HP ProLiant Gen9 Troubleshooting Guide

Volume I: Troubleshooting Guide

Abstract

This document describes common procedures and solutions for the many levels of troubleshooting HP ProLiant Gen9 servers. This document is intended for the person who installs, administers, and troubleshoots servers or server blades. HP assumes you are qualified to service computer equipment and are trained in recognizing hazards in products with hazardous energy levels.

Contents

Using this guide

How to use this guide

The *HP ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting* focuses on troubleshooting procedures for HP ProLiant Gen9 ML, DL, BL, XL, and SL servers. The complete list of Gen9 error messages is included in the *HP ProLiant Gen9 Troubleshooting Guide, Volume II: Error Messages*. For more information, see "Error message resources (on page 94)."

For more information on troubleshooting HP ProLiant Gen8 and prior servers, see "Troubleshooting resources for previous HP ProLiant server models (on page 93)."

> **NOTE:** For common troubleshooting procedures, the term "server" is used to mean servers and server blades.

This guide provides common procedures and solutions for troubleshooting an HP ProLiant server—from the most basic connector issues to complex software configuration problems.

To understand the sections of this guide and to identify the best starting point for a problem, review the following descriptions:

- Troubleshooting preparation (on page 10)

  This section provides information on how to prepare to begin troubleshooting the server, including important safety information, tips on how to gather symptom information, how to prepare your server to begin diagnosis, and other pre-diagnostic information.

- Common problem resolution (on page 17)

  Many server problems are caused by loose connections, outdated firmware, and other issues. Use this section to perform basic troubleshooting for common problems.

- Remote troubleshooting (on page 22)

  This section provides a list of the tools and processes to begin troubleshooting a server from a remote location.

- Diagnostic flowcharts (on page 27)

  If a server exhibits symptoms that do not immediately pinpoint the problem, use this section to begin troubleshooting. The section contains a series of flowcharts that provide a common troubleshooting process for HP ProLiant servers. The flowcharts identify a diagnostic tool or a process to help solve the problem.

- Hardware problems (on page 50)

  If the symptoms point to a specific component, use this section to find solutions for problems with power, general components, system boards, system open circuits and short circuits, and external devices.

- Software problems (on page 72)

  If you have a known, specific software problem, use this section to identify and solve the problem.

- Software tools and solutions (on page 78)

  Use this section as a reference for software tools and utilities.

- HP resources for troubleshooting (on page 93)

  When additional information becomes necessary, use this section to identify websites and supplemental documents that contain troubleshooting information.

- Support and other resources (on page 100)

  When you need to contact HP Technical Support, use this section to find the phone number and a list of the information needed prior to making the phone call.

What's new (3rd Edition)

The third edition of the *HP ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting*, part number 795674-XX3, includes the following additions and updates:

- Added processor servicing information to the following sections of Troubleshooting preparation (on page 10):
  - Performing processor procedures in the troubleshooting process (on page 15)
  - Breaking the server down to the minimum hardware configuration (on page 15)
- Improved the directions for locating service notifications in the following sections:
  - Service notifications (on page 17)
  - Service notifications, advisories, and notices (on page 95)

795674-XX2 (December 2014)

The second edition of the *HP ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting*, part number 795674-XX2, includes the following additions and updates:

- Improved information in the following sections of Troubleshooting preparation (on page 10):
  - Pre-Diagnostic steps (on page 10)
  - Symptom information (on page 13)
  - Prepare the server for diagnosis (on page 14)
  - Breaking the server down to the minimum hardware configuration (on page 15)
- Updated and improved content in the following sections of Remote troubleshooting (on page 22):
  - Remote access to the Virtual Connect Manager (on page 23)
  - Using HP iLO for remote troubleshooting of servers and server blades (on page 23)
  - Using the OA CLI (on page 25)
- Updated the following sections in Diagnostic flowcharts (on page 27):
  - Troubleshooting flowchart reference websites (on page 28)
  - Start diagnosis flowchart (on page 29)
  - Power-on problems flowcharts ("Power-on problems flowchart" on page 30)
  - POST problems flowchart (on page 34)
  - Intelligent Provisioning problems flowchart (on page 36)
  - OS boot problems flowchart (on page 42)
  - Fault indications flowcharts ("Fault indications flowchart" on page 43)
- Added the following new information and flowcharts to Diagnostic flowcharts (on page 27):

- o Gather important information before you begin (on page 28)
- o HP Smart Storage Battery problems flowchart ("HP Smart Storage Battery problems" on page 39)
- o Cache module problems flowchart ("Cache module problems" on page 38)
- o Controller problems flowchart ("Controller problems" on page 36)
- o NIC problems flowchart ("NIC problems" on page 46)
- o Logical drive problems flowchart ("Logical drive problems" on page 41)
- o Physical drive problems flowchart ("Physical drive problems" on page 40)
- o Power profile problems flowchart ("Power profile problems" on page 45)
- Made changes to Software and configuration utilities.
  - o Updated Server mode to include new software tools
  - o Added Updating firmware or System ROM (on page 89) and several subsections

Troubleshooting preparation

Pre-diagnostic steps

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

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

1. Review the important safety information (on page 10).
2. Gather and record symptom information (on page 13).
3. Gather all error information such as the full POST error message displayed and the IML ("Integrated Management Log" on page 80).
4. If it is necessary to contact HP, download the Active Health System log ("Active Health System log overview" on page 104).
5. Prepare the server for diagnosis (on page 14).
6. Use the Start diagnosis flowchart (on page 29) to begin the diagnostic process.

Important safety information

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

⚠ Important safety information

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

Symbols on equipment

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

⚠⚡ This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

⚠🚫 This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

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

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

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

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

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.

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

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

Warnings and cautions

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

WARNING: To reduce the risk of personal injury or damage to the equipment, consult the safety information and user documentation provided with the server before attempting the installation. Some servers contain high energy circuits, high current circuits, moving parts (such as fan blades), or any combination of these hazards, that may be exposed if covers and access panels are removed while the product is connected to a power source. These products are intended to be serviced only by qualified personnel who have been trained to deal with these hazards. Do not remove enclosures or attempt to bypass any interlocks designed to guard against these hazardous conditions.

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:
- The leveling feet are extended to the floor.
- The full weight of the rack rests on the leveling feet.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

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

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

weight in kg
weight in lb

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

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

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

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

Electrostatic discharge

Preventing electrostatic discharge

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

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

- Place parts on a grounded surface before removing them from their containers.

- Avoid touching pins, leads, or circuitry.

- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods to prevent electrostatic discharge

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

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ±10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

- Use conductive field service tools.

- Use a portable field service kit with a folding static-dissipating work mat.

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

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

Symptom information

Before troubleshooting a server problem, collect the following information:

- Does the server power on?

- Does the server complete POST?

  If not, then what do the health LEDs indicate?

  Is video display available?

  If server completes POST and video is available, are there any POST error messages? Record the text of the POST error message as displayed.

- Does the server successfully boot an operating system or hypervisor? If not, does the server display any of the following symptoms?
  - An uncorrectable machine check exception
  - Stop error or blue screen (Windows)
  - Purple diagnostic screen (Linux)
  - Linux kernel panic
  - A system "hang"
  - A system "freeze"

- If the problem occurs after an OS is installed:
  - Does the problem occur when a new application is loading?
  - What symptoms did the server display when the server malfunctioned? (for example, did it reboot, were there LED codes, health logs, messages on the screen, and so forth)

- Are any indications present that show that the malfunction was reported as a memory error, PCI error, or so forth?

  The processor now contains the memory controller and PCI Express controller, so faults in other areas may be attributed to a processor malfunction.

- When did the problem occur?

  Record exactly when the problem happens (include the date and time). If it happens more than once, keep a list of all symptoms for each occurrence.

- What events preceded the failure?

  After which steps does the problem occur?

- What has been changed since the time the server was working?

- 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?

- How long has the server exhibited problem symptoms?

- If the problem occurs randomly, what is the duration or frequency?

- What failed based on the HP iLO Event Log or the IML ("Integrated Management Log" on page 80)?

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

- Run HP Insight Diagnostics (on page 82) and use the survey page to view the current configuration or to compare it to previous configurations.

- Observe the server LEDs and their statuses. For more information, see the server user guide in the HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs).

Prepare the server for diagnosis

1. Be sure the server is in the proper operating environment with adequate power, air conditioning, and humidity control. For required environmental conditions, see the server documentation (on page 94).

2. Record any error messages displayed by the system.

3. Remove all CD-ROMs, DVD-ROMs, USB drive keys, or SD cards that are not bootable devices.

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

   o You must have the appropriate support software installed on the server.

     To verify the server configuration, connect to the System Management Homepage (http://h18013.www1.hp.com/products/servers/management/agents/index.html) and select **Version Control Agent**. The VCA ("Version control" on page 91) provides a list of names and versions of all installed HP drivers, Management Agents, and utilities, and whether they are current.

   o HP recommends you have access to the server documentation (on page 94) for server-specific information.

5. Determine if the server will be diagnosed offline or online:

   o If you will diagnose the server online, complete steps 6 and 8.

   o If you will diagnose the server offline, complete steps 7 and 8.

6. To diagnose the server online, review and collect the following information:

   a. Obtain a record of all current ROM settings by running CONREP from Scripting Toolkit for Windows and Linux (on page 83).

   b. Review the IML ("Integrated Management Log" on page 80).

   c. Review the HP iLO information on both the **Overview** and the **System Information** page.

   d. Review the **Diagnostics** page.

e. If the OS is operating and the System Management Homepage is installed, then review the operational status from the System Management Homepage.

f. Download the Active Health System log (on page 105).

g. Record survey data.

7. To diagnose the server offline, power down the server and peripheral devices. If possible, always perform an orderly shutdown:

a. Exit any applications.

b. Exit the operating system.

c. Power down the server.

8. Disconnect any peripheral devices not required for testing (any devices not necessary to power up the server).

Performing processor procedures in the troubleshooting process

⚠ **CAUTION:** When reducing the server to a minimum configuration for troubleshooting, do not remove additional processors unless specifically requested by the HP Support Center. Improperly replacing or reseating processors can result in damage to the system board.

Before performing any troubleshooting steps that involve processors, review the following guidelines:

- Be sure that only authorized personnel perform the troubleshooting steps that involve installation, removal, or replacement of a processor.

- Always locate the documentation for your processor model before performing **any** steps that require installing, removing, or replacing a processor. If you cannot locate the hard copy of the instructions, locate the server user guide or maintenance and service guide in the HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs).

- Never touch the contacts in the processor socket. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED**. If the contacts inside the processor socket are damaged, you must replace the system board.

- Always complete all other troubleshooting procedures before removing or replacing a processor. Only replace or reseat processors when directed to do so by the HP Support Center.

Breaking the server down to the minimum hardware configuration

⚠ **CAUTION:** When reducing the server to a minimum configuration for troubleshooting, do not remove additional processors unless specifically requested by the HP Support Center. Improperly replacing or reseating processors can result in damage to the system board.

⚠ **CAUTION:** Before removing or replacing any processors, be sure to follow the guidelines provided in "Performing processor procedures in the troubleshooting process (on page 15)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

During the troubleshooting process, you may be asked to break the server down to the minimum hardware configuration. A minimum configuration consists of only the components needed to boot the server and successfully pass POST.

When requested to break the server down to the minimum configuration, uninstall the following components, if installed:

- All additional cooling fans, if applicable

  For the minimum fan configuration, see the server user guide.

- All additional power supplies, if applicable (leave one installed)

- All hard drives and solid state drives

- All optical drives (DVD-ROM, CD-ROM, and so forth)

- All optional mezzanine cards

- All expansion boards

Before removing the components, be sure to determine the minimum configuration for each component and follow all guidelines in the server user guide.

Always use the recommended minimum configuration above before removing any processors or DIMMs. If you are unable to isolate the issue with the configuration above, you will then remove all but one of the processors and the minimum number of associated DIMMs for the processor as directed by the HP Support Center.

Common problem resolution

Loose connections

Action:

- Be sure all power cords are securely connected.
- Be sure all cables are properly aligned and securely connected for all external and internal components.
- Remove and check all data and power cables for damage. Be sure no cables have bent pins or damaged connectors.
- If a cable routes through air baffles or other components, be sure the cords and cables connected to the server are routed correctly through the baffle.
- Be sure each device is properly seated. Avoid bending or flexing circuit boards when reseating components.
- If a device has latches, be sure they are completely closed and locked.
- Check any interlock or interconnect LEDs that may indicate a component is not connected properly.
- If problems continue to occur, remove and reinstall each device, checking the connectors and sockets for bent pins or other damage.
- For HP ProLiant BL c-Class Server Blades, be sure the OA tray is seated properly.

Service notifications

Service notifications are created to provide solutions for known issues with HP ProLiant servers. Check to see if your HP ProLiant server issue is covered by an existing service notification.

To search for service notifications, see the HP Support Center (http://www.hp.com/go/hpsc). Enter the product name or number, and then click **Go**. Select **Advisories, Bulletins & Notices**. The complete list of documents is displayed.

Firmware updates

Many common problems can be resolved by updating the firmware. Firmware updates and additional information can be found in the following ways:

- SPP: Update the firmware by downloading SPP ("HP Service Pack for ProLiant" on page 83) on the HP website (http://www.hp.com/go/spp).
- HP Support Center website: The most recent version of a particular server or option firmware from the HP website (http://www.hp.com/go/hpsc).

  To locate the drivers for a particular server, go to the HP website (http://www.hp.com/go/hpsc). Enter your product name and click **Go**.

- Subscription services: HP offers a subscription service that can provide notification of firmware updates. For more information, see "Subscription services (on page 95)."

For more information on updating firmware, see "Keeping the system current (on page 88)." If updating a server with a TPM installed, see "Server updates with an HP Trusted Platform Module and BitLocker enabled (on page 18)."

Server updates with an HP Trusted Platform Module and BitLocker enabled

When a TPM is installed and enabled in the UEFI System Utilities ("HP UEFI System Utilities" on page 84), and when the Microsoft Windows BitLocker Drive Encryption feature is enabled, always disable BitLocker before performing any of the following procedures:

- Restarting the computer for maintenance without a PIN or startup key
- Updating firmware (on page 76)
- Upgrading critical early boot components
- Upgrading the system board to replace or remove the TPM
- Disabling or clearing the TPM
- Moving a BitLocker-protected drive to another server
- Adding an optional PCI device, such as a storage controller or network adapter

DIMM handling guidelines

⚠ **CAUTION:** Failure to properly handle DIMMs can cause damage to DIMM components and the system board connector.

When handling a DIMM, observe the following guidelines:

- Avoid electrostatic discharge (on page 12).
- Always hold DIMMs by the side edges only.
- Avoid touching the connectors on the bottom of the DIMM.
- Never wrap your fingers around a DIMM.
- Avoid touching the components on the sides of the DIMM.
- Never bend or flex the DIMM.

When installing a DIMM, observe the following guidelines:

- Before seating the DIMM, open the DIMM slot and align the DIMM with the slot.
- To align and seat the DIMM, use two fingers to hold the DIMM along the side edges.
- To seat the DIMM, use two fingers to apply gentle pressure along the top of the DIMM.

For more information, see the HP website (http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?lang=en&cc=us&objectID=c008 68283&jumpid=reg_R1002_USEN).

DIMM installation and configuration guidelines

DIMM population order and configuration is critical in maximizing performance for the system. For more information, see the server label on the server or the server user guide on the HP website (http://www.hp.com/go/hpsc).

Component LED definitions

Many common problems can be identified by reviewing the component and server LEDs. For more information, see the server and component documentation on the HP website (http://www.hp.com/go/hpsc).

SAS, SATA, and SSD drive guidelines

When adding drives to the server, observe the following general guidelines:

- Drives must be the same capacity to provide the greatest storage space efficiency when drives are grouped together into the same drive array.

- Drives in the same logical volume must be of the same type. HP SSA does not support mixing SAS, SATA, and SSD drives in the same logical volume.

Hot-plug drive LED definitions
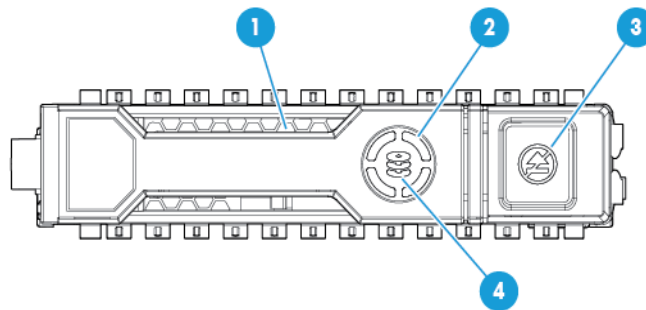
Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is rebuilding or performing a RAID migration, strip size migration, capacity expansion, or logical drive extension, or is erasing.
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.

Item	LED	Status	Definition
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.

System power LED definitions

The system power LED is located on the Power On/Standby button and each status is defined as follows:

System power LED	Definition
Off (Server)	System has no power.
Off (Server blade)	If the Health Status LED bar is off, then the system has no power. If the Health Status LED bar is flashing green, then the Power On/Standby Button service is being initialized.
Solid amber	System is in standby, Power On/Standby Button service is initialized.
Flashing green	System is waiting to power on, Power On/Standby button is pressed.
Solid green	System is powered on.

Health status LED bar definitions (blades only)

HP ProLiant Gen8 and later server blades have a health status LED bar with the following status definitions:

- Solid Green = Normal
- Flashing Green = Power On/Standby Button service is being initialized.
- Flashing Amber = Degraded condition
- Flashing Red = Critical condition

Front panel LEDs and buttons

This table provides standard descriptions for most HP ProLiant Gen9 servers. HP ProLiant Gen9 server blades have a Health status LED bar instead of the Health LED described below. For LED information for your server, see the server user guide.

Description	Status
UID LED/button*	Solid blue = Activated Flashing blue: • 1 Hz/cycle per sec = Remote management or firmware upgrade in progress • 4 Hz/cycle per sec = iLO manual reboot sequence initiated • 8 Hz/cycle per sec = iLO manual reboot sequence in progress Off = Deactivated
Power On/Standby button and system power LED*	Solid green = System on Flashing green (1 Hz/cycle per sec) = Performing power on sequence Solid amber = System in standby Off = No power present**

Description	Status
Health LED*	Solid green = Normal Flashing green (1 Hz/cycle per sec) = iLO is rebooting Flashing amber = System degraded Flashing red (1 Hz/cycle per sec) = System critical†
NIC status LED*	Solid green = Link to network Flashing green (1 Hz/cycle per sec) = Network active Off = No network activity

*When all four LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see "Front panel LED power fault codes (on page 21)."

**Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the power button cable is disconnected.

†If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.

Front panel LED power fault codes

When a power fault occurs, the following front panel LEDs flash simultaneously:

- System power LED
- Health LED
- NIC LED
- UID LED

For more information about the LED locations on your server, see the server user guide in the HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs).

The number of flashes in each sequence corresponds to the subsystem impacted by the power fault. The following table provides a list of power fault codes, and the subsystems that are affected. Not all power faults are used by all servers.

Subsystem	Front panel LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
FlexibleLOM	5 flashes
Removable HP Flexible Smart Array controller/Smart SAS HBA controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

Remote troubleshooting

Remote troubleshooting tools

HP provides several options that help IT administrators troubleshoot servers from remote locations.

- HP iLO (on page 78)

    HP iLO is available for all HP ProLiant servers. HP iLO consists of an intelligent processor and firmware that allows for remote server management. The HP iLO VSP provides bi-directional data flow with a server serial port. Using VSP, you can operate as if a physical serial connection exists on the remote server serial port. From an established HP iLO connection, the system status can be identified within the first interface presented to the Administrator. When diagnosing server issues, administrators can determine what failed based on the IML or iLO Event Log. For more information about HP iLO features (which may require a specific iLO license), see the HP iLO documentation on the HP website (http://www.hp.com/go/ilo/docs).

- Onboard Administrator (for HP ProLiant server blades only)

    HP Onboard Administrator and HP Onboard Administrator Command Line Interface assist Administrators in remotely troubleshooting server blades in the HP BladeSystem environment. Using the OA CLI (on page 25), administrators obtain access to all configuration information on each blade bay and interconnect. A standard SHOW ALL command from the OA CLI provides configuration information on the HP ProLiant c-Class Blade Enclosures. For more information about using the OA CLI and other HP BladeSystem documentation, see the HP website (http://www.hp.com/support/BladeSystem/docs).

    Administrators can also generate an OA SHOW ALL report using the guidelines on the HP website (http://www.hp.com/go/OAlog).

- HP SIM

    HP SIM offers remote access for event monitoring, maximizing uptime for servers and storage. HP SIM provides the ability to remotely monitor fault management and event handling in combination with scripting options for custom configuration of policies. Performance is another key feature of HP SIM used to analyze environment for performance bottlenecks. For more information about HP SIM, see the HP website (http://www.hp.com/go/hpsim).

- Virtual Connect (for HP ProLiant server blades)

    The GUI provides a syslog containing detailed information that may not be reported in VC logs yet. Other access to VC is through the CLI. For more information on how to remotely access the VC manager, see "Remote access to the VCM ("Remote access to the Virtual Connect Manager" on page 23)."

    For more information on capturing Healthreport, SHOW ALL, and SupportDump Files using VCSU, see the HP website (http://www.hp.com/go/VClog).

- Active Health System (on page 79)

    The HP Active Health System monitors and records changes in the server hardware and system configuration. The Active Health System assists in diagnosing problems and delivering rapid resolution when server failures occur. The Active Health System log ("Active Health System log overview" on page

104), in conjunction with the system monitoring provided by Agentless Management or SNMP Pass-thru, provides continuous monitoring of hardware and configuration changes, system status, and service alerts for various server components.

The Agentless Management Service is available in the SPP, which is a disk image (.iso) that you can download from the HP website (http://www.hp.com/go/spp/download). The Active Health System log can be downloaded manually and sent to HP. For more information, see "Active Health System log overview (on page 104)" or one of the following documents:

o   *HP iLO User Guide* on the HP website (http://www.hp.com/go/ilo/docs)

o   *HP Intelligent Provisioning User Guide* on the HP website (http://www.hp.com/go/intelligentprovisioning/docs)

Remote access to the Virtual Connect Manager

To access the VCM CLI remotely through any SSH session:

1.   Using any SSH client application, start an SSH session to the VCM.

2.   When prompted, enter the assigned IP address or DNS name of the VCM.

3.   Enter a valid user name.

4.   Enter a valid password. The CLI command prompt is displayed.

5.   Enter commands for the VCM.

6.   To terminate the remote access SSH session, close the communication software or enter Exit at the CLI command prompt.

For more information, see the *HP Virtual Connect Manager Command Line Interface for c-Class BladeSystem User Guide* on the HP website (http://www.hp.com/go/vc/manuals).

Using HP iLO for remote troubleshooting of servers and server blades

1.   Log in to the iLO web interface.

2.   Review the initial **Overview** screen for status and health.

Observe the following fields on the **Overview** screen:

o   **System ROM**

o   **iLO Firmware Version**

o   **System Health**

o   **Server Power**

o   **SD-Card Status**

3.   Navigate to the **Information** > **System Information** page, and then click the **Summary** tab.

a.   Review all installed **Subsystems and Devices** to verify that all are marked OK and Green.

b.   If any degraded subsystems or devices exist, then click the degraded subsystem or device to review the status. Logical drives must be configured in either HP SSA before the drives are displayed. The storage tab displays the drive firmware and the drive/cache module serial number, if needed for replacement.

4.   On the **Firmware** tab, review the list of firmware versions on the server.

5. Review the Event Log and IML for possible hardware faults or power-on or boot up issues when the server is not booting properly.

6. Review the **Information** > **Diagnostics** page. From this page, you can do the following:
   o Verify the status of iLO Self-Test Results.
   o Use the **Reset** button to reset iLO.
   o If a memory dump recording is required, use the **Generate NMI to System** button to Initiate NMI for a memory dump recording.

7. Be sure the **Power On** and **Health** status icons in the lower right portion of the iLO screen are green.

The System Information screen content can be downloaded using the XML command:
```
<GET_EMBEDDED_HEALTH />
```

The following example uses the HP Onboard Administrator CLI for a blade in bay 6:
```
hpONCFG 6 << end_marker
<RIBCL VERSION="2.21">
  <LOGIN USER_LOGIN="adminname" PASSWORD="password">
    <SERVER_INFO MODE="read">
 <GET_EMBEDDED_HEALTH />
    </SERVER_INFO>
  </LOGIN>
</RIBCL>
end_marker
```

Using Onboard Administrator for remote troubleshooting of server blades

1. Review the **Entire Enclosure Status** in the upper left corner of the **System Status** view screen.

   This shows how the entire enclosure is operating. Critical events, such as incorrectly placed components like mezzanine boards and interconnect devices, are displayed.

