# HP Servers Troubleshooting Guide


January 2003 (Seventh Edition)
Part Number 161759-007

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# About This Guide

This guide provides troubleshooting information for ProLiant and TaskSmart servers. For convenience, this guide includes a complete list of Power-On Self-Test (POST) error messages, Diagnostics test error codes, Integrated Management Log (IML) event list error messages, and Array Diagnostic Utility (ADU) error messages.

**IMPORTANT:** The chapters in this guide provide information for multiple servers. Some of the hardware or software information covered may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

**WARNING: To reduce the risk of personal injury or damage to the equipment, refer to the user documentation supplied with the server and observe the appropriate safety precautions.**

## Who Should Use This Guide

This guide is for two types of users:

- The novice user interested in learning troubleshooting methods such as how to record what happened before a problem, procedures for troubleshooting, tools to use for problem resolution, and general information to help you avoid future problems
- The advanced user already familiar with troubleshooting techniques who is interested in specific information to troubleshoot server problems

# How to Use This Guide

To learn and use proper troubleshooting methods, follow the procedures described throughout Chapter 1, which helps you isolate the problem and refers you to the part of this guide containing the information necessary to solve the problem.

To immediately find help for the specific problem you are troubleshooting, refer to "Locating Troubleshooting Information" in Chapter 1, which lists the location of information in this guide.

Because this guide contains information covering multiple servers, refer to your server-specific user documentation to find information about the system specifications, switch settings, and status and LED indicators for your server.

# Key Terms

- Boot—The process of initializing a server, beginning when the power switch is pressed, including the running of self-tests, and concluding with the loading of the operating system.
- Reboot—To restart a server by reloading the operating system.
- Power up—To apply power to the server by pressing the power switch. Powering up a server is the first step of the boot process.
- Power down—To turn off a server by pressing the power switch or as required by the operating system.

**WARNING: Live circuits may still be present when the server is powered down. To reduce the risk of injury or equipment damage, remove power from the server by disconnecting all power cords from the power supplies.**

- Server-specific user documentation—The set of documents that apply specifically to a server, such as the setup and installation guide, maintenance and service guide, and installation poster.
- Shut down—To completely remove all sources of power from a server.

- Server setup utility—a utility designed to set up and configure your server, including ROM-Based Setup Utility (RBSU), System Configuration Utility (SCU), and BIOS Setup Utility.

## Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

**WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.**

**CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

**IMPORTANT:** Text set off in this manner presents essential information to explain a concept or complete a task.

**NOTE:** Text set off in this manner presents additional information to emphasize or supplement important points of the main text.

## Reader's Comments

HP welcomes your comments on this guide. Please send your comments and suggestions by e-mail to `ServerDocumentation@hp.com`.

## HP Resources

For information on additional HP resources, refer to Appendix A, "HP Resources."

# 1

# Diagnosing the Problem

This chapter covers the steps that you are recommended to take when an error occurs. Going through a structured set of tasks helps you to isolate the problem quickly.

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

The following sections are outlined in this chapter:

- Developing a Troubleshooting Plan
- Preparing to Troubleshoot the Server
- Gathering Information
- Locating Troubleshooting Information
- Contacting HP

Even if you are experienced in troubleshooting, consider skimming through this chapter before using the remainder of the book and the documentation that shipped with your server. Otherwise refer to "Locating Troubleshooting Information" in this chapter, which points you to the appropriate section of this guide.

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

# Developing a Troubleshooting Plan

Evaluate all of the information and symptoms to:

- Identify the problem.
  - — Prepare the server for diagnosis and familiarize yourself with appropriate troubleshooting methods using the following section, "Preparing to Troubleshoot the Server."
  - — Collect the facts related to the problem you want to troubleshoot using the "Gathering Information" section later in this chapter.
  - — If the problem has not been identified after following the procedures in this guide, refer to the "Contacting HP" section of this chapter.
- Plan your solution to each problem.
  - — Identify all steps necessary for implementation of each solution.
  - — Balance the time and cost required for implementing each solution against the likelihood of resolving the problem.
  - — Gather the documentation that shipped with your server. Server-specific user documentation is also located on the following website:

    www.compaq.com/support/servers

    Select your server, and then look in the **Manuals** section.
  - — Compile a master plan to be sure that you manipulate one variable at a time.
- Identify and collect all tools, such as a Torx screwdriver, electrostatic discharge (ESD) wrist strap, and software utilities, necessary to troubleshoot the problem.
- Troubleshoot the problem using the information in this guide. Record each action you take and list the results.
- Test your actions to be sure that the problem is truly resolved.
- Perform preventive steps to stop the problem from recurring. Refer to Chapter 6, "Error Prevention," for prevention information.

**IMPORTANT:** Familiarize yourself with the appropriate warnings for your server by referring to your server-specific user documentation.

# Preparing to Troubleshoot the Server

Before troubleshooting, follow the steps to prepare the server for diagnosis. Also, read the proper troubleshooting procedures to increase troubleshooting effectiveness.

## Preparing the Server for Diagnosis

Before troubleshooting the server:

1. Record any error messages displayed by the system.
2. Remove all diskettes and CDs from the media drives.
3. Power down the server and peripheral devices. Always perform an orderly server shutdown if possible. This means that you must:
   a. Exit the applications.
   b. Exit the operating system.
   c. Power down the server.
4. 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 log error messages.

At this point, you can attempt to boot the server using the steps provided in your server-specific user documentation to determine if the server is starting as it should. First, however, read through the proper troubleshooting procedures in the "Using a Troubleshooting Methodology" section.

## Using a Troubleshooting Methodology

As you follow the troubleshooting steps in this guide and your server-specific user documentation, use the methods described in Table 1-1. When troubleshooting, some results are obvious, such as error messages or significant changes in functionality. Other changes may not be as obvious, requiring you to check system logs for new events recorded after the change was made.

After familiarizing yourself with these troubleshooting methods, follow the steps outlined in "Gathering Information" in this chapter to troubleshoot your server.

**Table 1-1: Troubleshooting Methodology**

| What to Check | Troubleshooting Method |
|---|---|
| What are the results of each troubleshooting step? | Look for and record new symptoms, such as error messages or informational messages.<br><br>Were the results logical, consistent, and expected? |
| Did anything change? If so, what? | Check system logs. Look for any type of change, no matter how insignificant. |
| Was any functionality gained or diminished? | Look for functionality changes to judge the effectiveness of each troubleshooting step. |
| Were any errors made in implementing a step? | Look for and record any mistakes made while executing a step. |
| Was more than one variable changed at a time? | To be sure that the specific cause of the problem is isolated, be sure that during each step only one variable is changed at a time. |
| Were any steps skipped or completed out of order? | Place checkmarks against the steps as they are executed, and circle the steps not executed. Look for skipped steps or steps executed out of order. |
| Were any steps accidentally added? Were any steps added intentionally to complete or correct another step? | If steps had to be added in order to proceed, record why, and note the preceding step. |

# Gathering Information

If you encounter a problem with your server, follow the guidelines in this section and record your findings in a notebook. Having these details available reduces troubleshooting time. This information also helps the authorized service provider to diagnose and solve your problem, if their assistance is used.

## Preliminary Information

Before troubleshooting your specific 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?
- Was the server recently installed or moved?
- 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 the Survey Utility and compare what has changed (for servers running the Microsoft Windows NT, Linux, or Novell NetWare operating system).
- Refer to your software and hardware records for information.

After collecting this information, refer to the appropriate section in this chapter:

- When the Server Does Not Start
- When the Self-Tests Fail
- When the Operating System Does Not Load

## When the Server Does Not Start

The following visual and audio clues indicate that the server is not starting:

- The LEDs are off.
- The fans are not spinning.
- Something seems, looks, or sounds wrong or different.
- There is physical damage to the system.
- Something is cool that should be warm.
- There are frayed cables.
- The system does not follow the normal power-up sequence, as described in your server-specific user documentation.

### When a ProLiant ML, ProLiant DL, TaskSmart, or Previously Released Server Does Not Start

Use the information in Table 1-2 to troubleshoot problems with a ProLiant ML, ProLiant DL, TaskSmart, or previously released server.

**Table 1-2: When the Server Does Not Start**

| What to Check | What to Do |
|---|---|
| Check for connection problems:<br>• Is the server power cord plugged into a working grounded (earthed) AC outlet?<br>• Has the Power On/Standby switch been firmly pressed?<br>• Are there unconnected or loose plugs or cables?<br>• Are any connections loose or improperly seated? | Refer to "Loose Connections" in Chapter 2. |

*continued*

**Table 1-2: When the Server Does Not Start** *continued*

| What to Check | What to Do |
|---|---|
| Check for incorrect system settings:<br>• Are switches set correctly? | Refer to your server-specific user documentation to verify switch settings. |
| Check for faulty power delivery:<br>• Is the power cord working?<br>• Is the power strip working?<br>• Is the power outlet working, and at the correct voltage level? | Refer to "Power Source" in Chapter 2. |
| Check for power supply problems:<br>• Is each power supply fan spinning?<br>• Are the power supplies' LEDs indicating that each power supply is working?<br>• Have you recently added hardware which might be overburdening the power supplies?<br>• Is the uninterruptible power supply (UPS) starting and working correctly? | Refer to:<br>• "Power Supply" in Chapter 2<br>• "Uninterruptible Power Supply" in Chapter 2<br>• Your server-specific user documentation for more information on LEDs |
| Check for a system short circuit:<br>• Is the power status LED blinking intermittently, turning amber, or staying off? | Refer to:<br>• "System Short Circuit" in Chapter 2<br>• Your server-specific user documentation for more information on LEDs |

*continued*

**Table 1-2: When the Server Does Not Start** *continued*

| What to Check | What to Do |
|---|---|
| Check for Processor Power Module (PPM) problems:<br>• Has a PPM failed and forced the server into a reset condition? | Refer to "Processor Power Modules" in Chapter 2. |
| Check for automatic server recovery-2 (ASR-2) reboot:<br>• Is your server rebooting repeatedly? | Be sure that the server is not rebooting due to a problem that initiates an ASR-2 reboot. Refer to "Automatic Server Recovery-2" in Chapter 5 for more information. |

## When a ProLiant BL Server Does Not Start

Use the information in Table 1-3 to troubleshoot problems with a ProLiant BL server.

**Table 1-3: When a ProLiant BL Server Does Not Start**

| What to Check | What to Do |
|---|---|
| Check the enclosure(s): | |
| Check for connection problems:<br>• Are all power cords properly connected throughout the system? Are there unconnected or loose plugs or cables? | Refer to:<br>• "Loose Connections" in Chapter 2<br>• Your server-specific user documentation for more information about the cabling necessary for enclosures |
| Check for power delivery problems:<br>• Are all power cords working?<br>• Is the power outlet working, and at the correct voltage level?<br>• If applicable to your system, are the circuit breakers set in their appropriate positions?<br>• Do the LEDs on the system indicate that power delivery is working? | Refer to:<br>• "Power Source" in Chapter 2<br>• Your server-specific user documentation for LED information |

*continued*

**Table 1-3: When a ProLiant BL Server Does Not Start** *continued*

| What to Check | What to Do |
|---|---|
| Check for power supply problems:<br>• Is each power supply fan spinning?<br>• Do the power supplies' LEDs indicate that each power supply is working?<br>• Have you recently added hardware which might be overburdening the power supplies? | Refer to:<br>• "Power Supply" in Chapter 2.<br>• Your server-specific user documentation for more information on LEDs. |
| • If you have an uninterruptible power supply (UPS), is it starting and working correctly? | Refer to "Uninterruptible Power Supply" in Chapter 2. |
| Check for a system short circuit:<br>• Is the power status LED blinking intermittently, turning amber, or staying off? | Refer to "System Short Circuit" in Chapter 2. |
| If your system supports the Integrated Administrator:<br>• Is the Integrated Administrator rebooting repeatedly? | Be sure that the server is not rebooting due to a problem that initiates an enclosure self recovery (ESR) reboot. Refer to the *ProLiant BLe-Series Integrated Administrator User Guide* for more information. |

*continued*

**Table 1-3: When a ProLiant BL Server Does Not Start** *continued*

| What to Check | What to Do |
|---|---|
| Check each server blade: | |
| Check for power delivery problems:<br>• Do all appropriate LEDs indicate that the server blade is receiving power?<br>• If applicable to your system, has the server blade power button been firmly pressed? | Refer to your server-specific user documentation for LED information. |
| Check for connection problems:<br>• Is the server blade seated properly in the enclosure?<br>• Are any connections loose or improperly seated? Are there unconnected or loose plugs or cables? | Refer to “Loose Connections” in Chapter 2. |
| Check for incorrect system settings:<br>• Are switches set correctly? | Refer to your server-specific user documentation to verify switch settings. |
| If applicable, check for Processor Power Module (PPM) problems:<br>• Has a PPM failed and forced the server blade into a reset condition? | Refer to “Processor Power Modules” in Chapter 2. |
| Check for memory problems:<br>• Is memory working and properly seated?<br>• Is memory set up correctly for your server? | Refer to “Memory” in Chapter 2. |
| If applicable, check for automatic server recovery-2 (ASR-2) reboot:<br>• Is your server rebooting repeatedly? | Be sure that there is not a problem that is initiating an ASR-2 reboot. Refer to “Automatic Server Recovery-2” in Chapter 5. |

## When the Self-Tests Fail

This section provides steps to follow if the system starts, but fails to complete the self-tests without error. The following visual and audio clues indicate that the system is not completing the self-tests:

- The system begins to boot, then suddenly shuts down.
- The system keeps restarting.
- Random errors are occurring during the boot process.
- There are intermittent problems during the boot process.
- Error messages are appearing on the screen.
- Your server has an Integrated Management Display (IMD), but the IMD does not display a twirling baton and checkmarks during POST, or the twirling baton appears but continues twirling for an excessive amount of time.

**Table 1-4: When the Self-Tests Fail**

| What to Check | What to Do |
|---|---|
| Check for failure information:<br>Are there error messages such as: | Record the full error message. |
| • Power-On Self-Test (POST) messages? | Refer to Appendix C, "POST Error Messages." |
| • Stop/Abend/Trap? | Refer to:<br>• Chapter 3, "Software Problems"<br>• Chapter 2, "Hardware Problems" |
| • Integrated Management Log (IML) messages? | Refer to "Integrated Management Log" in Chapter 4. |
| • Insight Manager 7 (or previous version) detail? | Refer to "Server Management" in Chapter 4. |

*continued*

**Table 1-4: When the Self-Tests Fail** *continued*

| What to Check | What to Do |
|---|---|
| Check the system configuration: | |
| • Are all required switch settings set correctly? | Refer to your server-specific user documentation. |
| What is the system configuration for the:<br>• Memory<br>• Processors; check speed, type, and location<br>• Cache memory<br>• Controllers<br>• Shadow RAM<br>• Free space on the hard drive | Run the Inspect Utility. Refer to:<br>• "Inspect Utility" in Chapter 4<br>• Your system configuration settings; check the server setup utility |
| Check component information, such as:<br>• IRQ settings<br>• I/O address<br>• Direct memory access (DMA) channels<br>• Connector type | Run the Survey Utility (for servers running the Windows NT, Linux, or NetWare operating system) and Insight Manager.<br>Refer to:<br>• "Survey Utility" in Chapter 4<br>• "Server Management" in Chapter 4 |
| • Do you have third-party devices that may have caused a conflict? | Refer to:<br>• "Third-Party Devices" in Chapter 2<br>• Your third-party documentation |

*continued*

**Table 1-4: When the Self-Tests Fail** *continued*

| What to Check | What to Do |
|---|---|
| Check for system failures: | |
| • Be sure that all expansion boards, drives, and processors are firmly seated and that all latches are firmly closed.<br>• Be sure that all system cables are properly connected and not damaged. | Refer to "Loose Connections" in Chapter 2. |
| If your server includes one or more Processor Power Modules (PPMs), check each PPM. | Refer to "Processor Power Modules" in Chapter 2 for information on testing PPMs. |
| Be sure that there are no processor problems. | Refer to "Processors" in Chapter 2. |
| Be sure that there are no memory problems. | Refer to "Memory" in Chapter 2. |
| For configure-to-order servers: | |
| • Check the initial factory-installed configuration.<br>• Note any changes that have been made to the original system.<br>• Note configuration changes made before or after completing the operating system installation. | Refer to your server-specific user documentation. |

## When the Operating System Does Not Load

This section provides steps to follow if the server starts and completes the self-tests without error, but encounters errors while loading the operating system. Make note of the following information before following the steps in this section:

- What operating system version is installed?
- Was the operating system factory installed?
- Has the operating system ever started?
- What version of the diagnostic utilities is installed?
- If applicable, what file system is used (example for Windows NT: NTFS, FAT)?
- In addition to the operating system, what other software has been added?

**Table 1-5: When the Operating System Does Not Load**

| What to Check | What to Do |
|---|---|
| Check for any errors detected by the system: | |
| • For Microsoft Windows NT users, were there any errors in the event log? | Refer to the Microsoft Windows NT user documentation. |
| • Check for any Survey errors. | Run the Survey Utility (for servers running Windows NT, Linux, or NetWare operating systems).<br>Refer to:<br>• "Survey Utility" in Chapter 4<br>• "List of Events" in Chapter 4 |

*continued*

**Table 1-5: When the Operating System Does Not Load** *continued*

| What to Check | What to Do |
|---|---|
| • Were there any test errors? | Run Diagnostics.<br>Refer to:<br>• "Diagnostics" in Chapter 4<br>• Appendix B, "Test Error Codes" |
| Check for any incorrect, conflicting, or out-of-date software versions: | |
| • Are you running the latest ROM version? | Refer to your server-specific user documentation. |
| • What version of the diagnostic utilities is installed? | Refer to "Diagnostics" in Chapter 4. |
| • If the problem is with a particular device, what version of the driver is installed? | Refer to:<br>• Your device-specific user documentation<br>• The section for the specific device in Chapter 2 |
| • Is the Insight Manager console software version different from the Management Agents version? | Refer to the user documentation on the Management CD. |
| • If your server uses the Rapid Deployment Pack, has the system been configured correctly with this software? | Refer to:<br>• Your server-specific user documentation<br>• The documentation that ships with the Rapid Deployment Pack |

*continued*

**Table 1-5: When the Operating System Does Not Load** *continued*

| What to Check | What to Do |
|---|---|
| If your server uses EFI boot manager, check the EFI settings: | |
| • Is the operating system configured as the default operating system in EFI boot manager? | Refer to your server-specific user documentation for more information. |
| Check the utilization rate/traffic: | |
| • Is the utilization rate/traffic shown in Insight Manager 7 (or previous version) appropriate?<br>• How does the current utilization differ from the historical? | Refer to the utilization information provided by your third-party tools. |

# Locating Troubleshooting Information

This section is a reference to help you locate detailed troubleshooting information in the remainder of this guide, and refers you to other guides if necessary. For other resources, refer to Appendix A, "HP Resources."

**Table 1-6: Locating Troubleshooting Information**

| Problem | Location of information |
|---|---|
| Server does not power up. | Your server-specific user documentation |
| Server powers up, but you cannot tell if it is starting in the appropriate sequence. | Your server-specific user documentation |
| Server has no video, and: | |
| • No fans can be heard running. | • "Power Problems" in Chapter 2<br>• "Fans" in Chapter 2 |
| • Fans are running. | • "Video" in Chapter 2 |
| Server has a POST error message. | Appendix C, "POST Error Messages" |
| Server has a test error code message. | Appendix B, "Test Error Codes" |
| Memory count error occurs during startup. | "Memory" in Chapter 2 |
| Processor information error occurs during startup. | • "Processors" in Chapter 2<br>• "Processor Power Modules" in Chapter 2 |
| Server cannot read the diskette drive. | "Diskette Drives" in Chapter 2 |
| Server does not have sound. | "Audio" in Chapter 2 |
| Server cannot read the CD-ROM or DVD drive. | "CD-ROM and DVD Drives" in Chapter 2 |

*continued*

**Table 1-6: Locating Troubleshooting Information** *continued*

| Problem | Location of information |
|---|---|
| Mouse/keyboard does not work. | "Mouse and Keyboard" in Chapter 2 |
| A peripheral device is not working. | • "General Hardware Problems" in Chapter 2<br>• "External Device Problems" in Chapter 2 |
| Server LEDs are on, and you are unsure of their meaning. | Your server-specific user documentation |
| You are unsure of the system switch settings. | Your server-specific user documentation |
| A software lockup occurs. | Chapter 3, "Software Problems" |
| Intermittent power loss occurs. | "Power Problems" in Chapter 2 |
| Server is not communicating correctly in network. | • "Loose Connections" in Chapter 2<br>• "Network Controllers" in Chapter 2<br>• LED information in your server-specific user documentation |
| New hardware was recently added, resulting in system problems. | "General Hardware Problems" in Chapter 2 |
| A Service Pack upgrade took place, resulting in system problems. | Chapter 3, "Software Problems" |
| You have trouble accessing data on the hard drive. | "Hard Drives" in Chapter 2 |
| You have corrected the problem and want to be sure that you prevent future problems. | Chapter 6, "Error Prevention" |
| None of the attempted techniques were effective. | Appendix A, "HP Resources" |

# Contacting HP

Contact HP only if you have followed the procedures described in this guide and still have not fixed the problem with your server.

## Contacting Technical Support or Authorized Reseller

If you have exhausted the information in this guide, you can obtain further information and help from the following locations.

**IMPORTANT:** See the "Server Information You Need" section for a list of information you must gather before contacting HP for support.

In the United States and Canada, call the Technical Support Center at 1-800-652-6672, where a technical support specialist will help you diagnose the problem. For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Technical Support Center. Telephone numbers for worldwide Technical Support Centers are listed in the *Worldwide Telephone Numbers* booklet included with your product or available on the HP website:

www.hp.com

For the name of your nearest authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

**NOTE:** For additional resources outside the United States and Canada, contact your authorized reseller or service provider.

## Server Information You Need

Before contacting HP, obtain the following:

- All information from the "Gathering Information" section in this chapter.
- A printed copy of the system and operating environment information and a copy of any historical data that might be relevant. To obtain this information, run the Inspect utility (if supported by your server), described in "Inspect Utility" in Chapter 4, and refer to your server-specific user documentation.

  **NOTE:** Also run the Survey Utility on servers with the Microsoft Windows NT, Linux, or Novell NetWare operating system.

- A list of your system components:
  - Product, model, and serial number
  - Hardware configuration
  - Add-on boards
  - Connected printer or printers
  - Monitor
  - Connected peripherals such as tape drives
- A list of all third-party hardware and software:
  - Complete product name
  - Complete company name
  - Product version
  - Driver version
- Information from the "Operating System Information You Need" section.
- Your notes describing the conditions under which the problem occurred.
- Your notes describing troubleshooting attempts up to this point.
- Notes on anything nonstandard about your server setup.

## Operating System Information You Need

Be sure that you have the following operating system information available before contacting your authorized service provider. If possible, gather this information about the last working version and the current version.

**IMPORTANT:** This section provides general operating system information for several servers. Some information covered may not apply to your specific server. You may need to modify some of the examples or procedures in this section for your work environment. Always refer to your operating system software documentation, server user documentation, and maintenance and service guide for information on procedures, software tools, and operating systems supported by and specific to your server.

Operating system information outlined in this section:

- Microsoft operating systems
- Linux operating systems
- Novell NetWare operating systems
- Caldera and SCO operating systems
- IBM OS/2 operating systems
- Sun Solaris operating systems
- Banyan VINES operating systems
- SQL Server software

## 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 Windows 2000 systems)

  Boot.ini

  Memory.dmp

  Event logs

  IRQ and I/O address information in text format
- An updated Emergency Repair Diskette
- If HP drivers are installed:
  - — Version of the Compaq Support Paq (CSP), ProLiant Support Pack (PSP), or Support Software Diskette (SSD) used
  - — List of drivers from the CSP, PSP, or SSD
- The drive subsystem and file system information:
  - — Number and size of partitions and logical drives
  - — File system on each logical drive
- Current level of service packs installed
- A list of all third-party hardware and software installed, with versions
- A detailed description of the problem and any associated error messages

**NOTE:** If your configuration includes SQL server, refer to “SQL Server” in this chapter.

## 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 -qa
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

  /etc/fstab
- A list of all third-party hardware and software installed, with 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 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 NLMs used on your server, including the names, versions, dates, and sizes
- If HP drivers are installed:
  - Version of the Compaq Support Paq (CSP), ProLiant Support Pack (PSP), or Support Software Diskette (SSD) used
  - List of drivers from the CSP, PSP, or SSD
- Printouts of:

  SYS:SYSTEM\SYS$LOG.ERR

  SYS:SYSTEM\ABEND.LOG

  SYS:ETC\CPQLOG.LOG
- Current patch level
- A list of all third-party hardware and software installed, with versions
- A detailed description of the problem and any associated error messages

### Caldera and SCO Operating Systems

Collect the following information:

- Installed system software versions (TCP/IP, VP/Ix)
- Process status at time of failure, if possible
- Printouts 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 Extended Feature Supplement (EFS) used
  - — List of drivers from the EFS
- If management agents are installed, version number of the agents installed
- System dumps, if they can be obtained (in case of panics)
- A list of all third-party hardware and software installed, with 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 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 HP Support Software Diskette (SSD) used
  - List of drivers from the SSD
  - Versions of the OS/2 Management Insight Agents, CPQB32.SYS, and OS/2 Health Driver used
- 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 all third-party hardware and software installed, with versions
- A detailed description of the problem and any associated error messages

**NOTE:** If your configuration includes SQL server, refer to the "SQL Server" section in this chapter.

## 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 Driver Updates (DUs):
  - 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 of:

  /usr/sbin/crash (accesses the crash dump image at /var/crash/$hostname)

  /var/adm/messages

  /etc/vfstab

  /usr/sbin/prtconf

### Banyan VINES Operating Systems

Collect the following information:

- Operating system versions, revisions, and installed patches
- The Banyan list of installed boards. Software settings should match your hardware configurations.
- Number of servers on the network
- A list of all third-party hardware and software installed, with versions
- A detailed description of the problem and any associated error messages

### SQL Server

If your system uses SQL Server for IBM OS/2 or Microsoft Windows, collect:

- General information:
  - — Description of the database layout
  - — Database activity before the problem
  - — Description, if available, of how to reproduce the problem
  - — Names and functions of all stored procedures
  - — All available information used to troubleshoot the problem at this point
- SQL Server version and registry information
- Master Database configuration information
- SQL Server configuration parameters
- SQL Server device configuration
- Default Network, DB-LIBRARY, and NET-LIBRARY information
- SQL Server error log
- Windows NT event log
- Detailed description of the problem and any associated error messages

# 2

# Hardware Problems

This chapter provides steps for troubleshooting common hardware problems.

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

For a definition of terms such as **boot**, see the "Key Terms" section in "About This Guide."

The following information is covered in this chapter:

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

- Important Safety Information
- Power Problems
- General Hardware Problems
- Internal System Problems
- Drive Problems
- External Device Problems
- Network and Modem Problems

# ⚠ Important Safety Information

This section is a reference which explains the safety information placed on equipment and in your server-specific user documentation. Familiarize yourself with the warnings in this section to reduce the potential risks involved in handling equipment.

Before handling any equipment, read the *Important Safety Information* document provided.

## Symbols on Equipment

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

**WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.**

**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.**

**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.**

Weight in kg
Weight in 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.**

## Rack Stability

Before working with racks, be sure that you understand the following warning and caution information, which may appear in your server-specific user documentation.

**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.**

46-109 kg
100-240 lb

**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.**
- **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, the media/power supply drawer, the processor/memory drawer, and all System Power Modules to reduce the overall weight of the product.**

**WARNING: To reduce the risk of personal injury or damage to the equipment, extend only one component at a time. The rack may become unstable if more than one component is extended.**

**CAUTION:** To maintain optimum cooling, a perforated rack door must be used with this server. Failure to use a properly ventilated door results in thermal damage to your server.

# Power Problems

## Power Source

Use the information in Table 2-1 to troubleshoot power source problems.

**Table 2-1: Power Source Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Power is not working properly or power-related errors are occurring. | Power On/Standby switch | Be sure that the switch is on.<br>If your server has a Power On/Standby switch that returns to its original position after being pressed, be sure that you press the switch firmly. |
| | AC outlet (if applicable to your system) | Plug another device into the grounded AC outlet to be sure that the outlet works.<br>Be sure that the AC power meets applicable standards. |
| | DC source (if applicable to your system) | Have a licensed electrician check the DC source. |
| | Power cord | Replace the power cord to be sure that the original power cord was not faulty. |
| | Power strip | Replace the power strip to be sure that the original power strip was not faulty. |
| | Line voltage | Have a qualified electrician check the voltage to be sure that it meets the required specifications. |
| | Circuit breakers | Be sure that your circuit breakers are all in the On position. |
| | Power supply | Refer to “Power Supply” in this chapter. |
| | Uninterruptible power supply (UPS) and cables | Refer to “Uninterruptible Power Supply” in this chapter. |

## Power Supply

Use the information in Table 2-2 to troubleshoot power supply problems.

**Table 2-2: Power Supply Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Power is not working properly or power-related errors are occurring. | Power supplies are not connected properly. | Check for loose connections. Refer to "Loose Connections" in this chapter for more information. |
| Server does not boot. | Power supplies are not working. | If the power supplies have LEDs, be sure that they indicate that each power supply is working properly. Refer to your server-specific user documentation for details on LEDs.<br><br>If LEDs indicate a problem with a power supply, replace the power supply. |
| | System does not have enough power. | Be sure that the system has enough power, especially if you recently added hardware. Additional power supplies may need to be added. Check the system information from the Integrated Management Log (IML) and use your server-specific user documentation for product-specific information. Refer to "Integrated Management Log" in Chapter 4. |

## System Power Module

Some servers use one or more System Power Modules (SPMs) to distribute direct current to system components. If your system uses SPMs, use Table 2-3 to troubleshoot SPM problems.

**Table 2-3: System Power Module Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| SPM- or power supply-related errors are occurring | SPMs are not installed properly. | Be sure that each SPM is installed with a corresponding power supply, as shown in your server-specific user documentation. |
| | | Be sure that each SPM is installed correctly, as directed in your server-specific user documentation. |
| | SPMs are not connected properly. | Check for loose connections. Refer to "Loose Connections" in this chapter for more information. |
| | SPMs are not working properly. | Check the SPM LEDs to be sure each SPM is working and does not need to be replaced. LED information is detailed in your server-specific user documentation. |
| Thermal problems are occurring with the server. | SPMs are not installed properly. | Be sure that each SPM is installed correctly, as directed in your server-specific user documentation. |

## Uninterruptible Power Supply

Use the information in Table 2-4 to troubleshoot UPS problems.

**Table 2-4: UPS Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| UPS is not working properly. | UPS software is not up to date. | Check the version of your UPS software to be sure that it is current. Use the Power Management software located on your Power Management CD. |
| | UPS power cord is not correct. | Be sure that the 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. |

*continued*

**Table 2-4: UPS Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| UPS will not start. | Line cord is not connected. | Connect the line cord. |
| | Circuit breaker or fuse is open. | Push the circuit breaker button or replace the fuse. If this occurs repeatedly, contact an authorized service provider. |
| | Battery or site wiring problem has occurred. | Check the UPS LEDs. Refer to the UPS documentation. |
| | UPS is in sleep mode. | Disable sleep mode for proper operation. The UPS has a sleep mode that can be turned off through the configuration mode on the front panel. Sleep mode initiates if the power is removed and no load shows on the UPS. |
| | Heat damage or recent air conditioning outage has occurred. | Change the battery. The optimal operating temperature for UPS batteries is 25ºC (or 77ºF). 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. |
| Insufficient warning of low batteries is displayed. | Batteries need charging or service. | Plug the UPS into an AC grounded outlet for at least 24 hours to charge the batteries, and then test batteries. Replace the batteries if necessary. |
| | Alarm is not appropriately set. | Change 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. | Cause depends on the specific LED. | Refer to the UPS documentation for instructions. |

## System Short Circuit

When powering up the server, the power status LED may blink intermittently, turn amber, or stay off. Any of these situations indicate that the system is trying to start but may have a short circuit.

**CAUTION:** Never operate the server for an extended period of time if an access panel is removed. Doing so can cause thermal damage to drives and components and can void your system warranty.

Perform the following steps:

1. Remove the appropriate access panel, and then check the system-interlock or system-interconnect status LEDs. For complete information, refer to your server-specific user documentation.
2. Remove all power sources to the server.
3. Check the specific area.

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.

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

- Reseat all I/O expansion boards.
- Check all system cables and external cables for misalignment, bent pins, damage to wiring, crimps, backward installation, or any abnormalities.
- Check all connectors, such as cables, PCI slots, and processor slots, for foreign material or bent pins.
- Look for foreign material, such as screws, bits, or slot bracket blanks, that may be short circuiting components.

## Redundant Line Cord Switch

If your server has a redundant line cord switch, but you are only using one 120-volt power cord to power your server, be sure that the power cord is connected to the primary power plug.

Refer to your server-specific user documentation for more information on this feature.

# General Hardware Problems

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

## Loose Connections

If a device does not work, it is often because the device is not properly connected or not properly seated. Good device connections are essential to a functioning server. To ensure that each device is properly connected and seated:

1. Be sure that all power cords are properly connected. If any are not, plug the power cord in firmly and correctly.
2. Be sure that the cables of all components, such as the monitor, keyboard, mouse, and any external or internal devices, are securely connected.
3. If a fixed cable tray is available for your server, make sure that the cords and cables connected to the server are correctly routed through the tray.
4. Be sure that all cables are lined up properly with any connector pins in the sockets to which they connect. Be sure that there are no bent connectors.
5. Be sure that each device is properly seated by pushing in the device.
6. If a device has latches, be sure that they are completely closed and locked.
7. If problems continue to occur, remove each device, reinstall it, and then firmly push it in again.

## Cabling Order

On some systems, electrical damage can occur to peripheral devices if the power cord and device cables are connected to the server in an improper sequence. Refer to the cabling requirements in your server-specific user documentation for more information on the proper way to connect the cables to your server.

## New Hardware

To troubleshoot problems that occur after you add hardware to the server:

**IMPORTANT:** Always obtain a printed copy of Inspect data before and after adding, removing, or repositioning any board or options. Refer to "Inspect Utility" in Chapter 4.

