Hewlett Packard Enterprise

HPE ProLiant Gen9

Troubleshooting Guide

Volume I: Troubleshooting

Abstract

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

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Using this guide

Getting started

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 HPE ProLiant server—from the most basic connector issues to complex software configuration issues.

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

- Troubleshooting preparation (on page 12)

  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 issue resolution (on page 18)

  Many server issues are caused by loose connections, outdated firmware, and other issues.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

- Remote troubleshooting (on page 24)

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

- Diagnostic flowcharts (on page 28)

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

- Hardware issues (on page 56)

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

- Software issues (on page 97)

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

- Software tools and solutions

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

- Resources for troubleshooting (on page 119)

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

- Support and other resources (on page 126)

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

Supported servers

The *HPE ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting* focuses on troubleshooting procedures for HPE ProLiant Gen9 ML, DL, BL, and XL servers.

Additional troubleshooting references

The complete list of Gen9 error messages is included in the *HPE ProLiant Gen9 Troubleshooting Guide, Volume II: Error Messages*. For more information, see "Error message resources (on page 119)."

For more information on troubleshooting HPE ProLiant Gen8 and prior servers, see "Troubleshooting resources for previous HPE ProLiant server models (on page 119)."

What's new (6th Edition)

The sixth edition of the *HPE ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting*, part number 795674-XX6, includes the following additions and updates:

- Updated the following sections in Troubleshooting preparation (on page 12):
  - Prerequisites for server troubleshooting (on page 12)
  - Collecting symptom information (on page 15)
  - Preparing the server for diagnosis (on page 16)
  - Processor troubleshooting guidelines (on page 16)
- Updated the following sections in Common issue resolution:
  - Resolving loose connections (on page 18)
  - Searching for service notifications (on page 18)
  - Firmware updates (on page 18)
  - Front Panel LEDs and Buttons (on page 22)
- Added Front panel LED notations (on page 22) to Common issue resolution.
- Updated structure in all sections in Diagnostic flowcharts (on page 28).
- Added the following sections to Hardware issues (on page 56):
  - Insufficient power supply configuration (on page 59)
  - SSD Smart Wear error (on page 65)
  - NVDIMM issues (on page 73)
  - Fans running at a higher than expected speed (on page 67)
  - Excessive fan noise (high speeds) (on page 68)
  - Excessive fan noise (low speeds) (on page 68)
  - System battery is low ("System battery is low or lost power" on page 83)
  - Uncorrectable machine check exception (on page 83)
  - General controller issues (on page 92)
  - Controllers are no longer redundant (on page 93)
  - HPE Smart Storage Battery issues (on page 95)
- Updated the following sections in Hardware issues (on page 56):
  - Server does not power on (on page 56)
  - Power source issues (on page 57)
  - Power supply issues (on page 58)

- Fan issues (on page 66)

- Changes made to Software and configuration utilities (on page 104):
  - Updated HPE iLO (on page 104).
  - Updated iLO RESTful API support (on page 105).
  - Updated iLO RESTful API support for UEFI (on page 110)
  - Added the Power capping (on page 113) section.
- Added Setup and installation guide (on page 120) to Resources for Troubleshooting (on page 119).

795674-XX5 (February 2016)

The fifth edition of the *HPE ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting*, part number 795674-XX5, includes the following additions and updates:

- Added the following sections to Common issue resolution:
  - NVMe SSD components (on page 21) — New content
- Updated references in the following sections in Diagnostic flowcharts (on page 28):
  - Remote diagnosis flowchart (on page 31)
  - Server power-on issues flowchart (ML and DL series) (on page 32)
  - Server power-on issues flowchart (XL series) (on page 34)
  - Server power-on issues flowchart (BL series) (on page 36)
  - POST issues flowchart (on page 39)
  - Intelligent Provisioning issues flowchart (on page 41)
  - Controller issues flowchart (on page 42)
  - Cache module issues flowchart (on page 44)
  - HPE Smart Storage Battery issues flowchart (on page 44)
  - Physical drive issues flowchart (on page 46)
  - Logical drive issues flowchart (on page 47)
  - OS boot issues flowchart (on page 48)
  - Server fault indications flowchart (non-blade servers) (on page 50)
  - Server fault indications flowchart (BL series) (on page 51)
  - Power profile issues flowchart (on page 52)
  - NIC issues flowchart (on page 53)
  - General diagnosis flowchart (on page 55)
- Updated the following sections in Hardware problems:
  - General memory issues (on page 70) — Added steps to reseat or replace DIMMs.
  - System board and power backplane issues (on page 83) — New content
  - Processor issues (on page 82) — Added references to support documentation.
- Added the following new sections to Resources for Troubleshooting (on page 119):
  - Server user guide (on page 120)
  - Server maintenance and service guide (on page 120)
  - HPE UEFI System Utilities documentation (on page 121)
  - Intelligent Provisioning software documentation (on page 121)
  - System Management Homepage software documentation (on page 121)

795674-XX4 (October 2015)

The fourth edition of the *HPE ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting*, part number 795674-XX4R, includes the following additions and updates:

Updated the following sections in Diagnostic flowcharts (on page 28):

- Server power-on issues flowchart (ML and DL series) (on page 32)
- Server power-on issues flowchart (BL series) (on page 36)
- Intelligent Provisioning issues flowchart (on page 41)
- Controller issues flowchart (on page 42)
- Physical drive issues flowchart (on page 46)
- OS boot issues flowchart (on page 48)
- Server fault indications flowchart (BL series) (on page 51)
- NIC issues flowchart (on page 53)
- General diagnosis flowchart (on page 55)

795674-XX3 (June 2015)

The third edition of the *HPE 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 12):
  - Processor troubleshooting guidelines (on page 16)
  - Breaking the server down to the minimum hardware configuration (on page 17)
- Improved the directions for locating service notifications in the following sections:
  - Searching for service notifications (on page 18)
  - Service notifications, advisories, and notices (on page 121)

795674-XX2 (December 2014)

The second edition of the *HPE 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 12):
  - Prerequisites for server troubleshooting (on page 12)
  - Collecting symptom information (on page 15)
  - Preparing the server for diagnosis (on page 16)
  - Breaking the server down to the minimum hardware configuration (on page 17)
- Updated and improved content in the following sections of Remote troubleshooting (on page 24):
  - Remote access to the Virtual Connect Manager (on page 25)
  - Using HPE iLO for remote troubleshooting of servers and server blades (on page 25)
  - Using the OA CLI (on page 26)
- Updated the following sections in Diagnostic flowcharts (on page 28):
  - Start diagnosis flowchart (on page 30)
  - Power-on issues flowchart (on page 31) (all 3 flowcharts)

  - POST issues flowchart (on page 39)
  - Intelligent Provisioning issues flowchart (on page 41)
  - OS boot issues flowchart (on page 48)
  - Fault indications flowchart (on page 48) (both flowcharts)
- Added the following new information and flowcharts to Diagnostic flowcharts (on page 28):
  - Gather important information before you begin (on page 29)
  - HPE Smart Storage Battery issues flowchart (on page 44)
  - Cache module issues flowchart (on page 44)
  - Controller issues flowchart (on page 42)
  - NIC issues flowchart (on page 53)
  - Logical drive issues flowchart (on page 47)
  - Physical drive issues flowchart (on page 46)
  - Power profile issues flowchart (on page 52)
- Made changes to Software and configuration utilities (on page 104).
  - Updated Server mode (on page 104) to include new software tools
  - Added Updating firmware or System ROM (on page 115) and several subsections

Troubleshooting preparation

Prerequisites for server troubleshooting

WARNING: To avoid potential issues, ALWAYS read the warnings and cautionary information in the product 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 12).
2. Gather and record symptom information. For more information, see "Collecting symptom information (on page 15)."
3. Gather all error information, such as the full POST error message displayed and the IML.
4. If it is necessary to contact Hewlett Packard Enterprise, download the Active Health System log. For more information, see the "Active Health System log overview (on page 130)."
5. Prepare the server for diagnosis. For more information, see "Preparing the server for diagnosis (on page 16)."
6. Use the Start diagnosis flowchart (on page 30) to begin the diagnostic process.

Important safety information

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

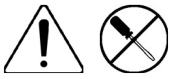
Important safety information

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 disconnect power from the system completely.

Warnings and cautions

WARNING: Only authorized technicians trained by Hewlett Packard Enterprise 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.

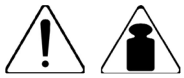
WARNING: To reduce the risk of personal injury or damage to the equipment, consult the safety information and user documentation provided with the server before attempting the installation.
Some servers contain high energy circuits, high current circuits, moving parts (such as fan blades), or any combination 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 must 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.

Collecting symptom information

Before troubleshooting a server issue, 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 issue occurs after an OS is installed:
  - Does the issue 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 might be attributed to a processor malfunction.
- When did the issue occur?

  Record exactly when the issue 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 issue 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 issue symptoms?
- If the issue occurs randomly, what is the duration or frequency?
- What failed based on the HPE iLO Event Log or the IML?

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

- Run HPE Insight Diagnostics (on page 106) 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 Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**).

Preparing 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 120).
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 issue, such as a Torx screwdriver, loopback adapters, ESD wrist strap, and software utilities.
   - You must have the appropriate support software installed on the server.

     To verify the server configuration, connect to the System Management Homepage (**http://www.hpe.com/info/smh**) and select **Version Control Agent**. The VCA provides a list of names and versions of all installed Hewlett Packard Enterprise drivers, Management Agents, and utilities, and whether they are current. For more information, see "Version control (on page 117)."
   - Hewlett Packard Enterprise recommends you have access to the server documentation (on page 120) for server-specific information.
5. Determine if the server will be diagnosed offline or online:
   - If you will diagnose the server online, complete steps 6 and 8.
   - 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 107).
   b. Review the IML. For more information, see the "Integrated Management Log (on page 106)."
   c. Review the HPE 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 131).
   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).

Processor troubleshooting guidelines

△ **CAUTION:** When reducing the server to a minimum configuration for troubleshooting, do not remove additional processors unless specifically requested by the Hewlett Packard Enterprise 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 Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/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. Replace or reseat processors only when directed to do so by the Hewlett Packard Enterprise 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 Hewlett Packard Enterprise 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 "Processor troubleshooting guidelines (on page 16)." 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 Hewlett Packard Enterprise Support Center.

Common issue resolution

Resolving loose connections

- 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 might indicate a component is not connected properly.
- If issues continue to occur, remove and reinstall each device, checking the connectors and sockets for bent pins or other damage.
- For ProLiant BL c-Class Server Blades, be sure the OA tray is seated properly.

Searching for service notifications

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

To search for service notifications:

1. See the Hewlett Packard Enterprise Support Center (**http://www.hpe.com/support/hpesc**).
2. Enter the product name or number, and then click **Go**.
3. Select **Top Issues and Solutions**, and then **Advisories Bulletins & Notices**.

The complete list of documents is displayed.

Firmware updates

Many common issues 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 from the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/spp**). For more information about SPP, see "Service Pack for ProLiant (on page 107)"
- Hewlett Packard Enterprise Support Center website: The most recent version of a particular server or option firmware from the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

  To locate the drivers for a particular server, go to the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**). Under **Select your HPE product**, enter the product name or number and click **Go**.

- Subscription services: Hewlett Packard Enterprise offers a subscription service that can provide notification of firmware updates. For more information, see "Subscription services (on page 122)."

For more information on updating firmware, see "Keeping the system current (on page 115)." If updating a server with a TPM installed, see "Server updates with an HP Trusted Platform Module and BitLocker enabled (on page 19)."

Server updates with an HP Trusted Platform Module and BitLocker enabled

When a TPM is installed and enabled in the HPE UEFI System Utilities (on page 108), 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 102)
- 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 14).
- 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 Hewlett Packard Enterprise website (**http://www.hpe.com/support/DIMM-20070214-CN**).

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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

Component LED definitions

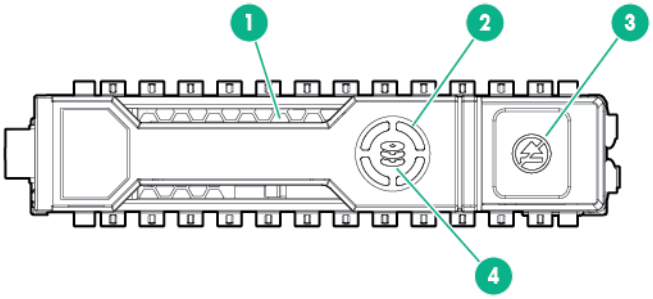
Many common issues can be identified by reviewing the component and server LEDs. For more information, see the server and component documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

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. HPE SSA does not support mixing SAS, SATA, and SSD drives in the same logical volume.

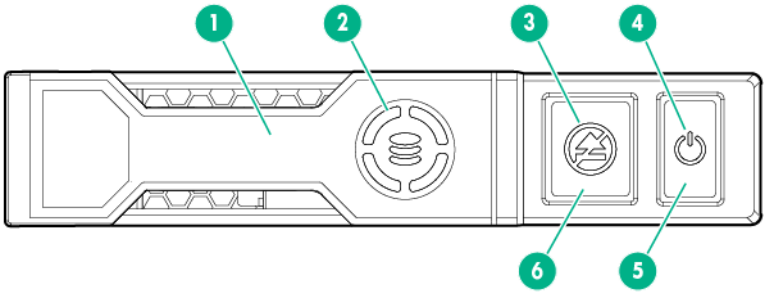
Hot-plug drive LED definitions



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.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.

Item	LED	Status	Definition
		Off	The drive is not configured by a RAID controller.

NVMe SSD components



Item	Component	Status	Definition
1	Release lever	—	Ejects the NVMe drive carrier from the cage.
2	Activity ring LED	Rotating green Off	Drive activity No drive activity
3	Do Not Remove LED	Solid white Flashing white Off	Drive is powered on, and configured in system. Do not remove the drive. Ejection request pending. Do not remove the drive. Drive removed from the PCIe bus, and can be ejected.
4	Power LED	Solid green Flashing green Off	Drive is powered on, and configured in system. Do not remove the drive. Ejection request pending. Do not remove the drive. Drive removed from the PCIe bus, and can be ejected.
5	Power button	—	Momentary press to request drive removal from PCIe bus and ejection. Drive removal request can be denied by operating system.
6	Do Not Remove button	—	Releases the release lever for removal and insertion.

Upon NVMe SSD insertion, an LED initiation sequence will be visible - lighting each LED in the carrier in sequence from left to right. The sequence will cycle until the drive is recognized by the system. When the SSD is recognized by the system - the Do Not Remove LED will be solid white and the Power LED will be solid green.

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)

HPE 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 HPE ProLiant Gen9 servers. HPE ProLiant Gen9 server blades have a Health status LED bar instead of the Health LED described below. For product-specific LED information, see the server user guide (on page 120).

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
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

For more information about LED combinations or notations, see "Front panel LED notations (on page 22)."

Front panel LED notations

For more information about LED combinations and LED definitions, review the following:

- 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 23)."
- When the system power LED is off, one of the following is true:
  - Facility power is not present.
  - The power cord is not attached.
  - No power supplies are installed.
  - A power supply failure has occurred.
  - The Power On/Standby 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 Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/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 HPE 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

Hewlett Packard Enterprise provides several options that help IT administrators troubleshoot servers from remote locations.

- HPE iLO (on page 104)

  HPE iLO is available for all HPE ProLiant servers. HPE iLO consists of an intelligent processor and firmware that allows for remote server management. The HPE 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 HPE 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 HPE iLO features (which may require a specific iLO license), see the HPE iLO documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo/docs**).

- Onboard Administrator (for HPE ProLiant server blades only)

  HPE Onboard Administrator and HPE Onboard Administrator Command Line Interface assist Administrators in remotely troubleshooting server blades in the HPE BladeSystem environment. Using the OA CLI (on page 26), 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 HPE ProLiant c-Class Blade Enclosures. For more information about using the OA CLI and other BladeSystem documentation, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/bladesystem/docs**).

  Administrators can also generate an OA SHOW ALL report using the guidelines on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/OAlog**).

- HPE SIM

  HPE SIM offers remote access for event monitoring, maximizing uptime for servers and storage. 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 SIM used to analyze environment for performance bottlenecks. For more information about SIM, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/hpsim**).

- Virtual Connect (for HPE 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 25)."

  For more information on capturing Healthreport, SHOW ALL, and SupportDump Files using VCSU, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/VClog**).

- Active Health System (on page 104)

  The HPE Active Health System monitors and records changes in the server hardware and system configuration. The Active Health System assists in diagnosing issues and delivering rapid resolution when server failures occur. The Active Health System log ("Active Health System log overview" on page 130), 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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/spp/download**).

The Active Health System log can be downloaded manually and sent to Hewlett Packard Enterprise. For more information, see "Active Health System log overview (on page 130)" or one of the following documents:

- *HPE iLO User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo/docs**)
- Intelligent Provisioning user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 *HPE Virtual Connect Manager Command Line Interface for c-Class BladeSystem User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/vc/manuals**).

Using HPE 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:

   - **System ROM**
   - **iLO Firmware Version**
   - **System Health**
   - **Server Power**
   - **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 HPE 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:
   - Verify the status of iLO Self-Test Results.
   - Use the **Reset** button to reset iLO.

- 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 HPE 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 *HPE BladeSystem c-Class Enclosure Troubleshooting Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.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 **HPE 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 *HPE BladeSystem c-Class Enclosure Troubleshooting Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.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:
  - OA GUI > Enclosure Settings > Configuration Scripts > `SHOW ALL`
  - 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:
   - `SHOW ENCLOSURE STATUS`
   - `SHOW SERVER STATUS ALL`
   - `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 Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**) 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 *HPE BladeSystem Onboard Administrator Command Line Interface Users Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.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 Hewlett Packard Enterprise Support for analysis, if needed. For more information, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/OAsupportdump**).

Diagnostic flowcharts

Diagnostic steps

To effectively troubleshoot an issue, Hewlett Packard Enterprise recommends that you start with the first flowchart in this section, "Start diagnosis flowchart (on page 30)," and follow the appropriate diagnostic path. If the other flowcharts do not provide a troubleshooting solution, follow the diagnostic steps in "General diagnosis flowchart (on page 55)." The General diagnosis flowchart is a generic troubleshooting process to be used when the issue is not server-specific or is not easily categorized into the other flowcharts.

Troubleshooting flowcharts

The available flowcharts include:

- Start diagnosis flowchart (on page 30)
- Remote diagnosis flowchart (on page 31)
- Power-on issues flowchart (on page 31)
  - Server power-on issues flowchart (ML and DL series) (on page 32)
  - Server power-on issues flowchart (XL series) (on page 34)
  - Server power-on issues flowchart (BL series) (on page 36)
- POST issues flowchart (on page 39)
- Intelligent Provisioning issues flowchart (on page 41)
- Controller issues flowchart (on page 42)
- Cache module issues flowchart (on page 44)
- HPE Smart Storage Battery issues flowchart (on page 44)
- Physical drive issues flowchart (on page 46)
- Logical drive issues flowchart (on page 47)
- OS boot issues flowchart (on page 48)
- Fault indications flowchart (on page 48)
  - Server fault indications flowchart (non-blade servers) (on page 50)
  - Server fault indications flowchart (BL series) (on page 51)
- Power profile issues flowchart (on page 52)
- NIC issues flowchart (on page 53)
- General diagnosis flowchart (on page 55)

Using the Diagnostic flowcharts

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

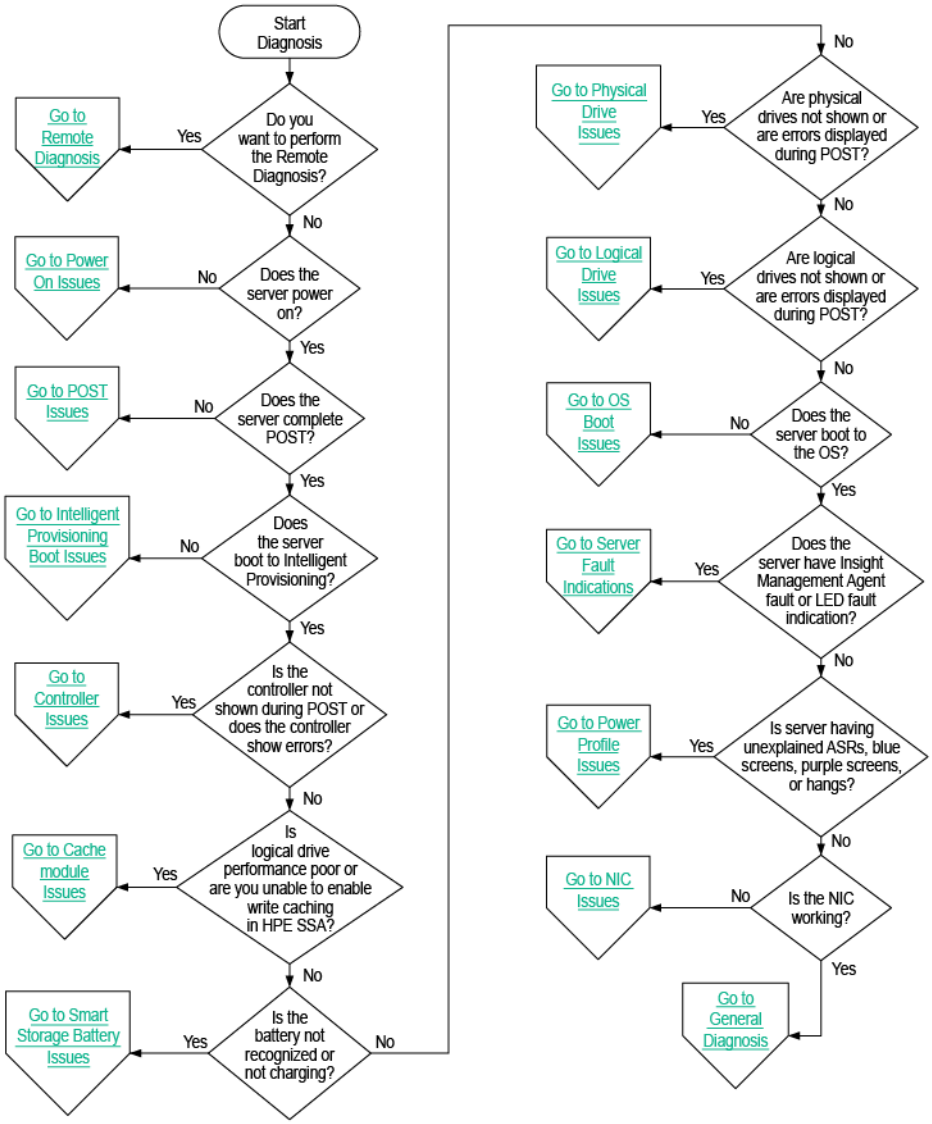
Gather important information before you begin

Before you begin troubleshooting the issue, gather the following information for use during troubleshooting and for use should the issue require contacting Hewlett Packard Enterprise support:

- IML — For more information, see "Integrated Management Log (on page 106)."
- POST error messages — For more information, see "Error message resources (on page 119)."
- Server and component information — For more information, see "Server information you need (on page 127)."
- Operating system information — For more information, see "Operating system information you need (on page 128)."
- Symptom information — For more information, see "Collecting symptom information (on page 15)."
- Active Health System log — For more information, see "Active Health System log overview (on page 130)."
- OA SHOW ALL report (for HPE ProLiant BL Server Blades only) — For more information, see "Using the OA CLI (on page 26)."
- Other reports and logs (on page 130)

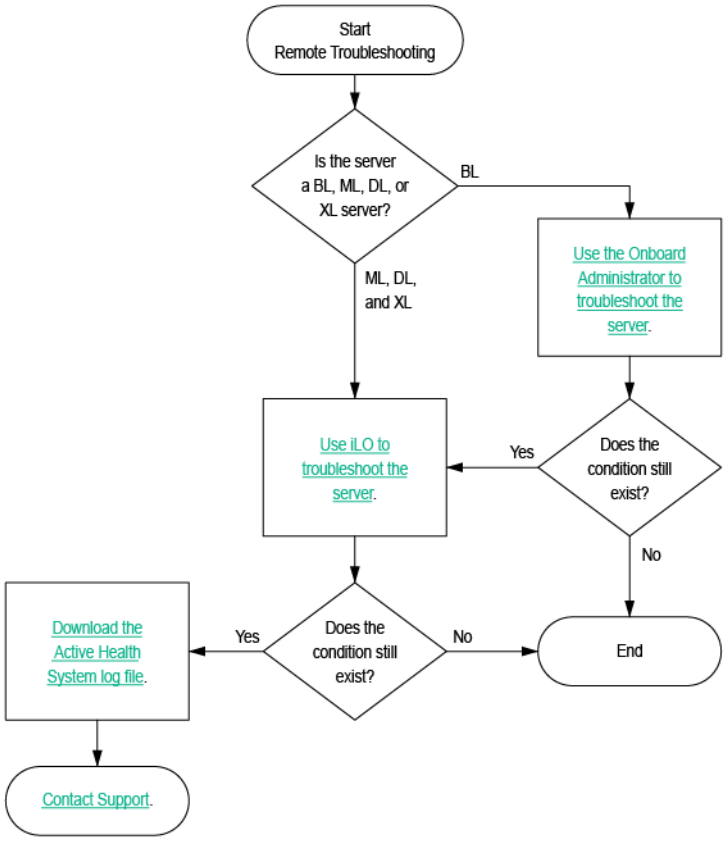
Start diagnosis flowchart

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 issues flowchart

Server power-on issues flowchart (ML and DL series)

For the location of server LEDs and information on their statuses, see the server documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**). System power and health LED definitions are also available in "Component LED definitions (on page 20)."