   For more information on how to review the Onboard Administrator SHOW ALL output for warnings or possible failures, see the *HP BladeSystem c-Class Enclosure Troubleshooting Guide* on the HP website (http://www.hp.com/support/BladeSystem_Enclosure_TSG_en).

2. To verify the status and diagnostics for the blade, access **Device bays > Host > Status** tab.

3. Review the **IML** tab for possible server hardware events that require action.

4. Review possible interconnect link state issues on the **Status** tab **> Port Mapping Information**.

   Any Green indicator on a Port indicates that a link is available at the transportation layer. This means that a NIC or a possible SAN connection should be established and that the midplane signals are transferred correctly from the server to the interconnect device.

   The **Table view** tab on this screen displays the Port Status indicator as Green for all connections.

   For any ports that are not green or that are failed ports, review the signal backplane on the server or the midplane for damage.

   For any blade power on issues, review the **HP iLO** screen on the **Status** tab and the **Event Log** tab on the "iLO – Device bay x" page.

5. If all status indicators are green and no warnings, failed, or degraded components exist, then proceed to the iLO WEB guide (**Status Tab > iLO > Web Administration**).

6. If the blade is not displayed in the Insight Display on the enclosure or within the OA GUI, then troubleshoot the issue further using the procedures in the *HP BladeSystem c-Class Enclosure Troubleshooting Guide* on the HP website (http://www.hp.com/support/BladeSystem_Enclosure_TSG_en).

Using the OA CLI

Gather and review health and system information using the OA CLI to troubleshoot the system:

- For systems using OA firmware 3.60 or later, execute the SHOW HEALTH CLI command and review the health status for the entire enclosure. The SHOW HEALTH status output is included within the OA SHOW ALL report as well as the first executed SHOW command.

- Execute the SHOW ALL command from either the OA GUI or the OA CLI as follows:
  - o OA GUI > Enclosure Settings > Configuration Scripts > SHOW ALL
  - o OA CLI > Execute the following CLI command: SHOW ALL

  This command executes all OA CLI SHOW commands to provide a detailed report of the enclosure configuration, status, and inventory available.

To gather and respond to information obtained by the SHOW ALL command, do the following:

1. For systems using OA firmware 3.60 and earlier, review the SHOW ENCLOSURE LCD output of the SHOW ALL report. A display status of "Blinking" indicates a warning condition. Review the data or remotely review messages on the Insight Display through the OA GUI.

2. For a status overview of the enclosure, review the output of the following commands listed in the SHOW ALL report:
   - o SHOW ENCLOSURE STATUS
   - o SHOW SERVER STATUS ALL
   - o SHOW INTERCONNECT STATUS ALL

   If the status of a component is "Degraded," then observe the subcomponents one by one to discover the degraded component. Subcomponents that are faulty can be marked as such.

3. Review the system log (SYSLOG) section of the SHOW ALL report to locate information that might be pertinent to the current issue.

   If the time frame of the failure is not available within the system log, then review the extended system log using the following CLI command:
   SHOW SYSLOG HISTORY 0

4. To search for support information about the issue (if available), go to the HP website (http://www.hp.com/go/hpsc) and do the following:
   a. Enter **HP Onboard Administrator** in the **Enter a product name or number** field.
   b. Select **HP Onboard Administrator** from the results list.
   c. Enter text from the system log or related search words into the **Search HP Onboard Administrator** field.

5. For any low level (transport layer) SAN or network connectivity errors in an interconnect device or network card connection, review any low level FRU firmware update information provided by the SHOW UPDATE output in the SHOW ALL report. Any newer version available in the New Version column must be updated using the UPDATE DEVICE command. These errors cause an interruption in I/O connectivity, so update the firmware per module and not simultaneously. For more information about

the `UPDATE DEVICE` command, see the *HP BladeSystem Onboard Administrator Command Line Interface Users Guide* on the HP website (http://www.hp.com/support/BladeSystem/docs).

6. Capture any entry in the system log file referring to "Saving supportdump" by using the OA CLI command `UPLOAD SUPPORTDUMP`. Send this file to HP Support for analysis, if needed. For more information, see the HP website (http://www.hp.com/go/OAsupportdump).

Diagnostic flowcharts

Troubleshooting flowcharts

To effectively troubleshoot a problem, HP recommends that you start with the first flowchart in this section, "Start diagnosis flowchart (on page 29)," and follow the appropriate diagnostic path. If the other flowcharts do not provide a troubleshooting solution, follow the diagnostic steps in "General diagnosis flowchart (on page 49)." The General diagnosis flowchart is a generic troubleshooting process to be used when the problem is not server-specific or is not easily categorized into the other flowcharts.

The available flowcharts include:

- Start diagnosis flowchart (on page 29)
- Remote diagnosis flowchart (on page 29)
- Power-on problems flowchart (on page 30)
  - o Server power-on problems flowchart (ML, DL, and SL series) (on page 30)
  - o Server power-on problems flowchart (XL series) (on page 31)
  - o Server blade power-on problems flowchart (BL series) (on page 32)
- POST problems flowchart (on page 34)
- Intelligent Provisioning problems flowchart (on page 36)
- Controller problems flowchart ("Controller problems" on page 36)
- Cache module problems flowchart ("Cache module problems" on page 38)
- HP Smart Storage Battery problems flowchart ("HP Smart Storage Battery problems" on page 39)
- Physical drive problems flowchart ("Physical drive problems" on page 40)
- Logical drive problems flowchart ("Logical drive problems" on page 41)
- OS boot problems flowchart (on page 42)
- Fault indications flowchart (on page 43)
  - o Server fault indications flowchart (non-blade servers) (on page 44)
  - o Server fault indications flowchart (BL series) (on page 45)
- Power profile problems flowchart ("Power profile problems" on page 45)
- NIC problems flowchart ("NIC problems" on page 46)
- General diagnosis flowchart (on page 49)

Using the Diagnostic flowcharts

Some information provided in the flowcharts can be further explained in conjunction with other sources of information provided on the HP website and in other sections of this document. To locate the appropriate information, click on the underlined text in the flowcharts.

Gather important information before you begin

Before you begin troubleshooting the problem, gather the following information for use during troubleshooting and for use should the problem require contacting HP support:

- IML ("Integrated Management Log" on page 80)
- POST error messages ("Error message resources" on page 94)
- Server and component information ("Server information you need" on page 100)
- Operating system information ("Operating system information you need" on page 101)
- Symptom information (on page 13)
- Active Health System log ("Active Health System log overview" on page 104)
- OA SHOW ALL report (for HP ProLiant BL Server Blades only) — For more information, see "Using the OA CLI (on page 25)."
- Other reports and logs (on page 103)

Troubleshooting flowchart reference websites

Each flowchart contains references to external websites. The following websites correspond to the numbered websites in each flowchart:

1. HP Support Center (http://www.hp.com/go/hpsc)
2. HP ProLiant product documentation:
   - HP Enterprise Information Library (http://www.hp.com/support/proliantgen9/docs)
   - HP BladeSystem Information Library (http://www.hp.com/support/BladeSystem/docs)
3. HP iLO Information Library (http://www.hp.com/go/ilo/docs)
4. Intelligent Provisioning Information Library (http://www.hp.com/go/intelligentprovisioning/docs)
5. HP BladeSystem Power Sizer (http://www.hp.com/go/bladesystem/powercalculator)

   Use the Power Sizer to plan your power infrastructure and meet the needs of an HP BladeSystem solution.
6. System Management Homepage (https://localhost:2381)

   Access consolidated system management information.
7. HP ProLiant UEFI Information Library (http://www.hp.com/go/ProLiantUEFI/docs)

Start diagnosis flowchart

Use the following flowchart to start the diagnostic process.
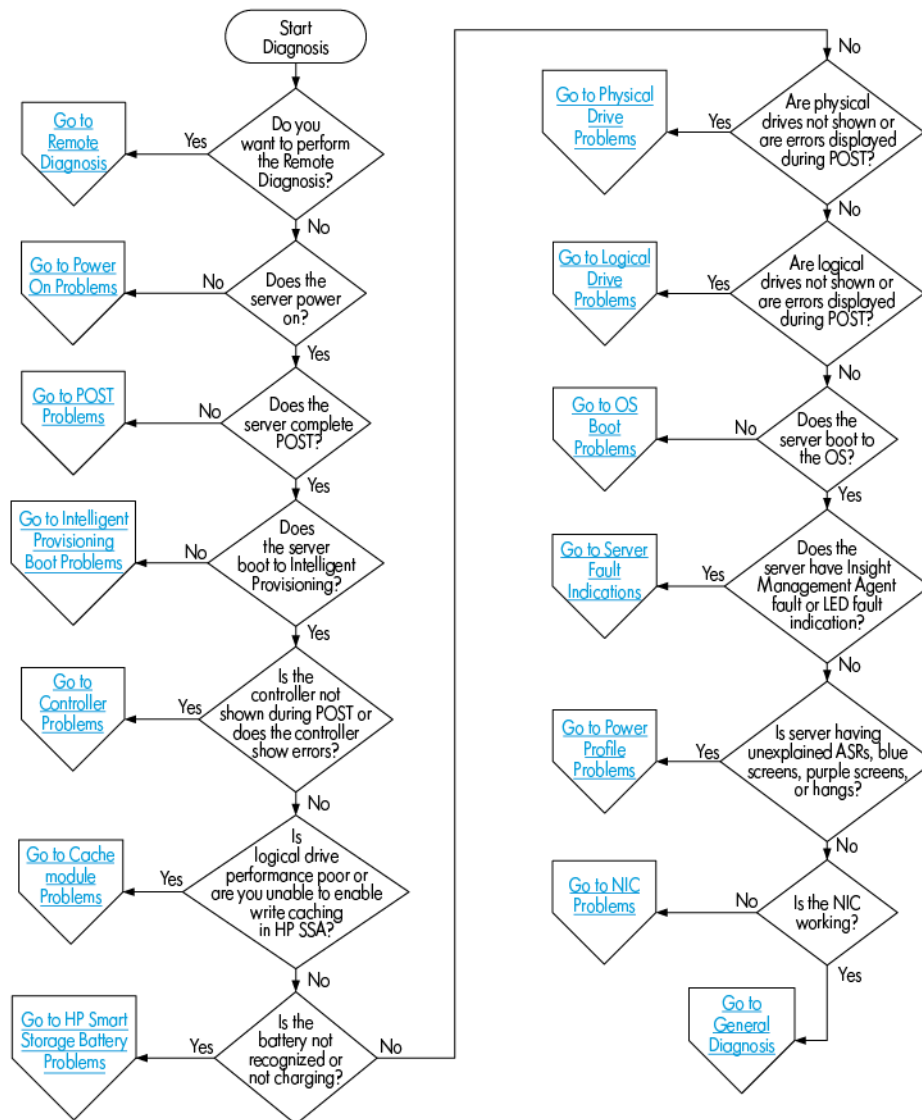
Remote diagnosis flowchart

The Remote diagnosis flowchart provides a generic approach to troubleshooting a server from a remote location.
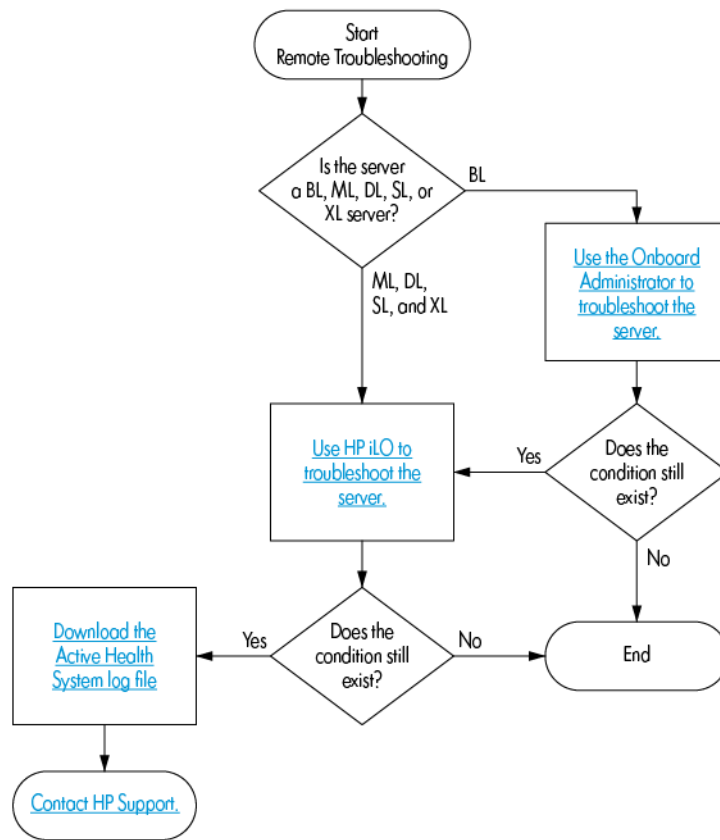
Power-on problems flowchart

Server power-on problems flowchart (ML, DL, and SL series)

For the location of server LEDs and information on their statuses, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

Symptoms:

- The server does not power on.
- The system power LED is off or solid amber.
- The health LED is solid red, flashing red, solid amber, or flashing amber.

Possible causes:

- Improperly seated or faulty power supply
- Loose or faulty power cord
- Power source problem
- Improperly seated component or interlock problem
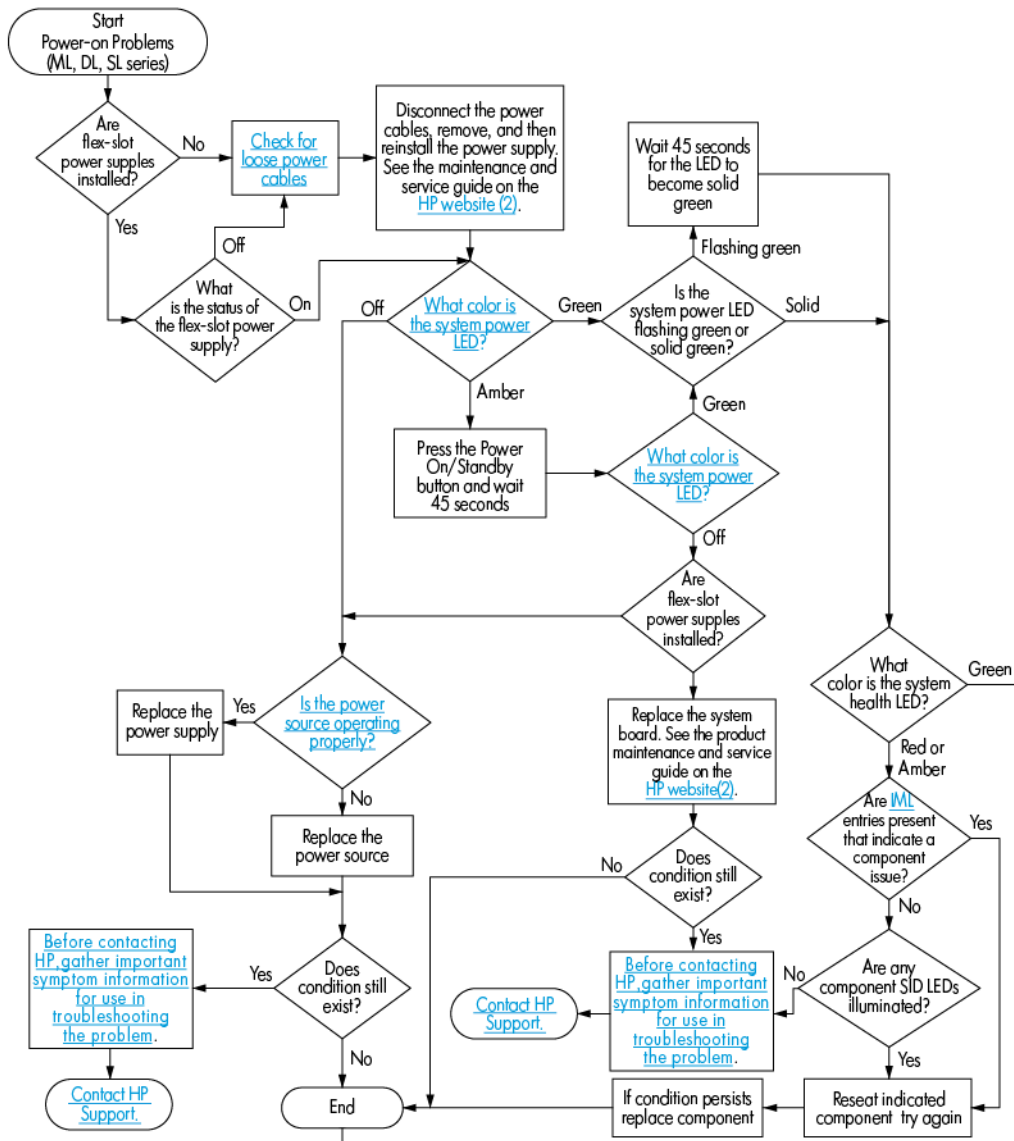
Server power-on problems flowchart (XL series)

For the location of server LEDs and information on their statuses, see the server documentation in the HP Enterprise Information Library (http://www.hp.com/support/proliantgen9/docs). System power and health LED definitions are also available in "Component LED definitions (on page 19)."

Symptoms:

- The server blade does not power on.
- The system power LED is off or solid amber.
- The health LED status bar is flashing red or flashing amber.

Possible causes:

- The server is not properly installed in the enclosure.
- The server is not configured to automatically power on in HP iLO.

- The power being supplied is not sufficient for the server installed in the chassis.
- The power cap is not configured properly for the chassis.
- The management module is not properly installed in the chassis.
- A power fault has occurred.
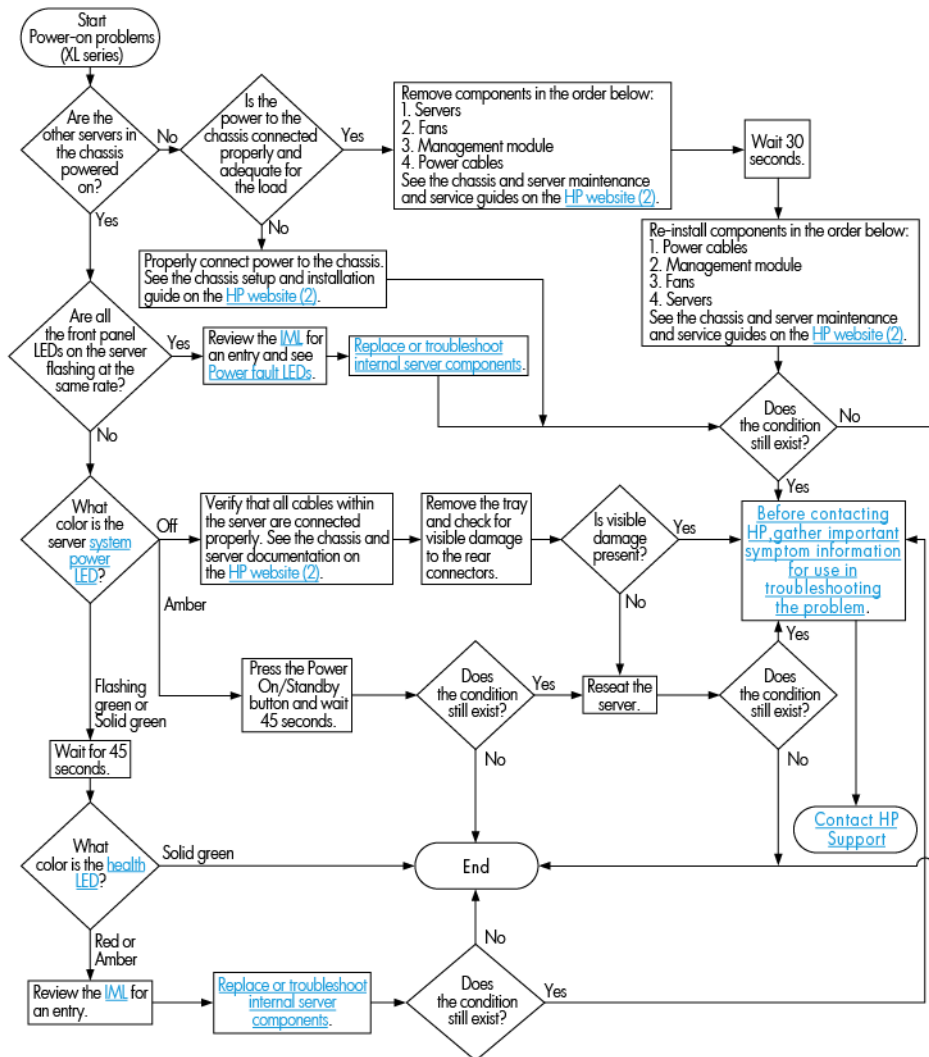
Server blade power-on problems flowchart (BL series)

For the location of server LEDs and information on their statuses, see the server documentation in the HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs). System power and health LED definitions are also available in "Component LED definitions (on page 19)."

Symptoms:

- The server blade does not power on.
- The system power LED is off or solid amber.
- The health LED status bar is flashing red or flashing amber.

Possible causes:

- The server blade is not properly installed in the enclosure.
- The server blade is not configured to automatically power on in HP iLO.
- The power being supplied is not sufficient for the server blades installed in the enclosure.
- The power cap is not configured properly for the enclosure.
- The OA module is not properly installed in the enclosure.
- A possible communication failure between HP iLO and the OA is causing the server blade to wait for permission to power on.
- The server blade has a mismatched fabric installed on the mezzanine 1 connector or the mezzanine 2 connector.