1. If the system completes POST, run the Inspect Utility, which shows changes made to the server. Use the resulting changes to troubleshoot possible causes of the problem. Refer to "Inspect Utility" in Chapter 4 for more information.
2. Check for memory, I/O, and interrupt conflicts.
3. Check all cables for loose connections. Be sure that all cables are connected to the correct locations and are the correct lengths. Refer to your server-specific user documentation and "Loose Connections" in this chapter.
4. Be sure that all software updates, such as device drivers, ROMPaq utilities, patches, SmartStart releases, and other SoftPaq utilities, are installed and current. For example, if you are using a Smart Array controller, you need the latest Smart Array Controller device driver.
5. Run the server setup utility after boards or other options are installed or replaced to be sure that 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 server setup utility, save and exit the utility, and then restart the server.
6. Be sure that all switch settings are set as indicated by the server setup utility. For additional information about required switch settings, refer to your server-specific user documentation.
7. Be sure that the hard drive signal cables are lined up properly with the connector pins on the controller and the hard drives. Be sure that there are no bent connectors.
8. Be sure that all boards are properly installed in the unit.
9. Run Diagnostics to see if it will recognize and test the device. Refer to "Diagnostics" in Chapter 4 for more information.

# General Devices

## Third-Party Devices

If a third-party device does not work, it may be because the device is not supported by your server or lacks up-to-date drivers.

- Refer to your device and server -specific user documentation to be sure that your server and operating system support the device.
- Be sure that you have the latest device drivers. Refer to "Maintaining Current Drivers" in Chapter 3.

Also, note which third-party board is installed into which slot because some third-party PCI boards must be installed on the primary PCI bus.

## Universal Serial Bus Devices

On some BL e-Series servers, connecting hot-plug universal serial bus (USB) devices during POST can cause the server to fail to boot. If this is the case with your server, wait until after POST to hot-plug your USB devices.

If you have a server that supports the Diagnostic Adapter and you are using USB devices, refer to "Diagnostic Adapter" in this chapter for potential compatibility issues.

## Testing the Device

To test the device after checking device connections and support:

1. Uninstall the device.

   Check whether the server works with the device removed and uninstalled. If it does, that indicates a problem with the device, the server's support of the device, or a conflict with another device.

2. If the SCSI device is the only device on its bus, check whether the bus works by installing a different device on the bus.
3. Move the device to a different bus or PCI slot.

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.
5. Move the device to a different slot on the same bus. If the board works, either the original slot is bad or the board was not properly seated. Insert the board into the original slot to verify.
6. Clearing nonvolatile RAM (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.

**CAUTION:** Clearing nonvolatile RAM (NVRAM) deletes your configuration information. Refer to your server-specific user documentation, including the maintenance and service guide, for complete instructions before performing this operation or data loss could occur.

7. To be sure that the device works, move the device to the same slot in another working server.

## Rack Environment

If you are using a rack system, be sure that you are not blocking any of the ventilation openings of the rack. Also, be sure that you are following the correct rack environment requirements. For more information on space and airflow requirements, rack stability, and rack planning resources, refer to your server-specific user documentation.

# Internal System Problems

## Processors

Use the information in Table 2-5 to troubleshoot processor problems.

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

**Table 2-5: Processor Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Processor problems are occurring. | Multiple processors are being used and have different stepping, core speeds, or cache sizes. | Be sure that you are not mixing processors that have different stepping, core speeds, or cache sizes if processor mixing in these areas is not supported by your server. Refer to your server-specific user documentation for information specific to your server. |
| | Server has only one processor installed, and the processor is faulty. | Test the processor by replacing it with a known functional processor. If the problem is resolved after you restart the computer, the original processor was faulty and needs to be replaced. |

*continued*

**Table 2-5: Processor Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Processor problems are occurring (*continued*). | Server has multiple processors installed, and one or more processors are faulty. | 1. Remove all processors but one from the server, replacing them with processor terminator boards or blanks, if applicable to your server.<br>2. If your server includes Processor Power Modules (PPMs) that are not integrated on the system board, remove all PPMs from the server except for the PPM associated with the remaining processor.<br>3. Replace the remaining processor with a known functional processor. If the problem is resolved after you restart the server, one or more of the original processors are at fault. Add each processor and its associated PPM (if applicable) back to the server one by one, restarting each time, to find the faulty processor or processors. Be sure that the processor configurations at each step are compatible with your server requirements. |

*continued*

**Table 2-5: Processor Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Processor problems are occurring (*continued*). | Processors are incorrectly installed in your server. | Be sure that each processor is correctly installed in your server, as detailed in your server-specific user documentation. |
| | Processors are unsupported by your server. | Be sure that each processor is supported by your server. Refer to your server-specific user documentation for processor requirements. |
| Server does not boot correctly due to a processor problem. | Bus core ratio may be set incorrectly. | Be sure that the appropriate jumpers and switches are set correctly for your server, especially if you have recently added new processors. Refer to your server-specific user documentation for jumper and switch settings. |

## Processor Power Modules

If the server configuration includes one or more PPMs and one fails, the server is forced into a reset condition and does not power up. To check for failure if the PPMs are not integrated on the system board:

**CAUTION:** Never operate the server for an extended period of time if an access panel is removed. Doing so can cause thermal damage to drives and components and can void your system warranty.

1. Briefly remove the appropriate access panel to inspect.
2. Try reseating each PPM.
3. If reseating the PPMs is not effective, replace each PPM one at a time and test.

To check for failure if your server has redundant PPMs, briefly remove the appropriate access panel to inspect for the following:

- If the failure LED is lit, then one of the voltage regulators on the redundant PPM has failed. The PPM is no longer redundant. The system will continue to run without redundancy, displaying a message from the Health Driver (if loaded on the system) to notify the user of the loss of redundancy.
- If a PPM fails, the server is forced into a reset condition and may not power up.

In either case, replace the PPM.

## PCI or PCI-X Hot Plug

Some servers support PCI or PCI-X Hot Plug functionality, which provides the ability to remove, replace, upgrade, and add PCI or PCI-X expansion boards without the server being powered down. PCI or PCI-X Hot Plug device drivers and operating system support are required to enable this functionality. If you are having problems with PCI or PCI-X Hot Plug functionality, be sure that the proper drivers and support exist on your server and that you are following the requirements described in your server-specific user documentation for this technology.

If errors are occurring, be sure that you are removing power to the slot using the PCI Hot Plug Utility (if supported by your server) or the PCI Hot Plug button before adding or removing any PCI hot plug devices.

## Memory

Use Table 2-6 to troubleshoot memory problems. Be sure that the memory meets your server requirements and that it is installed as required by your server. Some requirements may include that memory banks cannot be partially populated, or that all memory within a memory bank must be the same size, type, and speed. Refer to your server-specific user documentation to determine if the memory is installed correctly.

**Table 2-6: Memory Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Out of memory. | Memory configuration may not be set up correctly or you have run out of memory to run the application. | 1. Check the application documentation to determine the memory configuration requirements.<br>2. Check for operating system errors.<br>3. Check the memory count during Power-On Self-Test (POST) messages. If the memory count is wrong, complete the steps shown for a memory count error. |
| Memory count error. | Memory modules may not be installed correctly. | 1. Be sure that the memory modules have been installed correctly. Refer to your server-specific user documentation.<br>2. Be sure that the memory modules are properly seated.<br>3. Check the error information for your operating system.<br>4. Restart the server. If the POST count is still wrong, replace the memory. |
| Server fails to recognize existing memory. | Server fails to recognize the complete amount of memory. | 1. Reseat the memory.<br>2. Run the server setup utility.<br>3. If the server still fails to recognize the memory, then replace the memory. |

*continued*

**Table 2-6: Memory Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| | Memory count error occurs. | 1. Be sure that the memory modules have been installed correctly. Refer to your server-specific user documentation.<br>2. Be sure that the memory modules are properly seated.<br>3. Run the server setup utility.<br>4. Restart the server. If the POST count is still wrong, replace the memory. |
| Server fails to recognize new memory. | There may be a conflict with existing memory. | 1. Check the IML.<br>2. Check for conflicts with existing memory.<br>3. Run the server setup utility. |
| Server fails to recognize new memory (*continued*). | Memory may not be installed properly. | 1. Be sure that the memory is properly seated.<br>2. Be sure that the memory modules have been installed correctly. Refer to your server-specific user documentation. |
| | The memory installed may not be compatible with your server or may have exceeded limits set for the server or operating system. | 1. Be sure that the memory installed is the correct type of memory for your server.<br>2. Be sure that you have not exceeded the memory limits of the server or operating system. Check the appropriate documentation. |
| | Memory may have failed. | 1. Test by installing memory into a working server.<br>2. Replace the memory. Refer to the procedures in your server user documentation. |

# Fans

## General Fan Problems

Use the information in Table 2-7 to troubleshoot general fan problems.

**Table 2-7: General Fan Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Thermal and fan problems are occurring. | Fans are improperly seated. | Follow your server-specific user documentation procedures and warnings for removing the access panels and accessing and replacing fans.<br>1. Check the documentation for the functional requirements of the fan.<br>2. Be sure that the fans are properly seated.<br>3. Replace the access panels, and then attempt to restart the server. |
| | Ventilation is not adequate. | Be sure that there is proper ventilation. Refer to your server-specific user documentation for further requirements.<br>**IMPORTANT:** For proper airflow, keep all access panels closed whenever possible. |
| | Fan errors are occurring. | Check any POST messages for temperature violation or fan failure information. Refer to your server-specific user documentation for the temperature requirements for your server. |
| | | Access the IML to see if any fan errors are listed. Refer to “Integrated Management Log” in Chapter 4 for more information. |

*continued*

**Table 2-7: General Fan Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Thermal and fan problems are occurring (continued). | Fans are not functioning properly. | Be sure that all fans are properly seated and working. |
| | | Replace any required nonfunctioning fans and restart the server. Refer to your server-specific user documentation for specifications on fan requirements. |
| | | Be sure that all fan slots have fans or blanks installed. Refer to your server-specific user documentation for requirements. |

## Hot-Plug Fan Problems

Use the information in Table 2-8 to troubleshoot hot-plug fan problems.

**Table 2-8: Hot-Plug Fan Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Thermal and fan problems are occurring. | Hot-plug fans are not working properly. | Check the LEDs. Refer to your server-specific user documentation. |
| | Hot-plug fan errors are occurring. | If the system powers up, generates two long beeps and two short beeps (if your server has speakers), displays `1611-Fan failure detected`, and then powers down, check whether all required fans are installed and installed properly. When the power comes on, the green LED on the top of the fan assembly comes on and stays on. An amber fan LED indicates a fan failure. If a fan has failed, replace the fan. |
| | Hot-plug fan requirements are not being met. | Refer to your server-specific user documentation for fan requirements. |

**NOTE:** For servers with redundant fans, backup fans may spin up periodically to test functionality. This is a part of normal redundant fan operation.

# Drive Problems

## Diskette Drives

Use Table 2-9 to troubleshoot diskette drive problems.

**Table 2-9: Diskette Drive Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Diskette drive light stays on. | Diskette is damaged. | Run your diskette utility on the diskette (CHKDSK on some systems). |
| | Diskette is incorrectly inserted. | Remove the diskette and reinsert correctly into the drive. |
| | Software is corrupt. | Check the program diskettes or reinstall software from the original media. |
| | Drive cable is not properly connected. | Reconnect the drive cable. |
| A problem has occurred with a diskette transaction. | The directory structure is bad, or there is a problem with a file. | Run your diskette utility to check for fragmentation (CHKDSK on some systems). |
| Diskette drive cannot read a diskette. | Diskette is not formatted. | Format the diskette. |
| | You are using the wrong diskette type for the drive type. | Check the type of drive you are using and use the correct diskette type. |
| Drive is not found. | Cable is loose. | Check all cable connections between the drive and controller. |
| Nonsystem disk message is displayed. | The system is trying to start from a diskette that is not bootable. | Remove the diskette from the drive. |

*continued*

**Table 2-9: Diskette Drive Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Diskette drive cannot write to a diskette. | Diskette is not formatted. | Format the diskette. |
| | Diskette is write-protected. | Use another diskette or remove the write protection. |
| | You are attempting to write to the wrong drive. | Check the drive letter in your path statement. |
| | Not enough space is left on the diskette. | Use another diskette. |

## CD-ROM and DVD Drives

Use Table 2-10 to troubleshoot CD-ROM and DVD drive problems.

**Table 2-10: CD-ROM and DVD Drive Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| System does not boot from CD-ROM or DVD drive. | The drive boot is not enabled through the server setup utility. | Run the server setup utility and set the drive priorities. |
| System does not boot from a USB CD-ROM | Your operating system does not support booting from a USB CD-ROM. | Check your operating system-specific documentation to see whether your operating system supports booting from a USB CD-ROM. |
| Data read from CD-ROM or DVD drive is inconsistent, or drive cannot read data. | The drive or the media inserted is unclean. | Clean the drive and media. |
| | 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. |
| | The inserted CD or DVD format may be invalid for this drive, such as a DVD disc in a non-DVD drive. | Replace the CD or DVD with valid media for the drive. |

*continued*

**Table 2-10: CD-ROM and DVD Drive Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| CD-ROM or DVD drive is not detected. | CD-ROM or DVD drive is not properly connected. | Refer to the documentation included with the drive. Connect cables correctly. |
| | Cable or cables are bad. | Check the connections and drive documentation. Replace cables as needed. |
| | Driver is not loaded. | Install the correct driver. |

# Hard Drives

## General Hard Drives

For information on individual drive specifications, refer to your server-specific user documentation, the drive documentation, and the array controller documentation.

**Table 2-11: Hard Drive Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Hard drive fails, and your system completes POST. | Hard drive failed. | Replace the hard drive. |
| | Drive is not supported. | Replace with a hard drive supported by both the server and the operating system. |
| | A SCSI cable failed. | Check the pins on both ends of all SCSI cables in the configuration. The pins and cables could be bent or otherwise damaged. |
| Hard drive is not recognized by server. | Hard drive connection problem occurred. | Check the LEDs on the hard drive. Refer to your server-specific user documentation for information on hard drive LEDs.<br><br>Try removing and replacing the hard drive. If you remove any hard drives, label the drive and its position, and make sure that you install it in its original position. |

*continued*

**Table 2-11: Hard Drive Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Hard drive is not recognized by server (*continued*). | Array is not configured for the hard drive. | Run your array configuration utility. |
| | There is a conflict with another hard drive. | On non-hot plug hard drives, check for SCSI ID conflicts. |
| | Driver problem occurred. | Install correct controller drivers. |
| You cannot access data. | Files are corrupted. | • The files on the server may contain viruses. Run a current version of a virus scan utility.<br>• The files on the server may be corrupted. Run the repair utility for your operating system.<br>• NetWare—run VREPAIR.<br>• IBM OS/2—run CHKDSK.<br>• Windows NT—run the repair facility. |
| Server response time is slower than usual. | Hard drive is full. | Increase the amount of free space on your hard drive. It is recommended that hard drives should have a minimum of 15 percent free space. |
| No hard drives are recognized. | Power problem is occurring. | Check power to backplane. |
| New hard drive is not recognized. | Drive bay is defective. | Try another bay. |
| | Hard drive is not supported. | Refer to your hard drive documentation to be sure that the drive is supported. |
| | Hard drive failed. | Replace hard drive. |
| | Hard drive sizes are incorrectly reported. | Run your array configuration utility or the utility supplied with the array controller. |

## SCSI Non-Hot-Plug Hard Drives

If the SCSI device is not recognized, be sure that it is configured correctly. Refer to the documentation provided with the SCSI device.

HP ships non-hot-plug hard drives set to ID 0 and CD-ROM drives set to ID 5.

- Be sure that each SCSI device connected to the same port on a SCSI backplane is set with a unique SCSI identification number.
- Check allocated SCSI IDs in the server setup utility before beginning an installation procedure. A SCSI device added to a port already connected to one or more SCSI devices must have a unique ID.
- Be sure that the SCSI ID switches are set according to the drive bay position required for your server. Refer to your server-specific user documentation or hard drive documentation for setting information.

## SCSI Hot-Plug Hard Drives

If the SCSI device is not recognized, be sure that it is configured correctly. Refer to the documentation provided with the SCSI device.

You should be able to install a hot-plug drive during normal activity. Be aware, however, that doing so can affect system performance and fault tolerance.

**NOTE:** Depending upon your configuration, both a drive failure and the subsequent rebuild process cause storage subsystem performance degradation. For example, the replacement of a single drive on an array with 50 logical drives has less of an impact than on an array with three logical drives.

When a hot-plug hard drive is installed during server operation, the drive subsystem may no longer be fault tolerant, although the system is functionally operational.

**CAUTION:** Fault tolerance is lost until the removed drive is replaced and the rebuild operation is completed (this process takes several hours, even if the system is not busy while the rebuild is in progress). If another drive in the array should incur an error during the period when fault tolerance is unavailable, it is possible to cause a fatal system error due to a data error. If another drive fails during this period, the entire contents of the array could be lost.

**CAUTION:** Before removing a hot-plug drive, refer to "Unsafe Hot-Plug Drive Replacement Precautions" in this chapter to avoid potential data loss.

**IMPORTANT:** It is recommended that disk drive replacement be performed during low-activity periods whenever possible. In addition, a current valid backup should be available for the logical drives in the array of the drive being replaced, even if drive replacement is being made during server downtime.

Each hot-plug SCSI hard drive has three LED indicators located on the front of the drive. The LEDs provide activity, online, and fault status for each corresponding drive, when configured as a part of an array and connected to a powered-up Smart Array Controller. The behavior of the LEDs varies, depending on the status of other drives in the array. Refer to your server-specific user documentation for information about drive statuses.

**IMPORTANT:** If the hard drive fault LED is on, follow the proper troubleshooting procedures, find the cause of the problem, and correct it. One common mistake with failed hot-plug drives in a fault-tolerant array is removing the hot-plug drive for a few seconds and reseating the same drive without dealing with the cause of the problem. This reseating of the hot-plug drive often causes the fault LED to turn off, but does not solve the problem that initially caused it to light. Usually the drive should be replaced, but in some situations a problem could exist with the drive cage, the SCSI cable, or the controller.

If you are installing a SCSI hot-plug hard drive, observe the following guidelines:

- If only one SCSI hard drive is used, it should be installed in the lowest-numbered bay. If several drives are installed, the drives must be installed adjacent to each other starting from the lowest-numbered bay, with the system-bootable drive installed in the lowest-numbered bay. It is not necessary to set the SCSI ID of a hot-plug hard drive. The backplane board automatically sets the ID when the drive is installed.
- To maintain proper system cooling, blanking panels must be installed into unused drive bays.

Refer to your server-specific user documentation for details on correct drive placement.

### Unsafe Hot-Plug Drive Replacement Precautions

Be aware of the following guidelines cautioning unsafe hot-plug replacement:

- Do not remove a drive if any other member of the array is offline (the online LED is off). No other drive in the array can be hot-plugged without data loss. The possible exception to this might be the utilization of RAID 0+1 as a fault-tolerant form. In this case, drives are mirrored in pairs. More than one drive can fail and be replaced as long as the drive or drives they are mirroring are online.

  Refer to your Smart Array Controller user guide for information on fault-tolerance options.

- Do not remove a drive if any member of an array is missing (previously removed and not yet replaced).

- Do not remove a drive if any member of an array is being rebuilt, unless the drive being rebuilt has been configured as an online spare. The online LED for the drive flashes, indicating that a replaced drive is being rebuilt from data stored on the other drives.

  If an online spare drive is installed, wait for rebuilding to complete before replacing the failed drive. When a drive fails, the online spare becomes active and begins rebuilding as a replacement drive. After the online spare has been completely rebuilt, replace the failed drive with a new drive. Do not replace the failed drive with the online spare.

  **NOTE:** An online spare does not activate and start rebuilding after a predictive failure alert because the degraded drive is still online. The online spare activates only after a drive in the array has failed.

- Do not power down a server storage system while the server controlling it is powered up.

**CAUTION:** Powering down a server storage system while the server controlling it is powered up causes the Smart Array controller to mark the drives as **failed** and results in permanent data loss.

- Do not replace more than one drive at the same time (for example, when the system is off), since the fault tolerance can be compromised.

**CAUTION:** Replacing more than one drive at the same time compromises the fault tolerance. When a drive is replaced, the controller uses data from the other drives in the array to reconstruct data on the replacement drive. If more than one drive is removed, a complete data set is not available to reconstruct data on the replacement drive or drives, and permanent data loss can occur.

- Do not turn off a connected hard drive enclosure when the server containing the Smart Array Controller is powered up. Also, do not power up the server before powering up the drive enclosure.

**CAUTION:** Turning off a connected hard drive enclosure when the server containing the Smart Array Controller is powered up may cause the Smart Array Controller to mark the drives in this enclosure as **failed**. Powering up the server before powering up the drive enclosure may also cause the Smart Array Controller to mark the drives in this enclosure as **failed**. Permanent data loss can occur.

- If POST error message 1786 occurs when the system is powered up after one or more drives have been replaced while the system is powered down, you will be prompted to:

```
PRESS <F1> TO BOOT THE SYSTEM AND REBUILD THE REPLACED DRIVE
-Or-
PRESS <F2> TO BOOT THE SYSTEM AND NOT REBUILD THE DRIVES
```

**CAUTION:** Pressing the **F2** key causes permanent data loss to the entire logical drive. Press the **F2** key only if all of the drives have been replaced or if complete data loss is desired.

## Predictive Failure Alert

The predictive failure alert is a powerful problem-prevention tool that warns you when the system has determined that a drive failure is imminent. This alert allows you to proactively schedule downtime for maintenance and not interrupt critical business operations that rely on your server. In addition, with hot-pluggable drives connected to Smart Array Controllers you can remove and replace one or several drives within a server while the system is online. This minimizes the interruption of the network, server downtime, and data loss. Refer to your Insight Manager 7 (or previous version) and Management Agents documentation, found on the Management CD, for instructions on implementing this function.

**CAUTION:** Failure to follow these guidelines can result in data loss.

**IMPORTANT:** It is recommended that some level of fault tolerance be utilized in your RAID configuration. Refer to the Smart Array Controller user guide for information on fault-tolerance options.

**IMPORTANT:** You must use Insight Manager 7 (or previous version) and a Smart Array Controller to manage the drive array on your server if you wish to implement the predictive failure alert.

### Predictive Failure Replacement Guidelines

To minimize server downtime and data loss, use these guidelines when Insight Manager 7 (or previous version) issues a predictive failure alert. The alert indicates that a drive is degraded and should be replaced.

- Be sure that all physical drives in the affected array are present and that the online LEDs are illuminated before removing the degraded hot-plug drive. If any online LEDs are flashing (indicating a rebuild) or are not illuminated, the degraded drive should not be removed.

  For step-by-step instructions on connecting a hot-plug hard drive, refer to the user documentation for your server.

- If you are upgrading to larger drives in the array, follow the previously stated rules and be sure that each drive has completed its rebuild before adding the next new drive to the array.

- You must follow the server cabling guidelines when configuring your array to implement the best possible cabling solution for your server.

  Refer to your server-specific user documentation for step-by-step instructions.

- Check for cabling configurations that are not supported. Signal integrity errors can be injected into the SCSI bus when an active drive is hot-plugged.
- Be sure that a drive is not currently being used to recover from errors, such as media errors or signal integrity errors, to other drives in the array.

**CAUTION:** In extreme cases, when the number of errors is greater than the firmware error recovery is able to sustain, connecting a hot-plug online drive can cause some unrecoverable errors to be reported to the operating system or can cause a complete failure of the array. Refer to your operating system documentation for more information on implications, as well as possible recovery options.

**IMPORTANT:** Before replacing a degraded drive, use Insight Manager 7 (or previous version) to examine the error counters recorded for each physical drive in the array to be sure that such errors are not presently occurring. Refer to the documentation on the Management CD.

# Tape Drives

## DLT Drives

Use Table 2-12 to troubleshoot Digital Linear Tape (DLT) drive problems.

**Table 2-12: Tape Drive Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Server cannot write to tape. | Drive is not clean. | Clean the drive. Refer to the instructions provided with the drive. |
| | Tape is not compatible with drive. | Check the tape specifications to be sure that the tapes are designed to work with the drive. |

*continued*

**Table 2-12: Tape Drive Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Server cannot write to tape (*continued*). | A lost leader is dropped. | Check every tape cartridge that has been used in the DLT drive. After you locate the bad cartridges, dispose of them. As soon as a good tape drive is installed with a bad cartridge, the tape drive will drop its leader, indicating that it needs replacing. |
| DLT drive failure occurs. | Power or signal cable is not seated. | Check the power and signal cables to be sure they are properly seated:<br>1. Push the cables to be sure that they are tightly connected.<br>2. If pushing in the cables does not solve the problem, remove the cables and then firmly reconnect them. |
| | Nonembedded controller is not properly seated. | Check the controller to be sure it is properly seated:<br>1. Push the controller to be sure that it is tightly connected.<br>2. If pushing in the controller does not solve the problem, remove the controller, and then firmly place it in again. |
| DLT drive does not read tape. | DLT drive is not firmly connected. | Check the DLT drive to be sure it is properly seated:<br>1. Push the DLT drive in tightly.<br>2. If that does not correct the problem, completely remove the DLT drive and reseat. |
| | Tape is write-protected. | 1. Remove write protection.<br>2. If the tape still does not work, try another tape. |

*continued*

**Table 2-12: Tape Drive Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| DLT drive does not read tape (*continued*). | Tape is not compatible with the drive. | Check your tape specifications to be sure that the tape is designed to work with the drive. |
| Server cannot see DLT drive. | Device conflict exists. | Be sure that each device on the controller has a unique ID. Use the server setup utility to check for conflicts. |
| | SCSI terminator is missing for the external DLT drive. | The external DLT drive requires a SCSI terminator to be secured to the unused SCSI IN connector on the back of the drive. DLT drives can be daisy chained. Do not connect more than three units per SCSI controller. The last DLT drive in the chain requires the SCSI terminator. If the terminator is not connected, the system may not recognize the DLT drive. |
| | Maximum number of drives per controller has been exceeded. | Refer to your controller documentation. |
| DAT drive error is displayed. | Problem exists with a DAT drive. | Refer to “DAT Drives” in this chapter. |
| Error occurs during backup, but the backup is completed. | Non-failure error has occurred. | Some errors do not cause a failure. If an error occurs but does not disrupt the backup, you may be able to ignore the error. Contact the software vendor for more information about the message. |

## DAT Drives

Use Table 2-13 to troubleshoot common DAT drive problems.

**Table 2-13: DAT Drive Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| DAT drive sense error codes are displayed. | There is a drive error. | DAT drive sense error codes are detailed in the whitepaper *Troubleshooting DAT Drives*. Search the following website:<br>www.hp.com |
| DAT drive error or failure occurs. | Drivers and software are not current. | Upgrade drivers, software, and firmware to the latest revisions. |
| | Drive has particle contamination on the heads. | 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.<br>DAT drives require cleaning every 8 to 25 hours or they may fail intermittently when using marginal or bad media. Be sure that you are following the proper regular cleaning procedures. Refer to Chapter 6, "Error Prevention." |
| DAT drive is providing poor performance. | Drive is being used to backup more than what is recommended. | DAT drives are designed with optimum and maximum data backup sizes due to the time it takes to backup and verify large amounts of data and the increased cleaning requirements of the drive when used for backing up large amounts of data. Refer to the drive documentation to determine the appropriate data backup size for the drive. |
| Latest firmware indicates a defective tape. | Media is defective. | Replace the media. |
| Head clogs occur regularly. | | |
| Problem is still not solved. | Drive is bad. | Replace the drive. |

# External Device Problems

## Video

When you first start the server, the monitor should display the server logo. Use Table 2-14 to troubleshoot video problems.

**Table 2-14: Video Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Screen is blank for more than 60 seconds after you power up the server. | Monitor is not powered up and the monitor light is not on. | Power up the monitor and check if the monitor light is on. Be sure that the monitor power cord is plugged into a working grounded (earthed) AC outlet. |
| | Correct server node is not connected. | Check the integrated two-port switch box to be sure both servers are connected. |
| | The cable connections are not correct. | If server is rack-mounted, check the cables to the switch box. Be sure that the cables are firmly secured and that the switch is correctly set for the server.<br><br>If server is a tower model, check the cable connection from the monitor to the server, and then to the power outlet. |
| | The energy saver feature has been enabled. | Press any key, or type your password, and wait a few moments for the screen to activate. |
| | The video driver requires updating. | Check the SmartStart CD or third-party video adapter documentation for driver requirements. |
| | A video expansion board, such as a Remote Insight Lights-Out Edition board, has been added to replace onboard video. | 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.

*continued*

**Table 2-14: Video Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Screen is blank for more than 60 seconds after you power up the server (*continued*). | The power-on password is enabled. | Press any key or type your password, and then wait a few moments for the screen to activate.<br><br>You can tell if the power-on password is enabled if a key symbol is displayed on the screen when POST completes.<br><br>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 your server-specific user documentation for further information. |
| | The video expansion board failed. | Check Insight Manager 7 (or previous version) messages for references to video expansion board failure.<br><br>Be sure that the PCI Hot Plug slot has power. Check the power LED on the slot.<br><br>Be sure that the server and the operating system support the expansion board. |
| Monitor does not function properly when used with energy saver features. | Monitor without energy saver capabilities is being used with energy saver features enabled. | Disable the monitor energy saver features. |
| Video colors are wrong. | Either the cabling or the monitor impedance is incorrect. | • Be sure that the red, green, and blue BNC cables are connected to the corresponding monitor connectors.<br><br>• Be sure that your monitor RGB inputs are set to 75 ohms. |
| Slow-moving horizontal lines are displayed. | Magnetic field interference is occurring. | Move the monitor away from other monitors or power transformers. |

## Audio

Use Table 2-15 to troubleshoot audio problems.

**Table 2-15: Audio Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Server does not beep during POST. | If the speaker has a cable, it is not properly connected. | Be sure that the speaker cable is connected. Refer to your server-specific user documentation. You can access the documentation from the following website:<br>www.compaq.com/support/servers<br>Select your server, and then look in the **Manuals** section. |
| | Server does not have internal speakers. | Continue booting the system. Some servers do not have internal speakers and thus do not generate beeps during POST. |

## Printers

Use Table 2-16 to troubleshoot printer problems.

**Table 2-16: Printer Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Printer does not print. | Printer is not powered up or online. | Power the printer up and be sure that it is online. |
| | The correct printer drivers for your application are not installed. | Install the correct printer drivers for your application. |
| | Printer network connection is not established. | Make the proper network connections to the printer. |

*continued*

**Table 2-16: Printer Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Printer output is garbled. | The correct printer drivers for your application are not installed. | Install the correct printer drivers for your application. |

## Mouse and Keyboard

Use Table 2-17 to troubleshoot mouse and keyboard problems.

**Table 2-17: Mouse/Keyboard Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Mouse does not respond to movement, or keyboard does not work | The mouse or keyboard is not firmly connected. | If this is a rack-mounted server, check the cables to the switch box. Be sure that the cables are secured and that the switch is set for the server in question. Check for bent connector pins.<br><br>If this is a tower model, check the cable connection from the input device to the server. |
| | Correct server node is not connected. | Check the integrated two-port switch box to be sure that both servers are connected to the switch. |
| | The driver is not correct. | Obtain the current driver for your operating system. |

*continued*

**Table 2-17: Mouse/Keyboard Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Mouse does not respond to movement, or keyboard does not work (*continued*). | System is not responding and must be restarted. | If the device or port is bad, there should be a POST error. If there is a POST error, swap another PS/2 mouse or keyboard.<br>• If the problem still occurs with the new mouse or keyboard, then the connector port on the system I/O board is defective. Replace the board.<br>• If the problem no longer occurs, then the original input device is defective. Replace the device.<br>If there was no POST error, check whether the input device functions properly after the system is restarted.<br>If the problem is still not resolved, there may be a corrupted device driver. Replace the device driver. |
| | Switch box cable is too long. | Replace with a supported cable. |
| | Keyboard is not connected to correct port. | Determine whether the keyboard lights flash at POST or the NumLock LED illuminates. If not, change port connections. |
| Keyboard does not work or some keys stick. | Look for signs of spilled beverages. | Keyboard requires cleaning or replacement. |

## Diagnostic Adapter

If you have a server that supports the Diagnostic Adapter and you are using a PS/2 keyboard or mouse, the Diagnostic Adapter cannot be connected as a hot-plug device. You must connect the Diagnostic Adapter before booting the server on these systems, or switch to USB devices (if the operating system supports USB devices) to use the Diagnostic Adapter hot-plug functionality.

On some servers, operation of the Diagnostic Adapter with both USB and PS/2 devices simultaneously connected to the server can cause errors within the operating system including an inadvertent shutdown. If this occurs, switch the PS/2 devices on your system to USB devices.

## Integrated Management Display

If the server has an Integrated Management Display (IMD), perform the following actions to make sure it is working:

- Be sure that the IMD backlight is on.
  - — If the IMD backlight is not on, check the IMD cable to be sure that it is not damaged and that it is properly connected.
  - — If the IMD backlight is on, check the IMD contrast. You can adjust the level of contrast on the IMD by using the up and down arrows. Press the up arrow key to increase the contrast, and press the down arrow key to decrease the contrast. For further information, refer to your server-specific user documentation.
- If the IMD displays the `LCD Error` *`XX`* message, check to be sure that the cable is firmly plugged in. If firmly plugging in the cable does not remove the error message, then replace the IMD.
- If there is a monitor, check the screen for messages.

## Hot-Plug Management Module

If you are having problems with a server enclosure or power enclosure Hot-Plug Management Module, check the following:

- Check the module LEDs to see if you can isolate the problem. Refer to your server-specific user documentation for more information.
- Check to be sure that there are no loose or disconnected cables, and that all connections are properly seated.

# Network and Modem Problems

## Network Controllers

Use Table 2-18 to troubleshoot common problems with network controllers. To be sure that you are using the latest drivers and support files before installing your network controllers, access the support information on the product website on the following website:

www.compaq.com/support

**Table 2-18: Network Controller Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Network controller is installed but does not work. | Software problem occurred. | Refer to your operating system documentation for guidelines on adding or replacing PCI Hot Plug devices. |
| | There is an unsupported component. | Confirm server and operating system support of third-party components prior to installation. Refer to the component documentation for this information. |
| Network controller has stopped working. | The cable is not securely connected. | Be sure that the cable is secured to the network connector and that the other end of the cable is securely connected to the correct device. |
| | The files containing the network drivers are corrupted. | Reinstall the network drivers. |
| | There is no power to the PCI slot. | Be sure that the PCI Hot Plug power LED is on. |
| | The network controller is damaged. | Contact your authorized service provider. |

*continued*

**Table 2-18: Network Controller Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| Network controller stops working when an expansion board is added. | The cable is not securely connected. | Be sure that the cable is secured to the network connector and that the other end of the cable is securely connected to the correct device. |
| | Network controller interrupt overlaps the interrupt of an expansion board. | Modify one of the overlapping interrupt values. To do this, either:<br>Make the change in your server setup utility.<br>-Or-<br>Run the setup utility provided by the operating system. |
| | The files containing the network drivers are corrupt. | Reinstall the network drivers. |
| | Network drivers are not loaded, or driver parameters do not match current configuration. | 1. Be sure that the drivers were not deleted when the drivers for the new expansion board were installed.<br>2. Refer to your operating system documentation to verify that the correct drivers are installed.<br>3. Refer to your operating system documentation to be sure that the driver parameters match the configuration of the network controller. |
| You are having problems with the network interconnect blades (if available for your server). | Network interconnect blades are not properly seated. | Be sure that the network interconnect blades are properly seated and connected. |

## Modems

Use Table 2-19 to troubleshoot modem problems.