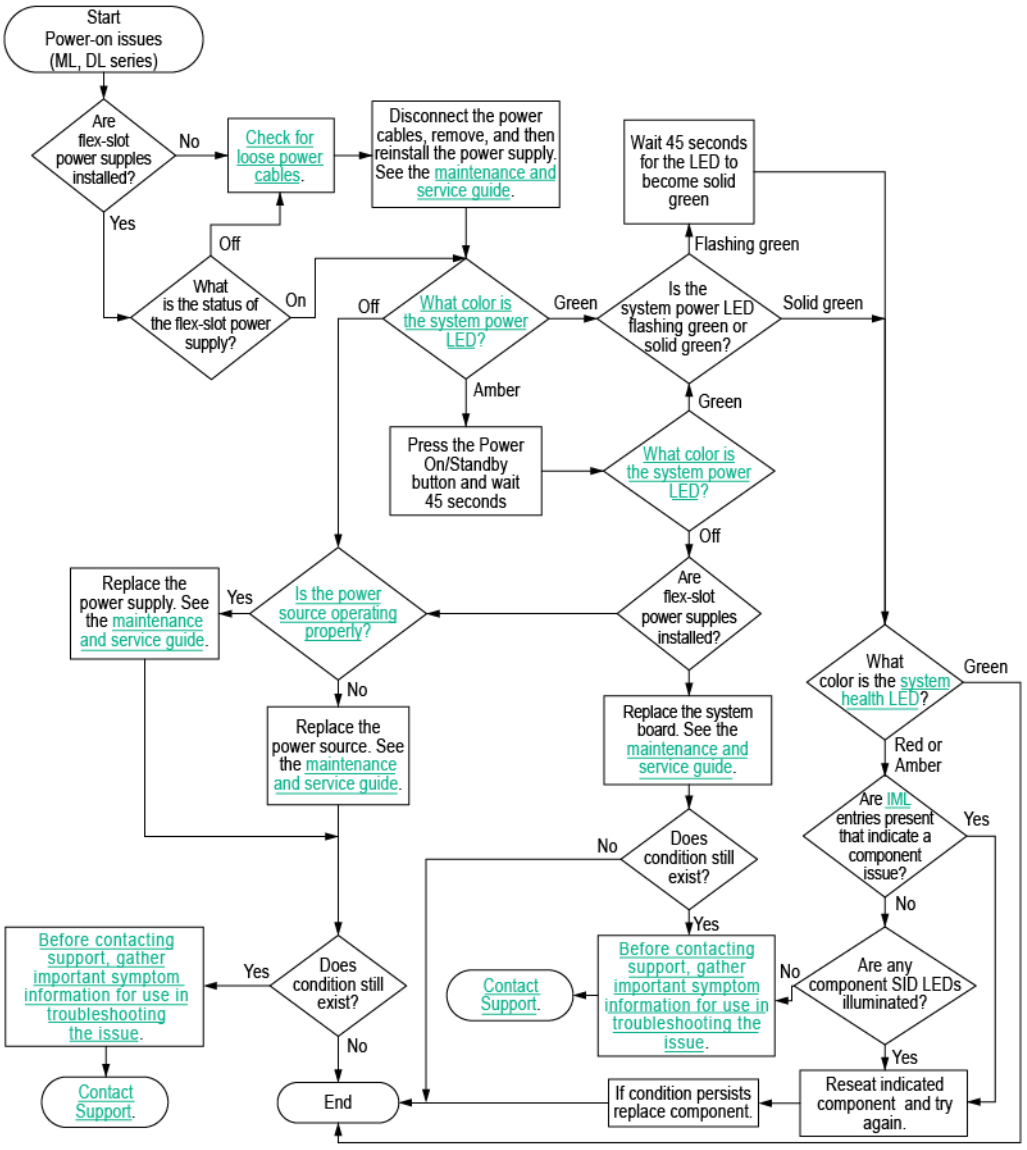
Symptoms

- 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.

Cause

- Improperly seated or faulty power supply
- Loose or faulty power cord
- Power source issue
- Improperly seated component or interlock issue

Action


Start
Power-on issues (ML, DL series)
Are flex-slot power supplies installed?
No
Check for loose power cables.
Disconnect the power cables, remove, and then reinstall the power supply. See the maintenance and service guide.
Yes
Off
What is the status of the flex-slot power supply?
On
Off
What color is the system power LED?
Green
Is the system power LED flashing green or solid green?
Flashing green
Wait 45 seconds for the LED to become solid green
Solid green
Amber
Press the Power On/Standby button and wait 45 seconds
What color is the system power LED?
Green
Off
Are flex-slot power supplies installed?
Is the power source operating properly?
Yes
Replace the power supply. See the maintenance and service guide.
No
Replace the power source. See the maintenance and service guide.
Replace the system board. See the maintenance and service guide.
What color is the system health LED?
Green
Red or Amber
Are IML entries present that indicate a component issue?
Yes
No
Does condition still exist?
No
Yes
Are any component SID LEDs illuminated?
No
Yes
Reseat indicated component and try again.
If condition persists replace component.
Before contacting support, gather important symptom information for use in troubleshooting the issue.
Contact Support.
Before contacting support, gather important symptom information for use in troubleshooting the issue.
Contact Support.
Does condition still exist?
Yes
No
End

Server power-on issues flowchart (XL series)

For the location of server LEDs and information on their statuses, see the server documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**). System power and health LED definitions are also available in "Component LED definitions (on page 20)."

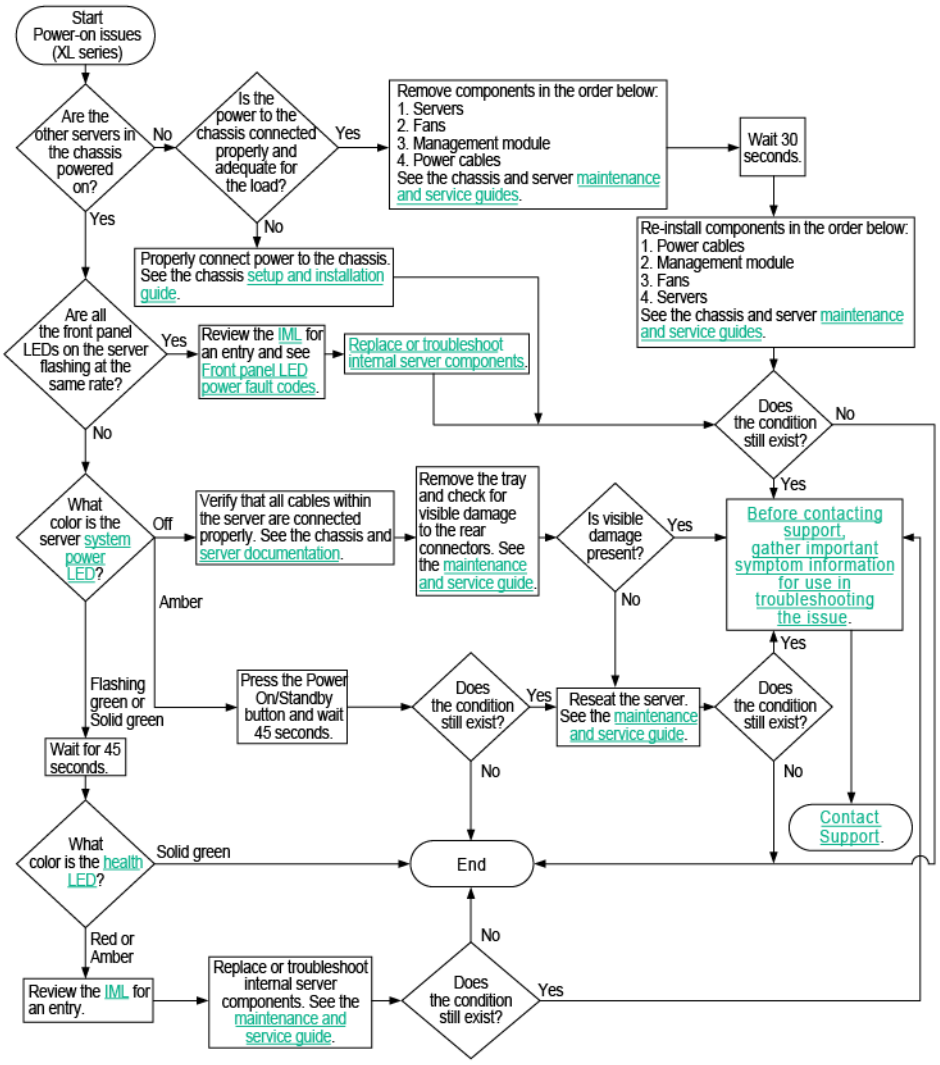
Symptom

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

Cause

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

Action


Start Power-on issues (XL series)
Are the other servers in the chassis powered on?
No
Is the power to the chassis connected properly and adequate for the load?
Yes
Remove components in the order below:
1. Servers
2. Fans
3. Management module
4. Power cables
See the chassis and server maintenance and service guides.
Wait 30 seconds.
Re-install components in the order below:
1. Power cables
2. Management module
3. Fans
4. Servers
See the chassis and server maintenance and service guides.
No
Properly connect power to the chassis. See the chassis setup and installation guide.
Yes
Are all the front panel LEDs on the server flashing at the same rate?
Yes
Review the IML for an entry and see Front panel LED power fault codes.
Replace or troubleshoot internal server components.
Does the condition still exist?
No
Yes
No
What color is the server system power LED?
Off
Verify that all cables within the server are connected properly. See the chassis and server documentation.
Remove the tray and check for visible damage to the rear connectors. See the maintenance and service guide.
Is visible damage present?
Yes
Before contacting support, gather important symptom information for use in troubleshooting the issue.
No
Amber
Yes
Flashing green or Solid green
Press the Power On/Standby button and wait 45 seconds.
Does the condition still exist?
Yes
Reseat the server. See the maintenance and service guide.
Does the condition still exist?
Wait for 45 seconds.
No
No
Contact Support.
What color is the health LED?
Solid green
End
Red or Amber
No
Review the IML for an entry.
Replace or troubleshoot internal server components. See the maintenance and service guide.
Does the condition still exist?
Yes

Server power-on issues flowchart (BL series)

For the location of server LEDs and information on their statuses, see the server documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**). System power and health LED definitions are also available in "Component LED definitions (on page 20)."

Symptoms

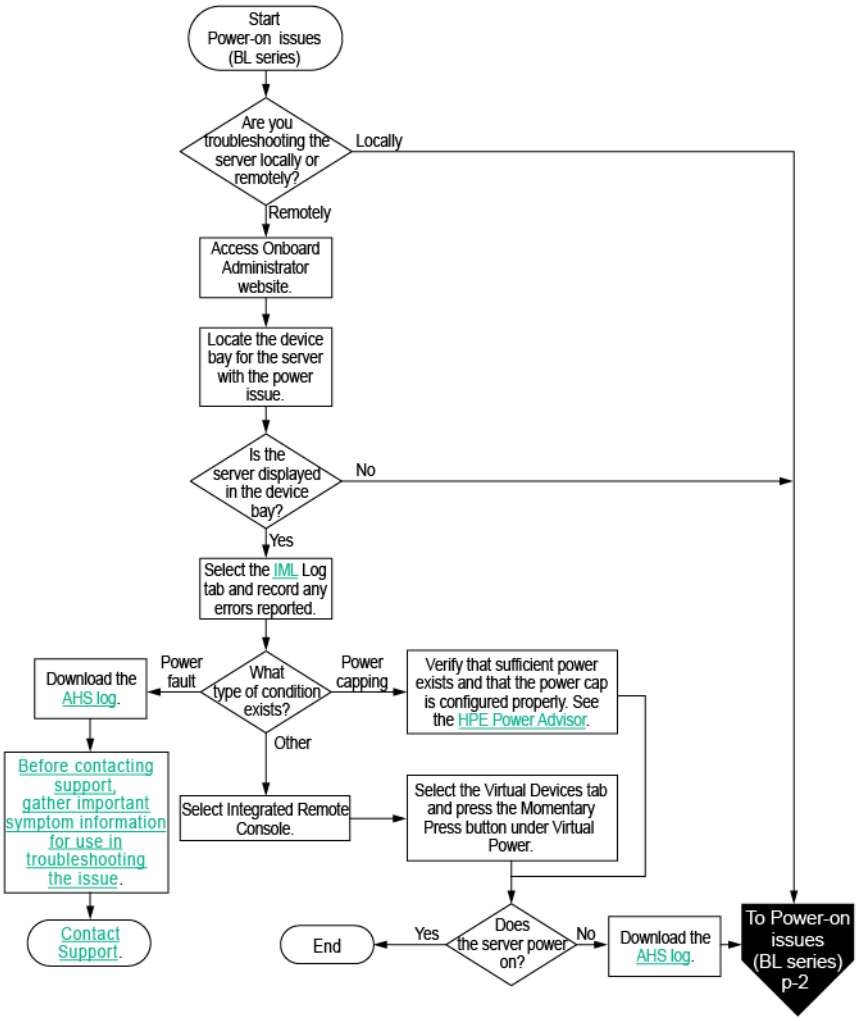
- The server blade does not power on.
- The system power LED is off or solid amber.
- The health LED status bar is flashing red or flashing amber.

Cause

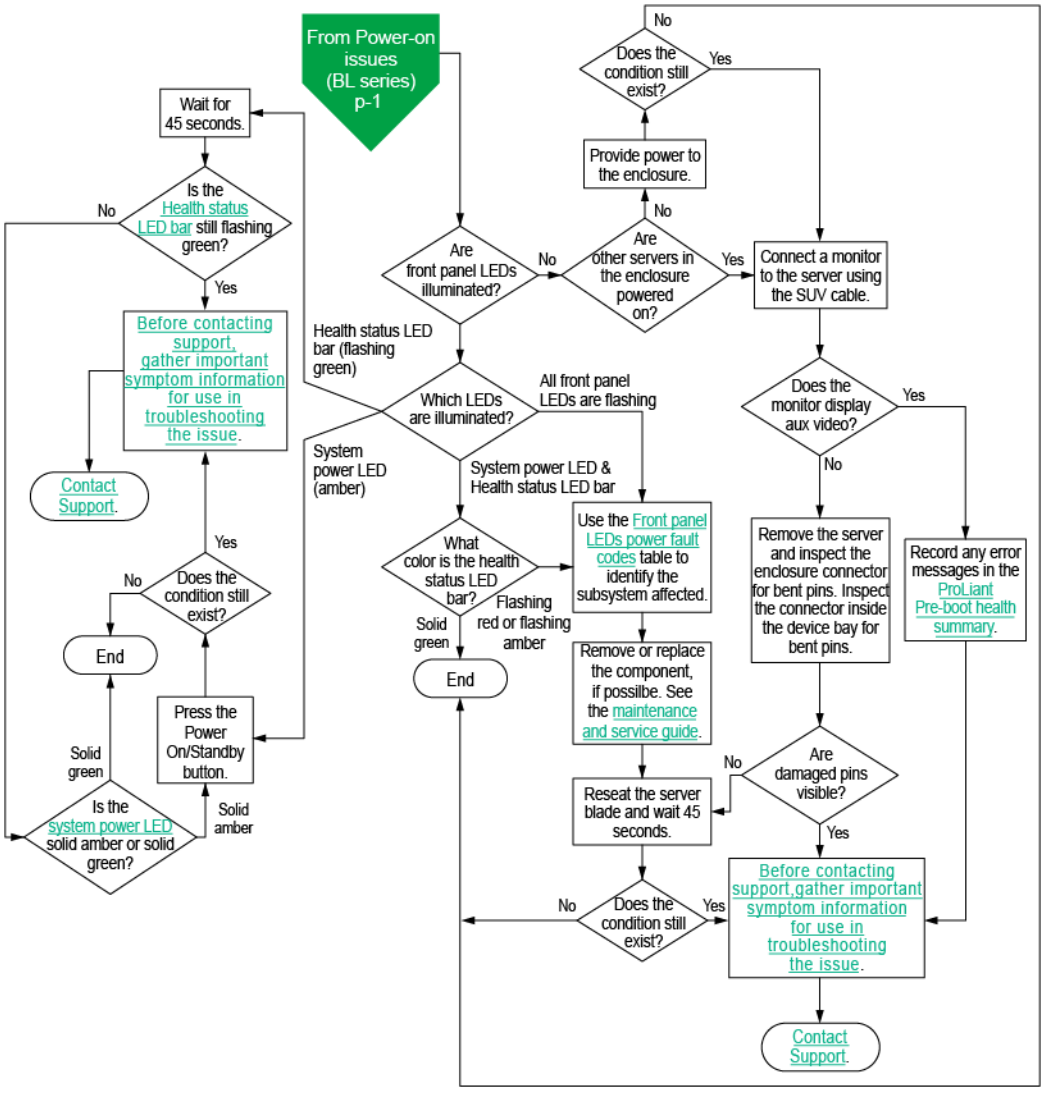
- The server blade is not properly installed in the enclosure.
- The server blade is not configured to automatically power on in HPE iLO.
- The power being supplied is not sufficient for the server blades installed in the enclosure.
- The power cap is not configured properly for the enclosure.
- The OA module is not properly installed in the enclosure.
- A possible communication failure between HPE 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.

Action

Server power-on issues flowchart – BL series (page 1 – remote troubleshooting)



Server power-on issues flowchart – BL series (page 2 – local troubleshooting)



POST issues flowchart

Symptoms

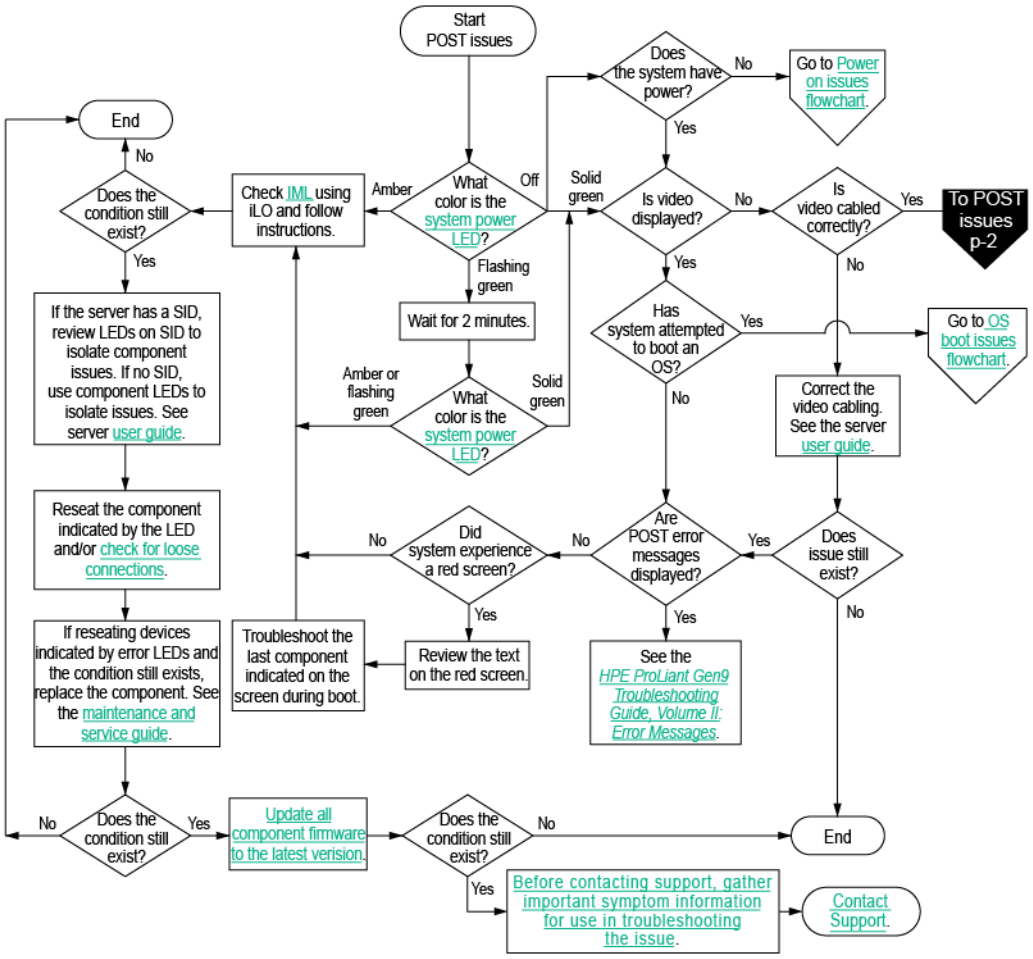
- The server does not complete POST
- The server completes POST with errors