Server blade power-on problems flowchart (page 1 – remote troubleshooting)
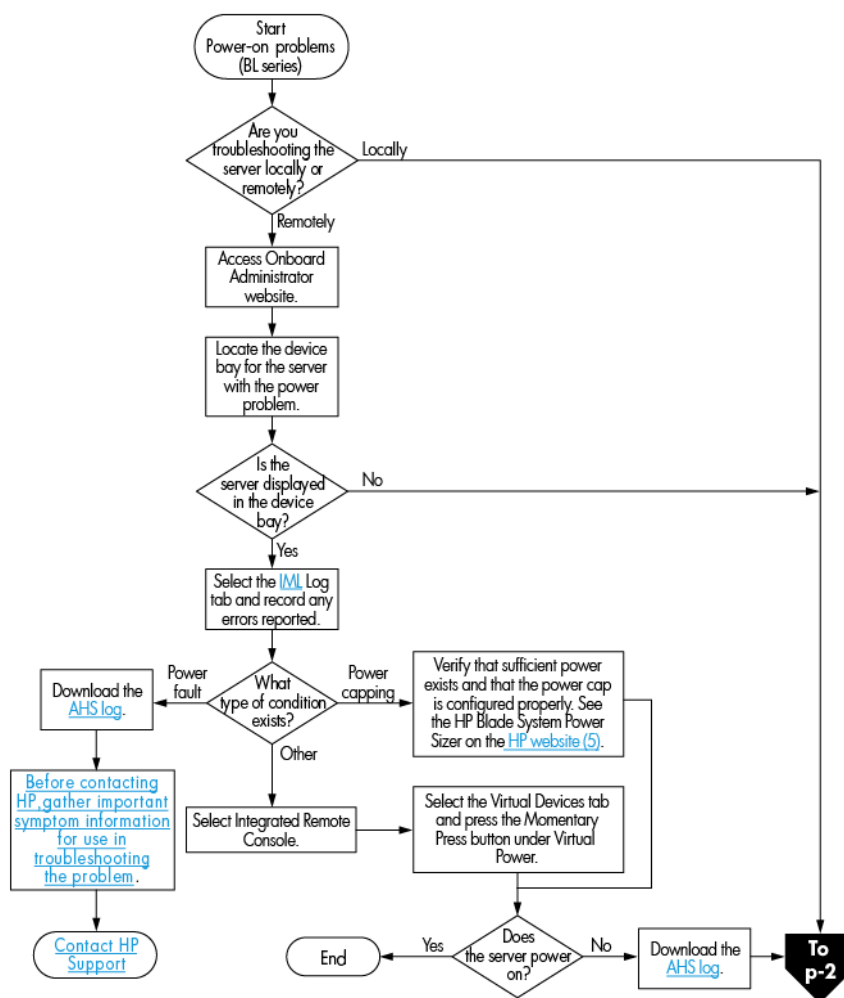
Server blade power-on problems flowchart (page 2 – local troubleshooting)
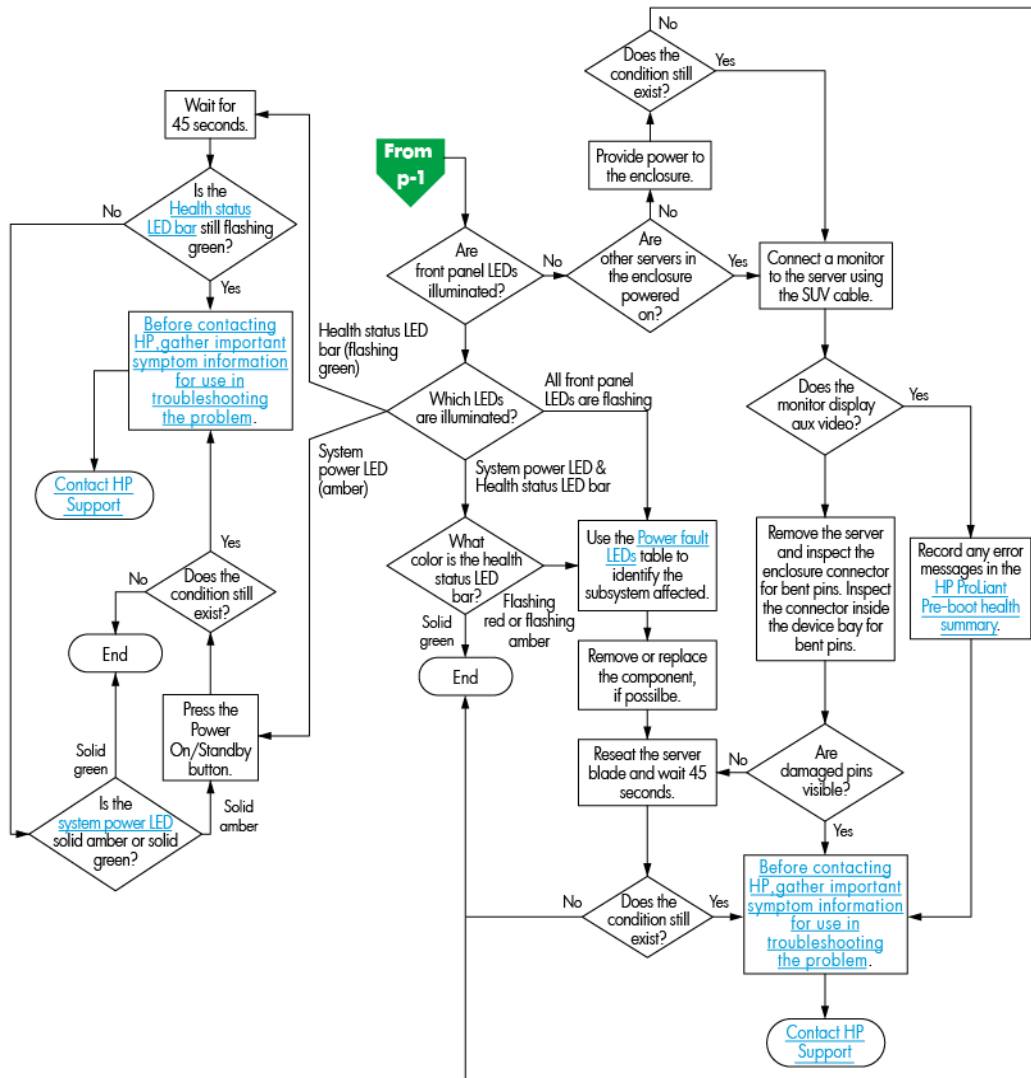
POST problems flowchart

Symptoms:

- Server does not complete POST
- Server completes POST with errors

Possible causes:

- Improperly populated memory
- Outdated firmware on adapter options
- Unsupported adapter
- Improperly seated or faulty internal component
- Faulty video device

POST problems flowchart (page 1 of 2)

Start POST problems

Does the system have power? → No → Go to Power on problems flowchart

Yes

What color is the system power LED?
- Amber → Check IML using iLO and follow instructions.
- Off / Solid green → Is video displayed?
- Flashing green → Wait 2 minutes.

Wait 2 minutes → What color is the system power LED?
- Amber or flashing green → Check IML using iLO and follow instructions.
- Solid green → Is video displayed?

Is video displayed? → No → Is video cabled correctly? → Yes → To p-2
Is video cabled correctly? → No → Correct the video cabling. See the server user guide on the HP website (2).

Is video displayed? → Yes → Has system attempted to boot an OS?
- Yes → Go to OS boot problems flowchart
- No → Are POST error messages displayed?

Correct the video cabling. See the server user guide on the HP website (2). → Does issue still exist?
- Yes → Are POST error messages displayed?
- No → End

Are POST error messages displayed?
- No → Did system experience a red screen?
- Yes → See the HP ProLiant Gen9 Troubleshooting Guide, Volume II: Error Messages.

Did system experience a red screen?
- No → Check IML using iLO and follow instructions.
- Yes → Review the text on the red screen.

Review the text on the red screen. → Troubleshoot the last component indicated on the screen during boot.

Check IML using iLO and follow instructions. → Does the condition still exist?
- No → End
- Yes → If the server has a SID, review LEDs on SID to isolate component problems. If no SID, use component LEDs to isolate problem. See server user guide on the HP website (2).

If the server has a SID, review LEDs on SID to isolate component problems. If no SID, use component LEDs to isolate problem. See server user guide on the HP website (2). → Reseat the component indicated by the LED and/or check for loose connections.

Reseat the component indicated by the LED and/or check for loose connections. → If reseating devices indicated by error LEDs and the condition still exists, replace the component. See the maintenance and service guide on the HP website (2).

If reseating devices indicated by error LEDs and the condition still exists, replace the component. See the maintenance and service guide on the HP website (2). → Does the condition still exist?
- No → (left)
- Yes → Update all component firmware to the latest verision.

Update all component firmware to the latest verision. → Does the condition still exist?
- No → End
- Yes → Before contacting HP, gather important symptom information for use in troubleshooting the problem. → Contact HP Support

POST problems flowchart (page 2 of 2)

From p-1

Check IML using iLO and follow instructions. → Does the condition still exist?
- Yes → If the server has a SID, review LEDs on SID to isolate component problems. If no SID, use component LEDs to isolate problem. See server user guide on the HP website (2).
- No → End

If the server has a SID, review LEDs on SID to isolate component problems. If no SID, use component LEDs to isolate problem. See server user guide on the HP website (2). → Reseat components and check for loose connections.

Reseat components and check for loose connections. → If the condition still exists, replace the component. See the maintenance and service guide on the HP website (2).

If the condition still exists, replace the component. See the maintenance and service guide on the HP website (2). → Does the condition still exist?
- No → (left)
- Yes → Reboot the server.

Reboot the server. → Does the condition still exist?
- No → End
- Yes → Before contacting HP, gather important symptom information for use in troubleshooting the problem. → Contact HP Support

Intelligent Provisioning problems flowchart

Symptom:

Server does not boot to Intelligent Provisioning (F10).

Possible causes:

- Corrupted installation of Intelligent Provisioning
- Hard drive subsystem problem
- Incorrect setting in UEFI System Utilities

Controller problems

Symptom:

- The array controller is not visible during the POST process.
- The Smart Array controller shows errors during the POST process.

Possible causes:

- The hardware is physically damaged.
- The controller is not supported on the server.
- The controller is faulty.
- The firmware is outdated.

Controller problems (1 of 2)
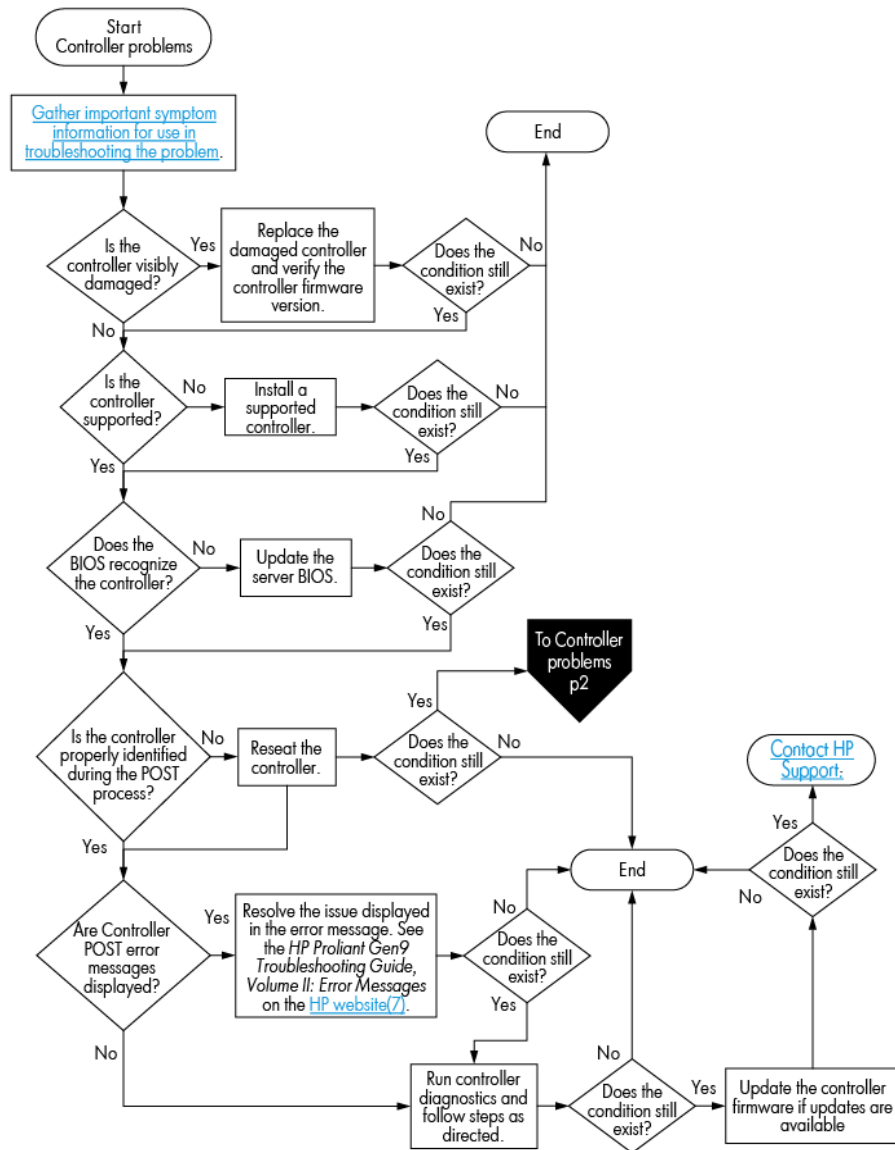
Controller problems (2 of 2)
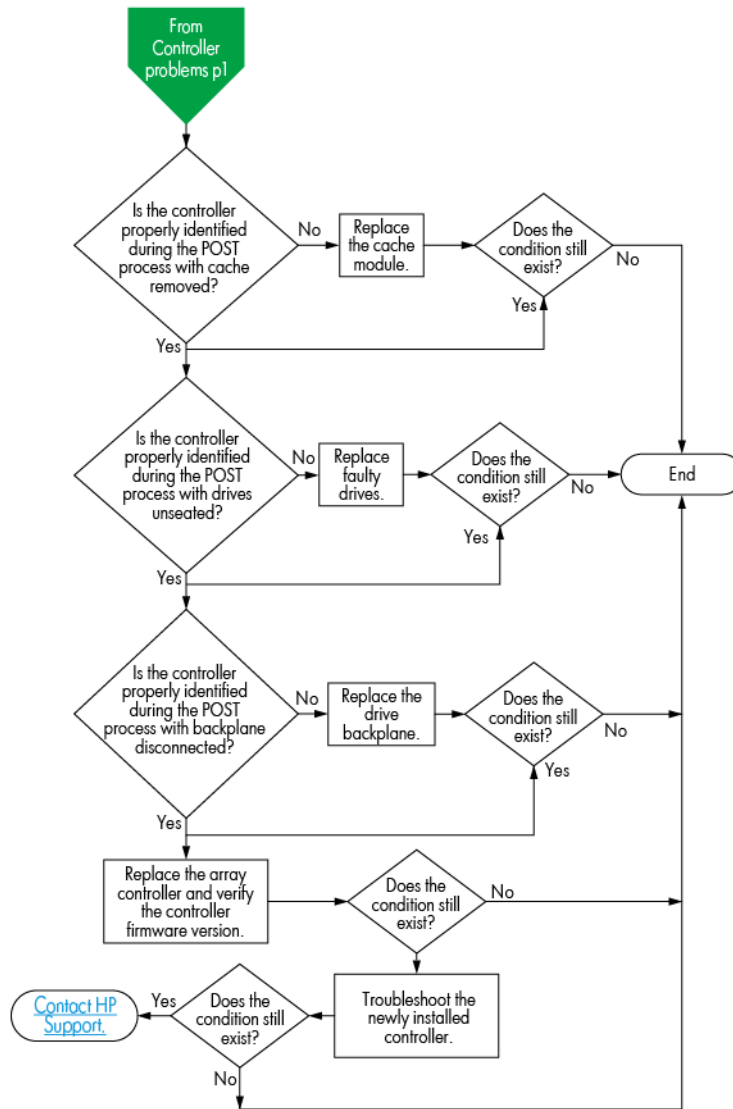
Cache module problems

Symptom:

- The logical drive performance is poor.
- Write-caching cannot be enabled in HP SSA.
- The cache module shows errors during the POST process.

Possible causes:

- The cache module is missing or failed.
- The battery is not sufficiently charged.

- The cache module is not supported on the server.
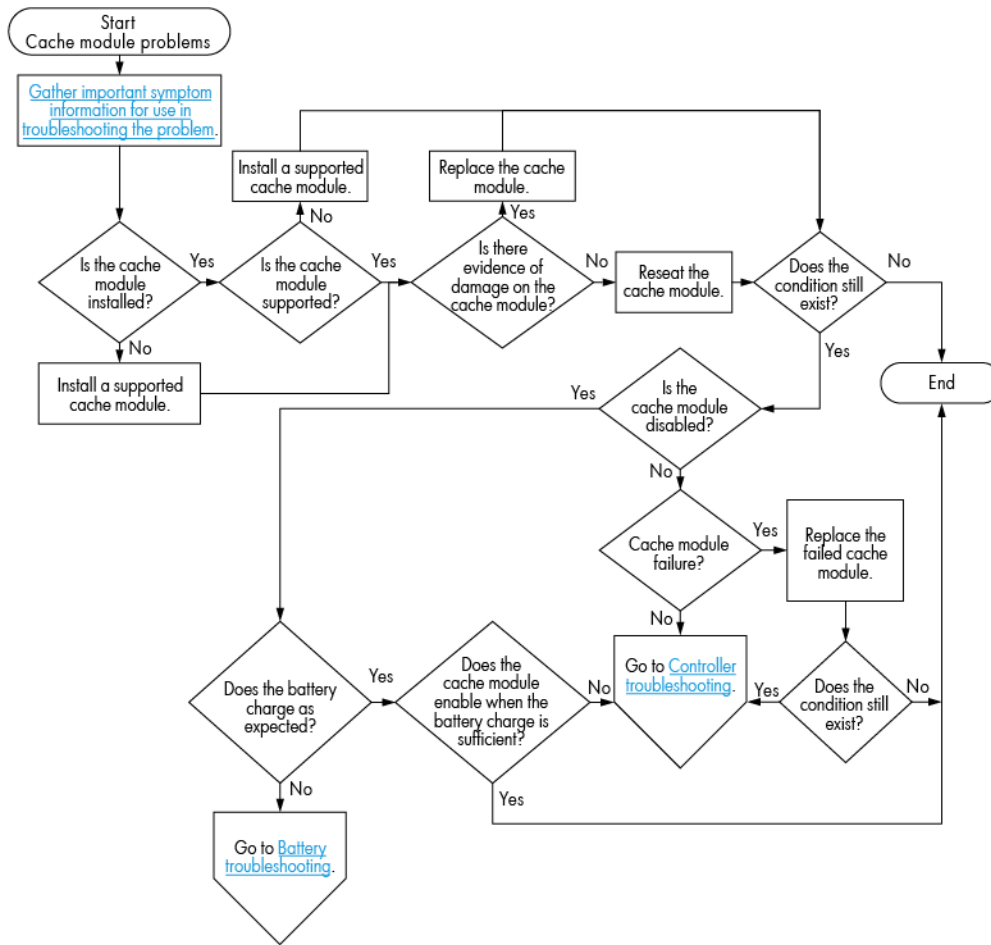
HP Smart Storage Battery problems

Symptom:

- The battery is not recognized.
- The battery is not charging.

Possible causes:

- The battery is unsupported on this server.
- The battery cable connector needs to be reseated.

- The battery is faulty.

Start
HP Smart Storage Battery problems

Gather important symptom information for use in troubleshooting the problem.

Is a battery installed? — No → Install a supported HP Smart Storage battery. → Does the condition still exist? — No → End
Yes

Is the battery supported? — No
Yes

Is the battery damaged? — No → Reseat the battery connector.
Yes

Replace the HP Smart Storage battery.

Does the condition still exist? — No
Yes

Has the battery failed? — No → Monitor the HP Smart Storage battery charge process.
Yes

Replace the HP Smart Storage battery. → Does the condition still exist? — No
Yes

Does the battery charge as expected? — No / Yes → Does the condition still exist? — Yes → Go to Cache module troubleshooting or Controller troubleshooting.
No

Physical drive problems

Symptom:

- A hard drive is not available.
- Drive errors are displayed during POST in the logs.

Possible causes:

- The drive is faulty.
- The firmware is outdated.

- The drive does not match other drives in the same configuration.
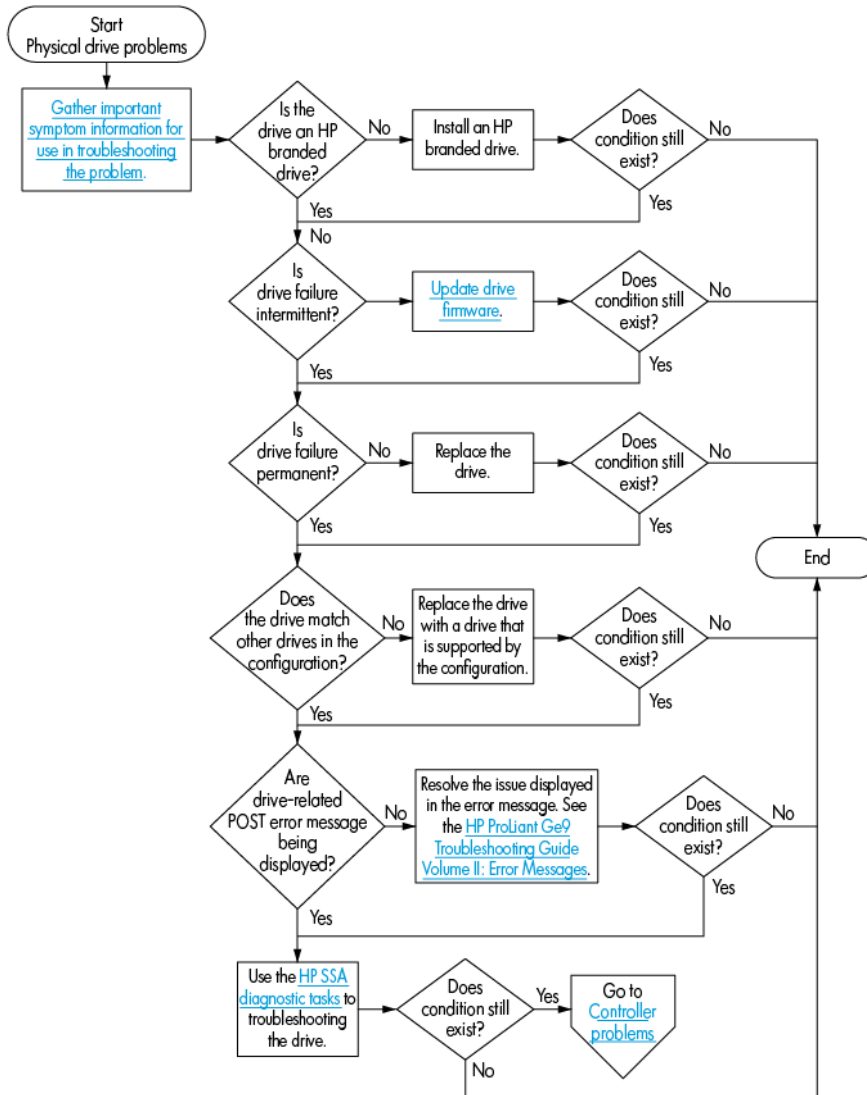
Logical drive problems

Symptom:

- Logical drive errors are displayed during POST or in one of the logs.
- The logical drives associated with an array controller are not visible during POST.

Possible causes:

- The controller is not in RAID mode.
- The drives or cables are not seated properly.
- The associated physical drives are not available.

- Logical drives are configured.
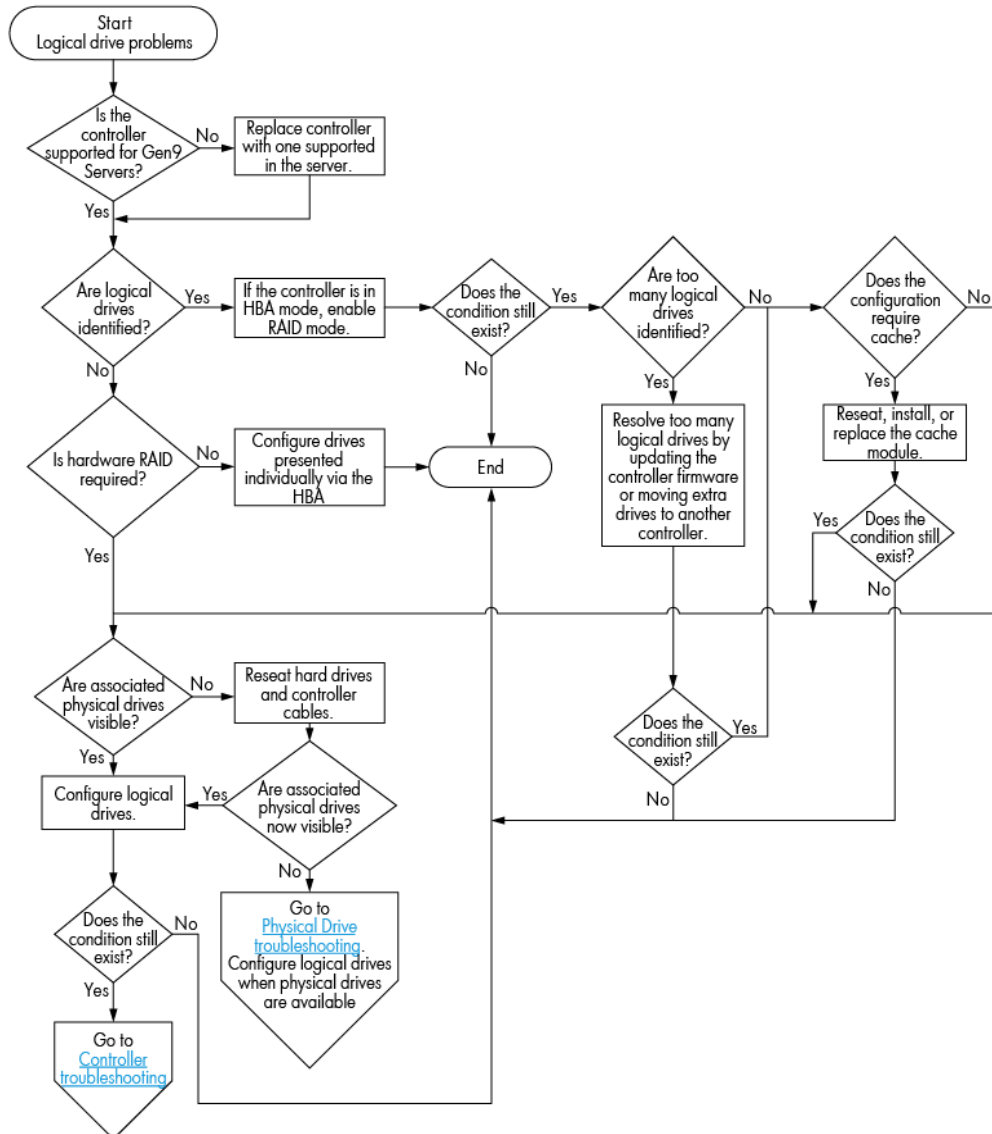
OS boot problems flowchart

Symptom:

Server does not boot a previously installed OS.

