Hewlett Packard
Enterprise

HPE iLO 7 User Guide

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HPE iLO 7 User Guide

Abstract

This guide provides information about configuring, updating, and operating supported HPE ProLiant servers using the HPE iLO 7 firmware. This document is intended for system administrators, Hewlett Packard Enterprise representatives, and Hewlett Packard Enterprise Authorized Channel Partners who are involved in configuring and using Hewlett Packard Enterprise servers that include iLO 7.

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Notices

Acknowledgments

Revision history

Part Number	Publication date	Edition	Summary of changes
30-842B82CC-008a	January 2026	2	Minor edits

Part Number	Publication date	Edition	Summary of changes
30-842B82CC-008	December 2025	1	HPE iLO 7 1.19.00 release updates. Added Automatic certificate enrollment section Updated the following sections: • Account Service access settings options • Configuring the minimum fan speed • Enabling the iLO Dedicated Network Port through the iLO web interface • Host Overview details • HPE SSO • iLO encryption settings • HPE Liquid Cooling Module details • Running a firmware verification scan
30-842B82CC-007	November 2025	1	HPE iLO 7 1.18.01 release updates. Added Viewing BIOS details section Updated the following sections: • Access settings options • Application account • Adding key manager configuration details • Brownout recovery • Configuring iLO access settings • iLO Virtual Serial Port • Configuring the thermal configuration setting • Connecting URL-based media • Fan summary details • Temperature information • Firmware verification • iLO licensing • Using remote key managers with iLO • Network details options • Using the performance management features • Viewing power information • iLO user account options • Added Configuring Windows for use with the iLO Virtual Serial Port section.
30-842B82CC-006a	September 2025	2	Updated the following sections: • Configuring the Virtual NIC feature • Features removed in HPE iLO 7

Part Number	Publication date	Edition	Summary of changes
30-842B82CC-006	August 2025	1	HPE iLO 7 1.17.00 release updates. Updated the following sections: • Administering TLS certificates (Replaced SSL with TLS). • Volumes • Storage controllers • Thermal configuration options • Supported firmware types • Slot details pane • Session list details • SSH cipher, key exchange, and MAC support • TLS cipher and MAC support • Power supplies list • iLO security states • Firmware verification • Certificate signing requests • Binding Datacenter Secure Control Module with Host Processor Module • Authorizing a new SSH key by using the web interface • Prerequisites for 802.1X authentication • System board replacement

30-842B82CC-005	June 2025	1	HPE iLO 7 1.16.00 release updates:
			• Added LLDP section.
			• Minor edits to the following sections:
			  ○ Impacts to the system after One-button secure erase completes
			  ○ One-button secure erase FAQ
			  ○ Access settings options
			  ○ System IAK certificate
			  ○ Websites

30-842B82CC-004a	June 2025	1	HPE iLO 7 1.15.00 release is reserved for FIPS 140-3 and Common Criteria validation. The firmware will be available on HPESC after the validation is complete. For more information on Implementation Under Test List, see **https://csrc.nist.gov/Projects/cryptographic-module-validation-program/modules-in-process/iut-list**. For more details on Common Criteria, see **https://www.commoncriteriaportal.org/index.cfm**.

Part Number	Publication date	Edition	Summary of changes
30-842B82CC-004	May 2025	1	HPE iLO 7 1.14.00 release updates: • Added Temperature graph information • Updated configuring time settings section • Updated deprecated features in iLO 7 section • Added view log information in the Access settings options section • Added note for LDAP server settings in the Managing iLO sessions section • Added note for iLO TLS Certificate in the Obtaining a trusted certificate from a CA section
30-842B82CC-003	May 2025	1	HPE iLO 7 1.13.00 release updates.
30-842B82CC-002	March 2025	1	HPE iLO 7 1.12.00 release updates.
30-842B82CC-001	March 2025	1	HPE iLO 7 1.11.00 is the initial release of HPE iLO 7 for Gen 12 Platforms.

Table of contents

HPE iLO

HPE iLO is a remote server management processor embedded on the system boards of supported HPE servers and compute modules. iLO enables the monitoring and controlling of servers from remote locations. iLO management is a powerful tool that provides multiple ways to configure, update, monitor, and repair servers remotely.

Subtopics

HPE iLO 7

HPE ProLiant Compute Gen12 with HPE iLO 7 provides additional layer of protection with embedded security processor. The embedded security processor is built on top of the HPE iLO Silicon Root of Trust, a robust security foundation embedded within the server hardware, ensuring that every layer of firmware and software loads securely and is verified from the moment the server is powered on. This provides an unbreakable chain of trust, protecting servers against firmware attacks, unauthorized access, and tampering, thereby ensuring the highest level of data integrity and system reliability.

New features in HPE iLO 7

- **Enhanced customer experience** with work-flow oriented design in the iLO 7 web interface:
  - Flexible navigation, faster UI, and improved usability through new Search functionality.
  - Quick access to iLO control icons from the Quick Glance menu.
  - Left navigation pane streamlined with key functions.
  - New card layout from the dashboard to each functionality with additional details at a glance.
- **Enhanced security processor**—iLO 7 supports enhanced security processor, an independent security system embedded in iLO ASIC.
- iLO firmware uses CNSA 2.0 signing algorithms - Leighton-Micali Signature (LMS). LMS signature schemes comply with NIST SP800-208 standards to verify the authenticity during firmware update and secure start.
- **Liquid Cooling Leakage Detection**—If the liquid cooling modules have leakage, the server will power off and iLO logs an IML for leakage detection.
- **Secure In-band access** through iLO Virtual NIC—The virtual NIC feature enables a secure connection to the iLO directly from the host operating system. The iLO connects to the host system through a USB interface where the iLO is physically connected to host system's USB-Enhanced Host Controller Interface (EHCI). The host OS uses the Network Control Model (NCM) driver to emulate a virtual Ethernet interface. Figure
- **iLO Service Port**—Uses a Type C USB adapter to connect a client to the iLO Service Port to access the server directly. When you have physical access to a server, you can use the Service Port to connect a host system (Windows/MAC/Linux laptops or desktops) using either a standard USB Type A to Type C cable or USB Type C to Type C cable to access iLO web interface, remote console, iLO RESTful API, or CLI. You can also connect a USB key to download the Active Health System Log.

iLO features

iLO includes the following standard and licensed features. To view the license requirements for these features, see the iLO licensing guide.

- **Active Health System Log**—The data collected by the Active Health System is stored in the Active Health System Log. The data is logged securely, isolated from the operating system, and separate from customer data. Host resources are not consumed in the collection and logging of Active Health System data.
- **Agentless Management**—With Agentless Management, the management software (SNMP) operates within the iLO firmware instead of the host OS. This configuration frees memory and processor resources on the host OS for use by server applications. iLO monitors all key internal subsystems, and can send SNMP alerts directly to a central management server, even with no host OS installed.
- **Deployment and provisioning**—Use virtual power and virtual media for tasks such as the automation of deployment and provisioning.
- **Firmware management**—Manage firmware updates by using the iLO firmware features, including the iLO Repository, install sets, and the installation queue.
- **Firmware verification and recovery**—Run scheduled firmware verification scans and configure recovery actions to implement when an issue is detected.
- **iLO backup and restore**—Back up the iLO configuration and then restore it on a system with the same hardware configuration.
- **iLO interface controls**—For enhanced security, enable, or disable selected iLO interfaces and features.
- **iLO RESTful API and RESTful Interface Tool (iLOREST)**—iLO 7 includes the iLO RESTful API, which is Redfish API conformant.
- **Integrated Management Log**—View server events and configure notifications through SNMP alerts, remote syslogs, and email alerts.
- **Integrated remote console**—If you have a network connection to the server, you can access a secure high performance console to manage the server from any location.
- **IPMI**—The iLO firmware provides server management based on the IPMI version 2.0 specification.
- **Learn more links**—Troubleshooting information for supported events is available on the Integrated Management Log page.
- **One-button secure erase**—Securely decommission a server or prepare it for another use.
- **Power consumption and power settings**—Monitor the server power consumption, configure server power settings, and configure power capping on supported servers.
- **Power management**—Securely and remotely control the power state of the managed server.
- **Secure recovery**—Validates the iLO firmware when power is applied. If the firmware is invalid, the iLO firmware is flashed automatically (iLO Standard license).

  Validates the system ROM during server startup. If valid system ROM is not detected, the server is prevented from booting. Recovery option includes initiating a firmware verification scan and recovery action. The iLO Advanced license is required for scheduled firmware verification scans and automated recovery.
- **Security log**—View a record of the security events recorded by the iLO firmware.
- **Security dashboard**—View the status of important security features and evaluate your configuration for potential risks. When a risk is detected, you can view details and advice for how to improve system security.
- **Security states**—Configure a security state that fits your environment. iLO supports the Secure Standard mode (default) and higher security states such as FIPS and CNSA.
- **Server health monitoring**—iLO monitors temperatures in the server and sends corrective signals to the fans to maintain proper server cooling. It also monitors installed firmware and software versions and the status of other monitored subsystems and devices.
- **System diagnostics**—Diagnose a system by booting to safe mode or Intelligent Diagnostics mode. You can restore the default manufacturing settings or the default system settings.
- **Two-factor authentication**—Two-factor authentication is supported with Kerberos and CAC smart card authentication. You can also set up Two Factor Authentication for Microsoft Active Directory login users.
- **User access**—Use local or directory-based user accounts to log in to iLO. You can use CAC smart card authentication with local or directory-based accounts.
- **Virtual media**—Remotely mount high performance Virtual Media devices to the server.

- Workload advisor—View selected server workload characteristics. You can view and configure recommended performance tuning settings based on the monitored data.
- **Workload matching**—Enables the use of preconfigured workload profiles to fine-tune server resources.

Features removed in HPE iLO 7

- Always On Intelligent provisioning from iLO 7 GUI
- HPE iLO Federation
- HPE SIM
- HPE Insight Remote Support
- HPE iLO Production Security State
- Serial interface configuration of BitRate: 115200 using /redfish/v1/Managers/1/SerialInterfaces/1
- Changing the std port# 22 of SSH through HPE iLO
- WINS configuration
- CHIF communication from Host OS to BMC
- .NET integrated remote console (.NET IRC)
- SMASH-CLP
- iLO Scripting and Command Line Toolkit (RIBCL)
- Standalone remote console (HPLOCONS)
- HPE Online Configuration Utility (HPONCFG)
- HPE Lights-Out Configuration Utility (HPQLOCFG)
- HPE Directory Migration Utility (HPLOMIG)

Accessing iLO

You can access iLO through iLO web interface, ROM-based configuration utility, iLO RESTful API, or RESTful Interface Tool.

Subtopics

HPE iLO web interface

You can use the HPE iLO web interface to access iLO through a supported browser to monitor and configure managed servers. The interface is organized with a navigation tree. To use the web interface, click an item in the navigation tree, and then click the name of the tab you want to view.

For more details, watch the **demo video**.

ROM-based configuration utility

You can use the iLO 7 Configuration Utility in the UEFI System Utilities to configure network parameters, global settings, and user accounts.

The iLO 7 Configuration Utility is designed for the initial iLO setup, and is not intended for continued iLO administration. You can start the utility when the server is booted, and you can run it remotely with the Remote Console.

You can configure iLO to require users to log in when they access the iLO 7 Configuration Utility, or you can disable the utility for all users. These settings can be configured on the Access page. Disabling the iLO 7 Configuration Utility prevents reconfiguration from the host unless the system maintenance switch is set to disable iLO security.

To access the iLO 7 Configuration Utility, press F9 during POST to start the UEFI System Utilities. Click System Configuration, and then click iLO 7 Configuration Utility.

iLO RESTful API

iLO includes the iLO RESTful API, which is Redfish API conformant. The iLO RESTful API is a management interface that server management tools can use to perform configuration, inventory, and monitoring tasks by sending basic HTTPS operations (GET, PUT, POST, DELETE, and PATCH) to the iLO web server.

To learn more about the iLO RESTful API, see the Hewlett Packard Enterprise website (**https://servermanagementportal.ext.hpe.com/docs/redfishclients/ilorest-userguide**).

For specific information about automating tasks using the iLO RESTful API, see libraries and sample code at **https://www.hpe.com/info/redfish**.

RESTful Interface Tool

The RESTful Interface Tool (iLOREST) is a scripting tool that allows you to automate HPE server management tasks. It provides a set of simplified commands that take advantage of the iLO RESTful API. You can install the tool on your computer for remote use or install it locally on a server with a Windows or Linux Operating System. The RESTful Interface Tool offers an interactive mode, a scriptable mode, and a file-based mode.

For more information, see the following website: **https://servermanagementportal.ext.hpe.com/docs/redfishclients/ilorest-userguide**.

Setting up iLO

Subtopics

Preparing to set up iLO

About this task

Before setting up an iLO management processor, you must decide how to handle networking and security. The following questions can help you set up iLO:

Procedure

1. How will iLO connect to the network?
2. Will NIC Teaming be used with the Shared Network Port configuration?
3. How will iLO acquire an IP address?
4. What access security is required, and what user accounts and privileges are needed?
5. What tools will you use to configure iLO?

Subtopics

iLO network connection options
NIC teaming with Shared Network Port configurations
iLO IP address acquisition
iLO access security
iLO configuration tools
Other iLO configuration tools

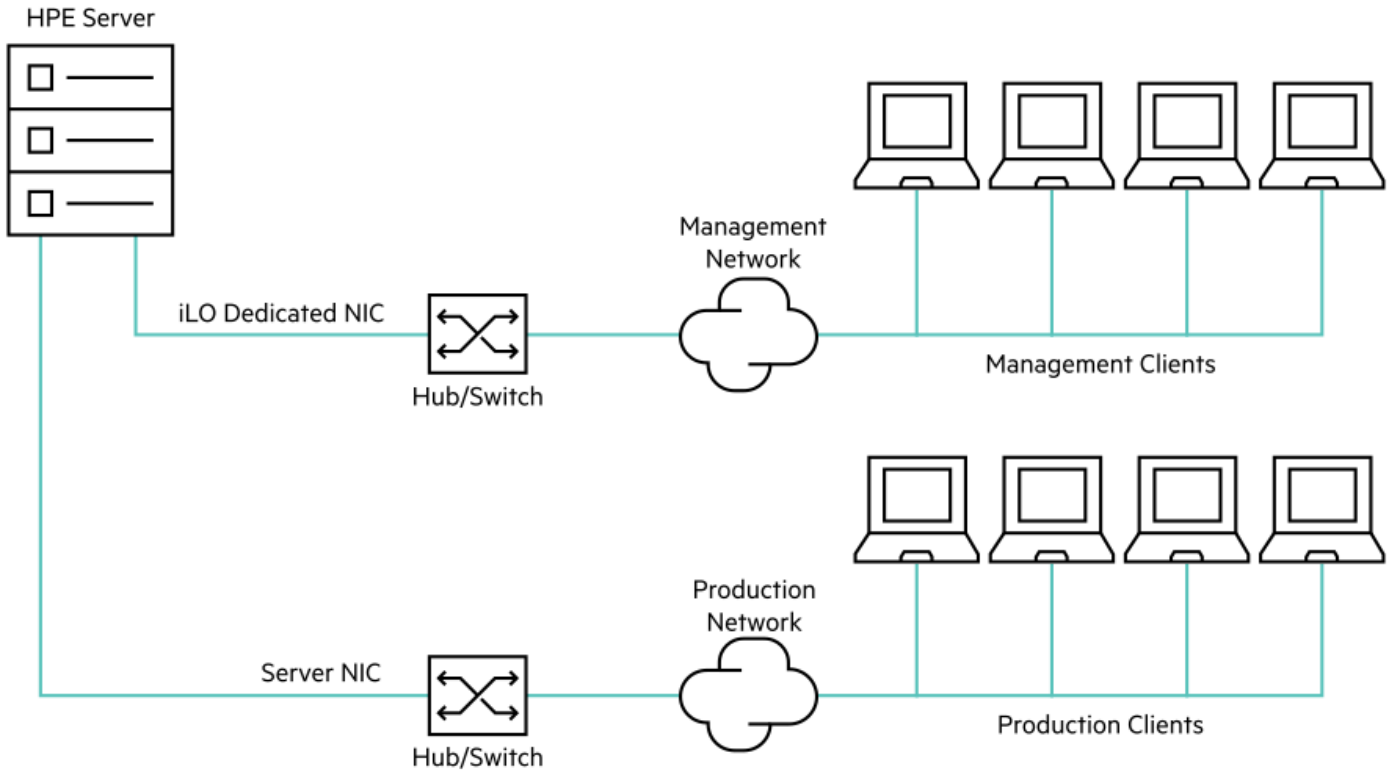
iLO network connection options

You can connect iLO to the network through a dedicated management network or a shared connection on the production network.

Dedicated management network

In this configuration, the iLO port is on a separate network. A separate network improves performance and security because you can physically control which workstations are connected to the network. A separate network also provides redundant access to the server when a hardware failure occurs on the production network. In this configuration, iLO cannot be accessed directly from the production network. The Dedicated management network is the preferred iLO network configuration.

Figure 1. Dedicated management network



Production network

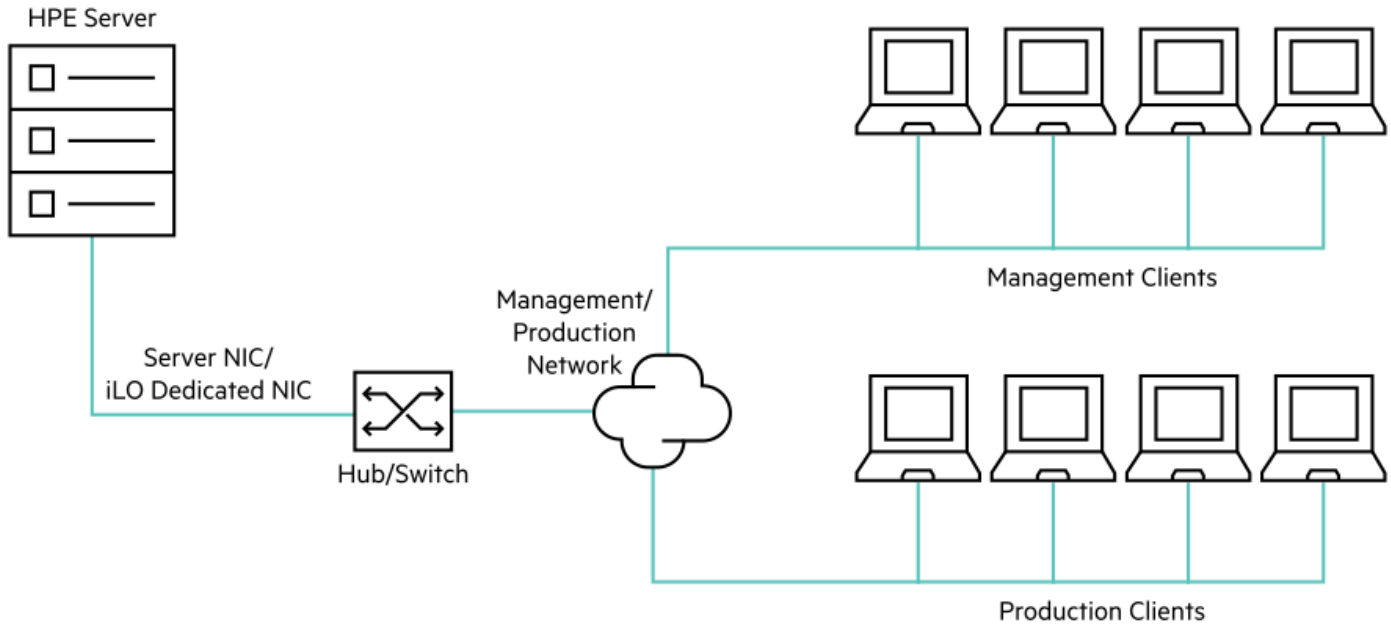
In this configuration, both the NIC and the iLO port are connected to the production network. In iLO, this type of connection is called the Shared Network Port configuration. Certain Hewlett Packard Enterprise embedded NICs and add-on cards provide this capability. This connection enables access to iLO from anywhere on the network. Using a Shared Network Port configuration reduces the amount of networking hardware and infrastructure required to support iLO.

There are some drawbacks to using this configuration.

- With a shared network connection, traffic can hinder iLO performance.
- During server startup, and when the operating system NIC drivers are loading and unloading, there are brief periods of time (2–8 seconds) when you cannot access iLO from the network. After these short periods, iLO communication is restored and iLO will respond to network traffic.

  When this situation occurs, the Remote Console and connected iLO Virtual Media devices might be disconnected.
- Network controller firmware updates or resets can also cause iLO to be unreachable over the network for a brief period of time.
- The iLO Shared Network Port connection cannot operate at a speed greater than 100 Mbps. Network-intensive tasks such as data transfer through iLO virtual media might be slower than the same tasks performed in a configuration that uses the iLO Dedicated Network Port.

Figure 2. Shared network connection



iLO network enablement module

Some servers require an optional iLO network enablement module to add support for remote management through a dedicated management network (default) or a shared network connection. If an iLO network enablement module is not installed, iLO access is supported only through host-based (in-band) access methods. Some examples of the supported host-based access methods include the iLO RESTful API, UEFI System Utilities, iLO Service Port (if available), and the Virtual NIC.

To review the network connections your server supports, see the server user guide.

NIC teaming with Shared Network Port configurations

NIC teaming is a feature you can use to improve server NIC performance and reliability.

Subtopics

NIC teaming constraints

When you select a teaming mode to use when iLO is configured to use the Shared Network Port:

- iLO network communications will be blocked in the following conditions:
  - The selected NIC teaming mode causes the switch that iLO is connected with to ignore traffic from the server NIC/port that iLO is configured to share.
  - The selected NIC teaming mode sends all traffic destined for iLO to a NIC/port other than the one that iLO is configured to share.
- Because iLO and the server transmit and receive on the same switch port, the selected NIC teaming mode must allow the switch to tolerate traffic with two different MAC addresses on the same switch port. Some implementations of LACP (802.3ad) will not tolerate multiple MAC addresses on the same link.

Hewlett Packard Enterprise NIC teaming modes

If your server is configured to use Hewlett Packard Enterprise NIC teaming, observe the following guidelines.

Network Fault Tolerance

The server transmits and receives on only one NIC (the primary adapter). The other NICs (secondary adapters) that are part of the team do not transmit server traffic and they ignore received traffic. This mode allows the iLO Shared Network Port to function correctly.

Select the NIC/port iLO uses as the Preferred Primary Adapter.

Transmit Load Balancing

The server transmits on multiple adapters but receives only on the primary adapter. This mode allows the iLO Shared Network Port to function correctly.

Select the NIC/port iLO uses as the Preferred Primary Adapter.

Switch Assisted Load Balancing

This mode type refers to the following:

- HPE ProCurve Port Trunking
- Cisco Fast EtherChannel/Gigabit EtherChannel (Static Mode Only, no PAgP)
- IEEE 802.3ad Link Aggregation (Static Mode only, no LACP)
- Bay Network Multi-Link Trunking
- Extreme Network Load Sharing

In this mode, there is no concept of primary and secondary adapters. All adapters are considered equal for the purposes of sending and receiving data. This mode is the most problematic for iLO Shared Network Port configurations because traffic destined for iLO can be received on only one of the server NIC/ports. To determine the constraints that your switch vendor places on their implementation of switch assisted load balancing, see the switch vendor documentation.

For information about selecting a NIC teaming mode when your server uses another implementation of NIC teaming, see NIC teaming constraints and the vendor documentation.

iLO IP address acquisition

To enable iLO access after it is connected to the network, the iLO management processor must acquire an IP address and subnet mask. You can use a dynamic address or a static address.

Dynamic IP address

A dynamic IP address is set by default. iLO obtains the IP address and subnet mask from DNS or DHCP servers. This method is the simplest.

If you use DHCP:

- The iLO management port must be connected to a network that is connected to a DHCP server, and iLO must be on the network before power is applied. DHCP sends a request soon after power is applied. If the DHCP request is not answered when iLO first boots, it will reissue the request.
- The DHCP server must be configured to provide DNS name resolution.

Static IP address

If DNS or DHCP servers are not available on the network, a static IP address is used. A static IP address can be configured by using the iLO 7 Configuration Utility.

If you plan to use a static IP address, you must have the IP address before starting the iLO setup process.

iLO access security

You can use the following methods to manage access to iLO:

Local accounts

Up to 12 user accounts can be stored in iLO. This configuration is ideal for small environments such as labs and small-sized or medium-sized businesses.

Login security with local accounts is managed through the iLO Access Settings and user privileges.

Directory services

To support more than 12 users, configure iLO to use a directory service to authenticate and authorize access. This configuration enables an unlimited number of users and easily scales to the number of iLO devices in an enterprise.

If you plan to use directory services, consider enabling at least one local administrator account for alternative access.

A directory provides a central point of administration for iLO devices and users, and the directory can enforce a strong password policy.

iLO configuration tools

iLO supports various interfaces for configuration and operation. The primary interfaces discussed in this guide include the following:

iLO web interface

Use the iLO web interface when you can connect to iLO on the network by using a web browser. You can also use this method to reconfigure an iLO management processor.

ROM-based setup

Use the iLO 7 Configuration Utility when the system environment does not use DHCP or DNS.

Other iLO configuration tools

iLO configuration options discussed in other guides include the following:

iLO RESTful API

A management interface that server management tools can use to perform configuration, inventory, and monitoring of a supported server through iLO. For more information, see the following website: **https://www.hpe.com/info/redfish**.

HPE OneView

A management tool that interacts with the iLO management processor to configure, monitor, and manage ProLiant servers or Synergy compute modules. For more information, see the **HPE OneView** user guide.

Initial setup steps

About this task

The iLO default settings enable you to use most features without additional configuration. However, the configuration flexibility of iLO enables customization for multiple enterprise environments. This chapter discusses the initial iLO setup steps.

Procedure

1. Review the General security guidelines for setting up and using iLO.
2. Connect iLO to the network.
3. If you are not using dynamic IP addressing, use the ROM-based setup utilities to configure a static IP address.
4. If you will use the local accounts feature, use the ROM-based setup utilities to Adding user accounts (iLO 7 Configuration Utility).
5. (Optional) Install an iLO license.

   iLO (Standard) is preconfigured on Hewlett Packard Enterprise servers without an additional cost or license. Features that enhance productivity are licensed. For more information, see the iLO licensing guide at the following website: **https://www.hpe.com/support/ilo-docs**.

Connecting iLO to the network

About this task

Connect iLO to the network through a production network or a dedicated management network.

iLO uses standard Ethernet cabling, which includes CAT 5 UTP with RJ-45 connectors. Straight-through cabling is necessary for a hardware link to a standard Ethernet hub or switch.

For more information about setting up your hardware, see the server user guide.

iLO setup with the iLO 7 Configuration Utility

Hewlett Packard Enterprise recommends using the iLO 7 Configuration Utility to set up iLO for the first time and to configure iLO network parameters for environments that do not use DHCP or DNS.

Subtopics

Configuring a static IP address (iLO 7 Configuration Utility)
Managing local user accounts with the iLO 7 Configuration Utility

Configuring a static IP address (iLO 7 Configuration Utility)

About this task

This step is required only if you want to use a static IP address. When you use dynamic IP addressing, the DHCP server automatically assigns an IP address for iLO.

To simplify installation, Hewlett Packard Enterprise recommends using DNS or DHCP with iLO.

Procedure

1. (Optional) If you access the server remotely, start an iLO remote console session.
2. Restart or power on the server.
3. Press F9 in the server POST screen.

   The UEFI System Utilities start.
4. Click System Configuration.
5. Click iLO 7 Configuration Utility.

6. Disable DHCP:
   a. Click Network Options.
   b. Select OFF in the DHCP Enable menu.

      The IP Address, Subnet Mask, and Gateway IP Address boxes become editable. When DHCP Enable is set to ON, you cannot edit these values.
7. Enter values in the IP Address, Subnet Mask, and Gateway IP Address boxes.
8. To save the changes and exit, press F12.

   The iLO 7 Configuration Utility prompts you to confirm that you want to save the pending configuration changes.
9. To save and exit, click Yes - Save Changes.