**Table 2-19: Modem Problems**

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| There is no dial tone. | Cable is not plugged in or is not plugged in correctly. | 1. Be sure that the cables are plugged in as specified in the modem documentation.<br>2. Connect a working telephone directly to the wall jack, and then test line for dial tone.<br>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. | Modem and computer or modem and telephone line are not connected correctly. | 1. Be sure that all connections are as specified in the modem documentation.<br>2. Connect a working telephone directly to the wall jack, and then test line for dial tone.<br>3. If no dial tone is detected, the phone line is not working. Contact the local telephone company and arrange to correct the problem. |
| | Telephone line is in use at another extension. | Be sure that the line is not in use at another extension. |
| | The number you are calling is not a modem line. | Be sure that the telephone number is correct. |
| | The number you are calling is a modem line, but the modem on the other end is not set up correctly. | The other modem must be set up correctly before you can complete the connection. |

*continued*

**Table 2-19: Modem Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| There is no response when you type AT commands. | There may be a conflicting port address. | Reconfigure the COM port address for the modem.<br>1. Be sure that the communications software is set to the COM port to which the modem is connected.<br>2. Check IRQ settings in the software and on the modem.<br>3. Type the following at the command prompt to reset the modem to factory-default settings:<br>`AT&F`<br>4. Be sure that you are in terminal mode and not MS-DOS mode.<br>Refer to the HP website for a complete list of AT commands:<br>www.hp.com |
| The AT commands are not visible. | The echo command may not be properly set. | Set the echo command to On, using the following AT command:<br>`ATE` |
| Data is displayed as garbled characters after the connection is established. | The modems that are connecting are not compatible. | Be sure that both modems are operating with the same settings, including speed, data, parity, and stop bits. |
| | The software may not be set for the correct terminal emulation. | 1. Reconfigure the software correctly.<br>2. Power down the server and restart.<br>3. Run the communications software, checking settings and making corrections where needed.<br>4. Restart the server and retry. |

*continued*

**Table 2-19: Modem Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| The modem does not answer an incoming call. | Auto-answer may not be enabled. | Enable this option in the communications software. |
| | An answering machine is connected and is answering before the modem can. | 1. Turn off the answering machine.<br>-Or-<br>Reconfigure auto-answer to respond in fewer rings than the answering machine.<br>2. Restart the server and retry. |
| The modem disconnects while online. | Connections may be loose. | Check for loose connections, and then reconnect. |
| | You are experiencing line interference or poor line conditions. | Retry the connection by dialing the number several times. If conditions remain poor, contact your telephone company to have the line tested. |
| | The call waiting feature on the telephone line is enabled, and an incoming call is breaking the connection. | Disable call waiting and retry. |
| The AT command initialization (init) string is not working. | The init string may be longer than necessary. | Utilize the most basic string possible to perform the task. The default init string is:<br>`AT&F&C1&D2&K3` |

*continued*

**Table 2-19: Modem Problems** *continued*

| Problem | Possible Cause | Possible Solution |
|---|---|---|
| You are receiving connection errors. | Your baud rate is too high for the line you are trying to access. | Check the maximum baud rate for the modem to which you are connecting, and change your baud rate to match. |
| | The line you are accessing requires error control to be turned off. | Turn error control off using the following AT command:<br>`AT&Q6%C0` |
| | You are experiencing line interference, or line conditions are poor. | Retry the connection by dialing the number several times. If conditions remain poor, contact your telephone company to have the line tested. |
| | The modem to which you are connecting may not be current or compliant with current CCITT and Bell standards. | Be sure that the modem is current and compliant with CCITT and Bell standards. |
| You are unable to connect to an online subscription service. | The internet service provider (ISP) requires error control to be turned off. | Turn error control off using the following AT command:<br>`AT&Q6%C0` |
| | The ISP you are accessing requires access at a decreased baud rate. | Reconfigure your communications software to correct the connection baud rate to match the service you are calling.<br>If this does not work, try forcing a slower baud rate (14400 baud) with the AT command:<br>`AT&Q6N0S37=11` |
| You are unable to connect at 56 Kbps. | The ISP cannot connect at that baud rate. | Find out the maximum baud rate at which the ISP connects, and change your settings to reflect this. Retry, connecting at the lower speed. |
| | You are experiencing line interference, or line conditions are poor. | Retry the connection by dialing the number several times. If conditions remain poor, contact your telephone company to have the line tested. |

# 3

# Software Problems

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

Other useful resources include the Survey utility, available for servers running a Microsoft Windows, Linux, or Novell NetWare operating system, and Insight Manager 7 (and previous versions). Use either utility to gather critical system hardware and software information and to help with problem diagnosis.

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

The following information is covered in this chapter:

- Operating Systems
- Application Software
- Clustering Software
- Remote ROM Flash
- Maintaining Current Drivers
- Erasing the System

# Operating Systems

## Operating System Problems

Use Table 3-1 to troubleshoot operating system problems.

**Table 3-1: Operating System Problems**

| Problem | Possible Solution |
|---|---|
| Operating system locks up. | Scan for viruses with an updated virus scan utility. |
| Errors are displayed in the error log. | Follow the information provided in the error log, and refer to your operating system documentation. |
| IBM Token-Ring drivers do not load. | For the first node of the ring, you must set the speed of the network interface controller. Refer to the documentation provided with the network interface controller drivers. |
| The operating system does not load, and it was installed using SmartStart. | Run the server setup utility. |
| The operating system does not load, and it was factory installed. | 1. Be sure that you are following the instructions in the *Factory-Installed Operating System Software User Guide* provided for your operating system.<br>2. If all instructions have been followed and a problem still exists, note at which phase the installation stops loading.<br>Is the server in the process of booting? During the installation, the server restarts several times.<br>Did you power down the server at any time during the installation process? If so, you must restart using the SmartStart CD. |

*continued*

**Table 3-1: Operating System Problems** *continued*

| Problem | Possible Solution |
|---|---|
| The operating system does not load, and it was factory installed. (*continued*) | 3. For Microsoft Windows NT and Windows 2000 installations, note whether the factory installation halted after you pressed **Ctrl+Alt+Del** to display the logon screen and logged on as Administrator.<br>4. Power up the system and attempt to restart the Post-Installation Tasks provided in the *Factory-Installed Operating System Software Installation Guide*.<br>-Or-<br>For Novell installations, note whether the factory installation halted after the installation interview when you logged on as Administrator. Was hardware added to the factory installation? Remove the new hardware, and then reinstall after the operating system installation is successfully completed. Refer to the documentation provided with the hardware. |
| | 5. If the factory-installed operating system is not recoverable, erase and reinstall the operating system.<br>Refer to "Erasing the System " in this chapter. |
| Server problems occur after the installation of a service pack. | The service pack may have overwritten a file. Refer to "Operating System Updates" in this chapter. |

*continued*

**Table 3-1: Operating System Problems** *continued*

| Problem | Possible Solution |
|---|---|
| You have a factory-installed Novell NetWare 5 operating system and you are unable to bind your NICs during the completion of the installation process. | If you are unable to bind your NICs during the Protocols Interview, your packet receive buffers may not be 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 your NICs. A minimum setting of 50 buffers per port is recommended, and the maximum setting should be 125 more than the minimum.<br><br>To make the setting changes, type the following command at the System Console screen (where *XXX* is the new numeric value):<br><br>`Set Minimum Packet Receive Buffers=`*XXX*<br><br>`Set Maximum Packet Receive Buffers=`*XXX*<br><br>Also, add these commands to the STARTUP.NCF file.<br><br>**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, NetWare attempts to load MEGA4 *XX*.HAM or 120PCI.HAM, and Remote Insight Lights-Out Edition board installed. | No action is needed. This occurrence does not impact the installation of NetWare. |

## Operating System Updates

Use care when applying operating system updates. First, check the bug fix list that comes with each update. If you require no specific fixes, 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. Refer to the "Maintaining Current Drivers," section in this chapter.
4. Power up your server.

If you apply the update and have problems, refer to the following website:

www.compaq.com/support/files/server

Select your server and operating system to find SoftPaq files to correct these problems.

## 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 that you do not lose additional functionality.

Refer to the documentation provided with your backup software.

## When to Reconfigure or Reload Software

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

1. Weigh the projected downtime against the time spent troubleshooting intermittent problems. It may be advantageous to start over by removing and reinstalling the problem software, or in some cases by using the System Erase Utility and reinstalling all system software.

**CAUTION:** Perform a backup before running the System Erase Utility because the utility sets the system to its original factory state, deletes the current hardware configuration information, including array setup and disk partitioning, and erases all connected hard drives completely. Refer to "Erasing the System" in this chapter for complete instructions on using this utility.

2. Be sure that you have printed records of all information listed in Chapter 1, "Diagnosing the Problem."
3. Be sure that you have two good backups before you start. Test the backups using your backup utility.
4. Check the operating system and application software resources to be sure that you have the latest information.
5. If the last-known functioning configuration does not work, try to recover your system with your operating system recovery software.

Refer to Table 3-2 for information on recovery software applicable to your operating system.

**Table 3-2: Recovery Software**

| Operating Systems | Software Tool |
|---|---|
| Microsoft Windows NT, Windows 2000, and BackOffice Small Business Server | Emergency Repair Diskette. Refer to your Windows NT, Windows 2000, or BackOffice Small Business Server documentation for more information.<br><br>HP servers shipped with factory-installed software include **Start** menu access to the Emergency Repair Disk Utility.<br><br>Click **Start**, **Programs**, and **System Tools**. You may then create or update your Emergency Repair Diskette. |
| 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 your NetWare documentation for more information. |
| Caldera UnixWare and SCO OpenServer from Caldera | Emergency boot diskette. Refer to your Caldera UnixWare or SCO OpenServer from Caldera documentation for more information. |
| Sun Solaris | Device Configuration Assistant boot diskette. Refer to your Solaris documentation for more information. |
| IBM OS/2 | Power up the server from the startup diskettes. Refer to your OS/2 documentation for more information. |
| Linux | Refer to your operating system documentation for information. |
| Banyan VINES | Refer to your operating system documentation for information. |

# Application Software

Use Table 3-3 to troubleshoot operating system or application software problems.

**Table 3-3: Application Software Problems**

| Problem | Possible Solution |
|---|---|
| Software locks up. | Power down the computer and peripheral devices. Reboot the computer. |
| | Scan for viruses with an updated virus scan utility. |
| Errors occur after a software setting is changed. | Check the system logs. Change settings to the original configuration. |
| Errors occur after the system software is changed. | 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. | Check system settings. You may need to obtain the settings from the server setup utility and manually set the software switches. Refer to your application documentation, the vendor website, or both. |
| | Check for overwritten files.<br>Check the application documentation to find out which files are added by the application. |
| | Be sure that the installation was completed successfully. Try reinstalling the application. |
| | Be sure that you have the most current drivers. Refer to “Maintaining Current Drivers” in this chapter. |
| Printer errors occur after an application is installed. | Be sure that all current printer drivers are installed. |

# Clustering Software

If your server utilizes cluster software, such as Microsoft Cluster Server or Novell Cluster Services, refer to the documentation provided with the application for cluster troubleshooting information. Check the Microsoft or Novell website for software troubleshooting information and frequently asked questions.

Also, Insight Manager 7 (and some earlier versions) includes an integrated Cluster Monitor that collects information on cluster configurations.

Refer to the following website for a number of technical documents relating to clusters:

www.compaq.com/highavailability

# Remote ROM Flash Problems

During the remote ROM flash process, problems can occur, causing the ROM upgrade on the target system to fail. Some of these failures may be due to user error, while others may be due to an incorrect system configuration or a functional hardware failure.

Be sure that you are following the necessary requirements for using the Remote ROM flash utility, including:

- A local administrative client system that is running the Microsoft Windows 2000, Windows NT 3.51, or Windows NT 4.0 operating system.
- One or more remote servers with system ROMs to be upgraded. If the local administrative server is the only system to be flashed, remote servers are unnecessary.
- An administrative user account on each target system. The administrative account must have the same username and password as the local administrative client system.
- All computers being connected to the same network and using protocols that enable them to be seen from the administrative client.
- Each target system having a system partition that is at least 32 MB in size.

- Verification that the ROM version to which you are upgrading can be used for all of the servers or array controllers that you are upgrading.

**NOTE:** Network connectivity is required for flashing remote clients only.

Also be sure that you are following the instructions for the Remote ROM Flash procedure, located on the following website:

www.compaq.com/support/files/server

Select the family, model, and operating system of your server.

If you continue to encounter errors, refer to Table 3-4, which describes the possible failures that can occur during this procedure, their symptoms, and possible corrective actions.

**Table 3-4: Remote ROM Upgrade Errors**

| Problem | Symptoms | Possible Solution |
|---|---|---|
| Command-line syntax error | If the correct command-line syntax is not used, an error message describing the incorrect syntax is displayed and the program exits. | Correct the syntax, and then restart the process. |
| Invalid or incorrect command-line parameters | If incorrect parameters are passed into command-line options, an error message describing the invalid or incorrect parameter is displayed and the program exits. (Example: Invalid source path for system configuration or ROMPaq files.) | Correct the invalid parameter, and then restart the process. |
| Access denied on target computer | If you specify a networked target computer for which you do not have administrative privileges, an error message is displayed describing the problem and the program exits. | Obtain administrative privileges for the target computer, and then restart the process. |

*continued*

**Table 3-4: Remote ROM Upgrade Errors** *continued*

| Problem | Symptoms | Possible Solution |
|---|---|---|
| Network connection fails on remote communication | Because network connectivity cannot be guaranteed, it is possible for the administrative client to become disconnected from the target server during the ROM flash preparation. If any remote connectivity procedure fails during the ROM flash online preparation, the ROM flash does not occur for the target system. An error message describing the broken connection displays and the program exits. | Attempt to ascertain and correct the cause of connection failure, and then restart the process. |
| Failure during ROM flash | After the online flash preparation has been successfully completed, the system ROM is flashed offline. The flash cannot be interrupted during this process or the ROM image is corrupted and the server does not start. The most likely reason for failure at this point is a loss of power to the system during the flash process. | You must initiate ROMPaq disaster recovery procedures, outlined in the "ROMPaq Disaster Recovery" section in Chapter 5. |
| Unsupported target system | If the target system is not listed in the supported servers list, an error message is displayed and the program exits. | Only supported systems can be upgraded using the Remote ROM Flash utility. To see if your system is supported:<br>1. Access the following website:<br>www.compaq.com/support/files/server<br>2. Select the family, model and operating system of your server.<br>3. Look under the **Utilities** heading for Remote ROM Flash Utility. |

# Maintaining Current Drivers

Depending on the operating system, drivers are available through various methods:

- Individual download
- Driver Updates (DUs)
- Compaq Support Paqs (CSPs) or ProLiant Support Packs (PSPs)
- Support Software Diskettes (SSDs)
- Extended Feature Supplements (EFSs)

Check the SoftPaq download website to find these driver files:

www.compaq.com/support/files/server

CSPs, PSPs, SSDs, and EFSs are operating system-specific bundles of optimized drivers, utilities, and management agents. With these packages, HP enhances basic support of some devices to increase performance and add functionality. CSPs, PSPs, SSDs, and EFSs, if available for your operating system, are provided on the previously listed website or from the SmartStart CD.

**NOTE:** If you are installing drivers from the SmartStart CD, refer to the SmartStart website at www.hp.com/servers/smartstart to be sure that you are using the latest version of SmartStart. For more information, refer to the documentation provided with your SmartStart CD.

CSPs and SSDs are also provided by ActiveUpdate, available on the following website:

www.compaq.com/activeupdate

**NOTE:** ActiveUpdate can operate only on a system running a Microsoft Windows operating system.

Table 3-5 lists the methods by which drivers are provided for each operating system.

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

**Table 3-5: Operating System Driver Delivery**

| Operating System | Method of Driver Delivery |
|---|---|
| Microsoft Windows | CSPs and PSPs are available for servers running Microsoft Windows 2000 or Windows NT 4.0 operating systems.<br><br>SSDs are available for other versions of Microsoft Windows operating systems. |
| Linux | Linux drivers are available for individual download.<br><br>Also, check the following website:<br><br>www.compaq.com/products/servers/linux/linux-drivers.html |
| Novell NetWare | CSPs and PSPs are available for servers running the latest versions of Novell NetWare.<br><br>SSDs are available for other versions of the Novell NetWare operating system. |
| Caldera and SCO | EFSs are available for servers running Caldera and SCO operating systems. |
| Sun Solaris | DUs are available for servers running the Sun Solaris operating system. |
| IBM OS/2 | SSDs are available for systems running the IBM OS/2 operating system. |
| Banyan VINES | Banyan VINES drivers are available for individual download. |

# Erasing the System

**CAUTION:** Perform a backup before running the System Erase Utility. All data and configuration information on your existing server is erased by the System Erase Utility. This utility sets the system to its original factory state, deleting the existing hardware configuration information (including array setup and disk partitioning) and erasing all connected hard drives completely.

Run the System Erase Utility if you must erase the system for the following reasons:

- You choose to install a new operating system on a server with an existing operating system.
- You want to change your operating system selection.
- You encounter a failure-causing error during the SmartStart installation.
- You encounter an error when completing the steps of a factory-installed operating system installation.

Using the SmartStart CD, you can run the System Erase Utility in one of the following ways:

- Run from CD
  a. Power up the server using the SmartStart CD.
  b. Click **Run System Erase Utility** on the menu screen.
  c. The next screen displays a warning message that **all data** will be destroyed as a result of running this utility.
  d. If you would like to erase your system, continue with the process, following onscreen instructions.

- Run from diskette
  a. Power up the server using the SmartStart CD.
  b. Click **Create Support Software** on the menu screen.
  c. The next screen displays a message asking if you want to create the software from CD only or from an integration server. Select **Create Software from CD Only**.
  d. The next screen lists the products that are available for diskette creation. Click **System Erase Utility**, and then follow the instructions to create your diskette.
  e. Remove the SmartStart CD, and then restart the server using the diskette you have created to run the System Erase Utility.

# 4

# Diagnostic Tools

The diagnostic tools for ProLiant servers were developed to assist you in diagnosing problems, as well as in testing, monitoring, and managing your server. To find out which diagnostic tools are provided with your server, refer to your server-specific user documentation. The following tools are covered in this chapter:

- Array Diagnostic Utility
- Diagnostics
- Server Management
- Survey Utility
- Diagnostic Adapter
- Diagnostic Station
- Inspect Utility
- Integrated Administrator
- Integrated Lights-Out
- Integrated Management Log
- Power-On Self-Test
- Server Blade Health Driver

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

# Array Diagnostic Utility

Array Diagnostic Utility (ADU) is a Windows-based tool designed to run on all ProLiant servers that support HP array controllers and are running SmartStart 4.10 or later. The two main functions of ADU are to collect all possible information about the array controllers in the system and to generate a list of detected problems. For a complete list of ADU error messages generated, refer to Appendix D. Your system only generates ADU error messages applicable to your configuration and options.

ADU works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file. In severe situations, this file can be sent to HP for analysis. In most cases, ADU provides enough information to initiate problem resolution immediately.

**NOTE:** ADU does not write to the drives or destroy data. It does not change or remove configuration information.

To run ADU:

1. Insert the SmartStart CD into the CD-ROM drive.
2. Restart the system using the SmartStart CD.
3. Select **Array Diagnostic Utility (ADU)** from the **System Utilities** menu.

   A **Please Wait** panel is displayed, indicating that ADU is identifying the system parameters.

ADU gathers information from all array controllers connected to the system. The time it takes to gather this information depends upon the extent of your array configuration.

**CAUTION:** Do not cycle the power during this process. ADU must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware that was soft-upgraded.

When the information-gathering process is complete, ADU displays either the main screen or a panel indicating problems detected.

To generate an ADU report, select **File**, **Save Data** from the command menu.

# Diagnostics

Diagnostics is a diagnostic utility that tests the operation of your hardware. If problems are found, Diagnostics isolates the failure down to the replaceable part, whenever possible. Several versions of Diagnostics are available, including the latest version, Enterprise Diagnostics LX32, as well as previous versions for 32- and 64-bit systems. Refer to your server-specific user documentation to determine what type of Diagnostics your server supports.

Diagnostic error codes are generated when Diagnostics recognizes a problem. These error codes help identify defective components. Refer to Appendix B for a list of possible test error codes, their causes, and the steps for problem resolution. For each test error code listed in Appendix B, the Recommended Action column lists the steps necessary to correct the problem. Complete each step one by one, running Diagnostics after each step to see whether the error condition has been corrected.

## Enterprise Diagnostics LX32

Enterprise Diagnostics LX32 is a tool designed to run on all ProLiant servers that are running SmartStart 6.00 or later. Enterprise Diagnostics LX32 lets you view information about your server's hardware configuration and perform hardware tests on processors, input devices, communication ports and devices, storage devices, graphics, and memory.

Enterprise Diagnostics LX32 works by exercising hardware components to determine if a functional problem exists. This data can then be saved to a file. In severe situations, this file can be sent to HP for analysis. In most cases, Enterprise Diagnostics LX32 provides enough information to initiate problem resolution immediately.

**NOTE:** Diagnostics does not write to the drives or destroy data. It does not change or remove configuration information.

The Enterprise Diagnostics LX32 screen is divided into several areas:

- Overview—allows you to select and display various categories of information about the server.

- Tests—provides the capability to test functionality of all the major pieces of hardware in the server, including the following tests:
  - — Quick test—provides a predetermined script where each piece of hardware is exercised and requires no user intervention. This test script is designed to run quickly.
  - — Complete test—provides a predetermined script where each piece of hardware is tested. You can select scripts with interactive or no interactive tests.
  - — Custom test—allows you to decide which tests to run. Some of the tests selected may require user intervention.

  You can select from the following test modes:

  - — Interactive mode—provides maximum control over the testing process. You determine whether the test was passed or failed and may be prompted to insert or remove devices.
  - — Unattended mode—does not display prompts. If errors are found, they are displayed when testing is complete.
- Status—allows the user to monitor the progress of tests while they are being performed.
- Log—summarizes any errors that are detected. If the Enterprise Diagnostics LX32 utility detects an error during a test, it displays the type of error, error code, and a recommended repair action if one exists. The following logs are available:
  - — **Log** tab—lists tests run on the system, the numbers of times each test has run, the number of errors found on each test, and the total run time of each test.
  - — **Error** tab—lists all errors found on the server with their error codes.
  - — Integrated Management Log—lists all server management events logged into the server's NVRAM.
- Online Help—provides information on using Enterprise Diagnostics LX32, such as the Tab interface, overview categories, test mode descriptions, device test descriptions, logging capabilities, and failure information.

Each of these items allows you to gather different types of information about the system.

### Accessing Enterprise Diagnostics LX32

To access Enterprise Diagnostics LX32:

1. Insert the SmartStart CD into the CD-ROM drive.
2. Restart the system using the SmartStart CD.
3. Select **Server Diagnostics** from the **Maintenance** tab on the SmartStart main menu.
4. A panel is displayed, indicating that diagnostics is identifying the system configuration. Diagnostics gathers information from all hardware in the server. The time it takes to gather this information depends upon the extent of the system configuration. When the information-gathering process is complete, Diagnostics displays the main screen or a panel providing an overview of what system hardware was detected.

### Running Tests

To run tests using Enterprise Diagnostics LX32:

1. Select the Test tab.
2. Select the type of testing that you want to perform: Quick, Complete, or Custom
3. Select the mode of testing that you want to perform: Unattended or Interactive
4. From the list, select the device(s) that you want test.
5. To begin testing, click on the Begin Testing button to start the test.

### Saving Error Reports

Choose the **Save** link on the menu bar to save an error report.

## Diagnostics on a 32-bit System

Diagnostics for 32-bit systems can be run from the system partition (if set up on your server) or from a Diagnostics diskette.

### Running Diagnostics

To run Diagnostics from the partition:

- If your server uses ROM-Based Setup Utility (RBSU), press the **F10** key when prompted during the boot process. A menu is displayed listing **Test Computer** and **Inspect Computer**. Select **Test Computer**.
- If your server uses System Configuration Utility (SCU):
  a. Power up the server, and then press the **F10** key when the following message is displayed:

     ```
     Press F10 for system partition utilities
     ```

  b. Select **Diagnostics and Utilities** from the SCU main menu.
  c. Select **Test Computer** to run Diagnostics.

If your system does not have a partition set up, a Diagnostics diskette is required to run Diagnostics. To run Diagnostics from a Diagnostics diskette, boot the server with the Diagnostics diskette in drive A. A Diagnostics diskette can be made by running the Server Diagnostics file available for download from the following website:

www.compaq.com/support/files/server

Select your server and operating system, and then select the Server Diagnostics file from the **Utilities** section on the website.

## Diagnostics on a 64-bit System

Diagnostics for 64-bit systems must be run from an LS-120 Diagnostics Diskette.

### Running Diagnostics

To create and use the LS-120 diskette:

1. Download the SoftPaq to a directory on your hard drive. The SoftPaq file is a self-extracting executable with a filename based on the SoftPaq number, and can be downloaded from the following website:

   www.compaq.com/support/files/server

Select your server and operating system, and then select the Server Diagnostics file from the **Utilities** section on the website.

2. Execute the downloaded file and it will unzip to the Diagnostics64 folder on your hard drive.
3. Insert an LS-120 diskette in your LS-240 drive. Copy all files in the Diagnostics64 directory to this diskette, but do not copy the Diagnostics64 folder itself.
4. On the system on which you want to run Diagnostics, insert the LS-120 Diagnostics diskette you created into drive A, and go to the EFI boot manager. If you booted with the diskette already in the drive, exit the diagnostics screen to return to the EFI boot manager screen.
5. Load the Diagnostics Multiprocessor Driver:
   a. From the EFI Boot Manager screen, select **Boot Configuration**.
   b. From the **Boot Configuration** screen, select **Install EFI Driver**.
   c. In the prompt window, enter `DIAGMP.EFI`.
   d. In the next prompt window, enter `Diagnostics Multiprocessor Driver`.
6. Reboot the server. The system will load into Diagnostics.

## Exiting Diagnostics

To exit Diagnostics, select **Exit Diagnostics** from the Diagnostics main menu, or press **Esc** and select **Yes** when you are asked if you are sure you want to exit.

After exiting Diagnostics, unload the Diagnostics Multiprocessor Driver:

> **IMPORTANT:** Failure to unload the Diagnostics Multiprocessor Driver after exiting Diagnostics will result in an error message being displayed during every system reboot and may result in the operating system not loading.

1. On the **EFI Boot Manager** screen, select **Boot Configuration**.
2. On the **Boot Configuration** screen, select **Uninstall EFI Driver**.
3. A list of drivers is displayed. Select **Diagnostics Multiprocessor Driver** and press **Enter**.

**NOTE:** The driver name Diagnostics Multiprocessor Driver was set in step 5 of "Running Diagnostics" in this section. If the user selected a different name from this suggested name, that name will be displayed in the list of drivers.

# Server Management

Insight Manager 7 and its previous versions (Insight Manager XE and Insight Manager) are comprehensive network management tools that monitor and control the operation of HP servers and clients. These utilities use the Management Agents to monitor key subsystems and diagnose potential problems. For more information about the server management tools, refer to the following website:

www.hp.com/servers/manage

The server management tools are available on the Management CD, which ship with 32-bit servers, or the following website:

www.compaq.com/support/files/server

Select your server and operating system from the drop-down menus.

## Server Management on 64-bit Servers

Neither Insight Manager 7 nor previous versions of Insight Manager can be run directly on a 64-bit server. You must install Insight Manager 7 (or previous version) on a 32-bit Windows-based client PC that is connected to the 64-bit server through a network connection. Special 64-bit management agents are provided on the server-specific support software CD that ships with your server. These agents are installed on the 64-bit server and interface with the version of Insight Manager running on the 32-bit computer.

For more information on how to install the 64-bit management agents on a 64-bit server, refer to your 64-bit server-specific user documentation. Insight Manager 7 (or previous version) is not shipped with 64-bit servers. This utility is included on the Management CD that ships with all 32-bit ProLiant servers. Insight Manager 7 and previous versions are also available for download from the HP website at

www.hp.com/servers/manage

Refer to the user guide included on the Management CD for more information about Insight Manager 7 or any other version of Insight Manager that is included on the CD.

# Survey Utility

Survey Utility, available for the Microsoft Windows, Linux, and Novell NetWare operating systems, is an online application that gathers and saves critical hardware and software information in a single configuration history file. If a change occurs between data-gathering intervals, the file is overwritten to reflect both the latest configuration and the changes from the previous configuration, allowing you to keep a historical record of server configuration changes. It was developed to allow you to resolve problems without taking the server offline, and to assist in maximizing server availability.

## Running Survey Utility

The Survey Utility can be installed from the SmartStart CD (if available for your server), the Management CD, Integration Maintenance Utility, or from a SoftPaq downloaded from the following website:

www.compaq.com/support/files/server

Refer to the Management CD for information on installing and running the Survey Utility.

**NOTE:** If your operating system is factory installed, refer to your server-specific user documentation for instructions on Survey Utility installation and access procedures.

When the Survey Utility runs, it creates a text file, typically called SURVEY.TXT, which can be viewed in a text viewer such as Microsoft Notepad. The SURVEY.TXT file contains the IML as well as information about hardware, services running, and system resources. The event list follows the system slot information. After opening the text file, you can print it using the print feature of the viewer. For more information on the event list error messages, refer to the “List of Events” section of this chapter.

# Diagnostic Adapter

Available for some ProLiant BL servers, the Diagnostic Adapter provides keyboard, mouse, monitor, and serial connection access to an individual server blade. This allows you to troubleshoot a specific server blade using the Integrated Administrator and other server diagnostic functionality. Refer to your server-specific user documentation for more information.

# Diagnostic Station

Available for some ProLiant BL servers, the Diagnostic Station enables you to power up and communicate with a server blade or interconnect switch outside of the rack environment. With this functionality, you are able to observe blade LEDs, test NIC activity, configure a server blade or interconnect switch, load software, and diagnose server blade or interconnect switch problems using Integrated Lights-Out (iLO). Refer to the Diagnostic Station installation guide for more information.

# Inspect Utility

The Inspect Utility provides configuration information, such as the current memory configuration and the ROM version. Two versions of Inspect are available, one version for 32-bit systems and one version for 64-bit systems. Refer to your server-specific user documentation to determine what type of system you have.

## Running Inspect on a 32-bit System

On a 32-bit system, Inspect can be run from the system partition (if set up on your server) or from a Diagnostics diskette.

To run Inspect from the partition:

- If your server uses the ROM-Based Setup Utility (RBSU), press the **F10** key when prompted during the boot process. A menu is displayed listing **Test Computer** and **Inspect Computer**. Select **Inspect Computer**.

- If your server uses the System Configuration Utility (SCU):
  a. Power up the server, and then press the **F10** key when the following message is displayed:

     ```
     Press F10 for system partition utilities
     ```

  b. Select **Diagnostics and Utilities** from the SCU main menu.
  c. Select **Inspect Computer** to run Inspect.

If your system does not have a partition set up, a Diagnostics diskette is required to run Inspect. To run Inspect from a Diagnostics diskette, boot the server with the Diagnostics diskette in drive A. A Diagnostics diskette can be made by running the Server Diagnostics file available for download from the following website:

www.compaq.com/support/files/server

Select your server and operating system, and then select the Server Diagnostics file from the **Utilities** section on the website.

When Inspect has been initialized, select a hardware option for information about that device.

## Running Inspect on a 64-bit System

On a 64-bit system, Inspect can be run from within Diagnostics by selecting Inspect Information from the main menu. Refer to the "Diagnostics on a 64-bit System" section in this chapter for more information on running Diagnostics.

Inspect can also be run from the EFI Boot Manager. From the main menu in EFI Boot Manager, select the **System Maintenance** menu, and then select **System Inspect Menu**.

# Integrated Administrator

Available for ProLiant BL e-Series servers, the Integrated Administrator is a centralized management and monitoring system that acts as a combination terminal server and remote power controller, enabling out-of-band, secure, serial console connections to all server blades in the enclosure. The Integrated Administrator provides enclosure health, server blade health, and remote server manageability, and is a useful tool for diagnosing problems with your server. For more information, refer to the Integrated Administrator user guide for more information.

# Integrated Lights-Out

If supported on your system, iLO provides server health and remote server manageability, accessed from a network client using a supported Web browser. The iLO subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface, making iLO independent of the host server and its operating system. Advanced troubleshooting features are also accessible through iLO, such as the ability to view the IML, the iLO Event Log, POST error messages, and NVRAM environmental variables. Also available with iLO is a virtual NMI button, which halts the operating system for debugging. For more information using the iLO features, and for a list of iLO Event Log messages, refer to the *Integrated Lights-Out User Guide*.

# Integrated Management Log

On servers supporting the Integrated Management Display (IMD), the Integrated Management Log (IML) replaces the Critical Error and Correctable Memory logs. The IML records system events and stores them in an easily viewable form, marking each with a timestamp that is accurate to the minute.

**NOTE:** If your operating system is factory installed, refer to your server-specific user documentation for instructions on IML installation and access procedures.

Events listed in the IML are categorized as one of four event-severity levels:

- **Status** indicates that the message is informational only.
- **Repaired** indicates that corrective action has been taken.
- **Caution** indicates a nonfatal error condition.
- **Critical** indicates a vital component failure.

The IML requires operating system-dependent drivers. Refer to the SmartStart CD, if available for your server, for instructions on installing the appropriate drivers.

Refer to your server-specific user documentation or the *Integrated Management Display User Guide* provided with the IMD option kit.

