP technical support or an authorized reseller (on page <a href="#">68</a> )"



### Power-on problems flowchart

Symptoms:

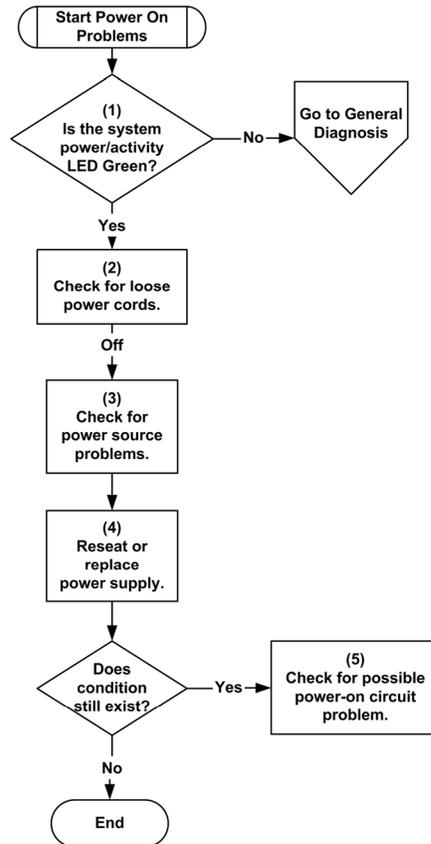
- The server does not power on.
- The system power LED is off or amber.

**NOTE:** For the location of server LEDs and information on their statuses, refer to the server documentation.

Possible causes:

- Improperly seated or faulty power supply
- Loose or faulty power cord
- Power source problem
- Power on circuit problem
- Improperly seated component or interlock problem
- Faulty internal component

Item	Refer to
1	Server user guide located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> ).
2	"Loose connections (on page 23)"
3	"Power source problems (on page 42)"
4	<ul style="list-style-type: none"><li>• "Power supply problems (on page 42)"</li><li>• Server maintenance and service guide, located on the Support CD or the HP website (<a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a>)</li></ul>
5	"System open circuits and short circuits (on page 58)"



**POST problems flowchart**

Symptoms:

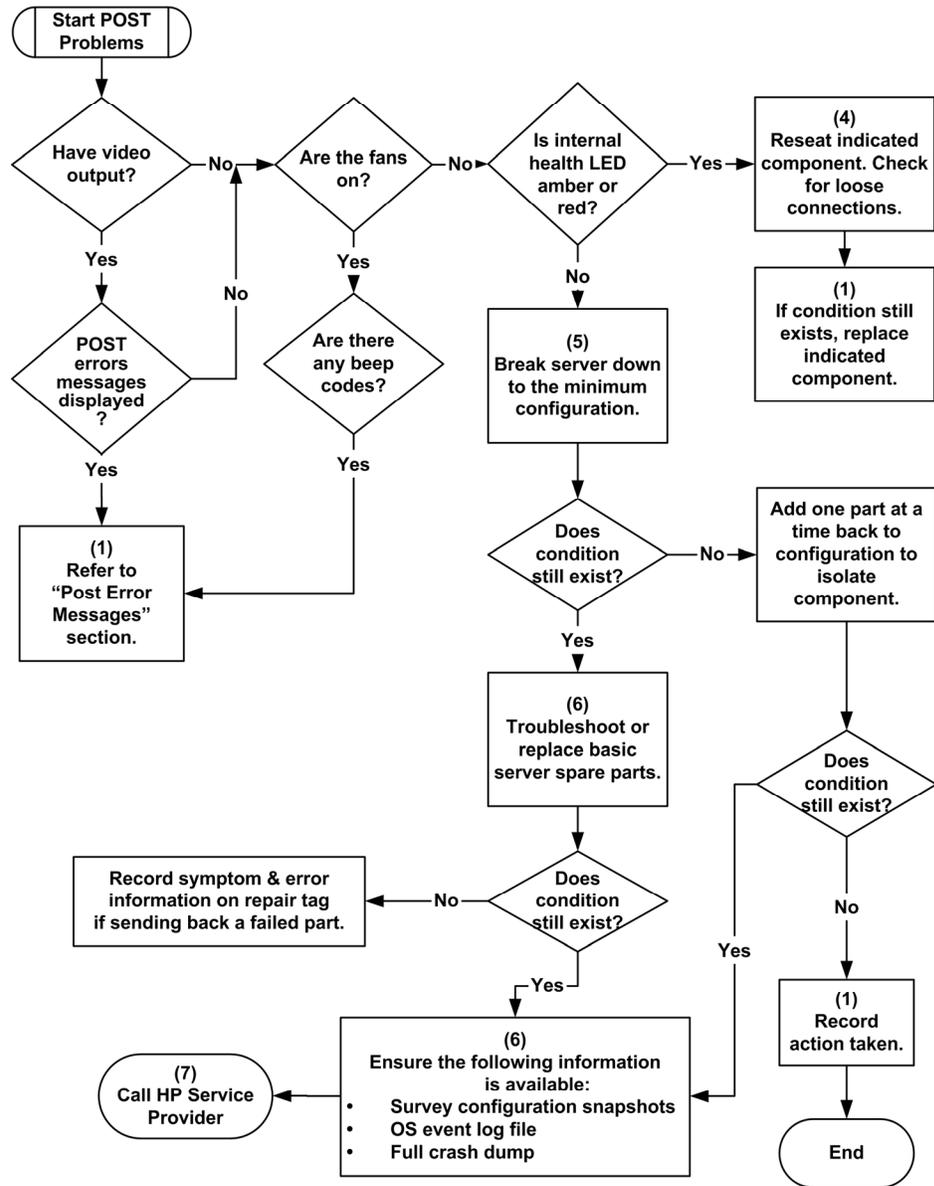
- Server does not complete POST
  - NOTE:** The server has completed POST when the system attempts to access the boot device.
- Server completes POST with errors

Possible Problems:

- Improperly seated or faulty internal component

- Faulty KVM device
- Faulty video device

Item	Refer to
1	Server maintenance and service guide, located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> )
2	"Video problems (on page <a href="#">59</a> )"
3	KVM documentation
4	"Loose connections (on page <a href="#">23</a> )"
5	Server user guide, located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> )
6	<ul style="list-style-type: none"> <li>• "Hardware problems (on page <a href="#">41</a>)"</li> <li>• Server maintenance and service guide, located on the Support CD or the HP website (<a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a>)</li> </ul>
7	Contacting HP technical support or an authorized reseller (on page <a href="#">68</a> ).



**OS boot problems flowchart**

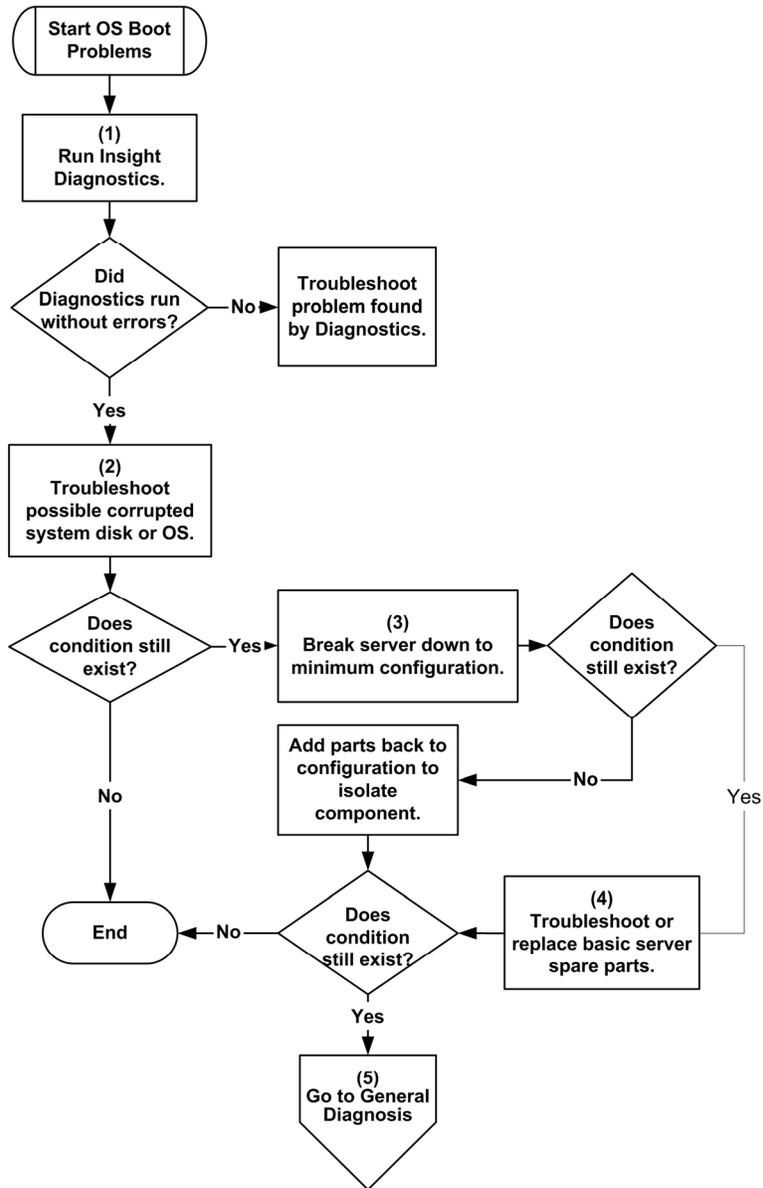
Symptoms:

- Server does not boot a previously installed operating system

Possible Causes:

- Corrupted operating system
- Hard drive subsystem problem

Item	Refer to
1	"HP Insight Diagnostics (on page <a href="#">22</a> )"
2	<ul style="list-style-type: none"><li>• "Operating system problems ("Introduction to software problems" on page <a href="#">76</a>)"</li><li>• "Contacting HP technical support or an authorized reseller (on page <a href="#">68</a>)"</li></ul>
3	Server user guide, located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> )
4	<ul style="list-style-type: none"><li>• "Hardware problems (on page <a href="#">41</a>)"</li><li>• Server maintenance and service guide, located on the Support CD or the HP website (<a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a>)</li></ul>
5	"General diagnosis flowchart (on page <a href="#">32</a> )"



## Server fault indications flowchart

Symptoms:

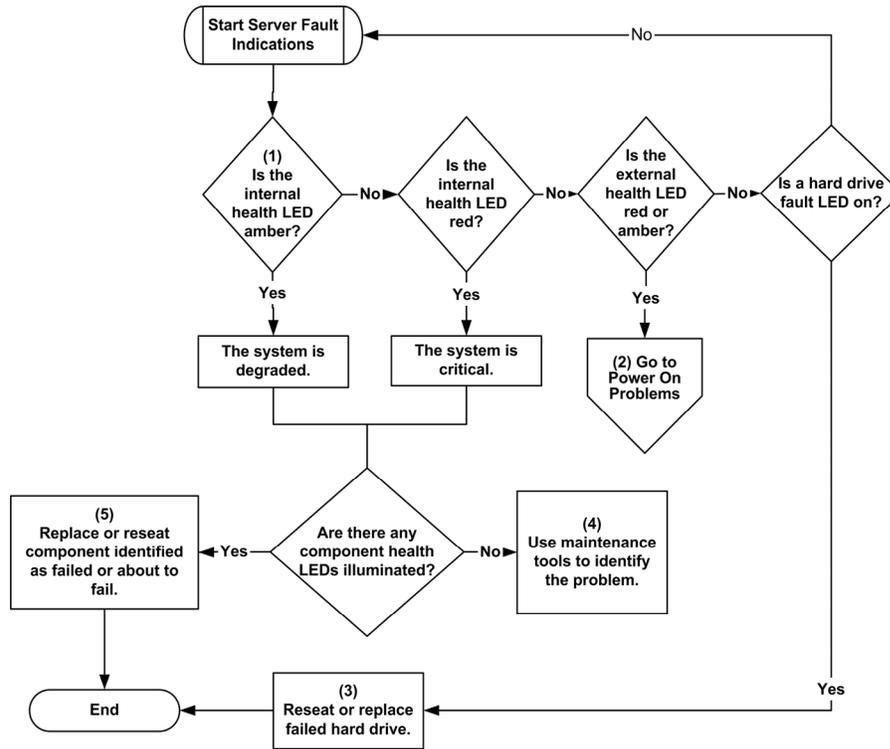
- Server boots, but the internal health LED or external health LED is red or amber

**NOTE:** For the location of server LEDs and information on their statuses, refer to the server documentation.

Possible causes:

- Improperly seated or faulty internal or external component
- Unsupported component installed
- Redundancy failure
- System overtemperature condition

Item	Refer to
1	Server user guide, located on the Support CD or the HP website ( <a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a> )
2	System Management Homepage at <a href="https://localhost:2381">https://localhost:2381</a> ( <a href="https://localhost:2381">https://localhost:2381</a> )
3	"Power-On problems ("Power-on problems flowchart" on page <a href="#">34</a> )"
4	<ul style="list-style-type: none"><li>• "Hard drive problems (on page <a href="#">53</a>)"</li><li>• Server maintenance and service guide, located on the Support CD or the HP website (<a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a>)</li></ul>
5	"HP Insight Diagnostics (on page <a href="#">22</a> )"
6	<ul style="list-style-type: none"><li>• "Hardware problems (on page <a href="#">41</a>)"</li><li>• Server maintenance and service guide, located on the Support CD or the HP website (<a href="http://www.hp.com/products/servers/platforms">http://www.hp.com/products/servers/platforms</a>)</li></ul>



## Hardware problems

The procedures in this section are comprehensive and include steps about or references to hardware features that may not be supported by the server you are troubleshooting.

### Hardware problems

Power problems (on page [42](#))

General hardware problems (on page [45](#))

Internal system problems (on page [48](#))

External Device Problems (on page [59](#))

System Short Circuit ("System open circuits and short circuits" on page [58](#))

## Power problems

Power source problems (on page [42](#))

Power supply problems (on page [42](#))

UPS problems (on page [43](#))

### Power source problems

#### Action:

1. Press the Power On/Standby button to be sure it is on. If the server has a Power On/Standby button that returns to its original position after being pressed, be sure you press the switch firmly.
2. Plug another device into the grounded power outlet to be sure the outlet works. Also, be sure the power source meets applicable standards.
3. Replace the power cord with a known functional power cord to be sure it is not faulty.
4. Replace the power strip with a known functional power strip to be sure it is not faulty.
5. Have a qualified electrician check the line voltage to be sure it meets the required specifications.
6. Be sure the proper circuit breaker is in the On position.

### Power supply problems

#### Action:

1. Be sure no loose connections (on page [23](#)) exist.

2. If the power supplies have LEDs, be sure they indicate that each power supply is working properly. Refer to the server documentation. If LEDs indicate a problem with a power supply, replace the power supply.
3. Be sure the system has enough power, particularly if you recently added hardware, such as hard drives. Additional power supplies may be required. Use the server documentation for product-specific information.

## UPS problems

### UPS is not working properly

#### Action:

1. Be sure the UPS batteries are charged to the proper level for operation. Refer to the UPS documentation for details.
2. Be sure the UPS power switch is in the On position. Refer to the UPS documentation for the location of the switch.
3. Be sure the UPS software is updated to the latest version. Use the Power Management software located on the Power Management CD.
4. Be sure the correct power cord is the correct type for the UPS and the country in which the server is located. Refer to the UPS reference guide for specifications.
5. Be sure the line cord is connected.
6. Be sure each circuit breaker is in the On position, or replace the fuse if needed. If this occurs repeatedly, contact an authorized service provider.
7. Check the UPS LEDs to be sure a battery or site wiring problem has not occurred. Refer to the UPS documentation.
8. If the UPS sleep mode is initiated, disable sleep mode for proper operation. The UPS sleep mode can be turned off through the configuration mode on the front panel.
9. Change the battery to be sure damage was not caused by excessive heat, particularly if a recent air conditioning outage has occurred.

**NOTE:** The optimal operating temperature for UPS batteries is 25°C (77°F). For approximately every 8°C to 10°C (16°F to 18°F) average increase in ambient temperature above the optimal temperature, battery life is reduced by 50 percent.

**Low battery warning is displayed**

**Action:**

1. Plug the UPS into an AC grounded outlet for at least 24 hours to charge the batteries, and then test the batteries. Replace the batteries if necessary.
2. Be sure the alarm is set appropriately by changing the amount of time given before a low battery warning. Refer to the UPS documentation for instructions.

**One or more LEDs on the UPS is red**

**Action:** Refer to the UPS documentation for instructions regarding the specific LED to determine the cause of the error.