Cause

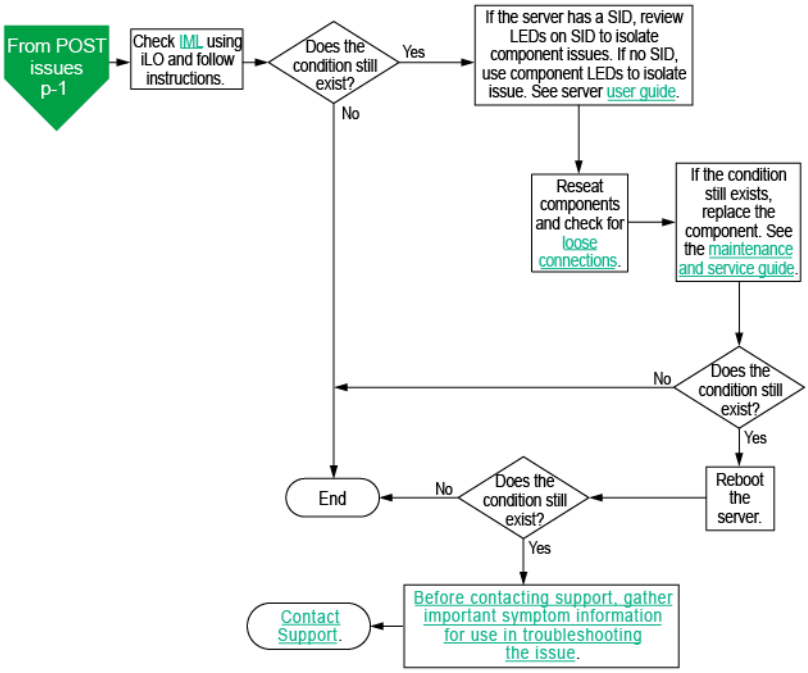
- Improperly populated memory
- Outdated firmware on adapter options
- Unsupported adapter
- Improperly seated or faulty internal component
- Faulty video device

Action

POST issues flowchart (page 1 of 2)



POST issues flowchart (page 2 of 2)



Intelligent Provisioning issues flowchart

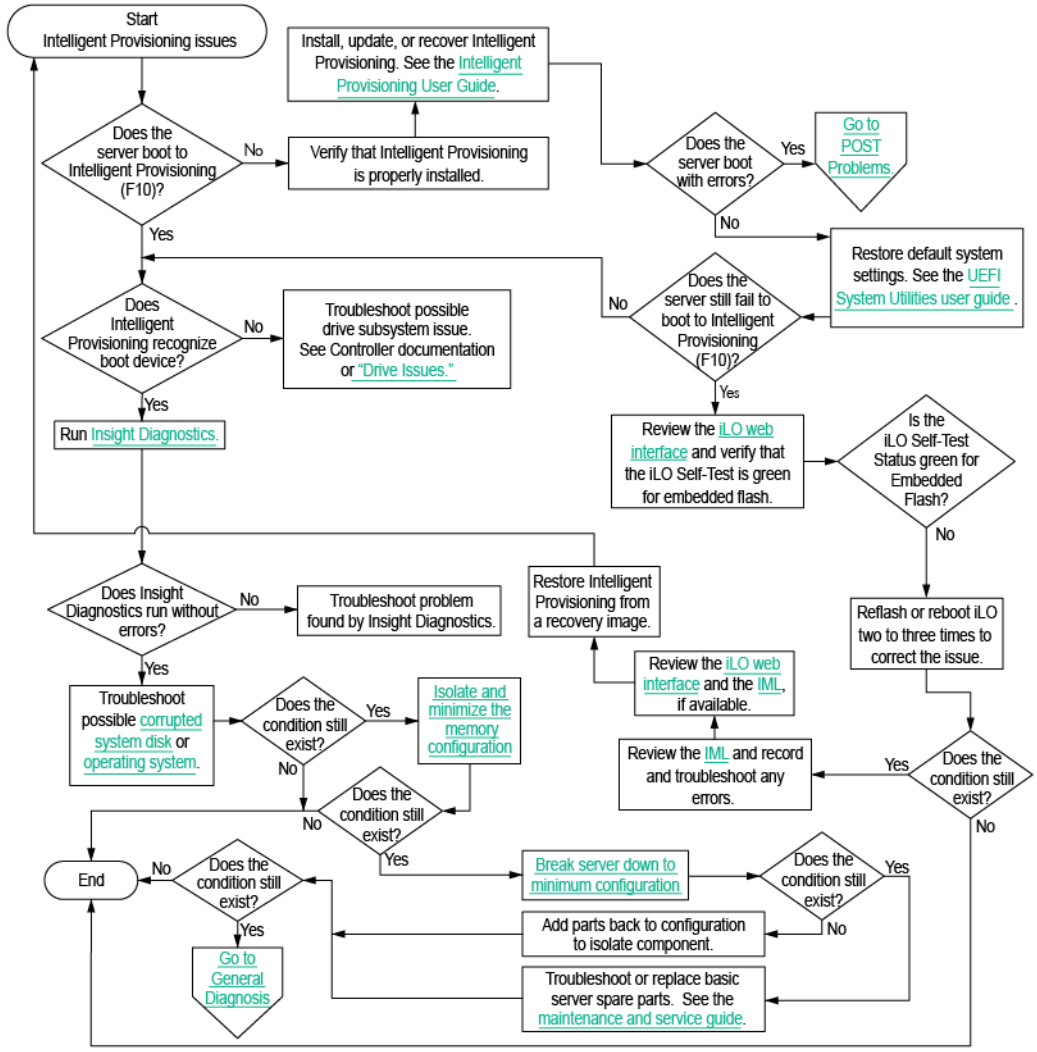
Symptom

The server does not boot to Intelligent Provisioning (F10).

Cause

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

Action



Controller issues flowchart

Symptom

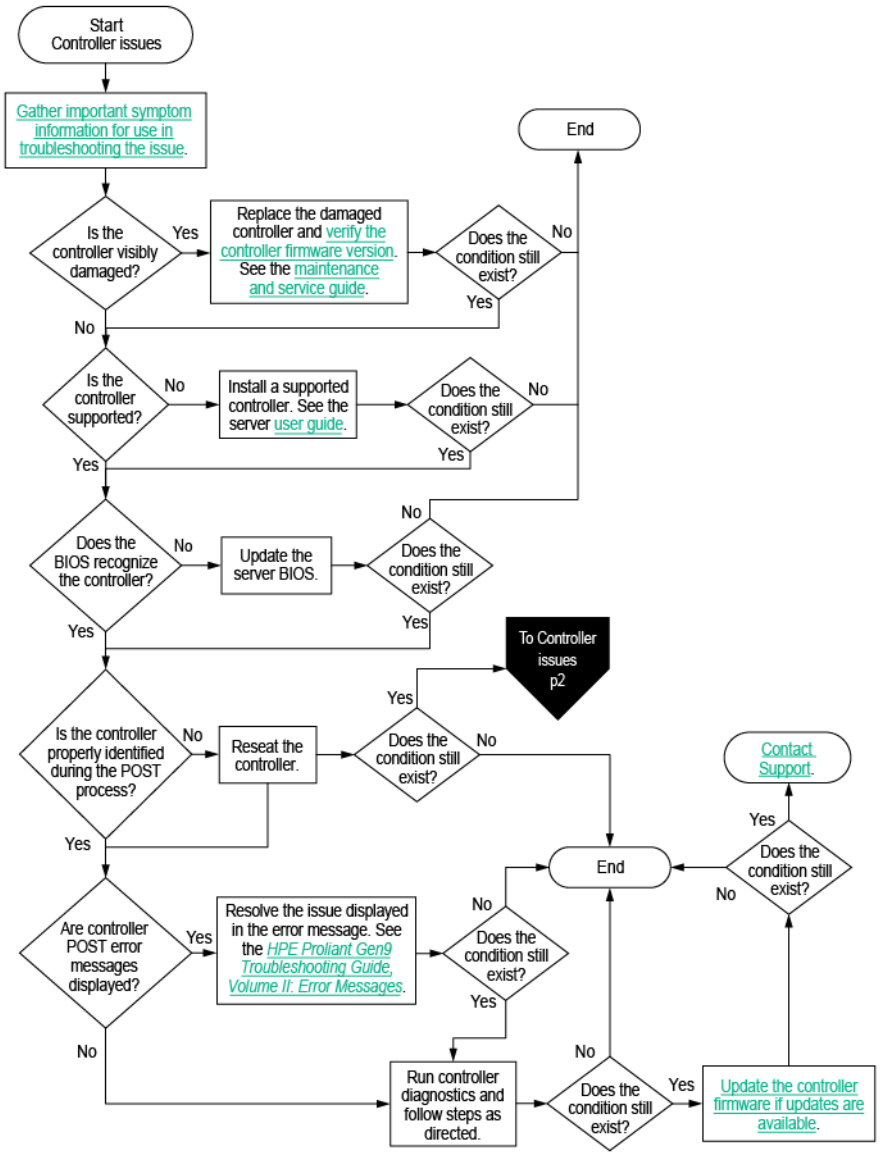
- The array controller is not visible during the POST process.
- The Smart Array controller shows errors during the POST process.

Cause

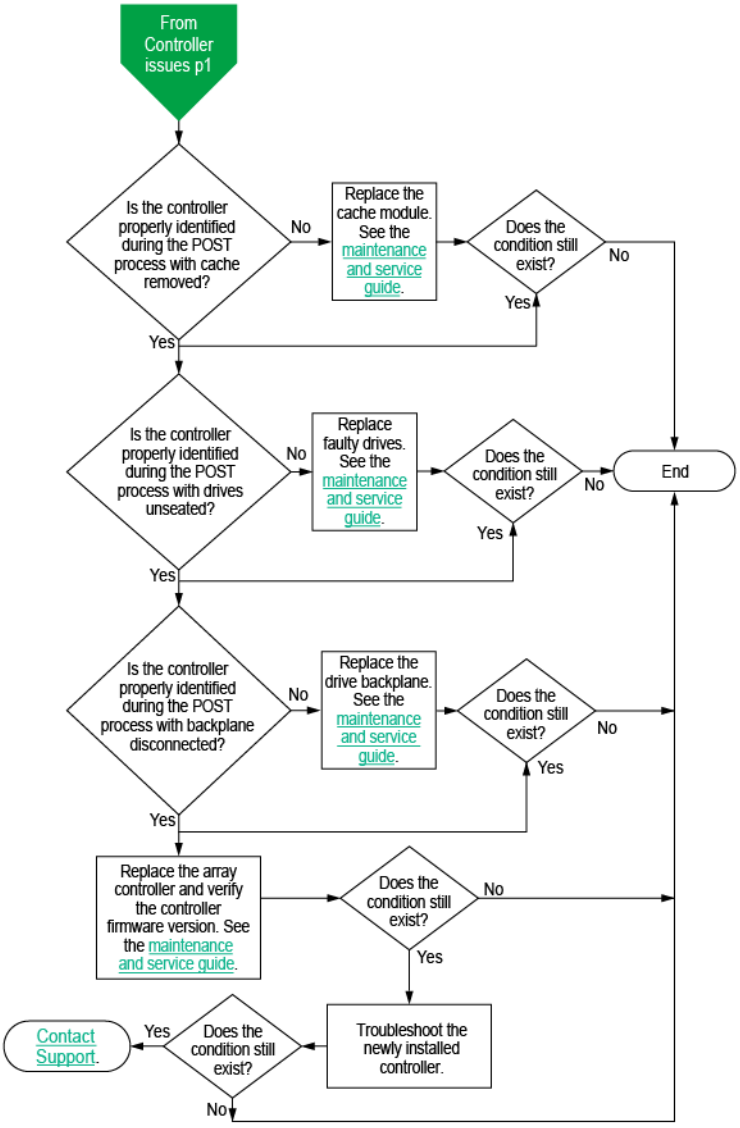
- The hardware is physically damaged.
- The controller is not supported on the server.
- The controller is faulty.
- The firmware is outdated.

Action

Controller issues (1 of 2)



Controller issues (2 of 2)



Cache module issues flowchart

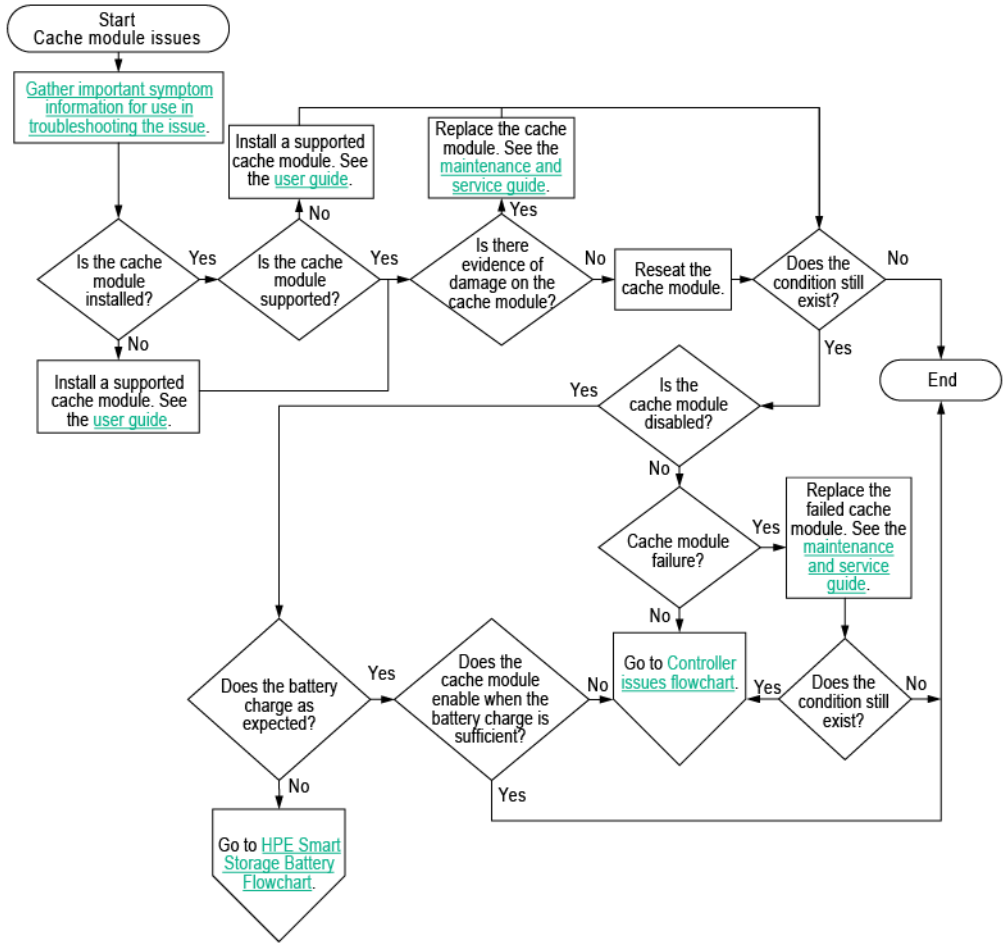
Symptom

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

Cause

- The cache module is missing or failed.
- The battery is not sufficiently charged.
- The cache module is not supported on the server.

Action



HPE Smart Storage Battery issues flowchart

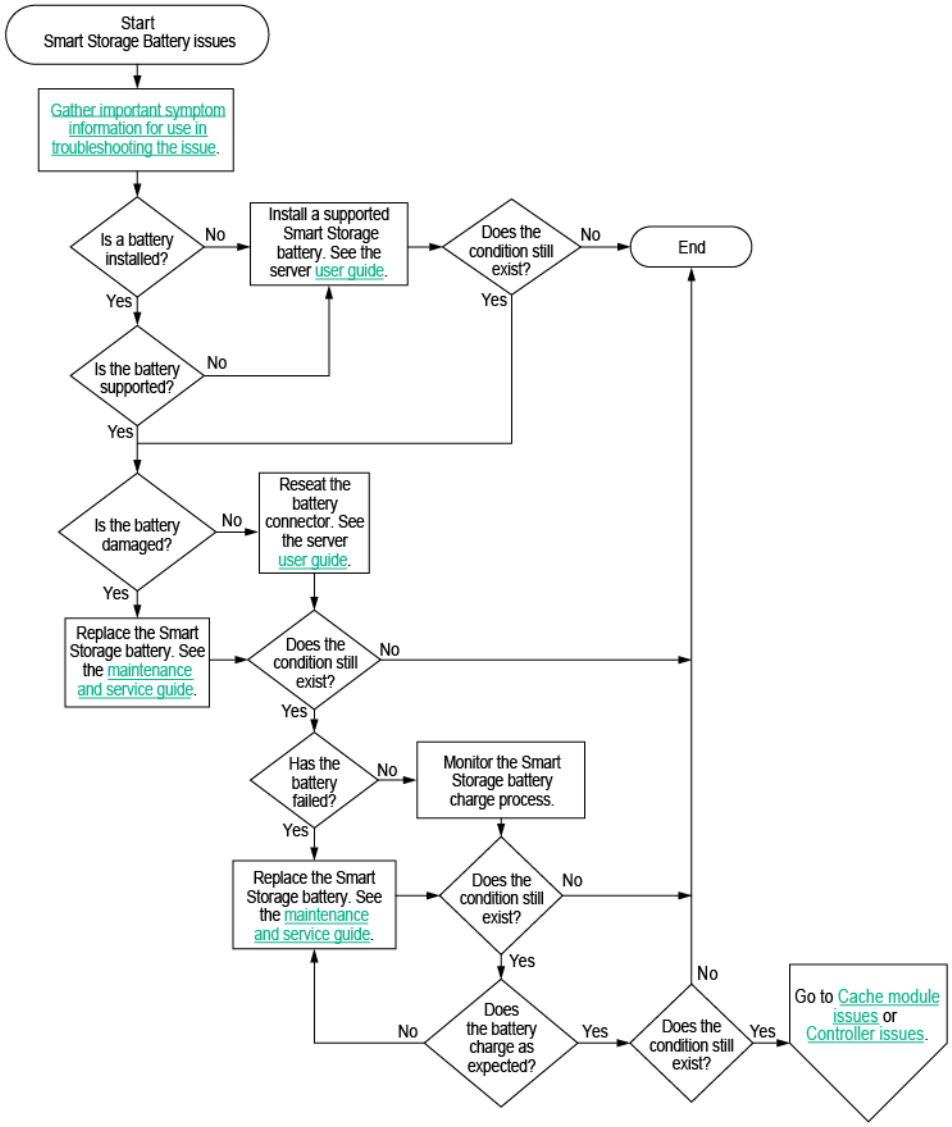
Symptom

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

Cause

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

Action



Physical drive issues flowchart

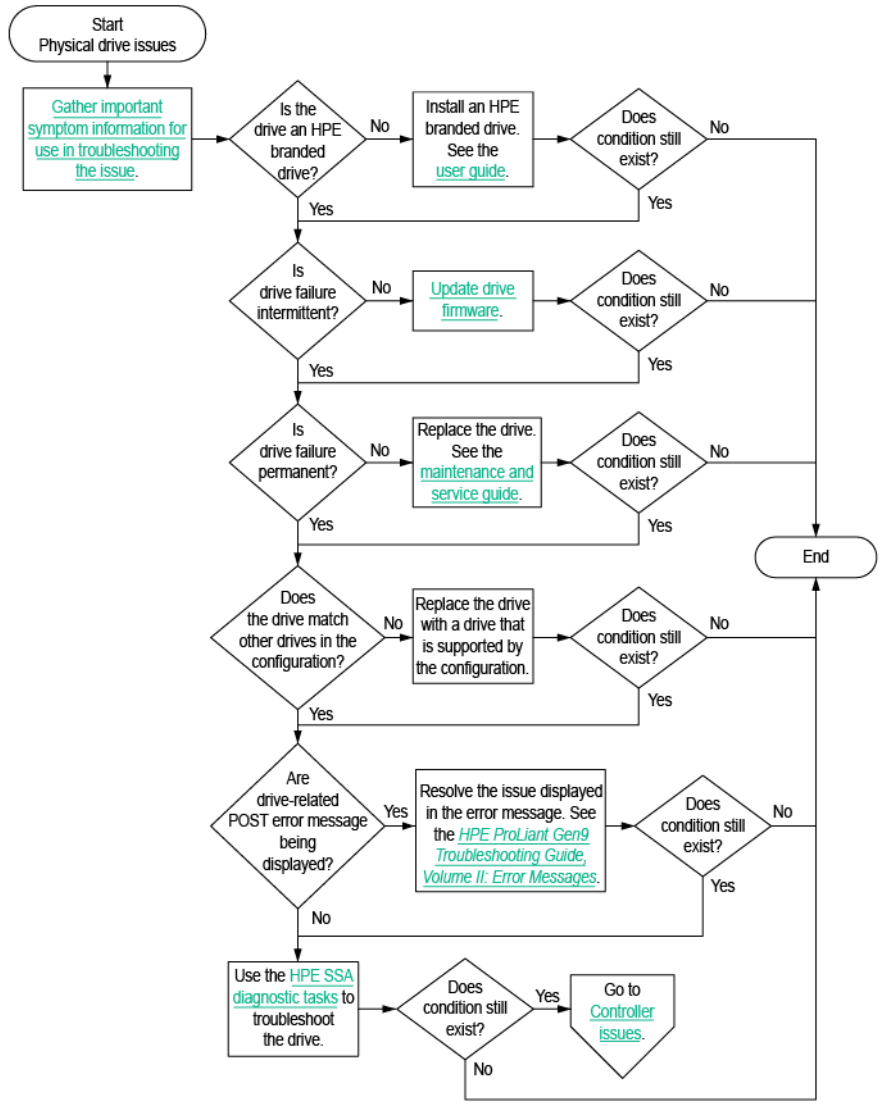
Symptom

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

Cause

- The drive is faulty.
- The firmware is outdated.
- The drive does not match other drives in the same configuration.