You can view an event in the IML in several ways:

- On the IMD
- From within Insight Manager 7 (and earlier versions)
- From within the Survey Utility
- From the IML Viewer
- From the IML Management Utility

**NOTE:** Some of these utilities may not be available for every operating system or server.

## List of Events

The IML event list displays affected components and their associated error messages. Refer to Table 4-1 for a list of event messages. The format of the list is different when viewed through different tools, but an example of the format of an event as displayed on the IMD follows:

```
**001 of 010**
---caution---
03/19/2002
12:54 PM
FAN INSERTED
Main System
Location:
System Board
Fan ID: 03
**END OF EVENT**
```

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

**Table 4-1: Event Messages**

| Event Message | Event Type | Action |
|---|---|---|
| **Machine Environment** | | |
| System Fan Failure (Fan *X*, Location) | Fan failure | Replace fan. |
| System Fans Not Redundant | Fans not redundant | Add new fan or replace defective fan. |
| System Overheating (Zone *X*, Location) | Overheat condition | Check fans. |
| **Main Memory** | | |
| Corrected Memory Error threshold passed (Slot *X*, Memory Module *Y*)<br>Corrected Memory Error threshold passed (System Memory)<br>Corrected Memory Error threshold passed (Memory Module unknown) | Correctable error threshold exceeded | Continue normal operation, and then replace the memory module during the next scheduled maintenance to ensure reliable operation. |

*continued*

**Table 4-1: Event Messages** *continued*

| Event Message | Event Type | Action |
|---|---|---|
| Uncorrectable Memory Error (Slot *X*, Memory Module *Y*)<br>Uncorrectable Memory Error (System Memory)<br>Uncorrectable Memory Error (Memory Module unknown) | Uncorrectable error | Replace the memory module. If that does not resolve the problem, replace the memory board. |
| **Processor** | | |
| Processor Correctable error Threshold passed (Slot *X*, Socket *Y*) | Correctable error threshold exceeded | Replace the processor. |
| Processor Uncorrectable internal error (Slot *X*, Socket *Y*) | Uncorrectable error | Replace the processor. |
| Unrecoverable Host Bus Data Parity Error<br>Unrecoverable Host Bus Address Parity Error | Host bus error | Replace the board on which the processor is installed. |
| **EISA Bus Error** | | |
| EISA Expansion Bus Master Timeout (Slot *X*)<br>EISA Expansion Bus Slave Timeout<br>EISA Expansion Board Error (Slot *X*)<br>EISA Expansion Bus Arbitration Error | Expansion bus error | Power down the server, and then replace the EISA board. |

*continued*

**Table 4-1: Event Messages** *continued*

| Event Message | Event Type | Action |
|---|---|---|
| **PCI Bus Error** | | |
| PCI Bus Error (Slot *X*, Bus *Y*, Device *Z*, Function *x*) | Expansion bus error | Replace the PCI board. |
| **Automatic Server Recovery-2 (ASR-2)** | | |
| ASR Lockup Detected: Cause | System lockup | Examine the Integrated Management Log (IML) to determine the cause of the lockup, and then refer to Chapter 5, "Error Recovery," for information on problem resolution. |
| **Power Subsystem** | | |
| System Power Supply Failure (Power Supply *X*) | Power supply failure | Replace the power supply. |
| System Power Supplies Not Redundant | Power supply not redundant | Add a power supply or replace the failed power supply. |
| Real-Time Clock Battery Failing | System configuration battery low | Replace the system configuration battery. |
| A CPU Power Module (System Board, Socket *X*)<br>A CPU Power Module (Slot *X*, Socket *Y*) | Power module failure | Replace the power module. |
| System AC Power Problem (Power Supply *X*) | AC voltage problem | Correct problem with AC power supplied to system. |

*continued*

**Table 4-1: Event Messages** *continued*

| Event Message | Event Type | Action |
|---|---|---|
| System AC Power Overload (Power Supply *X*) | Power supply overload | Switch the voltage from 110 V to 220 V or add an additional power supply (if applicable to your system).<br>If the problem is still not resolved, remove some of the options installed. |
| **Operating System** | | |
| Blue Screen Trap: Cause [NT]<br>Kernel Panic: Cause [UNIX]<br>Abnormal Program Termination: Cause [NetWare] | System lockup | Refer to the documentation for your operating system. |
| Automatic Operating System Shutdown Initiated Due to Fan Failure | Fan failure | Replace fan. |
| Automatic Operating System Shutdown Initiated Due to Overheat Condition<br>Fatal Exception (Number *X*, Cause) | Overheat condition | Check fans. Also, be sure that the server is properly ventilated and that the room is set within the required temperature range. |

# Power-On Self-Test

Power-On Self-Test (POST) is a series of diagnostic tests that runs automatically on ProLiant and TaskSmart servers when the system is powered up. POST checks firmware and assemblies to ensure that the system is functioning properly.

If POST finds an error in the system, an audible beep (if supported by your system), visual message, or both indicate an error condition. If an error code is displayed on the screen during POST or after the system is reset, use the instructions in Appendix C, which provides a complete list of POST error messages generated by ProLiant and TaskSmart servers. Your system generates only the codes that are applicable to your configuration and options.

**NOTE:** Many of the actions listed require you to run Diagnostics or the server setup utility provided with your server. Steps for running Diagnostics are provided in the "Diagnostics" section in this chapter.

## BIOS Serial Console

The BIOS Serial Console, available for some servers, provides you with the capability to view the POST error messages, configure option ROMs, and use RBSU through a serial connection without needing a local keyboard and monitor. If your server supports the BIOS Serial Console, refer to the *BIOS Serial Console User Guide* for more information.

# Server Blade Health Driver

Available on some ProLiant BL servers, the server blade health driver monitors operational data of the server blades and logs abnormal conditions. The log created by the health driver can be accessed with Insight Manager 7.

# 5

# Error Recovery

Error recovery tools allow you to restore your server in case of error. This chapter describes the procedures for ROMPaq disaster recovery, which allows you to flash corrupt system ROM, and rapid error recovery tools, such as Automatic Server Recovery-2 (ASR-2), which are able to diagnose and quickly restore your system in the case of system error. The tools described in this chapter include:

- ROMPaq Disaster Recovery
- Automatic Server Recovery-2
- Health Driver
- ASR-2 Password Security
- ASR-2 Integrated Management Log Messages
- Automatic Revision Tracking
- Storage Fault Recovery Tracking
- Storage Automatic Reconstruction
- Network Interface Fault Recovery Tracking
- Memory Fault Recovery Tracking

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

# ROMPaq Disaster Recovery

Any server that does not have a valid ROM image may utilize the following process.

**IMPORTANT:** This operation should be performed on a server with redundant ROM **only if** both ROM images have been corrupted. If only one image is corrupted, read the "Redundant ROM Image Recovery" section in this chapter for complete instructions.

1. Create a new ROMPaq diskette using the latest version for the server involved.

   **IMPORTANT:** If the ROM is corrupted by a ROMPaq interruption, the initial ROMPaq attempt may have affected the contents of the original diskette.

2. Power down the server.
3. Insert the ROMPaq diskette.

   Although you utilize a standard ROMPaq diskette, the old ROM image is not saved during this process.

4. Power up the server.

   The keyboard, mouse, and monitor are all inactive. If your server has an Integrated Management Display (IMD), it is active. The server generates two long beeps to indicate that you are in disaster recovery mode.

   If you are not in disaster recovery mode, power down the server and activate disaster recovery mode by setting the configuration switches on the system maintenance switch block.

   **IMPORTANT:** These switch settings are different for each server. Refer to the switch setting information provided in your server-specific user documentation to find these settings for your server.

   Make a note of the positions of all switches in the system maintenance switch box so that they can be restored after successful completion of this process. Power up the server again to boot into disaster recovery mode.

The server analyzes the diskette, searching for the latest ROM image. If the diskette is not in place, the system continues to beep until a valid ROMPaq diskette is inserted.

**NOTE:** If your server has an IMD, it displays the `Please insert ROMPaq diskette` message even after a valid ROMPaq diskette has been installed. Disregard this message as long as the server stops beeping, indicating that the diskette is a valid ROMPaq diskette.

The ROMPaq diskette then flashes the system ROM.

If your server has an IMD, the IMD displays the following message:

```
ROMPaq flashing system ROM
```

At the successful completion of this process, a sequence of ascending audible beeps is generated, and the IMD displays:

```
ROMPaq flash successful - Cycle Power
```

Or, if the flash is not successful, a descending sequence of audible beeps is generated, and the IMD displays:

```
ROMPaq flash failed
```

5. After successful completion of this process:
   a. Power down the server.
   b. Remove the ROMPaq diskette.
   c. Reset configuration switches.
   d. Power up the server as usual.

   -Or-

   After a failed ROMPaq upgrade procedure, power down the server and repeat the above process.

**IMPORTANT:** If you are performing this procedure on a server with redundant ROM where both ROM images have been corrupted, repeat the process in succession (once for each corrupted image). If only one image is corrupted, read the “Redundant ROM Image Recovery” section for complete instructions.

### Redundant ROM Image Recovery

If power is interrupted during the flash process, a server with redundant ROM boots as usual, but the inactive (redundant) ROM image is corrupted.

A Power-On Self-Test (POST) error message is displayed:

```
105 – Current System ROM is corrupt – now booting redundant
System ROM
```

In this instance, you are required to flash again for the invalid image to become valid. After you flash the invalid image, the system then powers up using the most recently flashed image.

## Automatic Server Recovery-2

You can enable the Automatic Server Recovery-2 (ASR-2) feature to restart a server after a critical hardware or software error occurs. If a critical error occurs, the server records the error information in the IML, and then restarts the system. Depending on your server setup utility, you can configure the system for either automatic recovery or for attended local or remote access to diagnostic and configuration tools.

**NOTE:** ASR-2 is available only on operating systems using the ASR-2 drivers provided by HP.

ASR-2 depends on the ASR-2 timer and the Health Driver to routinely notify the ASR-2 hardware of proper system operations. If the time between ASR-2 notifications exceeds the specified period, ASR-2 assumes a fault has occurred and initiates the recovery process.

To configure ASR-2:

- On servers running the ROM-Based Setup Utility (RBSU):
  a. Run RBSU.
  b. Select the **Automatic Server Recovery** menu.
  c. Set the ASR Status to Enabled.
  d. Set the ASR Timeout.

- On servers running the System Configuration Utility (SCU):
  a. Run SCU.
  b. Select the **System Configuration** menu, and then select **Configure Hardware**.
  c. Select **View or Edit Details**.
  d. Set the software error recovery status to Enabled.
  e. Set the software error recovery time-out.

The available recovery features are:

- **Software Error Recovery**—automatically restarts the server after a software-induced server failure
- **Environmental Recovery**—allows the server to restart when temperature, fan, or AC power conditions return to normal

## Unattended Recovery

For unattended recovery, ASR-2 executes the following functions:

- Logs the error information to the IML
- Resets the server
- Attempts to restart the operating system

  Often the server restarts successfully, making unattended recovery the ideal choice for remote locations where trained service personnel are not immediately available.

  ASR-2 tries to restart the server up to ten times. If ASR-2 cannot restart the server within ten attempts, the system logs a critical error in the IML, restarts the server, initiates Diagnostics, and enables remote access (if you configured remote access).

To use this level of ASR-2, you must configure ASR-2 to load the operating system after restart.

## Attended Recovery

For attended recovery, ASR-2 executes the following functions:

**NOTE:** This feature is only available on servers that use the System Configuration Utility. Attended recovery is not available on systems that use RBSU.

- Logs the error information to the IML
- Resets the server
- Initiates Diagnostics from the hard drive
- Enables remote access:
  - — If you have configured for dial-in access and have a modem with an auto-answer feature installed, you can dial in and remotely diagnose or reconfigure the server.
  - — If you have configured the Diagnostics for network access, you can access the utilities over the network. Use Insight Manager for either dial-in or network access.

## Hardware Requirements

To obtain full utilization of ASR-2 over a modem, you need the following:

- A non-PCI Hayes-compatible modem
- Diagnostics installed on the system partition of the hard drive
- ASR-2 configured to load Diagnostics after restart

You can also run Diagnostics remotely over an Internetwork Packet Exchange (IPX) or Internet Protocol (IP) network using the Network feature.

- To use Diagnostics on an IPX network, you must have Insight Manager 2.0 or later, or a Novell Virtual Terminal (NVT) terminal emulator with VT100 or American National Standards Institute (ANSI) terminal capabilities.
- To use Diagnostics on an IP network, you must have Insight Manager 2.10 or later, or a Telnet terminal emulator with VT100 or ANSI capabilities.

If you are notified that ASR-2 has restarted the server and initiated the **Diagnostics and Utilities** menu, use Insight Manager 7 (or previous version) to view the critical error in the IML. Run Diagnostics to diagnose and resolve the problem.

You can configure ASR-2 to restart the server and then:

- Access the **Diagnostics and Utilities** menu to diagnose the critical error.

  -Or-

- Start the operating system to return the server to operational status as rapidly as possible.

When you enable ASR-2 to start the operating system, the server attempts to start from the primary partition. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access Diagnostics.

**IMPORTANT:** Before configuring Automatic Server Recovery-2 (ASR-2), be sure that the server setup utility and Diagnostics are installed. ASR-2 must have these installed to start Diagnostics after a system restart. HP recommends this even if you configure ASR-2 to start the operating system.

When you enable ASR-2 to start Diagnostics, your server restarts after a critical error and loads Diagnostics from the system partition on the hard drive. Depending on your server, you can configure your server to start Diagnostics in up to four different ways:

- Without remote console support, such as running Diagnostics from the server console only
- With remote console support, using modems for dial-in access
- With remote console support, using a modem to dial a predetermined telephone number
- With remote console support through a network connection (IP or IPX)

**Table 5-1: Automatic Server Recovery-2 (ASR-2) Features**

| Features | Definition |
|---|---|
| Software error recovery | When enabled, ASR-2 is activated if the operating system stops responding, resulting in a lockup. |
| Software error recovery time-out | This feature determines how long the server waits before enabling ASR-2 after an operating system lockup. |
| Standby recovery server option | When enabled, ASR-2 activation initiates a switch to a designated standby recovery server. |
| Standby recovery server port | This port is used to communicate with the recovery server. |
| Standby recovery time-out | This feature determines how long the server waits to initiate a switch to a designated standby recovery server after ASR-2 activation. |
| Software error recovery boot option | This option allows the server to restart, either initiating the operating system or Diagnostics. |
| Thermal shutdown | When enabled, this feature shuts down the server if a critical thermal error occurs. |
| UPS shutdown | When enabled, this feature allows the server to perform a shutdown if an uninterruptible power supply (UPS) is activated. |
| UPS shutdown threshold | This feature determines how long the server waits to shut down after the UPS is activated. If desired, this setting can provide enough time for an administrator to perform any necessary operations or to properly shut down the server. |

# Health Driver

The Health Driver continually resets the Automatic Server Recovery-2 (ASR-2) timer according to the frequency specified in the server setup utility (for example, ten minutes). If the ASR-2 timer counts down to zero before being reset, indicating an operating system or a server lockup, ASR-2 restarts the server into either Diagnostics or the operating system (as indicated by the system configuration parameters). The default value is ten minutes, and the allowable settings are 5, 10, 20, and 30 minutes.

For remote and offsite (unattended) servers, setting the software error recovery time-out for five minutes reduces the server downtime and allows the server to recover quickly. For local (attended) servers, you can set the software error recovery time-out for 20 or 30 minutes, giving you time to arrive at the server if you wish to diagnose the problem manually.

The Health Driver is independent of the ASR-2 timer; loading it enables the ASR-2 timer, allowing the driver to detect and log information about numerous hardware and software errors in the Integrated Management Log (IML) if an error occurs. However, you cannot enable the ASR-2 timer without loading the Health Driver.

Before ASR-2 restarts the server, it records any information available about the condition of the operating system in the IML. This information can be used to diagnose an operating system or server lockup, while still allowing the server to be restarted.

For additional information about the ASR-2 flow of events, refer to your server maintenance and service guide on the on the following website:

www.compaq.com/support/servers

Select your server to display the reference library.

## Initiating Diagnostics

Initiating Diagnostics is only supported on systems that use the System Configuration Utility. When a critical error occurs and you have enabled ASR-2 to initiate Diagnostics, the operating system-specific Health Driver logs critical error information in the IML, and ASR-2 restarts the server. When the system reinitializes, ASR-2 starts Diagnostics from the hard drive.

If Dial-In status is enabled, the modem is placed in auto-answer mode. If you enable Dial-Out status, you are automatically enabled for Dial-In status.

If Network Status is enabled, the appropriate network support software (IP or IPX, depending on the network protocol) is loaded. This software allows remote access through the network.

**IMPORTANT:** Diagnostics are loaded from a specially created system partition on the hard drive. This partition was configured during server configuration.

You can access the server and view the Server Health Logs:

- In servers not supporting the IML
- Remotely by non-PCI modem
- In-band over the network
- Directly from the server

For modem access, you must have either Insight Manager 2.0 or later, or have a VT100 or ANSI terminal-type device. You can use a standard CRT with VT100 or ANSI emulation capability, or you can use a personal computer (PC) with a VT100 or ANSI terminal emulation package. The communication parameters must be set for 8-data bits, no parity, and 1-stop bit.

You can also enable ASR-2 to allow network access by using the Network Status feature in the System Configuration Utility. You must have either Insight Manager 2.0 or later or a Novell Virtual Terminal (NVT) emulator on an IPX network to use this feature. You must also have version 2.24 or later of the System Configuration Utility. For IP access, you must have either Insight Manager 2.10 or later, or a Telnet Terminal Emulator to use this feature. You also must have version 2.24 or later of the System Configuration Utility.

The System Configuration Utility settings should resemble the settings in Table 5-2 when you enable ASR-2 to initiate Diagnostics.

**Table 5-2: System Configuration Utility Settings for Booting into Diagnostics**

| Option | Setting | Description |
|---|---|---|
| Serial interface | COM1, COM2 | Select the communications port for the modem used by the pager and the remote ASR-2 functions. The options are COM1 and COM2. |
| Dial-in status | Enabled | Set Dial-In Status to Enabled. Be sure that the Reset Boot option is set to Boot Diagnostics. When the system starts because of an ASR-2 reset, it starts to Diagnostics, sets the Management Modem to auto-answer, and waits for the administrator to dial in and run Diagnostics.<br><br>You automatically disable this option when you configure the software error recovery start option to Boot Operating System. When ASR-2 pages you, you cannot dial in unless ASR-2 exceeds 10, the threshold number of server restart retries. When this happens, ASR-2 restarts the server into Diagnostics and places the modem in auto-answer mode. |
| Dial-out status | Enabled | Allows ASR-2 to dial out to a remote workstation. If you selected this option, Dial-In Status is automatically selected.<br><br>To use the dial-out feature, set Dial-Out Status to Enabled and set the Dial-Out String to the correct phone number. You must also set the Reset Boot option to Boot Diagnostics. When the system restarts because of an ASR-2 reset, the administrator is paged by the Pager Status and Pager Dial String, and then the system restarts to Diagnostics and dials out to the phone number provided in the Dial-Out string. The dial-out number will be tried five times. If it fails to connect after five attempts, the modem goes into auto-answer mode. |

*continued*

**Table 5-2: System Configuration Utility Settings for Booting into Diagnostics**
*continued*

| Option | Setting | Description |
|---|---|---|
| Dial-out string | 555-1234 | Enter the dial string followed by the remote computer's telephone number. |
| Network status | Enabled | To allow network access to Diagnostics, set Network Status to Enabled and be sure that the Reset Boot option is set to Boot Diagnostics.<br><br>**NOTE:** The Network Status must be set to Enabled for network access. |
| Network controller slot | Slot # | Select the slot number of the network interface controller you wish to use for network access to Diagnostics. |
| Network protocol | IP/IPX | To use IPX network access, set Network Protocol to IPX. When ASR-2 restarts the server to Diagnostics, it loads IPX network support. This enables remote access by NVT.<br><br>To use IP network access, set Network protocol to IP. Also be sure to set Network IP address, Network IP net mask, and Network IP router address. When ASR-2 restarts the server to Diagnostics, it loads IP network support, enabling remote access by Telnet. |
| Network host name | HP_Server | Enter the network name of the server. Use underscores instead of spaces within the name, for example, HP_Server. If you are using IPX network access to Diagnostics, this server name is used to advertise NVT host services. This server name is displayed in the Insight Manager server list when the system determines that it can communicate by NVT. Set this name to be the same as the server name you assign when the host operating system is running. |
| Network controller | HP | For all HP standard network controllers. |
| Network frame type | ETHERNET_II | Select the frame type for your network. Selections include both Ethernet and IBM Token-Ring topologies. |

*continued*

**Table 5-2: System Configuration Utility Settings for Booting into Diagnostics**
*continued*

| Option | Setting | Description |
|---|---|---|
| Network IP address | *xxx.xxx.xxx.xxx* | Enter the IP address for this server in standard dot notation.<br><br>**NOTE:** The network IP address is not used if you select Custom for Network controller. You must enter your IP address in the NET.CFG file that you load into the system partition. |
| Network IP net mask | *xxx.xxx.xxx.xxx* | Enter the net mask for this server in standard dot notation.<br><br>**NOTE:** The network IP net mask is not used if you select Custom for Network controller. You must enter your IP address in the NET.CFG file that you load into the system partition. |
| Network IP router address | *xxx.xxx.xxx.xxx* | Enter the router to be used for this server in standard dot notation.<br><br>**NOTE:** The network IP router address is not used if you select Custom for Network controller. You must enter your IP address in the NET.CFG file that you load into the system partition. |

If you configure the server to restart and then access the **Diagnostics and Utilities** menu, it prepares for remote communication. You can run Diagnostics, the Inspect Utility, or the server setup utility remotely by using a workstation running terminal emulation software, such as Insight Manager 7.

## Initiating the Operating System

Initiating the operating system is only supported on systems that use the System Configuration Utility. When you enable ASR-2 to restart the operating system and a critical error occurs, ASR-2 logs the error in the IML and restarts the server. The system then executes the normal restart process.

**IMPORTANT:** When you enable ASR-2 to restart the operating system, Modem Dial-In Status, Network Status, and Modem Dial-Out Status are automatically disabled. In this mode you cannot access the server and the server cannot dial out to a remote workstation.

During the recovery process, the ASR-2 feature tries (up to ten times) to restart the server. If the ASR-2 feature cannot restart the server within ten attempts, it logs a critical error in the IML, restarts the server in Diagnostics, and puts the modem into auto-answer mode.

Your System Configuration Utility settings should resemble those listed in Table 5-3 when you enable ASR-2 to restart into the operating system:

**Table 5-3: System Configuration Utility Settings for Initiating the Operating System**

| Option | Settings |
|---|---|
| Serial interface | COM1 |
| Dial-in status | Disabled |
| Dial-out status | Disabled |
| Dial-out string | 555-1234 |
| Network status | Disabled |
| Network protocol | IPX |
| Network controller | HP |
| Network host name | HP_Server |
| Network card slot | Slot # |
| Network frame type | ETHERNET_II |

*continued*

**Table 5-3: System Configuration Utility Settings for Initiating the Operating System** *continued*

| Option | Settings |
|---|---|
| Network IP address | *xxx.xxx.xxx.xxx* |
| Network IP net mask | *xxx.xxx.xxx.xxx* |
| Network IP router address | *xxx.xxx.xxx.xxx* |

# ASR-2 Password Security

The standard HP password features function differently during ASR-2 than during a typical system startup.

During ASR-2, the system does not prompt for the power-on password, allowing ASR-2 to restart the operating system or Diagnostics without user intervention.

To maintain system security:

1. Set the server to boot in network server mode (an option in the server setup utility). This option ensures that the server keyboard is locked until you enter the keyboard password.
2. Select an Administrator Password (an option in the server setup utility). During attended ASR-2 (local or remote), you must enter this Administrator Password before any modifications can be made to the server configuration.

# ASR-2 Integrated Management Log Messages

The Integrated Management Log (IML) records memory errors, as well as catastrophic hardware and software errors, that cause the system to fail. This information helps you quickly identify and correct the problem, thus minimizing downtime.

You can view the IML through Insight Manager 7 (or a previous version). The Diagnostics utility either resolves the error or suggests corrective action in systems that do not support event logs.

The IML identifies and records all of the errors described in Table 5-4.

**Table 5-4: Automatic Server Recovery-2 (ASR-2) IML Messages**

| Message | Description |
|---|---|
| Abnormal Program Termination | The operating system encountered an abnormal situation that caused a system failure. |
| ASR-2 detected by ROM | An ASR-2 activity was detected and logged by the system ROM. |
| ASR-2 Test Event | The server setup utility generated a test alert. |
| ASR-2 Base Memory Parity Error | The system detected a data error in base memory following a reset, due to the ASR-2 timer expiration. |
| ASR-2 Extended Memory Parity Error | The system detected a data error in extended memory following a reset, due to the ASR-2 timer expiration. |
| ASR-2 Memory Parity Error | The system ROM was unable to allocate enough memory to create a stack. It was then unable to display a message on the screen or continue booting the server. |
| ASR-2 Reset Limit Reached | The maximum number of system resets due to ASR-2 timer expiration was reached, resulting in the loading of Diagnostics. |
| Battery Failing | This is a low system battery warning. Replace battery within seven days to prevent loss of nonvolatile configuration memory. Failure of the battery supporting the system nonvolatile RAM is imminent. |
| Caution: Temperature Exceeded | The operating system detected that the temperature of the system exceeded the caution level. Accompanying data is in the log notes if an auto-shutdown sequence was invoked by the operating system. |
| Diagnostic Error | An error was detected by the Diagnostics. |
| Error Detected On Boot Up | The server detected an error during the Power-On Self-Test (POST). |

*continued*

**Table 5-4: Automatic Server Recovery-2 (ASR-2) IML Messages** *continued*

| Message | Description |
|---|---|
| NMI – ASR-2 Timer Expiration | The operating system received notice of an impending ASR-2 timer expiration. |
| NMI – Expansion Board Error | A board on the expansion bus indicated an error condition, resulting in a server failure. |
| NMI – Expansion Bus Master Time-Out | A bus master expansion board in the indicated slot did not release the bus after its maximum time, resulting in a server failure. |
| NMI – Expansion Bus Slave Time-Out | A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a server failure. |
| NMI – Fail-Safe Timer Expiration | Software was unable to reset the system fail-safe timer, resulting in a server failure. |
| NMI – PCI Bus Parity Error | A parity error was detected on the PCI bus. |
| NMI – Processor Parity Error | The processor detected a data error, resulting in a server failure. |
| NMI – Software Generated Interrupt Detected Error | Software indicated a system error, resulting in a server failure. |
| Processor Exception | The indicated processor exception occurred. |
| Processor Prefailure | A CPU passed an internal corrected error threshold, with excessive internal error checking and correcting (ECC) cache errors occurring. |
| Required System Fan Failure | A required system fan failed. Accompanying data in the log notes if an auto-shutdown sequence was invoked by the operating system. |
| Server Manager Failure | An error occurred with the Server Manager/R board. |
| UPS A/C Line Failure Shutdown or Battery Low | The uninterruptible power supply (UPS) notified the operating system that the AC power line failed. Accompanying data indicates if an auto-shutdown sequence was invoked or if the battery was nearly depleted. |

# Automatic Revision Tracking

Reviewing the changes that have been made to the server configuration can resolve some errors. The server has an Automatic Revision Tracking (ART) feature that helps you review recent configuration changes.

One ART feature is the Revision History Table, which contains the hardware version number of the system board and any other system boards providing ART-compatible revision information. This feature lets you determine the level of system assembly functionality without opening or powering down the unit. Table 5-5 contains an example of the Revision History format.

**Table 5-5: Revision History Format**

| **Current Revisions** | |
|---|---|
| Date | 10/31/2000 |
| System board revision | 03 |
| Assembly version | 1 |
| Functional revision level | C |
| Processor 01 revision | 01 |
| Assembly version | 1 |
| Functional revision level | A |
| **Previous Revisions** | |
| Date | 9/21/2000 |
| System board revision | 03 |
| Assembly version | 1 |
| Functional revision level | C |
| Processor 01 revision | 01 |
| Assembly version | 1 |
| Functional revision level | A |

The Revision History Table is stored in nonvolatile RAM (NVRAM) and is accessed through the Inspect Utility and Insight Manager 7 (or previous versions).

## Storage Fault Recovery Tracking

This feature tracks more than 12 failure-indication parameters for SCSI drives, such as time-out, spin-up, and self-test errors. You can use these parameters to pinpoint failed storage subsystem components and to recover from controller or hard drive failures.

## Storage Automatic Reconstruction

This feature automatically reconstructs data to an online spare drive or to a replaced drive if a drive fails. To use the reconstruction feature, you must configure your server for drive mirroring or data guarding. The reconstruction decreases system downtime by allowing rapid recovery to full system operation.

## Network Interface Fault Recovery Tracking

This feature tracks over 20 failure indication parameters, such as alignment errors, lost frames, and frame copy errors, of Ethernet and IBM Token-Ring network interfaces. Network interface fault recovery tracking decreases network downtime by enabling diagnosis of actual network interface failures.

## Memory Fault Recovery Tracking

This feature inspects the operation of the memory subsystem looking for noncorrectable memory errors.

# 6

# Error Prevention

This chapter provides information to help you avoid future problems. While many of the pointers provided are common-sense suggestions, these prevention tasks are too important to overlook. You will receive tips on:

- Preparing for changes
- Minimizing the impact of changes by using HP tools
- Using a methodology
- Visually checking your server
- Recognizing power problems caused by acts of nature
- Preventing
  - — Power management problems
  - — Grounding problems
  - — Temperature problems
  - — Damage to removable drives
  - — Electrostatic damage
  - — Cable damage
  - — Tape drive errors

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

# Preparing for Changes

Most problems occur when something in the server system has been changed. Follow these tips when making any changes to your server.

- Back up your system often. Be sure that the backups are not corrupted before making changes. If the system contains valuable data, have at least two complete known functional backups of the operating system and data, a copy of the backup software, and a functional tape drive that can read the backup. Two backups ensure complete data recovery in the event that something happens to the first tape or during the first restore attempt.
- Obtain a record of all other settings. Use the "Gathering Information" section in Chapter 1 as a guide for the type of information to record.
- Document the system settings. If the system configuration will be changed, first obtain a record of the current system configuration settings. On systems using the System Configuration Utility, create a BACKUP.SCI file on a diskette before making any changes. This can be accomplished by pressing the **F10** key during the boot process to enter the system partition. Select **System Configuration**, **Configuration Backup**, **Backup to a System Configuration SCI file**, **Enter filename (BACKUP.SCI)**, and then press **Enter** to write the data to a diskette. Also print out an Inspect Utility report. Refer to Chapter 4, "Diagnostic Tools," for instructions.
- Check the HP resources, your software, and third-party product resources for information about potential problems. Websites are excellent places to find this information. Refer to Appendix A, "HP Resources."
- If possible, make changes one at a time. This minimizes variables and maintains a controlled environment.
- Record the results of each change after it is executed, being sure to include any error messages or additional information collected.

- Be sure that you allow enough time to make the changes.
- Check for potential device conflicts before adding a device.
- If you are adding a processor, keep the terminator board. If you have a processor problem, you can restore the server with the remaining processors. Put terminator boards in all processor slots not occupied by processors.
- If you are adding faster or larger hard drives to a storage system, a thermal upgrade or power supply upgrade may be necessary. The heat generated by some of the larger and faster hard drives can cause a thermal overload if you have not made provisions for additional cooling.
- If a fixed cable tray or other cable routing system is available for your server, using this system can help prevent loose cabling and damage to cables that can result from improper disconnection. For more information on correctly routing the cords and cables for your server, refer to your server-specific user documentation.

# Minimizing the Impact of Changes by Using HP Tools

## Managing Updates Through Integration Servers

Consider using an integration server as part of the SmartStart integration process on a new server or during maintenance of an existing server. You can create an integration server using the Integration Maintenance Utility. The utility facilitates network-based updates by managing the connection to the integration server and providing a list of the supported updates available on the integration server.

The Integration Maintenance Utility can also access software for server updates on the SmartStart CD, the Management CD, and the Software Products CDs.

## Installing Servers Consistently Through Replicated Install

When initially setting up a server, SmartStart can access the integration server as the source of the system software instead of the system software CDs. SmartStart on the target server connects to the integration server during the Assisted Integration or Replicated Install interview process. SmartStart examines the integration server to determine which software is available for installation.

To set up a new target server using an integration server as the software source, refer to the SmartStart installation poster.

## Maintaining Server Software

When you update an existing server located on the same network as the integration server, the target server may access the integration server using the Integration Maintenance Utility and apply updated software stored on the integration server.

## Other Ways to Minimize the Impact of Changes

### Version Control

A preventive measure for out-of-date drivers is to be aware of the version control feature of Insight Manager 7 (or previous versions). It checks the versions of operating system drivers, Insight Management Agents, Diagnostics, and firmware on the server. The version control option then compares the system versions against a database of current software and firmware versions, and indicates whether an upgrade is needed and why.

### Server Design

Design your server setup to minimize the impact of downtime. If possible, divide the workload between several machines rather than just one. If you can, group users across different servers in your network. Anticipate the utilization rate and distribute servers based on that rate.

### Minimizing Updates

Stay aware of the latest software updates for your operating system and applications. Weigh the risks of updating versus the need for the changes. If you update the software, it may be harder to restore your system after a failure. On the other hand, you should update software for fixes that you require.

## Using a Methodology

Following a set of procedures when using your server can help prevent problems, or make your troubleshooting easier if problems do occur.

- Use uniform naming conventions for your servers, such as names that denote server location. Uniform naming conventions help when you try to remember often overlooked details that can hold the key to resolving a crisis.
- Use unique IDs or names for your devices. You can reduce the risk of components competing for the same resource if you have a list. Use the server setup utility to check for conflicts.
- Make a habit of using the HP tools and resources, your software, and third-party product resources to keep abreast of potential problems. You may be able to avoid problems by noting the problems of others.
- Have a reliable back-up plan. Schedule backups based on the needs of your server. If data is changed frequently, frequent backups are required. Maintain a library of backups based on your information-restoring needs. Test your backups periodically to be sure that your data is correctly stored.
- Have a plan of action before the server fails. For example, decide what action to take if any of the following fails:
  - Mirror
  - SCSI board
  - Network interface controller (NIC) board
- Check hard disk space periodically. It is recommended that hard drives have a minimum of 15 percent free space.