**Unknown problem**

**Action:**

1. Disconnect power to the server.
2. Following the guidelines and cautionary information in the server documentation, strip the server to its most basic configuration by removing every card or device that is not necessary to start the server. Keep the monitor connected to view the server startup process.
3. Reconnect power, and then power the system on.
  - If the video does not work, refer to "Video problems (on page [59](#))."



**CAUTION:** Only authorized technicians trained by HP should attempt to remove the system board. If you believe the system board requires replacement, contact HP Technical Support before proceeding.

- If the system fails in this minimum configuration, one of the primary components has failed. If you have already verified that the processor, PPM, power supply, and memory are working before getting to this point, replace the system board. If not, be sure each of those components is working.

- If the system boots and video is working, add each component back to the server one at a time, restarting the server after each component is added to determine if that component is the cause of the problem. When adding each component back to the server, be sure to disconnect power to the server and follow the guidelines and cautionary information in the server documentation.

### General hardware problems

Problems with new hardware (on page [45](#))

Unknown problem (on page [44](#))

Third-Party Device Problems (on page [46](#))

Testing the Device (on page [47](#))

#### Problems with new hardware

##### Action:

1. Refer to the server documentation to be sure the hardware being installed is a supported option on the server. Remove unsupported hardware.
2. Refer to the release notes included with the hardware to be sure the problem is not caused by a last minute change to the hardware release. If no documentation is available, refer to the HP support website (<http://www.hp.com/support>).
3. Be sure the new hardware is installed properly. Refer to the device, server, and operating system documentation to be sure all requirements are met.

Common problems include:

- Incomplete population of a memory bank
- Installation of a processor without a corresponding PPM
- Installation of a SCSI device without termination or without proper ID settings
- Setting of an IDE device to Primary/Secondary when the other device is set to CS

- Connection of the data cable, but not the power cable, of a new device
- 4. Be sure no memory, I/O, or interrupt conflicts exist.
- 5. Be sure no loose connections (on page [23](#)) exist.
- 6. Be sure all cables are connected to the correct locations and are the correct lengths. For more information, refer to the server documentation.
- 7. Be sure other components were not unseated accidentally during the installation of the new hardware component.
- 8. Be sure all necessary software updates, such as device drivers, ROM updates, and patches, are installed and current. For example, if you are using a Smart Array controller, you need the latest Smart Array Controller device driver.
- 9. Be sure all device drivers are the correct ones for the hardware. Uninstall any incorrect drivers before installing the correct drivers.
- 10. Press the **F10** key to run the BIOS Setup Utility after boards or other options are installed or replaced to be sure all system components recognize the changes. If you do not run the utility, you may receive a POST error message indicating a configuration error. After you check the settings in the BIOS setup menu, press the **F10** key to save and exit the utility, and then restart the server.
- 11. Be sure all switch settings are set correctly. For additional information about required switch settings, refer to the labels located on the inside of the server access panel or the server documentation.
- 12. Be sure all boards are properly installed in the server.
- 13. Run HP Insight Diagnostics (on page [22](#)) to see if it recognizes and tests the device.
- 14. Uninstall the new hardware.

### Third-party device problems

#### Action:

1. Refer to the server and operating system documentation to be sure the server and operating system support the device.
2. Be sure the latest device drivers are installed.

3. Refer to the device documentation to be sure the device is properly installed. For example, a third-party PCI or PCI-X board may be required to be installed on the primary PCI or PCI-X bus, respectively.

### Testing the device

#### Action:

1. Uninstall the device.  
If the server works with the device removed and uninstalled, either a problem exists with the device, the server does not support the device, or a conflict exists with another device.
2. If the device is the only device on a bus, be sure the bus works by installing a different device on the bus.
3. Restarting the server each time to determine if the device is working, move the device:
  - a. To a different slot on the same bus (not applicable for PCI Express)
  - b. To a PCI, PCI-X, or PCI Express slot on a different bus
  - c. To the same slot in another working server of the same or similar design

If the board works in any of these slots, either the original slot is bad or the board was not properly seated. Reinsert the board into the original slot to verify.

4. If you are testing a board (or a device that connects to a board):
  - a. Test the board with all other boards removed.
  - b. Test the server with only that board removed.



**CAUTION:** Clearing NVRAM deletes the configuration information. Refer to the server documentation for complete instructions before performing this operation or data loss could occur.

5. Clearing NVRAM can resolve various problems. Clear the NVRAM, but do not use the backup .SCI file if prompted. Have available any .CFG, .OVL, or .PCF files that are required.

## Internal System Problems

CD-ROM and DVD Drive Problems (on page [48](#))

DAT Drive Problems (on page [49](#))

DLT Drive Problems ("DLTdrive problems" on page [50](#))

Fan Problems (on page [52](#))

Hard Drive Problems (on page [53](#))

Memory Problems (on page [55](#))

PPM Problems (on page [58](#))

Processor Problems (on page [57](#))

### CD-ROM and DVD drive problems

#### System does not boot from the drive

##### Action:

1. Be sure the drive boot order is set so that the server boots from the CD-ROM drive first.
2. If the CD-ROM drive jumpers are set to CS (the factory default), be sure the CD-ROM drive is installed as device 0 on the cable so that it is in position for the server to boot from the drive.
3. Be sure no loose connections (on page [23](#)) exist.
4. Be sure the media from which you are attempting to boot is not damaged and is a bootable CD.
5. If attempting to boot from a USB CD-ROM drive, refer to the operating system and server documentation to be sure both support booting from a USB CD-ROM drive.

**Data read from the drive is inconsistent, or drive cannot read data**

**Action:**

1. Clean the drive and media.
2. If a paper or plastic label has been applied to the surface of the CD or DVD in use, remove the label and any adhesive residue.
3. Be sure the inserted CD or DVD format is valid for the drive. For example, be sure you are not inserting a DVD into a drive that only supports CDs.

**Drive is not detected**

**Action:**

1. Be sure no loose connections (on page [23](#)) exist.
2. Refer to the drive documentation to be sure cables are connected as required.
3. Be sure the cables are working properly. Replace with known functional cables to test whether the original cables were faulty.
4. Be sure the correct, current driver is installed.

**DAT drive problems**

**Sense error codes are displayed**

**Action:** Refer to the *Troubleshooting DAT Drives* white paper for information on DAT drive sense error codes. Search for it on the HP website (<http://www.hp.com>).

**DAT drive error or failure occurs**

**Action:**

1. Be sure drivers, software, and firmware are upgraded to the latest revisions.
2. Clean the drive at least four times to be sure that the heads are clean and to eliminate dirty heads as the possible cause of the failure.

DAT drives require cleaning every 8 to 25 hours of use or they may fail intermittently when using marginal or bad media. Be sure you are following the proper cleaning procedures described in the device and server documentation.

**NOTE:** New DAT tapes may contain debris that will contaminate the DAT drive read/write head. If using new tapes for backup, clean the DAT drive frequently.

**DAT drive is providing poor performance**

**Action:** Be sure the drive is not being used to backup more data than is recommended for the drive. DAT drives are designed with optimum and maximum data backup sizes. Refer to the drive documentation to determine the appropriate data backup size for the drive.

**Latest firmware indicates a defective tape, or head clogs occur regularly**

**Action:** Replace the tape.

**Other errors are occurring**

**Action:** Replace the drive.

**DLTdrive problems**

**Server cannot write to tape**

**Action:**

- If the drive cleaning light is on, clean the drive.

**NOTE:** DLT cleaning cartridges are good for only 20 uses. If the cleaning cartridge is near that limit and the drive cleaning light is still on after running the cleaning cartridge, use a new cleaning tape to clean the drive.
- If the tape is write protected, remove the write protection. If the tape still does not work, insert another tape into the drive to see if the original tape is faulty.
- Refer to the tape drive documentation to be sure the type of tape being used is supported by the drive.

- Check each tape cartridge that has been used in the drive to verify its condition and inspect its tape leader to verify it is not damaged and is in the correct position. After you locate any bad cartridges, dispose of them. A working tape drive may drop its leader when using bad cartridges, indicating that they need replacing. If bad cartridges are found, you will need to inspect the DLT drive's leader assembly.
  - To examine the cartridge take-up leader, tilt the cartridge receiver door on the front of the drive and look inside to see that the drive leader is connected to the buckling link-hook.
  - To examine the drive take-up leader, tilt the cartridge receiver door on the front of the drive and look inside to see that the drive leader is connected to the buckling link-hook, which should be engaged in the leader slot.