Action



Logical drive issues flowchart

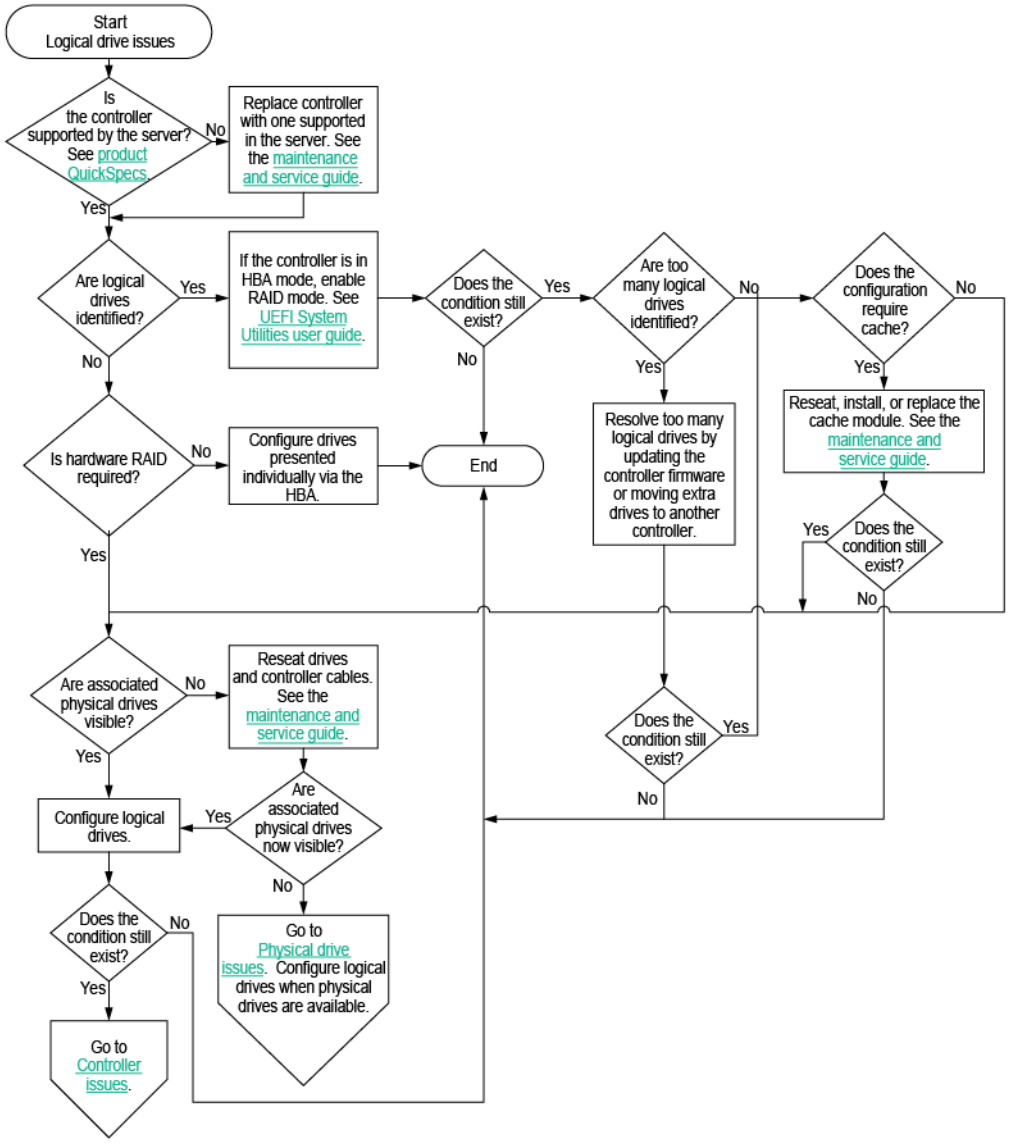
Symptom

- 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.

Cause

- 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.

Action



OS boot issues flowchart

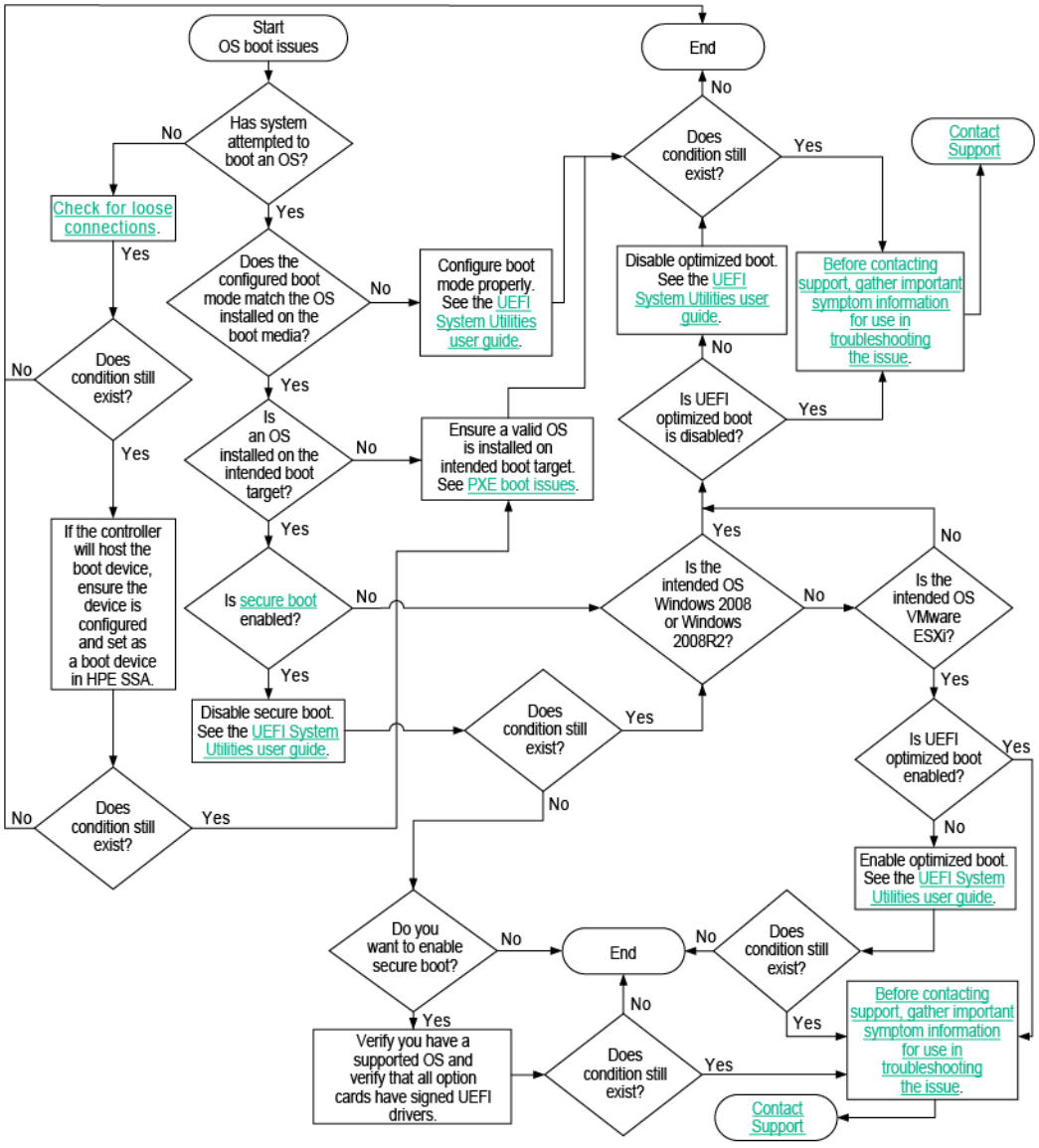
Symptom

The server does not boot a previously installed OS.

Cause

- Corrupted OS
- Drive subsystem issue
- Incorrect setting in HPE UEFI System Utilities

Action



Fault indications flowchart

Symptom

- The server boots, but a fault event is reported by Insight Management Agents.

- The 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.

Cause

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

Action

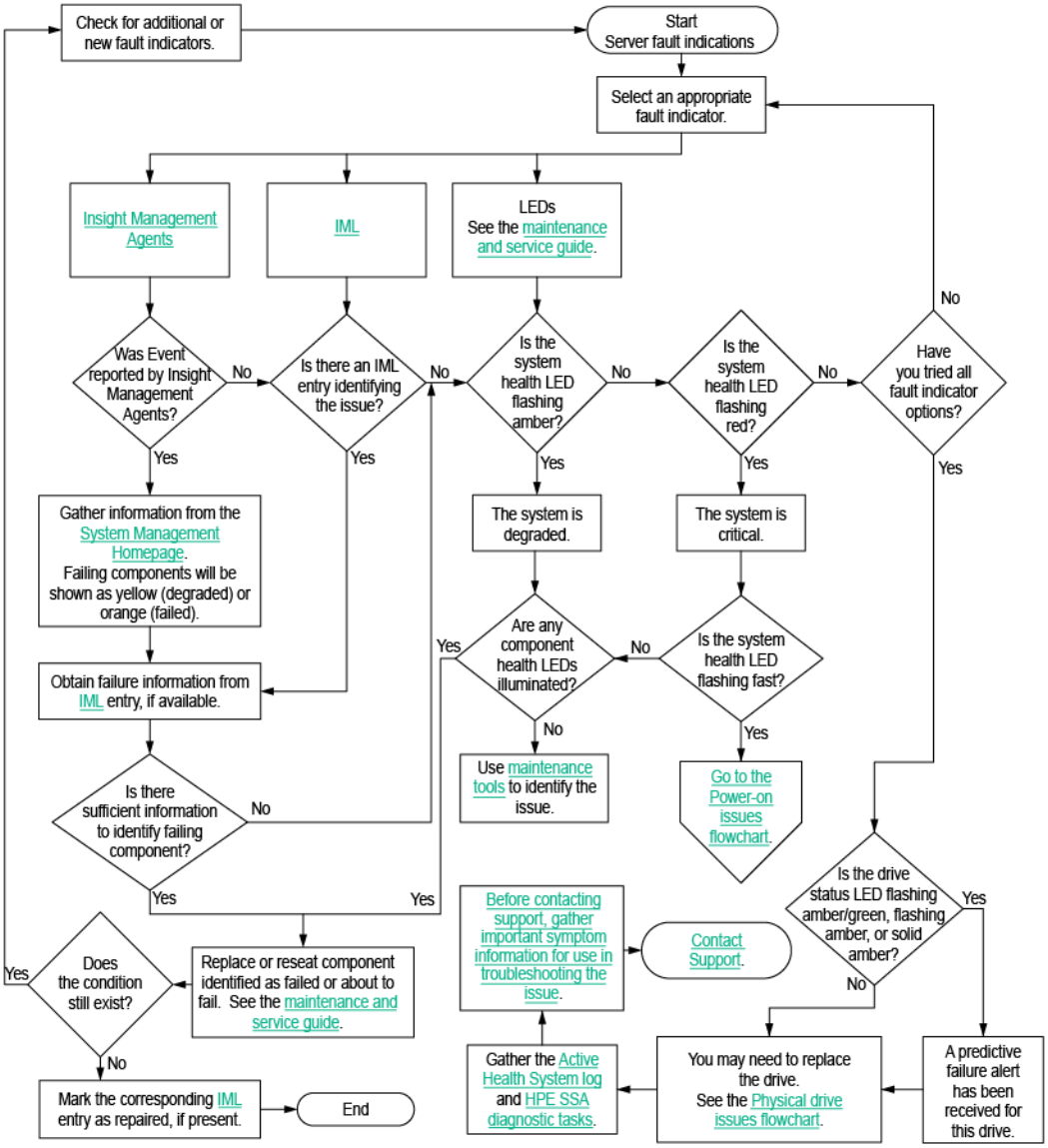
Troubleshoot the issue using the one of the following flowcharts:

- Server fault indications flowchart (non-blade servers) (on page 50)
- Server fault indications flowchart (BL series) (on page 51)

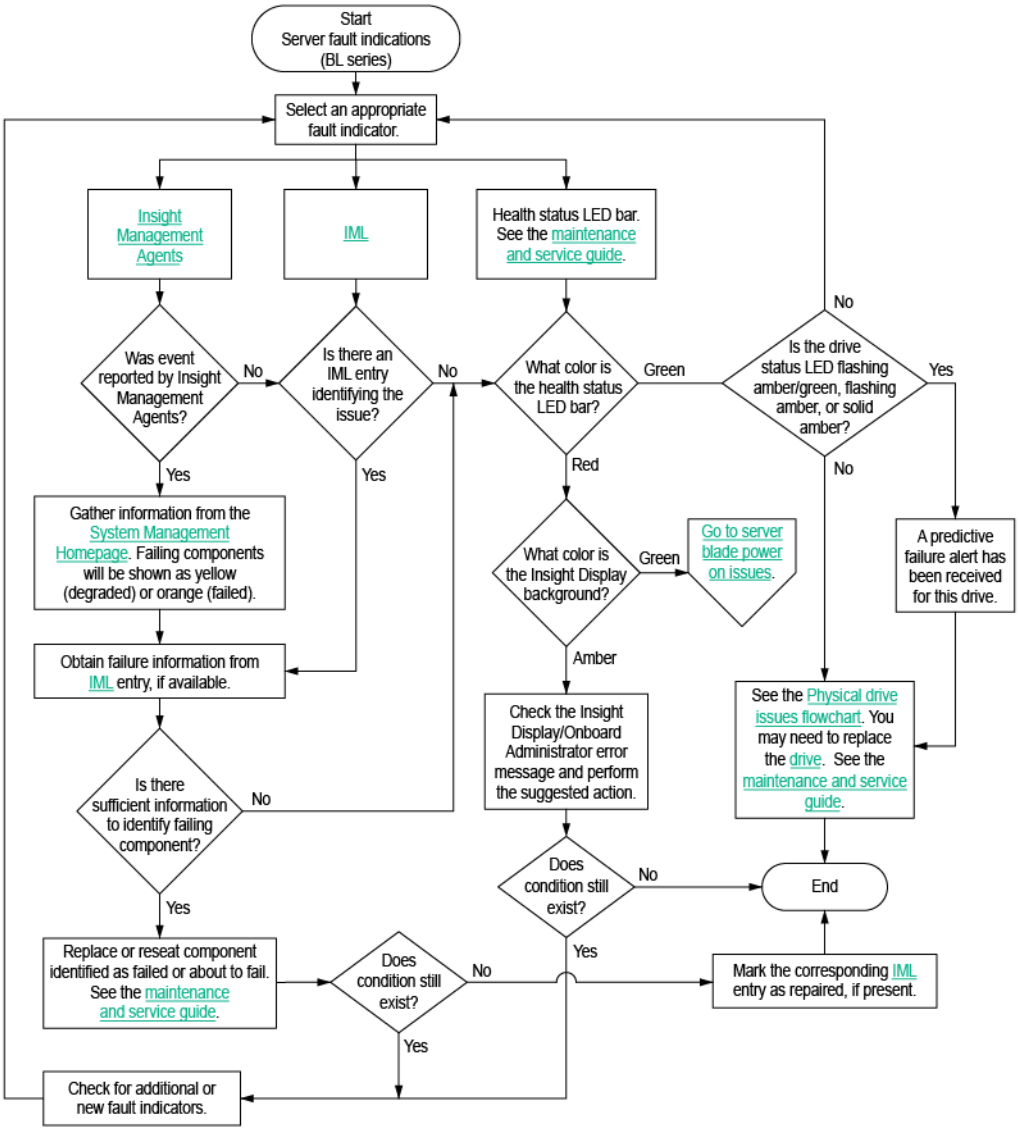
Server fault indications flowchart (non-blade servers)

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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).



Server fault indications flowchart (BL series)



Power profile issues flowchart

Symptom

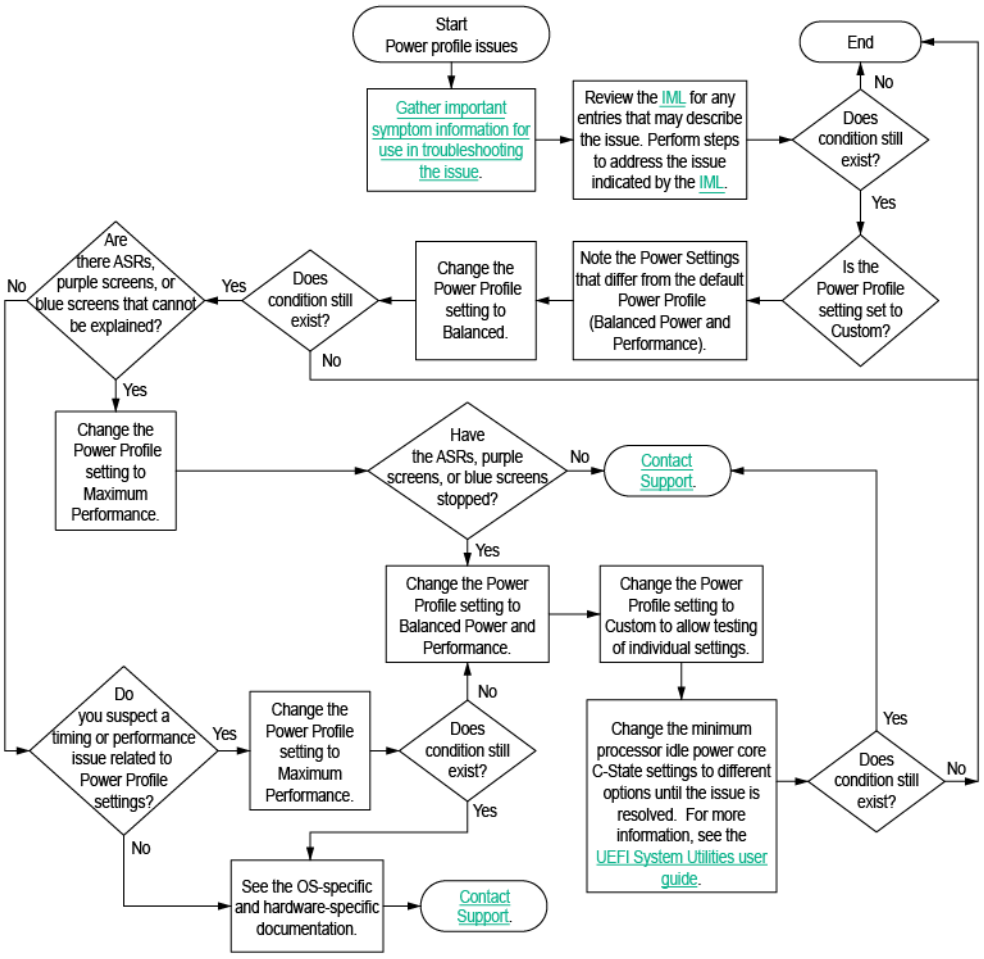
- Unexplained ASRs, blue screens, purple screens, or server hangs occur unexpectedly.
- Poor performance exists with some applications.

Cause

- 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.

For more information on Power Profile settings, see the HPE UEFI System Utilities user guide. For more information, see "HPE UEFI System Utilities documentation (on page 121)."

Action



NIC issues flowchart

Symptom

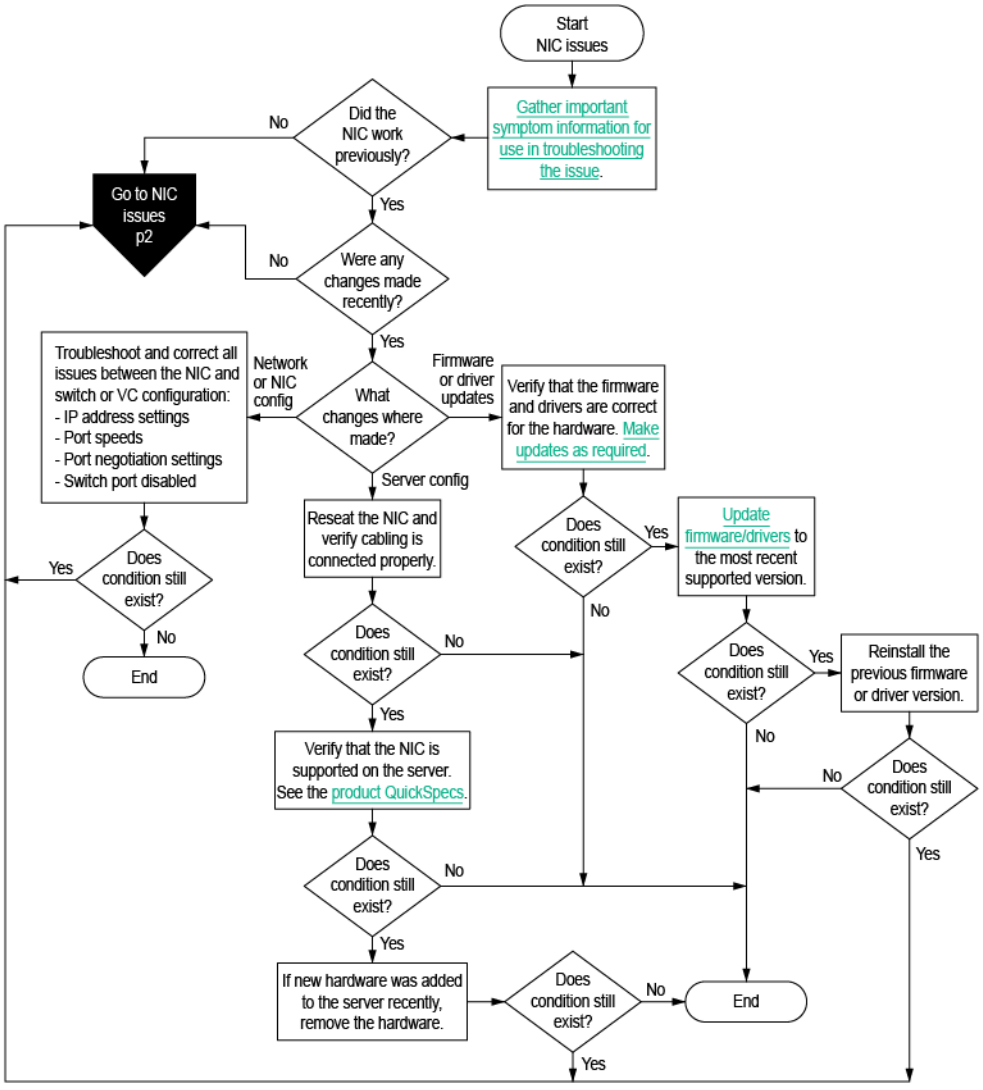
- The NIC is not working.
- One or more ports on the NIC is not working.

Cause

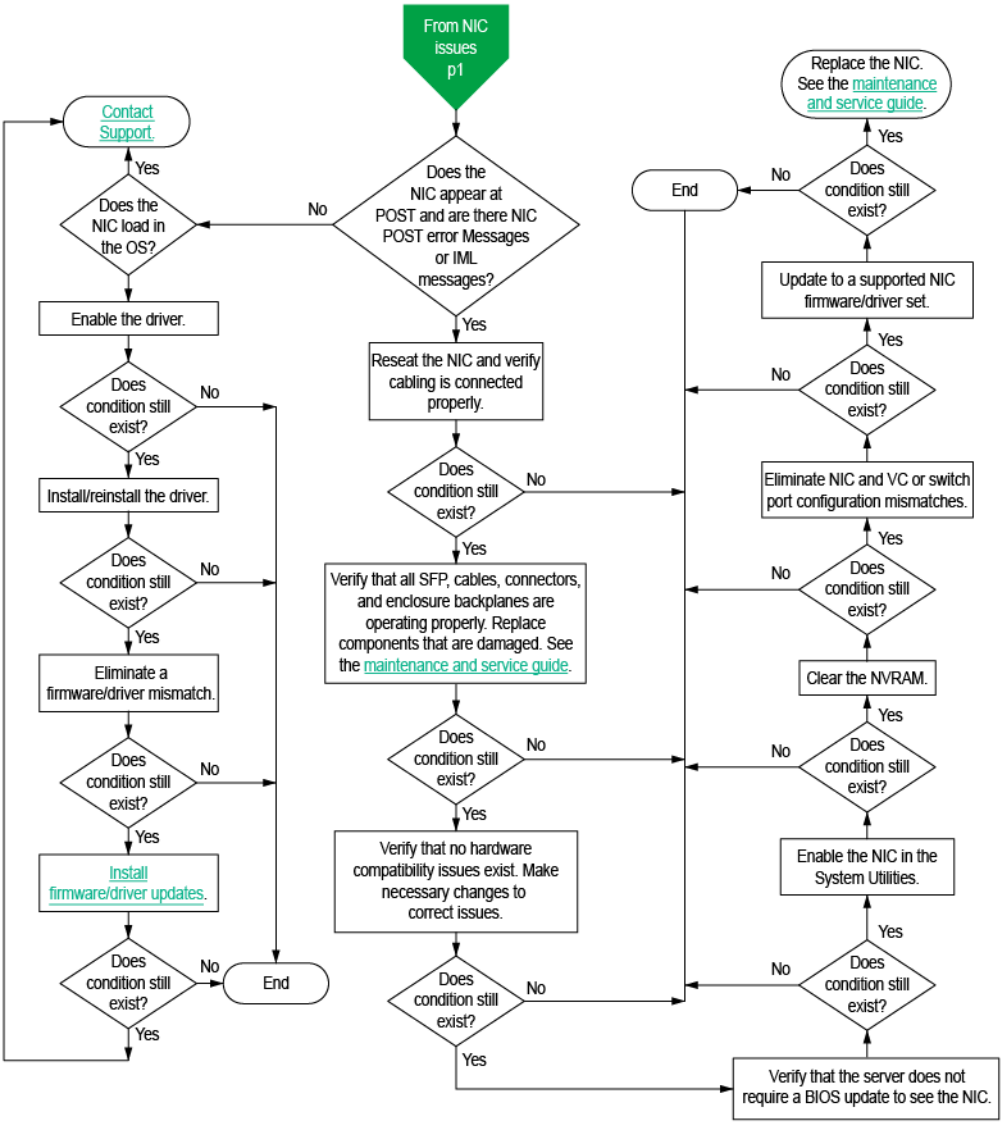
- The firmware or drivers are outdated, mismatched, or faulty.
- The NIC or cable is not seated properly.
- The NIC, the cable, or other hardware is faulty.
- The hardware components are not supported in the same configuration.
- The NIC is not supported on the server.