Possible causes:

- Corrupted OS
- Hard drive subsystem problem

- Incorrect setting in UEFI System Utilities
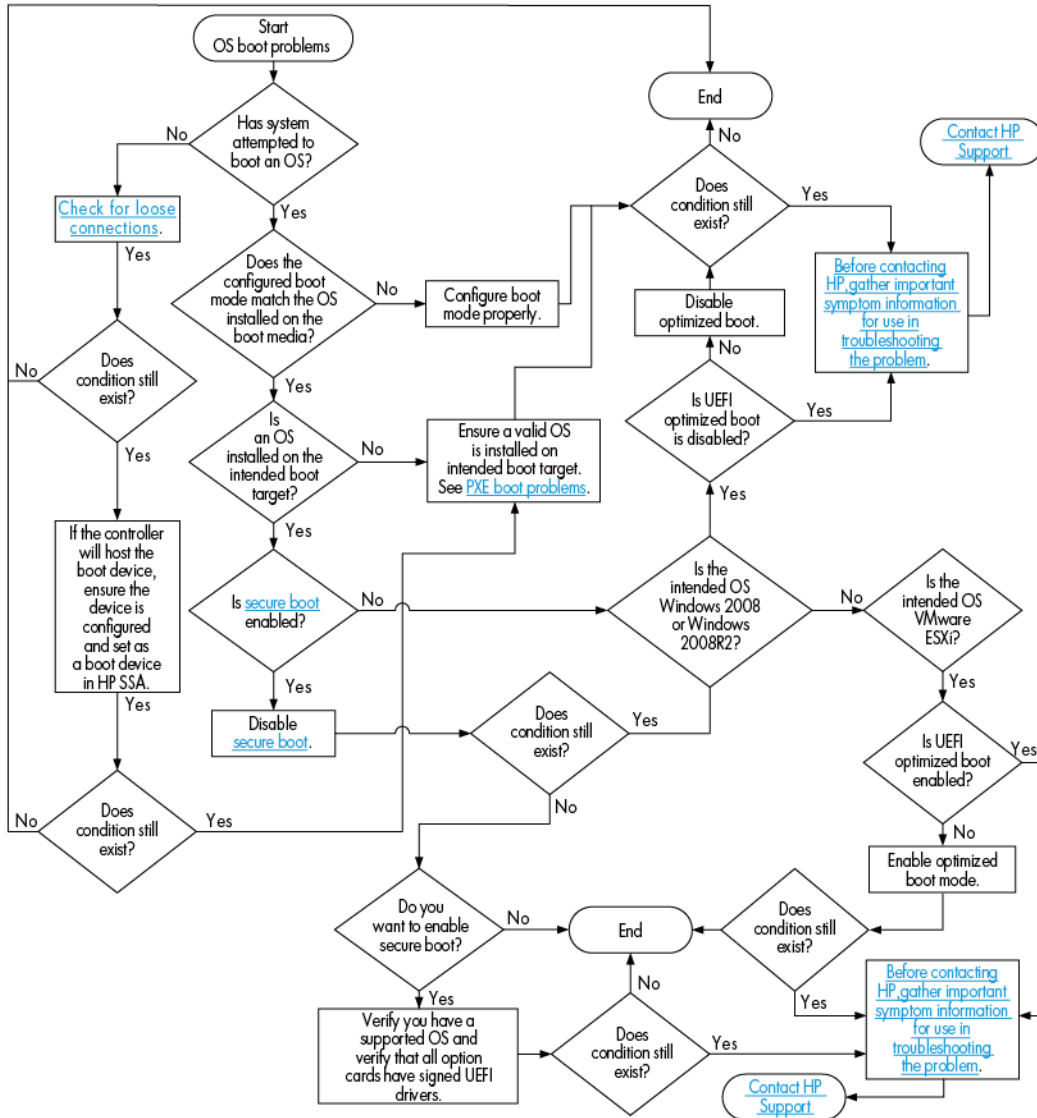
Fault indications flowchart

Symptoms:

- Server boots, but a fault event is reported by Insight Management Agents
- Server boots, but the system health LED or component health LED is red or amber

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

Possible causes:

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

- System overtemperature condition

Server fault indications flowchart (non-blade servers)

Some servers have an internal health LED and an external health LED, while other servers have a single system health LED. The system health LED provides the same functionality as the two separate internal and external health LEDs. Depending on the model, the internal health LED and external health LED may either appear solid or they may flash. Both conditions represent the same symptom.

For the location of server LEDs and information on their statuses, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

Server fault indications flowchart (BL series)

Power profile problems

Symptom:

- Unexplained ASRs, blue screens, purple screens, or server hangs occur unexpectedly.
- Poor performance exists with some applications.

Possible causes:

- Power profile settings allow the server to get to a state that cannot be exited quickly enough to avoid timeouts.

• The transitions between power states result in poor performance.
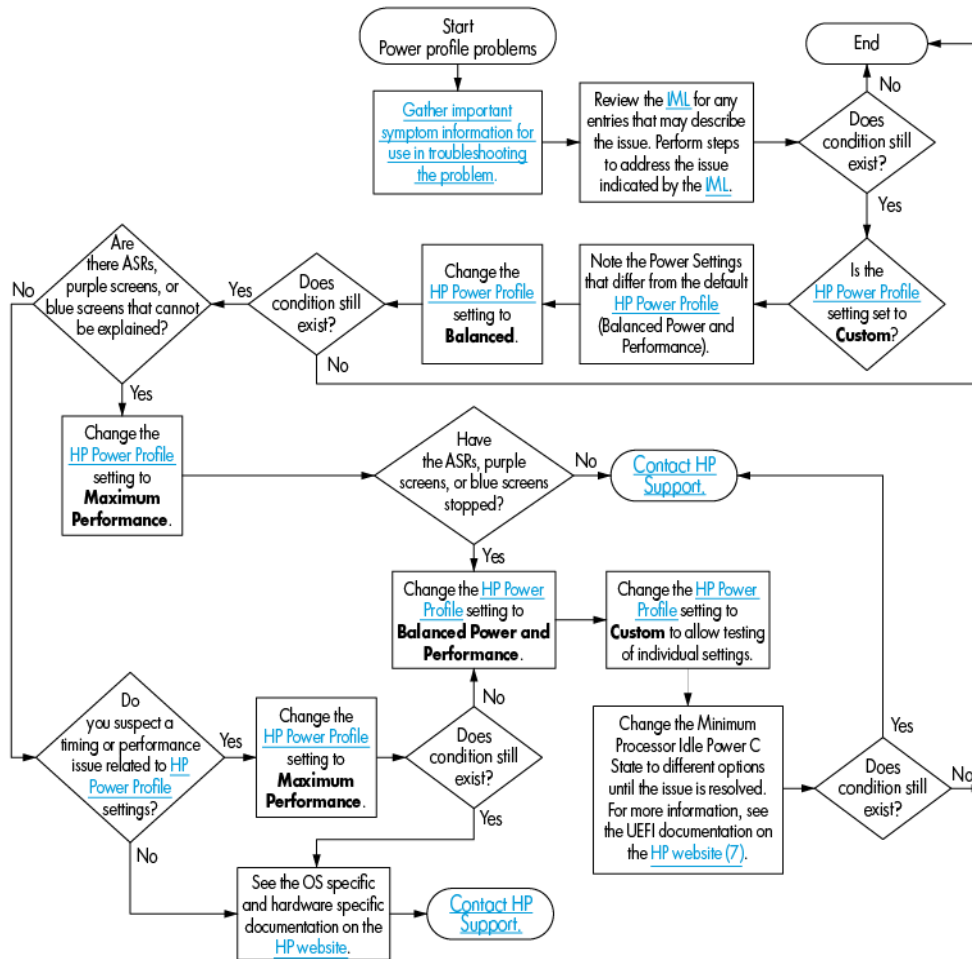
NIC problems

Symptoms:

• The NIC is not working.

• One or more ports on the NIC does not work.

Possible causes:

• The firmware or drivers are outdated, mismatched, or faulty.

• The NIC or cable is not seated properly.

• The NIC, the cable, or other hardware is faulty.

• The hardware components are not supported in the same configuration.

• The NIC is not supported on the server.

NIC problems flowchart (1 of 2)
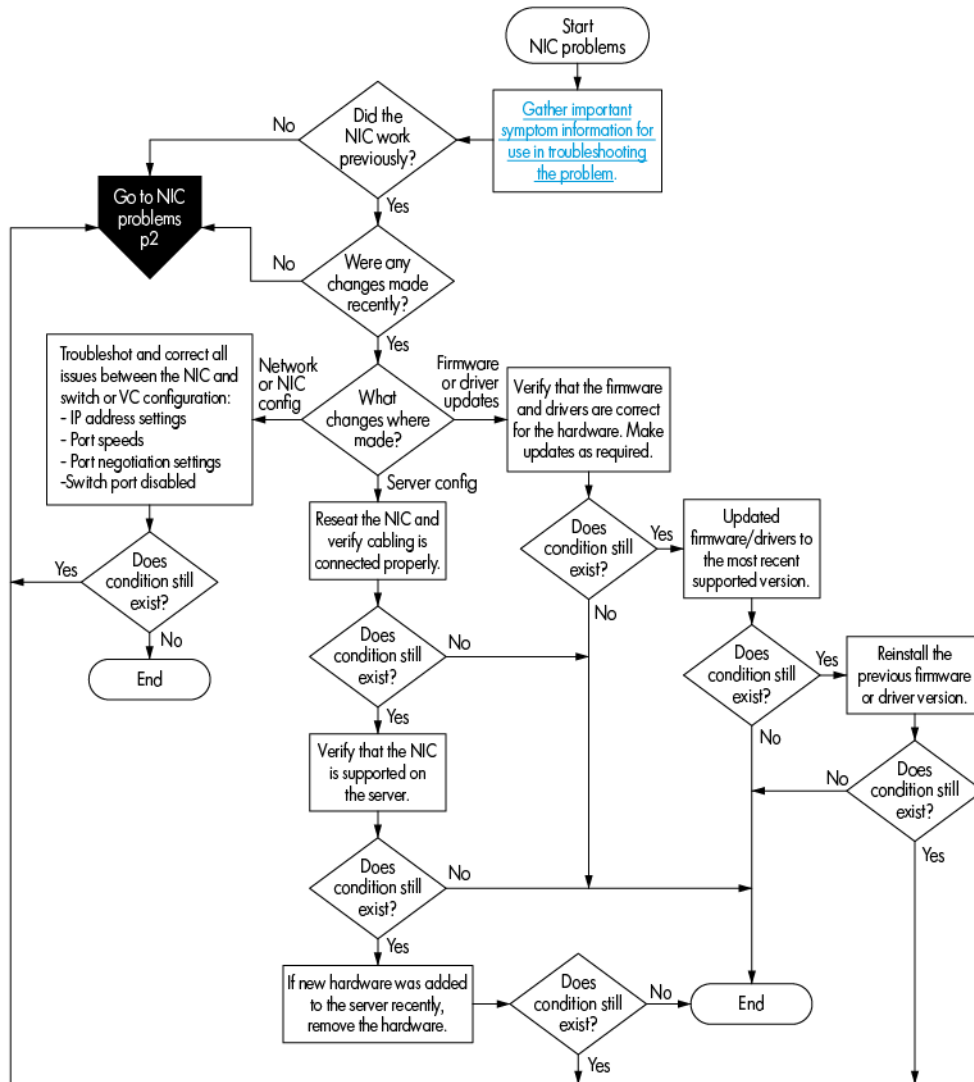
NIC problems flowchart (2 of 2)
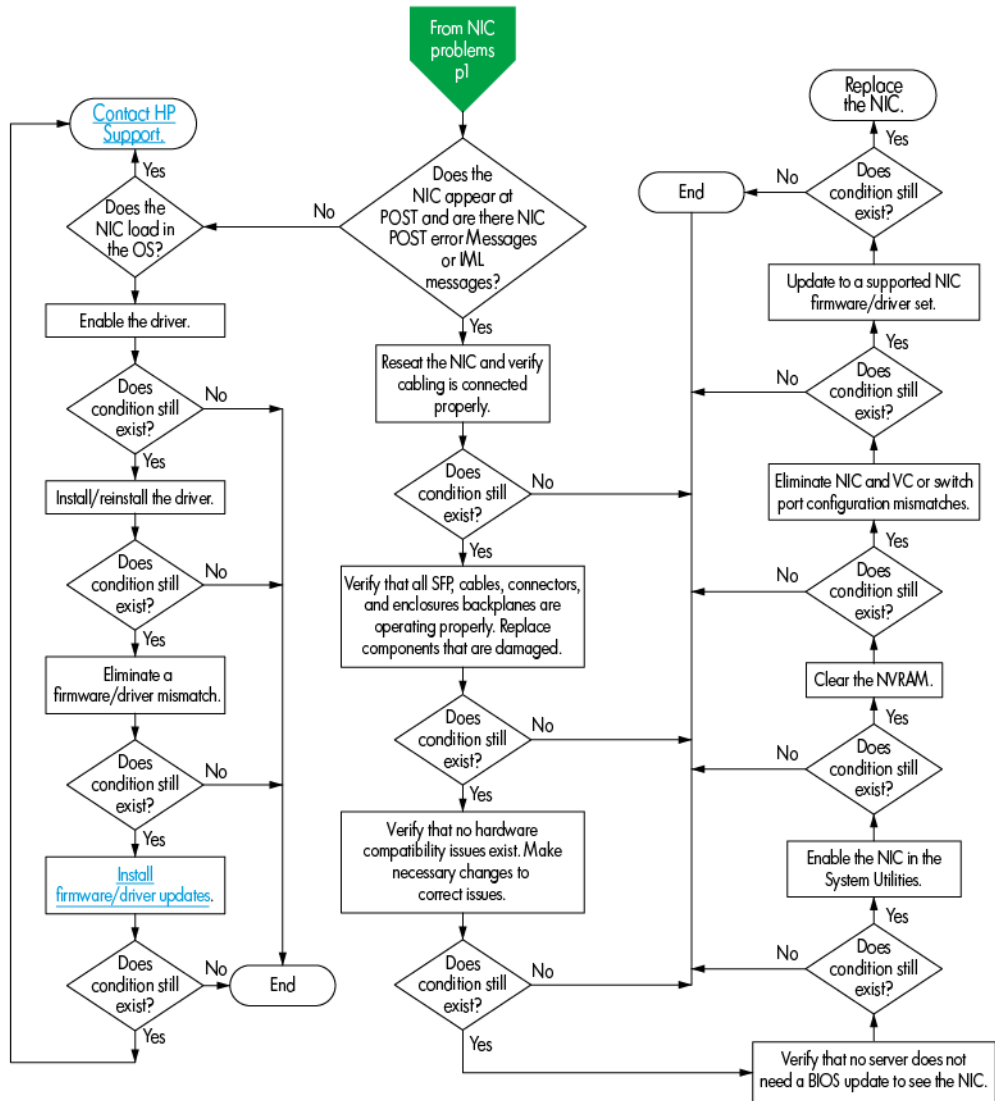
General diagnosis flowchart

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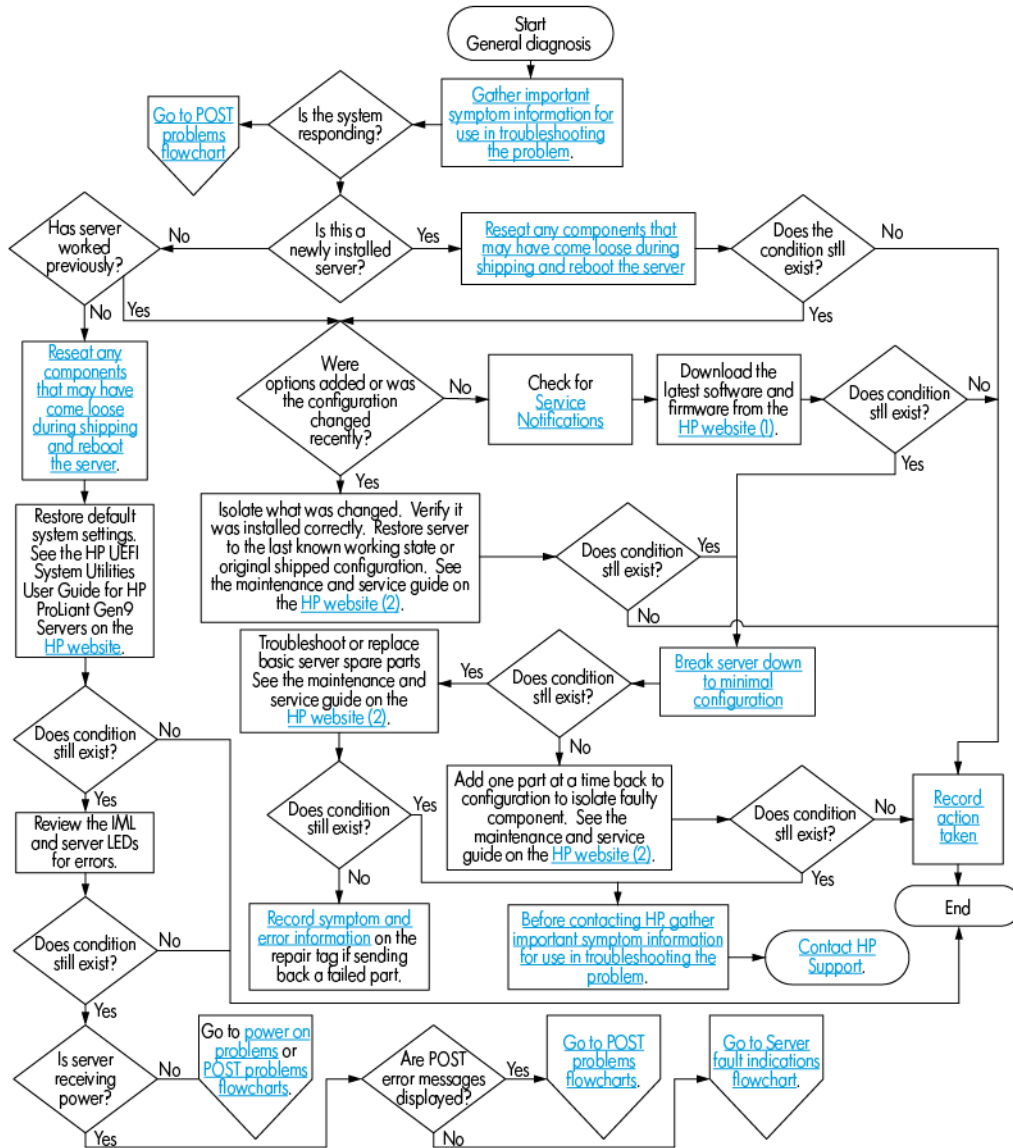
Hardware problems

Procedures for all ProLiant servers

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

> ⚠ **CAUTION:** Before removing or replacing any processors, be sure to follow the guidelines provided in "Performing processor procedures in the troubleshooting process (on page 15)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

Power problems

Power source problems

Action:

1. Press the Power On/Standby button to be sure it is on. If the server has a Power On/Standby button that returns to its original position after being pressed, be sure you press the switch firmly. For more information about system power LED status, see "System Power LED definitions (on page 20)."

2. Plug another device into the grounded power outlet to be sure the outlet works. Also, be sure the power source meets applicable standards.

3. Replace the power cord with a known functional power cord to be sure it is not faulty.

4. Replace the power strip with a known functional power strip to be sure it is not faulty.

5. Have a qualified electrician check the line voltage to be sure it meets the required specifications.

6. Be sure the proper circuit breaker is in the On position.

7. If Enclosure Dynamic Power Capping or Enclosure Power Limit is enabled on supported servers, be sure there is sufficient power allocation to support the server. For more information, see the following documents:

   o *HP Power Capping and HP Dynamic Power Capping for ProLiant servers (http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01549455/c01549455.pdf)* technology brief

   o *HP BladeSystem Onboard Administrator User Guide* on the HP website (http://www.hp.com/support/BladeSystem/docs)

8. Be sure no loose connections exist ("Loose connections" on page 17).

Power supply problems

Action:

1. Be sure no loose connections exist ("Loose connections" on page 17).

2. If the power supplies have LEDs, be sure they indicate that each power supply is working properly. If the LEDs indicate a problem with a power supply (red, amber, or off), then check the power source. If the power source is working properly, then replace the power supply. If the power supply LED is off, it could mean any of the following:

   o Power supply may not be fully seated
   o AC power unavailable
   o Power supply failed
   o Power supply in standby mode
   o Power supply exceeded current limit

   For more information, see the server documentation on the HP website (http://www.hp.com/go/hpsc) and see the "Power-on problems flowchart (on page 30)."

3. Be sure the system has enough power, particularly if you recently added hardware, such as hard drives. Remove the newly added component and if the problem is no longer present, then additional power supplies are required. Check the system information from the IML.

   For product-specific information, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

   For more information, see the HP Power Advisor on the HP website (http://www.hp.com/go/hppoweradvisor).

4. If running a redundant configuration, be sure that all of the power supplies in the system have the same spare part number and are supported by the server. For a list of supported power supplies, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

Server will not power on

Action:

- Review the "HP ProLiant Pre-boot Health Summary (on page 51)."
- See the "Power-on problems flowchart (on page 30)."

HP ProLiant Pre-boot Health Summary

The HP ProLiant Pre-boot Health Summary includes the following information:

- Server model number
- Server serial number
- Product ID
- iLO IP address (IPv4 and Ipv6)—This is displayed only if Show iLO IP during POST is set to Enabled on the Administration > Access Settings page in iLO.
- iLO Hostname
- iLO firmware version
- HP ProLiant System ROM version
- HP ProLiant System ROM – Backup version
- iLO CPLD version
- System CPLD version

- Embedded Smart Array version number—This value is displayed only if server POST has successfully completed since the last auxiliary power cycle.
- Critical events—The most recent Critical events from the IML are displayed, with the most recent event displayed first.

If the server will not start up, you can use HP iLO to display diagnostic information on an external monitor. This feature is supported on servers that support external video and have a UID button or an SUV connector. When power is available to the server but the server is not powered on, iLO runs on auxiliary power and can take control of the server video adapter to display the HP ProLiant Pre-boot Health Summary.

HP ProLiant c-Class server blades do not have a UID button, but can access the HP ProLiant Pre-boot Health Summary when the server blade is connected to video using the SUV cable as described in this procedure.

To verify that the server supports a UID button or video, see the server user guide.

To view the HP ProLiant Pre-boot Health Summary:

1. Verify that the server is off and that power is available to the server.
2. Verify that the UID LED is not flashing.

   The HP ProLiant Pre-boot Health Summary cannot be accessed when the UID LED is flashing, for example, if the remote console is in use, or a firmware update is in progress.
3. Do one of the following:
   - Press and release the UID button on the server.

     ⚠ **CAUTION:** To use this feature, press and release the UID button. Holding the button down for longer than 5 seconds initiates a graceful iLO reboot or a hardware iLO reboot. Data loss or NVRAM corruption might occur during a hardware iLO reboot.

   - Log in to the iLO web interface, and change the UID state to UID ON.

     To do this, click the UID icon at the bottom right corner of any iLO web interface window.
4. Connect to video using the appropriate connection (SUV connector or VGA port).

The HP ProLiant Pre-boot Health Summary screen is displayed on the server monitor, and remains until one of the following occurs:

- The server is powered on.
- The UID state is changed to UID OFF.
- The video connection is disconnected.
- An iLO reboot completes.

UPS problems

UPS is not working properly

Action:

1. Be sure the UPS batteries are charged to the proper level for operation. For more information, see the UPS documentation.
2. Be sure the UPS power switch is in the On position. For the location of the switch, see the UPS documentation.

3. Be sure the UPS software is updated to the latest version. Use the Power Management software located on the HP website (http://www.hp.com/go/rackandpower).

4. Be sure the power cord is the correct type for the UPS and the country in which the server is located. For specifications, see the UPS reference guide.