   The iLO 7 Configuration Utility notifies you that iLO must be reset in order for the changes to take effect.
10. Click OK.

    iLO resets, and the iLO session is automatically ended. You can reconnect in approximately 30 seconds.
11. Resume the normal boot process:
    a. Start the iLO remote console.

       The iLO 7 Configuration Utility is still open from the previous session.
    b. Press ESC several times to navigate to the System Configuration page.
    c. To exit the System Utilities and resume the normal boot process, click Exit and resume system boot.

Managing local user accounts with the iLO 7 Configuration Utility

Subtopics

Adding user accounts (iLO 7 Configuration Utility)

Procedure

1. (Optional) If you access the server remotely, start an iLO remote console session.
2. Restart or power on the server.
3. Press F9 in the server POST screen.

   The UEFI System Utilities start.
4. Click System Configuration, click iLO 7 Configuration Utility, click User Management, and then click Add User.
5. Select the privileges for the new user.

   To assign a privilege, select YES in the menu next to the privilege name. To remove a privilege, select NO.

   The Login privilege is assigned to every user by default, so it is not listed in the iLO 7 Configuration Utility.

   You cannot assign the Recovery Set privilege through the iLO 7 Configuration Utility, so it is not available in the list.

6. Enter the user name and login name in the New User Name and Login Name boxes.
7. Enter the password.
   a. Move the cursor to the Password box, and then press Enter.

      The Enter your new password box opens.

   b. Type the password, and then press Enter.

      The Confirm your new password box opens.

   c. Type the password again to confirm, and then press Enter.

   The iLO 7 Configuration Utility confirms the new account creation.
8. To close the confirmation dialog box, click OK.
9. Create as many user accounts as needed, and then press F12 to save the changes and exit the system utilities.
10. When prompted to confirm the changes, click Yes - Save Changes to exit the utility and resume the boot process.

Editing user accounts (iLO 7 Configuration Utility)

About this task

NOTE

When the system is in Power On Self-Test (POST) state, Hewlett Packard Enterprise recommends NOT to perform a configuration change on iLO that would result in a reset of iLO. Making such a configuration change during POST may lead iLO to reset the factory defaults settings.

Procedure

1. (Optional) If you access the server remotely, start an iLO remote console session.
2. Restart or power on the server.
3. Press F9 in the server POST screen.

   The UEFI System Utilities start.
4. Click System Configuration, click iLO 7 Configuration Utility, click User Management, and then click Edit/Remove User.
5. In the Action menu for the user you want to edit or remove, select Edit.

   The account properties are displayed.
6. Update the Login Name.
7. Update the Password.
   a. Move the cursor to the Password box, and then press Enter.

      The Enter your new password box opens.

   b. Type the password, and then press Enter.

      The Confirm your new password box opens.

   c. Type the password again to confirm, and then press Enter.
8. Modify the user account privileges.

   To assign a privilege, select YES in the menu next to the privilege name. To remove a privilege, select NO.

The Login privilege is assigned to every user by default, so it is not available in the iLO 7 Configuration Utility.

You cannot assign the Recovery Set privilege through the iLO 7 Configuration Utility, so it is not available in the list.

9. Update as many user accounts as needed, and then press F12 to save the changes and exit the system utilities.
10. When prompted to confirm the changes, click Yes - Save Changes to exit the utility and resume the boot process.

Removing user accounts (iLO 7 Configuration Utility)

Procedure

1. (Optional) If you access the server remotely, start an iLO remote console session.
2. Restart or power on the server.
3. Press F9 in the server POST screen.

   The System Utilities start.
4. Click System Configuration, click iLO 7 Configuration Utility, click User Management, and then click Edit/Remove User.
5. In the Action menu for the user you want to remove, select Delete.

   The user name is marked to be deleted when you save the changes on this page.
6. If needed, mark other user accounts to delete, and then press F12 to save the changes and exit the system utilities.
7. When prompted to confirm the changes, click Yes - Save Changes to exit the utility and resume the boot process.

iLO setup with the web interface

If you can connect to iLO on the network by using a web browser, you can use the iLO web interface to configure iLO. You can also use this method to reconfigure an iLO management processor.

Access iLO from a remote network client by using a supported browser and providing the default DNS name, user name, and password.

Logging in to iLO for the first time

Procedure

1. Enter
   https://<iLO hostname or IP address>
   .

   HTTPS (HTTP exchanged over an TLS encrypted session) is required for accessing the iLO web interface.
2. Enter the default user credentials, and then click Log In.

TIP

After you log in to iLO for the first time, Hewlett Packard Enterprise recommends changing the password for the default user account.

iLO default DNS name and user account

The iLO firmware is configured with a default user name, password, and DNS name. The default information is on the serial label pull tab attached to the server that contains the iLO management processor. Use these values to access iLO remotely from a network client by using a web browser.

- **User name**—Administrator
- **DNS name**—ILOXXXXXXXXXXXX, where the **X** characters represent the server serial number.

> **IMPORTANT**
>
> Hewlett Packard Enterprise recommends changing the default password after you log in to iLO for the first time.
>
> If you reset iLO to the factory default settings, use the default iLO user credentials (on the serial label pull tab) to log in after the reset.

Using the iLO web interface

Subtopics

Supported browsers

HPE iLO 7 supports the latest versions of the following browsers:

Preferred browsers

- Google Chrome mobile and desktop versions
- Mozilla Firefox
- Microsoft Edge

Chrome, Firefox, and Edge provide the best performance with HPE iLO 7.

Browser requirements

- JavaScript—iLO uses client-side JavaScript extensively.

- Cookies—Cookies must be enabled for certain features to function correctly.
- Pop-up windows—Pop-up windows must be enabled for certain features to function correctly. Verify that pop-up blockers are disabled.
- **TLS**—To access iLO through a web browser, you must enable TLS 1.2 or TLS 1.3 in the browser.

Logging in to the iLO web interface

Procedure

1. Enter
   https://<iLO host name or IP address>
   .

   When you access the iLO web interface, you must use HTTPS (HTTP exchanged over an TLS encrypted session).

   The iLO login page opens.

   - If a login security banner is configured, the banner text is displayed in the NOTICE section. Click I acknowledge and agree to the terms to proceed with Log In.
   - If the Health LED status is Degraded or Critical, the Health LED icon is displayed next to the iLO host name.
   - If the iLO health status is Degraded, and the Anonymous Data access option is enabled, iLO displays the health status and a description of the issue on the login page. Self-test failures that could compromise security are not displayed in the description.
2. Enter a directory or local account login name and password, and then click Log In.

   If iLO is configured for Kerberos network authentication, the Zero Sign In button appears below the Log In button. You can use the Zero Sign In button to log in without entering a user name and password.

   If iLO is configured for CAC Smartcard Authentication, the Log in with Smartcard button appears below the Log In button. You can connect a smart card, and then click the Log in with Smartcard button. Do not enter a login name and password when you use CAC Smartcard Authentication.
3. For Microsoft Active Directory users, on successful validation of user credentials, if Two Factor Authentication is enabled, an OTP login screen appears. Enter the OTP received to the email address configured on the LDAP server.

Recovering default password using iLO web interface

Prerequisites

- iLO Security Override Switch is enabled

Procedure

1. Click Recover Password on the iLO login screen.

   Recover Password window appears.
2. Enter the Signed NodeID.

   Signed NodeID cannot be used multiple times. A login delay occurs after multiple failed attempts.

   For more information on generating the Signed NodeID, see iLO Troubleshooting Guide.
3. Enter the New Password.

   The password must be 8-15 characters. If Password Complexity is enabled, then the password must have 1 uppercase, 1 lowercase, and

1 digit.

On successful validation, iLO resets and the new password is set. After the reset, log in to iLO with the default user name (Administrator) and the new password.

4. Click Cancel to cancel the operation.
5. Click ✕ to close the Recover Password window.

Shared browser instances and iLO

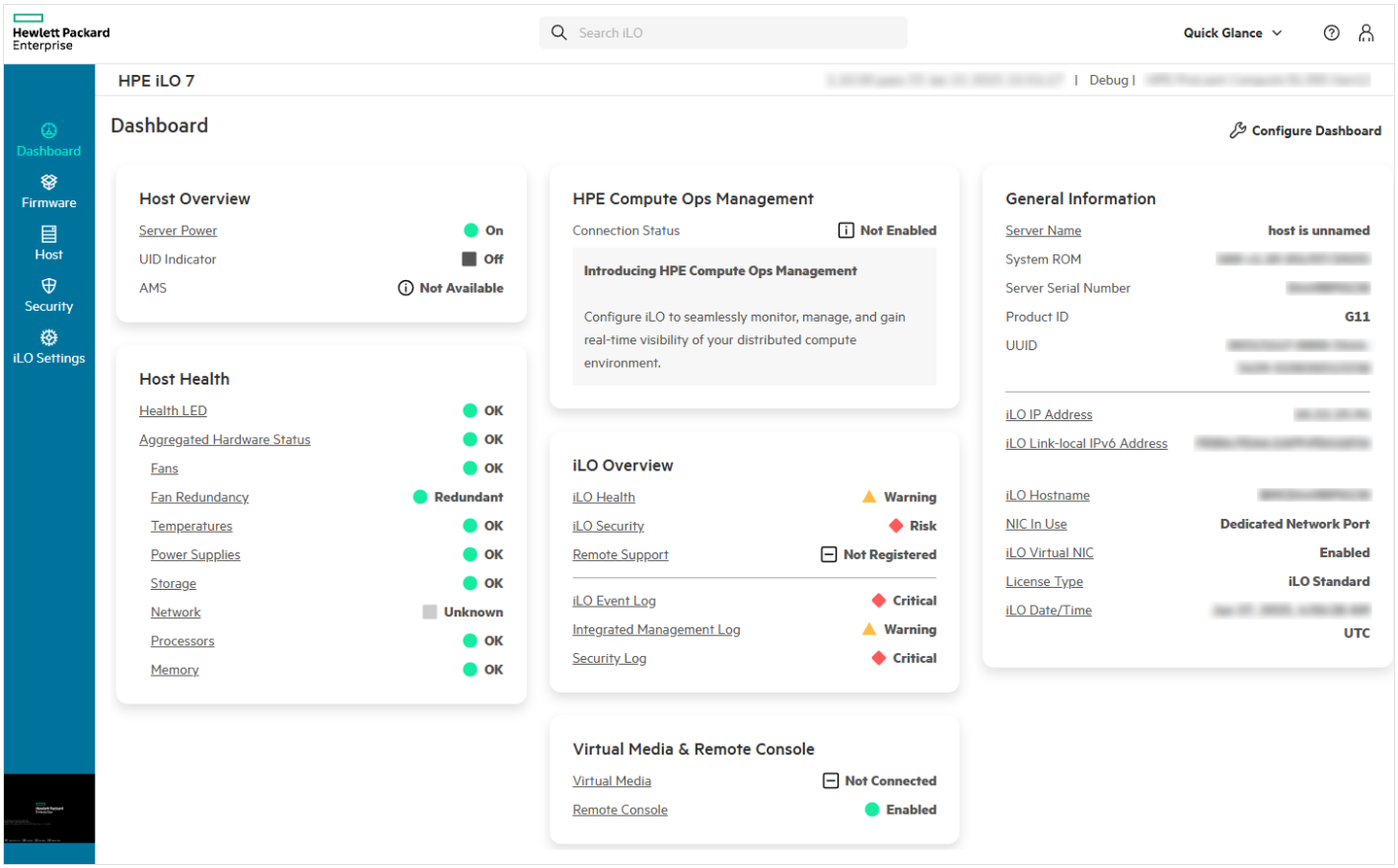
When you browse to iLO and log in, one session cookie is shared with all open browser windows that share the iLO URL in the browser address bar. As a consequence, all open browser windows share one user session. Logging out in one window ends the user session in all the open windows. Logging in as a different user in a new window replaces the session in the other windows.

iLO does not support multiple users logged in from two different browser windows in the same browser on the same client. When the iLO web interface opens another browser window or tab (for example, a help file), this window shares the connection to iLO and the session.

When you are logged into the iLO web interface, and you open a new browser window manually, a duplicate instance of the original browser window opens. If the domain name in the address bar matches the original browser session, the new instance shares a session cookie with the original browser window.

HPE iLO web interface overview

HPE iLO web interface groups similar tasks for easy navigation and workflow. The interface is organized with a navigation tree. To use the web interface, click an item in the navigation tree, and then click the name of the tab you want to view.



The following options are available in the navigation tree only if your server type or configuration supports them:

- When a remote management tool is used with iLO, the <Remote Management Tool Name> option is included.

iLO control icons

When you log in to the iLO web interface, the iLO controls are available from all the pages. You can view or navigate to the respective feature settings from the Quick Glance menu.

Server Name

The server name defined by the host OS.

iLO Hostname

The fully qualified network name assigned to the iLO subsystem. By default, the hostname is iLO, followed by the system serial number and the current domain name. This value is used for the network name and must be unique.

iLO Date/Time

The internal clock of the iLO subsystem.

Power icon

Use this icon to access the virtual power button features. The color of this icon varies based on the current power status.

UID icon

Use this icon to turn the UID LED on and off. The color of this icon varies based on the current UID LED status.

Health LED icon

Indicates the system LED status. The color of this icon varies based on the current system LED status. The possible values are OK, Warning, and Critical

iLO Health icon

Use this icon to view the iLO health status. The possible values are OK, Warning, and Critical

Security icon

This icon shows the iLO security status, which is based on the combined results from the Security page. The possible values are OK, Ignore Risk, and At Risk

Help

Use this icon to view online help for the current iLO web interface page.

Language

Use this icon to select a language for the current iLO web interface session.

Use the Settings option to view or modify the language settings.

This icon is available only if one or more language packs are installed.

User icon

This icon supports the following actions:

- Use the Logout option to log out of the current iLO web interface session.
- Use the Preferences option to set user preferences for Time Zone, Power Units, and Temperature Units, and Save iLO session key on the browser to reduce frequent login.

iLO navigation pane remote console thumbnail

The navigation pane shows a thumbnail of the remote console.

- To start a remote console, click the thumbnail.
- When you run the HTML5 IRC in docked mode, the static remote console thumbnail changes to display the active remote console session.

For more details, see remote console section.

Starting a remote management tool from the login page

Prerequisites

iLO is under the control of a remote management tool.

Procedure

1. Navigate to the iLO login page.

   When iLO is under the control of a remote management tool, the iLO web interface displays a message similar to the following:

   ```
   This system is being managed by <remote management tool name>. Changes
   made
   locally in iLO will be out of sync with the centralized settings.
   ```

   The name of the remote management tool is a link.

2. Click the remote management tool link.

Changing the language from the login page

Prerequisites

A language pack is installed.

About this task

If a language pack is installed, use the language menu on the login screen to select the language for the iLO session.

Procedure

1. Navigate to the iLO Login page.
2. Select a language from the language menu.

Viewing iLO information and logs

Subtopics

Host Overview details

Server Power

The server power state (ON or OFF).

To access the virtual power button features, click the Server Power icon.

To navigate to the Power Controls page, click the Server Power link.

UID Indicator

The state of the UID LED. The UID LED helps you identify and locate a server, especially in high-density rack environments. The possible states are UID ON, UID OFF, and UID BLINK.

If the iLO Service Port is in use, the UID BLINK status includes the Service Port status. The possible values are UID BLINK (Service Port Busy), UID BLINK (Service Port Error), and UID BLINK (Service Port Finished).

To turn the UID LED on or off, click the UID control at the Quick Glance option on top of the iLO web interface.

When the UID LED blinking, the state cannot be changed. An error occurs if you try to change the UID LED state. Once the UID LED stops blinking, the UID LED reverts to the previous sate (UID ON or UID OFF), and the requested new state is not applied.

When the UID is flashing, and then it stops flashing, the status reverts to the previous value (UID ON or UID OFF). If a new state is selected when the UID LED is flashing, that state takes effect when the UID LED stops flashing.

CAUTION

The UID LED flashes automatically to indicate that a critical operation is underway on the host, such as remote console access or a firmware update. Do not remove power from a server when the UID LED is flashing.

AMS

Agentless Management feature runs on the iLO hardware, independent of the operating system and processor. With Agentless Management, health monitoring and alerting is built into the system and begins working the moment a power cord is connected to the server.

To collect information from devices and components that cannot communicate directly with iLO, install the Agentless Management Service (AMS). This section shows the status of AMS.

More information is not available for the AMS.

The possible values are OK or Not Available.

Host Health details

Health LED

The system LED status. It is the operational status of the server. The possible values are OK, Warning, and Critical. You can also view the LED status from Quick Glance menu.

To navigate to the Integrated Management Logs page, click Health LED link.

Aggregated Hardware Status

The aggregate operation status of the hardware. The possible status is OK, Warning, and Critical

To navigate to the Hardware page, click Aggregated Hardware Status link.

Fans

The health status of the server fans. The possible values are OK, Warning, and Critical

To navigate to the Thermal and Cooling page, click Fans link.

Fan redundancy

The redundancy factor for server fans. The possible values are Redundant, Non Redundant, Failed Redundant, and Unknown.

To navigate to the Thermal and Cooling page, click Fans link.

Temperatures

The health status of server temperature sensors. The possible values are OK, Warning, and Critical

To navigate to the Thermal and Cooling page, click Fans link.

Power Supplies

The power supplies status. The possible values are OK, Warning, and Critical

To navigate to the Power page, click Power Supplies link.

Power Supplies Redundancy

The redundancy factor for power supply. The possible values are Redundant, Non Redundant, Failed Redundant, and Unknown

To navigate to the Power page, click Power Supplies Redundancy link.

Storage

The storage health status. The possible values are OK, Warning, and Critical.

To navigate to the Storage page, click Storage link.

Network

The network status of the server. The possible values are OK, Warning, and Critical.

To navigate to the Network page, click Network link.

Processors

The processor status of the server. The possible values are OK, Warning, and Critical

To navigate to the Processors page, click Processors link.

Memory

The memory status of the server. The possible values are OK, Warning, and Critical.

To navigate to the Memory page, click Memory link.

iLO overview details

iLO Health

The iLO health status, which is based on the combined results of the iLO diagnostic self-tests. The possible values are OK, Warning, and Critical.

To navigate to the Troubleshoot page, click the iLO Health link.

iLO Security

The iLO security status, which is based on the combined results from the Security Dashboard page. The possible values are OK, Ignore Risk, and At Risk.

To navigate to the Security Parameters page, click iLO Security link.

Remote Support

The remote support registration status for the supported servers.

To navigate to the Remote Support page, click Remote Support link.

iLO Event Log

Shows the record of significant events recorded by the iLO firmware.

To navigate to the iLO Event Log page, click iLO Event Log link.

Integrated Management Log

The Integrated Management Log (IML) provides a record of historical events that have occurred on the server.

To navigate to the Integrated Managemnet Log page, click Integrated Management Log link.

Security Log

The security log provides a record of the security events recorded by the iLO firmware.

To navigate to the Security Log page, click Security Log link.

Virtual Media and Remote Console details

Virtual Media

iLO virtual media provides a virtual device that can be used to boot a remote host server from a standard media anywhere on the network.

To navigate to the Virtual Media & Boot Options page, click the Virtual Media link.

Remote Console

Allows you to start a remote console for remote, out-of-band communication with the server console.

If the Remote Console option is disabled on the Remote Console page, the value Disabled is displayed.

If the current user is not assigned the Remote Console privilege, the value Unavailable is displayed.

To navigate to the Remote Console page, click the Remote Console link.

General information

Server Name

The server name defined by the host OS.

To navigate to the Host page, click Server Name link.

System ROM

The version of the active system ROM and the date of the active system ROM.

Server Serial Number

The server serial number, which is assigned when the system is manufactured. You can change this value by using the ROM-based system utilities during POST.

Product ID

This value distinguishes between different systems with similar serial numbers. The product ID is assigned when the system is manufactured. You can change this value by using the ROM-based system utilities during POST.

UUID

The universally unique identifier that software uses to identify this host. This value is assigned when the system is manufactured.

iLO IP Address

The network IP address of the iLO subsystem.

iLO Link-Local IPv6 Address

The SLAAC link-local address of the iLO subsystem.

To navigate to the IPv4 page, click Link-Local IPv6 Address link.

iLO Hostname

The fully qualified network name assigned to the iLO subsystem. By default, the hostname is iLO, followed by the system serial number and the current domain name. This value is used for the network name and must be unique.

To navigate to the iLO Shared Network Port page, click iLO Hostname link.

iLO NIC In Use

The network interface status (enabled or disabled). If the server does not support this option, this value is not displayed.

To navigate to the iLO Dedicated Network Port page, click iLO NIC In Use link.

iLO Virtual NIC

The status of iLO Virtual NIC.

The possible values are Enabled and Disabled.

To navigate to the Access page, where you can configure this feature, click iLO Virtual NIC.

License Type

Shows the iLO license type.

To navigate to the License page, click the License Type link.

iLO Date/Time

The internal clock of the iLO subsystem.

To navigate to the Time page, click iLO Date/Time link.

Using the security dashboard

Prerequisites

Configure iLO Settings privilege for configuring the Ignore option.

About this task

The Security page Overview section displays the Overall Security Status for the system and the current configuration for the Security State. Use the dashboard to evaluate your configuration for potential risks. When a risk is detected, you can view details and advice for how to improve system security.

Procedure

Click Security on the left navigation pane.

The Security page appears.
Review the details in the Overview section for Overall Security Status and the Security State.

Overall Security Status

- OK—iLO did not detect any security risks associated with the monitored security features.
- Ignore Risk—iLO detected a potential security risk associated with one or more monitored security features.

  If a security feature is listed with Risk status, see the on-screen information for more details. The additional information includes details about the risk and recommended solutions.
- Ignored—iLO detected a potential security risk associated with one or more monitored security features. All the affected features will be excluded from the Overall Security Status.

Server Configuration Lock

The configured server configuration lock setting. This feature alerts the administrator to activities such as device substitution or addition, hardware removal, Secure Boot changes, and firmware installations. You can configure this feature in the UEFI System Utilities or using the iLO RESTful API.

To view Server Configuration Lock information on the Security page, your environment must meet the following requirements:

- The server was rebooted after changing the security state.

- A license that includes Server Configuration Lock is installed.

Security State

- Secure Standard
- FIPS
- CNSA
- Synergy Security Mode

Subtopics

Security parameters details

Security parameters are the name of the monitored security feature.

For more information about the causes of security risk status, see Causes of security risk status.

You can configure the Ignore Risk option for security features. The Ignore option is disabled by default.

When you enable the Ignore option for a security feature, the status for that feature is ignored when iLO determines the Overall Security Status. Ignoring a security feature status does not change the Status value in the Overview section.

When you change the Ignore value for a security feature, iLO recalculates the Overall Security Status.

This status is also displayed on the Security page Overview section and in the iLO controls.

Ignoring a feature does not change the Status value displayed in the Security page Overview section.

For features that you can configure in the iLO web interface, click the links in the page to navigate to the related web interface page.

Subtopics

Risk details

When you view the risk details for a security feature on the Security page, the following information is available:

- Description—An explanation of why the security feature is in Risk status.
- Recommended Action—A recommended solution.

  This value is not displayed when the Ignore option is enabled.
- Ignored—The date and time that the Ignore option was enabled.
- Ignored by—The name of the user who enabled the Ignore option.

Causes of security risk status

The following security features are monitored on the Security page. If a server does not support a feature, it is not listed.

Access Panel Status

The chassis intrusion detection connector reported that the access panel status is Intrusion.

This feature is available only on servers that are configured for chassis intrusion detection.

> **NOTE**
> iLO detects a chassis intrusion even if the system does not have any power source. An IML is logged with the timestamp of the first intrusion.

Hewlett Packard Enterprise recommends auditing the events recorded in the IML and iLO Event log, and checking surveillance video for any physical intrusion activity on the server.

Authentication Failure Logging

iLO is not configured to log authentication failures.

Hewlett Packard Enterprise recommends enabling this feature on the User Management page.

Default TLS Certificate In Use

The iLO default self-signed certificate is in use.

Hewlett Packard Enterprise recommends configuring a trusted certificate on the TLS Certificate Customization page.

IPMI/DCMI Over LAN

The IPMI/DCMI over LAN feature is enabled, which exposes the server to known IPMI security vulnerabilities.

Hewlett Packard Enterprise recommends disabling this feature on the Access page.

Last Firmware Scan Result

The last firmware verification test failed. A firmware component is corrupted or its integrity is compromised.

Hewlett Packard Enterprise recommends updating the affected firmware component to a verified image.

To use this feature, you must install a license. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Minimum Password Length

The minimum password length is less than the recommended length, which makes the server vulnerable to dictionary attacks.

Hewlett Packard Enterprise recommends setting this value to 8 (default) or greater on the User Management page.

Password Complexity

iLO is not configured to enforce the password complexity guidelines, which makes the server vulnerable to dictionary attacks.

You can enable this feature on the User Management page.

Secure Boot

The UEFI Secure Boot option is disabled. In this configuration, the UEFI system firmware skips validation for the boot loader, Option ROM firmware, and other system software executables for trusted signatures. It breaks the chain of trust established by iLO from power-on.

Hewlett Packard Enterprise recommends enabling this feature.

For more information, see the UEFI System Utilities documentation.

SNMPv1 Request

SNMPv1 Request is enabled. This configuration allows iLO to receive SNMPv1 requests. Enabling SNMPv1 Request increases the system vulnerability to attack.

Hewlett Packard Enterprise recommends disabling this feature on the SNMP Settings page.

Global Component Integrity

SPDM authentication is enabled. This configuration allows iLO to authenticate all applicable components in the server using SPDM. Disabling Global Component Integrity in the Policy page will change the iLO security status to risk.

If the Global Component Integrity is disabled, iLO does not validate the components for SPDM authentication and even the SPDM supported cards will be reported as
Not Supported
.

You can enable this feature on the Policy page.

Subtopics

Security parameters state values

Security parameters state values

The possible security parameter state values are:

- Enabled—The feature is enabled.
- Disabled—The feature is disabled.
- Insufficient—The feature is enabled but the recommended configuration is not used.
- Off—The feature is set to Off.
- On—The feature is set to On.
- OK—The feature complies with the iLO security recommendations.
- Failed—The feature reported a failure.
- Repaired—The feature reported a failure that was repaired.
- True—The feature is in use.
- False—The feature is not in use.

Viewing host information

Subtopics

Viewing Host Settings
Editing host settings

Viewing Host Settings

Server Name

The server name defined by the host OS.

Server FQDN / IP Address

The domain name or IP address of the server.

Platform RAS Policy

The configured platform Resiliency and Serviceability (RAS) policy.

The possible values are:

- Firmware First (default)—The BIOS monitors corrected errors and logs an event when action is required for a corrected error. In this configuration, the OS does not monitor and log corrected errors.
- OS First—Corrected errors are unmasked to the OS and the OS controls the logging policy.

NOTE

Corrected errors are an expected and natural occurrence. No action is required based on the logging of corrected errors unless the BIOS has also logged an event.

You can configure this setting by navigating to System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options in the UEFI System Utilities. Hewlett Packard Enterprise recommends using the default setting.

Trusted Platform Module or Trusted Module

The status of the TPM or TM socket or module.

The possible values are Enabled and Disabled

Trusted Platform Modules and Trusted Modules are computer chips that securely store artifacts used to authenticate the platform. These artifacts can include passwords, certificates, or encryption keys. You can also use a TPM or TM to store platform measurements to make sure that the platform remains trustworthy.

On a supported system, ROM decodes the TPM or TM record and passes the configuration status to iLO.

Module Type

The TPM or TM type and specification version. The possible values are TPM 1.2, TPM 2.0, TM 1.0, Not Specified, and Not Supported. This value is displayed when a TPM or TM is present on a server.

microSD Flash Memory Card

The status of the internal SD card. If present, the SD card capacity is displayed.

Editing host settings

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.
2. Click on Host Settings section.

   The Host Settings window appears.
3. You can edit the following settings:
   - Server Name
   - Server FQDN / IP Address
   - Precision Time Measurement—You can edit this setting only when the server is in standby mode.
4. Click Update to save the changes.
5. Click Cancel to cancel the operation.
6. Click to close the window.

Managing iLO sessions

Prerequisites

Administer User Accounts privilege

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears,

2. Click Sessions.

   The Sessions page appears and shows information about the iLO sessions.

3. (Optional) To delete a session, click the check box next to it, and click  .

   iLO prompts you to confirm that you want to delete the selected session.