Action

NIC issues flowchart (1 of 2)

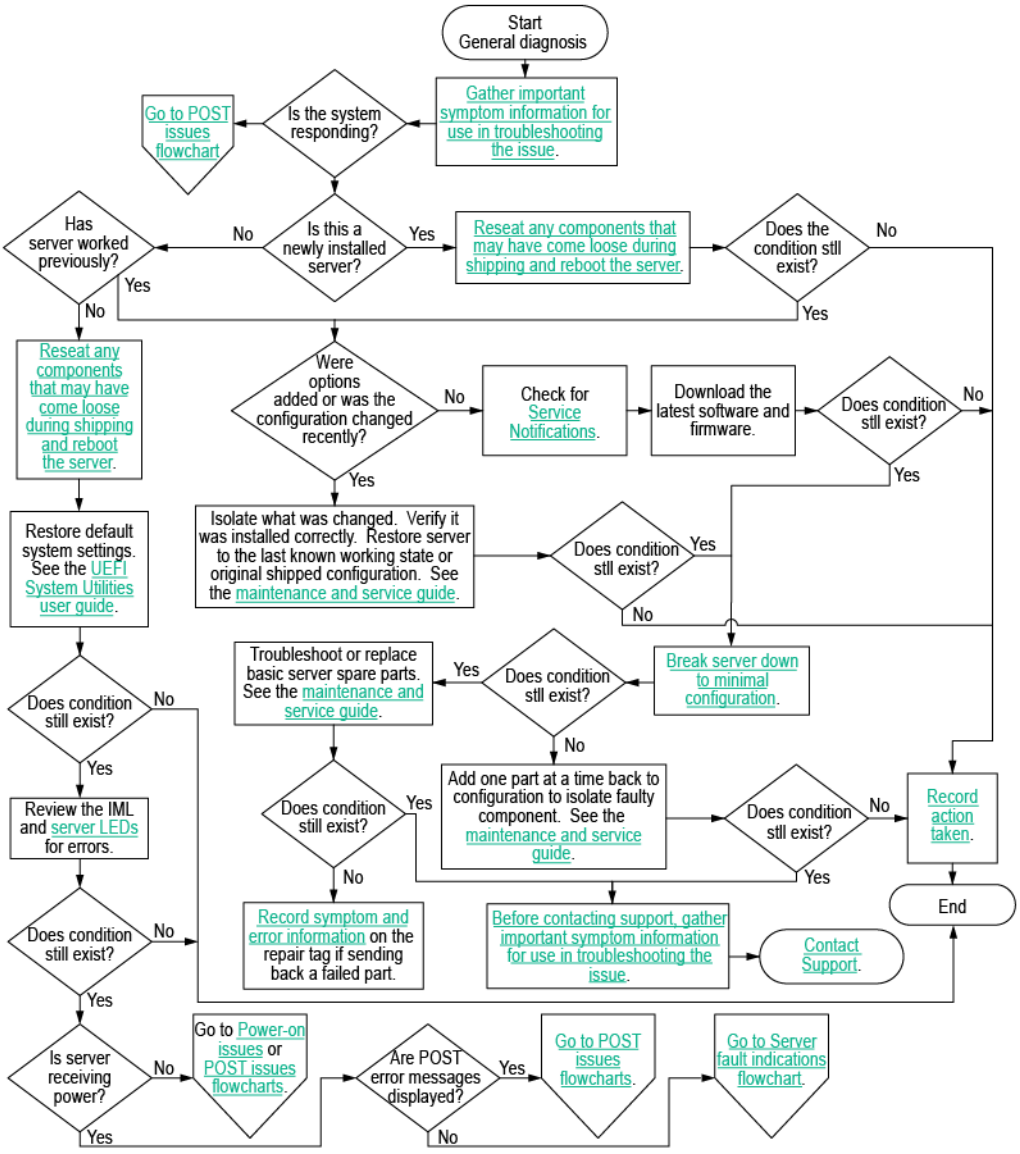


NIC issues flowchart (2 of 2)



General diagnosis flowchart

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



Hardware issues

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 "Processor troubleshooting guidelines (on page 16)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

Power issues

Server does not power on

Symptom

The server does not power on.

Action

1. Review the "HPE ProLiant Pre-boot Health Summary (on page 56)."
2. See the "Power-on issues flowchart (on page 31)."

HPE ProLiant Pre-boot Health Summary

If the server will not start up, you can use 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 HPE ProLiant Pre-boot Health Summary.

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

To verify that a server supports a UID button or video, see the server user guide (on page 120).

HPE ProLiant Pre-boot Health Summary

The HPE 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
- HPE ProLiant System ROM version

- HPE 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.

Accessing the HPE ProLiant Pre-boot Health Summary

To view the HPE 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 HPE 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 HPE 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.

Power source issues

Cause

- The server is not powered on.
- Components or cables might not be properly connected or seated.
- The grounded power outlet is not working.
- The power cord is not functional.
- The power strip is not functional.
- The circuit breaker is in the off position.
- The line voltage is insufficient for the load.
- Sufficient power is not allocated to support the server.

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 21)."
2. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
3. Plug another device into the grounded power outlet to be sure the outlet works. Also, be sure the power source meets applicable standards.
4. Replace the power cord with a known functional power cord to be sure it is not faulty.
5. Replace the power strip with a known functional power strip to be sure it is not faulty.
6. Be sure the proper circuit breaker is in the On position.
7. Have a qualified electrician check the line voltage to be sure it meets the required specifications.
8. 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:
   - *HPE Power Capping and HPE Dynamic Power Capping for ProLiant servers* technology brief on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpdpc**).
   - *HPE BladeSystem Onboard Administrator User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/BladeSystem/docs**)

Power supply issues

Cause

- The power supply might not be fully seated.
- AC power is unavailable.
- The power supply failed.
- The power supply is in standby mode.
- The power supply has exceeded the current limit.
- The power supply is not supported on the server.
- The power is not sufficient for the hardware installed.
- Redundant power supplies are configured but the power supplies are not compatible.

Action

1. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
2. If the power supplies have LEDs, be sure they indicate that each power supply is working properly.
   a. If the LEDs indicate an issue with a power supply (red, amber, or off), then check the power source.
   b. If the power source is working properly, then replace the power supply.
3. Be sure the system has enough power, particularly if you recently added hardware, such as drives. Remove the newly added component and if the issue 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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

   For more information, see the HPE Power Advisor on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/poweradvisor**).

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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
5. For further troubleshooting, see the "Power-on issues flowchart (on page 31)."

For more information, see the server documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

Insufficient power supply configuration

Symptom

The power supply configuration for the server is insufficient to meet the power requirements for the server.

Cause

The current power supply configuration is not sufficient to operate the server.

Action

1. Verify that the power supplies installed support the power requirements for the server configuration. For more information, see the HPE Power Advisor on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/poweradvisor**).
2. Verify that all power supplies are supported for this server. For more information, see the product QuickSpecs (on page 104).
3. If the power supplies have LEDs, be sure they indicate that each power supply is working properly.
   a. If the LEDs indicate an issue with a power supply (red, amber, or off), then check the power source.
   b. If the power source is working properly, then replace the power supply.
4. Be sure the system has enough power, particularly if you recently added hardware, such as drives. Remove the newly added component and if the issue 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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

   For more information, see the HPE Power Advisor on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/poweradvisor**).

UPS issues

UPS is not working properly

Cause

- The UPS switch is not in the ON position.
- The UPS batteries are not charged to the proper level.
- The UPS software is not up-to-date.
- The UPS power cord is not connected.
- The UPS power cord is not the correct type for the UPS and the country in which the server is located.

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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 issue 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

Symptom

A low battery warning is displayed on the UPS.

Cause

- The batteries need to be charged.
- The batteries are failing to hold a charge.
- The batteries are faulty.

Action

1. Plug the UPS into an AC grounded outlet for at least 24 hours to charge the batteries.
2. Test the batteries.
3. Replace the batteries if necessary.
4. Be sure the alarm is set appropriately by changing the amount of time given before a low battery warning. For more information, see the UPS documentation.

One or more LEDs on the UPS is red

Symptom

One or more of the UPS LEDs is red.

Action

For product-specific LED information and additional troubleshooting information, see the UPS documentation.

General hardware issues

New hardware issues

Cause

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

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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

   If necessary, remove unsupported hardware.
2. Be sure the issue is not caused by a change to the hardware release. For more information, see the release notes included with the hardware. If no documentation is available, see the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).
3. Be sure the new hardware is installed properly. To be sure all requirements are met, see the device, server, and OS documentation.
4. Be sure no memory, I/O, or interrupt conflicts exist.
5. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
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, verify that the system recognizes all changes to the hardware in the BIOS/Platform Configuration (RBSU) or in the options setup in UEFI System Utilities. If the new hardware is not configured properly, you may receive a POST error message indicating a configuration error. For more information on the UEFI System Utilities, see the *UEFI System Utilities User Guide for HPE ProLiant Gen9 and Synergy Servers* in the UEFI Information Library (**http://www.hpe.com/info/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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
11. Be sure all boards are properly installed in the server.
12. To see if the utility recognizes and tests the device, run HPE Insight Diagnostics (on page 106).
13. Uninstall the new hardware.

Unknown issue

Action

1. Check the server LEDs to see if any statuses indicate the source of the issue. For LED information, see the server documentation (on page 120).

2. Power down and disconnect power to the server. Remove all power sources to the server.
3. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
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 17)."
5. Reconnect power, and then power on the system.
   - If the video does not work, see "Video issues (on page 88)."

CAUTION: Only authorized technicians trained by Hewlett Packard Enterprise should attempt to remove the system board. If you believe the system board requires replacement, contact Hewlett Packard Enterprise technical support before proceeding. For more information, see "Accessing Hewlett Packard Enterprise Support (on page 126)."

CAUTION: Before removing or replacing any processors, be sure to follow the guidelines provided in "Processor troubleshooting guidelines (on page 16)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

   - 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.
   - 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 issue. 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 issues

Action

1. Verify that the server and operating system support the device. For more information, see the server and operating system documentation.
2. Be sure the latest device drivers are installed.
3. Be sure the device is properly installed. For more information, see the device documentation. 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 104).

Testing the device

1. Uninstall the device.

   If the server works with the device removed and uninstalled, an issue 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 issues.
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 issues

Drive issues (hard drives and solid state drives)

Drives are failed

Action:

1. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)".
2. Check to see if an update is available for any of the following:
   - Smart Array Controller firmware
   - Dynamic Smart Array driver
   - Host bus adapter firmware
   - Expander backplane SEP firmware
   - 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 HPE Insight Diagnostics (on page 106). Then, replace failed components as indicated.
7. Run HPE SSA and check the status of the failed drive. For more information, see "HPE Smart Storage Administrator (on page 111)".
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

Symptom

Drives are not recognized.

Action

1. Be sure no power issues exist.
2. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)".
3. Check for available updates on any of the following components:
   - Smart Array Controller firmware

- Dynamic Smart Array driver
- HBA firmware
- Expander backplane SEP firmware
- 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 20)." For server-specific drive LED information, see the server documentation (on page 120).
6. Be sure the drive is supported. To determine drive support, see the product QuickSpecs (on page 104).
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 HPE Insight Diagnostics (on page 106). Then, replace failed components as indicated.
11. When using an array controller, be sure the drive is configured in an array. Run HPE SSA. For more information, see "HPE Smart Storage Administrator (on page 111)."
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 Hewlett Packard Enterprise website (**http://www.hpe.com/support/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 HPE Dynamic Smart Array B140i RAID controller and the AHCI do not support SAS drives.

17. If the HPE Dynamic Smart Array B140i RAID controller is installed on the server, be sure that RAID mode is enabled in HPE UEFI System Utilities (on page 108).

Data is inaccessible

Symptom

The data on the drives is inaccessible.

Cause

- The files are corrupt.
- Viruses exist on the server.
- A TPM is installed but not properly enabled on the server.

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 HPE UEFI System Utilities (on page 108). 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

Symptom

The server response time is slower than usual.

Cause

- The drive is full.
- Operating system encryption technology is causing a decrease in performance.
- A recovery operation is pending on the logical drive.

Action

1. Be sure the drive is not full. If needed, increase the amount of free space on the drive. Hewlett Packard Enterprise 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 HPE SSA to verify that a recovery operation is not pending on the logical drive. For more information, see "HPE Smart Storage Administrator (on page 111)."

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

Symptom

- HPE SmartDrive icons or LEDs illuminate indicating an error.
- An error message is displayed in POST, HPE SSA, or HPE SADUCLI.

Action

Verify that the cabling from the drive backplane to the system board is correct. For server-specific cabling information, see the server user guide (on page 120).

SSD Smart Wear error

Symptom

A POST message or an IML message is received.

Cause

The device is approaching the maximum usage limit for writes to the device.

Action

Replace the device. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

Storage issues

HPE Dynamic Smart Array B140i RAID controller drives are not recognized

Symptom

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

Action

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

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

Symptom

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

Cause

The drive backplane is not cabled properly to the controller.

Action

Be sure that the 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. For more information on server cabling, see the server user guide (on page 120).

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

Symptom

Drive bays 1-13 or drive bays 14-25 are not available on a server with a 25SFF drive backplane.

Cause

The drive backplane is not cabled properly to the controllers.

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. For more information on server cabling, see the server user guide (on page 120).

Fan issues

General fan issues

Cause

- The fans are not seated properly.
- The fan configuration does not meet the functional requirements of the server.
- The server is not ventilated properly.
- One or more required fans are not installed.
- Required fan blanks are not installed.
- Error messages are displayed during POST or in the IML.
- One or more fans are not functioning.

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 (on page 120).

3. Be sure no ventilation issues exist. If the server is operated for an extended period of time with the access panel removed, airflow might be impeded, causing thermal damage to components. For further requirements, see the server documentation (on page 120).
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 (on page 120).
5. Use HPE 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 119)."
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.

      A hot spot is not an absolute temperature but is relative to a component specification. Hot spot is defined as temperature on a sensor within 3°C of a Caution threshold listed on the Temperature tab.
7. Replace any required non-functioning fans and restart the server. For specifications on fan requirements, see the server documentation (on page 120).
8. Be sure all fan slots have fans or blanks installed. For airflow requirements, see the server documentation (on page 120).
9. Verify the fan airflow path is not blocked by cables or other material.
10. For HPE BladeSystem c-Class enclosure fan issues, review the fan section of OA SHOW ALL and the FAN FRU low-level firmware. For more information, see the *HPE BladeSystem c-Class Enclosure Troubleshooting Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/BladeSystem_Enclosure_TSG_en**).

Fans running at a higher than expected speed

Symptom

The fans are running at a higher speed than expected.

Cause

- The system temperature sensor is reading within approximately 10°C of the Caution threshold.
- An air baffle or blank is missing or not installed properly and causing a disruption of the airflow.
- The processor heatsink is not installed as indicated in the server documentation.
- A supported fan is not installed in the server.

Action

1. Update the server to the latest firmware versions, such as iLO firmware, system BIOS, option firmware, etc.
2. Verify the Temperature tab. Fan speeds can be high if a sensor temperature is within approximately 10°C of the Caution threshold.
3. Verify that all air baffles and required blanks, such as drive blanks, processor heatsink blanks, power supply blanks, etc., are installed.
4. Verify that the correct processor heatsink is installed.
5. Verify that the correct fan is installed, if the system supports both standard fans and performance fans.

For more information about updating the firmware, see "Updating firmware or System ROM (on page 115)." For server-specific documentation, see "Server documentation (on page 120)."

Excessive fan noise (high speeds)

Symptom

Fans are operating at high speeds with excessive noise.

Cause

Fans can generate noise if running at a high speed (as expected) or when at low speed if there is an issue with the fan.

Action

1. In the iLO web interface, navigate to the **Information** > **System Information** page.
2. Click the **Fans** tab.
3. Verify the fan status and fan speed. Fan speeds greater than 60% are expected to be loud.
4. If the fan is running at a speed higher than expected, see "Fans running at a higher than expected speed (on page 67)."

For server-specific documentation, see "Server documentation (on page 120)."

Excessive fan noise (low speeds)

Symptom

Abnormal/rattling noise observed at low fan speeds might indicate an issue with the fan.

Action

Replace the fan. For server-specific documentation, see "Server documentation (on page 120)."

Hot-plug fan issues

Action

1. Check the LEDs to be sure the hot-plug fans are working. For LED information, see the server documentation on the Hewlett Packard Enterprise website.

   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. For more information, see the server documentation on the Hewlett Packard Enterprise website.

HPE BladeSystem c-Class enclosure fans are operating at a high speed

Symptom

All fans in an HPE 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 the following information from the OA or HPE 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 the FAN zone that indicates which server is consuming a lot of FAN speed.

Possible indicators could be either an outdated ROMBIOS or HPE 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 *HPE BladeSystem c-Class Enclosure Troubleshooting Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/bladesystem/docs**).

HP Trusted Platform Module issues

HP Trusted Platform Module fails or is not detected

Symptom

The HP TPM failed or is no longer detected.

Action

If the TPM fails and is no longer detected by UEFI System Utilities ("HPE UEFI System Utilities" on page 108), request a new system board and TPM board from a Hewlett Packard Enterprise authorized service provider. For more information, see "Accessing Hewlett Packard Enterprise Support (on page 126)."

△ **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.

HP Trusted Platform Module installation guidelines

△ **CAUTION:** Always observe the guidelines in this document. Failure to follow these guidelines can cause hardware damage or halt data access.

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, Hewlett Packard Enterprise 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, Hewlett Packard Enterprise 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.
- Hewlett Packard Enterprise 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 issues

General memory issues

Cause

- The memory does not meet server requirements.
- A DIMM has failed.
- Third-party memory is installed on the server.
- The DIMM is not properly seated.

Action

- Isolate and minimize the memory configuration. Use care when handling DIMMs. For more information, see "DIMM handling guidelines (on page 19)."
- Be sure the memory meets the server requirements and is installed as required by the server. Some servers might require that memory channels be populated fully or that all memory within a memory channel be of the same size, type, and speed. To determine if the memory is installed properly, see the server documentation (on page 120).
- Check any server LEDs that correspond to memory slots.
- If you are unsure which DIMM has failed, test each channel of DIMMs by removing all other DIMMs. Then, isolate the failed DIMM by switching each DIMM in a channel with a known working DIMM.
- Remove any third-party memory.
- To test the memory, run HPE Insight Diagnostics (on page 106).
- Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."
- Reseat the DIMM.
- Replace the DIMM. For more information, see the server maintenance and service guide (on page 120).

Server is out of memory

Symptom

- The server is out of memory.
- A POST error message or an IML message is displayed.

Cause

- The memory is not configured properly.
- An OS error is indicated.

Action

1. Be sure the memory is configured properly. For more information, see the product documentation to determine the memory configuration requirements.
2. Be sure no operating system errors are indicated.
3. Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."

DIMM configuration errors

Symptom

A POST error message or an IML message is displayed.

Cause

- The DIMM configuration does not support the Advanced Memory Protection setting configured for the server.
- The memory channel was not populated in the correct order.
- An unsupported DIMM is installed in the server.
- The corresponding processor is not installed.

Action

- Verify that the DIMMs are installed according to the DIMM population guides in the server user guide (on page 120).
- Verify that the Advanced Memory Protection settings and DIMMs are installed according to the DIMM population guidelines in the server user guide (on page 120).
- Verify that the DIMMs are supported on the server. For a list of supported options, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).
- Be sure that the associated processor is installed for all DIMMs on the server.
- Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."

Server fails to recognize existing memory

Symptom

The server does not recognize existing memory.

Cause

- The server does not support the processor installed in the server.
- The associated processor is not installed for all DIMMs installed in the server.
- The memory is not configured properly.
- The DIMM is degraded.
- The DIMM is not installed or seated properly.
- The DIMM is not installed.

Action

1. Be sure the server supports processor installed in the server. For a list of supported options, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 120).
3. Be sure the memory is configured properly. For more information, see the server documentation (on page 120).
4. Reseat the memory. Use care when handling DIMMs. For more information, see "DIMM handling guidelines (on page 19)."
5. Replace all degraded DIMMs. For more information, see the server documentation (on page 120).

6. Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."

Server fails to recognize new memory

Symptom

The server does not recognize new memory installed on the server.

Cause

- The memory is not supported on this server.
- The memory is not installed according to the server requirements.
- The memory limits are exceeded for the server.
- The processor is not supported on the server.
- The memory is not installed or seated properly.

Action

1. Be sure the memory is the correct type for the server. For a list of supported options, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).
2. Be sure the memory is installed according to the server requirements. For more information, see the server documentation (on page 120).
3. Be sure you have not exceeded the memory limits of the server or operating system. For more information, see the server documentation (on page 120).
4. Be sure the server supports the number of processor cores. Some server models support only 32 cores and this might reduce the amount of memory that is visible.
5. Be sure no Event List error messages are displayed in the IML. For more information, see "Integrated Management Log (on page 106)."
6. Be sure the memory is seated properly.
7. Be sure no conflicts are occurring with existing memory. Run the server setup utility.
8. 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.
9. Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."
10. Replace the memory. For more information, see the server maintenance and service guide (on page 120).

Uncorrectable memory error

Symptom

- A POST error message or an IML message is displayed.
- Stop error or blue screen (Windows)
- Purple diagnostic screen (Linux)
- Linux kernel panic
- A system “hang”
- A system “freeze”
- ASR
- Server restarts or powers down unexpectedly
- Parity errors occur

Cause

- The DIMM is not installed or seated properly.
- The DIMM has failed.

Action

1. Reseat the DIMM.
2. Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."
3. If the issue still exists, then replace the DIMM.

For more information, see the server maintenance and service guide (on page 120).