5. Be sure the line cord is connected.

6. Be sure each circuit breaker is in the On position, or replace the fuse if needed. If this occurs repeatedly, contact an authorized service provider.

7. Check the UPS LEDs to be sure a battery or site wiring problem has not occurred. See the UPS documentation.

8. If the UPS sleep mode is initiated, disable sleep mode for proper operation. The UPS sleep mode can be turned off through the configuration mode on the front panel.

9. Change the battery to be sure damage was not caused by excessive heat, particularly if a recent air conditioning outage has occurred.

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

Low battery warning is displayed

Action:

1. Plug the UPS into an AC grounded outlet for at least 24 hours to charge the batteries, and then test the batteries. Replace the batteries if necessary.

2. Be sure the alarm is set appropriately by changing the amount of time given before a low battery warning. Refer to the UPS documentation for instructions.

One or more LEDs on the UPS is red

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

General hardware problems

Problems with new hardware

Action:

1. Be sure the hardware being installed is a supported option on the server. For information on supported hardware, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

   If necessary, remove unsupported hardware.

2. To be sure the problem is not caused by a change to the hardware release, see the release notes included with the hardware. If no documentation is available, see the HP website (http://www.hp.com/go/hpsc).

3. Be sure the new hardware is installed properly. To be sure all requirements are met, see the device, server, and OS documentation.

   Common problems include:

- o Incomplete population of a memory bank
- o Connection of the data cable, but not the power cable, of a new device

4. Be sure no memory, I/O, or interrupt conflicts exist.

5. Be sure no loose connections (on page 17) exist.

6. Be sure all cables are connected to the correct locations and are the correct lengths. For more information, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

7. Be sure other components were not accidentally unseated during the installation of the new hardware component.

8. Be sure all necessary software updates, such as device drivers, ROM updates, and patches, are installed and current, and the correct version for the hardware is installed. For example, if you are using a Smart Array controller, you need the latest Smart Array Controller device driver. Uninstall any incorrect drivers before installing the correct drivers.

9. After installing or replacing boards or other options, run the options in BIOS/Platform Configuration (RBSU) in the UEFI System Utilities to be sure all system components recognize the changes. If you do not run the utility, you may receive a POST error message indicating a configuration error.

    a. Check the settings in UEFI System Utilities, depending on your server.

    b. Save and exit the utility.

    c. Restart the server.

    For more information on UEFI System Utilities, see the *HP UEFI System Utilities User Guide for HP ProLiant Gen9 Servers* in the HP UEFI Information Library (http://www.hp.com/go/ProLiantUEFI/docs).

10. Be sure all switch settings are set correctly. For more information about required switch settings, see the labels located on the server access panel or the server documentation on the HP website (http://www.hp.com/go/hpsc).

11. Be sure all boards are properly installed in the server.

12. To see if the utility recognizes and tests the device, run HP Insight Diagnostics (on page 82).

13. Uninstall the new hardware.

Unknown problem

Action:

1. Check the server LEDs to see if any statuses indicate the source of the problem. For LED information, see the server documentation.

2. Power down and disconnect power to the server. Remove all power sources to the server.

3. Be sure no loose connections (on page 17) exist.

4. Following the guidelines and cautionary information in the server documentation, reduce the server to the minimum hardware configuration by removing all cards or devices that are not necessary to power on the server. Keep the monitor connected to view the server power-on process. Before completing this step, see "Breaking the server down to the minimum hardware configuration (on page 15)."

5. Reconnect power, and then power on the system.

    - o If the video does not work, see "Video problems (on page 66)."

> ⚠ **CAUTION:** Only authorized technicians trained by HP should attempt to remove the system board. If you believe the system board requires replacement, contact HP Technical Support ("Contacting HP technical support or an authorized reseller" on page 100) before proceeding.

> ⚠ **CAUTION:** Before removing or replacing any processors, be sure to follow the guidelines provided in "Performing processor procedures in the troubleshooting process (on page 15)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

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

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

Third-party device problems

Action:

1. See the server and operating system documentation to be sure the server and operating system support the device.

2. Be sure the latest device drivers are installed.

3. See the device documentation to be sure the device is properly installed. For example, a third-party Gen3 x8 PCIe board would not operate at optimum performance installed on the primary PCIe riser slot 3. For more information on which PCIe technology is supported and for the slot PCIe bus width, see the product QuickSpecs (on page 78).

Testing the device

Action:

1. Uninstall the device.

    If the server works with the device removed and uninstalled, a problem exists with the device, the server does not support the device, or a conflict exists with another device.

2. If the device is the only device on a bus, be sure the bus works by installing a different device on the bus.

3. Restarting the server each time to determine if the device is working, move the device:

    a. To a PCIe slot on a different bus

    b. To the same slot in another working server of the same or similar design

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

4. If you are testing a board (or a device that connects to a board):

    a. Test the board with all other boards removed.

    b. Test the server with only that board removed.

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

5. Clearing NVRAM can resolve various problems.

6. Verify that the PCIe device or graphics controller does not need additional power to operate. For more information, see the device documentation.

Internal system problems

CD-ROM and DVD drive problems

System does not boot from the drive

Action:

1. Be sure the drive boot order in the UEFI System Utilities ("HP UEFI System Utilities" on page 84) is set so that the server boots from the CD-ROM drive first.

2. Be sure no loose connections (on page 17) exist.

3. Be sure the media from which you are attempting to boot is not damaged and is a bootable CD.

4. If attempting to boot from a USB CD-ROM drive:

   o See the operating system and server documentation to be sure both support booting from a USB CD-ROM drive.

   o Be sure legacy support for a USB CD-ROM drive is enabled in the UEFI System Utilities ("HP UEFI System Utilities" on page 84).

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

Action:

1. Clean the drive and media.

2. If a paper or plastic label has been applied to the surface of the CD or DVD in use, remove the label and any adhesive residue.

3. Be sure the inserted CD or DVD format is valid for the drive. For example, be sure you are not inserting a DVD into a drive that only supports CDs.

Drive is not detected

Action:

1. Be sure no loose connections (on page 17) exist.

2. Refer to the drive documentation to be sure cables are connected as required.

3. Be sure the cables are working properly. Replace with known functional cables to test whether the original cables were faulty.

4. Be sure the correct, current driver is installed.

Drive problems (hard drives and solid state drives)

Drives are failed

Action:

1. Be sure no loose connections (on page 17) exist.
2. Check to see if an update is available for any of the following:
   - o Smart Array Controller firmware
   - o Dynamic Smart Array driver
   - o Host bus adapter firmware
   - o Expander backplane SEP firmware
   - o System ROM
3. Be sure the drive or backplane is cabled properly.
4. Be sure the drive data cable is working by replacing it with a known functional cable.
5. Be sure drive blanks are installed properly when the server is operating. Drives may overheat and cause sluggish response or drive failure.
6. Run Insight Diagnostics ("HP Insight Diagnostics" on page 82) and replace failed components as indicated.
7. Run HP SSA ("HP Smart Storage Administrator" on page 87) and check the status of the failed drive.
8. Be sure the replacement drives within an array are the same size or larger.
9. Be sure the replacement drives within an array are the same drive type, such as SAS, SATA, or SSD.
10. Power cycle the server. If the drive shows up, check to see if the drive firmware needs to be updated.

Drives are not recognized

Action:

1. Be sure no power problems (on page 50) exist.
2. Be sure no loose connections (on page 17) exist.
3. Check for available updates on any of the following components:
   - o Smart Array Controller firmware
   - o Dynamic Smart Array driver
   - o Host bus adapter firmware
   - o Expander backplane SEP firmware
   - o System ROM
4. Be sure the drive or backplane is cabled properly.
5. Check the drive LEDs to be sure they indicate normal function. For information on drive LEDs, see "Hot-plug drive LED definitions (on page 19)." For server-specific drive LED information, see the server documentation in the HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs).
6. Be sure the drive is supported. To determine drive support, see the server QuickSpecs on the HP website (http://www.hp.com/go/qs).
7. Power cycle the server. If the drive appears, check to see if the drive firmware needs to be updated.
8. Be sure the drive bay is not defective by installing the hard drive in another bay.

9. When the drive is a replacement drive on an array controller, be sure that the drive is the same type and of the same or larger capacity than the original drive.

10. Run HP Insight Diagnostics (on page 82). Then, replace failed components as indicated.

11. When using an array controller, be sure the drive is configured in an array. Run HP SSA ("HP Smart Storage Administrator" on page 87).

12. Be sure that the correct controller drivers are installed and that the controller supports the hard drives being installed.

13. If the controller supports Smart Array Advanced Pack (SAAP) license keys and the configuration is dual domain, be sure the SAAP license key is installed. For more information, see the HP website (http://www.hp.com/go/SAAP).

14. If SAS expanders are used, be sure the Smart Array controller contains a cache module.

15. If a storage enclosure is used, be sure the storage enclosure is powered on.

16. If a SAS switch is used, be sure disks are zoned to the server using the Virtual SAS Manager.

> **IMPORTANT:** The HP Dynamic Smart Array B140i RAID controller and the AHCI do not support SAS drives.

17. If the HP Dynamic Smart Array B140i RAID controller is installed on the server, be sure that RAID mode is enabled in HP UEFI System Utilities (on page 84).

Data is inaccessible

Action:

1. Be sure the files are not corrupt. Run the repair utility for the operating system.

2. Be sure no viruses exist on the server. Run a current version of a virus scan utility.

3. When a TPM is installed and is being used with BitLocker, be sure the TPM is enabled in UEFI System Utilities ("HP UEFI System Utilities" on page 84). See the TPM replacement recovery procedure in the operating system documentation.

4. When migrating encrypted data to a new server, be sure to follow the recovery procedures in the operating system documentation.

Server response time is slower than usual

Action:

1. Be sure the drive is not full. If needed, increase the amount of free space on the drive. HP recommends that drives have a minimum of 15 percent free space.

2. Review information about the operating system encryption technology, which can cause a decrease in server performance. For more information, see the operating system documentation.

3. Use HP SSA ("HP Smart Storage Administrator" on page 87) to verify that a recovery operation is not pending on the logical drive.

HP SmartDrive icons or LEDs illuminate errors for the wrong drive or an error message is displayed in POST, HP SSA, or HP SSADUCLI

Action:

See the server user guide to verify that the cabling from the drive backplane to the system board is correct.

Storage problems

When installing an OS, the OS installation does not recognize the HP Dynamic Smart Array B140i RAID controller drives

Action:

Manually install the HP Dynamic Smart Array B140i RAID controller drivers. For more information, see the controller documentation.

Data failure or disk errors on a server with a 10 SFF drive backplane or a 12 LFF drive backplane

Action:

Be sure that the hard drive backplane ports are connected to only one controller. Only one cable is required to connect the backplane to the controller. The second port on the backplane is cabled to the controller to provide additional bandwidth.

Data failure or disk errors on a server with a 25 SFF drive backplane

Action:

Be sure that both backplane ports are connected to either one or two controllers using two SAS cables. The first port connects to bays 1-13, and the second port attaches to bays 14-25.

SD and MicroSD card problems

System does not boot from the drive

Action:

1. Be sure the drive boot order in the UEFI System Utilities is set so that the server boots from the SD or MicroSD card.
2. Use the HP iLO web interface to verify that the SD card is detected by HP iLO.
3. Remove all power from the server. Reseat the SD or MicroSD card, and then power on the server.

USB drive key problems

System does not boot from the drive

Action:

1. Be sure that USB is enabled in the UEFI System Utilities ("HP UEFI System Utilities" on page 84).
2. Be sure the drive boot order in the UEFI System Utilities ("HP UEFI System Utilities" on page 84) is set so that the server boots from the USB drive key.
3. Reseat the USB drive key.
4. Move the USB drive key to a different USB port, if available.

Fan problems

General fan problems are occurring

Action:

1. Be sure the fans are properly seated and working.

    a. Follow the procedures and warnings in the server documentation for removing the access panels and accessing and replacing fans.

    b. Unseat, and then reseat, each fan according to the proper procedures.

    c. Replace the access panels, and then attempt to restart the server.

2. Be sure the fan configuration meets the functional requirements of the server. See the server documentation.

3. Be sure no ventilation problems exist. If you have been operating the server for an extended period of time with the access panel removed, airflow may have been impeded, causing thermal damage to components. For further requirements, see the server documentation.

4. Be sure no POST error messages are displayed while booting the server that indicate temperature violation or fan failure information. For the temperature requirements for the server, see the server documentation.

5. Use HP iLO or an optional IML viewer to access the IML to see if any event list error messages relating to fans are listed. For more information about event list error messages, see "Error message resources (on page 94)."

6. In the iLO web interface, navigate to the **Information** > **System Information** page and verify the following information:

    a. Click the **Fans** tab and verify the fan status and fan speed.

    b. Click the **Temperatures** tab and verify the temperature readings for each location on the Temperatures tab. If a hot spot is located, then check the airflow path for blockage by cables and other material.

7. Replace any required non-functioning fans and restart the server. For specifications on fan requirements, see the server documentation.

8. Be sure all fan slots have fans or blanks installed. For requirements, see the server documentation.

9. Verify the fan airflow path is not blocked by cables or other material.

10. For HP BladeSystem c-Class enclosure fan problems, review the fan section of OA SHOW ALL and the FAN FRU low level firmware. For more information, see the *HP BladeSystem c-Class Enclosure Troubleshooting Guide* on the HP website (http://www.hp.com/support/BladeSystem_Enclosure_TSG_en).

Hot-plug fan problems are occurring

Action:

1. Check the LEDs to be sure the hot-plug fans are working. Refer to the server documentation for LED information.

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

2. Be sure no POST error messages are displayed.

3. Be sure hot-plug fan requirements are being met. Refer to the server documentation.

All fans in an HP BladeSystem c-Class enclosure are operating at a high speed
...while fans in the other enclosures are operating at normal speed.

Action:

If all fan LEDs are solid green but the fans in the enclosure are operating at a higher speed than normal, then access more information from the OA or HP iLO. Review the FAN section in OA SHOW ALL to locate the fan zone that is consuming more FAN speed. Verify the virtual FAN value for the affected servers within that FAN zone that indicates which server is consuming a lot of FAN speed. Possible indicators could be either an outdated ROMBIOS or HP iLO firmware or a server repeatedly going through POST or reboot.

If a single fan is operating at approximately 80% and the issue is resolved after resetting the OA, then upgrade to OA firmware 3.60 or later to resolve the issue.

For more information, review the *HP BladeSystem c-Class Enclosure Troubleshooting Guide* on the HP website (http://www.hp.com/go/bladesystem/documentation).

HP Trusted Platform Module problems

HP Trusted Platform Module fails or is not detected

Action:

If the TPM fails and is no longer detected by UEFI System Utilities ("HP UEFI System Utilities" on page 84), request a new system board and TPM board from an HP authorized service provider. For more information, see "Contacting HP technical support or an authorized reseller (on page 100)."

⚠ **CAUTION:** Any attempt to remove an installed TPM from the system board breaks or disfigures the TPM security rivet. Upon locating a broken or disfigured rivet on an installed TPM, administrators should consider the system compromised and take appropriate measures to ensure the integrity of the system data.

When installing or replacing a TPM, observe the following guidelines:

- Do not remove an installed TPM. Once installed, the TPM becomes a permanent part of the system board.

- When installing or replacing hardware, HP service providers cannot enable the TPM or the encryption technology. For security reasons, only the customer can enable these features.

- When returning a system board for service replacement, do not remove the TPM from the system board. When requested, HP Service provides a TPM with the spare system board.

- Any attempt to remove an installed TPM from the system board breaks or disfigures the TPM security rivet. Upon locating a broken or disfigured rivet on an installed TPM, administrators should consider the system compromised and take appropriate measures to ensure the integrity of the system data.

- When using BitLocker, always retain the recovery key/password. The recovery key/password is required to enter Recovery Mode after BitLocker detects a possible compromise of system integrity.

- HP is not liable for blocked data access caused by improper TPM use. For operating instructions, see the encryption technology feature documentation provided by the operating system.

Memory problems

General memory problems are occurring

Action:

- Isolate and minimize the memory configuration. Use care when handling DIMMs ("DIMM handling guidelines" on page 18).
  - o Be sure the memory meets the server requirements and is installed as required by the server. Some servers may require that memory banks be populated fully or that all memory within a memory bank must be the same size, type, and speed. To determine if the memory is installed properly, see the server documentation.
  - o Check any server LEDs that correspond to memory slots.
  - o If you are unsure which DIMM has failed, test each bank of DIMMs by removing all other DIMMs. Then, isolate the failed DIMM by switching each DIMM in a bank with a known working DIMM.
  - o Remove any third-party memory.
- To test the memory, run HP Insight Diagnostics (on page 82).

Server is out of memory

Action:

1. Be sure the memory is configured properly. Refer to the application documentation to determine the memory configuration requirements.
2. Be sure no operating system errors are indicated.
3. Be sure a memory count error ("Memory count error exists" on page 62) did not occur. Refer to the message displaying memory count during POST.

Memory count error exists

Possible Cause: The memory modules are not installed correctly.

Action:

1. Be sure the memory modules are supported by the server. See the server documentation.
2. Be sure the memory modules have been installed correctly in a supported configuration. See the server documentation.
3. Be sure the memory modules are seated properly ("DIMM handling guidelines" on page 18).
4. Be sure no operating system errors are indicated.
5. Restart the server and check to see if the error message is still displayed.
6. Run HP Insight Diagnostics (on page 82). Then, replace failed components as indicated.

Server fails to recognize existing memory

Action:

1. Be sure the server supports processor installed in the server. For more information, see the product QuickSpecs on the HP website (http://www.hp.com/go/qs).
2. For all DIMMs installed in the server, be sure the associated processor is installed. For more information on which DIMM slots are associated to each processor, see the server documentation (on page 94).

3. Be sure the memory is configured properly. See the server documentation (on page 94).

4. Be sure a memory count error did not occur ("Memory count error exists" on page 62). See the message displaying memory count during POST.

5. Reseat the memory. Use care when handling DIMMs ("DIMM handling guidelines" on page 18).

Server fails to recognize new memory

Action:

1. Be sure the memory is the correct type for the server and is installed according to the server requirements. See the server documentation or HP website (http://www.hp.com).

2. Be sure you have not exceeded the memory limits of the server or operating system. See the server documentation.

3. Be sure the server supports the number of processor cores. Some server models only support 32 cores and this may reduce the amount of memory that is visible.

4. Be sure no Event List error messages are displayed in the IML ("Integrated Management Log" on page 80).

5. Be sure the memory is seated properly ("DIMM handling guidelines" on page 18).

6. Be sure no conflicts are occurring with existing memory. Run the server setup utility.

7. Test the memory by installing the memory into a known working server. Be sure the memory meets the requirements of the new server on which you are testing the memory.

8. Replace the memory. See the server documentation.

Processor problems

Action:

1. Be sure each processor is supported by the server and is installed as directed in the server documentation. The processor socket requires very specific installation steps and only supported processors should be installed. For processor requirements, see the server documentation.

2. Be sure the server ROM is current.

3. Be sure you are not mixing processor stepping, core speeds, or cache sizes if this is not supported on the server. For more information, see the server documentation.

> ⚠ **CAUTION:** Removal of some processors and heatsinks require special considerations for replacement, while other processors and heatsinks are integrated and cannot be reused once separated. For specific instructions for the server you are troubleshooting, refer to processor information in the server user guide.

> ⚠ **CAUTION:** Before removing or replacing any processors, be sure to follow the guidelines provided in "Performing processor procedures in the troubleshooting process (on page 15)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

4. If the server has only one processor installed, reseat the processor. If the problem is resolved after you restart the server, the processor was not installed properly.

5. If the server has only one processor installed, replace it with a known functional processor. If the problem is resolved after you restart the server, the original processor failed.

> ⚠ **CAUTION:** Before removing or replacing any processors, be sure to follow the guidelines provided in "Performing processor procedures in the troubleshooting process (on page 15)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

6. If the server has multiple processors installed, test each processor:

    a. Remove all but one processor from the server. Replace each with a processor terminator board or blank, if applicable to the server.

    b. Replace the remaining processor with a known functional processor. If the problem is resolved after you restart the server, a fault exists with one or more of the original processors. Install each processor one by one, restarting each time, to find the faulty processor or processors. At each step, be sure the server supports the processor configurations.

Tape drive problems

The following sections include the most common tape drive issues. Actions are listed in the order that they should be tried. If the issue is resolved, it is not necessary to complete the remaining actions.

All actions may not apply to all tape drives.

For detailed tape drive guided troubleshooting information, see the HP website (http://www.hp.com/support/gts).

To download HP StorageWorks Library and Tape Tools, see the HP website (http://www.hp.com/support/tapetools).

Stuck tape issue

Action:

1. Manually press the Eject button. Allow up to 10 minutes for the tape to rewind and eject.
2. Perform a forced eject:
    a. Press and hold the Eject button for at least 10 seconds.
    b. Allow up to 10 minutes for the tape to rewind and eject. The green Ready LED should flash.
3. Power cycle the drive. Allow up to 10 minutes for the drive to become ready again.
4. Check for conflicts in backup software services.
5. Check the SAS/HBA/Driver configuration of the drive.
6. Inspect media and cables, and discard any that are faulty or damaged.
7. Contact HP support ("Contacting HP technical support or an authorized reseller" on page 100).

Read/write issue

Action:

1. Run the Drive Assessment Test in HP StorageWorks Library and Tape Tools.

    > ⚠ **CAUTION:** Running the Drive Assessment Test overwrites the tape. If it is not possible to overwrite the tape, run the logs-based Device Analysis Test instead.

2. Run the Media Assessment Test in HP StorageWorks Library and Tape Tools. This is a read-only test.

Backup issue

Action:

1. Run the Drive Assessment Test in HP StorageWorks Library and Tape Tools.

   ⚠ **CAUTION:** Running the Drive Assessment Test overwrites the tape. If it is not possible to overwrite the tape, run the logs-based Device Analysis Test instead.

2. Check the backup logs.

3. Verify that a supported configuration is being used.

4. Check for media damage:

   o Incorrect label placement

   o Broken, missing, or loose leader pin

   o Damaged cartridge seam

   o Usage in incorrect environment

5. Check for software issues:

   a. Check the backup software.

   b. Check that virus scanning software is not scheduled to run at the same time as the back-up.

6. Verify that a tape can be formatted.

Media issue

Action:

1. Verify that the correct media part number is being used.

2. Pull a support ticket using HP StorageWorks Library and Tape Tools.

   o Look for issues in the cartridge health section.

   o Look for issues in the drive health section.

3. Run the Media Assessment Test in HP StorageWorks Library and Tape Tools.

4. Check for media damage:

   o Incorrect label placement

   o Broken, missing, or loose leader pin

   o Damaged cartridge seam

   o Usage in incorrect environment

5. Check if the Tape Error LED is flashing:

   a. Reload the suspect tape. If the Tape Error LED stops flashing, the problem has cleared.

   b. Load a new or known good tape. If the Tape Error LED stops flashing, the problem has cleared.

   c. Reload the suspect tape. If the Tape Error LED flashes, discard the suspect media as faulty.

6. Discard any media that has been used at temperatures greater than 45°C (113°F) or less than 5°C (41°F).

Graphics and video adapter problems

General graphics and video adapter problems are occurring

Action:

- Use only cards listed as a supported option for the server. For a complete list of supported options, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

- Be sure that the power supplies installed in the server provide adequate power to support the server configuration. Some high-power graphics adapters require specific cabling, fans, or auxiliary power. For more information about adapter power requirements, see the documentation that ships with the graphics option or see the vendor website. For more information about server power capabilities, see the server documentation on the HP website (http://www.hp.com/go/hpsc).

- Be sure the adapter is seated properly.

External device problems

Video problems

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

Action:

1. Be sure the monitor power cord is plugged into a working grounded (earthed) AC outlet.
2. Power up the monitor and be sure the monitor light is on, indicating that the monitor is receiving power.
3. Be sure the monitor is cabled to the intended server or KVM connection.
4. Be sure no loose connections (on page 17) exist.
   - For rack-mounted servers, check the cables to the KVM switch and be sure the switch is correctly set for the server. You may need to connect the monitor directly to the server to be sure the KVM switch has not failed.
   - For tower model servers, check the cable connection from the monitor to the server, and then from the server to the power outlet.
   - For blades, verify that the HP c-Class Blade SUV cable is connected to the VGA cable on the monitor and to the connector on the front of the server blade.
5. Press any key, or enter the password, and wait a few moments for the screen to activate to be sure the energy saver feature is not in effect.
6. Verify that a PCIe device or graphics controller does not need additional power to operate. For more information, see the device documentation.
7. Be sure a video expansion board has not been added to replace onboard video, making it seem like the video is not working. Disconnect the video cable from the onboard video, and then reconnect it to the video jack on the expansion board.