**DLT drive failure occurs**

**Action:**

- Be sure the power and signal cables are properly connected.
- Be sure the power and signal cable connectors are not damaged.
- If the drive is connected to a nonembedded controller, be sure the controller is properly seated.

**DLT drive does not read tape**

**Action:**

- Be sure the drive is seated.
- Be sure the drive is installed properly.
- Check each tape cartridge that has been used in the drive to see if a leader was dropped. After you locate any bad cartridges, dispose of them. A working tape drive will drop the leader of a bad cartridge, indicating that the cartridge needs replacing.
- Refer to the tape drive documentation to be sure the type of tape being used is supported by the drive.

#### Server cannot find the DLT drive

##### Action:

- Be sure a device conflict does not exist. Check for duplicate SCSI IDs in use and refer to the documentation of the DLT drive and the array controller to be sure they are compatible.
- Be sure the maximum number of drives per controller has not been exceeded. Refer to the controller documentation to determine the capacity of the controller.

**NOTE:** It is recommended that no more than two DLT drives per bus exist.

- If using an external DLT drive that requires a SCSI terminator to be secured to the unused SCSI IN connector on the back of the drive, be sure the SCSI terminator is connected.

DLT drives can be daisy chained, but do not connect more than three units per SCSI controller. The last DLT drive in the chain requires the SCSI terminator.

- Check cables for damaged or bent connectors.

#### An error occurs during backup, but the backup is completed

**Action:** Contact the software vendor for more information about the message. If the error does not disrupt the backup, you may be able to ignore the error.

### Fan problems

#### General fan problems are occurring

##### Action:

1. Be sure the fans are properly seated and working.
  - a. Follow the procedures and warnings in the server documentation for removing the access panels and accessing and replacing fans.
  - b. Unseat, and then reseat, each fan according to the proper procedures.
  - c. Replace the access panels, and then attempt to restart the server.

2. Be sure the fan configuration meets the functional requirements of the server. Refer to the server documentation.
3. Be sure no ventilation problems exist. If you have been operating the server for an extended period of time with the access panel removed, airflow may have been impeded, causing thermal damage to components. Refer to the server documentation for further requirements.
4. Be sure no POST error messages are displayed while booting the server that indicate temperature violation or fan failure information. Refer to the server documentation for the temperature requirements for the server.
5. Replace any required non-functioning fans and restart the server. Refer to the server documentation for specifications on fan requirements.
6. Be sure all fan slots have fans or blanks installed. Refer to the server documentation for requirements.
7. Verify the fan airflow path is not blocked by cables or other material.

### **Hard drive problems**

#### **System completes POST but hard drive fails**

**Action:**

1. Be sure no loose connections (on page [23](#)) exist.
2. Be sure no device conflict exists.
3. Be sure the hard drive is properly cabled and terminated if necessary.
4. Be sure the SCSI cable is working by replacing it with a known functional cable.
5. Run Insight Diagnostics ("HP Insight Diagnostics" on page [22](#)) and replace failed components as indicated.

#### **Hard drive is not recognized by the server**

**Action:**

1. Check the LEDs on the hard drive to be sure they indicate normal function. Refer to the server documentation or the HP website for information on hard drive LEDs.
2. Be sure no loose connections (on page [23](#)) exist.

3. Remove the hard drive and be sure the configuration jumpers are set properly.
4. If using an array controller, be sure the hard drive is configured in an array. Run the array configuration utility.
5. Be sure the drive is properly configured. Refer to the drive documentation to determine the proper configuration.
6. If it is a non-hot-plug drive, be sure a conflict does not exist with another hard drive. Check for SCSI ID conflicts.
7. Be sure the correct drive controller drivers are installed.

**You are unable to access data**

**Action:**

1. Be sure the files are not corrupt. Run the repair utility for the operating system.
2. Be sure no viruses exist on the server. Run a current version of a virus scan utility.

**Server response time is slower than usual**

**Action:** Be sure the hard drive is not full, and increase the amount of free space on the hard drive, if needed. It is recommended that hard drives should have a minimum of 15 percent free space.

**No hard drives are recognized**

**Action:** Be sure no power problems (on page [42](#)) exist.

**A new hard drive is not recognized**

**Action:**

1. Be sure the drive bay is not defective by installing the hard drive in another bay.
2. If the drive has just been added, be sure the drive is supported. Refer to the server documentation or the HP website to determine drives support.

3. Run Insight Diagnostics ("HP Insight Diagnostics" on page [22](#)) and replace failed components as indicated.

### Memory problems

#### General memory problems are occurring

**Action:**

- Be sure the memory meets the server requirements and is installed as required by the server. Some servers may require that memory banks be fully populated or that all memory within a memory bank must be the same size, type, and speed. Refer to the server documentation to determine if the memory is installed properly.
- Check any server LEDs that correspond to memory slots.
- If you are unsure which DIMM has failed, test each bank of DIMMs by removing all other DIMMs. Then, isolate the failed DIMM by switching each DIMM in a bank with a known working DIMM.
- Remove any third-party memory.
- Run Insight Diagnostics to test the memory.

#### Server is out of memory

**Action:**

1. Be sure the memory is configured properly. Refer to the application documentation to determine the memory configuration requirements.
2. Be sure no operating system errors are indicated.
3. Be sure a memory count error ("Memory count error exists" on page [55](#)) did not occur. Refer to the message displaying memory count during POST.

#### Memory count error exists

**Possible Cause:** The memory modules are not installed correctly.

**Action:**

1. Be sure the memory modules are supported by the server. Refer to the server documentation.

2. Be sure the memory modules have been installed correctly in the right configuration. Refer to the server documentation.
3. Be sure the memory modules are properly seated.
4. Be sure no operating system errors are indicated.
5. Restart the server and check to see if the error message is still displayed.
6. Run Insight Diagnostics ("HP Insight Diagnostics" on page 22) and replace failed components as indicated.

**Server fails to recognize existing memory**

**Action:**

1. Reseat the memory.
2. Be sure the memory is configured properly. Refer to the server documentation.
3. Be sure a memory count error ("Memory count error exists" on page 55) did not occur. Refer to the message displaying memory count during POST.

**Server fails to recognize new memory**

**Action:**

1. Be sure the memory is the correct type for the server and is installed according to the server requirements. Refer to the server documentation or HP website (<http://www.hp.com>).
2. Be sure you have not exceeded the memory limits of the server or operating system. Refer to the server documentation.
3. Be sure the memory is properly seated.
4. Be sure no conflicts are occurring with existing memory. Run the server setup utility.
5. Test the memory by installing the memory into a known working server. Be sure the memory meets the requirements of the new server on which you are testing the memory.
6. Replace the memory. Refer to the server documentation.

## Processor problems

### Action:

1. If applicable, check the processor LEDs to identify if a PPM failure occurred. For information on LEDs, refer to the server documentation.
2. Be sure each processor is supported by the server and is installed properly. Refer to the server documentation for processor requirements.
3. Be sure the server ROM is up to date.
4. Be sure you are not mixing processor stepping, core speeds, or cache sizes if this is not supported on the server. Refer to the server documentation for more information.



**CAUTION:** Removal of some processors and heatsinks require special considerations for replacement, while other processors and heatsinks are integrated and cannot be reused once separated. For specific instructions for the server you are troubleshooting, refer to processor information in the Hardware options installation (on page [17](#)) section on the Documentation CD.

5. If the server has only one processor installed, replace it with a known functional processor. If the problem is resolved after you restart the server, the original processor failed.
6. If the server has multiple processors installed, test each processor:
  - a. Remove all but one processor from the server. Replace each with a processor terminator board or blank, if applicable to the server.
  - b. If the server includes PPMs that are not integrated on the system board, remove all PPMs from the server except for the PPM associated with the remaining processor.
  - c. Replace the remaining processor with a known functional processor. If the problem is resolved after you restart the server, a fault exists with one or more of the original processors. Install each processor and its associated PPM (if applicable) one by one, restarting each time, to find the faulty processor or processors. Be sure the processor configurations at each step are compatible with the server requirements.

## PPM problems

**Action:** If the PPMs are not integrated on the system board:



**CAUTION:** Do not operate the server for long periods without the access panel. Operating the server without the access panel results in improper airflow and improper cooling that can lead to thermal damage.

1. If applicable, check the PPM LEDs to identify if a PPM failure occurred. For information on LEDs, refer to the server documentation.
2. Reseat each PPM, and then restart the server.
3. If reseating the PPMs is not effective, remove all but one PPM, restart the server to see if the PPM is working, and then install each PPM individually, cycling power each time. Follow the warnings and cautionary information in the server documentation.