Correctable memory error threshold exceeded

Symptom

- Performance is degraded.
- The memory LED is amber.
- ECC errors occur with no other symptoms.

Cause

- The DIMM is not installed or seated properly.
- The DIMM has failed.

Action

1. Update the system ROM to the latest version. For more information, see "Updating firmware or System ROM (on page 115)."
2. Replace the DIMM. For more information, see the server maintenance and service guide (on page 120).

NVDIMM issues

NVDIMM population errors

Symptom

A POST error message or an IML message is displayed.

Cause

- An unsupported number of NVDIMMs are installed on the server.
- NVDIMMs are not supported on the server.
- An NVDIMM is not supported in the indicated slot.
- The server contains an unsupported mixture of DIMM types.
- The DIMMs are not installed according to population order.

Action

1. Verify that all DIMMs are installed according to the population guidelines. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
2. Remove all DIMM types that are not supported in the configuration. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

NVDIMM restore error

Symptom

A POST error message or an IML message is displayed.

Cause

- The restore operation, copying data from NVDIMM-N flash memory to NVDIMM-N DRAM, did not complete successfully.
- The NVDIMM has failed.

Action

Remove and replace the failed NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

NVDIMM backup error

Symptom

A POST error message or an IML message is displayed indicating an NVDIMM backup error.

Cause

- The backup operation, copying data from NVDIMM-N DRAM to NVDIMM-N flash memory, did not complete successfully.
- The NVDIMM has failed.

Action

1. Sanitize the NVDIMM. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
2. If the error persists, replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

NVDIMM uncorrectable memory error

Symptom

- A POST error message or an IML message is displayed indicating an NVDIMM uncorrectable memory error.
- If NVDIMM-N Memory Interleaving is enabled, all NVDIMMs on a processor are disabled.
- If NVDIMM-N Memory Interleaving is disabled, only the NVDIMM indicated is disabled.

Cause

- Backup data on the NVDIMM contains uncorrectable memory errors.
- A DIMM or an NVDIMM indicates an uncorrectable error.

Action

1. Sanitize the NVDIMM. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
2. If the error persists, replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

NVDIMM backup power error

Symptom

A POST error message or an IML message is displayed indicating an NVDIMM backup power error.

Cause

- The HPE Smart Storage Battery is disconnected, has lost charge, or has failed.
- The NVDIMM is not seated properly.
- The NVDIMM has failed.

Action

1. Verify that the Smart Storage battery is installed and functioning properly. For more information, see "HPE Smart Storage Battery issues flowchart (on page 44)."
2. Reseat the NVDIMM.
3. Reseat all NVDIMMs and DIMMs.
4. If the error persists, replace the NVDIMM.

For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

NVDIMM controller error

Symptom

A POST error message or an IML message is received indicating an NVDIMM controller error.

Cause

- The NVDIMM controller firmware is corrupt and the OS does not use the NVDIMM.
- An NVDIMM controller firmware update was interrupted.
- The NVDIMM controller failed.

Action

1. Update the NVDIMM firmware.
2. If the error persists, replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

NVDIMM erase error

Symptom

A POST error message or an IML message is received indicating an NVDIMM erase error.

Cause

The last erase operation failed and the NVDIMM contains the only copy of the restored data. If the server is reset or powered down, the backup will not complete and data will be lost.

Action

△ **CAUTION:** Contents of the NVDIMM must be saved to another media source immediately. If the server is reset or powered down prior to preserving the data, the data will be lost.

1. Save the contents of the NVDIMM to other media to preserve the data.
2. Replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

3. Sanitize the new NVDIMM. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
4. Copy the preserved data to the new NVDIMM.

   For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

NVDIMM arming error

Symptom

A POST error message or an IML message is received indicating an NVDIMM arming error.

Cause

The restore operation succeeded but the NVDIMM cannot be armed for backup due to an NVDIMM controller failure. As a result, the NVDIMM is reported to the operating system as read-only.

Action

1. Save the contents of the NVDIMM to other media to preserve the data.
2. Replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
3. Sanitize the new NVDIMM.
4. Copy the preserved data to the new NVDIMM.

   For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

NVDIMM sanitization error

Symptom

A POST error message is received indicating an NVDIMM sanitization error.

Cause

The NVDIMM has failed.

Action

1. Retry sanitizing the NVDIMM. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
2. If the error persists, replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

A new NVDIMM is detected and has been disabled

Symptom

When one or more new NVDIMMs are installed in a server where NVDIMMs are already installed, an error message is received indicating that all NVDIMMs are disabled.

Cause

New NVDIMMs are installed in the server.

Action

Do one of the following:

- Remove the newly installed NVDIMMs to continue using the existing NVDIMMs in the server. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

- Sanitize the NVDIMMs indicated to begin using all NVDIMMs in the server. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

The NVDIMM metadata is corrupted

Symptom

- If NVDIMM interleaving is disabled, only the NVDIMMs with corrupted metadata are disabled.
- If NVDIMM Interleaving is enabled, all NVDIMMs on a processor are disabled.

Cause

The data on the NVDIMM metadata that defines how the NVDIMM is used in the server is corrupt.

Action

Sanitize all NVDIMMs disabled due to corrupt metadata. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

NVDIMMs have been removed from the system

Symptom

All NVDIMMs on processor X are disabled.

Cause

One or more NVDIMMs were removed from this server and the server has NVDIMM-N Memory Interleaving enabled.

Action

Do one of the following:

- Reinstall the missing NVDIMMs. For more information, see the server user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
- Sanitize all NVDIMMs on processor X to begin using the smaller interleaved set. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

Memory initialization or uncorrectable errors for NVDIMMs

Symptom

A POST error message or an IML message is received indicating a memory initialization or uncorrectable error. If NVDIMM Interleaving is enabled, all NVDIMMs on processor X are disabled. If NVDIMM Interleaving is disabled, then only the affected NVDIMMs are disabled.

Cause

The server has NVDIMM-N Memory Interleaving enabled and one of the following is true:

- The NVDIMM experienced an uncorrectable error and caused the server to reboot.
- The server could not initialize the NVDIMM during POST.
- Data on all the NVDIMMs in the interleave set is affected.

Action

1. Reseat the NVDIMMs and all DIMMs in the server. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

2. Sanitize all NVDIMMs disabled due to this error. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
3. If the error persists, replace the NVDIMM. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

The NVDIMM is configured for a different processor type

Symptom

A POST error message or an IML message is received. If NVDIMM Interleaving is enabled, all NVDIMMs on processor X are disabled. If NVDIMM Interleaving is disabled, then only the affected NVDIMMs are disabled.

Cause

The server does not match the original server in which the NVDIMM was used, and NVDIMM-N Memory Interleaving is enabled.

Action

1. Remove the processor and replace it with the previously installed processor type. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
2. Reboot the server.
3. Save the contents of the NVDIMM to other media to preserve the data. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
4. Remove the processor and replace it with the new processor. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
5. Sanitize all NVDIMMs in the system. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
6. Restore data to the NVDIMM.
7. If the error persists, sanitize the NVDIMM. The data on the NVDIMM will be lost.

The NVDIMM location changed

Symptom

A POST error message or an IML message is received. If NVDIMM Interleaving is enabled, all NVDIMMs on processor X are disabled. If NVDIMM Interleaving is disabled, then only the affected NVDIMMs are disabled.

Cause

The NVDIMM was moved.

Action

Do one of the following:

- To preserve data, install the NVDIMM in the location indicated by the message. For more information, see the server user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
- Sanitize all NVDIMMs indicated by the message. The data on the NVDIMM is not available after sanitization. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

QPI Snoop Configuration errors for NVDIMMs

Symptom

An error message is received and all NVDIMMs on a processor are disabled.

Cause

- One or more NVDIMMs were previously on a system configured for Cluster On Die but the new system is NOT configured for Cluster on Die.
- One or more NVDIMMs were previously on a system NOT configured for Cluster On Die but the new system is configured for Cluster on Die.

Action

Do one of the following:

- Change the QPI Snoop Configuration setting to match the previous system. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
- Sanitize all NVDIMMs indicated by the error. The data on the NVDIMM is not available after sanitization. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

NVDIMM-N Memory Interleaving errors for NVDIMMs

Symptom

- A POST error message or an IML message is displayed.
- NVDIMMs are disabled in the system:
  - If the NVDIMM-N Memory Interleaving is enabled, then all NVDIMMs on processor X are disabled.
  - If the NVDIMM-N Memory Interleaving is disabled, then only affected NVDIMMs are disabled.

Cause

- The NVDIMM was previously being used in a server with NVDIMM-N Memory Interleaving enabled, but this server is configured for NVDIMM-N Memory Interleaving disabled.
- The NVDIMM was previously being used in a server with NVDIMM-N Memory Interleaving disabled, but this server is configured for NVDIMM-N Memory Interleaving enabled.

Action

Do one of the following:

- Change the NVDIMM-N Memory Interleaving setting for the NVDIMM to the same setting for the server and then, reboot the server. The data on the NVDIMM will be available after rebooting. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**). Change the setting as follows:
  - If the NVDIMM was previously installed in a server that had NVDIMM-N Memory Interleaving enabled, enable NVDIMM-N Memory Interleaving in HPE UEFI System Utilities.
  - If the NVDIMM was previously installed in a server that had NVDIMM-N Memory Interleaving disabled, disable NVDIMM-N Memory Interleaving in HPE UEFI System Utilities.
- Sanitize all NVDIMMs indicated. All data on the NVDIMM will not be available after sanitization.

Channel Interleaving errors for NVDIMMs

Symptom

- A POST error message or an IML message is displayed.
- All NVDIMMs on processor X are disabled.

Cause

- The NVDIMM was previously installed in a server that had Channel Interleaving enabled. The current server has Channel Interleaving disabled.
- The NVDIMM was previously installed in a server that had Channel Interleaving disabled. The current server has Channel Interleaving set to enabled.

Action

Do one of the following:

1. Change the Channel Interleaving setting in HPE UEFI System Utilities. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).
   - If the NVDIMM was previously installed in a server that had Channel Interleaving enabled, enable Channel Interleaving in HPE UEFI System Utilities.
   - If the NVDIMM was previously installed in a server that had Channel Interleaving disabled, disable Channel Interleaving in HPE UEFI System Utilities.
2. Sanitize all NVDIMMs on processor X.

Node Interleaving errors for NVDIMMs

Symptom

- A POST error message or an IML message is displayed.
- All NVDIMMs in the system are disabled.

Cause

Node Interleaving is not supported when NVDIMMs are installed on a server.

Action

Disable Node Interleaving in HPE UEFI System Utilities. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

Advanced Memory Protection mode errors for NVDIMMs

Symptom

- A POST error message or an IML message is displayed.
- All NVDIMMs in the system are disabled.

Cause

Advanced Memory Protection is set to an option other than Advanced ECC. Only Advanced ECC is supported with NVDIMMs.

Action

Change the setting for Advanced Memory Protection to Advanced ECC. For more information, see the *HPE 8GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/NVDIMM-docs**).

HPE Smart Storage Battery is not charged sufficiently to support the NVDIMMs on the system

Symptom

A POST error message or an IML message is received indicating that the HPE Smart Storage Battery is not charged sufficiently.

Cause

- The system is not configured to wait for the HPE Smart Storage Battery to charge.
- The ESC key was pressed to skip waiting for the HPE Smart Storage Battery to charge.

Action

To continue using the NVDIMMs, do one of the following:

1. Change NVDIMM-N Backup Power Policy to "Wait for Backup Power on Boot."
2. If NVDIMM-N Backup Power Policy is already configured to Wait for Backup Power on Boot, then reboot the server.
3. Wait for the HPE Smart Storage Battery to charge sufficiently.

An unsupported NVDIMM is installed on the system. Only HPE Smart Memory NVDIMMs are supported.

Symptom

A POST error message or an IML message is received indicating an unsupported NVDIMM on the system.

Cause

An unsupported NVDIMM is installed. The operating system only recognizes the unsupported NVDIMM as a standard DIMM.

Action

Replace the NVDIMM with a supported HPE SmartMemory NVDIMM. For more information, see the server maintenance and service guide (on page 120).

The NVDIMM has a capacitor pack installed

Symptom

- A POST error message or an IML message is displayed.
- The system halts.

Cause

A capacitor pack is attached to an installed NVDIMM. Capacitor packs are not supported with NVDIMMs. Power is provided to NVDIMMs by the HPE Smart Storage battery.

Action

1. Remove the unsupported capacitor pack from the system.
2. Install an HPE Smart Storage Battery. For more information on installing the HPE Smart Storage Battery, see the server user guide (on page 120).

The System Programmable Logic Device revision in this system does not meet minimum requirements for operation with NVDIMMs

Symptom

A POST error message or an IML message is displayed.

Cause

NVDIMMs are not supported in this server.

Action

Remove all NVDIMMs from the server. For more information on removing DIMMs, see the server maintenance and service guide (on page 120).

For more information about the types of memory supported in the server, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

Processor issues

Processor troubleshooting prerequisites

The actions in this section include removing, replacing, or reseating processors. Be sure to review the alert information before removing, replacing, or reseating a processor. The processor socket requires very specific installation, and removal and replacement steps. For more information on processor removal and replacement, see the server maintenance and service guide (on page 120).

△ **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 "Processor troubleshooting guidelines (on page 16)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

Troubleshooting the processor

Symptom

A POST error message or an IML message is received.

Cause

- One or more processors are not supported by the server.
- The processor configuration is not supported by the server.
- The server ROM is not current.
- A processor is not seated properly.
- A processor has failed.

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 user guide (on page 120).
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 product QuickSpecs (on page 104).
4. If the server has only one processor installed, reseat the processor. If the issue 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 issue is resolved after you restart the server, the original processor failed.
6. If the server has multiple processors installed, test each processor:
   a. Remove all but one processor from the server. Replace each with a processor terminator board or blank, if applicable to the server.
   b. Replace the remaining processor with a known functional processor. If the issue 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.

Uncorrectable machine check exception

Symptom

A POST error message or an IML message is received indicating an uncorrectable machine check exception.

Action

> △ **CAUTION:** Before removing or replacing any processors, be sure to follow the guidelines provided in "Processor troubleshooting guidelines (on page 16)." Failure to follow the recommended guidelines can cause damage to the system board, requiring replacement of the system board.

Replace the processor.

System battery is low or lost power

Symptom

An error message is received indicating low power or loss of power.

Cause

Real-time clock system battery is running low on power or lost power.

Action

Replace the battery. For more information, see the server maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).

System board and power backplane issues

Symptom

A POST message or an IML message is received indicating an issue with either the system board or the power backplane.

Action

- Review all error messages for possible issues with other components and troubleshoot components identified.
- Verify that no loose connections exist on the system board or power backplane. It is not necessary to reseat processors. For more information, see "Resolving loose connections (on page 18)."

- Remove any components recently added. For more information on removal and replacement procedures, see the product maintenance and service guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
- Power down and remove all power from the server. Remove the system battery for 10 minutes. Reinstall the battery and power on the server. To locate the system battery and for server-specific procedures, see the product documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
- Reset the NVRAM to default using the BIOS utility (F9). If the system will not boot, then use System Maintenance Switch, SW6, to reset the NVRAM. For more information, see the label on the server access panel or the server user guide (on page 120).
- Gather necessary information and contact Hewlett Packard Enterprise support. For more information, see "Accessing Hewlett Packard Enterprise Support (on page 126)."

SD and microSD card issues

System does not boot from the SD or microSD card

Symptom

The system is not booting from the drive.

Cause

- The drive boot order is not set to boot from the SD or microSD card.
- The SD or microSD card is not detected by HPE iLO.
- The SD or microSD card is not seated properly.

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 HPE iLO web interface to verify that the SD card is detected by HPE iLO.
3. Remove all power from the server. Reseat the SD or microSD card, and then power on the server.

USB drive key issues

System does not boot from the USB drive key

Symptom

The system does not boot from the USB drive key.

Cause

- The USB drive key is not enabled in the UEFI System Utilities.
- The drive boot order is not set to boot from the USB drive key.
- The USB drive key is not seated properly.

Action

1. Be sure that USB is enabled in the HPE UEFI System Utilities (on page 108).
2. Be sure the drive boot order in the HPE UEFI System Utilities 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.

CD-ROM and DVD drive issues

System does not boot from the CD-ROM or DVD drive

Symptom

The system does not boot from the CD-ROM or DVD drive.

Cause

- The CD-ROM or DVD drive is not enabled in the UEFI System Utilities.
- The drive boot order is not set to boot from the CD-ROM or DVD drive.
- The CD-ROM or DVD drive is damaged.
- The CD-ROM or DVD drive is not connected or cabled properly.

Action

1. Be sure the drive boot order in the HPE UEFI System Utilities (on page 108) is set so that the server boots from the CD-ROM or DVD drive first.
2. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
3. Be sure the media from which you are attempting to boot is not damaged and is a bootable CD-ROM or DVD drive.
4. If attempting to boot from a USB CD-ROM or DVD drive:
   - See the operating system and server documentation to be sure both support booting from a USB CD-ROM or DVD drive.
   - Be sure legacy support for a USB CD-ROM or DVD drive is enabled in the HPE UEFI System Utilities (on page 108).

Data read from the CD-ROM or DVD is inconsistent, or CD-ROM or DVD cannot read data

Symptom

The data from the CD-ROM or DVD drive is inconsistent or cannot be read.

Cause

- The CD or DVD has material or residue on the surface.
- The CD or DVD is not valid for the drive.

Action

1. Clean the drive and media.
2. If a paper or plastic label has been applied to the surface of the CD-ROM 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 supports only CDs.

Drive is not detected

Symptom

The CD-ROM or DVD drive is not detected.

Cause

- The CD-ROM or DVD drive is not cabled properly.

- The CD-ROM or DVD drive cables are not connected properly.
- The CD-ROM or DVD drive cable is faulty.
- The driver is not correct and needs to be updated.

Action

1. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
2. Be sure cables are connected as required. For more information, see the CD-ROM or DVD drive documentation or the server documentation (on page 120).
3. Be sure the cables are working properly. Replace with known functional cables to test whether the original cables are faulty.
4. Be sure the correct, current driver is installed.

Tape drive issues

Tape drive troubleshooting

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 might not apply to all tape drives.

For more information, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/storage_suppory**).

To download HPE StorageWorks Library and Tape Tools, see the Hewlett Packard Enterprise website (**http://www.hpe.com/storage/tapetools**).

Stuck tape issue

Symptom

The tape drive is stuck and will not eject.

Cause

- The SAS/HBA/Driver configuration of the drive is incorrect.
- The tape drive is damaged.
- One or more tape drive cables are damaged.

Action

1. Manually press the eject button. Wait for 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. Wait for up to 10 minutes for the tape to rewind and eject. The green Ready LED should flash.
3. Power cycle the drive. Wait for 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 Hewlett Packard Enterprise support.

Read/write issue

Symptom

The tape drive is experiencing read or write issues.

Action

1. Run the Drive Assessment Test in HPE 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 HPE StorageWorks Library and Tape Tools. This is a read-only test.

Tape drive backup issue

Symptom

The tape drive backup fails to complete without issues.

Action

1. Run the Drive Assessment Test in HPE 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:
   - Incorrect label placement
   - Broken, missing, or loose leader pin
   - Damaged cartridge seam
   - 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 backup.
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 HPE StorageWorks Library and Tape Tools:
   - Look for issues in the cartridge health section.
   - Look for issues in the drive health section.
3. Run the Media Assessment Test in HPE StorageWorks Library and Tape Tools.
4. Check for media damage:
   - Incorrect label placement
   - Broken, missing, or loose leader pin
   - Damaged cartridge seam
   - 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 issue has cleared.
   b. Load a new or known good tape. If the Tape Error LED stops flashing, the issue 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 (113ºF) or less than 5ºC (41ºF).

Graphics and video adapter issues

Troubleshooting general graphics and video adapter issues

Cause

- The graphics or video adapter is not supported on the server.
- Insufficient power to support the graphics or video adapter.
- The graphics or video adapter is not installed or seated properly.

Action

- Use only cards listed as a supported option for the server. For a complete list of supported options, see the product QuickSpecs (on page 104).
- 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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/enterprise/docs**).
- Be sure the adapter is seated properly.

External device issues

Video issues

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

Symptom

The screen is blank for more than 60 seconds after the server powered up.

Cause

- The monitor is not receiving power.
- The monitor is not cabled properly.
- The monitor cables are not connected properly.
- The power is not sufficient for a PCIe device or graphics controller installed on the server.
- A video expansion board is installed, but is not powered or configured properly.
- A video expansion board installed on the server is not supported.
- The video drive is not current.

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 exist by verifying the following connections:
   - For rack-mounted servers, check the cables to the KVM switch and be sure the switch is correctly set for the server. You might 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 c-Class Blade SUV cable is connected to the VGA cable on the monitor and to the connector on the front of the blade.

   For more information, see "Resolving loose connections (on page 18)."
5. Press any key, or enter the password, and wait for 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 for 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 (on page 120).
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 (on page 120).
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

Symptom

The monitor does not function properly with energy saver features.

Cause

The monitor does not support energy saver features.

Action

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

Video colors are wrong

Symptom

The video colors are displayed wrong on the monitor.

Cause

- The video cable is not connected securely to the correct port.
- The monitor and KVM switch are not compatible with the video output of the server.
- The video cable is damaged.

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

Symptom

Slow-moving horizontal lines are displayed on the monitor.

Cause

Magnetic field interference is occurring.

Action

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

Mouse and keyboard issues

Action

1. Be sure no loose connections exist by verifying the following:
   - If a KVM switching device is in use, be sure the server is properly connected to the switch.
   - For rack-mounted servers, check the cables to the switch box and be sure the switch is correctly set for the server.
   - For tower model servers, check the cable connection from the input device to the server.

   For more information, see "Resolving loose connections (on page 18)."
2. If a KVM switching device is in use, be sure all cables and connectors are of proper length and are supported by the switch. See the switch documentation.
3. Be sure the current drivers for the operating system are installed.
4. Be sure the device driver is not corrupted by replacing the driver.
5. Restart the system and check whether the input device functions correctly after the server restarts.
6. Replace the device with a known working equivalent device (another similar mouse or keyboard):
   - If the issue still occurs with the new mouse or keyboard, the connector port on the system I/O board is defective. Replace the board.
   - If the issue 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.

Expansion board issues

System requests recovery method during expansion board replacement

Symptom

The system requests a recovery method during expansion board replacement on a BitLocker-encrypted server.

Action

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**).

Network controller or FlexibleLOM issues

Network controller or FlexibleLOM is installed but not working

Symptom

The network controller or the FlexibleLOM is not working.

Action

1. Check the network controller or FlexibleLOM LEDs to see if any statuses indicate the source of the issue. For LED information, see the network controller documentation or server documentation (on page 120).
2. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
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 equivalent 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 issue 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 operating system documentation or server documentation (on page 120).
7. Be sure the controller is enabled in the HPE 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 HPE Insight Diagnostics (on page 106). Then, replace failed components as indicated.

Network controller or FlexibleLOM has stopped working

Symptom

The network controller or FlexibleLOM stopped working.

Action

1. Check the network controller or FlexibleLOM LEDs to see if any statuses indicate the source of the issue. For LED information, see the network controller documentation or server documentation (on page 120).
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 exist. For more information, see "Resolving loose connections (on page 18)."
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 HPE Insight Diagnostics (on page 106). Then, replace failed components as indicated.