- Scan for viruses weekly. Use the latest virus-scanning utilities available to be sure that your data is not corrupted.
- Keep historical data. You will not know that the CPU utilization has increased 50 percent if you do not know what it was initially. If you have problems, you can use the data to compare before and after scenarios. For example, you might want to know about the user, bus, and power utilization rates.
- Keep a trend analysis so that you will know what to expect during certain points in time. For example, if the CPU utilization rate always increases by 50 percent during certain hours, you will know that increase is normal for the server you are tracking.
- Create a problem resolution notebook. When problems do occur, keep a log of the actions you took to resolve them. This could help you solve the same problem more quickly in the future. System configuration, Inspect Utility, and Array Diagnostic Utility (ADU) printouts, as well as utility diskettes, can also be stored with the resolution notebook. This information can save a great deal of time in the future and ensure accuracy, especially when dealing with future part replacement.
- Keep an up-to-date network topology map in an accessible location. This will help in troubleshooting networking problems.
- If you have a tape drive, maintain a scheduled cleaning program.
- If you have a tape drive, remember the importance of tape cartridge label placement. Place the label on the exposed surface of the cartridge so that it cannot fall off or get lodged inside the tape drive.
- Store all processor slot terminators that have been replaced by installed processors. It is helpful to replace one or more processors with terminators when a failed processor is being diagnosed.

**NOTE:** It is required that all processor slots contain either a processor or terminator, properly seated, for the server to power up.

- Consider keeping certain spare parts available onsite. Spare parts to maintain include SCSI controllers, hot-pluggable redundant power supplies, hot-pluggable fans, hot-pluggable drives, SCSI cables, network adapters, Processor Power Modules (PPMs), and perhaps even complete I/O, media, processor, and memory modules, if your server is modular.

- Restock spare parts as they are used.
- Do not clean card edge connectors with erasers; it removes the gold, causes static discharge, and leaves residue. If connectors have to be cleaned, use isopropyl alcohol or a special cleaning solution applied with a cotton-tipped swab.

## Visually Checking Your Server

Periodically you should look at the following items on your server. A visual check can prevent many problems.

- Be sure that systems and racks are not positioned tightly up against walls and that there is adequate space around them for proper airflow.
- Move magnetized office items such as magnetized screwdrivers and telephones with electromagnetic ringers away from the system.
- Be sure the server does **not** share a power line with high-current machines, such as laser printers, air conditioners, copiers, and coffee machines, or ungrounded power strips.
- Periodically check AC grounded (earthed) outlets to see if they are in need of repair.
- Take the system cover off, and then remove any dust buildup with a can of compressed air, tighten any loose connections, reseat boards, and inspect any cables for frays. Move the cables away from sources of heat and give them more slack if possible.

**CAUTION:** To avoid potential problems, **always** read the cautionary information in your server-specific user documentation before removing, replacing, reseating, or modifying system components.

- Check for adequate airflow and dislodge anything blocking the fans.
- Check for dust on external server parts, such as fans.
- Check your server after power disruptions due to acts of nature. Refer to the "Recognizing Power Problems Caused by Acts of Nature" section in this chapter.

# Recognizing Power Problems Caused by Acts of Nature

Some power problems are caused by acts of nature, which can range from lightning and excessive heat to ice, rain, and windstorms. Lightning can cause spikes and surges. A spike is a quick impulse of undesirable high voltage on a power line, typically lasting only a fraction of a second, whereas a surge is a sudden increase in line voltage of short duration. Excessive heat from increased use of air conditioners can overload utility grids, causing erratic voltages, brownouts, or power outages. Brownouts are voltage reductions by a utility company to counter excessive demand on its generation and distribution system. Storms can cause total blackout conditions due to downed power lines.

Power disruptions take many forms, including power surges and sags, high-voltage spikes, switching transients, brownouts, and complete power failure. When a power disruption occurs, check the server for signs of data damage, data loss, file corruption, and hardware damage. The difficulty of dealing with power fluctuations is that the damage is not always immediately noticeable; thus, problems may not be noticed until long after the power disruption has occurred.

# Preventing Power Management Problems

When determining the power requirements for your server, consider the following factors:

- General power requirements
- Power consumption of the desired configuration
- Power supplies required for the desired configuration
- Power cords required for the desired configuration
- Power redundancy requirements

## General Power Requirements

Be sure that you are following the power requirements described in your server-specific user documentation. Also, the installation of your system equipment must be in accordance with local/regional electrical regulations governing the installation of information technology equipment by licensed electricians.

For electrical power ratings on options, refer to the rating label on the product or user documentation supplied with that option.

## Power Consumption Considerations

Before configuring your server, you must evaluate power consumption requirements and determine the appropriate number of power supplies (and SPMs, if applicable to your server) to be sure that the server has sufficient power capacity. In addition to determining the minimum power supply requirements, you must also consider whether AC power redundancy is a requirement, if applicable to your server. For more information on the specific power capabilities of your server, refer to your server-specific user documentation. To obtain the most accurate power capacity and assessment of power margin, use the power calculator provided on the ActiveAnswers website at

activeanswers.compaq.com/aaconfigurator

## Power Supply Considerations

After you determine the appropriate amount of power for your server, install the power supplies needed for the level of redundancy you require. If your server uses SPMs, refer to your server-specific user documentation to determine the necessary power supply/SPM configuration.

## Power Cord Considerations

If your server supports AC power redundancy, there are multiple power cord configurations possible with your server. Refer to your server-specific user documentation to determine the appropriate configuration, if applicable to your server.

### Power Redundancy Considerations

If available for your server, power redundancy protects your server from power failures caused by one of the following:

- Power failure in one of the two AC circuits providing power to the server
- Accidentally unplugging one of the power cords providing power to the server
- Failure of one power supply (or SPM, if applicable to your server)

**IMPORTANT:** The power redundancy described in this section is not the same as protection provided by a UPS. In the event of a catastrophic power failure affecting each power cord providing power to the server, the server loses power and shuts down. To provide complete power protection, HP recommends installing a suitable UPS.

Refer to your server-specific user documentation to determine what power redundancy requirements are necessary for your server.

## Preventing Grounding Problems

For proper operation and safety, the server must be properly grounded.

Refer to your server-specific user documentation for information about properly grounding your server.

## Preventing Temperature Problems

For continued safe and reliable operation of the equipment, install the server 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 should not exceed 35°C (95°F).

The operating temperature inside the rack is always higher than the room temperature and is dependent on the configuration of equipment in your rack. The TMRA for each piece of equipment should be checked before installation.

For more information on the temperature requirements of your server, refer to your server-specific user documentation.

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

- Be sure that the option equipment does not impede airflow to the rack-mountable ProLiant servers or increase the internal rack temperature beyond the specified maximum rating.
- Be sure that the manufacturer maximum recommended ambient operating temperature of the option equipment is not exceeded when the options are installed in the rack.

# Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a removable drive, or loss of information, observe these precautions:

- Before removing a diskette drive, CD-ROM drive, or DVD drive, be sure that a diskette or disc is **not** in the drive. Be sure that the CD-ROM or DVD tray is closed.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on a work surface that has at least one inch of shockproof foam.
- Do not drop drives from any height onto any surface.
- Do not expose a hard drive to products, such as monitors or speakers, that have magnetic fields.
- Do not expose a drive to temperature extremes or liquids.

# Preventing Electrostatic Damage

Many electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases the discharge contains enough power to alter device parameters or melt silicon junctions.

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or micro-circuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge may not be affected at all and can work perfectly throughout a normal cycle. However, the device may function normally for a while, then degrade in the internal layers, reducing the life expectancy of the device.

# Preventing Cable Damage

Handle cables with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid twisting or tearing cables. Make sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced.

# Preventing Tape Drive Errors

Often tape drive problems are caused by defective or substandard media. The following are recommended cleaning procedures:

- Clean the media every eight hours. This is much more frequent than the manufacturer's recommendation of "once every 25 hours," but this practice reduces the number of device failures. Cleaning frequently is especially important for new media, which requires more frequent cleaning than media that has been used for five or more backups.
- Clean the media four times after a failure occurs.
- If you receive a head clog error (and you are using the latest firmware and cleaning every eight hours), record that a failure occurred on the label of the cartridge. Then, replace any cartridges that fail more than three out of five times.

# A

# HP Resources

This appendix contains additional resources that may assist you in troubleshooting a particular problem. The resources covered in this chapter fall under the following categories:

- Online resources
- Software and option resources
- General server resources
- ProLiant BL e-Class system resources

**NOTE:** For additional resources, contact your authorized service provider.

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

# Online Resources

**Table A-1: Online Resources**

| Resource | What it is | Where to go |
|---|---|---|
| HP website | Troubleshooting tools and information, as well as the latest drivers and flash ROM images. | Access the following website:<br>www.hp.com |
| Server-specific user documentation | The set of documents that ship with a server, including the setup and installation guide, the maintenance and service guide, and the hardware configuration and installation poster. | Access the following website:<br>www.compaq.com/support/servers<br>and select your server. |
| Support staff email address | A way to submit questions to technical support staff through email.<br>The only HP email address that is monitored by technical support. | Use the following Internet email address:<br>support@compaq.com |
| Support on commercial online networks | A forum to post questions to technical support or other HP enthusiasts by using the Message Base Feature, a standard on support forums found on all three online networks. You can access HP utility files, drivers, software, and other information related to HP. | Contact these Internet providers directly for more information:<br>• America Online<br>• CompuServe<br>• Prodigy |
| ActiveUpdate | A Web-based application that provides information updates, customer advisories, and proactive notification and delivery of the latest software updates. | Access the following website:<br>www.compaq.com/products/servers/management/activeupdate |

*continued*

**Table A-1: Online Resources** *continued*

| Resource | What it is | Where to go |
|---|---|---|
| PaqFax information | Technical, warranty, and support information provided through a fax machine. | Access the following website:<br>www.compaq.com/support/paqfax |
| ActiveAnswers solutions | An online solutions service that provides a set of tools, forums, and information for HP servers. | Access the following website:<br>www.compaq.com/ActiveAnswers |
| Ask Compaq | A search engine, powered by Ask Jeeves, that finds information on ProLiant servers. The search engine responds to queries entered in question form. | Access the following website:<br>askq.compaq.com/askserver |
| CarePaq services | Information on warranties and service and support upgrades. | Access the following website:<br>www.compaq.com/services/carepaq |
| TechNotes | Electronic documentation to help you understand the use of a specific technical topic. Examples of topics include network performance management, server management, and operating system interconnectivity. | Access the following website:<br>www.compaq.com/support/techpubs/technotes |
| Whitepapers | Electronic documentation on complex technical topics. These whitepapers contain in-depth details and procedures. Topics include HP products, HP technology, operating systems, networking products, and performance. | Access the following website:<br>www.compaq.com/support/techpubs/whitepapers |

# Software and Option Resources

**Table A-2: Software and Option Resources**

| Resource | What it is | Where to go |
|---|---|---|
| Resource Paqs | Tools, utilities, and information for HP servers. Available for systems running Microsoft Windows NT, Windows 2000, Novell NetWare, or Linux operating systems. The Resource Paqs include utilities to monitor performance, software drivers, customer support information, and whitepapers on the latest server integration information. | Access the following website:<br>www.compaq.com/partners<br>Click **Microsoft**, **Novell**, or **Linux**, depending on your operating system, and then follow the Resource Paq link. |
| SoftPaqs, including ROMPaq tools | Software utilities (such as diagnostics and configuration utilities), software upgrades, ROMPaqs (firmware upgrades), and fixes that resolve software problems or provide workarounds. | Access the following website:<br>www.compaq.com/support/files/server<br>Using the drop-down menus, search for SoftPaqs and ROMPaqs by server type or category.<br>For more information on ROMPaq tools, refer to your server-specific user documentation. |
| SmartStart | A software package that provides a streamlined process for the installation of operating systems and other key system software, such as drivers, utilities, diagnostic tools, and ROMPaqs. SmartStart also provides automated methods for configuring your server settings. | If SmartStart is supported by your server, access SmartStart by booting the server with the SmartStart CD in the CD-ROM drive. The CD ships with 32-bit servers.<br>For more information on SmartStart, refer to the SmartStart user documentation as well as the following website:<br>www.hp.com/servers/smartstart |

**CAUTION:** Do not attempt to use SmartStart on a 64-bit system. Doing so can corrupt the system, possibly requiring a complete reinstallation of system software.

*continued*

**Table A-2: Software and Option Resources** *continued*

| Resource | What it is | Where to go |
|---|---|---|
| Management CD | The latest tools available for easily managing the server, such as Insight Manager 7, Management Agents, and Survey Utility. | Run the Management CD shipped with your server.<br>For more information, refer to the Management CD user documentation as well as the following website:<br>www.hp.com/servers/manage |
| ProLiant Essentials Rapid Deployment Pack | An integrated HP and Altiris solution that automates the process of deploying and provisioning server software. | For more information, refer to the following website:<br>www.hp.com/rdp |
| ROM Based Setup Utility (RBSU) | RBSU is a ROM-based configuration utility that allows you to modify server configuration settings. RBSU is machine-specific and customized for each type of server. RBSU facilitates a wide range of configuration functions, including displaying system information, selecting the operating system, and configuring system devices and options. | If RBSU is supported by your server, access the utility by pressing the **F9** key when prompted during the boot process.<br>For more information on running RBSU, refer to the *ROM-Based Setup Utility User Guide* or to your server-specific user documentation. |
| System Configuration Utility (SCU) | Provided for some servers, this utility allows you to modify server configuration settings, facilitating such functions as resolving resource conflicts, managing the installation of hardware, and configuring system settings. | If SCU is supported by your server, access the utility by pressing the **F10** key when the following message is displayed during the boot process:<br>`Press F10 for system partition utilities`<br>For more information on running SCU, refer to your server-specific user documentation. |

**CAUTION:** Do not attempt to use SCU on a 64-bit system. Doing so can corrupt the system, possibly requiring a complete reinstallation of system software.

*continued*

**Table A-2: Software and Option Resources** *continued*

| Resource | What it is | Where to go |
|---|---|---|
| BIOS Setup Utility | Provided for some servers, this utility allows you to modify server configuration settings, facilitating such functions as viewing system information, selecting the operating system, and configuring system devices and installed options. | If BIOS Setup Utility is supported by your server, access the utility by pressing the **F10** key when prompted during the boot process.<br>For more information on running BIOS Setup Utility, refer to your server-specific user documentation. |
| Array Configuration Utility (ACU) | ACU is a graphics-based application that assists you in configuring your HP Smart Array Controller. | If ACU is supported by your server, the utility can be run from either the SmartStart CD or from within the Microsoft Windows NT, Windows 2000, or Novell NetWare operating system.<br>For more information on running ACU, refer to your server-specific user documentation. |
|  **CAUTION:** Do not attempt to use ACU on a 64-bit system. Doing so can corrupt the system, possibly requiring a complete reinstallation of system software. | | |
| ACU-XE | ACU-XE is a web-based configuration utility available for some servers that makes it easy to configure and expand your disk drive arrays. ACU-XE runs under Microsoft Windows Advanced Server Limited Edition and can be run from the local host machine, or remotely from a client computer. | If ACU-XE is supported by your server, refer to your server-specific user documentation for more information. |
| Option ROM Configuration for Arrays (ORCA) Utility | The ORCA utility is a hardware-level configuration program, embedded in the option ROM of the controller, that creates logical drives based on the RAID configuration that you specify. | If the ORCA utility is supported by your server, press the **F8** key when prompted during the boot process.<br>For more information on the ORCA utility, refer to your server-specific user documentation. |

*continued*

**Table A-2: Software and Option Resources** *continued*

| Resource | What it is | Where to go |
|---|---|---|
| Integrated Lights-Out (iLO) | Provides server health and remote server manageability, accessible from a network client using a supported Web browser. The iLO subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface, making it independent of the host server and its operating system. Using a supported Web browser, you can remotely access the console of the host server with full keyboard and mouse controls, remotely power up, power down, or reboot the host server, and send alerts from iLO regardless of the state of the host server, along with many other features. | Refer to the *Integrated Lights-Out User Guide*. If your server supports iLO, also refer to your server-specific user documentation. |
| Remote Insight Lights-Out Edition | Allows browser access to servers through a hardware-based, operating system-independent graphical remote console. Some of the features include virtual diskette drive and power button, server management through any standard browser, dedicated LAN network connectivity, automatic network configuration, external power backup, group administration, and features available with the Remote Insight Board. | Refer to the *Remote Insight Lights-Out Edition User Guide*. |

*continued*

**Table A-2: Software and Option Resources** *continued*

| Resource | What it is | Where to go |
|---|---|---|
| Remote Insight Board/PCI | Allows remote monitoring of servers with features including dedicated LAN, with optional modem or serial connection, server management through a standard browser interface, on-board battery, remote reboot, integration with Insight Manager and Survey Utility, and deployment through SmartStart. | If your server supports this option, refer to your server-specific user guide. |
| Integrated Remote Console (IRC) | The standard IRC allows remote management capabilities, with features including accessibility through ANSI terminal, operation independent of the operating system, remote startup of servers, access to system configuration, and out-of-band communication with dedicated management non-PCI modem installed in the server. | Refer to the *Integrated Remote Console User Guide*. |
| Integrated Management Display (IMD) | The IMD is an informational LCD panel on the server that assists in diagnosing and servicing the server without using a keyboard and monitor. The IML can be viewed on the IMD. | Refer to your server-specific user documentation. |
| IML Viewer | The IML Viewer allows you to view or clear the IML, acknowledge pending IMD alerts, add a maintenance note, and sort, filter, and mark log entries. | If available for your server, the IML Viewer is part of the ProLiant Administration Tools. Refer to your server-specific user documentation and the online help files included with the viewer for more information. |

# General Server Resources

**Table A-3: General Server Resources**

| Type of Information | Document | Where to go |
|---|---|---|
| Additional product information | Product Information | Access the following website:<br>www.compaq.com/products/servers |
| Device driver information | Server Software Download Center | Access the following website:<br>www.compaq.com/support/files |
| External cabling information | Cabling information | Access the following website:<br>www.compaq.com/support/storage |
| Fault tolerance, security, care and maintenance, configuration and setup | Server-specific setup and installation guide, server online reference guide | Documentation CD or access the following website:<br>www.compaq.com/support/servers<br>and select your server. |
| Installation and configuration information for the server management system | *Insight Manager User Guide* | Management CD |
| Installation and configuration information for the server setup software | Server-specific setup and installation guide, server-specific installation poster, and SmartStart installation poster (if your server supports SmartStart) | Documentation CD, ProLiant Essentials Foundation Pack |
| Integrated Lights-Out information | *Integrated Lights-Out User Guide* or general information | Documentation CD or access the following website:<br>www.compaq.com/lights-out |
| Key features, option part numbers | QuickSpecs | Access the following website:<br>www.compaq.com/products/servers |
| Management of the server | *Insight Manager User Guide* | Management CD |

*continued*

**Table A-3: General Server Resources** *continued*

| Type of Information | Document | Where to go |
|---|---|---|
| Operating system installation and configuration information (for factory-installed operating systems) | Factory-installed operating system installation documentation | Server-specific user documentation |
| Operating system integration with the server platform | TechNotes | Access the following website:<br>www.compaq.com/support/techpubs/technotes |
| Operating system version support | Operating system support matrix | Access the following website:<br>ftp.compaq.com/pub/products/servers/os-support-matrix-310.pdf |
| Overview of server features and installation instructions | Server-specific setup and installation guide | Documentation CD, or access the following website:<br>www.compaq.com/support/servers<br>and select your server |
| Power capacity | Power Calculator | Access the following website:<br>activeanswers.compaq.com/aaconfigurator |
| Registering the server | Product registration | Registration card in ProLiant Essentials Foundation Pack or access the following website:<br>www.compaq.com/register |
| Server configuration information | Server-specific setup and installation guide, server-specific installation poster, and SmartStart installation poster (if your server supports SmartStart) | Documentation CD, ProLiant Essentials Foundation Pack |

*continued*

**Table A-3: General Server Resources** *continued*

| Type of Information | Document | Where to go |
|---|---|---|
| Software installation and configuration of the server (for servers which support SmartStart) | SmartStart installation poster | ProLiant Essentials Foundation Pack |
| Specifications for server and options, symbols, installation warnings and notices | Maintenance and service guide | Access the following website:<br>www.compaq.com/support/servers<br>and select your server. |
| Switch settings; LED functions; drive, memory, expansion board and processor installation instructions; and board layouts | Hood labels, Server-specific setup and installation guide | Hood labels inside the access panels of the server, Documentation CD, or access server-specific setup and installation guide online by accessing the following website:<br>www.compaq.com/support/servers<br>and selecting your server. |
| Server and option specifications, symbols, installation warnings, and notices | Server-specific setup and installation guide, printed notices | Printed documentation in the documentation set. Server-specific setup and installation guide on the Documentation CD, or access the following website:<br>www.compaq.com/support/servers<br>and select your server. |
| Teardown procedures, part numbers, specifications | Maintenance and service guide | Access the following website:<br>www.compaq.com/support/servers<br>and select your server. |
| Technical topics | Whitepapers | Access the following website:<br>www.compaq.com/support/techpubs/whitepapers |

# ProLiant BL e-Class System Resources

**Table A-4: ProLiant BL e-Class System Resources**

| Type of Information | Document | Where to go |
|---|---|---|
| Configuration and management information for enclosure software | *ProLiant BL e-Class Integrated Administrator User Guide* | Documentation CD in the server documentation box (where available) |
| Configuration and management information for interconnect switch | *ProLiant BL e-Class C-GbE Interconnect Switch User Guide* | Documentation CD that ships with the ProLiant BL e-Class C-GbE Interconnect Switch or access the HP website. |
| Software installation and configuration of the server blades | Altiris eXpress Deployment Server for ProLiant Servers installation poster, installation whitepapers | ProLiant Essentials Foundation Pack for ProLiant BL Servers or access the HP website |

# B

# Test Error Codes

This appendix contains a list of generated Diagnostics test error codes for every version of Diagnostics except Enterprise Diagnostics LX32. For more information on Diagnostics, refer to “Diagnostics” in Chapter 4.

The following table shows the organization of the test error code series within this chapter:

**Table B-1: Test Error Codes**

| | |
|---|---|
| 100 Series | 1200 Series |
| 200 Series | 6000 Series |
| 300 Series | 6100 Series |
| 400 Series | 6500 Series |
| 500 Series | 6600 Series |
| 600 Series | 6700 Series |
| 1100 Series | 8600 Series |

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

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

# 100-199, Primary Processor Test Error Codes

The 100 series of diagnostic error codes identifies failures with processor and system board functions. Corrective action may require replacing system boards or processor assemblies.

**Table B-2: Primary Processor Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 101-*XX* | CPU test failed | Replace the processor and retest. |
| 103-*XX* | DMA page registers test failed | For error codes 103-*XX* through 106-*XX*, replace the processor and retest. |
| 104-*XX* | Interrupt controller master test failed | |
| 105-*XX* | Port 61 error occurred | |
| 106-*XX* | Keyboard controller self-test failed | |
| 107-*XX* | CMOS RAM test failed | The following steps apply to error codes 107-*XX* through 109-*XX*.<br>1. Replace the battery/clock module and retest.<br>2. Replace the system board and retest. |
| 108-*XX* | CMOS interrupt test failed | |
| 109-*XX* | CMOS clock load data test failed | |
| 110-*XX* | Programmable timer load data test failed | For error codes 110-*XX* through 113-*XX*, replace the system board and retest. |
| 111-*XX* | Refresh detect test failed | |
| 113-*XX* | Protected mode test failed | |
| 114-*XX* | Speaker test failed | 1. Check the speaker connection and retest.<br>2. Replace the speaker and retest.<br>3. Replace the system board and retest. |
| 116-*XX* | Cache test failed | Replace the system board and retest. |

*continued*

**Table B-2: Primary Processor Test Error Codes** *continued*

| Error Code | Description | Recommended Action |
|---|---|---|
| 122-*XX* | Multiprocessor Dispatch test failed | The following steps apply to error codes 122-*XX* and 123-*XX*:<br>1. Check the system configuration and retest.<br>2. Replace the processor and retest.<br>3. Replace the system board and retest. |
| 123-*XX* | Interprocessor Communication test failed | |
| 199-*XX* | Installed devices test failed | 1. Check the system configuration and retest.<br>2. Check cable connections and retest.<br>3. Check switch settings, jumper settings, or both, and then retest.<br>4. Run the server setup utility and retest.<br>5. Replace the processor and retest.<br>6. Replace the system board and retest. |

# 200-299, Memory Test Error Codes

The 200 series of diagnostic error codes identifies failures with the memory subsystem. Corrective action may require replacement of the memory expansion board, the memory modules, or the processor assembly.

**Table B-3: Memory Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 200-*XX* | Invalid memory configuration | Reinsert memory modules in correct location and retest. |
| 201-*XX* | Memory machine ID test failed | The following steps apply to error codes 201-*XX* and 202-*XX*:<br>1. Replace the system ROM and retest.<br>2. Replace the processor and retest.<br>3. Replace the memory expansion board and retest. |
| 202-*XX* | Memory system ROM checksum failed | |

*continued*

**Table B-3: Memory Test Error Codes** *continued*

| Error Code | Description | Recommended Action |
|---|---|---|
| 203-*XX* | Memory write/read test failed | The following steps apply to error codes 203-*XX* through 206-*XX*:<br>1. Replace the memory module and retest.<br>2. Replace the processor and retest.<br>3. Replace the memory expansion board and retest. |
| 204-*XX* | Memory address test failed | |
| 205-*XX* | Walking I/O test failed | |
| 206-*XX* | Increment pattern test failed | |
| 207-*XX* | Invalid memory configuration; check DIMM installation. DIMMs installed have 8K refresh | Replace memory modules. |
| 208-*XX* | Invalid memory detected; check DIMM installation | Be sure that the memory is installed. Then, refer to your server-specific user documentation for supported memory and replace memory modules as indicated. |
| 210-*XX* | Random pattern test failed | 1. Replace the memory module and retest.<br>2. Replace the processor and retest.<br>3. Replace the memory expansion board and retest. |
| 0211-01 | RAND test failed | The following steps apply to error codes 0211-01 through 0214-89:<br>1. Replace the memory module/board and retest.<br>2. Replace the system board and retest.<br>3. Replace the memory expansion board and retest |
| 0211-02 | Error while saving test block | |
| 0211-03 | Error while restoring test block | |
| 0211-04 | Insufficient memory to perform test | |
| 0211-05 | Failed inverted pattern compare, but RAM was correct | |
| 0212-01 | RAM long test failed | |
| 0212-02 | Error while saving test block | |

*continued*

**Table B-3: Memory Test Error Codes** *continued*

| Error Code | Description | Recommended Action |
|---|---|---|
| 0212-03 | Error while restoring test block | |
| 0212-89 | ECC error during testing | |
| 0214-01 | Data error during test | |
| 0214-89 | ECC error during testing | |
| 215 | Non-functioning DC-DC converter for processor *X* | Replace the Processor Power Module (PPM). |

# 300-399, Keyboard Test Error Codes

The 300 series of diagnostic error codes identifies failures with keyboard and system board functions. Corrective action may require replacement of the keyboard or the system board assembly.

**Table B-4: Keyboard Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 301-*XX* | Keyboard short test, 8042 self-test failed | The following steps apply to error codes 301-*XX* through 304-*XX*:<br>1. Check the keyboard connection. If it is disconnected, turn off the computer, connect the keyboard, and then retest.<br>2. Replace the keyboard and retest.<br>3. Replace the system board and retest. |
| 302-*XX* | Keyboard long test failed | |
| 303-*XX* | Keyboard LED test, 8042 self-test failed | |
| 304-*XX* | Keyboard typematic test failed | |

# 400-499, Parallel Printer Test Error Codes

The 400 series of diagnostic error codes identifies failures with a parallel printer interface board or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

**Table B-5: Parallel Printer Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 401-*XX* | Printer failed or not connected | The following steps apply to error codes 401-*XX* through 498-*XX*:<br>1. Connect the printer and retest.<br>2. Check the power to the printer and retest.<br>3. Install the loopback connector and retest.<br>4. Check the switch on the serial/parallel interface board (if applicable) and retest.<br>5. Replace the serial/parallel interface board (if applicable) and retest.<br>6. Replace the system board and retest. |
| 402-*XX* | Printer data register failed | |
| 403-*XX* | Printer pattern test failed | |
| 498-*XX* | Printer failed or not connected | |

# 500-599, Graphics Controller Unit Test Error Codes

The 500 series of diagnostic error codes identifies failures with graphics or system board functions. Corrective action may require replacement of the graphics board or the system board assembly.

**Table B-6: Graphics Controller Unit Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 501-*XX* | Graphics controller test failed | The following steps apply to error codes 501-*XX* through 516-*XX*:<br>1. Replace the monitor and retest.<br>2. Replace the graphics controller and retest.<br>- Or -<br>If the controller is on a separate board, replace the graphics controller and retest.<br>3. Replace the system board and retest. |
| 502-*XX* | Graphics memory test failed | |
| 503-*XX* | Graphics attribute test failed | |
| 504-*XX* | Graphics character set test failed | |
| 505-*XX* | Graphics 80 x 25 mode 9 x 14 character cell test failed | |
| 506-*XX* | Graphics 80 x 25 mode 8 x 8 character cell test failed | |
| 507-*XX* | Graphics 40 x 25 mode test failed | |
| 508-*XX* | Graphics 320 x 200 mode color set 0 test failed | |
| 509-*XX* | Graphics 320 x 200 mode color set 1 test failed | |
| 510-*XX* | Graphics 640 x 200 mode test failed | |
| 511-*XX* | Graphics screen memory page test failed | |
| 512-*XX* | Graphics gray scale test failed | |

*continued*

**Table B-6: Graphics Controller Unit Test Error Codes** *continued*

| Error Code | Description | Recommended Action |
|---|---|---|
| 514-*XX* | Graphics white screen test failed | |
| 516-*XX* | Graphics noise pattern test failed | |

# 600-699, Diskette Drive Test Error Codes

The 600 series of diagnostic error codes identifies failures with diskette, diskette drive, or system board functions. Corrective action may require replacement of the diskette, the diskette drive, or the system board assembly.

**Table B-7: Diskette Drive Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 600-*XX* | Diskette ID drive types test failed | The following steps apply to error codes 600-*XX* through 610-*XX*:<br>1. Replace the diskette and retest.<br>2. Check the diskette power and signal cables and retest.<br>3. Replace the diskette power and signal cables and retest.<br>4. Replace the diskette drive and retest.<br>5. Replace the system board and retest. |
| 601-*XX* | Diskette format failed | |
| 602-*XX* | Diskette read test failed | |
| 603-*XX* | Diskette write/read/compute test failed | |
| 604-*XX* | Diskette random seek test failed | |
| 605-*XX* | Diskette ID media failed | |
| 606-*XX* | Diskette speed test failed | |
| 607-*XX* | Diskette wrap test failed | |
| 608-*XX* | Diskette write protect test failed | |

*continued*

**Table B-7: Diskette Drive Test Error Codes** *continued*

| Error Code | Description | Recommended Action |
|---|---|---|
| 609-*XX* | Diskette reset controller test failed | |
| 610-*XX* | Diskette change line test failed | |
| 699-*XX* | Diskette drive/media ID error | 1. Replace the media and retest.<br>2. Run the server setup utility and retest. |

# 1100-1199, Serial Test Error Codes

The 1100 series of diagnostic error codes identifies failures with serial interface board or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

**Table B-8: Serial Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 1101-*XX* | Serial port test failed | The following steps apply to error codes 1101-*XX* and 1109-*XX*:<br>1. Check the switch settings on the serial/parallel interface board (if applicable) and retest.<br>2. Replace the serial/parallel interface board (if applicable) and retest.<br>3. Replace the system board and retest. |
| 1109-*XX* | Clock register test failed | |

# 1200-1299, Modem Communications Test Error Codes

The 1200 series of diagnostic error codes identifies failures with the modem. Corrective action may require replacement of the modem.

**Table B-9: Modem Communications Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 1201-*XX* | Modem internal loopback test failed | The following steps apply to error codes 1201-*XX* through 1210-*XX*:<br>1. Refer to the modem documentation for correct setup procedures and retest.<br>2. Check the modem line and retest.<br>3. Replace the modem and retest. |
| 1202-*XX* | Modem time-out test failed | |
| 1203-*XX* | Modem external termination test failed | |
| 1204-*XX* | Modem auto-originate test failed | |
| 1206-*XX* | Dial multi-frequency tone test failed | |
| 1210-*XX* | Modem direct connect test failed | |

# 6000-6099, Network Interface Controllers Test Error Codes

The 6000 series of diagnostic error codes identifies failures with various network interface controllers. Corrective action may require replacement of the controller.

**Table B-10: Network Interface Controllers Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 6000-*XX* | Network card ID failed | The following steps apply to error codes 6000-*XX* through 6089-*XX*:<br>1. Check the controller installation in the EISA slot and retest.<br>2. Check the interrupt type and number setting and retest.<br>3. Check the media connection at the controller and Multistation Access Unit (MAU) and retest.<br>4. Check the media speed (4/16) and type Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings and retest.<br>5. Check the MAU, cabling, or other network components and retest.<br>6. Replace the controller and retest. |
| 6001-*XX* | Network card setup failed | |
| 6002-*XX* | Network card transmit failed | |
| 6014-*XX* | Network card configuration failed | |
| 6016-*XX* | Network card reset failed | |
| 6028-*XX* | Network card internal failed | |
| 6029-*XX* | Network card external failed | |
| 6089-*XX* | Network card open failed | |
| 6090-*XX* | Network card initialization failed | |
| 6091-*XX* | Network card internal loopback failed | |
| 6092-*XX* | Network card external loopback failed | |

# 6100-6199, Array Controller Test Error Codes

The 6100 series of diagnostic error codes identifies failures with an array controller. Refer to "Array Diagnostic Utility" in Chapter 4 for more information on diagnosing problems with the drive array.

**Table B-11: Array Controller Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 6100-*XX* | Array Controller ID Failed | 1. Replace the signal cables and retest.<br>2. Attempt to flash array firmware to the current version.<br>3. Replace the controller and retest. |
| 6115-*XX* | Array Controller Configuration Failed | |

# 6500-6599, SCSI Hard Drive Test Error Codes

The 6500 series of diagnostic error codes identifies failures with SCSI hard drives, SCSI hard drive controller boards, SCSI hard drive cabling, and system board functions. If the system uses a drive array controller, refer to "Array Diagnostic Utility" in Chapter 4 for more information about diagnosing problems with the drive array.