## System open circuits and short circuits

**Action:**



**CAUTION:** Do not operate the server for long periods without the access panel. Operating the server without the access panel results in improper airflow and improper cooling that can lead to thermal damage.

1. Check the server LEDs to see if any statuses indicate the source of the problem. For LED information, refer to the server documentation.
2. Remove all power sources to the server.
3. Be sure no loose connections (on page [23](#)) exist in the area.
4. Be sure each component in the area is working. Refer to the section for each component in this guide.

If you cannot determine the problem by checking the specific area, perform each of the following actions. Restart the server after each action to see if the problem has been corrected.

- Reseat all I/O expansion boards.

- Be sure no loose connections (on page [23](#)) exist in the rest of the server, particularly with the cables that connect to the system board.
- Be sure no foreign material exists, such as screws, bits, or slot bracket blanks, that may be short circuiting components.

### External device problems

Video problems (on page [59](#))

Audio problems (on page [61](#))

Printer problems (on page [61](#))

Mouse and keyboard problems (on page [61](#))

Diagnostic adapter problems (on page [62](#))

Modem problems (on page [62](#))

Network controller problems (on page [66](#))

### Video problems

**Screen is blank for more than 60 seconds after you power up the server**

**Action:**

1. Power up the monitor and be sure the monitor light is on, indicating that the monitor is receiving power.
2. Be sure the monitor power cord is plugged into a working grounded (earthed) AC outlet.
3. Be sure the monitor is cabled to the intended server or KVM connection.
4. Be sure no loose connections (on page [23](#)) exist.
  - For rack-mounted servers, check the cables to the KVM switch and be sure the switch is correctly set for the server. You may need to connect the monitor directly to the server to be sure the KVM switch has not failed.

- For tower-model servers, check the cable connection from the monitor to the server, and then from the server to the power outlet.
- 5. Press any key, or type the password, and wait a few moments for the screen to activate to be sure the energy saver feature is not in effect.
- 6. Be sure the video driver is current. Refer to the third-party video adapter documentation for driver requirements.
- 7. Be sure a video expansion board has not been added to replace onboard video, making it seem like the video is not working. Disconnect the video cable from the onboard video, and then reconnect it to the video jack on the expansion board.

**NOTE:** All servers automatically bypass onboard video when a video expansion board is present.

- 8. Press any key, or type the password, and wait a few moments for the screen to activate to be sure the power-on password feature is not in effect. You can also tell if the power-on password is enabled if a key symbol is displayed on the screen when POST completes.

If you do not have access to the password, you must disable the power-on password by using the Password Disable switch on the system board. Refer to the server documentation.

- 9. If the video expansion board is installed in a PCI Hot Plug slot, be sure the slot has power by checking the power LED on the slot, if applicable. Refer to the server documentation.
- 10. Be sure the server and the operating system support the video expansion board.

**Monitor does not function properly with energy saver features**

**Action:** Be sure the monitor supports energy saver features, and if it does not, disable the features.

**Video colors are wrong**

**Action:**

- Be sure the 15-pin VGA cable is securely connected to the correct VGA port on the server and to the monitor.

- Be sure the monitor and any KVM switch are compatible with the VGA output of the server.

**Slow-moving horizontal lines are displayed**

**Action:** Be sure magnetic field interference is not occurring. Move the monitor away from other monitors or power transformers.

**Audio problems**

**Action:** Be sure the server speaker is connected. Refer to the server documentation.

**Printer problems**

**Printer does not print**

**Action:**

1. Be sure the printer is powered up and online.
2. Be sure no loose connections (on page [23](#)) exist.
3. Be sure the correct printer drivers are installed.

**Printer output is garbled**

**Action:** Be sure the correct printer drivers are installed.

**Mouse and keyboard problems**

**Action:**

1. Be sure no loose connections (on page [23](#)) exist. If a KVM switching device is in use, be sure the server is properly connected to the switch.
  - For rack-mounted servers, check the cables to the switch box and be sure the switch is correctly set for the server.
  - For tower-model servers, check the cable connection from the input device to the server.

2. If a KVM switching device is in use, be sure all cables and connectors are the proper length and are supported by the switch. Refer to the switch documentation.
3. Be sure the current drivers for the operating system are installed.
4. Be sure the device driver is not corrupted by replacing the driver.
5. Restart the system and check whether the input device functions correctly after the server restarts.
6. Replace the device with a known working equivalent device (another similar mouse or keyboard).
  - If the problem still occurs with the new mouse or keyboard, the connector port on the system I/O board is defective. Replace the board.
  - If the problem no longer occurs, the original input device is defective. Replace the device.
7. Be sure the keyboard or mouse is connected to the correct port. Determine whether the keyboard lights flash at POST or the NumLock LED illuminates. If not, change port connections.
8. Be sure the keyboard or mouse is clean.

### Diagnostic adapter problems

**NOTE:** The diagnostic adapter is used only with ProLiant BL servers.

**Action:** If the diagnostic adapter does not have hot-plug functionality, be sure you are not using a PS/2 keyboard or mouse. With a PS/2 keyboard or mouse, the diagnostic adapter cannot be connected as a hot-plug device. Connect the diagnostic adapter before booting the server, or switch to USB devices (if supported) to use the diagnostic adapter hot-plug functionality.

### Modem problems

#### No dial tone exists

**Action:**

1. Be sure the cables are plugged in as specified in the modem documentation.
2. Connect a working telephone directly to the wall jack, and then test the line for dial tone.

3. If no dial tone is detected, the phone line is not working. Contact the local telephone company and arrange to correct the problem.

**Modem does not connect to another modem**

**Action:**

1. Be sure a dial tone exists ("No dial tone exists" on page [62](#)).
2. Be sure the line is not in use at another extension before using it.
3. Be sure you are dialing the correct telephone number.
4. Be sure the modem on the other end is working.

**No response occurs when you type AT commands**

**Action:** Reconfigure the COM port address for the modem.

1. Be sure the communications software is set to the COM port to which the modem is connected.
2. Check IRQ settings in the software and on the modem to be sure no conflict exists.
3. Type `AT&F` at the command prompt to reset the modem to factory-default settings.
4. Be sure you are in terminal mode and not MS-DOS mode.
5. Refer to the HP website (<http://www.hp.com>) for a complete list of AT commands.

**AT commands are not visible**

**Action:** Set the echo command to On using the AT command `ATE`.

**Data is displayed as garbled characters after the connection is established**

**Action:**

1. Be sure both modems have the same settings, including speed, data, parity, and stop bits.
2. Be sure the software is set for the correct terminal emulation.
  - a. Reconfigure the software correctly.

- b. Restart the server.
- c. Run the communications software, checking settings and making corrections where needed.
- d. Restart the server, and then reestablish the modem connection.

**Modem does not answer an incoming call**

**Action:**

1. Enable the auto-answer option in the communications software.
2. Be sure an answering machine is not answering the line before the modem is able to answer.
  - a. Turn off the answering machine.

-Or-

Reconfigure the auto-answer option to respond in fewer rings than the answering machine.

- b. Restart the server, and then reattempt the connection.

**Modem disconnects while online**

**Action:**

1. Be sure no loose connections (on page [23](#)) exist.
2. Be sure no line interference exists. Retry the connection by dialing the number several times. If conditions remain poor, contact the telephone company to have the line tested.
3. Be sure an incoming call is not breaking the connection due to call waiting. Disable call waiting, and then reestablish the connection.

**AT command initialization string is not working**

**Action:** Use the most basic string possible to perform the task. The default initialization string is AT&F&C1&D2&K3.

**Connection errors are occurring**

**Action:**

1. Check the maximum baud rate for the modem to which you are connecting, and then change the baud rate to match.
2. If the line you are accessing requires error control to be turned off, do so using the AT command `AT&Q6%C0`.
3. Be sure no line interference exists. Retry the connection by dialing the number several times. If conditions remain poor, contact the telephone company to have the line tested.
4. Be sure the modem is current and compliant with CCITT and Bell standards. Replace with a supported modem if needed.

**You are unable to connect to an online subscription service**

**Action:**

1. If the line you are accessing requires error control to be turned off, do so using the AT command `AT&Q6%C0`.
2. If the ISP you are accessing requires access at a decreased baud rate, reconfigure the communications software to correct the connection baud rate to match the ISP.
3. If this does not work, force a slower baud rate (14400 baud) with the AT command `AT&Q6N0S37=11`.