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

Symptom

The network controller or FlexibleLOM stopped working when an expansion board was added to the server.

Cause

- The network controller or FlexibleLOM is not seated or connected properly.
- The network controller or FlexibleLOM is not supported by the OS or the server.
- Installation of the network controller or FlexibleLOM changes the server configuration.
- The network controller or FlexibleLOM drivers are out of date.
- The driver parameters do not match the configuration of the network controller.

Action

1. Be sure no loose connections exist. For more information, see "Resolving loose connections (on page 18)."
2. Be sure the server and operating system support the controller. For more information, see the operating system documentation or server documentation (on page 120).
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.

Network interconnect blade issues

Symptom

The network interconnect blade has issues.

Cause

The network interconnect blade is not properly seated or connected.

Action

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

Controller issues

General controller issues

Symptom

- The controller is not visible during the POST process.

- The controller shows errors during the POST process.

Cause

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

Action

1. Verify that the controller is supported for the server.
2. Verify that the controller is not physically damaged.
3. If the controller is recognized by the system BIOS, then reseat the controller.
4. Run controller diagnostics and follow the steps displayed.
5. Update the firmware.
6. Download the Active Health System log. For more information, see the "Active Health System Log overview (on page 130)."
7. Contact Hewlett Packard Enterprise technical support. For more information, see "Accessing Hewlett Packard Enterprise Support (on page 126)."
8. Replace the controller. For more information, see the server maintenance and service guide (on page 120).

Controllers are no longer redundant

Symptom

- The controller shows errors during the POST process.
- The cache is disabled.

Cause

- The hardware on one or more controllers is physically damaged.
- One or more controllers are not supported on the server.
- The controllers are not compatible for redundant operation.
- One or more controllers are not installed properly.
- The firmware on one or more controllers is outdated or not compatible.
- The HPE Smart Storage Battery is not installed.
- The HPE Smart Storage Battery is not connected to the system board properly.
- The cache module cable is not connected to the PCIe riser board (for controllers installed on a PCIe riser board).

Action

1. Verify that the controllers are supported for the server.
2. Verify that both controllers are installed or seated properly.
3. Verify that the controllers are compatible controller models.
4. Verify that the controller firmware versions are compatible and current.
5. Verify that the controller cache sizes are compatible.
6. Verify that the HPE Smart Storage Battery is installed and connected properly.

7. Verify that the all controller cabling is connected properly.
8. If the issue persists, download the Active Health System log. For more information, see the "Active Health System log overview (on page 130)."
9. Contact Hewlett Packard Enterprise technical support. For more information, see "Accessing Hewlett Packard Enterprise Support (on page 126)."

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

Symptom

The HPE Dynamic Smart Array B140i drives are not found when RAID mode is disabled.

Cause

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

Action

1. Press the **F9** key during the startup process to access the HPE 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

Symptom

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

Hewlett Packard Enterprise 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

Symptom

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

Cause

A drive migration issue occurred.

Action

Be sure to follow all drive roaming rules when migrating drives. See "Drive roaming (on page 95)."

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.

HPE Smart Storage Battery issues

HPE Smart Storage Battery might lose charge when shelved for long periods of time

Symptom

Any HPE ProLiant Gen9 server configured with an HPE 96W Smart Storage Battery or HP 12W Smart Storage Battery for HPE Smart Array Controllers might display a POST error message.

Cause

The HPE Smart Storage Battery lost charge and must be replaced.

Action

1. Verify the HPE Smart Storage Battery version in HPE iLO. The battery version is identified in the location shown by the letter Z in the following example:

   xxxxx0Zxxxxxxx
2. Download the Active Health System log (on page 131).
3. Contact Hewlett Packard Enterprise technical support. For more information, see "Accessing Hewlett Packard Enterprise Support (on page 126)."

HPE Smart Storage Battery configuration error

Symptom

Any HPE ProLiant Gen9 server configured with an HPE Smart Storage Battery for HPE Smart Array Controllers or NVDIMMs receives a POST error message or an IML message.

Cause

The system exceeded the installed HPE Smart Storage Battery capacity.

Action

Do one of the following:

- Ensure the HPE Smart Storage Battery is fully charged.
- Remove some of the devices using the HPE Smart Storage Battery. Both HPE Smart Array Controllers and NVDIMMs use the HPE Smart Storage Battery.

For more information, see the server user guide (on page 120).

HPE Smart Storage Battery failure

Symptom

Any HPE ProLiant Gen9 server configured with an HPE Smart Storage Battery for HPE Smart Array Controllers receives a POST error message or an IML message.

Cause

- Communication with the HPE Smart Storage Battery failed.
- The HPE Smart Storage Battery output is not enabled.

Action

- Verify that the HPE Smart Storage Battery is installed properly. For more information, see the server user guide (on page 120).
- Update the system ROM.
- If the issue persists, contact Hewlett Packard Enterprise support ("Accessing Hewlett Packard Enterprise Support" on page 126).

Cable issues

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

Symptom

Errors, retries, timeouts, and unwarranted drive failures occur when using an older Mini-SAS cable.

Cause

The Mini-SAS cable might be reaching its life expectancy.

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

Symptom

- The USB device is not recognized when connected to an SUV cable.
- An error message is displayed.
- The device does not power on when connected to an SUV cable.

Cause

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

Action

Remove the USB device and do one of the following:

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

Software issues

Operating system issues and resolutions

Operating system issues

Operating system locks up

Symptom

The operating system locks up.

Action

- Scan for viruses with an updated virus scan utility.
- Review the HPE 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 130) for use when contacting Hewlett Packard Enterprise ("Accessing Hewlett Packard Enterprise Support" on page 126).

Errors are displayed in the error log

Symptom

Error messages are displayed in the error log.

Action

Follow the information provided in the error log. For more information, see the operating system documentation.

Issues occur after the installation of a service pack

Symptom

Issues occur after the installation of a service pack.

Action

Update the operating system. For more information, see "Updating the operating system (on page 98)."

Updating the operating system

Prerequisites for updating the operating system

Before updating the operating system, read the release notes for each update.

Use care when applying operating system updates (Service Packs, hotfixes, and patches). If you do not require specific fixes from the update, Hewlett Packard Enterprise recommends that you do **not** apply the updates. Some updates overwrite files specific to Hewlett Packard Enterprise.

Updating the operating system

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 issues, locate files to correct the issues on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

Reconfiguring or reloading software

Prerequisites for reconfiguring or reloading software

If all other options have not resolved the issue, consider reconfiguring the system. Before reconfiguring the system, do the following:

1. Weigh the projected downtime of a software reload against the time spent troubleshooting intermittent issues. It might be advantageous to start over by removing and reinstalling the software with issues, or, in some cases, by using the Erase utility (on page 107) 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.

Restoring to a backed-up version

If you recently upgraded the operating system or software and cannot resolve the issue, 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 issue, you can restore the current set to be sure you do not lose additional functionality.

For more information, see the documentation provided with the backup software.

Linux resources

For troubleshooting information specific to Linux operating systems, see the Linux for ProLiant website (**http://www.hpe.com/info/proliantlinux**).

To assist in possible LINUX installation issues on HPE ProLiant servers, capture either the sosreport or supportconfig before contacting Hewlett Packard Enterprise technical support ("Accessing Hewlett Packard Enterprise Support" on page 126). For more information, see "Linux tools (sosreport and supportconfig)."

Application software issues

Software locks up

Symptom

The software locks up.

Cause

- The software might be incompatible with other software on the server.
- Known issues might exist with the software.
- The server configuration might have changed.
- The server might be infected by a virus.

Action

1. Check the application log and operating system log for entries indicating why the software locked up.
2. Check for incompatibility with other software on the server.
3. Check the support website of the software vendor for known issues.
4. Review log files for changes made to the server that might have caused the issue.
5. Scan the server for viruses with an updated virus scan utility.

Errors occur after a software setting is changed

Symptom

The system locks up after settings were changed.

Cause

The new system settings are not supported.

Action

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

Errors occur after the system software is changed

Symptom

Errors occur after the system software is changed.

Action

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

Errors occur after an application is installed

Symptom

Errors occur after an application is installed on a server.

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 might need to obtain the settings from the server setup utility and manually set the software switches. For more information, see the application documentation, the vendor website, or both.
- Check for overwritten files. To determine which files are added by the application, see the application documentation.
- Reinstall the application.
- Be sure you have the most current drivers.

ROM issues

Remote ROM flash issues

Command-line syntax error

Symptom

If the correct command-line syntax is not used, an error message describing the incorrect syntax is displayed and the program exits.

Cause

Incorrect command-line is used.

Action

1. Correct the command-line syntax.
2. Restart the process.

Access denied on target computer

Symptom

When attempting to access a networked target computer for which administrative privileges are not authorized, an error message is displayed describing the issue, and then the program exits.

Cause

Administrative privileges are not available for the user requesting access.

Action

1. Obtain administrative privileges for the target computer or server.
2. Restart the process.

Be sure the remote registry service is running on a Windows-based system.

Invalid or incorrect command-line parameters

Symptom

If incorrect parameters are passed into command-line options, an error message describing the invalid or incorrect parameter is displayed and the program exits.

Cause

Invalid or incorrect command-line parameters are used.

Action

1. Correct the invalid parameter.
2. Restart the process.

Network connection fails on remote communication

Symptom

An error message describing the broken connection displays and the program exits.

Cause

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.

Action

1. Attempt to ascertain and correct the cause of connection failure.
2. Restart the process.

Failure occurs during ROM flash

Symptom

The server will not start.

Cause

The flash cannot be interrupted during a ROM flash, 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.

Action

Initiate ROMPaq disaster recovery procedures.

Target system is not supported

Symptom

If the target system is not listed in the supported servers list, an error message appears and the program exits.

Cause

Only supported systems can be upgraded using the Remote ROM Flash utility.

Action

To determine if the server is supported, see the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

System requests recovery method during a firmware update

Symptom

The system requests a recovery method during a firmware update.

Action

When updating the firmware on a BitLocker-encrypted server, do the following:

1. 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.
2. Update the firmware. If BitLocker is configured to measure option ROMs, follow the firmware upgrade steps in "Updating firmware (on page 102)." BitLocker can be configured to measure the following option ROMs:
   - HPE iLO

- NIC
- Smart Array storage
- Standup HBAs

3. Enable BitLocker after the firmware updates are complete.

For information on performing ROM updates, see "Firmware Updates (on page 18)."

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

Updating 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 issues

Server does not boot

Symptom

The server does not boot.

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 might require the boot logical drive to be selected within HPE SSA (F5).

Action

Access the redundant ROM using one of the following procedures:

- Accessing the redundant ROM (non-blade servers) (on page 102)
- Accessing the redundant ROM (server blades) (on page 103)

Accessing the redundant ROM (non-blade servers)

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 ("HPE UEFI System Utilities" on page 108).

Accessing the redundant ROM (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 ("HPE UEFI System Utilities" on page 108).

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.hpe.com/info/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 and configuration utilities

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
HPE iLO (on page 104)	Online and Offline
Active Health System (on page 104)	Online and Offline
RESTful API support for iLO ("iLO RESTful API support" on page 105)	Online and Offline
Integrated Management Log (on page 106)	Online and Offline
Intelligent Provisioning (on page 106)	Offline
HPE Insight Diagnostics (on page 106)	Online and Offline
Erase Utility (on page 107)	Offline
Scripting Toolkit for Windows and Linux (on page 107)	Online
Service Pack for ProLiant (on page 107)	Online and Offline
HP Smart Update Manager (on page 108)	Online and Offline
HPE UEFI System Utilities (on page 108)	Offline
HPE Smart Storage Administrator (on page 111)	Online and Offline
FWUPDATE utility (on page 115)	Offline

Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

HPE iLO

iLO is a remote server management processor embedded on the system boards of HPE ProLiant and Synergy servers. iLO enables the monitoring and controlling of servers from remote locations. HPE iLO management is a powerful tool that provides multiple ways to configure, update, monitor, and repair servers remotely. iLO (Standard) comes preconfigured on HPE servers **without an additional cost or license**.

Features that enhance server administrator productivity are licensed. For more information, see the HPE iLO documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo-docs**).

Active Health System

The HPE 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 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

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. 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 Hewlett Packard Enterprise Data Privacy policy. For more information, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 Hewlett Packard Enterprise website (**http://www.hpe.com/servers/spp/download**). The Active Health System log can be downloaded manually from iLO 4 or HPE Intelligent Provisioning and sent to Hewlett Packard Enterprise.

For more information, see the following documents:

- *iLO User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo/docs**)
- *Intelligent Provisioning User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/intelligentprovisioning/docs**)

iLO RESTful API support

HPE iLO 4 firmware version 2.00 and later includes the iLO RESTful API. The iLO RESTful API is a management interface that server management tools can use to perform configuration, inventory, and monitoring of the ProLiant server via iLO. The iLO RESTful API uses basic HTTPS operations (GET, PUT, POST, DELETE, and PATCH) to submit or return JSON-formatted data with iLO web server.

HPE iLO 4 2.30 and later is Redfish 1.0-conformant while remaining backward compatible with the existing iLO RESTful API.

HPE iLO 4 supports the iLO RESTful API with ProLiant Gen8 and later servers. For more information about the iLO RESTful API, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 HPE SIM
- From within UEFI System Utilities ("HPE UEFI System Utilities" on page 108)
- From within the Embedded UEFI shell (on page 110)
- From within operating system-specific IML viewers:
  - For Windows: IML Viewer
  - For Linux: IML Viewer Application
- From within the iLO web interface
- From within Insight Diagnostics ("HPE Insight Diagnostics" on page 106)

Intelligent Provisioning

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

- Intelligent Provisioning assists with the OS installation process by preparing the system for installing "off-the-shelf" and Hewlett Packard Enterprise branded versions of operating system software and integrating optimized 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 *Intelligent Provisioning Release Notes* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/intelligentprovisioning/docs**).

For more information about Intelligent Provisioning software, see the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/intelligentprovisioning**). For Intelligent Provisioning recovery media downloads, see the Resources tab on the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/intelligentprovisioning**). For consolidated drive and firmware update packages, see the Smart Update: Server Firmware and Driver Updates page on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/SmartUpdate**).

HPE Insight Diagnostics

The 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.

The 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 106).

The 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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/InsightDiagnostics**). The Insight Diagnostics Online Edition is also available in the SPP ("Service Pack for ProLiant" on page 107).

HPE Insight Diagnostics survey functionality

HPE Insight Diagnostics (on page 106) 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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 Insight Diagnostics installation, or it can be installed through the SPP ("Service Pack for ProLiant" on page 107).

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 *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 *Intelligent Provisioning User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/intelligentprovisioning/docs**).

Scripting Toolkit for Windows and Linux

The STK for Windows and Linux is a server deployment product that delivers an unattended automated installation for high-volume server deployments. The STK is designed to support ProLiant 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 STK 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 or to download the STK, see the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/proliant/stk**).

Service Pack for ProLiant

The 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 ProLiant servers including 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 Hewlett Packard Enterprise website:

- Service Pack for ProLiant download page (**http://www.hpe.com/servers/spp/download**)
- Smart Update: Server Firmware and Driver Updates page (**http://www.hpe.com/info/SmartUpdate**)

HP Smart Update Manager

HP SUM is a product used to install and update firmware, drivers, and systems software on ProLiant servers. The HP SUM provides a GUI and a command-line scriptable interface for deployment of systems software for single or one-to-many 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 Hewlett Packard Enterprise website (**http://www.hpe.com/servers/hpsum**).

To download HP SUM, see the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/hpsum/download**).

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

HPE UEFI System Utilities

The 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 UEFI System Utilities, see the *HPE UEFI System Utilities User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/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 UEFI System Utilities

To use the UEFI 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

Action	Key
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 UEFI 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 UEFI 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 *HPE UEFI System Utilities User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/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 Hewlett Packard Enterprise 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 *HPE UEFI System Utilities and Shell Release Notes for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**).

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

When Secure Boot is enabled, the System Maintenance Switch does not restore all manufacturing defaults when set to the ON position. For security reasons, the following are not restored to defaults when the System Maintenance Switch is in the ON position:

- Secure Boot is not disabled and remains enabled.
- The Boot Mode remains in UEFI Boot Mode even if the default boot mode is Legacy Boot Mode.
- The Secure Boot Database is not restored to its default state.
- iSCSI Software Initiator configuration settings are not restored to defaults.

Embedded UEFI shell

The system BIOS in all 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:

- *HPE UEFI Shell User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**)
- *UEFI Shell Specification* on the UEFI website (**http://www.uefi.org/specifications**)

Embedded Diagnostics option

The system BIOS in all 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 *HPE UEFI System Utilities User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**).

iLO RESTful API support for UEFI

The ProLiant Gen9 servers include support for a UEFI compliant System BIOS, along with UEFI System Utilities and Embedded UEFI Shell pre-boot environments. ProLiant Gen9 servers also support configuring the UEFI BIOS settings using the iLO RESTful API, a management interface that server management tools can use to perform configuration, inventory, and monitoring of a ProLiant server. The iLO RESTful API uses basic HTTPS operations (GET, PUT, POST, DELETE, and PATCH) to submit or return JSON-formatted data with iLO web server.

For more information about the iLO RESTful API and the RESTful Interface Tool, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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

HPE Smart Storage Administrator

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

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

Some HPE SSA features include the following:

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

For more information about HPE SSA, see the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/ssa**).

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

Hewlett Packard Enterprise 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, Hewlett Packard Enterprise 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, Hewlett Packard Enterprise 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, Hewlett Packard Enterprise 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 the UEFI System Utilities, so that the user can change the default operation of the USB ports. For more information, see the *HPE UEFI System Utilities User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**).

External USB functionality

Hewlett Packard Enterprise 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.

Power capping

The HPE Apollo Series of products provides a power capping feature that operates at the server enclosure level. The capping feature can be activated with PPIC.EXE, a stand-alone utility that runs in the environment of one of the resident servers in the chassis to be power capped. After a power cap is set for the enclosure, all the resident servers in the enclosure will have the same uniform power cap applied to them until the cap is either modified or canceled.

With HPE APM, the enclosure-level power capping feature can be expanded without the need to use the PPIC.EXE utility. A global power cap can be applied to all enclosures with one HPE APM command, or different caps can be applied to user-defined groups by using flexible zones within the same rack.

Power capping modes

NOTE: Mode 3 is only supported through HPE APM.

The following Power Management modes are standard and are configurable in the power management controller:

- Mode 0: No Redundancy

  All power-capping is disabled. This mode can be used to minimize any possible performance impact of power-capping logic.

- Mode 1: Max Performance with Redundancy

  This is the default power capping mode. This mode allows the maximum number of nodes to run by engaging power-capping if the power draw from the enclosure attempts to exceed the load supported by the active power supplies. In this mode, the system is expected to survive (with degraded performance) an unexpected power loss to one or more of the power supplies.

- Mode 2: Full AC/DC Redundancy Mode

  Power-capping is enforced such that system has N+1 power redundancy. In this mode, the system will throttle the nodes allowing for one of the available power supplies to be held in reserve. If only one power supply is available, the system will throttle the nodes as to allow the full use of that power supply's capacity.

- Mode 3: User Configurable Mode

  The user can specify a valid power cap value from a pre-defined range. A cap cannot be set below a minimum or above a maximum. The cap includes all server nodes, fans, and drives. User configurable mode requires an iLO Scale Out or iLO Advanced license.

- Mode 4: Rack Level Dynamic Power Capping Mode

  In conjunction with HPE APM, the user can specify a maximum power capacity for the entire rack. The HPE APM dynamically allocates power to the applicable chassis within the rack to maximize performance given the available power. For more information, see the *HPE Apollo Platform Manager User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/APM_UG_en**).

- Mode 5: Power Feed Redundancy Mode

  When used with an A+B power feed configuration, Power Feed Redundancy Mode throttles the system 100%, bringing the nodes to a complete stop if a power feed loss is deduced. Full throttling

continues until the power feed is brought back online. In this mode, the system is expected to survive an unexpected loss of an entire power feed to half of the power supplies.

Configuring a power cap

To configure power capping, you can use the following utilities:

- HPE ProLiant Power Interface Control Utility

  PPIC is a standalone utility that runs on a single server within the enclosure. For more information, see the *ProLiant Power Interface Control (PPIC) Utility User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/PPIC_UG_en**).

- HPE Apollo Platform Manager

  HPE APM is a rack level device that can control power caps for all enclosures in the rack. For more information, see the *HPE Apollo Platform Manager User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/APM_UG_en**).

Setting the chassis power cap mode with the PPIC utility

1. Download and install the ProLiant Power Interface Control Utility from the Hewlett Packard Enterprise website (**http://www.hpe.com/info/hpesc**).
2. Log in to the server, and then run the PPIC utility.
3. To set the power capacity mode, perform one of the following steps:
   - To set mode 0, 1, and 2, enter the following command at the prompt:

     `-s -mmode`

     The following example sets the power capacity to mode 0:

     `-s -m0`
   - To set mode 3, enter the following command at the prompt:

     `-s -mmode -lpower`

     The following example sets the power capacity to mode 3 with a 1500W maximum power limit:

     `-s -m3 -l1500`

Power capping modes show the valid values for `mode`. `Power` is required when setting Power Control Configuration to User Configurable.

For more information, see the *ProLiant Power Interface Control (PPIC) Utility User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/PPIC_UG_en**).

Setting the chassis power cap mode with HPE HPE APM

1. Log in to HPE APM:
   a. When the system boots, a Login prompt appears.
   b. At the prompt, enter `Administrator`.
2. Before setting the power cap, enter the following command to review the power baseline:

   `>show power baseline`

   The information displayed provides the minimum cap value, the maximum cap value, and the chassis that meet the requirements for power capping.
3. To set the power cap for eligible chassis connected to the HPE APM, enter the following command at the prompt:

   `>SET POWER CAP<wattage>|NONE[zone_name]`

   The wattage value, if provided, represents the total wattage to be allocated among all the chassis that are part of the baseline or partial baseline of a zone, if specified. This value is divided by the total maximum wattage established by the baseline to calculate a percentage cap value. This percentage

is then multiplied against each chassis maximum wattage value to arrive at an appropriate cap value for that individual chassis.

If `NONE` is specified instead of a cap wattage value, then HPE APM removes all (or the specified zone) of the power caps.

To remove baseline data from the EEPROM and to remove the power cap setting, enter the following command:

```
>SET POWER BASELINE NONE
```

After this command is issued, the only way to re-establish a power baseline is to issue the `SET POWER BASELINE` command. The system returns to the default power cap mode (mode 1).

Keeping the system current

Updating firmware or System ROM

Multiple methods exist to update the firmware or System ROM:

- Service Pack for ProLiant (on page 107)
- FWUPDATE utility (on page 115)
- FWUpdate command from within the Embedded UEFI shell (on page 116)
- Firmware Update application in UEFI System Utilities ("Firmware Update application in the UEFI System Utilities" on page 116)
- Online Flash components (on page 116)

Product entitlement is required to perform updates. For more information, see "Accessing updates ("Accessing Hewlett Packard Enterprise Support" on page 126)."

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 Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**).
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:
   - Configure the boot order so the USB key is the first bootable device.
   - 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 Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**).