**Table B-12: SCSI Fixed Disk Drive Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 6500-*XX* | SCSI Disk ID drive types test failed | The following steps apply to error codes 6500-*XX* through 6528-*XX*:<br>1. Run the server setup utility and check the drive type.<br>2. Replace the SCSI disk drive signal and power cables and retest.<br>3. Replace the SCSI controller and retest.<br>4. Replace the SCSI disk drive and retest.<br>5. Replace the system board and retest. |
| 6502-*XX* | SCSI Disk Unconditional Format test failed | |
| 6505-*XX* | SCSI Disk Read test failed | |
| 6506-*XX* | SCSI Disk SA/Media test failed | |
| 6509-*XX* | SCSI Disk Erase tape test failed | |
| 6523-*XX* | SCSI Disk Random Read test failed | |
| 6528-*XX* | Media load/unload test failed | |

# 6600-6699, SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of diagnostic error codes identifies failures with the CD-ROM cabling, CD-ROM drive, adapter board, or system board assembly. Corrective action may require replacement of the CD-ROM cabling, CD-ROM drive, adapter board, or system board assembly.

**Table B-13: SCSI/IDE CD-ROM Drive Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 6600-*XX* | CD-ROM ID failed | The following steps apply to error codes 6600-*XX* through 6608-*XX*:<br>1. Replace the CD-ROM media and retest.<br>2. Check the signal cable and retest.<br>3. Replace the signal cable and retest.<br>4. Check the switch settings on the adapter board (if applicable).<br>5. Replace the SCSI controller (if applicable) and retest.<br>6. Replace the CD-ROM drive and retest.<br>7. Replace the system board and retest. |
| 6605-*XX* | CD-ROM Read failed | |
| 6608-*XX* | SCSI controller test failed | |

# 6700-6799, SCSI Tape Drive Test Error Codes

The 6700 series of diagnostic error codes identifies failures with the tape cartridge, tape drive, media changer, tape drive cabling, SCSI adapter, or system board assembly. Corrective action may require replacement of any of these parts.

**Table B-14: SCSI Tape Drive Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 6700-*XX* | SCSI Tape ID drive types test failed | The following steps apply to error codes 6700-*XX* through 6728-*XX*:<br>1. Run the server setup utility and check drive type.<br>2. Replace the SCSI Tape drive signal and power cables and retest.<br>3. Replace the SCSI controller and retest.<br>4. Replace the SCSI Tape drive and retest.<br>5. Replace the system board assembly and retest. |
| 6706-*XX* | SCSI Disk SA/Media test failed | |
| 6708-*XX* | SCSI Controller test failed | |
| 6709-*XX* | SCSI Disk Erase tape test failed | |
| 6728-*XX* | Media load/unload test failed | |

# 8600-8699, Pointing Device Interface Test Error Codes

The 8600 series of diagnostic error codes identifies failures with the pointing device (mouse, trackball, and so forth) or the system board assembly. Corrective action may require replacement of the pointing device or the system board assembly.

**Table B-15: Pointing Device Interface Test Error Codes**

| Error Code | Description | Recommended Action |
|---|---|---|
| 8601-*XX* | Pointing Device Interface test failed | 1. Replace with working pointing device and retest.<br>2. Replace the system board and retest. |

# C

# POST Error Messages

This appendix contains a complete list of all Power-On Self-Test (POST) error messages. For more information, refer to "Power-On Self-Test" in Chapter 4. The error messages and codes listed include all codes generated by ProLiant and TaskSmart products. Your system generates only the codes that are applicable to your configuration and options. Some servers do not have speakers and thus do not support audio output. Please disregard the Audible Beeps column if your server falls into this category.

**Table C-1: POST Error Messages**

| | |
|---|---|
| Beeps only | 600-699 |
| Non-numeric | 800-899 |
| 100-199 | 900-999 |
| 200-299 | 1100-1199 |
| 300-399 | 1600-1699 |
| 400-499 | 1700-1799 |
| 500-599 | 1800-1899 |

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

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

# Non-Numeric POST Error Messages or Beeps Only

**Table C-2: Non-Numeric Error Messages or Beeps Only**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| A Correctable Memory Error occurred prior to this power-up | None | A memory module has experienced an error which, while recoverable, has generated a predictive failure warning. | Run Diagnostics to identify and replace the appropriate memory module. |
| A Critical Error occurred prior to this power-up | None | A catastrophic system error, which caused the server to crash, has been logged. | Run Diagnostics. Replace failed assembly as indicated. |
| A processor thermal event occurred prior to this power up, Processor *X* | None | Processor *X* (1 or 2) has reached an excessive temperature and has stopped operation. | Check the following information:<br>• The processor and heatsink assembly is properly installed.<br>• Ambient temperature is within an acceptable range. |
| *Beeps only* | 2 long, 2 short | The power has cycled because the temperature is too hot. The processor fan is not installed, or is not spinning. | Check fans. |

*continued*

**Table C-2: Non-Numeric Error Messages or Beeps Only** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| *Beeps only* | 2 long | No valid memory is present in the system. | • If no memory modules are present, install at least one memory module to conform to minimum hardware configuration specifications.<br>• Reseat all installed memory modules.<br>• If the system contains more than one memory module, remove one module, and restart the server. Repeat as needed to isolate the bad memory module. |
| Critical Error Occurred Prior to this power-up | None | A catastrophic system error, which caused the server to crash, has been logged. | Run Diagnostics. Replace failed assembly as indicated. |
| Critical Failure Detected - System Shutting Down in | None | Blower assembly has failed. | Replace blower assembly. |
| Critical Fan Failure Detected – System Shutting Down System Halted | None | A critical fan is not spinning. | Check fans.<br>Check fan cable connections. |
| Critical Fan Failure Detected – System Shutting Down in 5 seconds System Halted | None | A critical fan is not spinning. | Check fans.<br>Check fan cable connections. |

*continued*

**Table C-2: Non-Numeric Error Messages or Beeps Only** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| ECC Multiple Bit Error Detected in DIMM *X* | None | A memory module failure generated a multiple bit error that could not be corrected. | Run Diagnostics and replace failed memory module as indicated. |
| ECC Multiple Bit Error Detected in DIMM/SIMM pair:<br>DIMM *X* | None | A memory module failure generated a multiple-bit error that could not be corrected. | Run Diagnostics and replace failed memory module as indicated. |
| FATAL ROM ERROR: The System ROM is not properly programmed. | 1 long, 1 short | The System ROM is not properly programmed. | Replace the physical ROM part. |
| Fixed Disk Parameter Table or BIOS Error<br>System Halted | None | An error occurred while attempting to communicate with the CD-ROM/diskette drive assembly. This assembly may not be seated properly. | 1. Reseat the CD-ROM/diskette drive assembly.<br>2. Check the media currently in the drive. |
| Initialization failure.<br>Re-seat the processor and Processor Power Module before attempting replacement | None | Processor was not fully seated.<br>A processor internal failure occurred. | 1. Reseat the processor.<br>2. Replace the processor if the failure recurs. |
| Invalid electronic serial number | None | Serial number in BIOS is incorrect. | Run the server setup utility to program serial number. |
| Loss of Nonvolatile Configuration Memory | None | Nonvolatile memory has been corrupted or cleared. | No action needed. System will automatically load default nonvolatile configuration. |
| Network server mode active and no keyboard attached | None | This is not an error but simply displays when keyboard is not connected. | No action required. |

*continued*

**Table C-2: Non-Numeric Error Messages or Beeps Only** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| No Keyboard Present | None | Keyboard failure occurred, or keyboard not connected to server. | 1. Turn off the computer, and then reconnect the keyboard.<br>2. Be sure that no keys are depressed or stuck.<br>3. If this does not solve the problem, replace the keyboard. |
| No SCSI Devices Detected | None | No SCSI devices are connected to the boot controller. | Check configuration, SCSI cable, connected drives, and SCSI IDs. |
| Non-System disk or disk error | None | No bootable disk partition was found on the boot drive. | 1. Remove diskette from diskette drive.<br>2. Check controller order in server setup utility.<br>3. Check boot order in server setup utility.<br>4. Reinstall operating system. |
| Parity Check 2 | None | A PCI device generated a parity error 2. | 1. Remove recently installed PCI adapters.<br>2. Reinstall the adapters one at a time to determine which one is generating errors.<br>3. Replace the failed device. |
| PCI User Definable Features Detected and Configured with Default Settings. Run System Configuration Utility to View/Modify Settings | None | PCI card is not properly configured. | Run the server setup utility to make desired changes. |

*continued*

**Table C-2: Non-Numeric Error Messages or Beeps Only** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| Power Fault Detected in Hot-Plug PCI Slot X | 2 short | PCI-X Hot Plug expansion slot was not powered up properly. | Reboot the server. |
| Processor in incorrect socket. - System Halted!. | None | Processor is installed in socket 2 only. | Install processor in socket 1. |
| Processor packages do not match..<br>Please make sure that all processor packages are the same.<br>- System Halted! | 1 long, 1 short | Installed processors are different types. | Install processors of the same type. |
| REDUNDANT ROM ERROR: Backup ROM invalid. - run ROMPAQ to correct error condition. | None | System ROM and redundant ROM are both corrupt. | Run ROMPaq Utility. |
| REDUNDANT ROM ERROR: Bootblock invalid. - contact COMPAQ Representative. | None | ROM bootblock is corrupt. | Contact authorized service provider. |
| RESUME – F1 key | None | As indicated to continue. | Press the **F1** key**.** |
| (Run System Configuration Utility – F10 key) | None | A configuration error occurred during POST. | Press the **F10** key to run server setup utility. |
| Unsupported Processor Detected System Halted. | 1 long, 1 short | Processor not supported by current system ROM. | Check documentation for supported processors. If supported, remove the processor and update system to latest ROM. |

*continued*

**Table C-2: Non-Numeric Error Messages or Beeps Only** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| WARNING: A Type 2 Header PCI Device has been detected.<br>The BIOS will not configure this card.<br>It must be configured properly by the OS or driver. | 2 short | Only Type 0 and Type 1 Header PCI Devices are configured by the system ROM. The device will not work unless the OS or device driver properly configure the card. | Refer to the operating system documentation or the device driver information that ships with the Type 3 PCI device. |

# 100 Series POST Error Messages

**Table C-3: 100 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 101-ROM Error | 1 long, 1 short | System ROM checksum. | Run Diagnostics. Replace failed assembly as indicated. |
| 101-I/O ROM Error | None | Options ROM checksum. | Run Diagnostics. Replace failed assembly as indicated. |

*continued*

**Table C-3: 100 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 101-Option ROM Checksum Error<br><br>An add-in card in your system is not working correctly. If you have recently added new hardware, remove it and see if the problem remains. If this message goes away after you remove your new hardware, there may be a problem with the add-in card. | 1 long, 1 short | An expansion board in your system is not working correctly. | If you have recently added new hardware, remove it and see if the problem remains. If this message goes away after you remove your new hardware, there may be a problem with the expansion board. Review the expansion board documentation, and then try reinstalling the board. |
| 102-System Board Error | None | 8237 DMA controllers, 8254 timers, etc. | Replace the system board. Run the server setup utility. |
| 102-System Board Failure | None | 8237 DMA controllers, 8254 timers, etc. | Replace the system board. Run the server setup utility. |
| 102-System Board Failure, CMOS Test Failed. | None | 8237 DMA controllers, 8254 timers, etc. | Replace the system board. Run the server setup utility. |
| 102-System Board Failure, DMA Test Failed | None | 8237 DMA controllers, 8254 timers, etc. | Replace the system board. Run the server setup utility. |
| 102-System Board Failure, Timer Test Failed | None | 8237 DMA controllers, 8254 timers, etc. | Replace the system board. Run the server setup utility. |
| 102-System Board Failure<br><br>This is an unrecoverable error. Your computer needs servicing. | None | 8237 DMA controllers, 8254 timers, etc. | Replace the system board. Run the server setup utility. |

*continued*

**Table C-3: 100 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 104-ASR Timer Failure | None | System board failure. | Run Diagnostics. Replace failed assembly as indicated. |
| 105-Current System ROM is corrupt – now booting redundant System ROM | 2 long | Nonbooted ROM image is corrupted. | Flash the ROM utilizing ROMPaq. Refer to the "ROMPaq Disaster Recovery" section in Chapter 5 of this guide. |
| 162-System Options Not Set | 2 short | Configuration incorrect. | Run the server setup utility and correct. |
| 162-System Options Not Set | 2 short | Your system configuration has changed since your last boot (addition of a hard drive, for example) or a loss of power to the real-time clock has occurred. The real-time clock loses power if the onboard battery is not functioning correctly. Pressing the **F1** key records the new configuration. If this message persists, you may need to replace the onboard battery. | Run the server setup utility and correct. |
| 163-Time & Date Not Set | 2 short | Invalid time or date in configuration memory. | Run the server setup utility and correct. |

*continued*

**Table C-3: 100 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 163-Time & Date Not Set<br><br>The system time is invalid. This may be a result of a loss in battery power. Set the correct time and date using your operating system. If this message persists, you may need to replace the onboard battery. | 2 short | Invalid time or date in configuration memory. | Run the server setup utility and correct. |
| 164-Memory Size Error | 2 short | Configuration memory incorrect. | Run the server setup utility and correct. |
| 164-Memory Size Error<br><br>The system memory size is different from the last startup. The most common reason is the addition or removal of memory to the system board. Pressing F1 will record the configuration. If this message persists verify that the memory modules are installed correctly. | 2 short | Configuration memory incorrect. | Run the server setup utility and correct. |
| 170-EISA Expansion Device Not Responding | None | Device not detected. | Run the server setup utility and correct. |

*continued*

**Table C-3: 100 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 171-2-IRC Configuration Invalid | None | One or more of the following messages may also be displayed:<br>• `Comport Invalid`<br>• `PCI Comport Invalid`<br>• `Incorrect IRQ`<br>• `Video Controller Must be on Primary PCI Bus` | Run the server setup utility and correct. |
| 172-1-Configuration NVRAM invalid | None | Nonvolatile configuration corrupted or jumper installed. | Run the server setup utility and correct. |
| 172-Configuration Non-volatile Memory Invalid | None | Nonvolatile configuration corrupted. | Run the server setup utility and correct. |
| 172-Default System Configuration Installed! Run System Configuration Utility to View/Modify Settings | None | Nonvolatile configuration corrupted. The default system configuration has been installed. | Run the server setup utility to make any changes to the default configuration. |
| 172-1-Configuration Non-volatile Memory Invalid | None | Nonvolatile configuration corrupted. | Run the server setup utility and correct. |
| 172-System Configuration Nonvolatile Memory Invalid. Initialization Aborted. | None | Battery is low or not working. | Turn off the server, replace the battery located on the sideplane board, and then reboot the system. The default nonvolatile configuration will be loaded. |
| 173-PCI Config Slot Mismatch | None | Board replaced, configuration not updated. | Run the server setup utility and correct. |

*continued*

**Table C-3: 100 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 173-Slot ID Mismatch | None | Board replaced, configuration not updated. | Run the server setup utility and correct. |
| 174-Configuration/ Slot Mismatch Device Not Found | None | EISA or PCI board not found. | Run the server setup utility and correct. |
| 174- EISA configuration Mismatch - Device not found | None | EISA or PCI board not found. | Run the server setup utility and correct. |
| 174- PCI Config Slot Mismatch - Not Found | None | PCI board not found. | Run the server setup utility and correct. |
| 175-Configuration/ Slot Mismatch Device Found | None | EISA or PCI board added, configuration not updated. | Run the server setup utility and correct. |
| 175-PCI Configuration/Slot Mismatch. Device Found | None | There is a PCI device conflict on the PCI bus. | Move any recently added PCI boards to a slot on a different PCI bus. |
| 175-PCI user-definable features detected and configured with default settings | None | Incomplete system configuration detected. | Run the server setup utility and correct. |
| 176- EISA slot yields Valid ID | None | Incomplete system configuration detected. | Run the server setup utility and correct. |
| 177-Configuration Not Complete | None | Incomplete system configuration detected. | Run the server setup utility and correct. |
| 177-Controller order not set up. | None | Incomplete system configuration detected. | Run the server setup utility and correct. |
| 177- EISA configuration not complete | None | Incomplete system configuration detected. | Run the server setup utility and correct. |

*continued*

**Table C-3: 100 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 178-Processor Configuration Invalid | None | Processor type or step does not match configuration memory. | Run the server setup utility and correct. |
| 179- System revision mismatch | None | Incomplete system configuration detected. | Run the server setup utility and correct. |
| 180-Log Reinitialized | None | The Integrated Management Log has been reinitialized due to corruption of the log. | Event message, no action needed. |
| 180-Log reinitialized because length check out of bounds | None | The Integrated Management Log has been reinitialized due to corruption of the log. | Event message, no action required. |

# 200 Series POST Error Messages

**Table C-4: 200 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 201-Memory Error | None | RAM failure detected. | Run Diagnostics. Replace failed assembly as indicated. |
| 201-Memory Error The memory test performed during startup failed. Removing and replacing memory modules can isolate the faulty memory. Also verify that the memory modules are installed correctly. | None | RAM failure detected. | Run Diagnostics. Replace failed assembly as instructed. |
| 202-Memory Type Mismatch | 2 short | An incompatible memory module is installed in the system. | Compare part numbers from installed memory modules with those listed in your server-specific user documentation.<br>If not listed, the memory modules are incompatible and should be replaced or removed. |
| 203-Memory Address Error | None | RAM failure detected. | Run Diagnostics. Replace failed assembly as indicated. |
| 205-Cache Memory error | 2 short | A memory module is malfunctioning. | Run Diagnostics. Replace or remove malfunctioning memory module as indicated. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 206-cache controller error | 2 short | A memory module is malfunctioning. | Run Diagnostics. Replace or remove malfunctioning memory module as indicated. |
| 207-ECC Corrected Single Bit Errors in DIMM in Memory Module Socket | 2 short | A memory module is malfunctioning. | Run Diagnostics. Replace or remove malfunctioning memory module as indicated. |
| 207-ECC Corrected Single Bit Errors in DIMM/SIMM PAIR(s) in Memory Module Socket(s) in Memory Module DIMM | 2 short | A memory module is malfunctioning. | Run Diagnostics. Replace or remove malfunctioning memory module as instructed. |
| 207-Invalid Memory Configuration – Check DIMM Installation | None | Memory module installed incorrectly. | Check placement of memory modules. |
| 207-Invalid Memory Configuration – Insufficient Timings on DIMMs | 1 long, 1 short | Memory module installed incorrectly. | Check placement of memory modules. |
| 207-Invalid Memory Configuration - Unsupported DIMM in Board X, DIMM X. Insufficient Timings on DIMM. | 1 long, 1 short | Insufficient DIMM timings | Install registered PC 1600 ECC DDR SDRAM DIMMs. |
| 207-Invalid Memory Configuration – Memory within 2-DIMM Group(s) Not Utilized. | 1 long, 1 short | Memory module installed incorrectly. | All the DIMMs within a DIMM group must be alike. Put correctly matched DIMMs within a group |
| 207-Invalid Memory Configuration – Mismatched DIMMs within DIMM Group | 1 long, 1 short | Memory within the 2-DIMM group(s) is not utilized. | All the DIMMs within a DIMM group must be alike. Install correctly matched DIMMs within a group. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 207-Invalid Memory Configuration – Mismatched DIMMs within DIMM Group *X* | 1 long, 1 short | Memory within 2-DIMM Group *X* is not utilized. | Install correctly matched DIMMs in Group *X.* |
| 207-Invalid Memory Configuration – Mismatched DIMMs within DIMM Bank<br>Memory in Bank X Not Utilized. | One long, and one short | Installed DIMMs in the same bank are of different sizes. | Install correctly matched DIMMs. |
| 207-Invalid Memory Configuration - Mismatched DIMMs within DIMM Bank. Memory in Board X, Bank X Not Utilized. | 1 long, 1 short | DIMMs within a bank are mismatched or missing, or memory board 1 is missing. | Install correctly matched DIMMs. |
| 207-Invalid Memory Configuration – Only Registered SDRAM DIMMs Are Supported. | 1 long, 1 short | Memory module installed incorrectly. | Check placement of memory modules. |
| 207-Invalid Memory Configuration – Unsupported DIMM in Socket *X* | 1 long, 1 short | Unregistered DIMMs or insufficient DIMM timings. | Install registered ECC DIMMs. |
| 207-Invalid Memory Configuration - Unsupported DIMM In DIMM Socket X<br>Only Registered DDR DIMMs Are Supported. | 1 long, 1 short | DIMM is of an unsupported type. | Replace DIMMs in indicated slots with supported type. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 207-Invalid Memory Configuration - Unsupported DIMM In DIMM Socket X<br>Insufficient Timings on DIMM. | 1 long, 1 short | Installed DIMMs are too slow. | Replace DIMMs in indicated slots with supported type. |
| 207-Invalid Memory Configuration - Unsupported DIMM In DIMM socket X<br>Only ECC DIMMs Are Supported. | 1 long, 1 short | Installed DIMMs do not have ECC capability. | Replace DIMMs in indicated slots with supported type. |
| 207-Invalid Memory Configuration - Unsupported DIMM In DIMM socket X<br>DIMM Size Parameters Not Supported. | 1 long, 1 short | Installed DIMMs in the same bank are of different sizes. | Replace DIMMs in indicated slots with supported type. |
| 207-Invalid Memory Configuration - DIMMs must be installed sequentially. | 1 long, 1 short | Installed DIMMs are not sequentially ordered. | Reinstall DIMMs in proper order. |
| 207-Invalid Memory Configuration - Incomplete bank detected in bank X | 1 long, 1 short | Bank is missing a DIMM. | Install a DIMM to fill the bank. |
| 207-Invalid Memory Configuration - Unsupported DIMM in Board X, DIMM X. Only Registered DDR DIMMs are Supported. | 1 long, 1 short | Unregistered DIMMs | Install registered PC 1600 ECC DDR SDRAM DIMMs. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 207-Invalid Memory Configuration, Bank *X* | None | A memory bank has been incorrectly populated. | Check the location of the bank specified. This bank number will correspond to the bank number shown on the memory expansion board identification label located on the top air baffle of the processor/memory drawer. Check that a bank has been populated with four DIMMs of the same type, size, and speed. |
| 207- Memory Installation Error | None | Memory module installed incorrectly or unsupported DIMM. | Check placement of memory modules. |
| 207-Memory Configuration Warning – DIMM in DIMM Socket X does not have Primary Width of 4 and only supports standard ECC. | 1 long, 1 short, or none | Installed DIMMs have a primary width of x8. | Install DIMMs that have a primary width of x4. |
| 208-Invalid Memory Speed – Check DIMM Installation | 1 long, 1 short | The speed of the memory is not compatible. | Check the speed of the memory modules installed. Then, check your server user documentation and replace as indicated. |
| 209-Memory Detection Failure. Check Memory Installation. | 1 long, 1 short | Unable to size memory. | Check memory module installation. Check for additional resources at www.hp.com. |
| 209-Online Spare Memory Configuration - Bank A does not match Bank C. | 1 long, 1 short | DIMM group mismatch between Bank A and Bank C. | Check the size and speed of the memory modules installed. Then, check your server user documentation and replace as indicated. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 209-Online Spare Memory Configuration - Bank B does not match Bank C. | 1 long, 1 short | DIMM group mismatch between Bank B and Bank C. | Check the size and speed of the memory modules installed. Then, check your server user documentation and replace as indicated. |
| 209-Online Spare Memory Configuration— Bank C Insufficient for Bank A. | 1 long, 1 short | DIMM group mismatch between Bank A and Bank C. | Check the size and speed of the memory modules installed, then check your server user documentation and replace as indicated. |
| 209-Online Spare Memory Configuration— Bank C Insufficient for Bank B. | 1 long, 1 short | DIMM group mismatch between Bank B and Bank C. | Check the size and speed of the memory modules installed, then check your server user documentation and replace as indicated. |
| 209-Online Spare Memory Configuration - Bank C is invalid or by itself. | 1 long, 1 short | DIMM sizes are not the same, speeds are not the same, or one slot is not populated. | Check the size and speed of the memory modules installed. Then, check your server user documentation and replace as indicated. |
| 209 - Online Spare Memory Configuration - Board 1, Bank D is invalid. | 1 long, 1 short | Online spare bank is configured incorrectly. | Be sure that DIMMs in the online spare bank are populated correctly. |
| 209 - Online Spare Memory Configuration - No valid banks for online spare. | 1 long, 1 short | Two valid banks are not available to support Online Spare. | Install or reinstall DIMMs to support online spare configuration. |
| 209-Online Spare Memory Configuration-Spare bank is invalid | 1 long, 1 short | Installed DIMMs for online spare bank are of a size smaller than another bank. | Install or reinstall DIMMs to support online spare configuration. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 209-Online Spare Memory Configuration-Spare bank is invalid. Mixing of DIMMs with Primary Width of x4 and x8 is not allowed in this mode. | 1 long, 1 short | Installed DIMMs for online spare bank are of a different primary width than the DIMMs in other banks. | Install or reinstall DIMMs to support online spare configuration. |
| 209 - Mirror Memory Configuration - DIMMs on both boards do not match. | 1 long, 1 short | Memory boards are not populated identically, or a memory board is missing. | Be sure that two memory boards are installed and that DIMMs are populated correctly. |
| 209 - Mirror Memory Configuration - Single-Board Mirror DIMMs do not match. | 1 long, 1 short | Mirrored banks are not populated identically, or memory board 1 is missing. | Be sure mirrored banks are populated identically and that only memory board 1 is installed. |
| 209-Mirror Memory Configuration - Board 2 present in Single-Board Mirror. | 1 long, 1 short | A second memory board is installed in the single-board mirrored memory configuration. | Remove memory board 2. |
| 211-Invalid Processor Board PPM installed, Module *X* | None | Wrong PPM installed. | Replace processor PPM. |
| 211-Invalid Processor PPM installed, Module *X* | None | Wrong PPM installed. | Replace processor PPM. |
| 211-Invalid Voltage Regulator Module installed for Processor *X* | None | Nonredundant Processor Power Module (PPM) installed in indicated processor slot. | Replace with a PPM that supports redundancy. |
| 212-Processor Failed, Processor *X* | 1 short | Processor in slot *X* failed. | Run Diagnostics and replace failed processor. |
| 212-System Processor Failed/Mapped out | 1 short | Processor in slot *X* failed. | Run Diagnostics and replace failed processor. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 213-Processor Disabled, Processor *X* | None | The PPM and voltage regulator module (VRM) for processor *X* is not installed correctly. | Check whether the PPM and VRM is installed and correctly seated. |
| 214-DC-DC Converter Failed | None | PPM failed. | Run Diagnostics. Replace failed assembly as indicated. |
| 214-Memory Device Failure. Error Code:*X* Memory Module DIMM:*Y* | 2 short | A memory module has failed. | Run Diagnostics. Replace failed memory module as indicated. |
| 214-Processor board PPM failed | None | Missing or failed PPM. | Run Diagnostics. Replace failed assembly as indicated. |
| 214-Processor PPM Failed, Module *X*. | None | Indicated PPM failed. | Run Diagnostics. Replace failed assembly as indicated. |
| 214-Processor PPM Failed, Processor Bus *X* | None | A processor PPM has failed or is missing. The failed PPM is located on a disabled processor bus. | Run Diagnostics. Replace failed assembly as indicated. |
| 215-Non-functioning Voltage Regulator Module for Processor *X* | None | PPM (DC-DC converter) failed or lost redundancy. | Run Diagnostics. Replace failed assembly as indicated. |
| 215-Processor PPM not installed, module | None | A processor has been installed without its corresponding PPM. | Run Diagnostics. Install assembly as indicated. |
| 216-Processor board PPM has lost redundancy | None | Indicated PPM has lost redundancy. | Run Diagnostics. Replace failed assembly as indicated. |
| 216-Processor PPM has lost Redundancy, Module *X*. | None | Indicated PPM has lost redundancy. | Run Diagnostics. Replace failed assembly as indicated. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 216-Voltage Regulator Module for Processor *X* no longer redundant. | None | Indicated PPM has lost redundancy. | Run Diagnostics. Replace failed assembly as indicated. |
| 217-Unsupported Processor Detected | None | System does not recognize processor as supported. | 1. Check the processor bus speed and processor bus-to-core ratio jumper settings. Refer to the server-specific setup and installation guide for more information.<br>2. Be sure that all processors in the system have the same core speeds and cache sizes.<br>3. Be sure that all processors are no more than one stepping apart. ROM should be able to detect this and provide the stepping information.<br>4. Replace specified processor. |
| 218-Cache Accelerators Not Installed. System Halted | None | Cache accelerators not installed or improperly installed. | Check cache accelerator installation. |
| 219-Tag Update Rules SRAM Failure. System Halted | None | Catastrophic chipset failure occurred. | Replace failed assembly as indicated. |
| 219-Snoop Rules SRAM Failure. System Halted | None | Catastrophic chipset failure occurred. | Replace failed assembly as indicated. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 220-cache accelerator Slot *X* Initialization Failed. System Halted | None | Cache accelerator in slot *X* improperly installed or bad. | Check cache accelerator installation and if properly installed, replace. |
| 221-Power Fault On Processor Bus *X* | None | A Processor Power Module (PPM) on indicated bus is in a failed state. | Run Diagnostics. Replace failed assembly as indicated. |
| 222-Processor bus disabled, Processor Bus *X*. | None | Hardware or BIOS have disabled a processor bus. | Refer to actions for accompanying error messages. |
| 252-Invalid Memory SPD reading | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 253-Invalid Memory Cycle Time reading | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 254-Invalid Memory Revision Code | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 255-Invalid Memory CL2 Support | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 256-Invalid Memory TRP reading | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 257-Invalid Memory TRRD reading | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |

*continued*

**Table C-4: 200 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 258-Invalid Memory TRCD reading | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 259-Invalid Memory TRAS reading | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 260-Invalid Memory Burst Length | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 261-Invalid Memory DIMM Configuration Type | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 262-Invalid Memory Refresh Rate Setting | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |
| 263-DIMM is not valid or compatible | None | Failed or incompatible DIMM. | Be sure that the specified DIMM meets the requirements for supported DIMMs. Replace DIMM. |

# 300 Series POST Error Messages

**Table C-5: 300 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 301-Keyboard Error | None | Keyboard failure occurred. | 1. Turn off the computer, and then reconnect the keyboard.<br>2. Be sure that no keys are depressed or stuck.<br>3. If this does not solve the problem, replace the keyboard. |
| 301-Keyboard Error or Test Fixture Installed | None | Keyboard failure occurred. | 1. Turn off the computer, and then reconnect the keyboard.<br>2. Be sure that no keys are depressed or stuck.<br>3. If this does not solve the problem, replace the keyboard. |
| *ZZ*-301-Keyboard Error | None | Keyboard failure occurred. (*ZZ* represents the Keyboard Scan Code.) | 1. Be sure that no keys are depressed or stuck.<br>2. If this does not solve the problem, replace the keyboard. |
| 303-Keyboard Controller Error | None | System board, keyboard, or mouse controller failure occurred. | Run Diagnostics. Replace failed assembly as indicated. |

*continued*

**Table C-5: 300 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 303-keyboard controller error | None | System board, keyboard, or mouse controller failure occurred. | 1. Be sure that the keyboard and mouse are connected.<br>2. Run Diagnostics to determine which is in error.<br>3. Replace the indicated part. |
| 304-Keyboard or System Unit Error | None | Keyboard, keyboard cable, mouse controller, or system board failure. | 1. Be sure that the keyboard and mouse are connected.<br>2. Run Diagnostics to determine which is in error.<br>3. Replace the indicated part. |

# 400 Series POST Error Messages

**Table C-6: 400 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 40*X*-Parallel Port *X* Address Assignment Conflict. | 2 short | Both external and internal ports are assigned to parallel port *X*. | Run the server setup utility and correct. |
| 404-Parallel Port Address Conflict Detected<br><br>A hardware conflict in your system is keeping some system components from working correctly. If you have recently added new hardware remove it to see if it is the cause of the conflict. Alternatively, use Computer Setup or your operating system to insure that no conflicts exist. | 2 short | A hardware conflict in your system is preventing the parallel port from working correctly. | 1. If you have recently added new hardware, remove it to see if the hardware is the cause of the conflict.<br>2. Run your server setup utility to reassign resources for the parallel port and manually resolve the resource conflict.<br>3. Run Diagnostics and replace failed part as indicated. |

# 500 Series POST Error Messages

**Table C-7: 500 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 501-Display Adapter Failure | 1 long, 2 short | Integrated video controller on system board has failed. | Replace the system board. |

# 600 Series POST Error Messages

**Table C-8: 600 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 601-Diskette Controller Failed | None | Diskette-controller circuitry failure occurred. | 1. Be sure the diskette drive cables are connected.<br>2. Replace the diskette drive, the cable, or both.<br>3. Research and replace failed assembly as indicated. |
| 601-Diskette Controller Error | None | Diskette-controller circuitry failure occurred. | 1. Be sure that the diskette drive cables are connected.<br>2. Replace the diskette drive, the cable, or both.<br>3. Research and replace failed assembly as indicated. |
| 601-Diskette Controller Error<br>The drive is not installed correctly or has failed. Make sure that power and drive cables are connected, both to the drive and the system board. Also verify that the cables are the correct cables for your computer model. If this message persists, you may need service for your PC. | None | CD-ROM/diskette drive assembly is not seated correctly. A controller circuitry failure occurred. | 1. Be sure that the CD-ROM/diskette drive assembly is properly inserted.<br>2. Be sure that the cables are connected to the backplane.<br>3. Replace the CD-ROM/diskette drive assembly, or the cable, or the backplane, or all three.<br>4. Research and replace failed assembly as instructed. |

*continued*

**Table C-8: 600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 602-Diskette Boot Record Error | None | The boot sector on the boot disk is corrupt. | 1. Remove diskette from the diskette drive.<br>2. Replace diskette in drive.<br>3. Reformat diskette. |
| 605-Diskette Drive Type Error. | 2 short | Mismatch in drive type occurred. | Run the server setup utility to set diskette drive type correctly. |
| 611-Primary Floppy Port Address Assignment Conflict | 2 short | A hardware conflict in your system is preventing the diskette drive from operating properly. | 1. Run your server setup utility to configure the diskette drive port address and manually resolve the conflict.<br>2. Run Diagnostics and replace failed assembly as indicated. |
| 611- Primary Floppy Port Address Conflict | 2 short | A hardware conflict in your system is preventing the diskette drive from operating properly. | 1. Run your server setup utility to configure the diskette drive port address and manually resolve the conflict.<br>2. Run Diagnostics and replace failed assembly as indicated. |

# 800 Series POST Error Messages

**Table C-9: 800 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 800-Server Feature Board must be installed in slot 1 for proper operation | None | The system has detected the absence of the Server Feature Board.<br>The Server Feature Board is not installed in the proper slot.<br>The Server Feature Board does not match this system. | 1. Install the Server Feature Board in PCI slot 1.<br>2. Reseat the Server Feature Board.<br>3. Be sure that the Server Feature Board is from this system. |
| 801-Server Feature Board is not properly cabled to the system. Verify that the server management information cable from the system board to the Server Feature Board in slot 1 is intact and fully secured at both ends | None | The system has detected that the server-management information cable is not properly installed. | 1. Be sure that a server-management information cable is installed in the system.<br>2. Inspect the server-management information cable for signs of damage.<br>3. Reseat the server-management information cable on the system board and on the Server Feature Board. |