**You are unable to connect at 56 Kbps**

**Action:**

1. Find out the maximum baud rate at which the ISP connects, and change the settings to reflect this. Reattempt to connect at a lower baud rate.
2. Be sure no line interference exists. Retry the connection by dialing the number several times. If conditions remain poor, contact the telephone company to have the line tested.

## Network controller problems

### Network controller is installed but not working

#### Action:

1. Check the network controller LEDs to see if any statuses indicate the source of the problem. For LED information, refer to the network controller documentation.
2. Be sure no loose connections (on page [23](#)) exist.
3. Be sure the network cable is working by replacing it with a known functional cable.
4. Be sure a software problem has not caused failure. Refer to the operating system documentation for guidelines on adding or replacing PCI Hot Plug devices, if applicable.
5. Be sure the server and operating system support the controller. Refer to the server and operating system documentation.
6. Be sure the controller is enabled in the BIOS Setup Utility.
7. Check the PCI Hot Plug power LED to be sure the PCI slot is receiving power, if applicable.
8. Be sure the server ROM is up to date.
9. Be sure the controller drivers are up to date.
10. Be sure a valid IP address is assigned to the controller and that the configuration settings are correct.
11. Run Insight Diagnostics ("HP Insight Diagnostics" on page [22](#)) and replace failed components as indicated.

### Network controller has stopped working

#### Action:

1. Check the network controller LEDs to see if any statuses indicate the source of the problem. For LED information, refer to the network controller documentation.
2. Be sure the correct network driver is installed for the controller and that the driver file is not corrupted. Reinstall the driver.

3. Be sure no loose connections (on page [23](#)) exist.
4. Be sure the network cable is working by replacing it with a known functional cable.
5. Check the PCI Hot Plug power LED to be sure the PCI slot is receiving power, if applicable.
6. Be sure the network controller is not damaged.
7. Run Insight Diagnostics ("HP Insight Diagnostics" on page [22](#)) and replace failed components as indicated.

**Network controller stopped working when an expansion board was added**

**Action:**

1. Be sure no loose connections (on page [23](#)) exist.
2. Be sure the server and operating system support the controller. Refer to the server and operating system documentation.
3. Be sure the new expansion board has not changed the server configuration, requiring reinstallation of the network driver.
  - a. Uninstall the network controller driver for the malfunctioning controller in the operating system.
  - b. Restart the server, run BIOS Setup Utility, and be sure the server recognizes the controller and resources are available for the controller.
  - c. Restart the server, and then reinstall the network driver.
4. Refer to the operating system documentation to be sure the correct drivers are installed.
5. Refer to the operating system documentation to be sure that the driver parameters match the configuration of the network controller.

**Problems are occurring with the network interconnect blades**

**Action:** Be sure the network interconnect blades are properly seated and connected.

## Contacting HP

Contacting HP technical support or an authorized reseller (on page [68](#))

Server information you need (on page [69](#))

### Contacting HP technical support or an authorized reseller

Contact HP only if, after completing the procedures described in this guide, the problem with the server remains.

**IMPORTANT:** Collect the appropriate server information ("Server information you need" on page [69](#)) and operating system information ("Operating system information you need" on page [70](#)) before contacting HP for support.

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- In other locations, refer to the HP website (<http://www.hp.com>).

For HP technical support:

- In North America:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website (<http://www.hp.com>).
- Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, refer to the HP website (<http://www.hp.com>).

## Server information you need

Before contacting HP, collect the following:

- All information from any troubleshooting efforts to this point.
- A printed copy of the system and operating environment information and a copy of any historical data that might be relevant. If possible, obtain an electronic copy of this information to send by e-mail to a support specialist. To collect this information, run the Survey Utility (if available) and refer to the server documentation.
- A list of the system components:
  - Product, model, and serial number
  - Hardware configuration
  - Add-on boards
  - Monitor
  - Connected peripherals such as tape drives
- A list of all third-party hardware and software:
  - Complete product name and model
  - Complete company name
  - Product version
  - Driver version
- Any notes describing the details of the problem, including recent changes to the system, the events that triggered or are associated with the problem, and the steps needed to reproduce the problem.
- Notes on anything nonstandard about the server setup.
- Operating system information ("Operating system information you need" on page [70](#))

## Operating system information you need

Depending on the problem, you may be asked for certain pieces of information. Be prepared to access the information listed in the following sections, based on operating system used.

### Microsoft operating systems

Collect the following information:

- Whether the operating system was factory installed
- Operating system version number
- A current copy of the following files:
  - WinMSD (Msinfo32.exe on Microsoft® Windows® 2000 systems)
  - Boot.ini
  - Memory.dmp
  - Event logs
  - Dr. Watson log (drwtsn32.log) if a user mode application, such as the Insight Agents, is having a problem
  - IRQ and I/O address information in text format
- An updated Emergency Repair Diskette
- If HP drivers are installed:
  - Version of the PSP used
  - List of drivers from the PSP
- The drive subsystem and file system information:
  - Number and size of partitions and logical drives
  - File system on each logical drive
- Current level of Microsoft® Windows® Service Packs and Hotfixes installed
- A list of each third-party hardware component installed, with the firmware revision

- A list of each third-party software component installed, with the version
- A detailed description of the problem and any associated error messages

**Linux operating systems**

Collect the following information:

- Operating system distribution and version  
 Look for a file named */etc/distribution-release* (for example, */etc/redhat-release*)
- Kernel version in use
- Output from the following commands (performed by root):
  - `lspci -v`
  - `uname -a`
  - `cat /proc/meminfo`
  - `cat /proc/cpuinfo`
  - `rpm -ga`
  - `dmesg`
  - `lsmod`
  - `ps -ef`
  - `ifconfig -a`
  - `chkconfig -list`
  - `mount`
- Contents of the following files:
  - `/var/log/messages`
  - `/etc/modules.conf` or `etc/conf.modules`
  - `/etc/lilo.conf` or `/etc/grub.conf`
  - `/etc/fstab`
- If HP drivers are installed:

- Version of the PSP used
- List of drivers from the PSP (/var/log/hppldu.log)
- A list of each third-party hardware component installed, with the firmware revisions
- A list of each third-party software component installed, with the versions
- A detailed description of the problem and any associated error messages

**Novell NetWare operating systems**

Collect the following information:

- Whether the operating system was factory installed
- Operating system version number
- Printouts or electronic copies (to e-mail to a support technician) of AUTOEXEC.NCF, STARTUP.NCF, and the system directory
- A list of the modules. Use CONLOG.NLM to identify the modules and to check whether errors occur when the modules attempt to load.
- A list of any SET parameters that are different from the NetWare default settings
- A list of the drivers and NLM files used on the server, including the names, versions, dates, and sizes (can be taken directly from the CONFIG.TXT or SURVEY.TXT files)
- If HP drivers are installed:
  - Version of the PSP used
  - List of drivers from the PSP
- Printouts or electronic copies (to e-mail to a support technician) of:
  - SYS:SYSTEM\SYS\$LOG.ERR
  - SYS:SYSTEM\ABEND.LOG
  - SYS:ETC\CPQLOG.LOG
  - SYS:SYSTEM\CONFIG.TXT

- SYS:SYSTEM\SURVEY.TXT
- Current patch level
- A list of each third-party hardware component installed, with the firmware revisions
- A list of each third-party software component installed, with the versions
- A detailed description of the problem and any associated error messages

**SCO operating systems**

Collect the following information:

- Installed system software versions (TCP/IP, VP/Ix)
- Process status at time of failure, if possible
- Printouts or electronic copies (to e-mail to a support technician) of:
  - Output of `/etc/hwconfig` command
  - Output of `/usr/bin/swconfig` command
  - Output of `/etc/ifconfig` command
  - `/etc/conf/cf.d/sdevice`
  - `/etc/inittab`
  - `/etc/conf/cf.d/stune`
  - `/etc/conf/cf.d/config.h`
  - `/etc/conf/cf.d/sdevice`
  - `/var/adm/messages` (if PANIC messages are displayed)
- If HP drivers are installed:
  - Version of the EFS used
  - List of drivers from the EFS
- If management agents are installed, version number of the agents
- System dumps, if they can be obtained (in case of panics)

- A list of each third-party hardware component installed, with the firmware revisions
- A list of each third-party software component installed, with the versions
- A detailed description of the problem and any associated error messages