4. Click Yes, delete.

> **NOTE**
>
> Hewlett Packard Enterprise recommends to set the LDAP server's timeout settings to 45 seconds or more in the LDAP server settings. This will allow the LDAP session to remain active and avoid network timeouts. The default LDAP server timeout setting is 9000 seconds.

Subtopics

Session list details

Session list details

iLO displays the following details in the Current Session and Session List (*List of the sessions and details*) tables:

- User—The iLO user account name.

  Regular user accounts are displayed in the format *User: user account name*. Service accounts are displayed in the format *Service User: user account name*.

- IP—The IP address of the computer used to log in to iLO.
- Login Time—The date and time that the iLO session was started.
- Last Active—The time that the user session was last active (in hours and minutes).
- Expires—The date and time that the session will end automatically.
- Source—The session source (for example, remote console, web interface, ROM-based setup utility, iLO RESTful API, SSH. or VNIC).

iLO Event Log

The event log provides a record of significant events recorded by the iLO firmware.

Examples of the logged events include server events such as a server power outage or a server reset. Other logged events include logins, virtual power events, clearing the log, and some configuration changes.

iLO provides secure password encryption, tracking all login attempts and maintaining a record of all login failures. The Authentication Failure Logging setting allows you to configure logging criteria for failed authentications. The event log captures the client name for each logged entry to improve auditing capabilities in DHCP environments, and records the account name, computer name, and IP address.

When the event log is full, each new event overwrites the oldest event in the log.

For a list of the errors that might appear in the event log, see the error messages guide for your server.

Subtopics

Viewing the event log

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click iLO Event Log.

   iLO Event Log page appears and shows the iLO Event Log details.

3. (Optional) Use the sort, search, and filter features to customize the log view.
4. (Optional) To search for events, enter the date, event ID, or description text, in the search box.
5. (Optional) To refresh the event list, click Actions > Refresh Logs.
6. To access the log filters, click .

   The Filters window appears.

   - To filter by severity, select a severity level from the Severity list.
   - To filter by category, select a value in the Category list.
   - To filter by last update date, select the value in Last Update list.

7. To change the displayed date and time for events, click Actions and select a value in the Time menu. Choose from the following:
   - iLO Time Zone—Display iLO subsystem time.
   - User Local Time zone—Display the iLO web interface client time.
   - UTC (Coordinated Universal Time)—Display UTC time in ISO 8601 format.
8. Click Apply Filter to save the filter.
9. Click Reset Filter to set the filters back to the default values.
10. Click to close the Filter window.

Subtopics

Event log details

When you view the event log, the total number of recorded events is displayed below the Filter Logs icon.

When log filters are applied, the number of events that meet the filter criteria is displayed below the filter icon.

The following details are displayed for each event:

- ID—The event ID number. Events are numbered in the order in which they are generated.

  By default, the log is sorted by the ID, with the most recent event at the top. A factory reset will reset the counter.

- Severity—The importance of the detected event.
- Description—The description provides the characteristics of the recorded event.

  If the iLO firmware is rolled back to an earlier version, the description `UNKNOWN EVENT TYPE` might be displayed for events recorded by the newer firmware. You can resolve this issue by updating the firmware to the latest supported version, or by clearing the log.
- Last Update—The date and time when the latest event of this type occurred. This value is based on the date and time stored by the iLO firmware.

  If the iLO firmware did not recognize the date and time when an event was updated, the value `[NOT SET]` is displayed.
- Count—The number of times this event has occurred (if supported).

  In general, important events generate a log entry each time they occur. They are not consolidated into one log entry.

  When less important events are repeated, they are consolidated into one log entry, and iLO updates the Count and Last Update values.

  Each event type has a defined interval that determines whether repeated events are consolidated or a new event is logged.
- Category—The event category. For example, Administration, Configuration, or Security.

Event log icons

-  Critical—The event indicates a service loss or imminent service loss. Immediate attention is needed.
-  Caution—The event is significant but does not indicate performance degradation.
-  Informational—The event provides background information.

Saving the event log to a CSV file

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.
2. Click iLO Event Log.

   iLO Event Log page appears
3. Click Actions > Download CSV.

   The `CSV` file is downloaded.
4. (Optional) To download the `CSV` file for a specific event, select the checkbox next to the event and click Actions > Download CSV.

   The `CSV` file for the selected event is downloaded.

Clearing the event log

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click iLO Event Log.

   iLO Event Log page appears

3. Click Actions > ⃠ Clear Logs.

   iLO prompts you to confirm the request.

4. Click Yes, clear.

   The log is cleared of all previously logged information. This action is recorded in the event log.

Integrated Management Log

The IML provides a record of historical events that have occurred on the server. System ROM and iLO drivers generate the events. Logged events include server-specific information such as health and status information, firmware updates, operating system information, and ROM-based POST codes.

Entries in the IML can help you diagnose issues or identify potential issues. Preventive action helps to avoid disruption of service.

iLO manages the IML, which you can access through a supported browser, even when the server is off. The ability to view the log when the server is off can be helpful when you troubleshoot remote host server issues.

When the IML is full, each new event overwrites the oldest event in the log.

Subtopics

Examples of IML event types

- Fan actions and status
- Power supply actions and status
- Temperature status and automatic shutdown actions
- Drive failure
- Firmware flash actions
- Smart Storage Energy Pack status
- Network actions and status

Viewing the IML

Procedure

1. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

2. (Optional) Use the sort, search, and filter features to customize the log view.
3. (Optional) To search for events, enter the date, event ID, or description text, in the search box.
4. (Optional) To access the log filters, click .

   The Filters window appears.

   - To filter by severity, select a severity level from the Severity list.
   - To filter by category, select a value in the Category list.
   - To filter by last update date, select the value in Last Update list.

5. Click Apply Filter to save the filter.
6. Click Reset Filter to set the filters back to the default values.
7. Click to close the Filter window.

Subtopics

IML details

When you view the IML, the total number of recorded events is displayed below the Filter Logs icon.

When log filters are applied, the number of events that meet the filter criteria is displayed below the filter icon.

The following details are displayed for each event:

- **Repairable events**—The first column on the left side of the web interface displays an active check box next to each event. This check box is used to select an event with Critical or Caution status to mark as repaired. Also, for all other event status, select the check-box to download the CSV.
- ID—The event ID number. Events are numbered in the order in which they are generated.

  By default, the log is sorted by the ID, with the most recent event at the top. A factory reset will reset the counter.
- Severity—The importance of the detected event.
- Class—Identifies the type of event that occurred, for example, UEFI, environment, or system revision.
- Description—The description provides the characteristics of the recorded event.

  If the iLO firmware is rolled back, the description `UNKNOWN EVENT TYPE` might be displayed for events recorded by the newer firmware. You can resolve this issue by updating the firmware to the latest supported version, or by clearing the log.
- Last Update—The date and time when the latest event of this type occurred. This value is based on the date and time stored by the iLO firmware.

  If iLO did not recognize the date and time when an event was updated, the value `[NOT SET]` is displayed.
- Count—The number of times this event has occurred (if supported).

  In general, important events generate a log entry each time they occur. They are not consolidated into one log entry.

When less important events are repeated, they are consolidated into one log entry, and iLO updates the Count and Last Update values.

Each event type has a defined interval that determines whether repeated events are consolidated or a new event is logged.

- Category—The event category. For example, Hardware, Firmware, or Configuration.

IML icons

-  Critical—The event indicates a service loss or an imminent service loss. Immediate attention is needed.
-  Caution—The event is significant but does not indicate performance degradation.
-  Informational—The event provides background information.
-  Repaired—An event has undergone corrective action.

Managing IML Logs

You can perform the following tasks from the Actions menu:

- Adding a maintenance note to the IML
- Refresh Logs
- Clear Logs
- Download CSV
- Time Zone
- Marking an IML entry as repaired

Subtopics

Adding a maintenance note to the IML

Prerequisites

Configure iLO Settings privilege

About this task

Use maintenance notes to create log entries about activities such as:

- Upgrades
- System backups

- Periodic system maintenance
- Software installations

Procedure

1. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

2. Click Actions and select + Add Maintenance Note.

   The Enter Maintenance Notes window appears.

3. Enter the text that you want to add as a log entry and click OK.

   You can enter up to 227 bytes of text. You cannot submit a maintenance note without entering some text.

   An Informational log entry is added to the IML.

Refreshing IML Logs

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

2. Click Actions > Refresh Logs.

   The log is refreshed.

Clearing IML Logs

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

2. Click Actions > Clear Logs.

   iLO prompts you to confirm the request.

3. Click Yes, clear.

   The log is cleared of all previously logged information. This action is recorded in the IML.

Saving the IML to a CSV file

Procedure

1. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

2. Click Actions > Download CSV.

   The `CSV` file is downloaded.

3. (Optional) To download the `CSV` file for a specific event, select the checkbox next to the event and click Actions > Download CSV.

   The `CSV` file for the selected event is downloaded.

Time Zone settings

Procedure

1. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

2. Click Actions and click the preferred time zone option.

   - iLO Time Zone—Displays iLO subsystem time.
   - User Local Time zone—Displays the iLO web interface client time.
   - UTC (Coordinated Universal Time)—Displays the UTC time in ISO 8601 format.

Marking an IML entry as repaired

Prerequisites

Configure iLO Settings privilege

About this task

Use this feature to change the status of an IML entry from Critical or Caution to Repaired.

Procedure

1. Investigate and repair the issue.
2. Click Host in the left navigation pane and click Integrated Management Logs or click iLO Settings in the left navigation pane and click Troubleshoot > Integrated Management Logs.

   The Integrated Management Logs page appears.

3. Select the log entry.

   To select an IML entry, click the check box next to the entry in the first column of the IML table.

4. Click Mark as Repaired.

   The iLO web interface refreshes, and the selected log entry status changes to Repaired.

Security log

The security log provides a record of the security events recorded by the iLO firmware.

Examples of the logged events include changes to the security configuration and security compliance issues. Other logged events include hardware intrusion, maintenance, and denial of service.

The security log provides a focused view of all recorded security events. Some of the same events are also included in the iLO event log or IML.

When the security log is full, each new event overwrites the oldest event in the log.

Subtopics

Viewing the security log

Procedure

1. Click Security in the left navigation pane and click Security Log or click iLO Settings in the left navigation pane and click Troubleshoot > Security Log.

   The Security Log page appears and shows the log details.
2. (Optional) Use the sort, search, and filter features to customize the log view.
3. (Optional) To search for events, enter the date, event ID, or description text, in the search box.
4. (Optional) To refresh the event list, click Actions > Refresh Logs.
5. To access the log filters, click .

   The Filters window appears.

   - To filter by severity, select a severity level from the Severity list.
   - To filter by category, select a value in the Category list.
   - To filter by last update date, select the value in Last Update list.
6. To change the displayed date and time for events, click Actions and select a value in the Time menu. Choose from the following:

   - iLO Time Zone—Display iLO subsystem time.
   - User Local Time zone—Display the iLO web interface client time.
   - UTC (Coordinated Universal Time)—Display UTC time in ISO 8601 format.
7. Click Apply Filter to save the filter.
8. Click Reset Filter to set the filters back to the default values.
9. Click to close the Filter window.

Subtopics

Security log details

When you view the security log, the total number of recorded events is displayed below the Filter Logs icon.

When log filters are applied, the number of events that meet the filter criteria is displayed below the filter icon.

The following details are displayed for each event:

- ID—The event ID number. Events are numbered in the order in which they are generated.

  By default, the log is sorted by the ID, with the most recent event at the top. A factory reset will reset the counter.
- Severity—The importance of the detected event.
- Description—The description provides the characteristics of the recorded event.

  If the iLO firmware is rolled back, the description `UNKNOWN EVENT TYPE` might be displayed for events recorded by the newer firmware. You can resolve this issue by updating the firmware to the latest supported version, or by clearing the log.
- Last Update—The date and time when the latest event of this type occurred. This value is based on the date and time stored by the iLO firmware.

  If iLO did not recognize the date and time when an event was updated, the value `[NOT SET]` is displayed.
- Count—The number of times this event has occurred (if supported).

  In general, important events generate a log entry each time they occur. They are not consolidated into one log entry.

  When less important events are repeated, they are consolidated into one log entry, and iLO updates the Count and Last Update values.

  Each event type has a defined interval that determines whether repeated events are consolidated or a new event is logged.
- Category—The event category. For example, Security, Maintenance, or Configuration.

Security log icons

- Critical—The event indicates a service loss or an imminent service loss. Immediate attention is needed.
- Caution—The event is significant but does not indicate performance degradation.
- Informational—The event provides background information.

Saving the security log to a CSV file

Procedure

1. Click Security in the left navigation pane and click Security Log or click iLO Settings in the left navigation pane and click Troubleshoot > Security Log.

   The Security Log page appears.
2. Click Actions > Download CSV.

The `CSV` file is downloaded to your system Downloads folder.

3. (Optional) To download the `CSV` file for a specific event, select the checkbox next to the event and click Actions > Download CSV.

   The `CSV` file for the selected event is downloaded to your system Downloads folder.

Clearing the security log

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane and click Security Log or click iLO Settings in the left navigation pane and click Troubleshoot > Security Log.

   The Security Log page appears.

2. Click Actions > Clear Logs.

   iLO prompts you to confirm the request.

3. Click Yes, clear.

   The log is cleared of all previously logged information. This action is recorded in the event log.

Active Health System

The Active Health System monitors and records changes in the server hardware and system configuration.

The Active Health System provides:

- Continuous health monitoring of over 1600 system parameters
- Logging of all configuration changes
- Consolidated health and service alerts with precise time stamps
- Agentless monitoring that does not affect application performance

Subtopics

Active Health System data collection

The Active Health System does not collect information about your operations, finances, customers, employees, or partners.

Examples of information that is collected:

- Server model and serial number
- Processor model and speed
- Storage capacity and speed
- Memory capacity and speed
- Firmware/BIOS and driver versions and settings

The Active Health System does not parse or change OS data from third-party error event log activities (for example, content created or passed through the OS).

Active Health System Log

The data collected by the Active Health System is stored in the Active Health System Log. The data is logged securely, isolated from the operating system, and separate from customer data. Host resources are not consumed in the collection and logging of Active Health System data.

When the Active Health System Log is full, new data overwrites the oldest data in the log.

It takes less than 5 minutes to download the Active Health System Log and send it to a support professional to help you resolve an issue.

When you download Active Health System Log, you may optionally append your contact information. When you send Active Health System data to Hewlett Packard Enterprise, you agree to have the data used for analysis, technical resolution, and quality improvements. The data that is collected is managed according to the privacy statement, available at **https://www.hpe.com/info/privacy**.

Active Health System Log download methods

You can use the following methods to download the Active Health System Log:

- **iLO web interface**—Download the log for a range of days or download the entire log from the Active Health System Log page.
- **iLO Service Port**—Download the log by connecting a USB flash drive to the iLO Service Port on the front of the server.
- **cURL utility**—Download the log by using the cURL command-line tool.
- **iLO RESTful API and RESTful Interface Tool**—For more information, see **https://www.hpe.com/support/restfulinterface/docs**.

Downloading the Active Health System Log for a date range

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click Active Health System Log.

   The Active Health System Log page appears.

3. Select For a Date Range for Type.

4. Enter the range of days to include in the log. The default value is seven days.

   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.

To reset the range to the default values, click ↩.

5. (Optional) Enter the following information to include in the downloaded file:

- Support case number (up to 14 characters)
- Contact name
- Phone number (up to 39 characters)
- E-mail
- Company name

The contact information that you provide will be treated in accordance with the Hewlett Packard Enterprise privacy statement. This information is not written to the log data stored on the server.

6. Click Download.
7. Save the file.
8. If you have an open support case, you can email the log file to your service technician.

Use the following convention for the email subject: CASE: <case number>.

Files that are larger than 25 MB must be compressed and uploaded to an FTP site. If needed, contact Hewlett Packard Enterprise for FTP site information.

Downloading the entire Active Health System Log

About this task

It might take a long time to download the entire Active Health System Log. If you must upload the Active Health System Log for a technical issue, Hewlett Packard Enterprise recommends downloading the log for the specific range of dates in which the problem occurred.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

The Troubleshoot page appears.

2. Click Active Health System Log.

The Active Health System Log page appears.

3. Select Entire Log for Type.
4. (Optional) Enter the following information to include in the downloaded file:

- Support case number (up to 14 characters)
- Contact name
- Phone number (up to 39 characters)
- Email address

- Company name

The contact information that you provide will be treated in accordance with the Hewlett Packard Enterprise privacy statement. This information is not written to the log data stored on the server.

5. Click Download.
6. Save the file.
7. If you have an open support case, you can email the log file to your service technician.

   Use the following convention for the email subject: CASE: <case number>.

   Files that are larger than 25 MB must be compressed and uploaded to an FTP site. If needed, contact Hewlett Packard Enterprise for FTP site information.

Clearing the Active Health System Log

Prerequisites

- Configure iLO Settings privilege
- Enable Log is set in the Active Health System Log page.

About this task

If the log file is corrupted, or if you want to clear and restart logging, clear the Active Health System Log.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.
2. Click Active Health System Log.

   The Active Health System Log page appears.
3. Click Clear Log.
4. When prompted to confirm the request, click Yes, clear.

   iLO notifies you that the log is being cleared.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the window.
7. Reset iLO after clearing the log.

   Resetting iLO is required because some Active Health System data is recorded to the log only during iLO startup. Performing this step ensures that a complete set of data is available in the log.
8. Reboot the server.

   Rebooting the server is required because some information, such as the operating system name and version, is logged at server startup. Performing this step ensures that a complete set of data is available in the log.

Disabling the Active Health System Log

About this task

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click Active Health System Log.

   The Active Health System Log page appears.

3. Click Disable Log.

4. When prompted to confirm the request, click Yes, disable.

   The log is disabled.

5. Click Cancel to cancel the operation.

6. Click ✕ to close the window.

Using the iLO and system diagnostics

About this task

Subtopics

Viewing iLO self-test results
iLO reboot (reset)
Reimaging an appliance
System diagnostics

Viewing iLO self-test results

About this task

The iLO Self-Test Results section displays the results of internal iLO diagnostic tests, including the test name, status, and notes.

The tests that are run are system-dependent. Not all tests are run on all systems. If a status is not reported for a test, the test is not listed.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.
   iLO Self-Test Results section displays the self-test results.

2. (Optional) To sort by a table column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

Subtopics

iLO self-test details
iLO self-test types

iLO self-test details

iLO Health

The iLO health status, which is based on the combined results of the iLO diagnostic self-tests.

Test

The tested function.

Status

The test status.

- Pass—The test was successful.
- Degraded—The test detected a problem. A reboot, firmware or software update, or service might be required.

  If a self-test reports this status, check the IML for additional information.
- Informational—Supplemental data about the tested system is provided in the Notes column.

Notes

A test might include supplemental information in the Notes column.

For some tests, this column displays the versions of other system programmable logic, such as the System Board PAL or the Power Management Controller.

iLO self-test types

The tests that are run are system-dependent. Not all tests are run on all systems. The possible tests include:

- Cryptographic—Tests security features.
- Embedded Flash—Tests the state of the system that can store configuration, provisioning, and service information.
- Host ROM—Checks the BIOS to determine whether it is out-of-date compared to the management processor.
- Supported Host—Checks the management processor firmware to determine whether it is out of date for the server hardware.
- Power Management Controller—Tests functions related to power measurement, power capping, and power management.
- CPLD—Tests the programmable hardware in the server.
- EEPROM—Tests the hardware that stores basic iLO properties that are assigned during the manufacturing process.
- **ASIC Fuses**—Compares a known data pattern against expected data manufactured into the iLO chip to make sure that the chip was manufactured properly and that operating settings meet tolerances.

iLO reboot (reset)

In some cases, it might be necessary to reboot iLO; for example, if iLO is not responding to the browser.

The Reset option initiates an iLO reboot. It does not make any configuration changes, but ends all active connections to the iLO firmware. If a firmware file upload is in progress, it is terminated. If a firmware flash is in progress, you cannot reset iLO until the process is finished.

If none of the available reset methods are available or working as expected, power down the server and disconnect the power supplies.

Subtopics

iLO reboot (reset) methods

iLO reboot (reset) methods

iLO web interface

Use the Reset iLO option.

iLO 7 Configuration Utility

Use the iLO 7 Configuration Utility in the UEFI System Utilities.

iLO RESTful API

For more information, see the following website: **https://www.hpe.com/support/restfulinterface/docs**.

IPMI

For more information, see the HPE iLO 7 IPMI User Guide.

Server UID

Use the server UID button on supported servers to initiate a graceful reboot or a hardware reboot.

This method can be used if none of the other reset methods are available or working as expected.

Resetting the iLO processor with the web interface

Prerequisites

Configure iLO Settings privilege

About this task

In some cases, it might be necessary to reboot iLO; for example, if iLO is not responding to the browser.

Using the Reset option does not make any configuration changes, but ends all active connections to the iLO firmware. If a firmware file upload is in progress, it is stopped. If a firmware flash is in progress, you cannot reset iLO until the process is finished.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot or click Reset iLO from the Quick Actions menu.
2. If you navigate via Troubleshoot page, click System Diagnostics > Reset iLO.

   The Reset iLO window appears.

   If the server is in the Power On Self-Test (POST) process, iLO warns you that a reset may cause unexpected behavior like resetting iLO to the factory defaults settings. A system reboot may be required after the iLO reset is complete.
3. Click Yes, reset iLO to confirm the request.

   iLO resets and closes your browser connection.

Rebooting (resetting) iLO with the iLO 7 Configuration Utility

Prerequisites

Configure iLO Settings privilege

Procedure

1. (Optional) If you access the server remotely, start an iLO remote console session.
2. Restart or power on the server.
3. Press F9 in the server POST screen.

   The UEFI System Utilities start.
4. From the System Utilities screen, click System Configuration, and then click iLO 7 Configuration Utility.
5. Select Yes in the Reset iLO menu.

   The iLO 7 Configuration Utility prompts you to confirm the reset.
6. Click OK.
7. iLO resets and all active connections are ended. If you are managing iLO remotely, the remote console session is automatically ended.

   When you reset iLO, the iLO 7 Configuration Utility is not available again until the next server reboot.
8. Resume the boot process:
   a. (Optional) If you are managing iLO remotely, wait for the iLO reset to finish, and then start the iLO remote console.

      The UEFI System Utilities are open from the previous session.
   b. Press Esc until the main menu is displayed.
   c. Click Exit and resume system boot.
   d. When prompted to confirm the request, click OK to exit the utility and resume the normal boot process.

Performing a graceful iLO reboot with the server UID button

About this task

The UID button on supported servers can be used to initiate a graceful iLO reboot.

When you initiate a graceful iLO reboot, the iLO firmware initiates the iLO reboot.

Initiating a graceful iLO reboot does not make any configuration changes, but ends all active connections to iLO. If a firmware file upload is in progress, it is terminated. If a firmware flash is in progress, you cannot reboot iLO until the process is finished.

Procedure

To initiate a graceful iLO reboot, press and hold the UID button for 5 to 9 seconds.

The UID button/LED flashes blue 4 Hz/cycle per second to indicate that a graceful iLO reboot is in progress.

Performing a hardware iLO reboot with the server UID button

About this task

The UID button on supported servers can be used to initiate an iLO hardware reboot.

When you initiate a hardware iLO reboot, the server hardware initiates the iLO reboot.

Procedure

To initiate a hardware iLO reboot, press and hold the UID button for 10 seconds or longer.

CAUTION

Initiating a hardware iLO reboot does not make any configuration changes, but ends all active connections to iLO. If a firmware flash is in progress, it is interrupted, which might cause data corruption on the flash device. If data corruption occurs on the flash device, use the secure recovery or iLO network failed flash recovery features. Data loss or NVRAM corruption might occur during a hardware iLO reboot.

Do not initiate a hardware reboot if other troubleshooting options are available.

The UID button/LED flashes blue 8 Hz/cycle per second to indicate that an iLO hardware reboot is in progress.

Reimaging an appliance

Prerequisites

- Login privilege
- Remote Console privilege
- Virtual Power and Reset privilege
- Virtual Media privilege

About this task

You can use iLO to initiate the reimage process for supported appliances when you cannot access the appliance hardware directly.

WARNING

When you reimage an appliance, it will be offline until the reimage process is complete.

Procedure

1. Use the iLO virtual media feature to connect a USB device that contains an appliance software image.

   The image must include the HPE OneView software.
2. Click Information in the navigation tree, and then click the Diagnostics tab.
3. Click Reimage.

   iLO prompts you to confirm the request.
4. Click Yes, reimage the appliance.

System diagnostics

The System Diagnostics sections displays the features that are supported on a server. Feature support depends on your server model and iLO version.

IMPORTANT

Do not initiate more than one system diagnostics operation at the same time. Running more than one operation at the same time might cause unexpected results.

Subtopics

Restoring the default system settings

Prerequisites

- Host BIOS privilege
- Virtual Power and Reset privilege
- Configure iLO Settings privilege
- The server platform supports this feature.
- The server is powered off.

About this task

Use the Restore Default System Settings option to reset all BIOS configuration settings to their default values and restart the server.

Selecting this option resets all platform settings except:

- Secure boot BIOS settings
- Date and time settings
- Primary and redundant ROM selection (if supported)
- Other entities, such as option cards or iLO, that must be individually reset.

  When you use this feature, the iLO IP address and iLO settings stored in the nonvolatile memory are retained.

Procedure

1. (Optional) Set the Save User Defaults option to Yes, Save in the UEFI System Utilities.

   When enabled, this option causes the current BIOS settings to be used as the default settings when you restore the default system settings.

   For more information, see the UEFI System Utilities User Guide.

2. (Optional) Set the Save User Defaults option to Yes, Save in the UEFI System Utilities.

   When enabled, this option causes the current BIOS settings to be used as the default settings when you restore the default manufacturing settings.

   For more information, see the UEFI System Utilities User Guide.

3. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

4. Click System Diagnostics > Restore Default System Settings.

The Restore Default System Settings window appears.
iLO prompts you to confirm the request, and warns you that previously configured settings will be reset to the default values.

5. Click Yes, proceed.

   The UEFI nonvolatile variables are reset to the default values, and the server restarts.

   To monitor the status, check the server POST screen.

   The results of this action are recorded in the IML.

Booting to System Intelligent Diagnostics mode

Prerequisites

- Host BIOS privilege
- Virtual Power and Reset privilege
- Configure iLO Settings privilege
- The server platform supports this feature.
- The server is powered off.

About this task

When you enter System Intelligent Diagnostics mode on a supported system, the system can automatically diagnose a boot failure during POST.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click System Diagnostics > System Intelligent Diagnostics mode.

   iLO prompts you to confirm the request.

3. Click Yes, proceed.

   iLO confirms that the NMI was sent.

Restoring the default manufacturing settings

Prerequisites

- Host BIOS privilege
- Virtual Power and Reset privilege
- Configure iLO Settings privilege
- The server platform supports this feature.
- The server is powered off.

About this task

Use the Restore Default Manufacturing Settings option to reset all BIOS configuration settings to their default manufacturing values.

This process deletes all UEFI nonvolatile variables, such as boot configuration, Secure Boot security keys (if Secure Boot is enabled), and configured date and time settings.

To use an option that retains some UEFI settings, consider the Restoring Default System Settings option.

When you use this feature, the iLO IP address and iLO settings stored in the nonvolatile memory are retained.

Procedure

1. (Optional) Set the Save User Defaults option to Yes, Save in the UEFI System Utilities.

   When enabled, this option causes the current BIOS settings to be used as the default settings when you restore the default manufacturing settings.

   For more information, see the UEFI System Utilities user guide.

2. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

3. Click System Diagnostics > Restore Default Manufacturing Settings.

   iLO prompts you to confirm the request, and warns you that previously configured settings, including Secure Boot settings, will be reset to the default values.

4. Click Yes, proceed.

   The UEFI nonvolatile variables are reset to the default values, and the server restarts.

   To monitor the status, check the server POST screen.

   The results of this action are recorded in the IML.

Booting to system safe mode

Prerequisites

- Host BIOS privilege
- Virtual Power and Reset privilege
- Configure iLO Settings privilege
- The server platform supports this feature.
- The server is powered off.