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

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

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

9. If the video expansion board is installed in a PCI hot-plug slot, be sure the slot has power by checking the power LED on the slot, if applicable. See the server documentation.

10. Be sure the server and the OS support the video expansion board.

11. Be sure the video driver is current. For driver requirements, see the third-party video adapter documentation.

Monitor does not function properly with energy saver features

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

Video colors are wrong

Action:

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

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

- Be sure that the VGA cable is not damaged. Replace the cable with a known working cable.

Slow-moving horizontal lines are displayed

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

Mouse and keyboard problems

Action:

1. Be sure no loose connections (on page 17) exist. If a KVM switching device is in use, be sure the server is properly connected to the switch.

    o   For rack-mounted servers, check the cables to the switch box and be sure the switch is correctly set for the server.

    o   For tower model servers, check the cable connection from the input device to the server.

2. If a KVM switching device is in use, be sure all cables and connectors are the proper length and are supported by the switch. Refer to the switch documentation.

3. Be sure the current drivers for the operating system are installed.

4. Be sure the device driver is not corrupted by replacing the driver.

5. Restart the system and check whether the input device functions correctly after the server restarts.

6. Replace the device with a known working equivalent device (another similar mouse or keyboard).

    o   If the problem still occurs with the new mouse or keyboard, the connector port on the system I/O board is defective. Replace the board.

    o   If the problem no longer occurs, the original input device is defective. Replace the device.

7. Be sure the keyboard or mouse is connected to the correct port. Determine whether the keyboard lights flash at POST or the NumLock LED illuminates. If not, change port connections.
8. Be sure the keyboard or mouse is clean.

Cable problems

Drive errors, retries, timeouts, and unwarranted drive failures when using an older Mini SAS cable

Action: The Mini SAS connector life expectancy is 250 connect/disconnect cycles (for external, internal, and cable Mini SAS connectors). If using an older cable that could be near the life expectancy, replace the Mini SAS cable.

USB device not recognized, an error message is displayed, or the device does not power on when connected to an SUV cable

Possible cause:

The USB connectors on the SUV cable do not support devices that require greater than a 500mA power source.

Action:

Remove the USB device and do one of the following:

- Attach a USB device that requires less than a 500mA power source.
- Attach an externally powered USB hub to the SUV cable and connect the USB device to the hub.

Network controller or FlexibleLOM problems

Network controller or FlexibleLOM is installed but not working

Action:

1. Check the network controller or FlexibleLOM LEDs to see if any statuses indicate the source of the problem. For LED information, see the network controller or server documentation.
2. Be sure no loose connections (on page 17) exist.
3. Be sure the correct cable type is used for the network speed or that the correct SFP or DAC cable is used. For dual-port 10-GB networking devices, both SFP ports should have the same media (for example, DAC cable or equal SFP+ module). Mixing different types of SFP (SR/LR) on a single device is not supported.
4. Be sure the network cable is working by replacing it with a known functional cable.
5. Be sure a software problem has not caused the failure. For more information, see the operating system documentation.
6. Be sure the server and operating system support the controller. For more information, see the server and operating system documentation.
7. Be sure the controller is enabled in the UEFI System Utilities.
8. Be sure the server ROM is up to date.

9. Be sure the controller drivers are up to date.

10. Be sure a valid IP address is assigned to the controller and that the configuration settings are correct.

11. Run Insight Diagnostics ("HP Insight Diagnostics" on page 82) and replace failed components as indicated.

Network controller or FlexibleLOM has stopped working

Action:

1. Check the network controller or FlexibleLOM LEDs to see if any statuses indicate the source of the problem. For LED information, see the network controller or server documentation.

2. Be sure the correct network driver is installed for the controller and that the driver file is not corrupted. Reinstall the driver.

3. Be sure no loose connections (on page 17) exist.

4. Be sure the network cable is working by replacing it with a known functional cable.

5. Be sure the network controller or FlexibleLOM is not damaged.

6. Run Insight Diagnostics ("HP Insight Diagnostics" on page 82) and replace failed components as indicated.

Network controller or FlexibleLOM stopped working when an expansion board was added

Action:

1. Be sure no loose connections (on page 17) exist.

2. Be sure the server and operating system support the controller. For more information, see the server and operating system documentation.

3. Be sure the new expansion board has not changed the server configuration, requiring reinstallation of the network driver:

   a. Uninstall the network controller driver for the malfunctioning controller in the operating system.

   b. Restart the server and run the appropriate option in the UEFI System Utilities. Be sure the server recognizes the controller and that resources are available for the controller.

   c. Restart the server, and then reinstall the network driver.

4. Be sure the correct drivers are installed. For more information, see the operating system documentation.

5. Be sure that the driver parameters match the configuration of the network controller. For more information, see the operating system documentation.

Problems are occurring with the network interconnect blades

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

Controller problems

HP Dynamic Smart Array B140i drives are not found when RAID mode is disabled

Description:

When an HP Dynamic Smart Array B140i RAID controller is enabled on a server and RAID mode is disabled in the UEFI System Utilities, then the drives will be listed as AHCI drives or HP H220i drives and the RAID controller is not found in POST or device manager. When RAID mode is enabled, the drives will appear as HP Dynamic Smart Array B140i controller drives.

Action:

1. Press **F9** during the startup process to access the UEFI System Utilities.
2. In the Systems Configuration menu, select **BIOS/Platform Configuration (RBSU) > System Options > SATA Controller Options > Embedded SATA Configuration > Enable HP Dynamic Smart Array RAID support**.
3. Press **F10** to save the configuration.
4. Reboot the server.

Data located on drives accessed in RAID mode is not compatible with data accessed from non-RAID mode.
...and data located on drives accessed in non-RAID mode is not compatible with data accessed from RAID mode.

Action:

HP recommends that you access drive data only when the same RAID or non-RAID mode is enabled. Back up and restore the data on the drives.

The Smart Array controller does not show logical drives after moving drives to a new server or JBOD

Action:

A drive migration issue has occurred. Be sure to follow all drive roaming rules when migrating drives. See "Drive roaming (on page)."

Drive roaming

Drive roaming lets you move disk drives and arrays while maintaining data availability. You can move one or more disk drives in a configured logical drive to a different bay position as long as the new bay position is accessible by the same controller. In addition, you can move a complete array from one controller to another, even if controllers are in different servers. The logical drive status must be good before you move physical drives to a new bay position.

Drive roaming is an offline feature. There is no method for removing an array while the server is online and then moving it to a new physical location.

Expansion board problems

System requests recovery method during expansion board replacement

When replacing an expansion board on a BitLocker-encrypted server, always disable BitLocker before replacing the expansion board. If BitLocker is not disabled, the system requests the recovery method selected when BitLocker was configured. Failure to provide the correct recovery password or passwords results in loss of access to all encrypted data.

Be sure to enable BitLocker after the installation is complete.

For information on BitLocker, see BitLocker for Servers on the Microsoft website (http://www.microsoft.com).

Software problems

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

Other useful resources include HP Insight Diagnostics (on page 82) and HP SIM. 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 information may not apply to the server you are troubleshooting. Refer to the server documentation for information on procedures, hardware options, software tools, and operating systems supported by the server.

Refer to "Software tools and solutions (on page 78)" for more information.

Operating system problems and resolutions

Operating system problems

Operating system locks up

Action:

Do the following:

- Scan for viruses with an updated virus scan utility.
- Review the HP iLO event log.
- Review the IML.
- Gather the NMI Crash Dump information for review, if needed.
- Obtain the Active Health System log ("Active Health System log overview" on page 104) for use when contacting HP ("Contacting HP technical support or an authorized reseller" on page 100).

Errors are displayed in the error log

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

Problems occur after the installation of a service pack

Action: Follow the instructions for updating the operating system ("Operating system updates" on page 73).

Operating system updates

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

If you decide to apply an operating system update:

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

If you apply the update and have problems, locate files to correct the problems on the HP website (http://www.hp.com/go/hpsc).

Restoring to a backed-up version

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

Refer to the documentation provided with the backup software.

When to reconfigure or reload software

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

1. Weigh the projected downtime of a software reload against the time spent troubleshooting intermittent problems. It may be advantageous to start over by removing and reinstalling the problem software, or in some cases by using the Erase utility (on page 82) and reinstalling all system software.

   > ⚠ **CAUTION:** Perform a backup before running the System Erase Utility. 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 the instructions for using this utility.

2. Be sure the server has adequate resources (processor speed, hard drive space, and memory) for the software.
3. Be sure the server ROM is current and the configuration is correct.
4. Be sure you have printed records of all troubleshooting information you have collected to this point.
5. Be sure you have two good backups before you start. Test the backups using a backup utility.
6. Check the operating system and application software resources to be sure you have the latest information.
7. If the last-known functioning configuration does not work, try to recover the system with operating system recovery software. For more information, see the operating system documentation.

Linux resources

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

To assist in possible LINUX installation issues on HP ProLiant servers, capture the cfg2html report before contacting HP technical support ("Contacting HP technical support or an authorized reseller" on page 100). For more information, see the cfg2html website (http://www.cfg2html.com).

Application software problems

Software locks up

Action:

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

Errors occur after a software setting is changed

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

Errors occur after the system software is changed

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

Errors occur after an application is installed

Action:

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

ROM problems

Remote ROM flash problems

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.

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 then the program exits. Obtain administrative privileges for the target computer, and then restart the process. Be sure the remote registry service is running on a Windows®-based system.

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.

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 occurs during ROM flash

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 is a loss of power to the system during the flash process. Initiate ROMPaq disaster recovery procedures.

Target system is not supported

If the target system is not listed in the supported servers list, an error message appears and the program exits. Only supported systems can be upgraded using the Remote ROM Flash utility. To determine if the server is supported, see the HP website (http://www.hp.com/go/hpsc).

System requests recovery method during a firmware update

When updating the firmware on a BitLocker-encrypted server, always disable BitLocker before updating the firmware. If BitLocker is not disabled, the system requests the recovery method selected when BitLocker was configured. Failure to provide the correct recovery password or passwords results in loss of access to all encrypted data.

If BitLocker is configured to measure option ROMs, you must follow the firmware upgrade steps in "Updating firmware (on page 76)." BitLocker can be configured to measure the following option ROMs:

- HP iLO
- NIC
- Smart Array storage
- Standup HBAs

Be sure to enable BitLocker after the firmware updates are complete.

For information on performing ROM updates, see "Firmware Updates (on page 17)."

For information on BitLocker, see BitLocker for servers on the Microsoft website (http://www.microsoft.com).

Updating firmware

To update the firmware:

1. Check the firmware version on the device.
2. Determine the latest firmware version available.
3. If a TPM is installed and enabled on the server, disable BitLocker before updating the firmware. For more information, see the operating system documentation.
4. Download and update the firmware to the current version supported for the hardware configuration.
5. Verify the firmware update by checking the firmware version.
6. If a TPM is installed and enabled on the server, enable BitLocker after the firmware update is complete. For more information, see the operating system documentation.

Boot problems

Server does not boot

Possible cause:

- The system ROMPaq flash fails.
- The system ROM is corrupt.
- The server fails to boot after a SYSROM update using ROMPaq.
- A logical drive is not configured on the Smart Array RAID controller.
- The controller boot order is not set properly.
- Smart Arrays containing multiple logical drives may require the boot logical drive to be selected within HP SSA (F5).

Action:

Servers (non-blades)

If the system ROM is corrupted, the system automatically switches to the redundant ROM in most cases. If the system does not automatically switch to the redundant ROM, perform the following steps:

1. Power down the server.
2. Remove the server from the rack, if necessary.
3. Remove the access panel.

4. Change positions 1, 5, and 6 of the system maintenance switch to on.

5. Install the access panel.

6. Install the server into the rack.

7. Power up the server.

8. After the system beeps, repeat steps 1 through 3.

9. Change positions 1, 5, and 6 of system maintenance switch to off.

10. Repeat steps 5 and 6.

If both the current and backup versions of the ROM are corrupt, return the system board for a service replacement.

To switch to the backup ROM when the System ROM is not corrupt, use the UEFI System Utilities ("HP UEFI System Utilities" on page 84).

Server blades

If the system ROM is corrupted, the system automatically switches to the redundant ROM in most cases. If the system does not automatically switch to the redundant ROM, perform the following steps:

1. Power down the server.

2. Remove the server.

3. Remove the access panel.

4. Change positions 1, 5, and 6 of the system maintenance switch to on.

5. Install the access panel.

6. Install the server in the enclosure and power up the server.

7. After the system beeps, repeat steps 1 through 3.

8. Change positions 1, 5, and 6 of system maintenance switch to off.

9. Repeat steps 5 and 6.

If both the current and backup versions of the ROM are corrupt, return the system board for a service replacement.

To switch to the backup ROM when the System ROM is not corrupt, use the UEFI System Utilities ("HP UEFI System Utilities" on page 84).

PXE boot guidelines for UEFI servers

- When the server is configured for UEFI Boot Mode, PXE servers must be configured with a UEFI boot image. For x64 EFI machines, the DHCP server also needs to be configured to support x64 EFI DHCP boot requests. For more information, see the UEFI Information Library (http://www.hp.com/go/ProLiantUEFI/docs).

- When booting VMware ESX in UEFI Boot Mode, UEFI Optimized Boot must be enabled.

- When the server boots in UEFI Boot Mode, it does not boot media with a legacy OS installation. This includes DOS targets and Windows or Linux systems installed in Legacy BIOS Boot Mode. The reverse is also true for servers that boot in Legacy BIOS Boot Mode.

Software tools and solutions

Server mode

The software and configuration utilities presented in this section operate in online mode, offline mode, or in both modes.

Software or configuration utility	Server mode
HP iLO (on page 78)	Online and Offline
Active Health System (on page 79)	Online and Offline
HP RESTful API support for HP iLO (on page 80)	Online and Offline
Integrated Management Log (on page 80)	Online and Offline
HP Insight Remote Support (on page 81)	Online
HP Insight Online (on page 81)	Online
Intelligent Provisioning (on page 81)	Offline
HP Insight Diagnostics (on page 82)	Online and Offline
Erase Utility (on page 82)	Offline
Scripting Toolkit for Windows and Linux (on page 83)	Online
HP Service Pack for ProLiant (on page 83)	Online and Offline
HP Smart Update Manager (on page 83)	Online and Offline
HP UEFI System Utilities (on page 84)	Offline
HP Smart Storage Administrator (on page 87)	Online and Offline
FWUPDATE utility (on page 89)	Offline

Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the HP website (http://www.hp.com/go/qs).

HP iLO

The HP iLO subsystem is a standard component of HP ProLiant servers that simplifies initial server setup, server health monitoring, power and thermal optimization, and remote server administration. The HP iLO subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes HP iLO independent of the host server and its operating system.

HP iLO enables and manages the Active Health System (on page 79) and also features Agentless Management. All key internal subsystems are monitored by HP iLO. If enabled, SNMP alerts are sent directly by HP iLO regardless of the host operating system or even if no host operating system is installed.

Embedded remote support software is available on HP ProLiant Gen8 and later servers with iLO 4, regardless of the operating system software and without installing OS agents on the server.

Using HP iLO, you can do the following:

- Access a high-performance and secure Integrated Remote Console to the server from anywhere in the world if you have a network connection to the server.
- Use the shared .NET Integrated Remote Console to collaborate with up to four server administrators.
- Remotely mount high-performance Virtual Media devices to the server.
- Securely and remotely control the power state of the managed server.
- Implement true Agentless Management with SNMP alerts from HP iLO, regardless of the state of the host server.
- Download the Active Health System log.
- Register for HP Insight Remote Support.
- Use iLO Federation to manage multiple servers from one system running the iLO web interface.
- Use Virtual Power and Virtual Media from the GUI, the CLI, or the iLO scripting toolkit for many tasks, including the automation of deployment and provisioning.
- Control iLO by using a remote management tool.

For more information about HP iLO features, see the HP iLO documentation on the HP website (http://www.hp.com/go/ilo/docs).

The HP iLO 4 hardware and firmware features and functionality, such as NAND size and embedded user partition, vary depending on the server model. For a complete list of supported features and functionality, see the HP iLO 4 QuickSpecs on the HP website (http://h18000.www1.hp.com/products/quickspecs/14276_div/14276_div.pdf).

Active Health System

HP Active Health System provides the following features:

- Combined diagnostics tools/scanners
- Always on, continuous monitoring for increased stability and shorter downtimes
- Rich configuration history
- Health and service alerts
- Easy export and upload to Service and Support

The HP Active Health System monitors and records changes in the server hardware and system configuration. The Active Health System assists in diagnosing problems and delivering rapid resolution if server failures occur.

The Active Health System collects the following types of data:

- Server model
- Serial number
- Processor model and speed
- Storage capacity and speed
- Memory capacity and speed
- Firmware/BIOS

HP Active Health System does not collect information about Active Health System users' operations, finances, customers, employees, partners, or data center, such as IP addresses, host names, user names, and passwords. HP Active Health System does not parse or change operating system data from third-party error event log activities, such as content created or passed through by the operating system.

The data that is collected is managed according to the HP Data Privacy policy. For more information see the HP website (http://www.hp.com/go/privacy).

The Active Health System, in conjunction with the system monitoring provided by Agentless Management or SNMP Pass-thru, provides continuous monitoring of hardware and configuration changes, system status, and service alerts for various server components.

The Agentless Management Service is available in the SPP, which can be downloaded from the HP website (http://www.hp.com/go/spp/download). The Active Health System log can be downloaded manually from HP iLO or HP Intelligent Provisioning and sent to HP.

For more information, see the following documents:

- *HP iLO User Guide* on the HP website (http://www.hp.com/go/ilo/docs)

- *HP Intelligent Provisioning User Guide* on the HP website (http://www.hp.com/go/intelligentprovisioning/docs)

HP RESTful API support for HP iLO

HP iLO 4 firmware version 2.00 and later includes the HP RESTful API. The HP RESTful API is a management interface that server management tools can use to perform configuration, inventory, and monitoring of an HP ProLiant server via iLO. A REST client sends HTTPS operations to the iLO web server to GET and PATCH JSON-formatted data, and to configure supported iLO and server settings, such as the UEFI BIOS settings.

HP iLO 4 supports the HP RESTful API with HP ProLiant Gen8 and later servers. For more information about the HP RESTful API, see the HP website (http://www.hp.com/support/restfulinterface/docs).

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with 1-minute granularity.

You can view recorded events in the IML in several ways, including the following:

- From within HP SIM

- From within HP UEFI System Utilities (on page 84)

- From within the Embedded UEFI shell (on page 86)

- From within operating system-specific IML viewers:
    - For Windows: IML Viewer
    - For Linux: IML Viewer Application

- From within the HP iLO web interface

- From within HP Insight Diagnostics (on page 82)

HP Insight Remote Support

HP strongly recommends that you register your device for remote support to enable enhanced delivery of your HP Warranty, HP Care Pack Service, or HP contractual support agreement. HP Insight Remote Support supplements your monitoring continuously to ensure maximum system availability by providing intelligent event diagnosis, and automatic, secure submission of hardware event notifications to HP, which will initiate a fast and accurate resolution, based on your product's service level. Notifications can be sent to your authorized HP Channel Partner for onsite service, if configured and available in your country.

For more information, see *HP Insight Remote Support and Insight Online Setup Guide for ProLiant Servers and BladeSystem c-Class Enclosures* on the HP website (http://www.hp.com/go/insightremotesupport/docs). HP Insight Remote Support is available as part of HP Warranty, HP Care Pack Service, or HP contractual support agreement.

HP Insight Remote Support central connect

When you use the embedded Remote Support functionality with HP ProLiant Gen8 and later server models and HP BladeSystem c-Class enclosures, you can register a server or enclosure to communicate to HP through an HP Insight Remote Support centralized Hosting Device in your local environment. All configuration and service event information is routed through the Hosting Device. This information can be viewed by using the local HP Insight Remote Support user interface or the web-based view in HP Insight Online.

For more information, see *HP Insight Remote Support Release Notes* on the HP website (http://www.hp.com/go/insightremotesupport/docs).

HP Insight Online direct connect

When you use the embedded Remote Support functionality with HP ProLiant Gen8 and later server models and HP BladeSystem c-Class enclosures, you can register a server or enclosure to communicate directly to HP Insight Online without the need to set up an HP Insight Remote Support centralized Hosting Device in your local environment. HP Insight Online will be your primary interface for remote support information.

For more information, see the product documentation on the HP website (http://www.hp.com/go/insightremotesupport/docs).

HP Insight Online

HP Insight Online is a capability of the HP Support Center portal. Combined with HP Insight Remote Support central connect or HP Insight Online direct connect, it automatically aggregates device health, asset, and support information with contract and warranty information, and then secures it in a single, personalized dashboard that is viewable from anywhere at any time. The dashboard organizes your IT and service data to help you understand and respond to that information more quickly. With specific authorization from you, an authorized HP Channel Partner can also view your IT environment remotely using HP Insight Online.

For more information about using HP Insight Online, see the *HP Insight Online User's Guide* on the HP website (http://www.hp.com/go/insightremotesupport/docs).

Intelligent Provisioning

Intelligent Provisioning is a single-server deployment tool embedded in HP ProLiant Gen8 and later servers that simplifies HP ProLiant server setup, providing a reliable and consistent way to deploy HP ProLiant server configurations:

- Intelligent Provisioning assists with the OS installation process by preparing the system for installing "off-the-shelf" and HP branded versions of operating system software and integrating optimized HP ProLiant server support software.

- Intelligent Provisioning provides maintenance-related tasks using the Perform Maintenance window.

- Intelligent Provisioning provides installation help for Microsoft Windows, Red Hat and SUSE Linux, and VMware operating systems. For specific OS support, see the *HP Intelligent Provisioning Release Notes* on the HP website (http://www.hp.com/go/intelligentprovisioning/docs).

For more information about Intelligent Provisioning software, see the HP website (http://www.hp.com/go/intelligentprovisioning). For Intelligent Provisioning recovery media downloads, see the Resources tab on the HP website (http://www.hp.com/go/ilo). For consolidated drive and firmware update packages, see the HP Smart Update: Server Firmware and Driver Updates page on the HP website (http://www.hp.com/go/SmartUpdate).

HP Insight Diagnostics

HP Insight Diagnostics is a proactive server management tool, available in both offline and online versions, that provides diagnostics and troubleshooting capabilities to assist IT administrators who verify server installations, troubleshoot problems, and perform repair validation.

HP Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, boot the server using Intelligent Provisioning (on page 81).

HP Insight Diagnostics Online Edition is a web-based application that captures system configuration and other related data needed for effective server management. Available in Microsoft Windows and Linux versions, the utility helps to ensure proper system operation.

For more information or to download the utility, see the HP website (http://www.hp.com/servers/diags). HP Insight Diagnostics Online Edition is also available in the SPP ("HP Service Pack for ProLiant" on page 83).

HP Insight Diagnostics survey functionality

HP Insight Diagnostics (on page 82) provides survey functionality that gathers critical hardware and software information on ProLiant servers.

This functionality supports operating systems that are supported by the server. For operating systems supported by the server, see the HP website (http://www.hp.com/go/supportos).

If a significant change occurs between data-gathering intervals, the survey function marks the previous information and overwrites the survey data files to reflect the latest changes in the configuration.

Survey functionality is installed with every Intelligent Provisioning-assisted HP Insight Diagnostics installation, or it can be installed through the SPP ("HP Service Pack for ProLiant" on page 83).

Erase Utility

⚠ **CAUTION:** Perform a backup before running the Erase Utility. 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. Before using this utility, see the instructions in the *HP Intelligent Provisioning User Guide*.

Use the Erase Utility to erase drives and Active Health System logs, and to reset UEFI System Utilities settings. Run the Erase Utility if you must erase the system for the following reasons:

- You want to install a new operating system on a server with an existing operating system.

- You encounter an error when completing the steps of a factory-installed operating system installation.

To access the Erase Utility, click the Perform Maintenance icon from the Intelligent Provisioning home screen, and then select **Erase**.

For more information about the Erase Utility, see the *HP Intelligent Provisioning User Guide* on the HP website (http://www.hp.com/go/intelligentprovisioning/docs).