**IBM OS/2 operating systems**

Collect the following information:

- Operating system version number and printouts or electronic copies (to e-mail to a support technician) of:
  - IBMLAN.INI
  - PROTOCOL.INI
  - CONFIG.SYS
  - STARTUP.CMD
  - SYSLEVEL information in detail
  - TRAPDUMP information (if a TRAP error occurs)
- A directory listing of:
  - C:\
  - C:\OS2
  - C:\OS2\BOOT
  - HPFS386.INI (for Advanced or Advanced with SMP)
- If HP drivers are installed:
  - Version of the SSD used
  - List of drivers from the SSD
  - Versions of the OS/2 Management Insight Agents, CPQB32.SYS, and OS/2 Health Driver use
- The drive subsystem and file system information:
  - Number and size of partitions and logical drives

- File system on each logical drive
- Warp Server version used and:
  - Whether Entry, Advanced, Advanced with SMP, or e-Business
  - All services running at the time the problem occurred
- A list of each third-party hardware component installed, with the firmware revisions
- A list of each third-party software component installed, with the versions
- A detailed description of the problem and any associated error messages

**Sun Solaris operating systems**

Collect the following information:

- Operating system version number
- Type of installation selected: Interactive, WebStart, or Customer JumpStart
- Which software group selected for installation: End User Support, Entire Distribution, Developer System Support, or Core System Support
- If HP drivers are installed with a DU:
  - DU number
  - List of drivers in the DU diskette
- The drive subsystem and file system information:
  - Number and size of partitions and logical drives
  - File system on each logical drive
- A list of all third-party hardware and software installed, with versions
- A detailed description of the problem and any associated error messages
- Printouts or electronic copies (to e-mail to a support technician) of:
  - /usr/sbin/crash (accesses the crash dump image at /var/crash/\$hostname)
  - /var/adm/messages
  - /etc/vfstab

– /usr/sbin/prtconf

## Software tools and solutions

Software problems ("Introduction to software problems" on page [76](#))

Firmware maintenance (on page [81](#))

### Introduction to software problems

The best sources of information for software problems are the operating system and application software documentation, which may also point to fault detection tools that report errors and preserve the system configuration.

Another useful resource is HP Insight Diagnostics. Use this utility to gather critical system hardware and software information and to help with problem diagnosis.

**IMPORTANT:** This guide provides information for multiple servers. Some information may not apply to the server you are troubleshooting. Refer to the server documentation for information on procedures, hardware options, software tools, and operating systems supported by the server.

Refer to "Server software and configuration utilities (on page [21](#))" for more information.

### Operating system updates

Use care when applying operating system updates (Service Packs, hotfixes, and patches). Before updating the operating system, read the release notes for each update. If you do not require specific fixes from the update, it is recommended that you do **not** apply the updates. Some updates overwrite files specific to HP.

If you decide to apply an operating system update:

1. Perform a full system backup.
2. Apply the operating system update, using the instructions provided.
3. Install the current drivers.

If you apply the update and have problems, refer to the Software and Drivers Download website (<http://h18007.www1.hp.com/support/files/server>) to find files to correct the problems.

## Operating system problems

### Operating system locks up

**Action:** Scan for viruses with an updated virus scan utility.

### Errors are displayed in the error log

**Action:** Follow the information provided in the error log, and then refer to the operating system documentation.

### Problems occur after the installation of a service pack

**Action:** Follow the instructions for updating the operating system ("Operating system updates" on page [76](#)).

### You are unable to bind NICs during the Protocols Interview with a Factory-Installed Novell NetWare 5 operating system

**Action:** Be sure the packet receive buffers are set high enough. Toggle over to the console during the Protocols Interview and adjust these values to a higher setting that allows you to bind the NICs. A minimum setting of 50 buffers per port is recommended, and the maximum setting should be 125 more than the minimum. To make the setting changes:

1. Type the following commands at the System Console screen (where XXX is the new numeric value):

```
Set Minimum Packet Receive Buffers=XXX
```

```
Set Maximum Packet Receive Buffers=XXX
```

2. Add the commands to the STARTUP.NCF file.

**NOTE:** When gigabit NICs are installed, the minimum buffers should be set to at least 500, and the maximum to at least 2000.

**During installation of Sun Solaris, the system locks up or a panic error occurs**

**Action:** Disable ACPI support in Sun Solaris. Refer to the Sun website (<http://www.sun.com>) for documentation on how to disable ACPI.

**Restoring to a backed-up version**

If you recently upgraded the operating system or software and cannot resolve the problem, you can try restoring a previously saved version of the system. Before restoring the backup, make a backup of the current system. If restoring the previous system does not correct the problem, you can restore the current set to be sure you do not lose additional functionality.

Refer to the documentation provided with the backup software.

**When to reconfigure or reload software**

If all other options have not resolved the problem, consider reconfiguring the system. Before you take this step:

1. Weigh the projected downtime of a software reload against the time spent troubleshooting intermittent problems. It may be advantageous to start over by removing and reinstalling the problem software.
2. Be sure the server has adequate resources (processor speed, hard drive space, and memory) for the software.
3. Be sure the server ROM is current and the configuration is correct.
4. Be sure you have printed records of all troubleshooting information you have collected to this point.
5. Be sure you have two good backups before you start. Test the backups using a backup utility.
6. Check the operating system and application software resources to be sure you have the latest information.
7. If the last-known functioning configuration does not work, try to recover the system with operating system recovery software:
  - Microsoft® operating systems:

Windows® 2003—Automated System Recovery Diskette. If the operating system was factory-installed, click **Start>All Programs>Accessories>System Tools** to access the backup utility. Refer to the operating system documentation for more information.

Windows® 2000—Emergency Repair Diskette. If the operating system was factory-installed, click **Start>Programs>System Tools** to access the Emergency Repair Disk Utility. Refer to the operating system documentation for more information.

- Novell NetWare—Repair traditional volumes with VREPAIR. On NetWare 5.X systems, repair NSS volumes with the NSS menu command, and on NetWare 6 systems, repair NSS volumes using the NSS/PoolVerify command followed by the NSS/PoolRebuild command, if necessary. Refer to the NetWare documentation for more information.
- Caldera UnixWare and SCO OpenServer from Caldera—Emergency boot diskette. Refer to the Caldera UnixWare or SCO OpenServer from Caldera documentation for more information.
- Sun Solaris—Device Configuration Assistant boot diskette. Refer to the Solaris documentation for more information.
- IBM OS/2—Power up the server from the startup diskettes. Refer to the OS/2 documentation for more information.
- Linux—Refer to the operating system documentation for information.

**Linux operating systems**

For troubleshooting information specific to Linux operating systems, refer to the Linux for ProLiant website (<http://h18000.www1.hp.com/products/servers/linux>).

**Application software problems**

**List of Problems:**

Software locks up ..... [80](#)  
 Errors occur after a software setting is changed ..... [80](#)  
 Errors occur after the system software is changed ..... [80](#)  
 Errors occur after an application is installed ..... [80](#)

### **Software locks up**

**Action:**

1. Check the application log and operating system log for entries indicating why the software failed.
2. Check for incompatibility with other software on the server.
3. Check the support website of the software vendor for known problems.
4. Review log files for changes made to the server which may have caused the problem.
5. Scan the server for viruses with an updated virus scan utility.

### **Errors occur after a software setting is changed**

**Action:** Check the system logs to determine what changes were made, and then change settings to the original configuration.

### **Errors occur after the system software is changed**

**Action:** Change settings to the original configuration. If more than one setting was changed, change the settings one at a time to isolate the cause of the problem.

### **Errors occur after an application is installed**

**Action:**

- Check the application log and operating system log for entries indicating why the software failed.
- Check system settings to determine if they are the cause of the error. You may need to obtain the settings from the server setup utility and manually set the software switches. Refer to the application documentation, the vendor website, or both.
- Check for overwritten files. Refer to the application documentation to find out which files are added by the application.
- Reinstall the application.

- Be sure you have the most current drivers.

## Firmware maintenance

HP has developed technologies that ensure that HP servers provide maximum uptime with minimal maintenance. Many of these technologies also reduce server management efforts, enabling administrators to work on issues and resolve problems without taking servers offline.

### Types of ROM

Types of ROMs include:

- System ROMs (on page [81](#))
- Option ROMs (on page [81](#))

#### System ROMs

A system reboot is required for a ROM upgrade to take effect. For disaster recovery or ROM downgrade purposes, backups of the most current ROM image are available in either redundant ROM or a ROM backup.