About this task

Use the System Safe Mode option to boot the system with a minimum configuration to check if a boot processor is operating correctly. All other PCIe devices are removed from the configuration quickly and safely.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click System Diagnostics > System Safe Mode.

   iLO prompts you to confirm the request.

3. Click Yes, proceed.

A successful server boot in safe mode indicates that the boot processor is operating correctly.

The results of this action are recorded in the IML.

Generating an NMI

Prerequisites

Virtual Power and Reset privilege

About this task

The Generate NMI feature enables you to stop the operating system for debugging.

This feature is useful when a system does not boot and hangs in a pre-OS state (for example, during POST). Using an NMI enables the system ROM exception handler to run and capture a trace of the code that caused the issue.

CAUTION

Generating an NMI as a diagnostic and debugging tool is used primarily when the operating system is no longer available. NMI is not used during normal operation of the server. Generating an NMI does not gracefully shut down the operating system, but causes the operating system to crash, resulting in lost service and data. Use the Generate NMI button only in extreme cases in which the OS is not functioning correctly and an experienced support organization has recommended an NMI.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click System Diagnostics > Generate NMI.

   iLO prompts you to confirm the request.

   iLO prompts you to confirm the request.

   CAUTION

   Generating an NMI might cause data loss and data corruption.

3. Click Yes, proceed.

   iLO confirms that the NMI was sent.

Saving UEFI serial debug messages to the Active Health System Log during POST

Prerequisites

- The server is in the Power On Self-Test (POST) state.

About this task

During normal server operation, UEFI serial log messages are automatically saved to the Active Health System Log. These messages can be helpful when the Active Health System Log is used for troubleshooting. If a server stalls or fails to boot, UEFI serial debug messages are not sent automatically. Use this procedure to manually save UEFI serial debug messages to the Active Health System Log one time. To save the UEFI serial debug messages again, repeat this procedure.

This feature is available only during server POST. After POST is complete, the Capture button is unavailable.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click System Diagnostics > UEFI Serial Debug Message.
3. Click Capture.

   iLO notifies you that the UEFI serial debug messages were saved to the Active Health System Log.

AUX Power Cycle

Prerequisites

- Virtual Power and Reset privilege
- The server is powered off

About this task

Use the AUX Power Cycle option to remotely turn the auxiliary power off and then back on. This action resets all the hardware components, including the components powered by standby power.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click System Diagnostics > AUX Power Cycle.
3. Click AUX Power Cycle.
4. Click Yes, proceed.

   iLO will reset.

Resetting the iLO processor with the web interface

Prerequisites

Configure iLO Settings privilege

About this task

In some cases, it might be necessary to reboot iLO; for example, if iLO is not responding to the browser.

Using the Reset option does not make any configuration changes, but ends all active connections to the iLO firmware. If a firmware file upload is in progress, it is stopped. If a firmware flash is in progress, you cannot reset iLO until the process is finished.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot or click Reset iLO from the Quick Actions menu.
2. If you navigate via Troubleshoot page, click System Diagnostics > Reset iLO.

The Reset iLO window appears.

If the server is in the Power On Self-Test (POST) process, iLO warns you that a reset may cause unexpected behavior like resetting iLO to the factory defaults settings. A system reboot may be required after the iLO reset is complete.

3. Click Yes, reset iLO to confirm the request.

   iLO resets and closes your browser connection.

Binding Datacenter Secure Control Module with Host Processor Module

Prerequisites

- Administrator with Recovery Set privilege.
- The server is powered off.

About this task

Use this option to bind the Datacenter Secure Control Module (DC-SCM) with the Host Processor Module (HPM). The binding does not apply to server platforms that do not have a DC-SCM module. It is intended for field returned boards when the HPM authentication failure log appears in the Integrated Management Log.

Procedure

1. Click iLO Settings in the left navigation pane and click Troubleshoot.

   The Troubleshoot page appears.

2. Click System Diagnostics > Bind DC-SCM with HPM.

   The Bind DC-SCM with HPM window appears.

3. Click Automatically perform AUX Power cycle immediately after bind is complete to perform AUX power cycle once the bind is complete.

4. Click Yes, proceed to confirm the request.

   Binding DC-SCM with HPM is successfully completed.

5. (Optional) To view the latest changes, click AUX Cycle.

   A confirmation dialog box appears.

6. Click Yes, proceed.

   iLO initiates a reset. After the reset, Log in to iLO again and access the Integrated Management Log to check if the binding is successful.

   If the binding fails, repeat this procedure. If the binding fails, download the AHS log and contact **HPE Support**.

   If the binding fails, repeat this procedure. If the binding fails, download the AHS log and contact HPE support.

Viewing general system information

Subtopics

Viewing processor and GPU information

About this task

The Processors page displays the available processor slots, the type of processor installed in each slot, and a summary of the processor subsystem.

It also displays the GPU information for supported servers.

If the server is powered off, the system health information on this page is current as of the last power off. Health information is updated only when the server is powered on and POST is complete.

Procedure

Click Host in the left navigation pane and click Hardware > Processors.

The Processors page appears.

Subtopics

Processor details

The following information is displayed for each processor:

- Processor Name—The name of the processor.
- State—The current state of the processor.
- Health—The health status of the processor.
- Processor Speed—The speed of the processor.
- Execution Technology—Information about the processor cores and threads.
- Memory Technology—The processor memory capabilities.
- Internal L1 cache—The L1 cache size.
- Internal L2 cache—The L2 cache size.
- Internal L3 cache—The L3 cache size.

Viewing memory information

About this task

The Memory Information page displays a summary of the system memory. When server power is off, AMP data is unavailable, and only memory modules present at POST are displayed.

If the server is powered off, the system health information on this page is current as of the last power off. Health information is updated only when the server is powered on and POST is complete.

Procedure

1. Click Host in the left navigation pane and click Hardware > Memory.

   The Memory page appears.
   The Memory page displays details for the following:

   - Advanced Memory Protection (AMP)
   - Memory Summary
   - Physical Memory

2. (Optional) By default, empty memory slots are hidden in the Physical Memory table. To view empty memory slots, click show empty memory slots. When empty memory slots are displayed, click hide empty memory slots to hide them.

   This option is not displayed if there are no empty slots.

3. (Optional) To sort by a table column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

4. (Optional) To view additional memory details, select a memory module.

   The Memory Details pane is displayed.

Subtopics

Advanced Memory Protection details

Advanced memory protection is available only in supported platforms.

AMP Mode Status

The status of the AMP subsystem.

- Other/Unknown—The system does not support AMP, or the management software cannot determine the status.
- Not Protected—The system supports AMP, but the feature is disabled.
- Protected—The system supports AMP. The feature is enabled but not engaged.
- Degraded—The system was protected, but AMP is engaged. Therefore, AMP is no longer available.
- DIMM ECC—The system is protected by DIMM ECC only.
- Mirroring—The system is protected by AMP in the mirrored mode. No DIMM faults have been detected.
- Degraded Mirroring—The system is protected by AMP in the mirrored mode. One or more DIMM faults have been detected.
- On-line Spare—The system is protected by AMP in the hot spare mode. No DIMM faults have been detected.
- Degraded On-line Spare—The system is protected by AMP in the hot spare mode. One or more DIMM faults have been detected.
- RAID-XOR—The system is protected by AMP in the XOR memory mode. No DIMM faults have been detected.
- Degraded RAID-XOR—The system is protected by AMP in the XOR memory mode. One or more DIMM faults have been detected.
- Advanced ECC—The system is protected by AMP in the Advanced ECC mode.
- Degraded Advanced ECC—The system is protected by AMP in the Advanced ECC mode. One or more DIMM faults have been detected.

- LockStep—The system is protected by AMP in the LockStep mode.
- Degraded LockStep—The system is protected by AMP in the LockStep mode. One or more DIMM faults have been detected.
- A3DC—The system is protected by AMP in the A3DC mode.
- Degraded A3DC—The system is protected by AMP in the A3DC mode. One or more DIMM faults have been detected.

Configured AMP Mode

The active AMP mode. The following modes are supported:

- None/Unknown—The management software cannot determine the AMP fault tolerance, or the system is not configured for AMP.
- On-line Spare—A single spare bank of memory is set aside at boot time. If enough ECC errors occur, the spare memory is activated and the memory that is experiencing the errors is disabled.
- Mirroring—The system is configured for mirrored memory protection. All memory banks are duplicated in mirrored memory, as opposed to only one for online spare memory. If enough ECC errors occur, the spare memory is activated and the memory that is experiencing the errors is disabled.
- RAID-XOR—The system is configured for AMP with the XOR engine.
- Advanced ECC—The system is configured for AMP with the Advanced ECC engine.
- LockStep—The system is configured for AMP with the LockStep engine.
- Online Spare (Rank Sparing)—The system is configured for Online Spare Rank AMP.
- Online Spare (Channel Sparing)—The system is configured for Online Spare Channel AMP.
- Intersocket Mirroring—The system is configured for mirrored intersocket AMP between the memory of two processors or boards.
- Intrasocket Mirroring—The system is configured for mirrored intrasocket AMP between the memory of a single processor or board.
- A3DC—The system is configured for AMP with the A3DC engine.

Supported AMP Modes

- RAID-XOR—The system can be configured for AMP using the XOR engine.
- Dual Board Mirroring—The system can be configured for mirrored advanced memory protection in a dual memory board configuration. The mirrored memory can be swapped with memory on the same memory board or with memory on the second memory board.
- Single Board Mirroring—The system can be configured for mirrored advanced memory protection in a single memory board.
- Advanced ECC—The system can be configured for Advanced ECC.
- Mirroring—The system can be configured for mirrored AMP.
- On-line Spare—The system can be configured for online spare AMP.
- LockStep—The system can be configured for LockStep AMP.
- Online Spare (Rank Sparing)—The system can be configured for Online Spare Rank AMP.
- Online Spare (Channel Sparing)—The system can be configured for Online Spare Channel AMP.
- Intersocket Mirroring—The system can be configured for mirrored intersocket AMP between the memory of two processors or boards.
- Intrasocket Mirroring—The system can be configured for mirrored intrasocket AMP between the memory of a single processor or board.
- A3DC—The system can be configured for A3DC AMP.
- None—The system cannot be configured for AMP.

For more information about configuring AMP, see **UEFI System Utilities User Guide for HPE Compute servers** .

Memory Summary

The Memory Summary section shows a summary of the memory that was installed and operational at POST.

Location

The slot or processor on which the memory board, cartridge, or riser is installed. Possible values follow:

- System Board—There is no separate memory board slot. All DIMMs are installed on the motherboard.
- Board <Number>—There is a memory board slot available. All DIMMs are installed on the memory board.
- Processor <Number>—The processor on which the memory DIMMs are installed.
- Riser <Number>—The riser on which the memory DIMMs are installed.

Memory Type

The type of memory

Total Memory Slots

The number of memory module slots.

Total Memory

The capacity of the memory, including memory recognized by the OS and memory used for spare, mirrored, or XOR configurations.

Operating Frequency

The frequency at which the memory operates.

Physical Memory Details

The Physical Memory Details section shows the physical memory modules on the host that were installed and operational at POST. Unpopulated module positions are also listed. Various resilient memory configurations can change the actual memory inventory from what was sampled at POST. In systems that have a high number of memory modules, all module positions might not be listed.

Socket Locator

The slot or processor on which the memory module is installed.

State

The current physical memory state. The possible values are Absent and Enabled.

Health

The memory module status and whether the module is in use. The possible values are OK, Warning, Critical, and Unknown.

Size

The memory module size.

Max Supported Frequency

The maximum frequency supported by the memory module.

Technology

The memory module technology. Possible values follow:

- Unknown—Memory technology cannot be determined.
- N/A—Memory module not present.
- SDRAM (Synchronous DRAM)

- RDIMM (Registered memory module)
- UDIMM (Unregistered memory module)
- LRDIMM (Load-reduced memory module)

Subtopics

Memory Details pane (physical memory)

Memory Details pane (physical memory)

Manufacturer

The memory module manufacturer.

Part Number

The memory module part number.

This value is displayed only for HPE memory modules.

Serial Number

The memory module serial number.

This value is not displayed for empty memory slots.

Type

The type of memory installed. Possible values follow:

- Other—Memory type cannot be determined.
- Board—Memory module is permanently mounted (not modular) on a system board or memory expansion board.
- DDR5
- N/A—Memory module is not present.

Ranks

The number of ranks in the memory module.

Error Correction

The type of error correction used by the memory module.

Data Width Bits

The memory module data width in bits.

Bus Width Bits

The memory module bus width in bits.

Channel

The channel number in which the memory module is connected.

Memory Controller

The memory controller number.

CPU Socket

The memory module socket number.

Memory Slot

The memory module slot number.

State

The memory state.

Vendor

The memory vendor name. If the vendor name is not available, the value N/A is displayed.

Vendor ID

The memory vendor ID.

Armed

The current backup-ready status of the NVDIMM-N, if available.

Last Operation

The status of the last operation (NVDIMMs only).

Media Life

The percentage of media life left (NVDIMMs only).

Network Adapters

About this task

To view a full set of data on this page, ensure that AMS is installed and running. The server IP address, add in network adapters, and the server NIC status are displayed only if AMS is installed and running on the server.

Subtopics

Viewing Network details

Viewing Network details

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.

2. Click Network.

   The Network page appears and the available network adapter details are displayed.

3. Click a network adapter.

   The network adapter page appears with the following details:

   - Overview
   - Ports
   - Device Functions
   - Ethernet Interfaces
   - Metrics

Subtopics

Network details options

Network details options

Overview

The following information is displayed on the Overview section:

- State—The state of the adapter
- Health—The health of the adapter
- Location—The location of the adapter on the system board
- Part Number—NIC part number
- Firmware Version—The version of the installed adapter firmware, if applicable. This value is displayed for system NICs (embedded and stand-up) only
- Model—The model of the NIC
- Manufacturer—The manufacturer of the NIC
- Serial Number—The serial number of the NIC
- Number of Device Functions—The number of device functions connected to the network
- Number of Ports—The number of ports connected to the network

Click View All Properties to view more information of the adapters including the Controller details.

NOTE

If bifurcation is enabled on the network adapter, then the network page does not show the State, Health, and Location of the network adapter. For information on the adapter's state, health, and location, see the Device Inventory and Firmware Inventory page.

Ports

The configured network port. This value is displayed for system NICs (embedded and stand-up) only

For Ethernet:

- Port—The name of the port
- LLDP Enabled—Enable or disable LLDP for this port
- MAC Address—The port MAC address
- Link State—The port link state
- Link Status—The port link status
- State—The state of the port
- Health—The health of the port

For Fiber Channel:

- Port—The name of the port
- EEE Enabled —Enable or disable EEE for this port
- World Wide Name—The port World Wide Name
- Fabric Name—The port Fabric Name
- Link State—The port link state
- Link Status—The port link status
- State—The state of the port

- Health—The health of the Port

Click the Port to view the corresponding port details pane.

Device Functions

Depending on the device function, the following details are displayed:

For Ethernet, iSCSI, and FCoE:

- Id—Device function name
- State—The state of the device function
- Health—The health of the device function
- Device Technology—The configured capability of the device function
- Associated Ports— The associated ports of the device function
- MAC Address—The device function MAC address
- Boot Mode—The boot mode of the device function

> **NOTE**
> For base networks, network device function will not be available.

For Fibre Channel:

- Id—Device function name
- State—The state of the device function
- Health—The health of the device function
- Device Technology—The configured capability of the device function
- Associated Ports—The associated ports of the device function
- World Wide Node Name— The device function World Wide Node Name

  If Infiniband is configured for Device Technology, Node GUID is displayed.
- Boot Mode—The boot mode of the device function

Click Device Functions to view the corresponding device details pane.

Ethernet Interfaces

The following Ethernet details are displayed:

- Name—The name of the interface
- State—The state of the interface
- Health—The health of the interface
- IPv4 Address—For System NICs (embedded and stand-up), the server IP address (if available).
- IPv6 Address—For System NICs (embedded and stand-up), the server IP address (if available).
- Link Status—The interface link status
- MAC Address—The interface MAC address
- Team/Bridge— If a port is configured for NIC teaming, the name of the configured link between the physical ports that form a logical network adapter. This value is displayed for system NICs (embedded and stand-up) only.

Click the Ethernet Interface to view the corresponding Ethernet interface details pane.

NOTE

iLO does not display the IPv4 Address, IPv6 Address. and Team/Bridge details assigned to the network adapter ports for MCTP PLDM RDE-based network adapters.

Metrics

The network adapter metrics show usage and health statistics for a network adapter.

Viewing GPUs information

About this task

The GPUs page displays the available GPUs and a summary of the GPUs

Procedure

Click Host in the left navigation pane and click Hardware > GPUs.

The GPUs page appears.

Subtopics

GPUs details

GPUs details

The following information is displayed for each GPU:

- Manufacturer—The name of the manufacturer.
- Name—The name of the GPU.
- Model—The GPU model.
- State—The current state of the GPU.
- Health—The health status of the GPU.
- Part Number—The part number of GPU.
- Serial Number—The serial number of the GPU.

Viewing the device inventory

About this task

The Device Inventory page displays information about devices installed in the server. Some examples of the devices listed on this page include installed adapters, PCI devices, SATA controllers, and Smart Storage batteries.

If the server is powered off, the health status information on this page is current as of the last power on. Health information is updated only when the server is powered on and POST is complete.

For older adapters that do not comply with industry-standard management specifications, the Agentless Management Service (AMS) is required for obtaining the adapter firmware version, part number, serial number, and status.

Redfish DeviceDiscovery must reach `vMainDeviceDiscoveryComplete` state to display device inventory after host or iLO reboot.

For adapters that support the Field Replaceable Unit (FRU) EEPROM, iLO obtains static adapter details such as the product name and part number. These values are formatted according to the IPMI Platform Management FRU Information Storage Definition specification.

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.

2. Click Device Inventory.

   The Device Inventory page appears.

3. (Optional) By default, empty slots are hidden in the Device Inventory table. To view empty slots, click show empty slots. When empty slots are displayed, click hide empty slots to hide them.

   This option is not displayed if there are no empty slots.

4. (Optional) To sort by a table column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

5. (Optional) To view additional slot details, click a device in the table.

   The Slot Details pane is displayed.

Subtopics

Device Inventory details

- MCTP Discovery—Whether this feature is enabled or disabled for the server.
- Location—The device install location.

  If network or storage adapter is installed on the OCP slot, iLO displays the OCP device location details as OCP Slot A and OCP Slot B but the device populates the location details as `Slot <number>`.

- Product Name—The device product name.

  Typically, iLO obtains this value from the FRU EEPROM (Product Info Area Format region, Product Name value).

  For some adapters, this value is obtained through a proprietary adapter interface.

- Product Version—The device product version.

  Typically, iLO obtains this value from the FRU EEPROM (Product Info Area Format region, Product Version value).

  For some adapters, this value is obtained through a proprietary adapter interface.

- Firmware Version—The installed adapter firmware version.

  There are multiple methods iLO can use to obtain this adapter-specific information.

  For adapters that support the UEFI Device Driver interfaces, UEFI is the primary method for obtaining this value.

- Component Integrity Status—The SPDM authentication status of the device.
- State—The device state.

The value Absent might mean that:

- iLO has not completed initialization for the device.
- The device is not capable of providing status (for example, legacy chipset SAS/SATA controllers).
- Agentless Management and the Agentless Management Service do not provide information about this device.

For information about network adapter unknown status values, see the Network page documentation.

For information about storage device unknown status values, see the Storage page documentation.

- Health—The health of the device.

Slot details pane

When you click a row in the Device Inventory table, more information is displayed in the Slot Details pane.

The displayed values depend on the selected device type. Some device types do not display all the listed values.

- SKU Number—The adapter vendor's primary part number.

  Typically, iLO obtains this value from the FRU EEPROM (Product Info Area Format region, Product Part/Model Number value).

  Various is displayed when the part number depends on internal graphics devices that differ by server model.

  N/A is displayed for backplanes connected to storage controllers.

  NOTE

  - The SKU number on the Device Inventory page for the Network Controller may not match the SKU number on the Network page.
  - Downstream UBMs will not show the SKU Number, Part Number, and Serial Number in the Device Inventory page.

- Part Number—The adapter vendor's spare part number (if available).

  If the adapter vendor's spare part number is not available, iLO obtains this value from the FRU EEPROM (Board Info Area Format region, Board Part Number value).

  N/A is displayed for backplanes connected to storage controllers.

- Serial Number—The adapter serial number.

  Typically, iLO obtains this value from the FRU EEPROM (Product Info Area Format region, Product Serial Number value).

  N/A is typically displayed for embedded devices.

- MCTP Status—Whether MCTP Discovery is enabled or disabled.
- Slot details
  - Type—The slot type, for example, PCIe, MXM, SATA, or another industry-standard slot type.
  - Bus Width—The slot bus width.
  - Length—The slot length.
  - Characteristics—Information about the slot, for example, voltage or other support information.

  For more information about the slot detail values, see System Slots (Type 9) in the System Management BIOS (SMBIOS) Reference Specification.

- Segment (PCIe devices only)—The PCI segment assigned by the BIOS during PCI configuration. For all other device types, FFh or N/A is displayed.
- Bus (PCIe devices only)—The PCI bus assigned by the BIOS during PCI configuration. For all other device types, FFh or N/A is displayed.
- Device (PCIe devices only)—The PCI device assigned by the BIOS during PCI configuration. For all other device types, FFh or N/A is displayed.
- Function (PCIe devices only)—The PCI function assigned by the BIOS during PCI configuration. For all other device types, FFh or N/A is displayed.
- Bifurcated Device Peer Instance —Bifurcation details of the devices which support bifurcation. Bifurcated Device Peer Instance indicates if the device is bifurcated and the instance of the bifurcation.

Device status values

The Device Inventory page uses the following status values:

- Enabled—The device is enabled and the health status is OK.
- No Supporting CPU—The CPU that supports the device slot is not installed.
- N/A—The device is not installed.
- Enabled—The device is enabled and the health status is Critical.
- Enabled—The device is enabled and the health status is Warning.
- Unknown—The iLO firmware has not received data about the device status.
- Disabled—The device is disabled.
- Not Supported—Device does not support Security Protocol and Data Model (SPDM) authentication.
- Success—SPDM authentication of the device is successful.
- Failed—SPDM authentication of the device has failed.

Configuring MCTP discovery

Prerequisites

Configure iLO Settings privilege

About this task

MCTP is the industry standard technology iLO uses to communicate directly to options installed in the server. MCTP discovery is enabled by default. For troubleshooting of a problematic option, you can disable MCTP discovery for a server or an individual adapter. For example, if an adapter is not working, you could temporarily disable MCTP discovery to allow server operations to continue while you investigate the problem. When you disable MCTP discovery, the only way to enable it again is to perform an MCTP factory reset. An MCTP factory reset enables MCTP discovery on the server and all adapter slots.

For information on configuring PCIe MCTP options using UEFI System Utilities, see **UEFI System Utilities User Guide for HPE Compute servers**.

Disabling MCTP discovery for the server automatically disables it for all adapter slots.

Hewlett Packard Enterprise recommends that you do not disable MCTP discovery unless this action is recommended by support personnel.

WARNING

- If you disable MCTP discovery on a server managed by HPE OneView, disabled devices will be inaccessible to HPE OneView.
- If MCTP discovery is diabled, firmware updates initiated through HPE Compute Ops Management will fail.
- When MCTP discovery is disabled, for a server, iLO does not monitor or display status information for the following components: Embedded NICs, Smart Array, memory, CPU, and option adapters.
- When MCTP discovery is disabled, the Performance Settings, Performance Monitoring, and Workload Performance Advisor pages are unavailable.

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.
2. Click Device Inventory.

   The Device Inventory page appears.
3. Click Discovery Settings.

   The Discovery Settings window appears.
4. To disable MCTP discovery for the server and all adapter slots, set MCTP Discovery to disabled.
5. To disable MCTP discovery on selected adapter slots, set one or more MCTP options in the Devices table to disabled.
6. Click Update to save the changes.
7. Click MCTP Factory Reset to factory reset the settings.

   iLO notifies you that an MCTP factory reset is required to re-enable MCTP discovery.
8. Click Cancel to cancel the operation.
9. Click ✕ to close the Discovery Settings

Initiating an MCTP factory reset

Prerequisites

Configure iLO Settings privilege

About this task

If MCTP discovery is disabled for a server or the adapter slots in a server, the only way to re-enable it is to perform an MCTP factory reset. This procedure does not reset iLO or the server.

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.
2. Click Device Inventory.

   The Device Inventory page appears.

3. Click Discovery Settings.

   The Discovery Settings window appears.

4. Click MCTP Factory Reset.

   iLO warns you that an MCTP factory reset will enable MCTP on all devices, and prompts you to confirm the request.

5. Click Update.

   An MCTP factory reset is initiated.

   When the process is complete, MCTP discovery is enabled on all devices.

Viewing storage details

About this task

If the server is powered off, the system status information on the Storage page is current as of the last power off. Status information is updated only when the server is powered on and POST is complete.

To view a full set of data on the Storage page, ensure that AMS is installed and running. SAS/SATA controller information is displayed only if AMS is installed and running on the server.

The information displayed on this page depends on your storage configuration. Some storage configurations will not display information for every category.

Redfish DeviceDiscovery must reach `vMainDeviceDiscoveryComplete` state to display device inventory after host or iLO reboot.

Fiber Channel adapters are not listed on this page. To view information about fiber Channel adapters, click Host in the left navigation pane and click Network.

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.

2. Click Storage in the Hardware page.

   The Storage page appears.

3. (Optional) To view component details, click a listed component from the Entity table.

   Details pane opens and displays additional information.

   > **NOTE**
   >
   > Language translation capability is not applicable to the details pane.

4. (Optional) To change the physical drive indicator LED status for an NVMe or SATA drive, use the toggle button.

   This feature is available on supported servers only.

   The Configure iLO Settings privilege is required to use this feature.

   You can change the LED status to ON or OFF.

5. (Optional) To power an NVMe or SATA drive on or off, use the Drive Power Button feature.

   This feature is available on supported servers only.

   The Configure iLO Settings privilege is required to use this feature.

Subtopics

Storage details

The Storage page displays the following details about Smart Array and direct-attached storage.

NOTE

The information displayed depends on the storage type. Some storage types do not include all the listed properties.

Supported storage components

The Storage page displays the Entity, Count, and Health Summary information about the following storage components:

- Storage Controllers, Volumes, Storage Enclosures, Drives, Switches, and Ports.

  iLO can monitor 256 physical drives total and 256 volumes total.

- Hewlett Packard Enterprise and third-party storage controllers that manage direct-attached storage, and the attached physical drives.

  The following direct-attached storage types are supported: SATA, NVMe, and RDE-enabled devices. The information displayed depends on the storage type.

  NOTE

  Direct-attached NVMe or EDSSF Drives are listed only under Drives.

Supported storage products

- HPE ML/DL Server M.2 SSD Enablement Kit
- HPE Dual 8GB MicroSD EM USB Kit (Windows only)
- NVMe drives
- HPE MR416i-p Gen11 Controller
- HPE MR416i-o Gen11 Controller
- HPE MR408i-o Gen11 Controller
- HPE MR216i-p Gen11 Controller
- HPE MR216i-o Gen11 Controller
- Intel VROC 9.0

- M.2 SSD Enablement Kit
- Dual 8GB MicroSD EM USB Kit (Windows only)
- NVMe drives
- NS204i-u Boot Controller
- NS204i-d Boot Controller

Subtopics

Status values and definitions

Status values and definitions

The possible health values are:

- OK — Indicates Normal
- Critical — A critical condition exists that requires immediate attention.
- Warning — A condition exists that requires attention.

The possible state values are:

- Enabled — The device is enabled.
- Disabled — The device is disabled.
- In Test — The device is undergoing testing.
- Quiesced — The device is enabled but processes only a restricted set of command.
- Standby Offline — The device is enabled, but awaiting an external action to activate it.
- Standby Spare — The device is part of a redundancy set and is awaiting a failover or other external action to activate it.
- Starting — The device is starting.
- Unavailable Offline — The device is present but cannot be used.
- Updating — The device is updating and may be unavailable or degraded.
- Absent — The device is not present or not detected.
- Deferring — The device will not process any commands but will queue new requests.