*continued*

**Table C-9: 800 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 802-Processor *X* is missing or terminator board is not present. System Halted. | None | The system detected that the indicated processor slot is empty. | 1. Be sure that a processor or processor terminator board is installed in each processor slot.<br>2. Reseat the processor or processor terminator board in each processor slot.<br>3. Be sure that each processor has a corresponding Processor Power Module (PPM) installed.<br>4. Try replacing each processor with a processor terminator board to detect a failed processor or PPM. |
| 803-Processor speeds must match for system operation. System Halted | None | Two processors with different speed ratings are installed in the system.<br>All installed processors must have the same speed rating for safe operation. | 1. Replace one of the processors with a processor terminator board.<br>2. Replace one of the processors with an alternate processor rated for the same operating speed as the installed processor. |

*continued*

**Table C-9: 800 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 804-100MHz memory is incompatible. System Halted | None | A memory module other than 133-MHz ECC Registered SDRAM DIMM has been detected. | 1. Reseat all memory modules in the system.<br>2. Remove incompatible memory modules as indicated.<br>3. Sequentially try each memory module individually in DIMM slot 1 to identify the incompatible memory module. |
| 805-Unsupported Processor Detected System will ONLY boot ROMPAQ Utility. | None | One or both processors are unsupported. | Install supported processors. |
| 805-The bootstrap processor is not the lowest stepping processor in the system. This is unsupported configuration. Swap the position of the processors on the system board to correct this issue. | None | The system has detected that the processors in the system are not the same stepping and that the processor in processor slot 1 has a lower stepping than the processor in processor slot 2. The processor in processor slot 2 must have the same or lower stepping than the processor in processor slot 1. (Processor stepping is a designation that reflects the processor generation.) | 1. Remove the processor from processor slot 1.<br>2. Remove the processor from processor slot 2.<br>3. Install the processor from processor slot 1 into processor slot 2.<br>4. Install the remaining processor into the available processor slot. |

*continued*

**Table C-9: 800 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 806-CMOS has been reset<br><br>Please power off and restore the clear CMOS switch (SW2.2) | None | The system switch SW2.2 has been turned on and the system configuration data has been cleared from CMOS. This switch must be returned to the default off position for normal operation and to save configuration setup data.<br><br>The system must be reconfigured. | 1. Remove power from the system.<br>2. Locate the system switch SW2.2.<br>Check your server-specific user documentation for the location of this switch.<br>3. Return system switch SW2.2 to the off position.<br>4. Restart the system.<br>5. Press the **F9** key to run the server setup utility and configure the system.<br>6. Select the primary operating system.<br>7. Set the date and time.<br>8. Complete additional configuration as needed. |

*continued*

**Table C-9: 800 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 806-NVRAM has been reset<br><br>Please power off the system and restore SW1.2 to the default position. Run BIOS Setup to set default values.<br><br>System Halted. | None | The system configuration switch (SW1), position 2 has been turned on and the system configuration data has been cleared from CMOS. This switch must be returned to the default off position for normal operation and to save configuration setup data.<br><br>The system must be reconfigured. | 1. Remove power from the system.<br>2. Locate the system configuration switch (SW1). Refer to your server-specific user documentation for instructions.<br>3. Return position 2 to the off position.<br>4. Restart the system.<br>5. Press the **F10** key to run the server setup utility and configure the system.<br>6. Select the primary operating system.<br>7. Set the date and time.<br>8. Complete additional configuration as needed. |

*continued*

**Table C-9: 800 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 807-The password has been cleared. Please power off and restore the clear password switch (SW2.1) | None | The system switch SW2.1 has been turned on and the system configuration password has been cleared. System switch SW2.1 must be returned to the default off position for normal operation and to set a password with the server setup utility. | 1. Remove power from the system.<br>2. Locate the system switch SW2.1.<br>Check your server-specific user documentation for the location of this switch.<br>3. Return system switch SW2.1 to the off position.<br>4. Restart the system.<br>5. Press the **F9** key and use the server setup utility to set a new password, if desired. |
| 807-The Setup password is cleared. Please power off and restore the clear password switch (SW1.1) | None | The system board configuration switch SW1.1 has been turned on and the system configuration password has been cleared. SW1.1 must be returned to the default off position for normal operation and the ability to set a password with the server setup utility. | 1. Remove power from the system.<br>2. Locate the system board configuration switch.<br>3. Return SW1.1 to the off position.<br>4. Restart the system.<br>5. Press the **F10** key and use the server setup utility to set a new password. |

# 900 Series POST Error Messages

**Table C-10: 900 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 912-The computer cover has been removed since last system start up. The machine cover has been removed. Please ensure that any system access was authorized | None | The server cover has been removed since the last system startup. | Be sure that any system access was authorized. |

# 1100 Series POST Error Messages

**Table C-11: 1100 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1151-Com Port 1 Address Assignment Conflict. | 2 short | Both external and internal serial ports are assigned to COM1. | Run the server setup utility and correct. |
| 1151- Com port 1 address conflict. | 2 short | Both external and internal serial ports are assigned to COM1. | Run the server setup utility and correct. |
| 1151-Serial Port A Address Conflict Detected | 2 short | A hardware conflict is preventing the normal operation of a serial port. | Run the server setup utility to reassign serial port address and manually resolve conflict. |
| 1152- Com port 2 address conflict | 2 short | Both external and internal serial ports are assigned to COM2. | Run the server setup utility and correct. |
| 1152-Com Port 2, 3, or 4 Address Assignment Conflict. | 2 short | Both external and internal serial ports are assigned to COM2, COM3, or COM4. | Run the server setup utility and correct. |
| 1152-Serial Port B Address Conflict Detected | 2 short | A hardware conflict is preventing the normal operation of a serial port. | Run the server setup utility to reassign serial port address and manually resolve conflict. |
| 1153- Comm port 3 address conflict | 2 short | Both external and internal serial ports are assigned to COM3. | Run the server setup utility and correct. |
| 1154- Comm port 4 address conflict | 2 short | Both external and internal serial ports are assigned to COM4. | Run the server setup utility and correct. |
| 1155-Serial Port Address Conflict Detected | 2 short | A hardware conflict is preventing the normal operation of a serial port. | Run the server setup utility to reassign serial port address and manually resolve conflict. |

# 1600 Series POST Error Messages

**Table C-12: 1600 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1610- Temperature violation detected. - Waiting 5 Minutes for System to Cool. | None | The ambient system temperature has exceeded acceptable levels. | Room temperature is too high; lower the room temperature. |
| 1610- Temperature violation detected. Waiting for system to cool | 2 short | The ambient system temperature is too hot. | Check fan in system environment. |
| 1610-I/O Board Temperature Violation detected | None | An overheating condition has occurred on the I/O board. | Turn off system and let it cool down. Be sure that the system fans are functional and that the rack allows adequate ventilation.<br><br>Also, be sure that the ambient temperature is within the operating parameters of the system. Check your server-specific user documentation for the temperature requirements of your server. |
| 1611-Fan *X* not present | 2 short | Fan is not installed or is not seated. | Reseat or install a fan in position *X*. |
| 1611-CPU Fan failure detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1611-CPU Fan not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-CPU Fan (Fan *X*) failure detected | 2 short | CPU fan has failed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Critical Fan Failure Detected, system fan X | None | Required fan not properly functioning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Critical Fan Not Present, system fan X | None | Required fan not installed or not properly connected. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Fan failure detected | 2 short | Required fan not installed or spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Fan *X* failure detected | 2 short | Required fan not installed or spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Front CPU Fan *X* Failure Detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1611-Front CPU Fan *X* not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-I/O Fan failure detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-I/O Fan not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-I/O Fan (Fan *X*) failure detected | 2 short | I/O fan has failed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-I/O Slot Fan *X* not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-I/O Slot CPU Fan *X* Failure Detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Power Supply Fan *X* failure detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1611-Power Supply Fan *X* not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Rear CPU Fan *X* failure detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Rear CPU Fan *X* not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Redundant CPU Fan Failure Detected | None | Fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-Redundant CPU fan (Fan *X*) failure detected | 2 short | Redundant CPU fan has failed. | Replace the failed redundant CPU fan. |
| 1611-Redundant I/O Fan (Fan *X*) failure detected | 2 short | Redundant I/O fan has failed. | Replace the failed redundant I/O fan. |
| 1611-Redundant system fan failure (Fan *X*) detected | None | Required fan has failed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1611-Slot Fan Failure Detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-System Fan failure detected | None | Required fan not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1611-System Fan not present | None | Required fan not installed. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1612-Primary power supply failure. | 2 short | Primary power supply has failed. | Replace power supply as soon as possible. |
| 1613-Low System Battery. | None | Real-time clock system battery is running low on power. | Replace battery (or add external battery) as soon as possible. |
| 1614- Redundant Fan Failure | None | Fan is not spinning. | 1. Check fans.<br>2. Reseat fan cable.<br>3. If this does not solve the problem, replace the fan. |
| 1615-Power Supply Configuration Error | None | Your configuration requires an additional power supply. A moving bar is displayed, indicating that the system is waiting for another power supply to be installed. | Install the additional power supply. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1615- Power Supply Failure | None | Power supply has failed. | Reseat power supply firmly.<br>-Or-<br>Replace power supply as soon as possible. |
| 1615-Power Supply Failure, Power Supply Unplugged, or Power Supply Fan Failure in Bay *X*. | None | Power supply has failed. | Reseat power supply firmly.<br>-Or-<br>Replace power supply as soon as possible. |
| 1616- Power Supply Configuration Failure | None | Power supply is improperly configured. | Run the server setup utility and correct. |
| 1617-Fan controller not responding | 2 short | Fan controller failure detected. | Check and replace failed controller assembly. |
| 1617-Fan controller not responding. System halted. | 2 short | Fan controller failure detected. | Check and replace failed controller assembly. |
| 1617-I/O Fan controller not responding. System halted. | 2 short | I/O fan controller failure detected. | Check and replace failed controller assembly. |
| 1617-CPU Fan controller not responding. System halted. | 2 short | CPU fan controller failure detected. | Check and replace failed controller assembly. |
| 1618-PCI slots powered down. Check PCI Hot-Plug enabler connectors. | None | PCI Hot Plug enabler is missing or failed. | Check and replace missing or failed assembly. |
| 1618- PCI slots powered down. | None | PCI Hot plug enabler is missing or failed. | Check and replace missing or failed assembly. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1618-AC Line is not cord redundant | None | AC line cord redundancy is not achieved. | AC line cord redundancy is not necessary for the server to operate. If AC line cord redundancy is wanted, plug server into two separate AC sources. Each AC source should be on a different power grid/circuit. |
| 1619-Maximum Power Usage was exceeded | None | System has reached the maximum power draw for the current power configuration of the server. | 1. If running on a 110-volt AC source, switch to 220-volt.<br>2. Add an extra power supply/SPM pair.<br>3. Decrease the options in the system. Refer to the power calculator on the Web for power considerations:<br>activeanswers.compaq.com/aaconfigurator |
| 1619- Server management board is in the wrong slot | None | The server management board is not in the proper location. | Install the server management board in the correct slot. |
| 1620-Locked SCSI Bus Detected. Verify SCSI bus cabling. System halted. | None | SCSI bus failure detected. | Be sure that the integrated SCSI controller has SCSI termination connected. |
| 1620-Fan Not Present | None | Fans are missing or not cabled correctly. | For the system to function, it needs the fans described in the server-specific maintenance and service guide.<br>Be sure that the fans are present and installed correctly. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1621-Error - Power Supply required with System Power Module | None | There are more SPMs than power supplies. | Power supplies and System Power Modules (SPMs) must be installed in pairs and in line with each other. Be sure that an SPM is installed for each power supply. |
| 1621-Current SCSI bus cable configuration is not recommended | None | Improper SCSI bus cabling detected. | Check server-specific user documentation for proper SCSI bus cabling. |
| 1622-Internal SCSI Jumper Board Not Installed. | None | SCSI jumper board missing or not functional. The system has detected that the array enabler board is not installed. | 1. Install the array enabler board.<br>2. Install the Integrated Array Bypass Kit if a separate controller is used. |
| 1623-System Battery is missing | None | Battery is missing or has fallen out. | Check for the installation of the battery located on the sideplane board. |
| 1624-System Power Module Failed | None | System Power Module has failed. | Replace specified System Power Module. |
| 1625-Power Supply Failed | None | Power supply has failed. | Replace specified power supply. |
| 1626-Power Supply Reported Error Status | None | The power supply has returned an error status. | 1. Note the details of the error status and act accordingly. For example, if an over-temperature condition has occurred, check the system fans and ventilation.<br>2. If the problem persists, replace power supply. |

*continued*

**Table C-12: 1600 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1627-System Power Module Reported Error Status | None | The System Power Module has returned an error status. | 1. Note the details of the error status and act accordingly. For example, if an over-temperature condition has occurred, check the system fans and ventilation.<br>2. If the problem persists, replace System Power Module. |

# 1700 Series POST Error Messages

**Table C-13: 1700 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1701-SCSI Controller Failure | None | Embedded SCSI controller has failed or a connected device is preventing normal operation. | 1. Check SCSI cables and be sure that they are fully seated.<br>2. Be sure that SCSI IDs are assigned correctly at each SCSI device.<br>3. Remove SCSI cables from the controller and observe if the failure still occurs. If necessary, replace the cables.<br>4. Run Diagnostics.<br>5. Remove individual SCSI devices from the cable to identify a suspect device.<br>6. Replace failed assembly. |
| 1702-SCSI Cable Error Detected | None | SCSI cable has failed. | 1. Reseat the SCSI cable on the controller and all connected devices.<br>2. Check the SCSI cable at all connectors for bent pins.<br>3. Replace SCSI cable. |
| 1704-Unsupported Virtual Mode Disk Operation DOS Driver Required | None | The operating system currently running does not support virtual DMA service. | Load or update the SCSI device driver appropriate for this operating system. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1705-Locked SCSI Bus Detected | None | A SCSI controller cannot communicate with devices connected to a SCSI bus. | 1. Check the SCSI cable installation.<br>2. Be sure that the SCSI cable has proper termination. |
| 1711-Slot z Drive Array - RAID ADG logical drive(s) configured but Array Accelerator size <= 32 MB. This configuration is not recommended. Consider migrating logical drive(s) to RAID 5 or upgrading the Array Accelerator module. | None | Configuration not recommended. | Migrate logical drive(s) to RAID 5 or upgrade to a larger array accelerator module. |
| 1712-Slot z Drive Array - RAID 5 logical drive(s) configured with 56 drives, but Array Accelerator size <= 32 MB. This configuration is not recommended. Consider migrating logical drive(s) to RAID 0 or 1, reducing the number of drives in the array, or upgrading the Array Accelerator module. | None | Configuration not recommended. | Migrate logical drive(s) to RAID 0 or 1, reduce the number of drives in the array, or upgrade to a larger-size array accelerator module. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1713-Slot z Drive Array Controller - Redundant ROM Reprogramming Failure Replace the controller if this error persists after restarting system. | None | Flash ROM is going bad. Controller detected a checksum failure but is unable to reprogram the backup ROM. | Replace controller when possible, or try upgrading firmware using Options ROMPaq. |
| 1714-Slot z Drive Array Controller - Redundant ROM Checksum Error Backup ROM has automatically been activated. Check firmware version. | None | Controller flash operation interrupted by power-cycle, or flash ROM may be going bad. | Controller has detected a ROM checksum error and automatically switched to the backup ROM image. Upgrade controller firmware using Options ROMPaq if this backup ROM image is a lower version than that originally running. |
| 1720-Slot *X* Drive Array – S.M.A.R.T. Hard Drive(s) Detect Imminent Failure SCSI: Port *Y*: SCSI ID *Z*. | None | Hard drive predictive failure condition detected. | The indicated drive has reported a SMART predictive failure condition. It may fail at some time in the future.<br>• If this drive is part of a non-fault-tolerant configuration, back up all data before replacing the drive and restore all data afterward.<br>• If this drive is part of a fault-tolerant configuration, do not replace this drive unless all other drives in the array are online. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1720-S.M.A.R.T. Hard Drive Detects Imminent Failure | None | This is a prefailure notification of a SCSI hard drive that will fail soon. | • If configured as a non-RAID 0 array, replace the failing/failed drive. Refer to the maintenance and service guide for more information on when and how to replace the drive.<br>• If configured as a RAID 0 array or non-RAID setup, back up the drive or drives, replace, and restore. |
| 1721-Slot *X* Drive Array – Drive parameter tracking predicts imminent failure. The following devices should be replaced when conditions permit. Do not replace drive unless all other drives in the array are on-line! Back up data before replacing drive(s) if using RAID 0. | None | Drive parameter tracking predictive-failure condition. Monitor and Performance threshold exceeded. | Drive parameter tracking reports a predictive-failure condition on the indicated drive. It may fail at some time in the future.<br>• If this drive is part of a non-fault-tolerant configuration, back up all data before replacing the drive and restore all data afterward.<br>• If this drive is part of a fault-tolerant configuration, do not replace this drive unless all other drives in the array are online. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1722-Slot x Drive Array - Redundant Controller Pair Not Operating Redundantly (followed by one of the following:)<br>• Incompatible controller models.<br>• Inter-controller communication failed; check other controller.<br>• Incompatible firmware versions; upgrade firmware.<br>Array accelerator RAM sizes are different. | None | Controllers are not operating redundantly. | The Smart Array 3100ES or 4250ES Controllers are not operating properly.<br>• In a redundant configuration, both controllers must be the same Smart Array model. If they are, one of the controllers or the system board is defective.<br>• The adjacent Smart Array 3100ES or 4250ES Controller may have failed.<br>• Run Options ROMPaq to upgrade both controllers to the same firmware version.<br>• Both Smart Array 3100ES or 4250ES Controllers must have the 64-MB array accelerator board connected in order to operate in redundant mode. |
| 1723-Slot x Drive Array - To improve signal integrity, internal SCSI connector should be removed if external drives are attached to the same SCSI port (followed by detailed instructions). | None | Cabling problem. | With system power off, remove or replace connector daughterboard and/or external cables connected to the Smart Array Controller board as instructed. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1724-Slot *X* Drive Array – Physical Drive Position Change(s) Detected – Logical drive configuration has automatically been updated. | None | Indicates that logical drive configuration has been updated automatically following physical drive position changes. | No action is needed. |
| 1725-Slot X Drive Array-Optional SIMM Failure Detected | None | SIMM has been automatically disabled due to memory errors or unsupported SIMM type installed. | Replace SIMM memory module on indicated controller. |
| 1726-Slot *X* Drive Array – Array Accelerator Memory Size Change Detected. – Array Accelerator configuration has automatically been updated. | None | Array accelerator configuration has been automatically updated. | This message indicates that the array accelerator configuration has been updated automatically due to replacement of the array accelerator (or controller) with one having different cache memory size. Run the Array Configuration Utility, if desired, to change the default cache read/write allocation ratio. |
| 1727-Slot *X* Drive Array – New Logical Drive(s) Attachment Detected. If more than 32 logical drives, this message will be followed by: "Auto-configuration failed: Too many logical drives." | None | Additional drives detected. | This message indicates that the controller has detected an additional array of drives that was connected when the power was off. The logical drive configuration information has been updated to add the new logical drives. The maximum number of logical drives supported is 32. Additional logical drives will not be added to the configuration. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1728-Drive Array-Abnormal Shut-Down Detected With Write-Cache | None | There is no array accelerator battery backup on this array controller but caching was enabled. Any data that may have been in array accelerator memory has been lost due to the controller power loss. | Restore data from backup. |
| 1729-Slot 1 Drive Array – Performance Optimization Scan In Progress. RAID 4/5/ADG performance may be higher after completion. | None | RAID 4/5/ADG parity drive(s) are being initialized. | This message is normal following the initial configuration of RAID 4 or RAID 5 logical drives. Performance of the controller improves after the parity data has been initialized by ARM (an automatic process that runs in the background on the controller). |
| 1730-Fixed Disk 0 does not support DMA Mode | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1731-Fixed Disk 1 does not support DMA Mode. | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1740-Fixed Disk 0 failed Set Block Mode command | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1741-Fixed Disk 1 failed Set Block Mode command | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1750- Fixed Disk *X* failed ID command | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1750-Fixed Disk *X* failed Identify command | None | Fixed disk drive error detected. | Run the server setup utility and correct. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1753-Slot z Drive Array – Array Controller Maximum Operating Temperature Exceeded During Previous Power Up. | None | Controller is overheating. | Be sure that there is adequate system cooling and sufficient airflow across controller. |
| 1754-Slot z Drive Array - RAID ADG drive(s) configured but ADG Enabler Module is detached or defective. Please check for detached ADG Enabler Module. Array Accelerator is temporarily disabled. | None | RAID ADG drive(s) configured but ADG enabler module is detached or defective. | Replace or reseat ADG enabler module. |
| 1755-Slot z Drive Array - ADG Enabler Module appears to be Defective. Please replace ADG Enabler Module. | None | ADG enabler module is loose or defective. | Replace or reseat ADG enabler module. |
| 1756- Redundant Controllers are Not the Same Model | None | Smart Array 3100ES Controller paired with 4250ES controller, or not fully seated in PCI slot. | In a redundant controller configuration, both controllers must be the same model. Replace one of the controllers so they are both the same model. |
| | | There is a defective system board or a controller that is not fully seated in the PCI slot. | 1. Reseat the controllers.<br>2. Replace the system board. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1757 - Array Accelerator Daughterboard incompatible with this model controller | None | 4-MB array accelerator board installed on Smart Array 42*XX* Controller. | Replace 4-MB array accelerator board with a 16-MB or 64-MB board. |
| 1758- Drive Array - Accelerator Size Mismatch Between Controllers 64MB Array Accelerator should be attached to both controllers. Array Accelerator is temporarily disabled. | None | Redundant Smart Array 4250ES Controller pair with incorrect array accelerator installed. | Install 64-MB array accelerator module on both Smart Array 4250ES Controllers. |
| 1759-Slot z Drive Array – Redundant Controller Error | None | Redundant controller problem. | Replace or reseat controllers. May also be caused by a defective system board. |
| 1760-Fixed Disk *X* does not support Block Mode | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1761-Fixed Disk 1 does not support Block Mode | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1762-Redundant controller operation is not supported in this firmware version. | None | Old firmware on controller (does not support redundant-controller operation). | Upgrade controller firmware using Options ROMPaq. |
| 1763- Array Accelerator daughtercard is detached; please reattach. | None | Array accelerator module is loose, missing, or defective. | Replace array accelerator module, or reseat if connector is not fully mated. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1764-Slot *X* Drive Array – Capacity Expansion Process is temporarily disabled (followed by one of the following):<br>Expansion will resume when Array Accelerator has been reattached.<br>Expansion will resume when Array Accelerator has been replaced.<br>Expansion will resume when Array Accelerator RAM allocation is successful.<br>Expansion will resume when Array Accelerator battery reaches full charge.<br>Expansion will resume when automatic data recovery has been completed. | None | The capacity expansion process has been temporarily disabled for the reason that is described onscreen. | Follow the action that is displayed onscreen to resume the capacity expansion process. |
| 1766-Slot *X* Drive Array requires System ROM Upgrade. Run Systems ROMPaq Utility. | None | System ROM upgrade is required | Run the latest system ROMPaq utility to upgrade the system ROM as indicated.<br>Download it from the following website:<br>www.compaq.com/support. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1767- Slot x Drive Array Option ROM is not programmed correctly. | None | Controller Option ROM problem. | Upgrade firmware on all Smart Array Controllers using Options ROMPaq.<br>Download it from on the following website:<br>www.compaq.com/support |
| 1768-Slot *X* Drive Array – Resuming logical drive expansion process | None | Power was lost while a logical expansion operation was performed. | No action required. This message is displayed whenever a controller reset or power cycle occurs while array expansion is in progress. |
| 1769-Slot *X* Drive Array – Drive(s) disabled due to failure during capacity expansion. Select F1 to continue with logical drives disabled. Select F2 to accept data loss and to re-enable logical drives. | None | Capacity expansion failed due to one of the following problems:<br>• Array accelerator removed or failed; expansion progress data lost<br>• Expansion progress data could not be read from array accelerator<br>• Expansion aborted due to unrecoverable drive errors<br>• Expansion aborted due to array accelerator errors | Data lost while the array was expanded; therefore, the drives have been temporarily disabled.<br>1. Press the **F2** key to accept the data loss and re-enable the logical drives.<br>2. Restore data from backup.<br>3. If caused by bad drive or array accelerator failure, replace drive or array accelerator, as appropriate. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1770-Slot *X* Drive Array – SCSI Drive Firmware Update Recommended – Please upgrade firmware on the following drive(s) using Options ROMPaq (available from www.compaq.com): SCSI Port *Y* SCSI ID *Z* | None | Drive firmware update needed. | The indicated drives are running firmware that is known to cause intermittent problems. Use the Options ROMPaq utility to upgrade firmware on all drives to the latest revision.<br>Download it from the following website:<br>www.compaq.com/support |
| 1771-Primary Disk Port Address Assignment Conflict | None | Internal and external hard drive controllers are both assigned to the primary address. | Run the server setup utility and correct. |
| 1772-Secondary Disk Port Address Assignment Conflict | None | Address assignment conflict. Internal and external hard drive controllers are both assigned to the secondary address. | Run the server setup utility and correct. |
| 1773-Primary Fixed Disk Port Assignment Conflict | None | Fixed disk drive error detected. | Run the server setup utility and correct. |
| 1774-Slot *X* Drive Array – Obsolete data found in Array Accelerator. | None | Drives were used on another controller and reconnected to the original controller while data was in the original controller cache. | Data found in array accelerator is older than data found on drives and has automatically been discarded. Check file system to determine whether any data has been lost. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1775-Slot *X* Drive Array – ProLiant Storage System Not Responding SCSI Port *Y*: Check storage system power switch and cables. Turn the system power off while checking the ProLiant power and cable connections, then turn the system power back on to retry. | None | Storage system problem detected. A SCSI enclosure seems to be connected to the specified SCSI bus, but no drives or SCSI backplane processor were detected on this bus. | 1. Turn off power to system.<br>2. Check external ProLiant power switch—external drives must all be powered up before the main system is.<br>3. Check cables.<br>4. If retry does not help, try replacing the cable, firmware, backplane, or Smart Array Controller. |
| 1776-Slot *X* Drive Array – SCSI Bus Termination Error – Internal and external drives cannot both be attached to the same SCSI port.<br>SCSI port *Y*: Check cables | None | External and internal connectors of the specified SCSI ports are both connected to drives. The indicated SCSI bus is disabled until this problem is resolved. | The SCSI bus is not properly terminated when internal and external drives are connected concurrently to the same SCSI bus.<br>1. Turn off power to the server.<br>2. Check cabling to the specified port.<br>3. Reconfigure drives as indicated. |
| 1776-Drive Array Reports Improper SCSI Port 1 Cabling | None | • The integrated array enabler board failed.<br>• The integrated Smart Array option ROM is corrupted.<br>• The I/O board, media backplane fan board, or media backplane needs to be replaced. | • Replace the integrated array enabler board.<br>• Replace the integrated Smart Array option ROM.<br>• Replace and retry in the following order: media backplane fan board, media backplane, I/O board. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1777-Slot *X* Drive Array – ProLiant Drive Storage Enclosure Problem Detected (followed by one or more of the following):<br>SCSI Port *Y*: Cooling Fan Malfunction Detected<br>SCSI Port *Y*: Overheated Condition Detected<br>SCSI Port *Y*: Side-Panel must be Closed to Prevent Overheating<br>SCSI Port *Y*: Redundant Power Supply Malfunction Detected<br>SCSI Port *Y*: Wide SCSI Transfer Failed<br>SCSI Port *Y*: Interrupt Signal Inoperative<br>SCSI Port y: Unsupported ProLiant Storage System Detected | None | Environment threshold was violated on the drive enclosure. | Check cooling fan operation by placing hand over fan. Be sure that internal plenum cooling fan in tower servers or storage systems is operational. If fan is not operating, check for obstructions and check all internal connections. Replace unit side panel if removed.<br>If the ProLiant Storage System power LED is amber instead of green, this indicates a redundant power supply failure.<br>Check SCSI cables. If the message indicates to check SCSI cables, compare your cabling against the diagrams in your HP Smart Array Controller user guide. If the routing is correct, replace cables on the specified port until the POST message is eliminated. |
| 1778-Drive Array resuming Automatic Data Recovery process | None | This message is displayed whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress. | No action necessary. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1779-Slot *X* Drive Array – Replacement drive(s) detected OR previously failed drive(s) now operational:<br>Port *Y*: SCSI ID *Z*:<br>Restore data from backup if replacement drive *X* has been installed. | None | More drives were failed (or were replaced) than the fault-tolerance level allows. Unable to rebuild array. | If this message is displayed and drives have not been replaced, this indicates an intermittent drive failure. Be sure that the system is always powered up and down correctly.<br>• When powering up the system, all external storage systems must be turned on before (or at the same time as) the server.<br>• When powering down the system, the server must be powered down before powering down any external storage systems. |
| 1780-Disk 0 Failure | None | Hard drive/format error detected. The drive is not installed correctly or has failed. | Be sure that any jumpers are set correctly, and that power and drive cables are connected, both to the drive and the system board. Also be sure that the cables are the correct cables for your computer model. Run Diagnostics. Replace failed assembly as indicated. |
| 1781-Disk 1 Failure | None | Hard drive/format error detected. | Run Diagnostics. Replace failed assembly as indicated. |
| 1782-Disk Controller Failure | None | Hard disk drive circuitry error detected. | Run Diagnostics. Replace failed assembly as indicated. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1783-Slot *X* Drive Array Controller Failure. | None | Bad controller. If this message is displayed after Options ROMPaq is run, problems may have occurred while attempting to flash the ROM. | Reseat the array accelerator module if detached. Try reseating the controller in the PCI slot. Otherwise, replace the array controller. |
| 1783-Intelligent Drive Array Controller Failure | None | Integrated Array Controller firmware is corrupt, or IAC is bad or has failed. | 1. Be sure that integrated array controller ROM firmware is up to date.<br>2. Replace I/O board. |
| 1784-Slot *X* Drive Array Drive Failure. The following SCSI drive(s) should be replaced:<br>SCSI Port *Y*:<br>SCSI ID *Z*: | None | Defective drive and/or SCSI cables detected. | Check for loose cables. Be sure that all drives are fully seated in drive bay slots. Replace defective drive *X* and/or cable(s). |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1785-Slot *X* Drive Array not Configured (followed by one of the following):<br>(1) Run Compaq Array Configuration Utility<br>(2) No drives detected<br>(3) Drive positions appear to have changed – Run Drive Array Advanced Diagnostics if previous positions are unknown. Then turn system power OFF and move drives to their original positions.<br>(4) Configuration information indicates drive positions beyond the capability of this controller. This may be due to drive movement from a controller that supports more drives than the current controller.<br>(5) Configuration information indicates drives were configured on a controller with a newer firmware version. | None | Drive array configuration not detected. | 1. Run the Array Configuration Utility.<br>2. Turn off system and check SCSI cable connections to be sure that drives are connected properly.<br>3. Run Array Diagnostic Utility if previous positions are unknown. Then, turn system power off and move drives to their original positions.<br>4. To avoid data loss, reconnect drives to the original controller or upgrade the controller firmware to the version on the original controller (or higher) using Option ROMPaq. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1786-Slot 1 Drive Array Recovery Needed. The following SCSI drive(s) need Automatic Data Recovery: SCSI Port Y: SCSI ID Z<br><br>Select F1 to continue with recovery of data to drive. Select F2 to continue without recovery of data to drive.<br><br>-Or-<br><br>Slot 1 Drive Array Recovery Needed. Automatic Data Recovery Previously Aborted! The following SCSI drive(s) need Automatic Data Recovery: SCSI Port Y: SCSI ID Z<br><br>Select F1 to retry Automatic Data Recovery to drive. Select F2 to continue without starting Automatic Data Recovery. | None | System in Interim Data Recovery mode. Previously-failed or replacement drive has not yet been rebuilt. | Press the **F1** key to allow Automatic Data Recovery to begin. Data is automatically restored to drive *X* when the drive has been replaced or seems to be working.<br><br>-Or-<br><br>1. Press the **F2** key for the system to continue to operate in the Interim Data Recovery mode.<br><br>The previously aborted version of the 1786 POST message is displayed if the previous rebuild attempt was aborted for any reason.<br><br>2. Run Array Diagnostic Utility (ADU) for more information.<br><br>If the replacement drive was failed, try using another replacement drive.<br><br>-Or-<br><br>If rebuild was aborted due to a read error from another physical drive in the array, back up all readable data on the array, run Diagnostics Surface Analysis, and then restore your data. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1787-Drive Array Operating in Interim Recovery Mode.<br>Physical drive replacement needed: Drive *X* | None | Hard drive *X* failed or cable is loose or defective. Following a system restart, this message notes that drive *X* is defective and fault tolerance is being used. | 1. Replace drive *X* as soon as possible (depending on the fault-tolerance level, all data may be lost if another drive fails).<br>2. Check loose cables.<br>3. Replace defective cables. |
| 1788-Slot *X* Drive Array Reports Incorrect Drive Replacement. The following SCSI drive(s) should have been replaced: SCSI Port *Y*: SCSI ID *Z*<br>The following SCSI drive(s) were incorrectly replaced: SCSI Port *y*: SCSI ID *z*.<br>Select F1 to continue – drive array will remain disabled.<br>Select F2 to reset configuration – all data will be lost. | None | Replacement drive(s) seem to have been installed in the wrong drive bay(s). Before taking action, refer to the following other possible sources of this problem. | 1. Reinstall the drives correctly as indicated.<br>2. Press the **F1** key to restart the computer with the drive array disabled.<br>-Or-<br>Press the **F2** key to use the drives as configured and lose all the data on them. |
| | | The 1788 error message might also be displayed inadvertently due to a bad power cable connection to the drive, noise on the data cable, or a defective SCSI cable. | 1. If this message was due to a bad power cable connection but not incorrect drive replacement, repair the connection and press the **F2** key**.**<br>2. If the message is not eliminated by pressing the **F2** key**,** run Array Diagnostic Utility (ADU) to resolve. |
| | | If this message was not due to a bad power cable connection, and no drive replacement took place, this could indicate noise on the data cable. | Check cable for proper routing. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1789-Slot *X* Drive Array SCSI Drive(s) Not Responding. Check cables or replace the following SCSI drives: SCSI Port *Y*: SCSI ID *Z*<br><br>Select F1 to continue – drive array will remain disabled.<br><br>Select F2 to failed drives that are not responding – Interim Recovery Mode will be enabled if configured for fault tolerance. | None | Drives that were working when the system was last used are now missing or are not starting up. Possible drive problem or loose SCSI cable. | 1. Power down the system, check cable connections, and be sure that all drives are fully seated in their drive bays.<br>2. Power cycle any external SCSI enclosures while the system is off.<br>3. Power on the server to see if problem still exists.<br>4. If configured for fault-tolerant operation and the RAID level can sustain failure of all indicated drive(s), press the **F2** key to fail the drive(s) that are not responding and replace with good drive(s) immediately.<br>5. Otherwise, press the **F1** key to start the system with all logical drives on the controller disabled.<br><br>Be sure that system is always powered up and down correctly.<br><br>• When powering up the system, all external storage systems must be turned on before server.<br>• When powering down the system, the server must be powered down before external storage systems. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1790-Disk *X* Configuration Error | None | Hard drive error or wrong drive type detected. | Run the server setup utility and Diagnostics and correct. Replace failed assembly as indicated. |
| 1790-Disk *X* Configuration Error | None | Hard drive error or wrong drive type detected. | Run the server setup utility and Diagnostics and correct. Replace failed assembly as indicated. |
| 1791-Disk 1 Error | None | Hard drive error or wrong drive type detected. | Run the server setup utility and Diagnostics and correct. Replace failed assembly as indicated. |
| 1792-Drive Array Reports Valid Data Found in Array Accelerator.<br>Data will automatically be written to drive array. | None | This indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. Power was then restored within several days, and the data in the array accelerator was flushed to the drive array. | No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the array accelerator. |
| 1792-Secondary Disk Controller Failure | None | Part of the IDE drive electronics has failed. | Run Diagnostics and replace failed assembly as indicated. |
| 1793-Drive Array – Array Accelerator Battery Depleted – Data Lost.<br>*(Error message 1794 also displays.)* | None | This indicates that while the system was in use, power was interrupted while data was in the array accelerator memory.<br>Array accelerator batteries failed. Data in array accelerator has been lost. | Power was not restored within enough time. Perform orderly system shutdowns to avoid data remaining in the array accelerator. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1794-Drive Array – Array Accelerator Battery Charge Low.<br>Array Accelerator is temporarily disabled.<br>Array Accelerator will be re-enabled when battery reaches full charge. | None | This is a warning that the battery charge is below 75 percent. Posted writes are disabled. | Replace the array accelerator board if batteries do not recharge within 36 power-on hours. |
| 1795-Drive Array – Array Accelerator Configuration Error.<br>Data does not correspond to this drive array. Array Accelerator is temporarily disabled. | None | This indicates that while the system was in use, power was interrupted while data was in the array accelerator memory.<br>The data stored in the array accelerator does not correspond to this drive array. | Match the array accelerator to the correct drive array, or run the Array Configuration Utility to clear the data in the array accelerator. |
| 1796-Drive Array – Array Accelerator Not Responding.<br>Array Accelerator is temporarily disabled. | None | Array accelerator is defective or has been removed. Depending on the array controller model, the cache may be disabled or the controller might not be usable at all until this problem is corrected. | Replace array accelerator daughter board, or reseat if connector has become loose. |