For more information about the One-Time Boot Menu, see the *HPE UEFI System Utilities User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/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 Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**). 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 *HPE UEFI Shell User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/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 *HPE UEFI Shell User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**).

Firmware Update application in the UEFI 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 Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**). 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 the HP SUM ("HP Smart Update Manager" on page 108), 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 106) 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 Hewlett Packard Enterprise website (**http://www.hpe.com/servers/spp/download**).

To locate the drivers for a particular server, go to the Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**). Under **Select your HPE product**, enter the product name or number 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 ("Service Pack for ProLiant" on page 107) from the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/spp/download**).
- Download individual drivers, firmware, or other systems software components from the server product page in the Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**).

Operating System Version Support

For information about specific versions of a supported operating system, refer to the operating system support matrix (**http://www.hpe.com/info/ossupport**).

Version control

The VCRM and VCA are web-enabled Insight Management Agents tools that 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 Hewlett Packard Enterprise.
- 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 *Systems Insight Manager User Guide,* the *Version Control Agent User Guide*, and the *Version Control Repository Manager User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 Insight Management.
3. Download the latest document.

Operating systems and virtualization software support for ProLiant servers

For information about specific versions of a supported operating system, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ossupport**).

Change control and proactive notification

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

For more information, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/pcn**).

Resources for troubleshooting

Online resources

Hewlett Packard Enterprise Support Center website

Troubleshooting tools and information, as well as the latest drivers and flash ROM images, are available on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

Hewlett Packard Enterprise Information Library

HPE ProLiant Server documentation is available in the Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**).

Troubleshooting resources for previous HPE ProLiant server models

The *HPE 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 blade models prior to Gen8. This guide includes problem-specific flowcharts to help you navigate complex troubleshooting processes. To view the guide, select a language:

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

Server blade enclosure troubleshooting resources

The *HPE BladeSystem c-Class Enclosure Troubleshooting Guide* provides procedures and solutions for troubleshooting an HPE BladeSystem c-Class enclosure, from using the Insight Display to more complex component-level troubleshooting. For more information, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/bladesystem/docs**).

Error message resources

The *HPE 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.hpe.com/support/Gen9_EMG_en**)
- French (**http://www.hpe.com/support/Gen9_EMG_fr**)

- Spanish (**http://www.hpe.com/support/Gen9_EMG_es**)
- German (**http://www.hpe.com/support/Gen9_EMG_de**)
- Japanese (**http://www.hpe.com/support/Gen9_EMG_ja**)
- Simplified Chinese (**http://www.hpe.com/support/Gen9_EMG_zh_cn**)

Server documentation

Each server has a number of product-specific documents that include setup, installation, maintenance, service, and cabling information.

The server documentation can be accessed from the following locations:

- Product specific information library — See the Start Here document that ships with the server.
- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/proliantgen9/docs**) — Select the product to narrow the list to fewer documents.
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Server user guide

The server user guide provides component and LED identification, server setup, cable routing, software, hardware options installation, and server specification information.

Server documentation can be accessed from the following locations:

- Product specific information library — See the Start Here document that ships with the server.
- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/proliantgen9/docs**) — Select the product to narrow the list to fewer documents.
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Server maintenance and service guide

The server maintenance and service guide provides a list of server spare parts, server spare parts removal and replacement, cable routing, component and LED identification, and server specification information.

Server documentation can be accessed from the following locations:

- Product-specific information library — See the Start Here document that ships with the server.
- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/proliantgen9/docs**) — Select the product to narrow the list to fewer documents.
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Setup and installation guide

The setup and installation guide provides information for planning the installation, component and LED identification, installation, cable routing, and configuration information for a system that normally includes a chassis or enclosure and one or more servers.

Product documentation can be accessed from the following locations:

- Product specific information library — See the Start Here document that ships with the server.
- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/proliantgen9/docs**) — Select the product to narrow the list to fewer documents.
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

HPE iLO software documentation

For more information about HPE iLO, see the HPE iLO user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo/docs**).

HPE UEFI System Utilities documentation

For more information about HPE UEFI System Utilities, see the UEFI System Utilities user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**). This user guide provides information on many topics and includes the following:

- Using the System Configuration menu options
- Using the iLO 4 Configuration utility
- Viewing Smart Array Controller information
- Viewing and configuring NIC and FCoE settings
- Using the One-Time Boot Menu
- Troubleshooting

Intelligent Provisioning software documentation

For more information about Intelligent Provisioning, see the Intelligent Provisioning user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/intelligentprovisioning/docs**). This user guide provides information on server configuration and OS installation, performing maintenance tasks, troubleshooting, and other advanced topics.

System Management Homepage software documentation

The SMH is a web-based interface that consolidates and simplifies the management of ProLiant servers running Windows or Linux. For more information about the SMH, see the SMH documentation on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/smh-manuals**).

To access the System Management homepage of a server, go to https://localhost:2381 (**https://localhost:2381**).

Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

White papers

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

- Hewlett Packard Enterprise Support Center (**http://www.hpe.com/support/hpesc**)
- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)

Service notifications, advisories, and notices

To search for service notifications, see the Hewlett Packard Enterprise Support Center (**http://www.hpe.com/support/hpesc**). Enter the product name or number, and then click **Go**. Select

Top Issues and Solutions, and then **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 Hewlett Packard Enterprise website (**http://www.hpe.com/info/myadvisory**).

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

HPE Technology Service Portfolio

Connect to Hewlett Packard Enterprise for assistance on the journey to the new style of IT. The Hewlett Packard Enterprise 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 Hewlett Packard Enterprise website (**http://www.hpe.com/services/consulting**).

Our support portfolio covers services for 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 Hewlett Packard Enterprise website (**http://www.hpe.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 Hewlett Packard Enterprise Servers website (**http://www.hpe.com/servers**).

Registering the server

To experience quicker service and more efficient support, register the product at the Hewlett Packard Enterprise Product Registration website (**http://www.hpe.com/info/register**).

Overview of server features and installation instructions

For server features, see the Product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

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

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Key features, option part numbers

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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:

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Spare part numbers

Hewlett Packard Enterprise continually improves and changes product parts. For complete and current supported parts information, see the Hewlett Packard Enterprise PartSurfer website (**http://www.hpe.com/info/partssurfer**).

Teardown procedures, part numbers, specifications

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

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Teardown or removal and replacement procedure videos

For more information about removal and replacement procedures for HPE ProLiant servers, see the Hewlett Packard Enterprise website (**http://www.hpe.com/support/sml**).

Technical topics

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

- Hewlett Packard Enterprise Support Center (**http://www.hpe.com/support/hpesc**)
- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)

Product installation resources

External cabling information

See the cabling information on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

Power capacity

For all HPE ProLiant Gen9 servers, see the HPE Power Advisor on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/poweradvisor**).

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:

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Product configuration resources

Device driver information

See the device driver information on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

DDR4 memory configuration

Locate the DDR4 Smart Memory Configurator on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/DDR4memoryconfig**).

Operating System Version Support

For information about specific versions of a supported operating system, refer to the operating system support matrix (**http://www.hpe.com/info/ossupport**).

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:

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Installation and configuration information for the server setup software

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

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Software installation and configuration of the server

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

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

HPE iLO information

For all HPE iLO documentation, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo/docs**).

Management of the server

See the *HPE Systems Insight Manager Help Guide* in the Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/hpsim/docs**).

Installation and configuration information for the server management system

See the *HPE Systems Insight Manager Installation and User Guide* on the Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**).

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

See the server documentation, available in the following locations:

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**)

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website (**http://www.hpe.com/assistance**).
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website (**http://www.hpe.com/support/hpesc**).

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
  - Hewlett Packard Enterprise Support Center Get connected with updates page (**http://www.hpe.com/support/e-updates**)
  - Software Depot website (**http://www.hpe.com/support/softwaredepot**)
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center More Information on Access to Support Materials page (**http://www.hpe.com/support/AccessToSupportMaterials**).

IMPORTANT: Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

- Hewlett Packard Enterprise Information Library (**http://www.hpe.com/info/enterprise/docs**)
- Hewlett Packard Enterprise Support Center (**http://www.hpe.com/support/hpesc**)
- Contact Hewlett Packard Enterprise Worldwide (**http://www.hpe.com/assistance**)

- Subscription Service/Support Alerts (**http://www.hpe.com/support/e-updates**)
- Software Depot (**http://www.hpe.com/support/softwaredepot**)
- Customer Self Repair (**http://www.hpe.com/support/selfrepair**)
- Insight Remote Support (**http://www.hpe.com/info/insightremotesupport/docs**)

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the Insight Remote Support website (**http://www.hpe.com/info/insightremotesupport/docs**).

Customer self repair

What is customer self repair?

Hewlett Packard Enterprise's customer self-repair program offers you the fastest service under either warranty or contract. It enables Hewlett Packard Enterprise 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:

- A Hewlett Packard Enterprise 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 Hewlett Packard Enterprise website (**http://www.hpe.com/support/hpesc**).

Server information you need

Before contacting Hewlett Packard Enterprise 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 130)

  Download and have available an Active Health System log for 7 days before the failure was detected. For more information, see the *HPE iLO 4 User Guide* or Intelligent Provisioning user guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo/docs**).
- Onboard Administrator SHOW ALL report (for HPE BladeSystem products only)

  For more information on obtaining the Onboard Administrator SHOW ALL report, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/OAlog**).
- Third-party hardware information:
  - Product name, model, and version
  - Company name
- Specific hardware configuration:
  - Product name, model, and serial number

  - Number of processors and model number
  - Number of DIMMs and their size and speed
  - List of controllers and NICs
  - List of connected peripheral devices
  - List of any other optional Hewlett Packard Enterprise or Compaq hardware
  - Network configuration
- Specific software information:
  - Operating system information ("Operating system information you need" on page 128)
  - List of third-party, Hewlett Packard Enterprise, and Compaq software installed
  - PCAnywhere information, if installed
  - Verification of latest drivers installed
  - Verification of latest ROM/BIOS
  - Verification of latest firmware on array controllers and drives
- Results from attempts to clear NVRAM

Operating system information you need

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

- Microsoft operating systems (on page 128)
- Linux operating systems (on page 129)
- Oracle Solaris operating systems (on page 130)

Microsoft operating systems

Collect the following information:

- Whether the operating system was factory installed
- Operating system version number
- A current copy of the following files:
  - WinMSD (Msinfo32.exe on Microsoft Windows 2008 systems)
  - Output of BCDedit /v
  - Memory.dmp
  - Event logs
  - Dr. Watson log (drwtsn32.log) if a user mode application, such as the Insight Agents, is having an issue
  - IRQ and I/O address information in text format
  - Contents of c:\cpqsystem directory
  - HPE Insight Diagnostics Online Edition survey output
  - HPS report (on page 137)
- If Hewlett Packard Enterprise drivers are installed:
  - Version of the SPP used
  - List of drivers from the SPP
- The drive subsystem and file system information:

  - Number and size of partitions and logical drives
  - File system on each logical drive
- Current level of Microsoft Windows Service Packs and 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 issue and any associated error messages

Linux operating systems

Collect the following information:

- Operating system distribution and version

  Look for a file named /etc/*distribution*-release (for example, /etc/redhat-release)
- Kernel version in use
- Output from the following commands (performed by root):
  - lspci -v
  - uname -a
  - cat /proc/meminfo
  - cat /proc/cpuinfo
  - rpm -qa
  - dmesg
  - lsmod
  - ps -ef
  - ifconfig -a
  - chkconfig -list
  - mount
- Contents of the following files:
  - /var/log/messages
  - /etc/modules.conf or /etc/conf.modules
  - /etc/lilo.conf or /etc/grub.conf or /boot/grub/menu.lst or boot/grub/grub.conf
  - /etc/fstab
- Capture the sosreport or the supportconfig report. For more information, see the "sosreport and supportconfig (on page 137)."
- If Hewlett Packard Enterprise drivers are installed, collect:
  - Version of the SPP used
  - 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 issue 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 was selected for installation: End User Support, Entire Distribution, Developer System Support, or Core System Support
- If Hewlett Packard Enterprise drivers are installed with a DU:
  - DU number
  - List of drivers in the DU diskette
- The drive subsystem and file system information:
  - Number and size of partitions and logical drives
  - File system on each logical drive
- A list of all third-party hardware and software installed, with versions
- A detailed description of the issue and any associated error messages
- Printouts or electronic copies (to e-mail to a support technician) of:
  - /usr/sbin/crash (accesses the crash dump image at /var/crash/$hostname)
  - /var/adm/messages
  - /etc/vfstab
  - /usr/sbin/prtconf

Reports and logs

The reports and logs in this section may be required before you contact Hewlett Packard Enterprise.

Active Health System log overview

The Active Health System log is a single file that contains basic information required by Hewlett Packard Enterprise support to analyze an HPE ProLiant Gen8 or later server. For more information about the Active Health System, see "Active Health System (on page 104)."

You can download the Active Health System log manually and send it to Hewlett Packard Enterprise. The log can be downloaded using the following tools:

- HPE iLO ("Use HPE iLO to download the Active Health System Log for a date range" on page 132)
- Intelligent Provisioning ("Use Intelligent Provisioning" on page 133)
- Active Health System download CLI for Windows Operating Systems ("Use the Active Health System download CLI for Windows Operating Systems" on page 133)
- Active Health System download CLI for Linux Distributions ("Use the Active Health System download CLI for Linux Distributions" on page 134)
- `curl` command line tool ("Use the curl command line tool" on page 134)

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, HPE iLO web interface	Intelligent Provisioning

Operating system	Online server	Offline server
Linux	AHS download CLI, HPE iLO web interface	Intelligent Provisioning
VMware	HPE iLO web interface	Intelligent Provisioning
Other operating systems	HPE 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 HPE 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 HPE Active Health System Download for Windows packages, see the Hewlett Packard Enterprise FTP website (**ftp://ftp.hp.com/pub/softlib2/software1/pubsw-windows/p1783870791/v75797/AHSdownload_Windows_1.0.8.04.zip**). To obtain the HPE Active Health System Download for Linux packages, see the Hewlett Packard Enterprise FTP website (**ftp://ftp.hp.com/pub/softlib2/software1/pubsw-linux/p1088551165/v75795/AHSdownload_Linux_1.0.8.05.tar**).

HPE iLO web interface

You can access the HPE iLO web interface by using your existing HPE iLO account information, or by using the IP address available on the server screen during POST and the username and password located on the HPE iLO Default Network Settings tag with the server (this HPE iLO Default Network Settings tag also contains the HPE iLO IP DNS name).

Download the Active Health System log from the HPE iLO web interface using the Active Health System log menu. This Active Health System log download method using the HPE 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 "HPE iLO (on page 104)."

HPE Intelligent Provisioning

With HPE 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 106)."

Download the Active Health System log

Use one of the methods in this section to download the Active Health System log.

Use HPE iLO

The Active Health System log can be downloaded using the following methods:

- Downloading the entire Active Health System log ("Use HPE iLO to download the entire Active Health System log" on page 132)
- Downloading the Active Health System log for a date range ("Use HPE iLO to download the Active Health System Log for a date range" on page 132)

For more information, see the *HPE iLO 4 User Guide* and the HPE Insight Remote Support documentation.

Use HPE iLO to download the Active Health System Log for a date range

To download the Active Health System log using 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):
   - **Support case number**
   - **Contact name**
   - **Phone number**
   - **Email**
   - **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 Hewlett Packard Enterprise Support, you can e-mail the log file to HPsupport_Global@hpe.com.

   Use the following convention for the email subject:

   <CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your Hewlett Packard Enterprise Support case number.

Active Health System logs larger than 15 MB must be compressed before they are emailed to Hewlett Packard Enterprise Support or they will need to be uploaded to an FTP site.

Use HPE 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, Hewlett Packard Enterprise recommends using the procedure "Use HPE iLO to download the Active Health System Log for a date range (on page 132)" to download the log for the specific range of dates in which the issue occurred. Active Health System logs larger than 15 MB must be compressed before they are emailed to Hewlett Packard Enterprise Support or they will need to be uploaded to an FTP site.

To download the entire log:

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:
   - **Support case number**
   - **Contact name**
   - **Phone number**

- **Email address**
- **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 Hewlett Packard Enterprise Support, you can e-mail the log file to HPsupport_Global@hpe.com.

   Use the following convention for the e-mail subject:

   <CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your Hewlett Packard Enterprise 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 Hewlett Packard Enterprise Services for issue 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.

   Hewlett Packard Enterprise recommends 7 days to keep the file size minimal. Files larger than 15 MB cannot be sent to Hewlett Packard Enterprise.

6. Click **Download** to save the data to USB key.
7. Enter contact information (optional) in the form provided. The contact information will help Hewlett Packard Enterprise Support in providing better assistance.
8. Contact Hewlett Packard Enterprise Support, with the log file available for email submission.
9. After getting a Case ID from Hewlett Packard Enterprise Support, email the log file to *HPSupport_Global@hpe.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 Hewlett Packard Enterprise 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 Hewlett Packard Enterprise 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 Hewlett Packard Enterprise support.

If you have an open case with Hewlett Packard Enterprise Support, you can e-mail the log file to HPsupport_Global@hpe.com. Use the following convention for the e-mail subject:

<CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your Hewlett Packard Enterprise Support case number.

Use the Active Health System download CLI for Linux Distributions

1. Download Active Health System download utility from Hewlett Packard Enterprise website (**http://h20565.www2.hpe.com/hpsc/swd/public/detail?swItemId=MTX_ed5e4d37632543a8b9ef950b2b#tab-history**).
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 Hewlett Packard Enterprise support.

If you have an open case with Hewlett Packard Enterprise Support, you can e-mail the log file to HPsupport_Global@hpe.com. Use the following convention for the e-mail subject:

<CASE:XXXXXXXXXX>, where XXXXXXXXXX represents your Hewlett Packard Enterprise 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:

   - `<iLO IP address>` is the iLO IP address.
   - `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.
   - `-k` specifies that HTTPS warnings will be ignored.
   - `-v` specifies verbose output.
   - `-u <username>:<password>` specifies your iLO user account credentials.

- `-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.

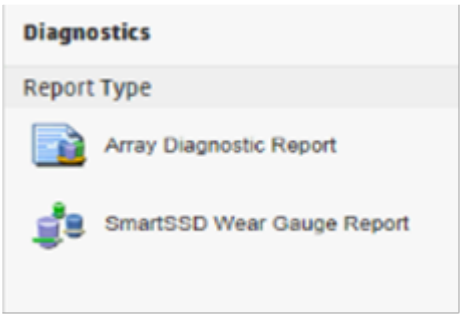
4. Close the command window.

HPE SSA diagnostic tasks

1. Open HPE SSA.

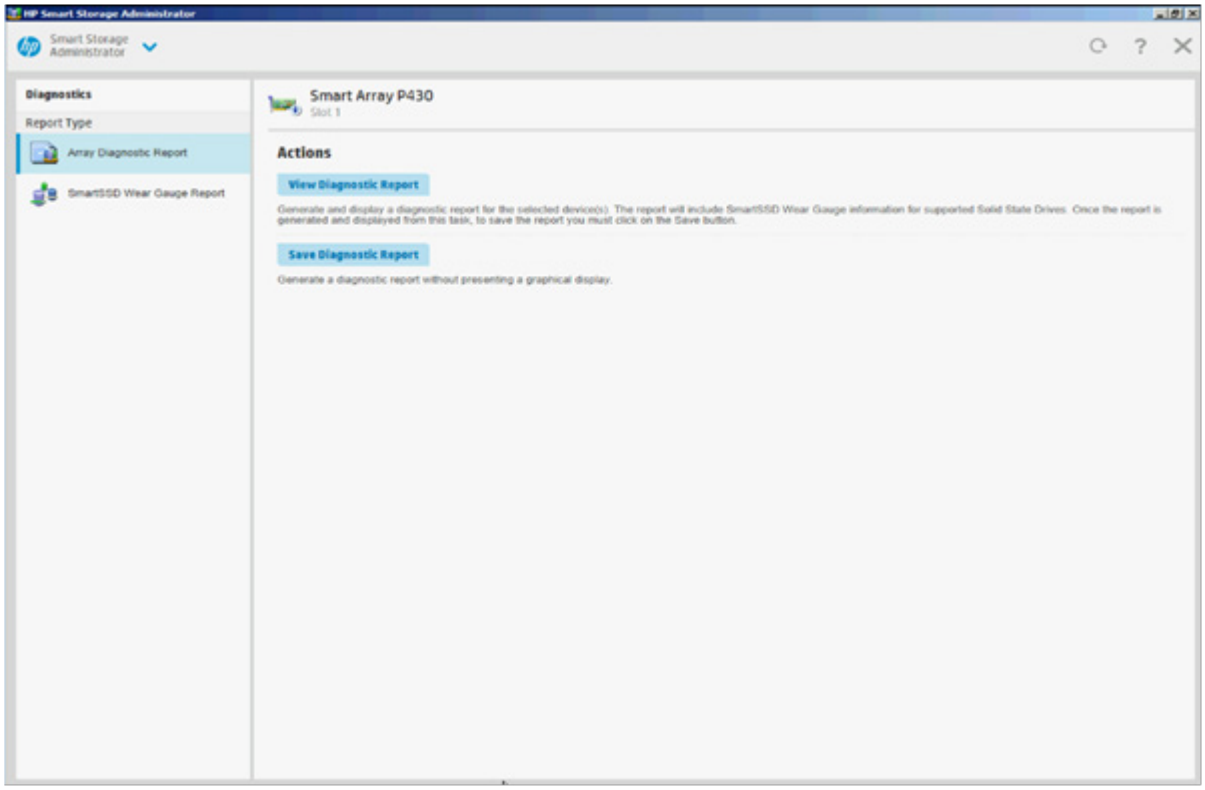
   For more information about HPE SSA, see the *HPE Smart Storage Administrator User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/smartstorage/docs**).

2. Open the **Diagnostics** panel by doing one of the following:
   - Choose a device and click **Diagnose** in the quick navigation menu
   - Select an available device from the **Home** screen, and then click **Diagnose** under the available options.
3. Choose a report type.



   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:
   - If you select **View Diagnostic Report**, the report appears. When you are finished viewing the current report, click **Close** or **Save**.
   - 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 *HPE Smart Storage Administrator User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/smartstorage/docs**).

HPE 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:
   - Generate a diagnostic report with the following command:

     ```
     hpssaducli -f adu-report.zip
     ```
   - 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:
   - Generate a diagnostic report with the following command:
     `hpssaducli -f adu-report.zip`
   - 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 *HPE Smart Storage Administrator User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/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 Hewlett Packard Enterprise website (**http://www.hpe.com/support/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 Hewlett Packard Enterprise technical support ("Accessing Hewlett Packard Enterprise Support" on page 126) and be prepared to send the cab file.

sosreport and supportconfig

To assist in possible LINUX installation issues on HPE ProLiant servers, capture either the sosreport or supportconfig before contacting Hewlett Packard Enterprise technical support ("Accessing Hewlett Packard Enterprise Support" on page 126). For more information, see "Linux tools (sosreport and supportconfig)."

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 SUM

HP Smart Update Manager

HPE SSA

HPE Smart Storage Administrator

HPE SSADUCLI

HPE Smart Storage Administrator Diagnostic Utility Command Line Interface

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

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

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