Storage controllers

The Storage Controllers section displays the following details for each controller:

- Name
- Location—The controller location in the server.
- State— A combination of the controller hardware health and the current state of the controller. The displayed value indicates a status icon (OK, Critical, or Warning), and text that provide more information.

  For more information on health and current state values and definitions, see Status values and definitions.
- Health

- Firmware Version
- Encryption Mode
- Enclosures
- Volumes
- Drives

Click a controller name to view the Details pane. Also, the Metrics and Volumes details appears.

Volumes

The Volumes section displays the following details for each volume:

- Name
- Location
- State
- Health
- Capacity
- RAID Type
- Drives
- Encrypted

To Create Volume see Creating a volume section.

Enclosure chassis

The Enclosure Chassis section displays the following for each enclosure:

- Location
- Status
- Drives
- Total Ports

When you select an enclosure, the associated Drives, Switches, and Ports appears.

Switches

The Switches section displays the following details for each switch:

- Model
- Status
- Firmware Version

Ports

The Ports section displays the following details for each port:

- Port Number
- Location
- Status
- Current Speed
- Active Width

NOTE

The Maximum link rate per lane (GT/s) mentioned in the Drive back-plane naming convention is different from the Current Speed or Max Speed displayed for Ports.

Volumes

The Volumes section displays the following details for each volume.

- Name
- Location
- State
- Health
- Capacity
- RAID Type
- Drives
- Encrypted

Volumes must be configured before they can be displayed on this page.

When you select a volume, the Details pane opens and displays more information. Also, the associated Drives appears.

Subtopics

Creating a volume

About this task

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.

2. Click Storage in the Hardware page.

   The Storage page appears.

3. Click Volumes on the Storage page.

   The Volumes page appears.

4. Click + Create Volume.

   The Create Volume window appears.

5. Specify the following information:

   - Storage Controller
   - RAID Type

- Drives
- Display Name
- Capacity & Unit
- Strip Size Bytes
- Read Cache Policy
- Write Cache Policy

6. Click Create to create the volume.
7. Click Cancel to cancel the operation.
8. Click ✕ to close the window.

Deleting a volume

About this task

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.
2. Click Storage in the Hardware page.

   The Storage page appears.
3. Click Volumes on the Volumes page.

   The Volumes page appears.
4. Select a volume that you want to remove.

   The selected volume page appears.
5. Click Delete Volume.

   A confirmation window appears.
6. Click Delete to delete the volume.
7. Click Cancel to cancel the operation.

Storage Enclosures

The Storage Enclosures section displays the following details for each enclosure. The enclosure information is available based on the controller capability to share the details of the enclosure.

- Name
- Location—The enclosure port and box numbers.
- Status— For more information on health and current state values and definitions, see Status values and definitions.
- Type

- Switches

Some enclosures do not include all the listed properties, and some storage configurations do not include drive enclosures.

When you select an enclosure, the Details pane opens and displays more information. Also, the associated Drives appears.

Drives

The Drives section displays the following details for each drive.

- Name
- State
- Health
- Capacity Bytes
- Durable Name
- Durable Name Format
- EUI
- Model
- Protocol
- Serial Number
- Media Type
- Predicted Media Life Left Percent
- Location Type
- Location

When you select a drive, the Details pane opens and displays more information.

The Details pane also displays the following details about the selected drive.

- Location Indicator Active —The LED status (on or off). Use the toggle button to change the LED status. This feature is available on NVMe and SATA drives.
- Toggle LED—The configure iLO Settings privilege is required to use this feature.
- Drive Power—The current drive power state (ON, Off, Starting).
- Force Power Off—You can use the Power On or Power Off buttons to control Drive Power for NVMe.
- Multipath
- False
- Drive Form Factor
- Firmware Version
- Failure Predicted
- Status Indicator
- Hotspare Type
- Encryption Ability

- Encryption Status—The drive encryption status.
  - Unencrypted—The drive is not currently encrypted.
  - Unlocked—The drive is currently encrypted but the data is accessible to the user in unencrypted form.
- WriteCache Enabled
- Capable Speed Gbs
- Negotiated Speed Gbs
- Slot Capable Protocols

Subtopics

Managing drive power

Managing drive power

Prerequisites

- Configure iLO Settings privilege
- iLO

About this task

When you select a supported drive, the Drive Power Button section in the Details pane displays the current drive power state. The possible values are ON, OFF, and Starting.

You can use the Drive Power Button options to power a drive on or off.

The power off option works only with supported drive firmware.

For the list of compatible drives, see **https://ssd.hpe.com/recommendation**.

The power on option (hot-plug) is not supported on standard IDE controllers. Cold boot the system to recover the drive. See the drive specifications to determine whether a drive supports these power reset features.

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.

2. Click Storage.

   The Storage page appears.

3. Click Drives

   The Drives page appears.

4. Select a drive.

   The Details pane opens.

5. Click the Power On or Power Off button.

6. When prompted to confirm the request, click OK.

Subtopics

Drive power button options

Drive power button options

- Force Power On—Power on the drive immediately.
- Force Power Off—Power off the drive immediately. Using this option results in a nongraceful shutdown.

Viewing and managing firmware and software

Subtopics

Firmware updates

Firmware updates enhance server and iLO functionality with new features, improvements, and security updates.

You can update firmware by using an online or offline firmware update method.

Subtopics

Online firmware update

When you use an online method to update firmware, you can perform the update without shutting down the server operating system. Online firmware updates can be performed in-band or out-of-band.

In-band

Firmware is sent to iLO from the server host operating system.

Virtual NIC drives are required for in-band firmware updates. For more information see, Using iLO on the host

When iLO is configured to Secure Standard, FIPS, or CNSA security states, user credentials are required.

Out-of-band

Firmware is sent to iLO over a network connection. Users with the Configure iLO Settings privilege can update firmware by using an out-of-band method.

Subtopics

In-band firmware update methods

Online ROM Flash Component

1. To flash the firmware package, download RESEFUL Interface Tool (iLORest) v. 6.x.0 or later.
2. Download the firmware package and the corresponding json file, if available, to the same location

   For example,

   ```
   ilorest flashfwpkg <file_name.fwpkg>--url<iLO7_IP_Address>-u<iLO7_username>-p<iLO7_password>
   ```

   or
   localhost OS example,

   ```
   ilorest flashfwpkd<file_name.fwpkg>-u<iLO7_username>-p<iLO7_password>
   ```

   The firmware package can also be insalled with Smart Update Manager v 12.0.0. or later.

Out-of-band firmware update methods

iLO web interface

Download a supported firmware file and install it by using the iLO web interface.

iLO RESTful API

Use the iLO RESTful API and a REST client such as the RESTful Interface Tool to update firmware.

iLO firmware and software management features

iLO supports the following firmware and software management features:

- Viewing installed firmware.
- Using the Update Firmware controls to install firmware on the local managed server.

  You can also use the Update Firmware controls to install an iLO language pack.
- Viewing installed software.
- Managing maintenance windows. You can apply maintenance windows to tasks that you add to the installation queue.
- Accessing the iLO with integrated Smart Update features. This version of iLO supports the following actions:
  - View and manage the components in the iLO Repository.
  - Add components from the iLO Repository to the installation queue.
  - View and remove install sets and add them to the installation queue.

    Use SUM to configure install sets. For more information, see the SUM documentation.
  - View the System Recovery Set.
  - View and manage tasks in the installation queue.

The best practice is to use SUM to manage the installation queue. For more information, see the SUM documentation.

Viewing installed firmware details

Procedure

1. Click Firmware in the left navigation pane and click Firmware Inventory.

   The Firmware Inventory page appears and displays the firmware information for various server components.

   If the server is powered off, the information on this page is current as of the last power off. Firmware information is updated only when the server is powered on and POST is complete.

   NOTE

   If a component is updated through a host system, then you have to reset iLO or the host to view the updated firmware.

2. (Optional) To sort the firmware list by column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

3. (Optional) To search for firmware, enter the firmware name in the search text box in the column heading next to Firmware Name.

Subtopics

Firmware types

The firmware types listed on the Firmware Inventory page vary based on the server or chassis model and configuration.

The firmware types listed on the Firmware Inventory page vary based on the server model and configuration.

For most servers, the system ROM and iLO firmware are listed. Some of the other possible firmware options include the following:

- Storage and network controllers
- Various Programmable logic devices
- Drive Firmware
- TPM or TM firmware
- Power supply firmware

Firmware details

The Firmware List page displays the following information for each listed firmware type:

- Firmware Name—The name of the firmware.
- Firmware Version—The version of the firmware.
- Location—The location of the component that uses the listed firmware.

Updating iLO or server firmware

Prerequisites

- The Configure iLO Settings privilege is required for updating firmware and storing components in the iLO Repository.
- The Recovery Set privilege is required for making an optional update to the System Recovery Set after a successful firmware update.
- If you want to use the Update Recovery Set feature, a System Recovery Set must exist and contain the component you want to update.

About this task

You can update the firmware from any network client using the iLO web interface. A signed file is required.

> **IMPORTANT**
>
> Update Firmware option does not work for firmware packages which must be updated using UEFI or Runtime Agent.
>
> To update such packages using iLO, you must add the packages to the iLO repository using the Also store in iLO Repository option. The packages are automatically picked up for installation during POST.

Procedure

1. Obtain a server firmware or iLO firmware file.
2. Click Firmware in the left navigation pane and click Firmware Inventory > Update Firmware or click Firmware > Update Firmware from the Quick Actions menu.

   If the Update Firmware option is not displayed, click the ellipsis icon in the top-right corner of Firmware page.

   The Update Firmware window appears.
3. Select the Local file or Remote file option.
4. Depending on the option you selected, do one of the following:
   - Depending on the browser you use, click Browse or Choose File in the Local file field, and then specify the location of the firmware component (`.fwpkg`).

     You can download the firmware from **HPESC**.
   - In the Remote file URL field, enter the URL for a firmware component on an accessible web server.

   a. (Optional) To enable Enhanced Download Performance, click in the Firmware Settings option.

   The Firmware Settings pop-up window appears. You can edit the settings on the Firmware Settings window.

   For more information on the option, see the help on the Firmware Settings page.
5. (Optional) To save a copy of the component to the iLO Repository, select the Also store in iLO Repository check box.
6. (Optional) If a version of the component you selected in step 6 exists in the System Recovery Set, select the Update Recovery Set check box to replace the existing component with the selected component.

   Selecting this option replaces the component, even if the version in the System Recovery Set is newer.

   If there is no System Recovery Set, or you are not assigned the required privilege for this action, then this option is not displayed.

   Also store in iLO Repository option is selected automatically when you select Update Recovery Set option since the System Recovery set is stored in the iLO Repository.
7. On servers with an installed TPM or TM, suspend or back up software that stores information on the TPM or TM, then select the Confirm TPM override check box.

Drive encryption software is an example of software that stores information on the TPM or TM.

> **CAUTION**
>
> If you use drive encryption software, suspend it before initiating a firmware update. Failure to follow these instructions might result in losing access to your data.

8. To start the update process, click Update.

   Depending on the server configuration, iLO notifies you that:

   - When you update the iLO firmware, iLO will reboot automatically.
   - Some types of server firmware might require a server reboot, but the server will not reboot automatically.

9. Click OK.

   > **IMPORTANT**
   >
   > Do not boot or reboot the server during a PLDM firmware update because this action might cause the server to go into standby mode for approximately 20 minutes before starting up.

   The iLO firmware receives, validates, and then flashes the firmware image.

   When you update the iLO firmware, iLO reboots and closes your browser connection. It might take several minutes before you can re-establish a connection.

10. For iLO firmware updates only: To start working with the new firmware, clear your browser cache, and then log in to iLO.
11. For server firmware updates only: If the firmware type requires powering on or rebooting the server or initiating a system reset take the appropriate action.
12. (Optional) To confirm that the new firmware is active, check the firmware version on the Firmware Inventory page.

    You can also check the iLO firmware version on the Dashboard.

13. Click Cancel to cancel the operation.
14. Click ✕ to close the Update Firmware window.

Subtopics

Requirements for firmware update to take effect

Depending on the firmware type, additional action might be required for the update to take effect.

- iLO firmware or language pack—These firmware types take effect after an automatically triggered iLO reset.
- System ROM (BIOS)—Requires a server reboot.
- System Programmable Logic Device (CPLD)—Requires a server reboot.

> **NOTE**
>
> A server reboot after a CPLD firmware update is converted to a server AC power cycle. iLO will reset as part of the AC power cycle.

- Power Management Controller and NVMe Backplane Firmware—Do not require a server reboot or a system reset.

The NVMe firmware version will be displayed in the iLO web interface after the next server reboot.

Supported firmware types

Many firmware update types are supported, depending on the server platform. Some common examples follow:

- iLO
- System ROM/BIOS
- Power Management Controller
- System Programmable Logic Device (CPLD)
- Backplane
- Language Packs
- Third-party firmware packages

  Platform Level Data Model (PLDM) firmware packages are supported if the Accept 3rd Party Firmware Update Packages option is enabled in the Firmware Settings.

  NOTE

  FIPS and CNSA security modes do not support the installation of third-party PLDM packages.

Some firmware types are delivered as a combined update. For example:

- A SAS Programmable Logic Device update is often combined with a SAS controller firmware update.
- The Intelligent Platform Abstraction Data firmware is often combined with a System ROM/BIOS update.

Firmware verification

The Firmware Verification feature allows you to run scheduled scans.

To respond to detected issues, you can configure iLO to:

- Log the results.
- Log the results and initiate a repair action that uses a recovery install set.

Depending on the scan results, information is logged in the Active Health System Log and the Integrated Management Log.

The following firmware types are supported:

- iLO Firmware
- System ROM (BIOS)
- System Programmable Logic Device (CPLD)

NOTE

After an iLO reset, health information for iLO and BIOS will be displayed. The health information for other supported components will be displayed after the next scan.

Hewlett Packard Enterprise recommends not to install firmware updates or upload firmware to the iLO Repository, when a firmware verification scan is in progress.

If an invalid iLO or System ROM (BIOS) firmware file is detected, the invalid file is saved to a quarantine area in the iLO Repository. You can download the invalid file to investigate its type and origin. Quarantined images are not displayed on the iLO Repository page, and you cannot select them when you use the Flash Firmware feature.

If a supported management tool is configured to listen for system recovery events, you can send a recovery event from this page.

Subtopics

Configuring the firmware verification settings

Prerequisites

- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: https://www.hpe.com/support/ilo-docs.

Procedure

1. Click Firmware in the left navigation pane and click Firmware Verification.

   Firmware Verification page appears.

2. Click Settings.

   The Scan Settings window appears.

3. Select an Integrity Failure Action.
4. Set the Scan Interval in days.

   Valid values are from 1 to 365 days.

5. Set Enable Background Scan to enabled or disabled status.
6. Click Update to save the settings.
7. Click Cancel to cancel the operation.
8. Click ✕ to close the Scan Settings window.

Subtopics

Firmware Verification scan options

- Integrity Failure Action—Determines the action iLO takes when a problem is found during a Firmware Verification scan.
  - To log the results, select Log Only.
  - To log the results and initiate a repair action, select Log and Repair Automatically.

If a problem is detected for a supported firmware type, iLO checks for the affected firmware type in a protected install set. By default, this set is the Recovery Set. If a firmware image is available, iLO flashes that firmware image to complete the repair.

If your Downgrade Policy is set to Downgrade requires Recovery set privilege the automatic recovery for BIOS/ iLO/CPLD will fail. This is an expected behavior. The recovery must be done manually after logging in as a user who has Recovery set privilege.

- Scan Interval (in days)—Sets the background scan frequency in days. Valid values are from 1 to 365.
- Enable Background Scan—Enables or disables firmware verification scanning. When enabled, iLO scans the supported installed firmware for file corruption.

Update Service access settings options

Downgrade Policy

Specifies how iLO handles requests to downgrade any of the firmware types that you can update through iLO.

A license is required to use this feature. If a license that supports this feature is not installed, this option is not displayed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Choose from the following values:

- Allow downgrades (default)—Any user with the Configure iLO Settings privilege can downgrade firmware.
- Downgrade requires Recovery Set privilege—Only a user with the Configure iLO Settings and Recovery Set privileges can downgrade firmware.
- Permanently disallow downgrades—No user can downgrade firmware.

> **CAUTION**
> Configuring this setting makes a permanent change to iLO. After you configure iLO to permanently disallow downgrades, you cannot reconfigure this setting through any iLO interface or utility. Setting iLO to the factory default settings will not reset this value.

Accept 3rd Party Firmware Update Packages

Specifies whether iLO will accept third-party firmware update packages that are not digitally signed. Platform Level Data Model (PLDM) firmware packages are supported.

This setting is disabled by default.

Viewing firmware health status

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

Click Firmware in the left navigation pane and click Firmware Verification.

Firmware Verification page appears.
The firmware status details are displayed in the page.

Subtopics

Firmware health status details

The following information is displayed for each supported firmware type.

Firmware Name

The name of the installed firmware.

Firmware Version

The firmware version.

Health

The firmware health status.

State

The firmware status. The possible values follow:

- Enabled—The firmware is verified and enabled.
- Scanning—A firmware verification scan is in progress or is about to start.
- Flashing—A firmware update is in progress.
- Failed/Offline—The firmware could not be verified and was not repaired.

Recovery Set Version

The version of the firmware in the System Recovery Set.

If this firmware type is not in the System Recovery Set, or there is no System Recovery set, Not present is displayed.

Viewing quarantined firmware

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

Click Firmware in the left navigation pane and click Firmware Verification.

Quarantined firmware files are listed in the Quarantine section.

If there are no quarantined files, the message `There are no items under quarantine` is displayed.

Subtopics

Quarantined firmware details

The Quarantine section displays the following information about invalid firmware files.

Name

The name of the invalid firmware file.

Created

The invalid file creation date.

Size

The invalid file size.

Individual quarantined file details

When you click a file in the list, the following details are displayed:

- Name—The name of quarantined file.
- Created—The invalid file creation date.
- Size—The invalid file size.

Downloading quarantined firmware

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

About this task

If a file is saved to the quarantine area in the iLO Repository, you can download the file for offline analysis.

Procedure

1. Click Firmware in the left navigation pane, and click Firmware Verification.

   Firmware Verification page appears.

2. In the Quarantine section, select the file you want to download and click Actions > Download Firmware.

   A status message displays the download progress.

3. Follow the browser instructions to save or open the file.

Deleting quarantined firmware

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

1. Click Firmware in the left navigation pane, and click Firmware Verification.

Firmware Verification page appears.

2. In the Quarantine section, select the file you want to delete and click Actions > Remove Firmware.

   iLO prompts you to confirm the request.

3. Click Yes, remove.

Initiating a full system recovery

Prerequisites

- Configure iLO Settings privilege
- Virtual Media privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.
- A System Recovery Set exists in the iLO Repository.
- A supported management tool (such as iLO Amplifier Pack 1.15 or later) is configured to manage the server.
- A supported management tool is configured to manage the server.

About this task

You can use iLO to generate a recovery event that triggers a separate management tool to initiate a full system recovery. Recovery involves installation of the System Recovery Set followed by reimaging the server operating system.

> **CAUTION**
> Reimaging a server might cause the loss of existing data.

Procedure

1. Click Firmware in the left navigation pane, and click Firmware Verification.

   Firmware Verification page appears.

2. Click Send Recovery Event.

3. In the Send Recovery Event pane, select the Yes, generate a recovery event check box, and then click Send Recovery Event.

   The recovery event is sent to the management tool that is configured to listen for recovery events.

   If the event was sent successfully, the following informational event is logged in the IML:

   `Firmware recovery is requested by Administrator.`

Running a firmware verification scan

Prerequisites

- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

1. Click Firmware in the left navigation pane and click Firmware Verification.

   Firmware Verification page appears.

2. Click Run Scan in the Firmware Verification page.

   The scan results are displayed at the top of the page.

   If a failure occurred, the firmware state on the Firmware Verification page changes to Failed/Offline, the System Health status changes to Critical, and an event is recorded in the IML. If the firmware verification scan feature is configured to Log and Repair Automatically, the failed firmware is flashed. If successful, the firmware state and System Health status are updated, and the IML event changes to Repaired status.

   If automatic repair is not configured, you must complete the repair manually.

   CAUTION

   When the firmware scan setting is set to Log only mode, Hewlett Packard Enterprise recommends not to perform an iLO reset while iLO is in a corrupted state. For more information about troubleshooting, see **iLO Troubleshooting Guide**.

   NOTE

   - When a firmware verification scan is in progress, you cannot install firmware updates or upload firmware to the iLO Repository.
   - If firmware scans are set to Log only and a scan fails, manually flashing iLO will restore it, but the Last Scan status will be displayed as Failed. The status will clear after a manual scan or when iLO automatically re-scan based on the scheduled scan settings.

Viewing Software details

Prerequisites

To display a complete set of data on this page, AMS must be installed, configured, and running.

Procedure

1. Click Host in the left navigation pane and click Software.

   The Software page appears.

2. (Optional) To sort by a table column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

Subtopics

HPE Software details Product-related software details

The Software Inventory table lists all the HPE software on the managed server. The list includes Hewlett Packard Enterprise and Hewlett Packard Enterprise-recommended third-party software that was added manually or by using the SPP.

This section lists all the product-related software on the managed server.

- Name—The name of the software.
- Version—The software version.

  The versions of the displayed firmware components indicate the firmware versions available in the firmware flash components that are saved on the local OS. The displayed version might not match the firmware running on the server.
- Description—The description of the software installed.
- Manufacturer—The name of software manufacturer.

Running Software details

This section lists all the software that is running or available to run on the managed server.

- Name—The name of the software.
- Path—The file path of the software.

Installed Software details

The Installed Software list displays the name of each installed software program.

Maintenance Window

A maintenance window is a configured time period that applies to an installation task.

You can create a maintenance window:

- On the Maintenance Window page.
- When you add a task to the installation queue.

Subtopics

Viewing maintenance windows

Procedure

1. Click Firmware in the left navigation pane, and click Maintenance Window.

   The Maintenance Window appears.

2. (Optional) Click an individual maintenance window to view detailed information.

Subtopics

Maintenance window details

The Maintenance Window page displays the iLO Date/Time and the following details about each configured maintenance window:

- Name—The user-defined name for the maintenance window.
- Start time—The maintenance window start time (UTC).
- End time—The maintenance window end time (UTC).

Maintenance windows are automatically deleted 24 hours after they expire.

Individual Maintenance Window details

When you click an individual maintenance window, the following details are displayed:

- Name—The user-defined name for the maintenance window.
- Start—The maintenance window start time (UTC).
- End—The maintenance window end time (UTC).
- Description—A description of the maintenance window.

Adding a maintenance window

Prerequisites

Configure iLO Settings privilege

About this task

iLO supports a maximum of eight maintenance windows.

Procedure

1. Click Firmware in the left navigation pane and click Maintenance Window > Add New Window.

   iLO prompts you to enter the maintenance window information.
2. Enter a name in the Name box.
3. Enter a description in the Description box.
4. Enter the maintenance window start and end times in the From and To boxes.
   a. (Optional) Click in the From and To box.

      A calendar is displayed.

Enter the date and time based on the local time on the client that you are using to manage iLO.

The equivalent UTC value is displayed above the date and time that you entered.

If you enter a To value that occurs prior to the start time of an existing task, iLO prompts you to enter a different value. The installation queue is a first-in, first-out list of tasks, and you cannot create a maintenance window that will expire prior to an existing task will run.

5. Click Add.

   The maintenance window is added.

6. Click Cancel to cancel the operation.
7. Click ✕ to close the Add Maintenance Window.

Editing a maintenance window

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Firmware in the left navigation pane, and click Maintenance Window.

   The Maintenance Window appears.

2. Click the ellipsis icon and then click Edit next to the maintenance window that you want to edit.

   Edit Maintenance window appears.

3. Update the required changes, and click OK.

   The maintenance window is updated.

4. Click ✕ to close the Edit maintenance window.

Removing a maintenance window

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Firmware in the left navigation pane and click Maintenance Window.

   Maintenance Window appears.

2. Click the ellipsis icon and then click Delete next to the maintenance window that you want to edit.

   A confirmation window appears.

3. Click Yes, Delete to remove the maintenance window.

   The maintenance window is removed. All tasks associated with the removed maintenance window are canceled.

4. (Optional) Click Delete All If you want to remove all the maintenance windows and associated tasks.

iLO Repository

The iLO Repository is a secure storage area in the nonvolatile flash memory embedded on the system board. The nonvolatile flash memory is 1 gigabyte in size and is called the iLO NAND. Use SUM or iLO to manage signed software and firmware components in the iLO Repository.

iLO, the UEFI BIOS, SUM, and other client software can retrieve these components and apply them to supported servers. Use SUM to organize the stored components into install sets and SUM or iLO to manage the installation queue.

To learn more about how iLO, SUM, and the BIOS software work together to manage software and firmware, see the SUM documentation.

To learn more about how iLO, SUM, and the BIOS software work together to manage software and firmware, see the **SUM documentation**.

Subtopics

iLO Repository contents

The Contents section of the iLO Repository page displays the following details about each firmware or software component:

- Name
- Version
- Locked/Not locked

Subtopics

Viewing iLO Repository summary and component details

Procedure

1. Click Firmware in the left navigation pane and click iLO Repository.
2. (Optional) To view detailed component information, click an individual component.

Subtopics

iLO Repository storage details

The Summary section of the iLO Repository page displays the following details about the iLO Repository storage use:

- Capacity—Total iLO Repository storage capacity
- In use—Used storage
- Free space—Available iLO Repository storage

- Components—Number of saved components in the iLO Repository

Installing a component from the iLO Repository

Prerequisites

Configure iLO Settings privilege

About this task

You can add a component to the installation queue from the iLO Repository page.

When you add a component to the installation queue, a task is added to the end of the queue. After other queued tasks are complete, the added component is installed when the software that initiates updates for the component type detects the installation request. To determine the software that can initiate an update, check the component details on the Firmware > Installation Queue page.

If a previously queued task is waiting to start or finish, a new task might be delayed indefinitely. For example, if a queued component is installable by the UEFI BIOS, a server restart is required before the next installation can start. If the server is not restarted, the tasks that follow in the queue are delayed indefinitely.

Procedure

1. Click Firmware in the left navigation pane, and then click iLO Repository.
2. Click the ellipsis icon next to the component that you want to install, and then click Installation Queue.

   The Install Components pop up window opens and prompts you to confirm the request.

   While adding the Firmware package 2.0 from the repository to the **install queue** through iLO web interface, iLO creates multiple tasks based on the package **UpdatableBy** field values, ex, BMC, and UEFI. Then iLO creates tasks for BMC and UEFI. If there are no devices **UpdatableBy** the BMC or UEFI, either of the tasks becomes in an exception state. You must manually clear the task to execute the remaining tasks in the queue.
3. (Optional) If you want to specify an installation schedule, select the Set schedule window check box.
   a. Select a method for defining the schedule.
      - Select Use maintenance window (default) to choose a maintenance window you configured on the Maintenance Window page.

        To add a new maintenance window, click Add new maintenance window to navigate to the Maintenance Window page. Create a maintenance window, and then restart this procedure.
      - Select Specify time window to enter a schedule now.

   b. Depending on the method you selected, do one of the following:
      - If you selected Use maintenance window, select a value in the Maintenance window list.
      - If you selected Specify time window, enter the schedule details.

   On servers with an installed TPM or TM, suspend or back up software that stores information on the TPM or TM, then select the Confirm TPM override check box.
4. Click Add.

   If the installation queue is empty, and iLO can initiate the component installation, the button is labeled Yes, install now.

   The update is initiated after existing queued tasks finish and the software that initiates installation for the selected component type detects a pending installation.

If the installation queue is empty and iLO can initiate the update, the update begins immediately.

Subtopics

Scheduling time window

Scheduling time window

Prerequisites

Configure iLO Settings privilege

About this task

Use this procedure to enter the schedule when Specify Time Window is selected.

Procedure

1. Click in the From box.

   A calendar appears.

2. Select a start date and time, and then click Done.

   The selected date and time are displayed in the From box.

3. Click in the To box.

   A calendar appears.

4. Select an end date and time, and then click Done.

   This value sets the expiration date and time for the tasks in the install set.

   The selected date and time are displayed in the To box.