Scripting Toolkit for Windows and Linux

The Scripting Toolkit for Windows and Linux is a server deployment product that delivers an unattended automated installation for high-volume server deployments. The Scripting Toolkit is designed to support ProLiant BL, ML, DL, and SL servers. The toolkit includes a modular set of utilities and important documentation that describes how to apply these tools to build an automated server deployment process.

The Scripting Toolkit provides a flexible way to create standard server configuration scripts. These scripts are used to automate many of the manual steps in the server configuration process. This automated server configuration process cuts time from each deployment, making it possible to scale rapid, high-volume server deployments.

For more information, and to download the Scripting Toolkit, see the HP website (http://www.hp.com/go/ProLiant/STK).

HP Service Pack for ProLiant

SPP is a comprehensive systems software (drivers and firmware) solution delivered as a single package with major server releases. This solution uses HP SUM as the deployment tool and is tested on all supported HP ProLiant servers including HP ProLiant Gen8 and later servers.

SPP can be used in an online mode on a Windows or Linux hosted operating system, or in an offline mode where the server is booted to an operating system included on the ISO file so that the server can be updated automatically with no user interaction or updated in interactive mode.

For more information or to download SPP, see one of the following pages on the HP website:

- HP Service Pack for ProLiant download page (http://www.hp.com/go/spp)

- HP Smart Update: Server Firmware and Driver Updates page (http://www.hp.com/go/SmartUpdate)

HP Smart Update Manager

HP SUM is a product used to install and update firmware, drivers, and systems software on HP ProLiant servers. HP SUM provides a GUI and a command-line scriptable interface for deployment of systems software for single or one-to-many HP ProLiant servers and network-based targets, such as iLOs, OAs, and VC Ethernet and Fibre Channel modules.

For more information about HP SUM, see the product page on the HP website (http://www.hp.com/go/hpsum).

To download HP SUM, see the HP website (http://www.hp.com/go/hpsum/download).

To access the *HP Smart Update Manager User Guide*, see the HP SUM Information Library (http://www.hp.com/go/hpsum/documentation).

HP UEFI System Utilities

The HP UEFI System Utilities is embedded in the system ROM. The UEFI System Utilities enable you to perform a wide range of configuration activities, including:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options
- Selecting a language
- Launching other pre-boot environments such as the Embedded UEFI Shell and Intelligent Provisioning

For more information on the HP UEFI System Utilities, see the *HP UEFI System Utilities User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

Scan the QR code located at the bottom of the screen to access mobile-ready online help for the UEFI System Utilities and UEFI Shell. For on-screen help, press **F1**.

Using HP UEFI System Utilities

To use the System Utilities, use the following keys.

Action	Key
Access System Utilities	F9 during server POST
Navigate menus	Up and Down arrows
Select items	Enter
Save selections	F10
Access Help for a highlighted configuration option*	F1

*Scan the QR code on the screen to access online help for the UEFI System Utilities and UEFI Shell.

Default configuration settings are applied to the server at one of the following times:

- Upon the first system power-up
- After defaults have been restored

Default configuration settings are sufficient for typical server operations; however, you can modify configuration settings as needed. The system prompts you for access to the System Utilities each time the system is powered up.

Flexible boot control

This feature enables you to do the following:

- Add Boot Options
  - Browse all FAT16 and FAT32 file systems.
  - Select an X64 UEFI application with an .EFI extension to add as a new UEFI boot option, such as an OS boot loader or other UEFI application.

The new boot option is appended to the boot order list. When you select a file, you are prompted to enter the boot option description (which is then displayed in the Boot menu), as well as any optional data to be passed to an .EFI application.

- Boot to System Utilities

    After pre-POST, the boot options screen appears. During this time, you can access the System Utilities by pressing the **F9** key.

- Choose between supported modes: Legacy BIOS Boot Mode or UEFI Boot Mode

    IMPORTANT: If the default boot mode settings are different than the user defined settings, the system may not boot the OS installation if the defaults are restored. To avoid this issue, use the User Defined Defaults feature in UEFI System Utilities to override the factory default settings.

For more information, see the *HP UEFI System Utilities User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

Restoring and customizing configuration settings

You can reset all configuration settings to the factory default settings, or you can restore system default configuration settings, which are used instead of the factory default settings.

You can also configure default settings as necessary, and then save the configuration as the custom default configuration. When the system loads the default settings, it uses the custom default settings instead of the factory defaults.

Secure Boot configuration

Secure Boot is integrated in the UEFI specification on which the HP implementation of UEFI is based. Secure Boot is completely implemented in the BIOS and does not require special hardware. It ensures that each component launched during the boot process is digitally signed and that the signature is validated against a set of trusted certificates embedded in the UEFI BIOS. Secure Boot validates the software identity of the following components in the boot process:

- UEFI drivers loaded from PCIe cards
- UEFI drivers loaded from mass storage devices
- Pre-boot UEFI shell applications
- OS UEFI boot loaders

Once enabled, only firmware components and operating systems with boot loaders that have an appropriate digital signature can execute during the boot process. Only operating systems that support Secure Boot and have an EFI boot loader signed with one of the authorized keys can boot when Secure Boot is enabled. For more information about supported operating systems, see the *HP UEFI System Utilities and Shell Release Notes* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

A physically present user can customize the certificates embedded in the UEFI BIOS by adding/removing their own certificates.

Embedded UEFI shell

The system BIOS in all HP ProLiant Gen9 servers includes an Embedded UEFI Shell in the ROM. The UEFI Shell environment provides an API, a command line prompt, and a set of CLIs that allow scripting, file manipulation, and system information. These features enhance the capabilities of the UEFI System Utilities.

For more information, see the following documents:

- *HP UEFI Shell User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs)

- *UEFI Shell Specification* on the UEFI website (http://www.uefi.org/specifications)

Embedded Diagnostics option

The system BIOS in all HP ProLiant Gen9 servers includes an Embedded Diagnostics option in the ROM. The Embedded Diagnostics option can run comprehensive diagnostics of the server hardware, including processors, memory, drives, and other server components.

For more information on the Embedded Diagnostics option, see the *HP UEFI System Utilities User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

HP RESTful API support for UEFI

HP ProLiant Gen9 servers include support for a UEFI compliant System BIOS, along with UEFI System Utilities and Embedded UEFI Shell pre-boot environments. HP ProLiant Gen9 servers also support configuring the UEFI BIOS settings using the HP RESTful API, a management interface that server management tools can use to perform configuration, inventory, and monitoring of an HP ProLiant server. A REST client uses HTTPS operations to configure supported server settings, such as UEFI BIOS settings.

For more information about the HP RESTful API and the HP RESTful Interface Tool, see the HP website (http://www.hp.com/support/restfulinterface/docs).

Re-entering the server serial number and product ID

After you replace the system board, you must re-enter the server serial number and the product ID.

1. During the server startup sequence, press the **F9** key to access UEFI System Utilities.

2. Select the **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Advanced Options** > **Advanced System ROM Options** > **Serial Number**, and then press the **Enter** key.

3. Enter the serial number and press the **Enter** key. The following message appears:

   The serial number should only be modified by qualified service personnel. This value should always match the serial number located on the chassis.

4. Press the **Enter** key to clear the warning.

5. Enter the serial number and press the **Enter** key.

6. Select **Product ID**. The following warning appears:

   Warning: The Product ID should ONLY be modified by qualified service personnel. This value should always match the Product ID located on the chassis.

7. Enter the product ID and press the **Enter** key.

8. Press the **F10** key to confirm exiting System Utilities. The server automatically reboots.

Utilities and features

HP Smart Storage Administrator

HP SSA is a configuration and management tool for HP Smart Array controllers. Starting with HP ProLiant Gen8 servers, HP SSA replaces ACU with an enhanced GUI and additional configuration features.

HP SSA exists in three interface formats: the HP SSA GUI, the HP SSA CLI, and HP SSA Scripting. Although all formats provide support for configuration tasks, some of the advanced tasks are available in only one format.

Some HP SSA features include the following:

- Supports online array capacity expansion, logical drive extension, assignment of online spares, and RAID or stripe size migration
- Suggests the optimal configuration for an unconfigured system
- Provides diagnostic and SmartSSD Wear Gauge functionality on the Diagnostics tab
- For supported controllers, provides access to additional features.

For more information about HP SSA, see the HP website (http://www.hp.com/go/hpssa).

Automatic Server Recovery

ASR is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue screen, ABEND, or panic. A system fail-safe timer, the ASR timer, starts when the System Management driver, also known as the Health Driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server.

ASR increases server availability by restarting the server within a specified time after a system hang. You can disable ASR from the System Management Homepage or through UEFI System Utilities.

USB support

HP servers support both USB 2.0 ports and USB 3.0 ports. Both types of ports support installing all types of USB devices (USB 1.0, USB 2.0, and USB 3.0), but may run at lower speeds in specific situations:

- USB 3.0 capable devices operate at USB 2.0 speeds when installed in a USB 2.0 port.
- When the server is configured for UEFI Boot Mode, HP provides legacy USB support in the pre-boot environment prior to the operating system loading for USB 1.0, USB 2.0 , and USB 3.0 speeds.
- When the server is configured for Legacy BIOS Boot Mode, HP provides legacy USB support in the pre-boot environment prior to the operating system loading for USB 1.0 and USB 2.0 speeds. While USB 3.0 ports can be used with all devices in Legacy BIOS Boot Mode, they are not available at USB 3.0 speeds in the pre-boot environment. Standard USB support (USB support from within the operating system) is provided by the OS through the appropriate USB device drivers. Support for USB 3.0 varies by operating system.

For maximum compatibility of USB 3.0 devices with all operating systems, HP provides a configuration setting for USB 3.0 Mode. Auto is the default setting. This setting impacts USB 3.0 devices when connected to USB 3.0 ports in the following manner:

- **Auto (default)**—If configured in Auto Mode, USB 3.0 capable devices operate at USB 2.0 speeds in the pre-boot environment and during boot. When a USB 3.0 capable OS USB driver loads, USB 3.0 devices transition to USB 3.0 speeds. This mode provides compatibility with operating systems that do not support USB 3.0 while still allowing USB 3.0 devices to operate at USB 3.0 speeds with state-of-the art operating systems.

- **Enabled**—If Enabled, USB 3.0 capable devices operate at USB 3.0 speeds at all times (including the pre-boot environment) when in UEFI Boot Mode. This mode should not be used with operating systems that do not support USB 3.0. If operating in Legacy Boot BIOS Mode, the USB 3.0 ports cannot function in the pre-boot environment and are not bootable.

- **Disabled**—If configured for Disabled, USB 3.0 capable devices function at USB 2.0 speeds at all times.

The pre-OS behavior of the USB ports is configurable in System Utilities, so that the user can change the default operation of the USB ports. For more information, see the *HP UEFI System Utilities User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

External USB functionality

HP provides external USB support to enable local connection of USB devices for server administration, configuration, and diagnostic procedures.

For additional security, external USB functionality can be disabled through USB options in UEFI System Utilities.

Redundant ROM support

The server enables you to upgrade or configure the ROM safely with redundant ROM support. The server has a single ROM that acts as two separate ROM images. In the standard implementation, one side of the ROM contains the current ROM program version, while the other side of the ROM contains a backup version.

> **NOTE:** The server ships with the same version programmed on each side of the ROM.

Safety and security benefits

When you flash the system ROM, the flashing mechanism writes over the backup ROM and saves the current ROM as a backup, enabling you to switch easily to the alternate ROM version if the new ROM becomes corrupted for any reason. This feature protects the existing ROM version, even if you experience a power failure while flashing the ROM.

Keeping the system current

Access to HP Support Materials

Access to some updates for HP ProLiant Servers may require product entitlement when accessed through the HP Support Center support portal. HP recommends that you have an HP Passport set up with relevant entitlements. For more information, see the HP website (http://h20564.www2.hp.com/portal/site/hpsc/public/kb/docDisplay/?docId=c03859703).

Updating firmware or System ROM

Multiple methods exist to update the firmware or System ROM:

- HP Service Pack for ProLiant (on page 83)
- FWUPDATE utility (on page 89)
- FWUpdate command from within the Embedded UEFI shell (on page 89)
- Firmware Update application in System Utilities (on page 90)
- Online Flash components (on page 90)

Product entitlement is required to perform updates. For more information, see "Access to HP Support Materials (on page 88)."

FWUPDATE utility

The FWUPDATE utility enables you to upgrade the system firmware (BIOS).

To use the utility to upgrade the firmware:

1. Download the FWUPDATE flash component from the HP website (http://www.hp.com/go/hpsc).
2. Save the FWUPDATE flash components to a USB key.
3. Set the boot order so the USB key will boot first using one of the following options:
   o Configure the boot order so the USB key is the first bootable device.
   o Press **F11** (Boot Menu) when prompted during system boot to access the **One-Time Boot Menu**. This menu allows you to select the boot device for a specific boot and does not modify the boot order configuration settings.
4. Insert the USB key into an available USB port.
5. Boot the system.

   The FWUPDATE utility checks the system and provides a choice (if more than one exists) of available firmware revisions.

To download the flash components, see the HP website (http://www.hp.com/go/hpsc).

For more information about the One-Time Boot Menu, see the *HP UEFI System Utilities User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

FWUpdate command from within the Embedded UEFI Shell

For systems configured in either boot mode, update the firmware:

1. Access the System ROM Flash Binary component for your server from the HP Support Center (http://www.hp.com/go/hpsc). When searching for the component, always select **OS Independent** to locate the binary file.
2. Copy the binary file to a USB media or iLO virtual media.
3. Attach the media to the server.
4. Boot to Embedded Shell.
5. To obtain the assigned file system volume for the USB key, enter `Map -r` . For more information about accessing a file system from the shell, see the *HP UEFI Shell User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

6. Change to the file system that contains the System ROM Flash Binary component for your server. Enter one of the fsx file systems available, such as `fs0` or `fs1`, and press **Enter**.

7. Use the `cd` command to change from the current directory to the directory that contains the binary file.

8. Enter `fwupdate –d BIOS -f <filename>` to flash the system ROM.

   For help on the FWUPDATE command, enter the command:

   `help fwupdate -b`

9. Reboot the server. A reboot is required after the firmware update for the updates to take effect and for hardware stability to be maintained.

For more information about the commands used in this procedure, see the *HP UEFI Shell User Guide for HP ProLiant Gen9 Servers* on the HP website (http://www.hp.com/go/ProLiantUEFI/docs).

Firmware Update application in System Utilities

For systems configured in either boot mode, update the firmware:

1. Access the System ROM Flash Binary component for your server from the HP Support Center (http://www.hp.com/go/hpsc). When searching for the component, always select **OS Independent** to find the component.

2. Copy the binary file to a USB media or iLO virtual media.

3. Attach the media to the server.

4. During POST, press **F9** to enter System Utilities.

5. Select **Embedded Applications** → **Firmware Update** → **System ROM** → **Select Firmware File**.

6. Select the device containing the flash file.

7. Select the flash file. This step may take a few moments to complete.

8. Select **Start firmware update** and allow the process to complete.

9. Reboot the server. A reboot is required after the firmware update for the updates to take effect and for hardware stability to be maintained.

Online Flash components

This component provides updated system firmware that can be installed directly on supported Operating Systems. Additionally, when used in conjunction with HP SUM ("HP Smart Update Manager" on page 83), this Smart Component allows the user to update firmware on remote servers from a central location. This remote deployment capability eliminates the need for the user to be physically present at the server to perform a firmware update.

Drivers

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

The server includes new hardware that may not have driver support on all OS installation media.

If you are installing an Intelligent Provisioning-supported OS, use Intelligent Provisioning (on page 81) and its Configure and Install feature to install the OS and latest supported drivers.

If you do not use Intelligent Provisioning to install an OS, drivers for some of the new hardware are required. These drivers, as well as other option drivers, ROM images, and value-add software can be downloaded as part of an SPP.

If you are installing drivers from SPP, be sure that you are using the latest SPP version that your server supports. To verify that your server is using the latest supported version and for more information about SPP, see the HP website (http://www.hp.com/go/spp/download).

To locate the drivers for a particular server, go to the HP website (http://www.hp.com/go/hpsc) and click on **Drivers, Software & Firmware**. Then, enter your product name in the **Find an HP product** field and click **Go**.

Software and firmware

Software and firmware should be updated before using the server for the first time, unless any installed software or components require an older version.

For system software and firmware updates, use one of the following sources:

- Download the SPP ("HP Service Pack for ProLiant" on page 83) from the HP Service Pack for ProLiant download page (http://www.hp.com/go/spp).

- Download individual drivers, firmware, or other systems software components from the server product page in the HP Support Center (http://www.hp.com/go/hpsc).

Operating System Version Support

For information about specific versions of a supported operating system, refer to the operating system support matrix (http://www.hp.com/go/supportos).

Version control

The VCRM and VCA are web-enabled Insight Management Agents tools that HP SIM uses to schedule software update tasks to the entire enterprise.

- VCRM manages the repository for SPP. Administrators can view the SPP contents or configure VCRM to automatically update the repository with internet downloads of the latest software and firmware from HP.

- VCA compares installed software versions on the node with updates available in the VCRM managed repository. Administrators configure VCA to point to a repository managed by VCRM.

For more information about version control tools, see the *HP Systems Insight Manager User Guide,* the *HP Version Control Agent User Guide*, and the *HP Version Control Repository Manager User Guide* on the HP website (http://www.hp.com/go/enterprise/docs).

1. Select **HP Insight Management** from the available options in Products and Solutions.
2. Select **HP Version Control** from the available options in HP Insight Management.
3. Download the latest document.

HP operating systems and virtualization software support for ProLiant servers

For information about specific versions of a supported operating system, see the HP website (http://www.hp.com/go/ossupport).

HP Technology Service Portfolio

Connect to HP for assistance on the journey to the new style of IT. HP Technology Services delivers confidence and reduces risk to help you realize agility and stability in your IT infrastructure.

Utilize our consulting expertise in the areas of private or hybrid cloud computing, big data and mobility requirements, improving data center infrastructure and better use of today's server, storage and networking technology. For more information, see the HP website (http://www.hp.com/services/consulting).

Our support portfolio covers services for HP server, storage and networking hardware and software plus the leading industry standard operating systems. Let us work proactively with you to prevent problems. Our flexible choices of hardware and software support coverage windows and response times help resolve problems faster, reduce unplanned outages and free your staff for more important tasks. For more information, see the HP website (http://www.hp.com/services/support).

Tap into our knowledge, expertise, innovation and world-class services to achieve better results. Access and apply technology in new ways to optimize your operations and you'll be positioned for success.

Change control and proactive notification

HP offers Change Control and Proactive Notification to notify customers 30 to 60 days in advance of upcoming hardware and software changes on HP commercial products.

For more information, refer to the HP website (http://www.hp.com/go/pcn).

HP resources for troubleshooting

Online resources

HP Support Center website

Troubleshooting tools and information, as well as the latest drivers and flash ROM images, are available on the HP website (http://www.hp.com/go/hpsc).

HP Enterprise Information Library

HP ProLiant Server documentation is available in the HP Enterprise Information Library (http://www.hp.com/go/hpsc).

HP Guided Troubleshooting website

HP Guided Troubleshooting is available for many products and components on the HP website (http://www.hp.com/support/gts).

Troubleshooting resources for previous HP ProLiant server models

HP ProLiant Gen8 Servers

The *HP ProLiant Gen8 Troubleshooting Guide, Volume I: Troubleshooting* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_TSG_v1_en)
- French (http://www.hp.com/support/ProLiant_TSG_v1_fr)
- Spanish (http://www.hp.com/support/ProLiant_TSG_v1_sp)
- German (http://www.hp.com/support/ProLiant_TSG_v1_gr)
- Japanese (http://www.hp.com/support/ProLiant_TSG_v1_jp)
- Simplified Chinese (http://www.hp.com/support/ProLiant_TSG_v1_sc)

The *HP ProLiant Gen8 Troubleshooting Guide, Volume II: Error Messages* provides a list of error messages and information to assist with interpreting and resolving error messages on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_EMG_v1_en)
- French (http://www.hp.com/support/ProLiant_EMG_v1_fr)
- Spanish (http://www.hp.com/support/ProLiant_EMG_v1_sp)
- German (http://www.hp.com/support/ProLiant_EMG_v1_gr)

- Japanese (http://www.hp.com/support/ProLiant_EMG_v1_jp)
- Simplified Chinese (http://www.hp.com/support/ProLiant_EMG_v1_sc)

HP ProLiant Gen7 and prior servers

The *HP ProLiant Servers Troubleshooting Guide* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, error message interpretation, issue resolution, and software maintenance on ProLiant servers and server blades. This guide includes problem-specific flowcharts to help you navigate complex troubleshooting processes. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_TSG_en)
- French (http://www.hp.com/support/ProLiant_TSG_fr)
- Italian (http://www.hp.com/support/ProLiant_TSG_it)
- Spanish (http://www.hp.com/support/ProLiant_TSG_sp)
- German (http://www.hp.com/support/ProLiant_TSG_gr)
- Dutch (http://www.hp.com/support/ProLiant_TSG_nl)
- Japanese (http://www.hp.com/support/ProLiant_TSG_jp)

Server blade enclosure troubleshooting resources

The *HP BladeSystem c-Class Enclosure Troubleshooting Guide* provides procedures and solutions for troubleshooting an HP BladeSystem c-Class enclosure, from using the Insight Display to more complex component-level troubleshooting. For more information, see the HP website (http://www.hp.com/go/bladesystem/documentation).

Error message resources

The *HP ProLiant Gen9 Troubleshooting Guide, Volume II: Error Messages* provides a list of error messages and information to assist with interpreting and resolving error messages on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/Gen9_EMG_en)
- French (http://www.hp.com/support/Gen9_EMG_fr)
- Spanish (http://www.hp.com/support/Gen9_EMG_es)
- German (http://www.hp.com/support/Gen9_EMG_de)
- Japanese (http://www.hp.com/support/Gen9_EMG_ja)
- Simplified Chinese (http://www.hp.com/support/Gen9_EMG_zh_cn)

Server documentation

Server documentation can be accessed from the following locations:

- Product specific information library — See the Start Here document that ships with the server.
- HP Enterprise Information Library (http://www.hp.com/support/proliantgen9/docs) — Select the product to narrow the list to fewer documents.

- HP Support Center website (http://www.hp.com/go/hpsc)

HP product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the HP website (http://www.hp.com/go/qs).

White papers

White papers are electronic documentation on complex technical topics. Some white papers contain in-depth details and procedures. Topics include HP products, HP technology, OS, networking products, and performance. See one of the following websites:

- HP Support Center (http://www.hp.com/go/hpsc)

- Industry Standard Server Technology Communications (http://www.hp.com/servers/technology)

Service notifications, advisories, and notices

To search for service notifications, see the HP Support Center (http://www.hp.com/go/hpsc). Enter the product name or number, and then click **Go**. Select **Advisories, Bulletins & Notices**. The complete list of documents is displayed.

Subscription services

Receive support alerts, product support communications, driver updates, software releases, firmware updates, and customer replaceable component information in your email by signing up on the HP website (http://www.hp.com/go/myadvisory).

To change options for support alerts you already receive, click the link to sign in on the right.

HP Technology Service Portfolio

Connect to HP for assistance on the journey to the new style of IT. HP Technology Services delivers confidence and reduces risk to help you realize agility and stability in your IT infrastructure.

Utilize our consulting expertise in the areas of private or hybrid cloud computing, big data and mobility requirements, improving data center infrastructure and better use of today's server, storage and networking technology. For more information, see the HP website (http://www.hp.com/services/consulting).

Our support portfolio covers services for HP server, storage and networking hardware and software plus the leading industry standard operating systems. Let us work proactively with you to prevent problems. Our flexible choices of hardware and software support coverage windows and response times help resolve problems faster, reduce unplanned outages and free your staff for more important tasks. For more information, see the HP website (http://www.hp.com/services/support).

Tap into our knowledge, expertise, innovation and world-class services to achieve better results. Access and apply technology in new ways to optimize your operations and you'll be positioned for success.

Product information resources

Additional product information

Refer to product information on the HP Servers website (http://www.hp.com/country/us/eng/prodserv/servers.html).

Registering the server

To experience quicker service and more efficient support, register the product at the HP Product Registration website (http://register.hp.com).

Overview of server features and installation instructions

For server features, see the Product QuickSpecs on the HP website (http://www.hp.com/go/qs).

For installation instructions, see the server user guide available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Key features, option part numbers

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the HP website (http://www.hp.com/go/qs).