*continued*

**Table C-13: 1700 Series POST Error Messages** *continued*

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1797-Drive Array – Array Accelerator Read Error Occurred.<br>Data in Array Accelerator has been lost.<br>Array Accelerator is disabled. | None | Hard parity error detected while reading data from posted-writes memory. | Replace array accelerator daughter board. |
| 1798-Drive Array – Array Accelerator Write Error or Self-Test Error Occurred.<br>Array Accelerator is disabled. | None | Array accelerator failed self-test. Depending on the array controller model, the cache may be disabled or the controller might not be usable at all until this problem is corrected. | Replace array accelerator daughter board. |
| 1799-Drive Array – Drive(s) Disabled due to Array Accelerator Data Loss.<br>Select "F1" to continue with logical drives disabled.<br>Select "F2" to accept data loss and to re-enable logical drives. | None | Logical drive(s) failed due to loss of data in posted-writes memory. | Press the **F1** key to continue with logical drive(s) disabled or the **F2** key to accept data loss and re-enable logical drive(s). After pressing the **F2** key, check integrity of file system and restore lost data from backup. |

# 1800 Series POST Error Messages

**Table C-14: 1800 Series POST Error Messages**

| Error Code | Audible Beeps | Probable Source of Problem | Action |
|---|---|---|---|
| 1800 - Temperature Alert | None | System has exceeded allowable temperature thresholds. | 1. Turn system off and allow it to cool.<br>2. Check fans for proper airflow and obstructions.<br>3. Check fans for proper operation.<br>4. Analyze ambient temperature in which the server is currently operating, and compare to server-specific user documentation recommendations.<br>5. Adjust as needed before restarting the server. |
| 1801-Microcode Patch Error<br>Missing or Invalid Processor Microcode Patch. Please contact Compaq Computer Corporation for a new ROM BIOS to support the new Processor Stepping | None | The newly installed processor is not supported by the current system ROM. | Upgrade the system ROM or reinstall the original processor. |

# D

# ADU Error Messages

This appendix contains a complete alphabetical list of all Array Diagnostic Utility (ADU) error messages. For more information, refer to "Array Diagnostic Utility" in Chapter 4.

**IMPORTANT:** This guide provides information for multiple servers. Some of the hardware or software information may not apply to your specific server. You may need to modify some of the examples or procedures in this guide for your work environment. Refer to your server-specific user documentation for information on procedures, hardware options, software tools, and operating systems supported by, and specific to, your server.

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

**Table D-1: Array Diagnostic Utility (ADU) Error Messages**

| Message | Description | Recommended Action |
|---|---|---|
| Accelerator board not detected | Array controller did not detect a configured array accelerator board. | Install an array accelerator board on an array controller. If an array accelerator board is installed, check for proper seating on the array controller board. |
| Accelerator error log | List of the last 32 parity errors on transfers to or from the memory on the array accelerator board. Displays starting memory address, transfer count, and operation (read and write). | If there are many parity errors, you may need to replace the array accelerator board. |
| Accelerator parity read errors: *X* | Number of times that read memory parity errors were detected during transfers from memory on array accelerator board. | If there are many parity errors, you may need to replace the array accelerator board. |
| Accelerator parity write errors: *X* | Number of times that write memory parity errors were detected during transfers to memory on the array accelerator board. | If there are many parity errors, you may need to replace the array accelerator board. |
| Accelerator status: Cache was automatically configured during last controller reset | Cache board was replaced with one of a different size. | Normal operations should continue. |
| Accelerator status: Data in the cache was lost due to some reason other than the battery being discharged. | Data in cache was lost, but not because of the battery being discharged. | Check to be sure that the array accelerator is properly seated. If the error continues, you may need to replace the array accelerator. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Accelerator status: Dirty data detected has reached limit. Cache still enabled, but writes no longer being posted. | Number of cache lines containing dirty data that cannot be flushed (written) to the drives has reached a preset limit. The cache is still enabled, but writes are no longer being posted. This problem usually occurs when there is a problem with the drive or drives. | Resolve the problem with the drive or drives. The controller can then write the dirty data to the drives. Posted-writes operations are restored. |
| Accelerator status: Dirty data detected. Unable to write dirty data to drives | At least one cache line contains dirty data that the controller has been unable to flush (write) to the drives. This problem usually occurs when there is a problem with the drive or drives. | Resolve the problem with the drive or drives. The controller can then write the dirty data to the drives. |
| Accelerator status: Excessive ECC errors detected in at least one cache line. As a result, at least one cache line is no longer in use. | At least one line in the cache is no longer in use due to excessive error checking and correcting (ECC) errors detected during use of the memory associated with that cache line. | Consider replacing the cache. If cache replacement is not done, the remaining cache lines generally continue to operate properly. |
| Accelerator status: Excessive ECC errors detected in multiple cache lines. As a result, the cache is no longer in use. | The number of cache lines experiencing excessive error checking and correcting (ECC) errors has reached a preset limit. Therefore, the cache has been shut down. | Try reseating the cache to the controller. If that does not work, replace the cache. |
| Accelerator status: Obsolete data detected | During reset initialization, obsolete data was found in the cache due to the drives being moved and written to by another controller. | Normal operation should continue. The controller either writes the data to the drives or discards the data completely. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Accelerator status: Obsolete data was discarded | During reset initialization, obsolete data was found in the cache, and was discarded (not written to the drives). | Normal operations should continue. |
| Accelerator status: Obsolete data was flushed (written) to drives | During reset initialization, obsolete data was found in the cache. The obsolete data was written to the drives, but newer data may have been overwritten. | If newer data was overwritten, you may need to restore newer data; otherwise, normal operation should continue. |
| Accelerator status: Permanently disabled | Array accelerator board has been permanently disabled. It will remain disabled until it is reinitialized using the Array Configuration Utility (ACU). | Check the Disable Code field. Run ACU to reinitialize the array accelerator board. |
| Accelerator status: Possible data loss in cache | Possible data loss was detected during power-up due to all batteries being below sufficient voltage level and no presence of the identification signatures on the array accelerator board. | There is no way to determine if dirty or bad data was in the cache and is now lost. |
| Accelerator status: Temporarily disabled | Array accelerator board has been temporarily disabled. | Check the Disable Code field. |
| Accelerator status: Unrecognized status | A status returned from the array accelerator board that ADU does not recognize. | Obtain the latest version of ADU. |
| Accelerator status: Valid data found at reset | Valid data was found in posted-write memory at reinitialization. Data will be flushed to disk. | There is no error or data loss condition. No action is necessary. |
| Accelerator status: Warranty alert | Catastrophic problem with array accelerator board. Refer to other messages on Diagnostics screen for exact meaning of this message. | Replace the array accelerator board. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Adapter/NVRAM ID mismatch | EISA nonvolatile RAM (NVRAM) has an ID for a different controller from the one physically present in the slot. | Run the server setup utility. |
| Array accelerator battery pack *X* not fully charged | Battery is not fully charged. | If 75% of the batteries present are fully charged, the array accelerator is fully operational. If more than 75% of the batteries are **not** fully charged, allow 36 hours to recharge them. |
| Array accelerator battery pack *X* below reference voltage (recharging) | Battery pack on the array accelerator is below the required voltage levels. | Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board. |
| Board in use by expand operation | Array accelerator memory is in use by an expand operation. | Operate the system without the array accelerator board until the expand operation completes. |
| Board not attached | An array controller is configured for use with array accelerator board, but one is not connected. | Connect array accelerator board to array controller. |
| Cache has been disabled because ADG Enabler Dongle is broken or missing. | The cache has been disabled because RAID ADG volume is configured but the ADG Enabler Dongle is broken or missing. | Check the ADG Enabler Dongle. Replace if needed. |
| Cache has been disabled; likely caused by a loose pin on one of the RAM chips. | Cache has been disabled due to a large number of ECC errors detected while testing the cache during POST. Likely caused by a loose pin on one of the RAM chips. | Try reseating the cache to the controller. If that does not work, replace the cache. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Configuration signature is zero | ADU detected that nonvolatile RAM (NVRAM) contains a configuration signature of zero. Old versions of the server setup utility could cause this. | Run the latest version of server setup utility to configure the controller and NVRAM. |
| Configuration signature mismatch | Array accelerator board configured for a different array controller board. Configuration signature on array accelerator board does not match the one stored on the array controller board. | To recognize the array accelerator board, run ACU. |
| Controller communication failure occurred | Controller communication failure occurred. | ADU was unable to successfully issue commands to the controller in this slot. |
| Controller detected. NVRAM configuration not present | EISA nonvolatile RAM (NVRAM) does not contain a configuration for this controller. | Run the server setup utility to configure the NVRAM. |
| Controller firmware needs upgrading | Controller firmware is below the latest recommended version. | Run Options ROMPaq to upgrade the controller to the latest firmware revision. |
| Controller is located in special "video" slot | Controller is installed in slot for special video control signals. If controller is used in this slot, LED indicators on front panel may not function properly. | Install the controller into a different slot, and run the server setup utility to configure NVRAM. Then, run ACU to configure the controller. |
| Controller is not configured | Controller is not configured. If controller was previously configured and you change drive locations, there may be a problem with placement of the drives. ADU examines each physical drive and looks for drives that have been moved to a different drive bay. | Look for messages indicating which drives have been moved. If none are displayed and drive swapping did not occur, run ACU to configure the controller and server setup utility to configure NVRAM. **Do not** run either utility if you believe drive swapping has occurred. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Controller reported POST error.<br>Error Code: *X* | The controller returned an error from its internal Power-On Self-Test (POST). | Replace the controller. |
| Controller restarted with a signature of zero | ADU did not find a valid configuration signature to use to get the data. NVRAM may not be present (unconfigured) or the signature present in NVRAM may not match the signature on the controller. | Run the server setup utility to configure the controller and NVRAM. |
| Disable command issued | The issuing of the Accelerator Disable command has disabled posted-writes. This occurred because of an operating system device driver. | Restart the system. Run ACU to reinitialize the array accelerator board. |
| Drive (bay) *X* firmware needs upgrading | Firmware on this physical drive is below the latest recommended version. | Run the Options ROMPaq Utility to upgrade the drive firmware to the latest revision. |
| Drive (bay) *X* has insufficient capacity for its configuration | Drive has insufficient capacity to be used in this logical drive configuration. | Replace this drive with a larger capacity drive. |
| Drive (bay) *X* has invalid M&P stamp | Physical drive has invalid monitor and performance data. | Run the server setup utility to properly initialize this drive. |
| Drive (bay) *X* has loose cable | The array controller could not communicate with this drive at power-up. This drive has not previously failed. | Check all cable connections first. The cables could be bad, loose, or disconnected. Power up the system and attempt to reconnect data/power cable to the drive. If this does not work, replace the cable. If still not successful, the drive may need to be replaced. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Drive (bay) *X* is a replacement drive | This drive has been replaced. This message is displayed if a drive is replaced in a fault tolerant logical volume. | If the replacement was intentional, allow the drive to rebuild. |
| Drive (bay) *X* is a replacement drive marked OK | This drive has been replaced and marked OK by the firmware, which may occur if a drive has an intermittent failure. For example, a drive has previously failed, then starts working again when ADU is run. | Replace the drive. |
| Drive (bay) *X* is failed. | The indicated physical drive has failed. | Replace this drive. |
| Drive (bay) *X* is undergoing drive recovery | This drive is being rebuilt from the corresponding mirror or parity data. | Normal operations should occur. |
| Drive (bay) *X* needs replacing. | The 210-MB hard drive has firmware version 2.30 or 2.31. | Replace the drive. |
| Drive (bay) *X* upload code not readable. | An error occurred while ADU was trying to read the upload code information from this drive. | If there were multiple errors, this drive may need to be replaced. |
| Drive (bay) *X* was inadvertently replaced. | The physical drive was incorrectly replaced after another drive failed. | 1. Replace the drive that was incorrectly replaced.<br>2. Replace the original drive that failed.<br>Do not run the server setup utility and try to reconfigure; data will be lost. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Drive Monitoring features are unobtainable. | ADU is unable to get monitor and performance data due to fatal command problem (such as drive time-out), or is unable to get data due to these features not being supported on the controller. | Check for other errors such as time-outs. If no other errors occur, upgrade the firmware to a version that supports monitor and performance, if desired. |
| Drive Monitoring is NOT enabled for SCSI Port *X* Drive ID *Y*. | The monitor and performance features have not been enabled on this drive. | Run the server setup utility to initialize the monitor and performance features. |
| Drive time-out occurred on physical drive bay *X*. | ADU issued a command to a physical drive and the command was never acknowledged. | The drive or cable may be bad. Check the other error messages on the **Diagnostics** screen to determine resolution. |
| Drive *X* indicates position *Y*. | Message indicates a designated physical drive, which seems to be scrambled or in a drive bay other than the one for which it was originally configured. | Examine the graphical drive representation on ADU to determine proper drive locations. Remove drive *X* and place it in drive position *Y*. Rearrange the drives according to the ADU instructions. |
| Duplicate write memory error. | Data cannot be written to the array accelerator board in duplicate due to the detection of parity errors. This is not a data-loss situation. | Replace the array accelerator board. |
| Error occurred reading RIS copy from SCSI Port *X* Drive ID. | An error occurred while ADU was trying to read the reserve information sector (RIS) from this drive. | HP stores the hard drive configuration information in the RIS. If there are multiple errors, this drive may need to be replaced. |
| FYI: Drive (bay) *X* is non-Compaq supplied. | Compaq did not supply the installed drive. | If problems exist with this drive, replace it with a supported drive. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Identify controller data did not match with NVRAM. | The controller identification data from the array controller does not match with the information stored in NVRAM. This can occur if new, previously configured drives are placed in a system that has also been previously configured. It can also occur if the firmware on the controller has been upgraded and the server setup utility was not. | Run the Inspect Utility to check the controller identification data. If the firmware version field is the only difference between the controller and NVRAM data, this is not a problem. Otherwise run the server setup utility. |
| Identify logical drive data did not match with NVRAM. | The identify unit data from the array controller does not match with the information stored in NVRAM. This can occur if new, previously configured drives have been placed in a system that has also been previously configured. | Run the server setup utility to configure the controller and NVRAM. |
| Insufficient adapter resources | The adapter does not have sufficient resources to perform posted-write operations to the array accelerator board. Drive rebuild may be occurring. | Operate the system without the array accelerator board until the drive rebuild completes. |
| Inter-controller link connection could not be established | Unable to communicate over the link connecting the redundant controllers. | Be sure that both controllers are using the same hardware and firmware revisions. If one controller failed, replace it. |
| Less than 75% batteries at sufficient voltage | The operation of the array accelerator board has been disabled due to less than 75% of the battery packs being at the sufficient voltage level. | Allow sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the array accelerator board. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Less than 75% of batteries at sufficient voltage Battery pack *X* below reference voltage | Battery pack on the array accelerator is below the required voltage levels. | Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board. |
| Logical drive *X* failed due to cache error | This logical drive failed due to a catastrophic cache error. | Replace the array accelerator board and reconfigure using ACU. |
| Logical Drive *X* status = Failed | This status could be issued for several reasons:<br>• Logical drive is configured for No Fault Tolerance, and one or more drives fail.<br>• Mirroring is enabled, and any two mirrored drives fail.<br>• Data Guarding is enabled, and two or more drives fail.<br>• Another configured logical drive is in the WRONG DRIVE REPLACED or LOOSE CABLE DETECTED state. | Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive or drives, and then restore the data for this logical drive from the tape backup. Otherwise, follow the procedures for correcting problems when an incorrect drive is replaced or a loose cable is detected. |
| Logical Drive *X* status = Interim recovery (volume functional, but not fault tolerant) | A physical drive in this logical drive has failed. The logical drive is operational, but the loss of an additional drive causes permanent data loss. | Replace the failed drive as soon as possible. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Logical Drive *X* status = loose cable detected<br><br>SOLUTION: Turn the system off and attempt to reattach any loose connections. If this does not work, replace the cable(s) and connection(s). | A physical drive or an external storage unit may have a cabling or connection problem. | Power the system down and attempt to reconnect any loose connections. If this does not work, replace the cable(s) and connection(s). |
| Logical Drive *X* status = Overheated | The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels and has shut down to avoid damage. | Check the fans and the operating environment. |
| Logical Drive *X* status = Overheating | The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels. | Check the fans and the operating environment. |
| Logical Drive *X* status = Recovering<br><br>(rebuilding data on a replaced drive) | A physical drive in this logical drive has failed and has now been replaced. The replaced drive is rebuilding from the mirror drive or the parity data. | Nothing needs to be done. Normal operations can occur; however, performance will be less than optimal until after the rebuild process completes. |
| Logical Drive *X* status = Wrong drive replaced | A physical drive in this logical drive has failed. The incorrect drive was replaced. | Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. Do not run the server setup utility to reconfigure; you will lose data on the drive. |
| Loose cable detected – logical drives may be marked FAILED until corrected | ADU found a loose cable. The Smart Array Controller is unable to communicate with one or more physical drives. One or more logical drives may be marked FAILED, and are unusable until problem is corrected. | Power down the system. Check the cables for a tight connection to the logical drives. Restart the system. If the same message occurs again, the cables may be defective. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Loose cable detected – logical drives may be marked FAILED until corrected | Controller is unable to communicate with one or more physical drives, probably because of a cabling problem. Logical drives may be in a FAILED state until the condition is corrected, preventing access to data on the controller. | Check all controller and drive cable connections. |
| Mirror data miscompare | Data was found at reset initialization in the posted-write memory; however, the mirror data compare test failed resulting in that data being marked as invalid. Data loss is possible. | Replace the array accelerator board. |
| No configuration for array accelerator board | The array accelerator board has not been configured. | If the array accelerator board is present, run ACU to configure the board. |
| NVRAM configuration present, controller not detected | EISA NVRAM has a configuration for an array controller, but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot. | Place the array controller in the proper slot, or run the server setup utility to reconfigure NVRAM to reflect the removal or new position. |
| One or more drives is unable to support redundant controller operation | At least one drive in use does not support redundant controller operation. | Replace the drive that does not support redundant controller operation. |
| Other controller indicates different hardware model | The other controller in the redundant controller configuration is a different hardware model. | Be sure that both controllers are using the same hardware model. If they are, make sure that controllers are fully seated in their slots. |
| Other controller indicates different firmware version | The other controller in the redundant controller configuration is using a different firmware version. | Be sure that both controllers are using the same firmware revision. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Other controller indicates different cache size | The other controller in the redundant controller configuration has a different size array accelerator. | Be sure that both controllers are using the same capacity array accelerator. |
| RIS copies between drives do not match | The drives on this controller contain copies of the reserve information sector (RIS) that do not match. | The hard drives in the array do not have matching configuration information. To remedy this:<br>1. Resolve all other errors encountered.<br>2. Obtain the latest version of ADU, and then rerun ADU.<br>3. If unconfigured drives were added, configure these drives using ACU, which should resolve the error.<br>4. If drives or arrays were moved, be sure that the movement adheres to the guidelines listed in the documentation for the array controller.<br>5. If the error persists after completing steps 1 through 4, contact an authorized service provider. |
| SCSI Port *X* Drive ID *Y* failed – REPLACE *(failure message)* | ADU detected a drive failure. | Correct the condition that caused the error, if possible, or replace the drive. |
| SCSI port *X*, Drive ID *Y* firmware needs upgrading | Drive firmware may cause problems and should be upgraded. | Run Options ROMPaq to upgrade the drive firmware to a later revision. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| SCSI port *X*, Drive ID *Y* has exceeded the following threshold(s) | The monitor and performance threshold for this drive has been violated. | Check and resolve the threshold that has been violated. |
| SCSI port *X*, Drive ID *Y* is not stamped for monitoring | The drive has not been stamped with monitor and performance features. | To change without destroying the current configuration:<br>1. Run ACU.<br>2. Change the array accelerator size and save the configuration.<br>3. Change the array accelerator back to the original size and save again.<br>This should cause ACU to stamp the drive with monitoring and performance features. |
| SCSI port *X*, Drive ID *Y* may have a loose connection<br>SOLUTION: Turn the system off and attempt to reattach any loose connections. If this does not work, replace the cable(s) and connection(s). | SMART is unable to communicate with the drive, because the cable is not securely connected, or the drive cage connection has failed. | 1. Power down the system.<br>2. Reconnect the cable securely.<br>3. Restart the system.<br>4. If this does not solve the problem, replace the cables and connectors as needed. |
| SCSI port *X*, Drive ID *Y* RIS copies within this drive do not match | The copies of RIS on the drive do not match. | Check for other errors. The drive may need to be replaced. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| SCSI Port *X*, Drive ID *Y*…S.M.A.R.T. predictive failure errors Have been detected in the factory Monitor and Performance data.<br>SOLUTION: Please replace this drive when conditions permit. | A predictive failure warning for this hard drive has been generated, indicating that a drive failure is imminent. | Replace this drive at the earliest opportunity.<br>Refer to "SCSI Hot-Plug Hard Drives" in Chapter 2 before performing this operation. |
| SCSI Port *X*, Drive ID *Y*…S.M.A.R.T. predictive failure errors Have been detected in the since power Monitor and Performance data.<br>SOLUTION: Please replace this drive when conditions permit. | A predictive failure warning for this hard drive has been generated, indicating a drive failure is imminent. | Replace this drive at the earliest opportunity.<br>Refer to "SCSI Hot-Plug Hard Drives" in Chapter 2 before performing this operation. |
| SCSI Port *X*, Drive ID *Y* was replaced on a good volume: (failure message) | ADU found this drive was replaced, even though there was no problem with the volume. | No action needs to be taken. |
| Set configuration command issued | The configuration of the array controller has been updated. The array accelerator board may remain disabled until it is reinitialized. | Run the server setup utility to reinitialize the array accelerator board. |
| Soft Firmware Upgrade required | ADU has determined that your controller is running firmware that has been soft upgraded by the Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system. | Run the Upgrade Utility to place the latest firmware on all drives. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Storage enclosure on SCSI bus *X* has a cabling error (bus disabled).<br><br>SOLUTION: The SCSI controller has an internal and external cable attached to the same bus. Please disconnect the internal or external cable from the controller. If this controller supports multiple buses, the cable disconnected can be reattached to an available bus. | The current cabling configuration is not supported. | Refer to your server-specific user documentation for cabling guidelines, and reconfigure as indicated. |
| Storage enclosure on SCSI bus *X* indicated a door alert.<br><br>SOLUTION: Be sure that the storage enclosure door is closed or the side panel is properly installed. | The side panel of the external storage unit is open. | Be sure that the side panel of the storage unit is securely closed. |
| Storage enclosure on SCSI bus *X* indicated a power supply failure.<br><br>SOLUTION: Replace the power supply. | A power supply in the external storage unit has failed. | Replace the power supply. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Storage enclosure on SCSI bus *X* indicated an overheated condition.<br><br>SOLUTION: Make sure all cooling fans are operating properly. Also be sure the operating environment of storage enclosure is within temperature specifications. | The external storage unit is generating a temperature alert. | 1. Be sure that all fans are connected and operating properly.<br>2. Be sure that the operating environment of the storage unit is within specifications.<br>3. For better airflow, remove any dust buildup from fans or other areas.<br>4. Check your server-specific user documentation for allowable temperature specifications and additional tips.<br>5. If none of the previous steps solve this problem, replace the fan. |
| Storage enclosure on SCSI bus *X* is unsupported with its current firmware version.<br><br>SOLUTION: Upgrade the firmware version on the storage enclosure. | The firmware version of the external storage unit is not supported. | Upgrade the firmware. |
| Storage enclosure on SCSI bus *X* indicated that the fan failed.<br><br>SOLUTION: Replace the fan. | The cooling fan located in the external storage unit has experienced a failure. | Replace the fan. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Storage enclosure on SCSI bus *X* indicated that the fan is degraded.<br><br>SOLUTION: this condition usually occurs on enclosures with multiple fans and one of those fans has failed. Replace any fans not operating properly. | One or more fans in the external storage unit have failed. | Replace the failed fans. |
| Storage enclosure on SCSI bus *X* indicated that the fan module is unplugged.<br><br>SOLUTION: Make sure the fan module is properly connected. | A fan in the external storage unit is not connected properly. | Check and reseat all fan connections securely. |
| Storage enclosure on SCSI bus *X* – Wide SCSI transfer failed.<br><br>SOLUTION: This may indicate a bad SCSI cable on bus *X*. Try replacing the cable. | A cable on bus *X* has failed. | 1. Replace the failed cable.<br>2. If that does not solve the problem, contact your authorized service provider. |
| Swapped cables or Configuration error detected. A configured array of drives was moved from another controller that supported more drives than this controller supports.<br><br>SOLUTION: Upgrade the firmware on this controller. If this doesn't solve the problem, then power down system and move the drives back to the original controller. | You have exceeded the maximum number of drives supported for this controller, and the connected controller was not part of the original array configuration. | 1. Upgrade the firmware on this controller.<br>2. If the problem is not resolved:<br>Replace this controller with the original controller.<br>-Or-<br>Replace this controller with a new controller that supports the number of drives in the array. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Swapped cables or Configuration error detected. A drive rearrangement was attempted while an expand operation was running. This is an unsupported operation.<br><br>SOLUTION: Power down system then move drives back to their original location. Power on system and wait for the expand operation to complete before attempting a drive rearrangement. | One or more drive locations were changed while an expand operation was in progress. | 1. Power down the server.<br>2. Place the drives in their original locations.<br>3. Restart the server, and then complete the expand operation.<br>4. Move the drives to their new locations after the expand operation is completed. |
| Swapped cables or Configuration error detected. An unsupported drive arrangement was attempted.<br><br>SOLUTION: Power down system then move drives back to their original location. | One or more physical drives were moved, causing a configuration that is not supported. | Move all drives to their original locations, and then refer to your server-specific user documentation for supported configurations. |
| Swapped cables or Configuration error detected. The cables appear to be interchanged.<br><br>SOLUTION: Power down system then move the drives or cables back to their original location. | ADU has detected a change in the cable configuration.<br><br>One or more cables may be connected to the incorrect bus.<br><br>-Or-<br><br>One or more drives have been moved to new locations. | Refer to your server-specific user documentation for supported configurations and cabling guidelines.<br><br>Restore to the original configuration. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Swapped cables or Configuration error detected. The configuration information on the attached drives is not backward compatible with this controller's firmware.<br><br>SOLUTION: Upgrade the firmware on this controller. If this doesn't solve the problem then power down system then move drives back to the original controller. | The current firmware version on the controller cannot interpret the configuration information on the connected drives. | Upgrade the firmware.<br><br>-Or-<br><br>If that does not solve the problem, move the drives to the original controller. |
| Swapped cables or Configuration error detected. The maximum logical volume count *X* was exceeded during logical volume addition. All logical volumes beyond *X* have been lost and cannot be recovered.<br><br>SOLUTION: Identify the drives that contain the lost logical volumes. Move those drives to another controller where the logical volumes can be recreated. NOTE! If a drive contains a valid logical volume and a lost logical volume, then do not move that drive to another controller. | More logical drives were created than are supported on this controller, causing lost logical drive volumes. | Identify the drives containing lost volumes, and then move them to another controller so the lost volumes can be recreated.<br><br>**WARNING:** Do not move a drive if it also contains valid volume data. This process causes all valid data to be destroyed. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| System board is unable to identify which slots the controllers are in | Slot indicator on system board is not working correctly. Firmware recognizes both controllers as being installed in the same slot. | 1. Be sure that both controllers are fully seated in their slots.<br>If the problem persists, this might indicate a controller problem or a system board problem.<br>2. Remove one of the controllers in the configuration and see if the remaining controller generates a POST message.<br>3. Move the remaining controller to the other slot to see if it still generates a POST message.<br>4. Repeat these steps with the other controller.<br>If both controllers give POST messages in one slot but not the other, it is a system board problem. If one of the controllers gives POST messages and the other controller does not, replace the controller that is giving the POST messages. Contact an authorized service provider for any warranty replacements. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| The redundant controllers installed are not the same model.<br><br>SOLUTION: Power down the system and verify that the redundant controllers are different models. If they are different models, replace the other controller with the same model as this one. | ADU detected two different controller models installed in a redundant controller configuration. This is not supported, and one or both controllers may not be operating properly. | Use the same controller models for redundant controller configurations. |
| This controller can't see the drives but the other controller can | The other controller in the redundant controller configuration can recognize the drives, but this controller cannot. | Resolve any other errors and then rerun ADU. |
| This controller can see the drives but the other controller can't | The other controller in the redundant controller configuration cannot recognize the drives, but this controller can. | Resolve any other errors and then rerun ADU. |
| Unable to communicate with drive on SCSI Port *X*, Drive ID *Y* | The array controller cannot communicate with the drive. | If the hard drive amber LED is on, replace the drive. |
| Unable to retrieve identify controller data. Controller may be disabled or failed.<br><br>SOLUTION: Power down the system. Verify that the controller is fully seated. Then power the system on and look for helpful error messages displayed by the controller. If this doesn't help, contact your COMPAQ service provider. | ADU requested the identify controller data from the controller but was unable to obtain it. This usually indicates that the controller is not seated properly, or has failed. | 1. Power down the server.<br>2. Be sure that the controller is fully seated.<br>3. Restart the server.<br>4. Resolve any error messages displayed by the controller.<br><br>If this does not solve the problem, contact an authorized service provider. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Unknown disable code | A code was returned from the array accelerator board that ADU does not recognize. | Obtain the latest version of ADU. |
| Unrecoverable read error | Read parity errors were detected when an attempt to read the same data from both sides of the mirrored memory was made. Data loss will occur. | Replace the array accelerator board. |
| Warning bit detected | A monitor and performance threshold violation may have occurred. The status of a logical drive may not be OK. | Check the other error messages for an indication of the problem. |
| WARNING – Drive Write Cache is enabled on *X* | Drive has its internal write cache enabled. The drive may be a third-party drive, or the operating parameters of the drive may have been altered. Condition can cause data corruption if power to the drive is interrupted. | Replace the drive with a supported drive, or restore the operating parameter of the drive. |
| WARNING: Storage enclosure on SCSI bus *X* indicated it is operating in single ended mode.<br><br>SOLUTION: This usually occurs when a single-ended drive type is inserted into an enclosure with other drive types; and that makes the entire enclosure operate in single ended mode. To maximize performance replace the single-ended drive with a type that matches the other drives. | One or more single-ended mode SCSI drives are installed in an external storage unit that operates in low-voltage differential (LVD) mode. | The array continues to operate, but installing all LVD drives maximizes performance. |

*continued*

**Table D-1: Array Diagnostic Utility (ADU) Error Messages** *continued*

| Message | Description | Recommended Action |
|---|---|---|
| Write memory error | Data can not be written to the cache memory. This typically means that a parity error was detected while writing data to the cache. This can be caused by an incomplete connection between the cache and the controller. This is not a data loss circumstance. | With the system powered down, be sure that the cache board is fully connected to the controller. |
| Wrong Accelerator | This may mean that the board was replaced in the wrong slot or was placed in a system previously configured with another board type. Included with this message is a message indicating (1) the type of adapter sensed by ADU, and (2) the type of adapter last configured in EISA nonvolatile RAM. | Check the diagnosis screen for other error messages. Run the server setup utility to update the system configuration. |

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