Adding a component to the iLO Repository

Prerequisites

- The Configure iLO Settings privilege is required for uploading files to the iLO Repository.
- The Recovery Set privilege is required for making an optional update to the System Recovery Set after you upload a file to the iLO Repository.
- If you want to use the Update Recovery Set feature, a System Recovery Set must exist and contain the component you want to update.

About this task

You can use the Upload option to add components to the iLO Repository.

Procedure

1. Click Firmware in the left navigation pane and select iLO Repository.

   The iLO Repository page appears.

2. Click Upload.

   If the browser window is a small size, and the Upload option is not displayed, click the ellipsis icon in the top right corner of the iLO web

interface, then click Upload .

The Upload to iLO iLO window appears.

3. Select the Local file or Remote file option.
4. Depending on the option you selected, do one of the following:
   - In the Local file box, click Browse or Choose File (depending on your browser), and then specify the location of the firmware component.
   - In the Remote file URL box, enter the URL for a firmware component on an accessible web server.
5. For firmware components specified by multiple files only: Select the I have a component signature file check box.
6. If you selected the check box in step 4, do one of the following:
   - In the Local signature file box, click Browse or Choose File (depending on your browser), and then specify the location of the component signature file.
   - In the Remote signature file URL box, enter the URL for a component signature file on an accessible web server.
7. (Optional) If a version of the component you selected in step 3 exists in the System Recovery Set, select the Update Recovery Set check box to replace the existing component with the selected component.

   Selecting this option replaces the component, even if the version in the System Recovery Set is newer.

   If there is no System Recovery Set, or you are not assigned the required privilege for this action, then this option is not displayed.
8. Click Upload.

   iLO notifies you that uploading a component with the same name as an existing component will replace the existing component.
9. Click OK.

   The upload starts. The upload status is displayed at the top of the iLO web interface.
10. Click ✕ to close the Upload to iLO iLO maintenance window.
11. Click Cancel to cancel the operation.

Subtopics

iLO Repository individual component details
Removing a component from the iLO Repository

iLO Repository individual component details

When you click an individual component, the following details are displayed:

- Name—Component name
- Version—Component version
- File name—Component file name
- Size—Component size
- Uploaded—Upload date and time
- Installable by—The software that can initiate an update with the component.
- In use by install set or task? —Whether the component is part of an install set or queued task.

  When a component is part of an install set or queued task, you can click the install set or task name link to view the install set details or queued task details.

Removing a component from the iLO Repository

Prerequisites

- Configure iLO Settings privilege
- The component is not in an install set.
- The component is not part of a queued task.

Procedure

1. Click Firmware in the left navigation pane, and then select iLO Repository.
2. Click the ellipsis icon next to the component that you want to remove and then click Delete.

   iLO prompts you to confirm the request.
3. Click Yes, delete.

   The component is removed.
4. (Optional) Click Delete All to remove all the components. Confirm the message when prompted.

   All the components are removed.

Install sets

An install set is a group of components that can be applied to supported servers with a single command. SUM determines what to install on a server and creates an install set that is copied to iLO. You can view existing install sets on the Install Sets page in the iLO web interface.

Saving an install set when you deploy from SUM keeps all the components on the iLO system for later use. For example, you could use the saved components to restore or roll back a component version without needing to find the original SPP.

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To learn more about how iLO, SUM, and the BIOS software work together to manage software and firmware, see the SUM documentation.

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Subtopics

Viewing install sets

Procedure

1. Click Firmware in the left navigation pane and then click Install Sets.
2. (Optional) Click an install set to view detailed information.

System Recovery Set

By default, a System Recovery Set is included with every server. User accounts with the **Recovery Set** privilege can configure this install set. Only one System Recovery Set can exist at a time.

The following firmware components are included in the default System Recovery Set for Intel servers:

- System ROM (BIOS)
- iLO firmware
- System Programmable Logic Device (CPLD)

If the default System Recovery Set is deleted:

- A user with the Recovery Set privilege can use the iLO RESTful API and the RESTful Interface Tool to create a System Recovery Set from components stored in the iLO Repository.

  For instructions, see the iLO user guide at the following website: **https://www.hpe.com/support/ilo-docs**.

- A user with the Recovery Set privilege can use SUM to create an install set, and then designate it as the System Recovery Set by using the iLO RESTful API.

Installing an install set

Prerequisites

- Configure iLO Settings privilege
- No components in the install set are queued as part of another installation task.

About this task

You can add an install set to the installation queue from the Install Sets page.

When you add an install set to the installation queue, iLO adds a task for each component or command in the install set. The new tasks are added to the end of the queue.

Components in the queue are installed after other queued tasks are complete, and when the software that initiates updates for the component type detects the installation request. To determine the software that can initiate an update, check the component details on the iLO Repository and Installation Queue pages.

If a previously queued component is waiting to start or finish, a new task might be delayed indefinitely. For example, if a queued component is installable by the UEFI BIOS, a server restart is required before installation can start. If the server is not restarted, the tasks that follow in the queue are delayed indefinitely.

Procedure

1. Click Firmware in the left navigation pane and then click Install Sets.

   The Install Sets page appears.

2. Click the ellipsis icon next to the component that you want to install, and then click Install.

   Install Components window appears.

3. (Optional) If you want to specify a schedule for installation, select the Set schedule window check box.

   a. Select a method for defining the schedule.

      - Select Use maintenance window (default) to choose a maintenance window you configured on the Maintenance Windows page.

        To add a maintenance window, click Add New Mainteneance Window link to navigate to the Maintenance Windows page. Create a maintenance window, and then restart this procedure.

- Select Specify time window to enter a schedule now.

b. Depending on the method you selected, do one of the following:

- If you selected Use maintenance window, select a value in the Maintenance Window drop-down list.
- If you selected Specify time window, enter the schedule details.

4. (Optional) If there are existing queued tasks, select the Clear installation queue check box if you want to remove them.

   When there are existing tasks, iLO displays the number of queued tasks and notifies you that the install set contents will be added to the end of the queue.

   This check box is not displayed when the queue is empty and iLO can initiate the updates in the install set.

   This check box is disabled when the queue is empty and iLO cannot initiate the updates in the install set.

5. (Optional) Select Confirm TPM override
6. Click Yes, add to the end of the queue .

   If you selected the check box in step 4 or the queue was already empty, and iLO can initiate the updates in the install set, the button label is Yes, install now.

   The updates are initiated after existing queued tasks finish and the software that initiates installation for the selected component types detects a pending installation.

   If the installation queue is empty and iLO can initiate the requested updates, the updates begin immediately.

7. Click Cancel to cancel the operation.
8. Click ✕ to close the Install Components window.

Subtopics

Scheduling time window
Removing install set

Scheduling time window

Prerequisites

Configure iLO Settings privilege

About this task

Use this procedure to enter the schedule when Specify Time Window is selected.

Procedure

1. Click 🕒 in the From box.

   A calendar appears.

2. Select a start date and time, and then click Done.

   The selected date and time are displayed in the From box.

3. Click 🕒 in the To box.

   A calendar appears.

4. Select an end date and time, and then click Done.

   This value sets the expiration date and time for the tasks in the install set.

The selected date and time are displayed in the To box.

Removing install set

Prerequisites

- Configure iLO Settings privilege for unprotected install sets.
- Configure iLO Settings privilege and Recovery Set privilege for removing the protected install set.

Procedure

1. Click Firmware in the left navigation pane and then click Install Sets.
2. Click Delete next to the install set that you want to remove.

   Click Delete All , if you want to remove all the install sets.

   iLO prompts you to confirm the request.
3. Click Yes, delete.

   The install set is removed.
4. Click Cancel to cancel the operation.

Installation queue

The installation queue is an ordered list of components and commands that were added to the queue individually or as parts of an install set. You can add tasks to the queue by using the following methods:

> **NOTE**
> The maximum number of components that can be added to an install set is 35.

- Use the iLO Install Queue option.
- Use Add to Queue option on the Installation Queue page.
- Use Install components option on the iLO Repository page.
- Use SUM.

Subtopics

Viewing the Installation Queue

About this task

The Installation Queue page displays summary information for each queued task, and you can click an individual task for more information. The current iLO Date/Time value is displayed at the top of the page.

Procedure

1. Click Firmware in the left navigation pane, and then select Installation Queue.

   The Installation Queue page appears.

2. (Optional) To view the detailed information on components, click an individual task.

Subtopics

Queued task summary details

State

Status of the task. The possible values follow:

- Pending—The task will run when the software that initiates updates for the component type detects the installation request.
- In progress—The task is being processed.
- Complete—The task completed successfully.
- Canceled—The task is associated with a canceled or expired maintenance window.
- Expired—The task is expired. Subsequent tasks will not run until this task is removed from the queue.
- Exception—The task could not complete. Subsequent tasks will not run until this task is removed from the queue.

Name

The task name.

Starts

The task start date and time (UTC). If the task is waiting for other tasks to complete, the value is After previous tasks are executed.

The value N/A is displayed for tasks that are in the following states: Complete, Expired, or Exception.

Expires

The task expiration date and time (UTC). If no expiration date is set, the value Never is displayed.

Individual task details

Name

The task name.

Command

If a command is selected, this value is the command name. For example, Wait or iLO Reset.

If a component is selected, the value Apply Update is displayed.

Component name

The component name, when a component from the iLO Repository is selected.

You can click the component name link to view the component details in the iLO Repository.

File name

The component file name, when a component from the iLO Repository is selected.

State

Task status. The possible values are Pending, In progress, Complete, Canceled, Expired, or Exception.

Wait time (seconds)

The wait time in seconds, if the task is a Wait command.

Result

Task results, if available. For example, The task completed successfully or The update failed with a component specific error. Retry the update after fixing the component error.

Installable by

The software that can initiate an update with the selected component. For example, iLO, **Smart Update Tool**, or UEFI BIOS.

Maintenance Window

The maintenance window name if the task is configured to run during a maintenance window.

Start time

The task start date and time (UTC).

- If a time window is specified, the start time is listed.
- If a maintenance window is selected, the maintenance window start time is listed.
- If a start time is not specified and the task state is Complete, Expired, or Exception, the value N/A is displayed.
- If a start time is not specified and the task state is InProgress or Pending:
  - The value Immediately after the associated updater checks is displayed when the task is first in the queue.
  - The value After previous tasks are executed is displayed if the task is not first in the queue.

Expiration

The task expiration date and time (UTC).

If a maintenance window is selected, the maintenance window end time is listed.

Update Recovery Set?

This value is displayed only when a component is selected. A value of Yes means that the queued component will replace the component in the System Recovery Set after the task is initiated and completed successfully.

Created by user with Recovery Set privilege?

This value is displayed only when a component is selected. A value of Yes indicates that the task was created by a user with the Recovery Set privilege.

This privilege is required for making an optional update to the System Recovery Set after a queued update is completed successfully.

This privilege is also required for firmware downgrades when the Downgrade Policy is set to the Downgrade requires Recovery Set privilege option.

How tasks in the installation queue are processed

When you add a task to the installation queue:

- It is added to the end of the queue.
- If you added a command, the task is initiated after existing queued tasks finish.
- If you added a component, the task is initiated after:
  - Existing queued tasks finish.

- The software that initiates installation for the selected component type detects a pending installation.

If the installation queue is empty and iLO can initiate the update, the update begins immediately.

To determine the software that can initiate an update, check the component details on the iLO Repository and Installation Queue pages.

- If a previously queued task is waiting to start or finish, a new task might be delayed indefinitely. For example, there might be a queued component waiting until the UEFI BIOS detects it during server POST. If the server is not restarted, the tasks that follow this task in the queue will remain on hold indefinitely.
- If the task expires before the start time of a task that precedes it in the installation queue, iLO will not save the task.
- If an update is not initiated within the specified time window, it expires. If the update expires, delete and then recreate the task, or edit the task.

Adding a task to the installation queue

Prerequisites

- The Configure iLO Settings privilege is required for adding tasks to the installation queue.
- The Recovery Set privilege is required for making an optional update to the System Recovery Set after a queued update is completed successfully.
- If you want to use the Update Recovery Set feature, a System Recovery Set must exist and contain the component you want to update.

Procedure

1. Click Firmware in the left navigation pane and select Installation Queue > Add to Queue or click Firmware > Add to Queue from the Quick Actions click +

   If the Add to Queue option is not displayed, click the ellipsis icon in the top-right corner of Firmware page.

   Add to Install Queue window appears.
   While adding the Firmware package 2.0 from the repository to the
   install queue
   through iLO web interface, iLO creates multiple tasks based on the package
   UpdatableBy
   field values, ex, BMC, and UEFI. Then iLO creates tasks for BMC and UEFI. If there are no devices
   UpdatableBy
   field values the BMC or UEFI, either of the tasks becomes in an exception state. You must manually clear the task to execute the remaining tasks in the queue.
2. Enter a task name (up to 64 characters) in the Task Name box.
3. Select a value in the Components/Commands box.

   The list includes the following:

   - Components stored in the iLO Repository.
   - The Wait and Reset iLO commands.
4. If the Wait command is selected, enter the wait time in the Wait time (sec) box.

   Valid values are from 1 to 3600 seconds.
5. (Optional) If you want to specify an installation schedule, select the Set schedule window check box.
   a. Select a method for defining the schedule.
      - Select Use maintenance window (default) to choose a maintenance window you configured on the Maintenance Windows page.

To add a maintenance window, click New to navigate to the Maintenance Windows page. Create a maintenance window, and then restart this procedure.

- Select Specify time window to enter a schedule now.

b. Depending on the selected method, do one of the following:

- If you selected Use maintenance window, select a value in the Maintenance window list.
- If you selected Specify time window, enter the schedule details.

6. (Optional) Select Add to start of queue to move the task to the start of the installation queue.
7. (Optional) If you selected a component in step 3 and the component exists in the System Recovery Set, select the Update Recovery Set check box to replace the existing component with the selected component.

   Selecting this option replaces the component, even if the version in the System Recovery Set is newer.

   This option is not displayed if:

   - A command is selected.
   - There is no System Recovery Set.
   - Your user account is not assigned the required privilege.
8. If the server has a TPM or TM, suspend or back up any software that stores information on the TPM or TM, then select the Confirm TPM override check box.

   Drive encryption software is an example of software that stores information on the TPM or TM.

   CAUTION

   If you use drive encryption software, suspend it before initiating a firmware update. Failure to follow these instructions might result in losing access to your data.
9. Click Add.

   iLO notifies that the task was added to the end of the installation queue. This event is recorded in the iLO event log.

   If the task would expire before the start time of an existing task that precedes it in the queue, iLO notifies you that it cannot save the task. The installation queue is a first-in, first-out list of tasks, and you cannot create a task that will expire before an existing task will run.

   If you selected the Update Recovery Set check box, the component is updated after the task is initiated and completed successfully.

Subtopics

Scheduling time window

Prerequisites

Configure iLO Settings privilege

About this task

Use this procedure to enter the schedule when Specify Time Window is selected.

Procedure

1. Click in the From box.

   A calendar appears.

2. Select a start date and time, and then click Done.

   The selected date and time are displayed in the From box.

3. Click in the To box.

   A calendar appears.

4. Select an end date and time, and then click Done.

   This value sets the expiration date and time for the tasks in the install set.

   The selected date and time are displayed in the To box.

Commands that can be added to the installation queue

Wait

Causes the installation queue to stop and wait for the configured amount of time (seconds). Valid values are from 1 second to 3600 seconds.

Reset iLO

This command does not make any configuration changes, but ends all active connections to the iLO firmware.

Editing a task in the installation queue

Prerequisites

- The Configure iLO Settings privilege is required for editing tasks in the installation queue.
- The Recovery Set privilege is required for making an optional update to the System Recovery Set after a queued update is completed successfully.
- If you want to use the Update Recovery Set feature, a System Recovery Set must exist and contain the component you want to update.
- The task you want to edit is in Pending status.

Procedure

1. Click Firmware in the left navigation pane, and then select Installation Queue.
2. Click Edit next to the task that you want to edit.

   iLO prompts you to update the task information.

3. To update the task name, enter a new name (up to 64 characters) in the Task name box.
4. Select a value in the Components/Commands box.
   - If the original task is a component update, you can select only another component.
   - If the original task is a command, you can select only another command.
5. If the Wait command is selected, enter or update the wait time in the Wait time (seconds) box.

   Valid values are from 1 to 3600 seconds.

6. (Optional) If you want to specify or edit the installation schedule, select, or clear the Set schedule window check box.
   a. If the Set schedule window check box is selected, select or update the method you want to use to define the schedule.
      - Select Use maintenance window (default) to choose a maintenance window you configured on the Maintenance Windows page.

        To add a maintenance window, click New to navigate to the Maintenance Windows page. Create a maintenance window, and then restart this procedure.
      - Select Specify time window to enter a schedule now.
   b. Depending on the selected method, do one of the following:
      - If Use maintenance window is selected, select or change the value in the Maintenance window list.
      - If Specify time window is selected, add or update the schedule details.
7. (Optional) If you selected a component in step 4, and the component exists in the System Recovery Set, select or clear the Update Recovery Set check box.

   When this option is enabled, the existing component in the System Recovery Set is replaced by the selected component when the task is is completed.

   Selecting this option replaces the component, even if the version in the System Recovery Set is newer.

   This option is not displayed if:
   - A command is selected.
   - There is no System Recovery Set.
   - Your user account is not assigned the required privilege.
8. If the server has a TPM or TM, suspend or back up any software that stores information on the TPM or TM, then select the Confirm TPM override check box.

   Drive encryption software is an example of software that stores information on the TPM or TM.

   CAUTION

   If you use drive encryption software, suspend it before initiating a firmware update. Failure to follow these instructions might result in losing access to your data.
9. Click OK.

   iLO notifies you that the task was updated.

   If the task would expire before the start time of a task that precedes it in the queue, iLO notifies you that it cannot save the task. The installation queue is a first-in, first-out list of tasks, and you cannot create a task that will expire before an existing task will run.

   If you selected the Update Recovery Set check box, the component is updated after the task is initiated and completed successfully.

Removing a task from the installation queue

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Firmware in the left navigation pane and click Installation Queue.
2. Click Delete next to the component that you want to remove.

Click Delete All, if you want to remove all the components.

iLO prompts you to confirm the request.

3. Click Yes, delete.

   The component is removed.

iLO remote console

The iLO remote console can be used to remotely access the graphical display, keyboard, and mouse of the host server. The remote console provides access to the remote file system and network drives.

With remote console access, you can observe POST messages as the server starts, and initiate ROM-based setup activities to configure the server hardware. When you install an OS remotely, the remote console enables you to view and control the host server monitor throughout the installation process.

Integrated remote console (IRC) access options

You can access the following integrated remote console options from the iLO web interface:

- **HTML5 integrated remote console** —For clients with a supported browser.

On Synergy servers, the integrated remote console is always enabled.

On ProLiant servers, a license must be installed to use the integrated remote console after the OS is started.

Other remote console access options

The following remote console options are available from outside of the iLO web interface:

- **HTML5 standalone remote console** —Provides HTML5 remote console access through a supported browser, without going through the iLO web interface.

Remote console usage considerations

- The integrated remote console is suitable for high-latency (modem) connections.
- Do not run the integrated remote console from its host operating system on the same server.
- When you log into a server through the remote console, Hewlett Packard Enterprise recommends that you log out before closing the console.
- When you finish using the remote console, logout to exit.
- The UID LED flashes when a remote console session is active.
- The Idle Connection Timeout specifies how long a user can be inactive before a remote console session ends automatically. This value does not affect remote console sessions when a virtual media device is connected.
- When the mouse is positioned over the remote console window, the console captures all keystrokes, regardless of whether the console window has focus.
- You can enable and disable the Remote Console feature on the Remote Console page.
- When you use the HTML5 remote console in standalone mode or new window mode, the remote console initially runs in an iLO web UI session. When remote console video starts, a dedicated remote console session starts. If the web UI session ends, your connection to the HTML5 console ends and you must reconnect to the remote console.

NOTE

If you are using shared network port, the remote console and virtual media may disconnect.

Subtopics

Viewing Remote Console details

Procedure

1. Click Dashboard or Host in the left navigation pane and click Remote Console.

   The Remote Console page appears.
   Remote Console Status and Remote Console Thumbnail status are displayed on the Overview section. The security settings are displayed on the Security section.

2. Click on the Overview section.

   The Overview window appears.

3. Click Update after editing the required settings.
4. Click Cancel to cancel the operation.
5. Click to close the Overview window.

Subtopics

Remote Console details

Remote Console Status

The current remote console access setting (enabled or disabled).

When the remote console is disabled:

- You cannot access the graphical remote console.

Remote Console Thumbnail

Remote Console Thumbnail status (enabled or disabled). This setting is enabled by default.

Acquiring the remote console

Prerequisites

- Remote Console privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- The Remote Console status is enabled on the Remote Console page.

About this task

If another user is working in the remote console, you can acquire it from that user.

Procedure

1. Click Host in the left navigation pane and click Remote Console.

   The Remote Console console page appears.

2. Click Launch HTML 5 Console.

   The remote console starts in a new window.
   If another user is working in the remote console, iLO notifies that another user is working in the remote console.

3. To send a request to acquire the remote console, follow the onscreen instructions.

   The other user is prompted to approve or deny the request.

   If the other user approves, or they do not respond in 10 seconds, permission is granted. The remote console starts.

Configuring remote console computer lock settings

Prerequisites

Configure iLO Settings privilege

About this task

This feature locks the OS or logs you out when a remote console session ends or the network link to iLO is lost. If you open a remote console window when this feature is enabled, the OS is locked when you close the window.

Procedure

1. Click Dashboard or Host in the left navigation pane and click Remote Console.

   The Remote Console page appears.

2. Click  on Security section.

   Security window appears.

3. Select an option from Remote Console Computer Lock settings:

   Windows, Custom, or Disabled

4. Select a computer lock key sequence, if you selected Custom.

5. (Optional) Select IRC Requires a Trusted Certificate in iLO.

6. Click Update to save the changes.

7. Click Cancel to cancel the operation.

8. Click  to close the Security window.

Remote console hot keys

The Hot Keys page allows you to define up to six hot keys to use during remote console sessions. Each hot key represents a combination of up to five keys. The key combination is sent to the host server when the hot key is pressed. Hot keys are active during remote console

sessions that use the integrated remote console.

If a hot key is not set—for example, Ctrl+V is set to NONE, NONE, NONE, NONE, NONE—this hot key is disabled. The server OS will interpret Ctrl+V as it usually does (paste, in this example). If you set Ctrl+V to use another combination of keys, the server OS will use the key combination set in iLO (losing the paste functionality).

Example 1: If you want to send Alt+F4 to the remote server, but pressing that key combination closes your browser, you can configure the hot key Ctrl+X to send the Alt+F4 key combination to the remote server. After you configure the hot key, press Ctrl+X in the remote console window when you want to send Alt+F4 to the remote server.

Example 2: If you want to create a hot key to send the international AltGR key to the remote server, use R_ALT in the key list.

NOTE

If you do numerous typing in remote console sessions, you may want to avoid assigning hot keys that use Ctrl+X and Ctrl+V shortcuts. These shortcuts are normally assigned to the cut and paste features.

Subtopics

Creating remote console hot keys

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Dashboard or Host in the left navigation pane and click Remote Console.

   The Remote Console page appears.

2. Click on the Hot Keys section.

   The Hot Keys window appears.

3. For each hot key that you want to create, select the key combination to send to the remote server.

   To configure hot keys to generate key sequences from international keyboards, select the key on a U.S. keyboard that is in the same position as the key on the international keyboard. Keys for configuring remote console computer lock keys and hot keys lists the keys that you can use when you configure hot keys.

4. Click Update.

   iLO confirms that the hot key settings were updated successfully.

5. Click Cancel to cancel the operation.

6. Click to close the Hot Keys window.

Keys for configuring remote console computer lock keys and hot keys

ESC	SCRL LCK	0	f
L_ALT	SYS RQ	1	g
R_ALT	PRINT SCREEN	2	h
L_SHIFT	F1	3	I
R_SHIFT	F2	4	j
L_CTRL	F3	5	k
R_CTRL	F4	6	l
L_GUI	F5	7	m
R_GUI	F6	8	n
INS	F7	9	o
DEL	F8	;	p
HOME	F9	=	q
END	F10	[	r
PG UP	F11	\	s
PG DN	F12	]	t
ENTER	SPACE	`	u
TAB	'	a	v
BREAK	,	b	w
BACKSPACE	-	c	x
NUM PLUS	.	d	y
NUM MINUS	/	e	z

Resetting hot keys

Prerequisites

Configure iLO Settings privilege

About this task

Resetting the hot keys clears all current hot key assignments.

Procedure

1. Click Dashboard or Host in the left navigation pane and click Remote Console.

   The Remote Console page appears.

2. Click ↻ on Hot Keys section.

Reset Hot Keys window appears.

3. Click Confirm Reset.

   iLO notifies you that the hot keys are reset.

4. Click Cancel to cancel the operation.
5. Click ✕ to close the Reset Hot Keys window.

Starting the HTML5 IRC

Prerequisites

- Remote Console privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- The Remote Console feature is enabled on the Host page.

About this task

Use this procedure to access the remote console in a supported browser.

Procedure

1. Click Host in the left navigation pane and click Remote Console.

   The Remote Console page appears.

2. Click Launch HTML5 Console.

   The console opens in a new window.

Viewing BIOS details

About this task

The BIOS feature enables the user to view and configure all the BIOS settings through the iLO web interface.

Procedure

1. Click Host in the left navigation pane and click BIOS.

   The BIOS page appears.

   Depending on your server configuration, the attributes are listed in the BIOS page. iLO web interface supports all the attributes which are supported by Redfish.

2. (Optional) Enter a key word in the 🔍 Search Attributes field for searching an attribute.
3. (Optional) Click › next to an attribute to view the sub components and the current settings.
4. Click View Details to view any existing errors occured from the BIOS configuration settings. Error details are displayed only after host reboot.
5. (Optional) Click Actions > Expand All to expand all sub components.

6. (Optional) Click Actions > Collapse All to collapse all sub components.
7. (Optional) Click Actions > Reboot Server to reboot the server.

Subtopics

Configuring BIOS settings

Prerequisites

Host BIOS privilege

About this task

Use the BIOS section to configure the BIOS settings through the iLO web interface

Procedure

1. Click Host in the left navigation pane and click BIOS.

   The BIOS page appears.
2. Click > next to an attribute or sub component to view the sub components.
3. Click Dependency Map to view the dependency details. For more information about dependency map see dependency map options.
4. Select or enter the required settings for the desired attributes or sub components.
5. Click Save Draft.

   The changes are saved as draft.
6. Click Review Draft and Apply to review draft setting and update the configuration. For more information about review draft and apply, see Review draft and apply options.

   The Review Draft and Apply window appears.
7. Review the draft settings and select one of the following options from the Choose Apply Option:
   - Update and Reboot Now
   - Update at Next Reboot
8. Select the disclaimer.
9. Click Yes, proceed to update the settings.
10. Click Discard Draft to discard the draft settings.
11. Click Cancel to cancel the operation.

Review draft and apply options

The Review Draft and Apply section displays the following details:

- Attribute—Indicates the attribute name

- Current Value—Indicates the existing value of the attribute
- Pending Value—Indicates the updated value of the attribute before reboot
- New Value—Indicates the draft value saved in iLO web interface, which will be updated after reboot
- Apply Risk—Indicates the risk while applying the configuration

The Choose Apply Option allows to select one of the following update and reboot option:

- Update and Reboot Now—Select this option to update the draft settings and reboot immediately
- Update at Next Reboot—Select this option to update the draft settings in the next reboot

Dependency map options

The Dependency Map displays the following details:

- Depends On table shows how the current attribute's state is dependent on the values of other related attributes.
- Affects table shows how changing the value of the current attribute impacts or alters the values of other related attributes.