Server and option specifications, symbols, installation warnings, and notices

See the printed notices, available in the Reference Information pack.

See the server documentation, available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Spare part numbers

HP continually improves and changes product parts. For complete and current supported parts information, see the HP PartSurfer website (http://partsurfer.hp.com).

Teardown procedures, part numbers, specifications

See the server maintenance and service guide, available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Teardown or removal and replacement procedure videos

For more information about removal and replacement procedures for HP ProLiant servers, see the HP website (http://thesml.hp.com).

Technical topics

White papers are electronic documentation on complex technical topics. Some white papers contain in-depth details and procedures. Topics include HP products, HP technology, OS, networking products, and performance. See one of the following websites:

- HP Support Center (http://www.hp.com/go/hpsc)
- Industry Standard Server Technology Communications (http://www.hp.com/servers/technology)

Product installation resources

External cabling information

See the cabling information on the HP website (http://www.hp.com/go/hpsc).

Power capacity

For all HP ProLiant ML, DL, SL and XL servers, see the HP Power Advisor on the HP website (http://www.hp.com/go/hppoweradvisor).

For all HP ProLiant BL server blades, see the HP BladeSystem Power Sizer on the HP website (http://www.hp.com/go/bladesystem/powercalculator).

Switch settings, LED functions, drive, memory, expansion board and processor installation instructions, and board layouts

See the access panel labels and the server user guide. The access panel labels are located on the server, and the server user guide is available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Product configuration resources

Device driver information

See the device driver information on the HP website (http://www.hp.com/go/hpsc).

DDR4 memory configuration

Locate the DDR4 Smart Memory Configurator on the HP website (http://www.hp.com/go/DDR4memoryconfig).

Operating System Version Support

For information about specific versions of a supported operating system, refer to the operating system support matrix (http://www.hp.com/go/supportos).

Operating system installation and configuration information (for factory-installed operating systems)

Refer to the factory-installed operating system installation documentation that ships with the server.

Server configuration information

See the server user guide or setup and installation guide, available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Installation and configuration information for the server setup software

See the server user guide or setup and installation guide, available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Software installation and configuration of the server

See the server user guide or setup and installation guide, available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

HP iLO information

For all HP iLO documentation, see the HP website (http://www.hp.com/go/ilo/docs).

Management of the server

See the *HP Systems Insight Manager Help Guide* in the the HP Enterprise Information Library (http://www.hp.com/go/hpsim/docs).

Installation and configuration information for the server management system

See the *HP Systems Insight Manager Installation and User Guide* on the HP Enterprise Information Library (http://www.hp.com/go/hpsim/docs).

Fault tolerance, security, care and maintenance, configuration and setup

See the server documentation, available in the following locations:

- HP Enterprise Information Library (http://www.hp.com/go/enterprise/docs)
- HP Support Center website (http://www.hp.com/go/hpsc)

Support and other resources

Contacting HP technical support or an authorized reseller

Before contacting HP, always attempt to resolve problems by completing the procedures in this guide.

> **IMPORTANT:** Collect the appropriate server information ("Server information you need" on page 100) and operating system information ("Operating system information you need" on page 101) before contacting HP for support.

For United States and worldwide contact information, see the Contact HP website (http://www.hp.com/go/assistance).

In the United States:

- To contact HP by phone, call 1-800-334-5144. For continuous quality improvement, calls may be recorded or monitored.

- If you have purchased a Care Pack (service upgrade), see the Support & Drivers website (http://www8.hp.com/us/en/support-drivers.html). If the problem cannot be resolved at the website, call 1-800-633-3600. For more information about Care Packs, see the HP website (http://pro-aq-sama.houston.hp.com/services/cache/10950-0-0-225-121.html).

Customer self repair

What is customer self repair?

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

A convenient, easy-to-use program:

- An HP support specialist will diagnose and assess whether a replacement part is required to address a system problem. The specialist will also determine whether you can replace the part.

- For specific information about customer replaceable parts, refer to the maintenance and service guide on the HP website (http://www.hp.com/support).

Server information you need

Before contacting HP technical support, collect the following information:

- Explanation of the issue, the first occurrence, and frequency
- Any changes in hardware or software configuration before the issue surfaced
- Active Health System log ("Active Health System log overview" on page 104)

Download and have available an Active Health System log for 7 days before the failure was detected. For more information, see the *HP iLO 4 User Guide* or *HP Intelligent Provisioning User Guide* on the HP website (http://www.hp.com/go/ilo/docs).

- Onboard Administrator SHOW ALL report (for HP BladeSystem products only)

  For more information on obtaining the Onboard Administrator SHOW ALL report, see the HP website (http://www.hp.com/go/OAlog).

- Third-party hardware information:
  o Product name, model, and version
  o Company name

- Specific hardware configuration:
  o Product name, model, and serial number
  o Number of processors and model number
  o Number of DIMMs and their size and speed
  o List of controllers and NICs
  o List of connected peripheral devices
  o List of any other optional HP or Compaq hardware
  o Network configuration

- Specific software information:
  o Operating system information ("Operating system information you need" on page 101)
  o List of third-party, HP, and Compaq software installed
  o PCAnywhere information, if installed
  o Verification of latest drivers installed
  o Verification of latest ROM/BIOS
  o Verification of latest firmware on array controllers and drives

- Results from attempts to clear NVRAM

Operating system information you need

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

Microsoft operating systems

Collect the following information:

- Whether the operating system was factory installed
- Operating system version number
- A current copy of the following files:
  o WinMSD (Msinfo32.exe on Microsoft Windows 2008 systems)
  o Output of BCDedit /v
  o Memory.dmp

- o Event logs
- o Dr. Watson log (drwtsn32.log) if a user mode application, such as the Insight Agents, is having a problem
- o IRQ and I/O address information in text format
- o Contents of c:\cpqsystem directory
- o Insight Diagnostics Online Edition survey output
- o HPS report (on page)
- If HP drivers are installed:
  - o Version of the SPP used
  - o List of drivers from the SPP
- The drive subsystem and file system information:
  - o Number and size of partitions and logical drives
  - o File system on each logical drive
- Current level of Microsoft Windows Service Packs and Hot fixes installed
- A list of each third-party hardware component installed, with the firmware revision
- A list of each third-party software component installed, with the version
- A detailed description of the problem and any associated error messages

Linux operating systems

Collect the following information:

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

- o /etc/lilo.conf or /etc/grub.conf or /boot/grub/menu.lst or boot/grub/grub.conf
- o /etc/fstab
- Capture the cfg2html report. For more information, see the cfg2html website (http://www.cfg2html.com).
- If HP drivers are installed:
  - o Version of the SPP used
  - o List of drivers from the SPP (/var/log/hppldu.log)
- A list of each third-party hardware component installed, with the firmware revisions
- A list of each third-party software component installed, with the versions
- A detailed description of the problem and any associated error messages

Oracle Solaris operating systems

Collect the following information:

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

Reports and logs

The reports and logs in this section may be required before you contact HP.

Active Health System log overview

The Active Health System log is a single file that contains basic information required by HP support to analyze an HP ProLiant Gen8 or later server. For more information about the Active Health System, see "Active Health System (on page 79)."

You can download the Active Health System log manually and send it to HP. The log can be downloaded using the following tools:

- HP iLO ("Use HP iLO to download the Active Health System Log for a date range" on page 105)

- Intelligent Provisioning ("Use Intelligent Provisioning" on page 106)

- Active Health System download CLI for Windows Operating Systems ("Use the Active Health System download CLI for Windows Operating Systems" on page 107)

- Active Health System download CLI for Linux Distributions ("Use the Active Health System download CLI for Linux Distributions" on page 107)

- `curl` command line tool ("Use the curl command line tool" on page 108)

The Active Health System log can be captured using both offline or online methods.

Operating system	Online server	Offline server
Microsoft Windows	AHS download CLI, HP iLO web interface	Intelligent Provisioning
Linux	AHS download CLI, HP iLO web interface	Intelligent Provisioning
VMware	HP iLO web interface	Intelligent Provisioning
Other operating systems	HP iLO web interface	Intelligent Provisioning

Active Health System download CLI utility

The Active Health System Download CLI is available for Microsoft Windows operating systems and LINUX distributions. AHS download CLI requires the HP ProLiant Integrated Lights-Out Management Interface Driver v1.15 or later.

The Active Health System Download CLI is the preferred tool to download the log when a supported operating system is installed. To obtain the HP Active Health System Download for Windows packages, see the HP FTP website (ftp://ftp.hp.com/pub/softlib2/software1/pubsw-windows/p1783870791/v75797/AHSdownload_Windows_1.0.8.04.zip). To obtain the HP Active Health System Download for Linux packages, see the HP FTP website (ftp://ftp.hp.com/pub/softlib2/software1/pubsw-linux/p1088551165/v75795/AHSdownload_Linux_1.0.8.05.tar).

HP iLO web interface

You can access the HP iLO web interface by using your existing HP iLO account information, or by using the IP address available on the server screen during POST and the username and password located on the HP iLO Default Network Settings tag with the server (this HP iLO Default Network Settings tag also contains the HP iLO IP DNS name).

Download the Active Health System log from the HP iLO web interface using the Active Health System log menu. This Active Health System log download method using the HP iLO web interface is the only option for

online downloading the Active Health System log when the Active Health System download CLI tool is not available. For more information, see "HP iLO (on page 78)."

HP Intelligent Provisioning

With HP ProLiant Gen8 Servers and later, all diagnostic tools are now embedded on a NAND flash module that can be accessed by pressing F10 at POST during server boot. For more information, see "Intelligent Provisioning (on page 81)."

Download the Active Health System log

Use one of the methods in this section to download the Active Health System log.

Use HP iLO

The Active Health System log can be downloaded using the following methods:

- Downloading the entire Active Health System log ("Use HP iLO to download the entire Active Health System log" on page 106)

- Downloading the Active Health System log for a date range ("Use HP iLO to download the Active Health System Log for a date range" on page 105)

For more information, see the *HP iLO 4 User Guide* and the HP Insight Remote Support documentation.

Use HP iLO to download the Active Health System Log for a date range

To download the Active Health System log using HP iLO:

1. Navigate to the **Information > Active Health System log** page.
2. Enter the range of days to include in the log.

   The default setting is to include log information for the last seven days. Click **Reset range to default values** to reset the dates.

   a. Click the **From** box.

      A calendar is displayed.

   b. Select the range start date on the calendar.

   c. Click the **To** box.

      A calendar is displayed.

   d. Select the range end date on the calendar.

3. Enter the contact information to include in the downloaded file (optional):

   o **HP Support case number**

   o **Contact name**

   o **Phone number**

   o **Email**

   o **Company name**

4. Click **Download**.

   A dialog box prompts you to open or save the file.

5. Click **Save**.

   A dialog box prompts you to choose a file location.

6. Specify a file location and file name, and then click **Save**.

7. If you have an open case with HP Support, you can e-mail the log file to HPsupport_Global@hp.com.

   Use the following convention for the email subject:

   <CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your HP Support case number.

Active Health System logs larger than 15 MB must be compressed before they are emailed to HP Support or they will need to be uploaded to an FTP site.

Use HP iLO to download the entire Active Health System log

It might take a long time to download the entire Active Health System log. If you need to upload the Active Health System log for a technical issue, HP recommends using the procedure "Use HP iLO to download the Active Health System Log for a date range (on page)" to download the log for the specific range of dates in which the problem occurred. Active Health System logs larger than 15 MB must be compressed before they are emailed to HP Support or they will need to be uploaded to an FTP site.

To download a log for a date range:

1. Navigate to the **Information > Active Health System log** page.

2. Click **Show Advanced Settings**.

3. Enter the contact information to include in the downloaded file:

   o **HP support case number**

   o **Contact name**

   o **Phone number**

   o **Email address**

   o **Company name**

4. Click **Download Entire Log**.

   A dialog box prompts you to open or save the file.

5. Click **Save**.

   A dialog box prompts you to choose a file location.

6. Specify a file location and file name, and then click **Save**.

7. If you have an open case with HP Support, you can e-mail the log file to HPsupport_Global@hp.com.

   Use the following convention for the e-mail subject:

   <CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your HP Support case number.

Use Intelligent Provisioning

The Active Health System download option on the Intelligent Provisioning Maintenance Options screen allows you to download Active Health System telemetry data from the server onto a USB key in the form of an Active Health System log file:

```
hp_serial#_date.ahs
```

The log file is sent to HP Services for problem resolution. Use this screen to select the duration for which data needs to be extracted and the USB key as destination media. You can select a specific start and end date to limit the duration of data extraction. A sample of the Active Health System telemetry is displayed on the Active Health System download screen.

To download and submit the Active Health System log file:

1. Insert a USB key into the server.

2. Press the **F10** key to boot to Intelligent Provisioning during server boot.

3. Launch the Active Health System download from the Intelligent Provisioning Maintenance page.

4. In the Active Health System download screen, select the USB key from the drop down menu.

   If you have inserted the USB key after launching Active Health System Download, click **Rescan**.

5. Select the duration of data retrieval in days, or select **Download the entire Active Health System log** to extract all data available in Active Health System download.

   HP recommends 7 days to keep the file size minimal. Files larger than 15 MB cannot be sent to HP.

6. Click **Download** to save the data to USB key.

7. Enter contact information (optional) in the form provided. The contact information will help HP Support in providing better assistance.

8. Contact HP Support, with the log file available for email submission.

9. After getting a Case ID from HP Support, email the log file to *HPSupport_Global@hp.com*, with the case ID in the subject. For example, <CASE:123456789>.

10. You will receive a confirmation email when your AHS log file is correctly attached to your open HP Support case and received.

    Click **Cancel** to cancel the operation at any time.

Use the Active Health System download CLI for Windows Operating Systems

1. Download Active Health System download utility from HP FTP website (ftp://ftp.hp.com/pub/softlib2/software1/pubsw-windows/p1783870791/v75797/AHSdownload_Windows_1.0.8.04.zip).

2. Extract the .zip file using WinZip or any other application.

3. Verify the README.txt file for possible command line options or execute the file by entering the following command:
   ```
   AHSdownload
   ```

   During the execution of the Active Health System download, a pop-up window for a virtually mounted drive may be displayed briefly during the download. This drive will disconnect automatically.

If the log is larger than 15 MB, then zip or compress the file before sending it to HP support.

If you have an open case with HP Support, you can e-mail the log file to HPsupport_Global@hp.com. Use the following convention for the e-mail subject:

<CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your HP Support case number.

Use the Active Health System download CLI for Linux Distributions

1. Download Active Health System download utility from HP FTP website (ftp://ftp.hp.com/pub/softlib2/software1/pubsw-linux/p1088551165/v75795/AHSdownload_Linux_1.0.8.05.tar).

2. Extract the Active Health System download using the following example.

   tar -xf {AHSdownload file name}.tar

3. Verify the README.txt file for possible command line options or just execute the file by entering the following command:
   ```
   ./AHSdownload
   ```

   During the execution of the Active Health System download, a pop-up window for a virtually mounted drive may be displayed briefly during the download. This drive will disconnect automatically.

If the log is larger than 15 MB, then zip or compress the file before sending it to HP support.

If you have an open case with HP Support, you can e-mail the log file to HPsupport_Global@hp.com. Use the following convention for the e-mail subject:

<CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your HP Support case number.

Use the curl command line tool

iLO 4 1.30 and later supports extracting the Active Health System log with the `curl` command line tool. You can download curl from the following curl website (http://curl.haxx.se/).

To download the Active Health System log:

1. Install curl.
2. Open a command window.
3. Enter the following command to download the Active Health System log for a range of dates:

   ```
   curl "https://<iLO IP
   address>/ahsdata/ahs.ahs?from=<yyyy-mm-dd>&to=<yyyy-mm-dd>" -k -v -u
   <username>:<password> -o <filename>.ahs
   ```

   Where:

   o `<iLO IP address>` is the iLO IP address.

   o `from=<yyyy-mm-dd>&to=<yyyy-mm-dd>` represents the start and end date of the range of dates to include in the log. Enter dates in the format year-month-day, for example, 2013-07-29 for July 29, 2013.

   o `-k` specifies that HTTPS warnings will be ignored.

   o `-v` specifies verbose output.

   o `-u <username>:<password>` specifies your iLO user account credentials.

   o `-o <filename>` specifies the output file name and path.

   To download the entire log, omit the from and to parameters and use the following command:

   ```
   curl "https://<iLO IP address>/ahsdata/ahs.ahs" -k -v -u
   <username>:<password> -o <filename>.ahs
   ```

   The file is saved to the path you specified.

4. Close the command window.

HP SSA diagnostic tasks

1. Open HP SSA.

   For more information about HP SSA, see the *HP Smart Storage Administrator User Guide* on the HP website (http://www.hp.com/go/smartstorage/docs).

2. Open the **Diagnostics** panel by doing one of the following:

   o Choose a device and click **Diagnose** in the quick navigation menu

   o Select an available device from the **Home** screen, and then click **Diagnose** under the available options.

3. Choose a report type.

Diagnostics

Report Type

📄 Array Diagnostic Report

🖥️ SmartSSD Wear Gauge Report
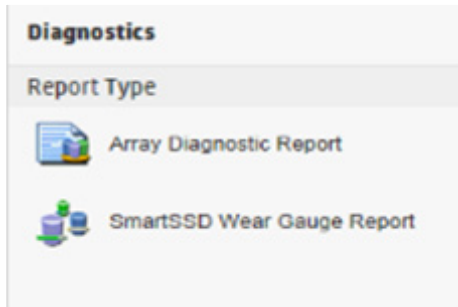
For this example, use the Array Diagnostic Reports selection.

4. Select **Array Diagnostic Report**.

The **Actions** panel for Array Diagnostic Report appears.
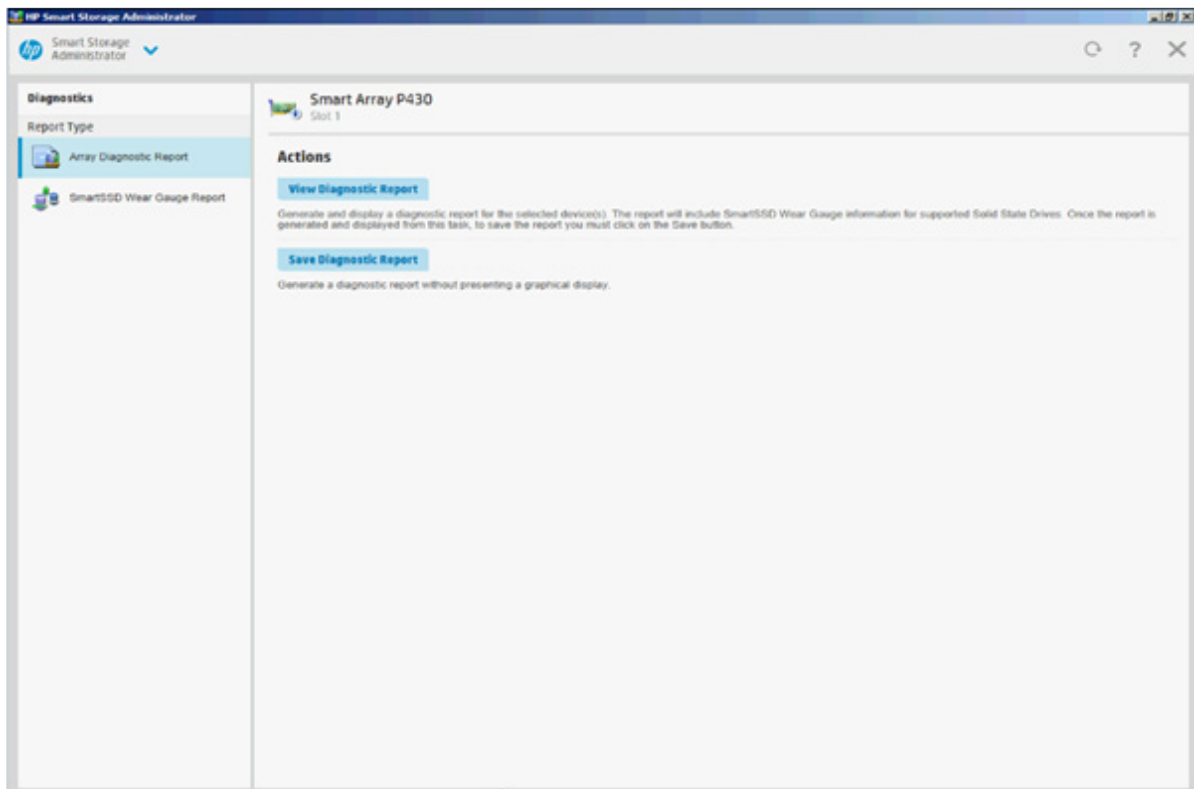
5. Click one of the task buttons:
   o If you select **View Diagnostic Report**, the report appears. When you are finished viewing the current report, click **Close** or **Save**.
   o If you select **Save Diagnostic Report**, wait for the report to generate, and then click **Close Report** or **Save Report**.

For more information about reports and viewing them in a browser, see the *HP Smart Storage Administrator User Guide* on the HP website (http://www.hp.com/go/smartstorage/docs).

HP Smart Storage Administrator Diagnostic Utility CLI reports

Windows

1. Click **Start>All Programs>HP System Tools>HP Smart Storage Administrator Diagnostics Utility>Read Me**

2. Open a command prompt.

3. Change directory (cd) to the location where `hpssaducli.exe` is installed.

   This directory is commonly C:\Program Files\hp\hpssaducli\bin.

4. Do one of the following:

   o Generate a diagnostic report with the following command:

   ```
   hpssaducli -f adu-report.zip
   ```

   o Generate a SmartSSD Wear Gague report with the following command:

   ```
   hpssaducli -ssd -f ssd-report.zip
   ```

For more options, use the following command:
```
hpssaducli -help
```

Linux

1. View the readme file.
   ```
   /opt/hp/hpssaducli/README.TXT
   ```

2. Open a command prompt.

3. Do one of the following:

   o Generate a diagnostic report with the following command:

   ```
   hpssaducli -f adu-report.zip
   ```

   o Generate a SmartSSD Wear Gague report with the following command:

   ```
   hpssaducli -ssd -f ssd-report.zip
   ```

For more options, use the following command:
```
hpssaducli -help
```

For more information about reports and viewing them in a browser, see the *HP Smart Storage Administrator User Guide* on the HP website (http://www.hp.com/go/smartstorage/docs).

HPS report

The HPS reports are used to capture critical operation and configuration information from Windows server environments. The HPS report utility can be downloaded from the HP website (http://update.external.hp.com/HPS/HPSreports). To start the report, run the executable file and the utility will save a cab file in the C:\WINDOWS\HPSReports\Enhanced\Report directory.

Run this report before contacting HP technical support ("Contacting HP technical support or an authorized reseller" on page 100) and be prepared to send the cab file.

cfg2html report

To assist in possible LINUX installation issues on HP ProLiant servers, capture the cfg2html report before contacting HP technical support ("Contacting HP technical support or an authorized reseller" on page 100). For more information, see the cfg2html website (http://www.cfg2html.com).

Acronyms and abbreviations

ABEND

abnormal end

AMP

Advanced Memory Protection

ASR

Automatic Server Recovery

DU

driver update

ESD

electrostatic discharge

HBA

host bus adapter

HP SIM

HP Systems Insight Manager

HP SSA

HP Smart Storage Administrator

HP SSADUCLI

HP Smart Storage Administrator Diagnostic Utility Command Line Interface

HP SUM

HP Smart Update Manager

iLO

Integrated Lights-Out

IML

Integrated Management Log

IRQ

interrupt request

ISO

International Organization for Standardization

KVM

keyboard, video, and mouse

NVRAM

nonvolatile memory

OA

Onboard Administrator

POST

Power-On Self Test

PXE

preboot execution environment

RBSU

ROM-Based Setup Utility

SAS

serial attached SCSI

SATA

serial ATA

SD

Secure Digital

SIM

Systems Insight Manager

SPP

HP Service Pack for ProLiant

SSD

solid-state drive

SSH

Secure Shell

TPM

Trusted Platform Module

UEFI

Unified Extensible Firmware Interface

UPS

uninterruptible power system

USB

universal serial bus

VCA

Version Control Agent

VCM

Virtual Connect Manager

VCRM

Version Control Repository Manager

VSP

virtual serial port

Documentation feedback

HP is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (mailto:docsfeedback@hp.com). Include the document title and part number, version number, or the URL when submitting your feedback.

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