#### Option ROMs

Types of option ROMs include:

- Array controller ROMs
- Integrated Lights-Out (iLO) ROMs
- Hard drive ROMs

### Flashing ROM

The process of upgrading system and option ROMs is referred to as **flashing the ROM**. A ROM flash uses software to replace the current system ROM on a target server with a new ROM image. Flash the ROM to:

- Support new features
- Correct problems in a previous ROM version

## ROMPaq Utility

Flash ROM enables you to upgrade the firmware (BIOS) with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into the diskette drive and boot the system.

The ROMPaq utility checks the system and provides a choice (if more than one exists) of available ROM revisions. This procedure is the same for both system and option ROMPaq utilities.

For more information about the ROMPaq utility, refer to the HP website (<http://www.hp.com/servers/manage>).

To flash the ROM using ROMPaq:

1. Download the system ROMPaq utility diskette for each target server or option for which a ROM flash is planned. ROMPaq downloads are available on the HP website (<http://www.hp.com/support>).
2. Shut down each server where the system or option ROM images are to be upgraded and reboot using the correct ROMPaq diskette for that server.
3. Follow the interactive session in the ROMPaq utility, which enables you to select the devices to be flashed.
4. After the ROMPaq utility flashes the ROM for the selected devices, cycle power manually to reboot the system back into the operating system.

## Drivers

HP drivers and utilities can be found on the Support CD. For the latest drivers and information on supported operating systems, refer to the HP website (<http://www.hp.com/support>).

**IMPORTANT:** Always perform a backup before installing or updating device drivers.

## Battery replacement

If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years.



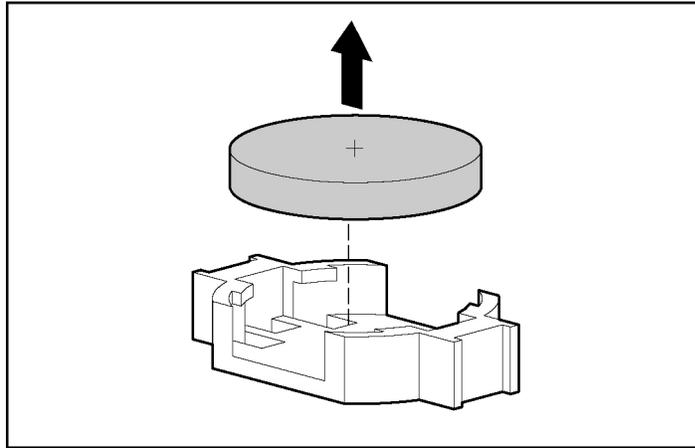
**WARNING:** The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

To remove the component:

1. Power down the server ("Powering down the server" on page [7](#)).
2. Extend the server from the rack, if applicable.
3. Remove the access panel ("Access Panel" on page [8](#)).
4. Remove any hardware that will interfere with accessing the battery.

5. Remove the battery.



To replace the component, reverse the removal procedure.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

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## Regulatory compliance notices

### In This Section

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## Regulatory compliance identification numbers

For the purpose of regulatory compliance certifications and identification, this product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

## Federal Communications Commission notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

### FCC rating label

The FCC rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or ID on the label. Class A devices do not have an FCC logo or ID on the label. After you determine the class of the device, refer to the corresponding statement.

### Class A equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

## Class B equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit that is different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

## Declaration of conformity for products marked with the FCC logo, United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding this product, contact us by mail or telephone:

- Hewlett-Packard Company  
P. O. Box 692000, Mail Stop 530113  
Houston, Texas 77269-2000
- 1-800-HP-INVENT (1-800-474-6836). (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact us by mail or telephone:

- Hewlett-Packard Company  
P. O. Box 692000, Mail Stop 510101  
Houston, Texas 77269-2000
- 1-281-514-3333

To identify this product, refer to the part, series, or model number found on the product.

## Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

## Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

## Canadian notice (Avis Canadien)

### Class A equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### Class B equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## European Union regulatory notice

This product complies with the following EU Directives:

- Low Voltage Directive 73/23/EEC
- EMC Directive 89/336/EEC

Compliance with these directives implies conformity to applicable harmonized European standards (European Norms) which are listed on the EU Declaration of Conformity issued by Hewlett-Packard for this product or product family.

This compliance is indicated by the following conformity marking placed on the product:



This marking is valid for non-Telecom products and EU harmonized Telecom products (e.g. Bluetooth).



This marking is valid for EU non-harmonized Telecom products.

\*Notified body number (used only if applicable—refer to the product label)

## Japanese notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

## BSMI notice

### 警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

## Korean notice A&B

### Class A equipment

#### A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

### Class B equipment

#### B급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

## Laser compliance

This product may be provided with an optical storage device (that is, CD or DVD drive) and/or fiber optic transceiver. Each of these devices contains a laser that is classified as a Class 1 Laser Product in accordance with US FDA regulations and the IEC 60825-1. The product does not emit hazardous laser radiation.



**WARNING: Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:**

- **Do not try to open the module enclosure. There are no user-serviceable components inside.**
- **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**
- **Allow only HP Authorized Service technicians to repair the unit.**

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

## Battery replacement notice



**WARNING: The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:**

- **Do not attempt to recharge the battery.**
- **Do not expose the battery to temperatures higher than 60°C (140°F).**
- **Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.**



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, an authorized HP Partner, or their agents.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

## Taiwan battery recycling notice

The Taiwan EPA requires dry battery manufacturing or importing firms in accordance with Article 15 of the Waste Disposal Act to indicate the recovery marks on the batteries used in sales, giveaway or promotion. Contact a qualified Taiwanese recycler for proper battery disposal.



## Power cord statement for Japan

製品には、同梱された電源コードをお使い下さい。  
同梱された電源コードは、他の製品では使用出来ません。



# Electrostatic discharge

## In This Section

Preventing electrostatic discharge .....	<a href="#">95</a>
Grounding methods to prevent electrostatic discharge.....	<a href="#">96</a>

## Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

## Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm  $\pm$ 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact an authorized reseller.

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## Technical support

### In This Section

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## HP contact information

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- In other locations, refer to the HP website (<http://www.hp.com>).

For HP technical support:

- In North America:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website (<http://www.hp.com>).
- Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, refer to the HP website (<http://www.hp.com>).

## Before you contact HP

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)

- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

## Customer self repair

What is customer self repair?

HP's customer self-repair program offers you the fastest service under either warranty or contract. It enables HP to ship replacement parts directly to you so that you can replace them. Using this program, you can replace parts at your own convenience.

A convenient, easy-to-use program:

- An HP support specialist will diagnose and assess whether a replacement part is required to address a system problem. The specialist will also determine whether you can replace the part.
- For specific information about customer replaceable parts, refer to the maintenance and service guide on the HP website (<http://www.hp.com/support>).

## Acronyms and abbreviations

**ACPI**

Advanced Configuration and Power Interface

**BIOS**

Basic Input/Output System

**CCITT**

International Telegraph and Telephone Consultative Committee

**CS**

cable select

**DIMM**

dual inline memory module

**DU**

driver update

**EFS**

Extended Feature Supplement

**ESD**

electrostatic discharge

**I/O**

input/output

**IDE**

integrated device electronics

**IEC**

International Electrotechnical Commission

**IML**

Integrated Management Log

**IRQ**

interrupt request

**ISP**

Internet service provider

**KVM**

keyboard, video, and mouse

**LED**

light-emitting diode

**NEC**

National Electrical Code

**NEMA**

National Electrical Manufacturers Association

**NFPA**

National Fire Protection Association

**NIC**

network interface controller

**NLM**

NetWare Loadable Module

**NVRAM**

non-volatile memory

**OS**

operating system

**PCI**

peripheral component interface

**PCI Express**

peripheral component interconnect express

**PCI-X**

peripheral component interconnect extended

**PDU**

power distribution unit

**POST**

Power-On Self-Test

**PPM**

Processor Power Module

**PSP**

ProLiant Support Pack

**ROM**

read-only memory

**SCSI**

small computer system interface

**SDRAM**

synchronous dynamic RAM

**SIM**

Systems Insight Manager

**SSD**

support software diskette

**TCP/IP**

Transmission Control Protocol/Internet Protocol

**TMRA**

recommended ambient operating temperature

**UPS**

uninterruptible power system

**USB**

universal serial bus

**VCA**

version control agent

**VGA**

video graphics array



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