For Depends On table:

- Attribute—Indicates the dependent name
- Condition—Indicates the condition related to the dependent attribute. The possible values are Equal, Greater than or Equal, Greater than, Less than or Equal, Less than, Not Equal.
- Value—Indicates the current value of the dependent attribute
- Current Attribute State—Indicates the state of the current attribute. The possible values are Read Only True, Not Configurable.
- For Affect table:

For Affect table:

- Condition—Indicates the condition of the current attribute
- Current Value—Indicates the value of the current attribute. The possible values are Equal, Greater than or Equal, Greater than, Less than or Equal, Less than, Not Equal.
- Affected Attributes—Indicates the name of the affected attribute
- Resulting Value—Indicates the updated value of the affected attribute after the current attribute update

iLO Virtual Serial Port

The Virtual Serial Port provides a bidirectional data flow with a server serial port. By using the Virtual Serial Port, a remote user can perform operations such as the following:

- Interact with the server POST sequence and the operating system boot sequence.
- Use the EMS Console through the Virtual Serial Port. EMS is useful for debugging Windows boot issues and kernel-level issues.
- For an iLO system running Linux in a graphical format, you can configure `getty()` on the server serial port, and then use the Virtual Serial Port to view a login session to the Linux OS.
- Establish a login session with the OS, interact with the OS and execute and interact with applications on the OS.

Below are the keys supported on the OS prompt (after OS redirection):

Subtopics

- Configuring Linux to use the iLO Virtual Serial Port
- Configuring Windows for use with the iLO Virtual Serial Port

Configuring Linux to use the iLO Virtual Serial Port

About this task

You can manage Linux servers remotely using console redirection. To configure Linux to use console redirection, you must configure the Linux boot loader (GRUB). The boot-loader application loads from the bootable device when the server system ROM finishes POST. Define the serial interface as the default interface so that if no input arrives from the local keyboard within 10 seconds (the default timeout value), the system will redirect output to the serial interface (iLO Virtual Serial Port).

Subtopics

- Configuring Red Hat Enterprise Linux 9 to use the iLO Virtual Serial Port
- Configuring Red Hat Enterprise Linux 8 to use the iLO Virtual Serial Port
- Configuring SUSE Linux Enterprise Server to use the iLO Virtual Serial Port

Configuring Red Hat Enterprise Linux 9 to use the iLO Virtual Serial Port

Procedure

1. Open `/etc/sysconfig/grub` with a text editor.

   This configuration example uses `ttys0`.

   - At the end of the line `GRUB_CMDLINE_LINUX`, enter **`console=ttys0`**.
   - Remove `rhgb quiet`.
   - Enter the following parameters:

     ```
     GRUB_TIMEOUT=5
     GRUB_DEFAULT=saved
     GRUB_DISABLE_SUBMENU=true
     GRUB_TERMINAL_OUTPUT="console"
     ```

```
GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap
console=ttyS0,115200n8"
GRUB_DISABLE_RECOVERY="true"
```

2. Enter the following command to create the `grub.cfg` file:

   ```
   grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg
   ```

3. Enable a `getty` login service for the serial port.

   For example:

   ```
   systemctl enable serial-getty@ttyS0.service
   ```

4. Configure `getty` to listen on the serial port.

   For example:

   ```
   systemctl start getty@ttyS0.service
   ```

5. To begin a shell session on a configured serial port, add the following line to the `/etc/inittab` file to start the login process automatically during system boot:

   The following example initiates the login console on `/dev/ttyS0`:

   ```
   S0:2345:respawn:/sbin/agetty 115200 ttyS0 vt100
   ```

Configuring Red Hat Enterprise Linux 8 to use the iLO Virtual Serial Port

Procedure

1. Use the `grub2-env` command to view the `kernelopts` parameters.

   For example:

   ```
   # grub2-editenv - list | grep kernelopts
   kernelopts=root=/dev/mapper/rhel-root ro crashkernel=auto
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap
   ```

2. Copy the results of the list command.

   For example:

   ```
   kernelopts=root=/dev/mapper/rhel-root ro crashkernel=auto
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap
   ```

3. Set the kernel options.

   Include the existing kernel options copied in step 2, and add the serial console options at the end.

   For example:

   ```
   # grub2-editenv - set
   "kernelopts=root=/dev/mapper/rhel-root ro crashkernel=auto
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap console=ttyS0,115200 console=tty0"
   ```

4. (Optional) To verify that the parameters were set correctly, run the list command again.

   For example:

```
# grub2-editenv - list | grep kernelopts
kernelopts=root=/dev/mapper/rhel-root ro crashkernel=auto
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap console=ttyS0,115200 console=tty0
```

5. Reboot the server.

Subtopics

Configuring GRUB to use a serial console (Red Hat Enterprise Linux 8)

Configuring GRUB to use a serial console (Red Hat Enterprise Linux 8)

About this task

You can configure GRUB to use the serial console instead of the VGA console. This feature allows you to perform tasks such as interrupting the boot process to choose a different kernel, or adding kernel parameters for tasks such as booting into single user mode.

Procedure

To configure GRUB to use the serial console, comment out the splash image and add the `serial` and `terminal` options to the `grub.conf` file.

For example:

```
[root@localhost ~]# cat /boot/grub/grub.conf
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE:  You have a /boot partition.  This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/hda2
#          initrd /initrd-version.img
#boot=/dev/hda
default=0
timeout=10
#splashimage=(hd0,0)/grub/splash.xpm.gz
serial --unit=0 --speed=115200
terminal --timeout=5 serial console
title Red Hat Enterprise Linux AS (2.4.21-27.0.2.ELsmp)
        root (hd0,0)
        kernel /vmlinuz-2.4.21-27.0.2.ELsmp ro root=LABEL=/ console=ttyS0,115200
console=tty0
        initrd /initrd-2.4.21-27.0.2.ELsmp.img
```

The changes take effect after the next system reboot.

Configuring SUSE Linux Enterprise Server to use the iLO Virtual Serial Port

Procedure

1. Open `/etc/default/grub` with a text editor.

   This configuration example uses `ttyS0`.

   At the end of the line `GRUB_CMDLINE_LINUX_DEFAULT`, enter

```
"console=tty0 console=ttyS0,115200n8"
```

.

2. To update the `grub.cfg` file, enter one of the following commands:

   For servers using the UEFI boot mode:

   ```
   grub2-mkconfig -o /boot/grub2/grub.cfg
   ```

   For servers using the Legacy BIOS boot mode:

   ```
   grub-mkconfig -o /boot/efi/EFI/sles/grub.cfg
   ```

3. Use `systemctl` to configure `getty` to listen on `/dev/ttyS0`:

   ```
   systemctl start getty@ttyS0.service
   ```

4. To configure `getty` to listen on `/dev/ttyS0` for every boot, enable the service for that specific port.

   For example:

   ```
   systemctl enable serial-getty@ttyS0.service
   ```

5. To begin a shell session on a configured serial port, add the following line to the `/etc/inittab` file to start the login process automatically during system boot:

   The following example initiates the login console on `/dev/ttyS0`:

   ```
   S0:2345:respawn:/sbin/agetty 115200 ttyS0 vt100
   ```

Configuring Windows for use with the iLO Virtual Serial Port

About this task

Enter
`bcdedit /?`
for syntax help when you complete these steps.

Procedure

1. Open a command window.
2. To edit the boot configuration data, enter the following command:

   ```
   bcdedit /ems on
   ```

3. Enter the following command to configure the EMSPORT and EMSBAUDRATE values:

   ```
   bcdedit /emssettings EMSPORT:1 EMSBAUDRATE:115200
   ```

   NOTE

   EMSPORT:1 is COM1, and EMSPORT:2 is COM2.

4. To enable or disable emergency management services for a boot application, enter the following command:

   ```
   bcdedit /bootems on
   ```

5. Reboot the operating system.

Using iLO on the host

The Virtual NIC feature enables a secure connection to iLO directly from the host operating system. Use this feature directly at the host server or through a Remote Console connection. You can interact with iLO by using the web interface, SSH, or the iLO RESTful API.

The Virtual NIC feature is useful when you want to:

- Access iLO when the network configuration prevents connection through the management network. For example, use a Virtual NIC connection when you have access to the production network but cannot access the iLO dedicated management network.
- Access iLO when there is no NIC cable attached to the host or iLO.

The factory default Virtual NIC setting is enabled for iLO 7. When you reset iLO to the factory default settings, the Virtual NIC setting returns to the default setting for the installed version of iLO. Firmware upgrades or downgrades do not change this setting.

Subtopics

Prerequisites for using the Virtual NIC

- The host server operating system that has an inbox driver module for NCM driver supports the Virtual NIC.

  Most of the supported Windows and Linux operating systems load the driver module automatically when the Virtual NIC is enabled in iLO.

  On Windows hosts, you can verify support by looking for driver details in Windows. For more information, see Configuring IP for virtual NIC - Windows OS.

  For Windows 2022, use the latest OS update. The update needs to be greater than 2024-6B or version 25398.950 or greater. The cumulative update containing NCM driver for this is `KB5039236`.

  On Linux hosts, you can use the following methods to verify support for Virtual NIC:

  - Look for `cdc_ncm.ko` under `/lib/modules`:

    ```
    find /lib/modules/$(uname -r)  *.ko* | grep cdc_ncm
    ```

  - Enter the following command to check if `cdc_ncm` is loaded:

    ```
    lsmod | grep cdc_ncm
    ```

- The host server OS supports the Virtual NIC .
- The supported version for VMware ESXi is ESXi 8.0 U3 P05 or later .
- The Virtual NIC feature is enabled on the Access page.
- The interface you want to use to connect to iLO is enabled on the Access page.

  For example, if you want to connect to the iLO web interface, then the iLO Web Interface option is enabled.
- The host server is not configured to block the port for the interface you want to use to connect to iLO.

  For example, when you use the iLO web interface with the default iLO configuration, ensure that the host server does not block port 443.

- The Virtual NIC interface is not teamed or bridged with any of the host NICs. This configuration might cause the Virtual NIC to be unavailable or insecure.
- The iLO hostname and the Virtual NIC IP address are in the `hosts` file on the client system you will use to access the Virtual NIC. When you use the iLO hostname to connect to iLO with the Virtual NIC, this configuration is required to allow name resolution to work, and for TLS connections to validate correctly.

Operating system support for Virtual NIC

The Virtual NIC feature is qualified on servers with iLO 7 and the following operating systems:

- Microsoft Windows Server 2025
- Microsoft Windows Server 2022 - Version greater than 25398.950 available through Patch `KB5039236` or `2024-6B`.
- Red Hat Enterprise Linux 9.4 Server
- Red Hat Enterprise Linux 9.6 Server
- SUSE Linux Enterprise Server 15 SP6
- SUSE Linux Enterprise Server 15 SP7
- VMWare ESXi 8.0 U3 P05
- VMWare ESXi 9.0

This feature is expected to work with other nonqualified operating systems that include the required driver.

Configuring the Virtual NIC feature

Prerequisites

Configure iLO Settings privilege

Procedure

1. Verify that the Virtual NIC feature is enabled.
   a. Click iLO Settings in the left navigation pane and click Access.

      The Access page is displayed.

   b. Confirm that Virtual NIC is set to Enabled in the Other Interfaces section.
2. If Virtual NIC is not set to Enabled, enable it.
   a. Click  next to the Other Interfaces.

      The Other Interfaces window opens.

   b. Select the Virtual NIC check box.

      iLO notifies you that pending changes require a reset to take effect.

   c. If you are done updating the settings, click Reset iLO.

      iLO prompts you to confirm the request.

   d. Click Yes, reset iLO.

It might take several minutes before you can re-establish a connection.

After the reset is complete, the Virtual NIC feature is enabled, and it is detected by the host server OS.

3. (Optional) For Linux distributions that do not automatically configure new network interfaces for DHCP: Change the network configuration of the Virtual NIC interface from static to DHCP.

   For more information, see:

   - Configuring IP for the Virtual NIC - RHEL commands
   - Configuring IP for the Virtual NIC - SLES commands

4. Verify that the Virtual NIC is available in the host OS.

   a. Start a remote console session or access the physical host system.

   b. Log in to the host server OS

   c. Do one of the following:

      - On Windows systems: Run `ipconfig` and look for an adapter named Ethernet adapter Ethernet with the IP address 16.1.15.2 and the subnet mask 255.255.255.252.
      - On Linux systems: Identify the network interface name and then run `ipaddr`. The adapter has the IP address 16.1.15.2 and the subnet mask 255.255.255.252.

      WARNING

      Do not change the adapter IP address on the host. Changing the IP address from 16.1.15.2 to any other value makes the Virtual NIC inaccessible.

   d. Run the following ping or curl command to check if iLO is accessible from the Host OS:

      Ping command

      `C:\Users\Administrator> ping 16.1.15.1`

```
Pinging 16.1.15.1 with 32 bytes of data:
Reply from 16.1.15.1: bytes=32 time<1ms TTL=64
Reply from 16.1.15.1: bytes=32 time<1ms TTL=64
Reply from 16.1.15.1: bytes=32 time<1ms TTL=64
Reply from 16.1.15.1: bytes=32 time<1ms TTL=64

Ping statistics for 16.1.15.1:
 Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
 Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

      Curl command

      `C:\Users\Administrator> curl -k https://16.1.15.1/redfish`

      `{"v1": "/redfish/v1/"}`

      `C:\Users\Administrator>`

Subtopics

Configuring IP for the Virtual NIC - RHEL commands

About this task

To get the IP address of the Virtual NIC device, run `nmcli` command.

For example,

```
[root@localhost ~]# nmcli device status
DEVICE       TYPE      STATE                 CONNECTION
ens14f3      ethernet  connected               Profile 1
enp63s0f4u5  ethernet  connected               enp63s0f4u5
lo           loopback  connected (externally)  lo
ens14f0      ethernet  disconnected            --
ens14f1      ethernet  disconnected            --
ens14f2      ethernet  disconnected            --
```

You can also configure a Virtual NIC device to use DHCP using the `nmcli` command.

Procedure

1. To list all the network devices, run `nmcli device status` command.
2. To add a new network connection for the second interface, run `sudo nmcli connection add type ethernet ifname <name of the second network interface>` command.
3. To change the new connection to use DHCP, run `sudo nmcli connection modify <name of the second network interface> ipv4.method auto` command.
4. To activate the new connection, run `sudo nmcli connection up <name of the second network interface>` command.
5. To verify the newly added interface, run `ip addr show <name of the second network interface>` command.

Configuring IP for the Virtual NIC - SLES commands

About this task

To check if the IP is configured for the Virtual NIC, run the `wicked` command.

For example,

```
SLES15-PROD2:~ # wicked ifstatus allusb0
usb0           up
     link:     #6, state up, mtu 1500
     type:     ethernet, hwaddr fa:4b:7f:fc:bc:02
     config:   compat:suse:/etc/sysconfig/network/ifcfg-usb0
     leases:   ipv4 dhcp granted
     leases:   ipv6 dhcp requesting
     addr:     ipv4 16.1.15.2/30 [dhcp]
```

To configure the virtual NIC device to use DHCP using `wicked` command:

Procedure

1. To check if the usb0 network device is configured, run `wicked ifstatus usb0` command.
2. To edit or create a configuration file to set up Virtual NIC with DHCP, run `vi /etc/sysconfig/network/ifcfg-usb0` command.

   For example,

   ```
   vi /etc/sysconfig/network/ifcfg-usb0
   ```

```
### save the file with below contents
BOOTPROTO=dhcp
STARTMODE=auto
ONBOOT=yes
###
```

3. To activate the new connection, run `wicked ifreload usb0` command.
4. To verify the newly added interface, run `wicked ifstatus usb0` command.

Viewing driver status in Windows

About this task

The NCM driver is available by default in Windows 2025. For Windows 2022, ensure to install the latest patch (version greater than 25398.950 available through Patch KB5039236 or 2024-6B).

Procedure

1. To view the Windows version, click System Settings from the Start menu and click About.

   The OS version details are displayed.
2. To view if the Virtual NIC device is available for the NCM driver, go to Device Manager
3. From the Device Manager window, select Network adapters > UsbNCM Host Device Properties.

   The UsbNCM Host Device Properties window appears.

Configuring IP for virtual NIC - Windows OS

Procedure

1. Open Windows Control Panel.
2. Click Network and Internet .

   The Network and Internet window appears.
3. Click Network and Sharing Center.

   The Network and Sharing Center window appears.
4. Click Change Adapter Settings on the left navigation pane.

   The Network Connections window appears.
5. Select the virtual NIC adapter - UsbNcm Host Device.
6. Click Properties on the right click menu.
7. Click Internet Protocol Version 4 (TCP/IPv4).

   The Internet Protocol Version 4 (TCP/IPv4) Properties window appears.
8. Select Obtain IP address automatically and Obtain DNS server automatically.
9. Click OK.

   The IP for virtual NIC is configured.

Using the Virtual NIC to access the iLO web interface

Prerequisites

- Your environment meets the general prerequisites for using the Virtual NIC feature.
- The browser is not configured to use a proxy server.

Procedure

1. Start a remote console session or access the physical host system.
2. Log in to the host server operating system.
3. Open a supported browser.
4. Enter the following URL:
   https://16.1.15.1
   .

   If the iLO hostname and Virtual NIC IP address are in the hosts file on the client system, you can also connect by using the iLO hostname:

   https://*iLO hostname*

   A security warning related to the website certificate is displayed.
5. Depending on your browser, do one of the following:
   - **Microsoft Edge**—Click Details, and then click Go on to the webpage.
   - **Google Chrome**—Click Advanced, and then click Proceed to <iLO hostname or IP address> (unsafe).
   - Mozilla Firefox—Click Advanced, and then click Accept the risk and continue.

   The iLO login screen for the local system is displayed.
6. Log in to iLO.

   Your session is displayed on the Session List page with the IP address 16.1.15.2.
7. Use the iLO web interface to view or update the server or iLO configuration.

Using iLOREST on the host

Prerequisites

- Your environment meets the general prerequisites for using the Virtual NIC feature.
- The RESTful Interface Tool is installed in the host server operating system.

Procedure

1. Start a remote console session or access the physical host system.
2. Log in to the host server OS.
3. Start iLOREST.
4. Log in to the iLO system:

```
iLOrest > login -u iLO user name -p iLO password
```

If the iLO hostname and Virtual NIC IP address are in the hosts file on the client system, you can also connect by using the iLO hostname:

```
iLOrest > login iLO hostname -u iLO user name -p iLO password
```

5. Use iLOREST commands to view or update the server or iLO configuration.

Using an SSH connection with the Virtual NIC

Prerequisites

- Your environment meets the general prerequisites for using the Virtual NIC feature.
- For Windows operating systems only: PuTTY or OpenSSH is installed.

Procedure

1. Start a Remote Console session or access the physical host system.
2. Log in to the host server operating system.
3. Depending on the installed operating system, open a command prompt or a PuTTY terminal prompt.
4. Log in to the iLO system:

   ```
   ssh iLO user name@16.1.15.1
   ```

   If the iLO hostname and Virtual NIC IP address are in the hosts file on the client system, you can also connect by using the iLO hostname:

   ```
   ssh iLO user name@iLO hostname
   ```

5. Use the SSH client to view or update the server or iLO configuration.

Using iLO virtual media

Subtopics

Virtual media operating system details

This section describes the operating system requirements to consider when you are using the iLO virtual media features.

Operating system USB requirement

To use virtual media devices, your operating system must support USB devices, including USB mass storage devices. For more information, see your operating system documentation.

Operating system considerations: floppy

Windows Server 2022 or later

To use a floppy as a driver disk during a Windows installation, disable the integrated disk drive in the host RBSU. This action forces the virtual floppy disk to appear as drive A.

Red Hat Enterprise Linux and SUSE Linux Enterprise Server

Linux supports the use of USB diskette and key drives.

Operating system considerations: CD/DVD-ROM

Windows

The CD/DVD-ROM appears automatically after Windows recognizes the mounting of the device. Use it as you would use a locally attached CD/DVD-ROM device.

Linux

The CD/DVD-ROM mounts automatically in a Linux GUI.

Depending on the Linux distribution, the CD/DVD-ROM is accessible at one of the following device files:

- `/dev/cdrom`
- `/dev/scd0`
- `/dev/sr0`

On servers that have a local CD/DVD-ROM device, the CD/DVD-ROM device is accessible with the device number that follows the local DVD device (for example, `/dev/cdrom1`).

Operating system considerations: Virtual folder

- **Windows**—A virtual folder appears automatically after Windows recognizes the mounting of the virtual USB device. You can use the folder the same way that you use a locally attached device. virtual folders are nonbootable. Attempting to boot from the virtual folder might prevent the server from starting.
- **Red Hat Enterprise Linux and SUSE Linux Enterprise Server** —Linux supports the use of the virtual folder feature, which uses a FAT 16 file system format.

iLO Web Interface Virtual Media and Boot options

When the Virtual Media feature is enabled on the Host > Virtual Media & Boot Options page, you can perform the following tasks:

- View connect or disconnect local media, including physical drives, local image files, and virtual folders. For more details, see local media section.
- View, connect, disconnect, or boot from URL-based media. URL-based media refers to connecting images hosted on a web server by using a URL. iLO accepts URLs in HTTPS format. For more details, see URL-based media section.
- View or change boot options and server boot order details. For more details, see boot options and server boot order sections.

Subtopics

Enabling or disabling Virtual Media

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.

2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.

3. Click  on the Overview section.

   The Overview window appears.

4. Click Virtual Media check box to enable or disable virtual media.
5. Click Update to save the settings.
6. Click Cancel to cancel the operation.
7. Click  to close the window.

Virtual media considerations

iLO virtual media provides a virtual device that can be used to boot a remote host server from standard media anywhere on the network. Virtual media devices are available when the host system is booting. Virtual media devices use USB technology to connect to the host server.

When you use virtual media, consider the following:

- Only one of each type of virtual media can be connected at a time.

  This limit classifies virtual floppy/USB keys and virtual folders as the same type of virtual media.

- The virtual media feature supports ISO images of up to 8 TB. The maximum ISO image file size depends on factors such as the single file size limit for the file system where the ISO image is stored, and the SCSI commands the server OS supports.
- Virtual folders up to 2 gigabytes in size are supported.
- In an OS, a virtual floppy/USB key or virtual CD/DVD-ROM behaves like any other drive. When you use virtual media for the first time, the host OS might prompt you to complete a New Hardware Found wizard.
- When virtual devices are connected, they are available to the host server until you disconnect them. When you finish using a virtual media device and you disconnect it, you might receive an “unsafe device removal” warning message from the host OS. You can avoid this

warning by using the OS feature to stop the device before disconnecting it.

- The iLO virtual CD/DVD-ROM is available at server boot time for supported operating systems. Booting from a virtual CD/DVD-ROM enables you to perform tasks such as deploying an OS from network drives, and performing disaster recovery of failed operating systems.
- If the host server OS supports USB mass storage devices or secure digital devices, the iLO virtual floppy/USB key is available after the host server OS loads.
  - When the host server OS is running, you can use the virtual floppy/USB key to upgrade drivers, create an emergency repair disk, and perform other tasks.
  - Having the virtual floppy/USB key available when the server is running can be useful if you must diagnose and repair the NIC driver.
  - For optimal performance, Hewlett Packard Enterprise recommends using image files stored on the hard drive of your client PC, or on a network drive that is accessible through a high-speed network link.
- If the host server OS supports USB mass storage devices, the iLO Virtual CD/DVD-ROM is available after the host server OS loads.
  - When the host server OS is running, you can use the virtual CD/DVD-ROM to upgrade device drivers, install software, and perform other tasks.
  - Having the virtual CD/DVD-ROM available when the server is running can be useful if you must diagnose and repair the NIC driver.
  - The virtual CD/DVD-ROM can be the physical CD/DVD-ROM drive on which the web browser is running, or an image file stored on your local hard drive or network drive.
  - For optimal performance, Hewlett Packard Enterprise recommends using image files stored on the hard drive of your client PC, or on a network drive accessible through a high-speed network link.
- When the virtual floppy/USB key or virtual CD/DVD-ROM feature is in use, you cannot typically access the floppy drive or CD/DVD-ROM drive from the client OS.

  CAUTION

  To prevent file and data corruption, do not try to access the local media when you are using it as a virtual media device.

- For the HTML5 IRC: When you refresh or close the iLO web interface window, the remote console connection is closed.
- When a remote console connection is closed, you lose access to virtual media devices connected through the remote console, except for devices that were connected by using URL-based virtual media.
- If you have mounted virtual media using a local IMG, ISO file, or Virtual Folder it cannot be unmounted through Redfish.
- Hewlett Packard Enterprise recommends the following for the Scripted Virtual Media feature to work correctly:
  - Web server to set the media type for `.iso` and `.img` files as octet-stream. iLO expects the requested content coming from the webserver as binary data.
  - Web server to support HTTP Range in the client request header and respond accordingly.

NOTE

If you are using a shared network port, the remote console and virtual media may disconnect. For more information see, Shared network port consideration.

Viewing connected local media

Prerequisites

- Virtual Media privilege
- The Virtual Media feature is enabled on the Virtual Media & Boot Options page.

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.

2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.
   The connected local media details are displayed on this page.

Subtopics

Disconnecting a local virtual media device
Connecting URL-based media

Disconnecting a local virtual media device

Prerequisites

- Virtual Media privilege
- The Virtual Media feature is enabled on the Virtual Media & Boot Options page.

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.

2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.

3. Click the Disconnect button in the Virtual Floppy/Virtual Folder Status or Virtual CD/DVD-ROM Status section.

Connecting URL-based media

Prerequisites

- Virtual Media privilege
- The Virtual Media feature is enabled on the Virtual Media & Boot Options page.
- The HTTPS server hosting the ISO image should enable the `Accept-Ranges: bytes` attribute to allow the client to download specific parts of the file using the range header. Additionally, the server should confirm this support in its response to a client's HEAD request.

About this task

You can connect URL-based media from the Virtual Media & Boot Options page. The Virtual Media & Boot Options supports the connection of 1.44 MB floppy images (IMG) and CD/DVD-ROM images (ISO). The image must be on a web server on the same network as iLO.

For more information about using URL-based media, see the iLO user guide.

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.

2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.

3. Click Connect next to Virtual Floppy or Virtual CD/DVD-ROM section.

4. Enter the URL for the URL-based media in the Virtual Media URL box in the Connect Virtual Floppy (IMG files) or Connect CD/DVD-ROM section (ISO files).

5. For CD/DVD-ROM only: Select the Boot on Next Reset check box if you want the server to boot to this image only on the next server reboot.

   The image will be ejected automatically on the second server reboot so that the server does not boot to this image twice.

   If this check box is not selected, the image remains connected until it is manually ejected. The server will boot to the image on all subsequent server resets, if the system boot options are configured accordingly.

   You cannot modify the boot order during POST. Wait for POST to finish and then try again.

6. For virtual floppy only: Select the Read-Only check box if you want to connect the virtual media device with read-only permission.

   The Read-Only check box is disabled by default.

7. Click Connect.

8. (Optional) To boot to the connected image now, reboot the server.

9. Click Cancel to cancel the operation.

10. Click ✕ to close the window

Subtopics

Viewing connected URL-based media
Disconnecting a URL-based virtual media device

Viewing connected URL-based media

Prerequisites

- Virtual Media privilege
- The Virtual Media feature is enabled on the Virtual Media & Boot Options page.

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.

2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.
   You can view the connected media in this page.

Disconnecting a URL-based virtual media device

Prerequisites

- Virtual Media privilege
- The Virtual Media feature is enabled on the Virtual Media & Boot Options page.

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.

2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.

3. To eject URL-based media devices, click the Disconnect button in the Virtual Floppy/Virtual Folder Status or Virtual CD/DVD-ROM Status section.

Server Boot Order

The boot order feature enables you to set the server boot options.

Changes made to the boot mode, boot order, or one-time boot status might require a server reset. iLO notifies you when a reset is required.

An error occurs if you try to change the server boot order when the server is in POST. You cannot modify the boot order during POST. If this error occurs, wait for POST to finish, and then try again.

Subtopics

Configuring the server boot order

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Host in the left navigation pane and click Virtual Media & Options.
2. To move a device up or down in the boot order, select the device in the Server Boot Order list, and then click Up or Down.
3. Click Update.

   iLO confirms that the boot order was updated successfully.

NOTE

You cannot update the boot order during POST.

Booting to the ROM-based utility on the next reset

Prerequisites

- Configure iLO Settings privilege

Procedure

1. Click Host in the left navigation pane and click Virtual Media & Boot Options

   The Virtual Media & Boot Options page appears.
2. To load the ROM-based setup utility on the next server reset, click Boot to System Setup Utilities.
3. Click Cancel to cancel the operation.
4. Click ✕ to close the window.

Configuring the server boot mode

Prerequisites

- Configure iLO Settings privilege

About this task

Procedure

1. Click Host on the left navigation pane.

   The Host page appears.
2. Click Virtual Media & Boot Options.

   The Virtual Media & Boot Options page appears.
3. Click ✎ next to Server Boot Order section.

   The Server Boot Order window appears.
4. Select the required option form the drop down.
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the edit window.
8. Reset the server.

> **NOTE**
>
> You cannot update the boot order during POST.

Changing the one-time boot status

About this task

Use the one-time boot status feature to set the type of media to boot on the next server reset, without changing the predefined boot order.

Subtopics

Changing the one-time boot status in UEFI mode

Prerequisites

- Configure iLO Settings privilege
- The server was rebooted after an iLO firmware or system ROM update.
- The server was rebooted after being configured to use the UEFI boot mode.

Procedure

1. Click Host in the left navigation pane and click Virtual Media & Boot Options

   The Virtual Media & Boot Options page appears.
2. Select an option from the Select One-Time Boot Option list.
3. If you selected UEFI Target in the Select One-Time Boot Option list, select a boot device from the Select UEFI Target Option list.

   For example, if you have a hard drive with two bootable partitions, you can select the partition to use on the next server reset.
4. Click Update.

   iLO confirms that the one-time boot option was updated successfully.

   The Current One-Time Boot Option value is updated to show the selection.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the window.

One-time boot options

The following UEFI mode one-time boot options are supported.

> **NOTE**
> Floppy drives are supported iLO virtual media devices, but they are not supported as bootable devices.

- No One-Time Boot
- CD/DVD Drive
- USB Storage Device
- Hard Disk Drive
- Network Device—The BIOS scans for enabled network devices. The server attempts to boot to the detected devices, one at a time, until successful.
- HTTP Boot—The server boots to an HTTP URI if a URI to a bootable image is defined in the ROM-based system utility.

This option is supported in configurations that use a DHCP server to configure the network settings.

- UEFI Target—When you select this option, you can select from the list of available boot devices in the Select UEFI Target Option list.
- Embedded UEFI Shell—The server boots to an embedded shell environment that is separate from the UEFI System Utilities.
- Embedded iPXE—The server boots to the embedded iPXE application.

  The embedded iPXE is an open-source network boot application embedded in the system BIOS. You can use this option to perform a network boot.

Setting up IIS for scripted virtual media

Prerequisites

Before you set up an IIS for scripted virtual media, verify that the IIS is operational. Use IIS to set up a simple website, and then browse to the site to verify that it is working correctly. You must configure the MIME Type of .img and .iso files as `application/octet-stream`. For more information, see your Web server documentation.

Setting up IIS for scripted virtual media

Prerequisites

Before you set up IIS for scripted virtual media, verify that IIS is operational. Use IIS to set up a simple website, and then browse to the site to verify that it is working correctly.

Subtopics

Configuring IIS

About this task

Use this procedure to configure IIS to serve diskette or ISO-9660 CD images for read-only access.

Procedure

1. Add a directory to your website and place your images in the directory.
2. Verify that IIS can access the MIME type for the files you are serving.

   For example, if your diskette image files use the extension `.img`, you must add a MIME type for that extension. Use the IIS Manager to access the Properties dialog box of your website. On the HTTP Headers tab, click **MIME Types** to add MIME types.

   Hewlett Packard Enterprise recommends adding the following types:

   - `.img application/octet-stream`
   - `.iso application/octet-stream`
3. Verify that the web server is configured to serve read-only disk images.

a. Use a web browser to navigate to the location of your disk images.

b. Download the disk images to a client.

If these steps complete successfully, the web server is configured correctly.

Configuring IIS for read/write access

Procedure

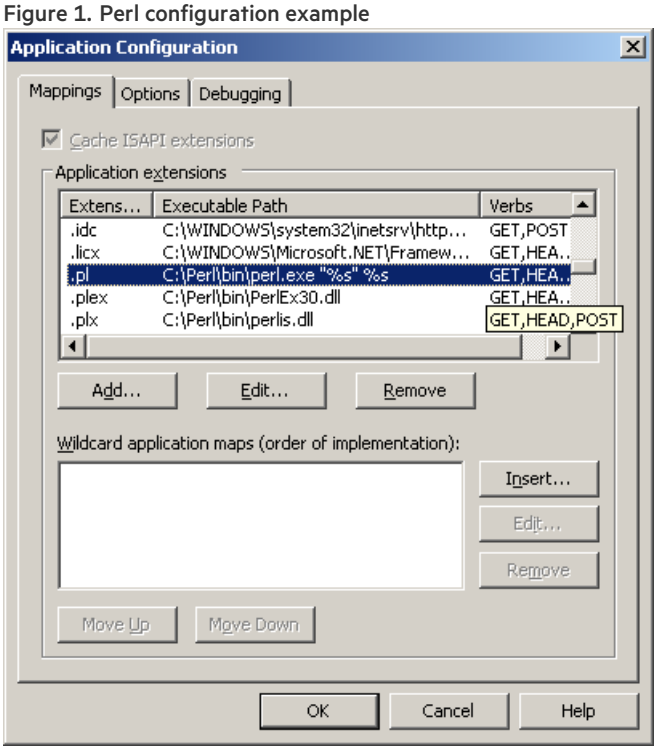
1. Install Perl (for example, ActivePerl).
2. Customize the virtual media helper application as needed.
3. Create a directory on your website for the virtual media helper script, and then copy the script to that directory.

   The sample script uses the directory name `cgi-bin`, but you can use any name.
4. On the Properties page for your directory, under Application Settings, click Create to create an application directory.

   The icon for your directory in IIS Manager changes from a folder icon to a gear icon.
5. Set the Execute permissions to Scripts only.
6. Verify that Perl is set up as a script interpreter.

   To view the application associations, click Configuration on the Properties page. Ensure that Perl is configured as shown in the following example:

   Figure 1. Perl configuration example



7. Verify that Web Service Extensions allows Perl scripts to execute. If not, click Web Service Extensions and set Perl CGI Extension to Allowed.
8. Verify that the prefix variable in the helper application is set correctly.

Inserting virtual media with a helper application

When you use a helper application with the `INSERT_VIRTUAL_MEDIA` command, the basic format of the URL is as follows:

```
protocol://user:password@servername:port/path,helper-script
```

where:

- `protocol` —Mandatory. HTTPS.
- `user:password` —Optional. When present, HTTP basic authorization is used.
- `servername` —Mandatory. Either the host name or the IP address of the web server.
- `port` —Optional. A web server on a nonstandard port.
- `path` —Mandatory. The image file that is being accessed.
- `helper-script` —Optional. The location of the helper script on IIS web servers.

For detailed information about the `INSERT_VIRTUAL_MEDIA` command, see the HPE iLO 7 Scripting and Command Line Guide.

Sample virtual media helper application

The following Perl script is an example of a CGI helper application that allows diskette writes on web servers that cannot perform partial writes. A helper application can be used in conjunction with the `INSERT_VIRTUAL_MEDIA` command to mount a writable disk.

When you are using the helper application, the iLO firmware posts a request to this application using the following parameters:

- The `file` parameter contains the name of the file provided in the original URL.
- The `range` parameter contains an inclusive range (in hexadecimal) that designates where to write the data.
- The `data` parameter contains a hexadecimal string that represents the data to be written.

The helper script must transform the `file` parameter into a path relative to its working directory. This step might involve prefixing it with "../," or transforming an aliased URL path into the true path on the file system. The helper script requires write access to the target file. Diskette image files must have the appropriate permissions.

Example:

```
#!/usr/bin/perl

use CGI;
use Fcntl;

#
# The prefix is used to get from the current working directory to the
# location of the image file that you are trying to write
#
my ($prefix) = "c:/inetpub/wwwroot";
my ($start, $end, $len, $decode);

my $q = new CGI();          # Get CGI data

my $file =  $q->param('file');  # File to be written
my $range = $q->param('range'); # Byte range to be written
my $data =  $q->param('data');  # Data to be written

#
# Change the file name appropriately
```

```
#
$file = $prefix . "/" . $file;

#
# Decode the range
#
if ($range =~ m/([0-9A-Fa-f]+)-([0-9A-Fa-f]+)/) {
 $start = hex($1);
 $end = hex($2);
 $len = $end - $start + 1;
}

#
# Decode the data (a big hexadecimal string)
#
$decode = pack("H*", $data);

#
# Write it to the target file
#
sysopen(F, $file, O_RDWR);
binmode(F);
sysseek(F, $start, SEEK_SET);
syswrite(F, $decode, $len);
close(F);

print "Content-Length: 0\r\n";
print "\r\n";
```

Using the power and thermal features

Subtopics

Server power-on

Secure recovery

When power is applied to the server, iLO validates and starts its own firmware. If the iLO firmware fails validation, the system automatically flashes the iLO firmware if a recovery image is available. This feature is supported with the iLO Standard license.

During server startup, the system ROM is validated. If both the active and the redundant system ROM are invalid, and an iLO Advanced license is installed, a firmware verification scan starts. Depending on the configured firmware verification settings, a repair is initiated with components in the System Recovery Set, or the failure is logged and you must complete the repair manually. If the system ROM is not verified, the server will not boot.

Check the IML for information about the firmware validation activities and recovery actions.

Nonblade servers

If an AC power loss occurs on a Gen12 server with iLO 7, approximately 30 seconds must elapse before the server can power on again. If the power button is pressed during that time, it will flash, indicating a pending request.

This delay is a result of the iLO firmware loading, authenticating, and booting. iLO processes pending power-button requests when initialization is complete. If the server does not lose power, there is no delay. A 30-second delay occurs only during an iLO reset. The power button is disabled until iLO is ready to manage power.

The iLO firmware monitors and configures power thresholds to support managed-power systems (for example, using Hewlett Packard Enterprise power capping technology). Multiple system brownout, blackout, and thermal overloads might result when systems are allowed to boot before iLO can manage power. The managed-power state is lost because of AC power loss, so iLO must first boot to a restore state and allow power-on.

Brownout recovery

A brownout condition occurs when power to a running server is lost momentarily. Depending on the duration of the brownout and the server hardware configuration, a brownout might interrupt the OS, but does not interrupt the iLO firmware.

iLO detects and recovers from power brownouts. If iLO detects that a brownout has occurred, server power is restored after the power-on delay unless Auto Power-On is set to Always Remain Off. After the brownout recovery, the iLO firmware records a `Brown-out recovery` event in the iLO Event Log.

NOTE

Depending on the server hardware configuration and M-CPRS model used, iLO may lose power during a brownout and reboot. In such cases, brownout recovery will not work.

Graceful shutdown

The ability of the iLO processor to perform a graceful shutdown requires cooperation from the operating system. To perform a graceful shutdown, the Agentless Management Service (AMS) must be loaded. iLO communicates with AMS and uses the appropriate operating system method of shutting down the system safely to ensure that data integrity is preserved.

If AMS is not loaded, the iLO processor attempts to use the operating system to perform a graceful shutdown through the power button. iLO emulates a physical power-button press (iLO momentary press) to prompt the operating system to shut down gracefully. The behavior of the operating system depends on its configuration and settings for a power-button press.

The Thermal Shutdown option in the UEFI System Utilities allows you to disable the automatic shutdown feature. This configuration allows the disabling of automatic shutdown except in the most extreme conditions when physical damage might result.

Power efficiency

iLO enables you to improve power usage by using High Efficiency Mode (HEM). HEM improves the power efficiency of the system by placing the secondary power supplies in step-down mode. When the secondary supplies are in step-down mode, the primary supplies provide all DC power to the system. The power supplies are more efficient because there are more DC output watts for each watt of AC input.

HEM is available on nonblade servers only.

When the system draws more than 70% of the maximum power output of the primary supplies, the secondary supplies return to normal

operation (exit step-down mode). When power use drops below 60% capacity of the primary supplies, the secondary supplies return to step-down mode. HEM enables you to achieve power consumption equal to the maximum power output of the primary and secondary power supplies, while maintaining improved efficiency at lower power-usage levels.

HEM does not affect power redundancy. If the primary supplies fail, the secondary supplies immediately begin supplying DC power to the system, preventing any downtime.

Use the UEFI System Utilities to configure HEM. You cannot configure these settings through iLO. For more information, see the UEFI System Utilities user guide.

The configured HEM settings are displayed on the Power Information page.

Power-on protection

Power-on protection works in conjunction with the Auto Power-On and Virtual Power Button Momentary Press features. If the server hardware cannot be identified when server power is restored or a Momentary Press is requested, the server will not power on.

When the power-on protection feature prevents server power-on:

- An event is recorded in the IML.
- The server health status is set to Critical.
- If HPE OneView manages the server, an SNMP trap is sent to HPE OneView.

Power allocation

Synergy servers operate in a shared power environment with an enclosure. Before a server can be powered on, it must obtain a power allocation from its enclosure.

If power-on is prevented, an error is recorded in the IML, and the server Health LED changes. The following errors might prevent power-on:

- **Electronic Keying or I/O Configuration Error** —There is a mismatch between the mezzanine devices in the server and the switches on the back of the enclosure.
- **Not Enough Power**—There is insufficient power available in the enclosure to power on the server.
- **Not Enough Cooling**—There is insufficient cooling available in the enclosure to cool the server.
- **Enclosure Busy**—The enclosure is busy collecting information about the blade. If this error occurs after server insertion and auto power-on is enabled, iLO will continue to request power until it is allowed. Otherwise, press the momentary press button again.

For troubleshooting information, see the error messages guide for your server.

Managing the server power

Prerequisites

Virtual Power and Reset privilege

About this task

The Virtual Power Button section on the Power Control page displays the current power state of the server, as well as options for remotely controlling server power. System Power indicates the state of the server power when the page is first opened. The server power state can be ON, OFF.

Procedure

1. Click Host in the left navigation.

   The Host page appears.

2. Click Power.

   The Power page appears.

3. When the power is on the following options are displayed:

   - Graceful Shutdown
   - Force Power Off
   - Power Cycle
   - Reset

   The Force Power Off, Reset, and Power Cycle options are not available when the server is powered off.

   A confirmation window appears.

4. Confirm the request to continue the operation.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the confirmation window.

Subtopics

Virtual power button options

Virtual power button options

- Graceful Shutdown—The same as pressing the physical power button. If the server is powered off, a momentary press will turn on the server power.

  Some operating systems might be configured to initiate a graceful shutdown after a momentary press, or to ignore this event. Hewlett Packard Enterprise recommends using system commands to complete a graceful operating system shutdown before you attempt to shut down by using the virtual power button.

- Force Power Off—The same as pressing the physical power button for 5 seconds and then releasing it.

  The server is powered off as a result of this operation. Using this option might circumvent the graceful shutdown features of the operating system.

  This option provides the ACPI functionality that some operating systems implement. These operating systems behave differently depending on a short press or long press.

- Reset—Forces the server to warm-boot: CPUs and I/O resources are reset. Using this option circumvents the graceful shutdown features of the operating system.
- Power Cycle—Immediately removes power from the server. Processors, memory, and I/O resources lose main power. The server will restart after approximately 8 seconds. Using this option circumvents the graceful shutdown features of the operating system.

Configuring the System Power Restore Settings

Prerequisites

Configure iLO Settings privilege

About this task

The System Power Restore Settings enable you to control the system behavior after power is lost.

Procedure

1. Click Host in the left navigation pane and click Power Controls.

   The Power Controls page appears.

2. Click  to change the System Power Restore Settings.

   System Power Restore Settings window appears.

3. Select a Auto Power-On value.

   Changes to the Auto Power On value may not take place until after the next server reboot.

4. Select a Power-On Delay value.

   This setting is not available if the Auto Power-On option is set to Always Remain Off.

5. Click Update to save the settings.

6. Click Cancel to cancel the operation.

7. Click  to close the window.

Subtopics

Auto Power-On

The Auto Power-On setting determines how iLO behaves after power is restored—for example, when the server is plugged in or when a UPS is activated after a power outage. This setting is not supported with micro-UPS systems.

Choose from the following Auto Power-On settings:

- Always Power On—Power on the server after the power-on delay.

  This option is the default settings for all ProLiant servers.

- Always Remain Off—The server remains off until directed to power-on.

- Restore Last Power State—Returns the server to the power state when power was lost. If the server was on, it powers on; if the server was off, it remains off.

  This option is the default settings for all ProLiant servers.

  If an issue such as insufficient power or insufficient cooling occurs, or an HPE OneView power hold occurs, then it might not be possible to restore the power state. For more information, check HPE OneView or the IML.

  When a Synergy compute module is configured to use this setting, iLO attempts to restore the previous power state when power is restored. If an issue such as insufficient power or insufficient cooling occurs, or an HPE OneView power hold occurs, then it might not be possible to restore the power state. For more information, check HPE OneView or the IML.

Power-On Delay

The Power-On Delay setting staggers server automatic power-on in a data center. It determines the amount of time that iLO waits before

powering on a server after iLO startup is complete. This setting is not supported with micro-UPS systems.

On supported servers, choose from the following Power-On Delay settings:

- Minimum Delay—Power-on occurs after iLO startup is complete.
- 15 Second Delay—Power-on is delayed by 15 seconds.
- 30 Second Delay—Power-on is delayed by 30 seconds.
- 45 Second Delay—Power-on is delayed by 45 seconds.
- 60 Second Delay—Power-on is delayed by 60 seconds.
- Random up to 120 seconds—The power-on delay varies and can be up to 120 seconds.

Viewing power information

Procedure

1. Click Host in the left navigation pane and click Hardware.

   The Hardware page appears.

2. Click Power in the Hardware page.

   The Power page appears.
   The information displayed on the Power Information page varies depending on the server type. The following sections are possible:

   - Power Supply Summary
   - Power Supplies
   - HPE Power Discovery Services
   - Smart Storage Energy Pack
   - Power Readings
   - Power Microcontroller

   If the server is powered off, the system health information on this page is current as of the last power off. Health information is updated only when the server is powered on and POST is complete.

Subtopics

Viewing server power usage

Prerequisites

A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

- The server power supplies and the system BIOS support power readings.

About this task

Power graphs display recent server power usage. Power history information is not collected when the server is powered off. When you view a graph that includes periods in which the server was powered off, the graph displays a gap to indicate that data was not collected.

The graph data is cleared when iLO is reset or the server is power cycled. For example, the data is cleared when you use the Virtual Power Button Reset or Cold Boot actions. The data is not cleared when you use the Graceful Power Off or Force Power Off actions.

Procedure

1. Click Host in the navigation left navigation pane and click Hardware > Power.

   The Power page appears.

2. Click 20 min, 24 hr, or 1 week to select a graph type.

   You can view a graph of the last 20 minutes, the last 24 hours, or the last week.

3. (Optional) To customize the graph display, select or clear the following legends:

   - Power Cap
   - Maximum
   - Average
   - Total Fan (Estimated)
   - Total CPU
   - Total GPU
   - Total DIMM

   If a server does not support a feature, then the associated legend is not displayed.

4. (Optional) Choose how to refresh data on this page.

   By default, the page data is not automatically refreshed after you open the page.

   - To start refreshing the page data automatically, click Auto Refresh toggle button.

5. (Optional) Configure the iLO power unit preference by clicking Watts or BTU/hr.

   When you set this value, the same setting is used on other pages that display power units.

Subtopics

Power Graph display options

Graph Type

Click the 20 min, 24 hr, or 1 week option to select a graph type.

- 20 min—Displays the power usage of the server over the last 20 minutes. The iLO firmware collects power usage information for this

graph every 10 seconds.

- 24 hr—Displays the power usage of the server over the last 24 hours. The iLO firmware updates power usage information for this graph every 5 minutes.
- 1 week—Displays the power usage of the server over the last 1 week. The iLO firmware updates power usage information for this graph once per hour.

Chart data

Use the following legend to customize the data included in power graphs.

If a server does not support a feature, then the associated legend is not displayed.

- Power Cap—The configured power cap during the sample.
  - A power cap limits average power draw for extended periods of time.
  - Power caps are not maintained during server reboots, resulting in temporary spikes during boot.
  - Power caps set lower than the specified percentage threshold between maximum power and idle power might become unreachable because of changes in the server. Hewlett Packard Enterprise does not recommend configuring power caps lower than this threshold. Configuring a power cap that is too low for the system configuration might affect system performance.
- Maximum—The highest instantaneous power reading during the sample. iLO records this value on a subsecond basis.
- Average—The mean power reading during the sample.
- Total Fan (Estimated)—The total estimated fan power reading of all the fans in the server. The actual fan power reading might vary from the estimated reading.
- Total CPU—The total power reading for all CPUs in the server.
- Total GPU—The total power reading for all GPUs in the server.

  This value is displayed when:
  - The server has one or more GPUs installed.
  - The OS is running (POST is complete).
  - GPU drivers are installed in the OS.

    For Linux and VMware: NVIDIA option cards must have the vendor driver installed and persistent mode enabled. For more information, see the vendor option card documentation.
  - The GPU supports power reporting.
  - Power history data is available.
- Total DIMM— The total power reading for all DIMMs in the server.

NOTE

For Total DIMM power reporting in Intel platforms, DRAM RAPL Reporting Support option must be enabled in ROM-Based system utility. The default value for RAM RAPL Reporting Support option in ROM-Based system utility is Enabled.

Power Status details

The Power Status table shows the following information:

- Power Consumed—The power consumed by the server.

- Power Regulator Mode—The configured power regulator mode.
- Power Input Voltage—The supplied input voltage to the server.

Power Metrics details

The Power Metrics table shows power readings from four time periods: 5 minutes, 20 minutes, 24 hours, and 1 week.

- Maximum Power—The maximum power reading from the server for the specified time period. If the server has not been running for the specified time period, the value is the maximum of all readings since the server booted.
- Average Power—The average of the power readings for the specified time period. If the server has not been running for the specified time period, the value is the average of all readings since the server booted.
- Minimum Power—The minimum power reading from the server for the specified time period. If the server has not been running for the specified time period, the value is the minimum of all readings since the server booted.

When multiple power supplies are removed from the server at the same time, there is a short period in which iLO will not display information in the Power History section or in the Power Meter graphs. This information will be displayed again after iLO collects information about the remaining installed power supplies.

Power Supply Summary details

This section is displayed for nonblade servers.

Present Power Reading

When Common Slot Power Supplies are present, the most recent power reading from the server is displayed. Other power supplies do not provide this data.

Although this value is typically equal to the sum of all active power supply outputs, there might be some variance as a result of reading the individual power supplies. This value is a guideline value and is not as accurate as the values presented on the Power Meter page.

Power Management Controller Firmware Version

The firmware version of the power management controller. The server must be powered on for the iLO firmware to determine this value. This feature is not available on all servers.

Power Status

The overall status of the power supplied to the server.

- If the server power supplies are connected to a nonintelligent power source, this section displays the status of the internal server power supplies.
- If the server power supplies are connected to Power Discovery Services through an iPDU, this section displays the status of the power supplied to the internal server power supplies.
- For dual power domain system, power supply redundancy rules are independent for each domain.

Possible Power Status values follow:

- Redundant—Indicates that the power supplies are in a redundant state.

  If Power Discovery Services is integrated into the infrastructure, this value indicates whether the externally supplied power to the internal power supplies is redundant.
- Not Redundant—Indicates that at least one of the power supplies or iPDUs (if Power Discovery Services is used) is not providing power to the server. The most common reason for this status is a loss of input power to the power supply. Another reason for this status is a configuration with multiple power supplies connected to the same iPDU. In this case, the individual power supply status

is Good, In Use, but the Power Status value is Not Redundant because the loss of input power to the iPDU would lead to a total loss of power to the server.

- Not Redundant—Indicates that at least one of the power supplies is not providing power to the server. The most common reason for this status is a loss of input power to the power supply.
- Failed Redundant—On servers that support four power supplies, this status indicates that the number of power supplies providing power to the server is less than the number required for server operation. The server might continue to operate, but there is a higher risk of power issues in this state. Verify that your power supply redundancy setting is correct in the ROM-based system utilities.
- OK—A Common Slot Power Supply is not installed. The installed power supply is working correctly.
- N/A—Only one power supply is installed. Redundancy is not applicable in this configuration.

Power Discovery Services Status

The possible values follow:

- Redundant—The server is configured for a redundant iPDU configuration.
- Not Redundant—There are not sufficient iPDUs to support redundancy, or the server power supplies are connected to the same iPDU.
- N/A—No iPDUs were discovered.

When the iLO processor or the server is reset, the iPDU discovery process might take a few minutes to complete.

High Efficiency Mode

The redundant power supply mode that will be used when redundant power supplies are configured.

For dual power domain system, high efficiency mode setting is independent for each domain.

The possible values follow:

- N/A—Not applicable.
- Balanced Mode—Delivers power equally across all installed power supplies.
- High Efficiency Mode (Auto)—Delivers full power to one of the power supplies, and places the other power supplies on standby at a lower power-usage level. A semirandom distribution is achieved because the Auto option chooses between the odd or even power supply based on the server serial number.
- High Efficiency Mode (Even Supply Standby)—Delivers full power to the odd-numbered power supplies, and places the even-numbered power supplies on standby at a lower power-usage level.
- High Efficiency Mode (Odd Supply Standby)—Delivers full power to the even-numbered power supplies, and places the odd-numbered power supplies on standby at a lower power-usage level.
- Not Supported—The installed power supplies do not support High Efficiency Mode.

Subtopics

System Domain/System Domain 1
GPU Domain/GPU Domain 1

System Domain/System Domain 1

Summarized information for system redundancy is displayed under System domain. For more information see Power supplies list (This option is available only for supported servers).

GPU Domain/GPU Domain 1

Summarized information for GPU redundancy is displayed under GPU domain. For more information see Power supplies list (This option is available only for supported servers).

> **NOTE**
> Summarized information for individual GPU domain redundancy is displayed on servers with multiple GPU domains support.

Power supplies list

Some power supplies do not provide information for all the values in this list. If a power supply does not provide information for a value, N/A is displayed.

This section is displayed for ProLiant servers (DL, ML).

- Bay—The power supply bay number.
- State—Indicates whether a power supply is installed. The possible values are Enabled, Disabled, UnavailableOffline.
- Health—The power supply status. The displayed value includes a status icon (OK, Warning, and Critical). The possible values follow:
  - Unknown
  - Good, In Use
  - Good, Standby
  - General Failure
  - Over Voltage Failure
  - Over Current Failure
  - Over Temperature Failure
  - Input Voltage Lost
  - Fan Failure
  - High Input A/C Warning
  - Low Input A/C Warning
  - High Output Warning
  - Low Output Warning
  - Inlet Temperature Warning
  - Internal Temperature Warning
  - High Vaux Warning
  - Low Vaux Warning
  - Mismatched Power Supplies
- Mismatch—Whether mismatched power supplies are present or not. The possible values are Yes or No.
- PDS—Whether the installed power supply is enabled for Power Discovery Services.
- Hotplug—Whether the power supply bay supports swapping the power supply when the server is powered on. If the value is Yes, and the power supplies are redundant, the power supply can be removed or replaced when the server is powered on.

- Model—The power supply model number.
- Spare—The spare power supply part number.
- Serial Number—The power supply serial number.
- Power Consumption—Power consumption of each power supply (watts).
- Capacity—The power supply capacity (watts).
- Input Voltage—The input voltage(volts)
- Output Voltage—The output voltage (volts)
- Input Current—The input current (Amps)
- Output Current—The output current (Amps)
- Input Power—The input power (Watts)
- Output Power—The output power (Watts)
- Firmware Version—The firmware version.
- Component Integrity—The SPDM authentication status for power supply unit. The possible values are Success, Failed, or Not Supported.

  When you select a power supply, the details pane opens and displays more information.

NOTE

In CNSA security mode, SPDM will not authenticate power supply unit.

Power Discovery Services iPDU Summary

This section is displayed for nonblade servers if the server power supplies are connected to an iPDU.

After iLO is reset, or when an iPDU is attached, it takes approximately 2 minutes for the iLO web interface to display iPDU summary data. This delay is due to the iPDU discovery process.

Bay

The power supply bay number.

Status

The overall communication-link status and rack input power redundancy, as determined by the iPDU. Possible values follow:

- iPDU Redundant—This Good status indicates that the server is connected to at least two different iPDUs.
- iPDU Not Redundant—This Caution status indicates that the server is not connected to at least two different iPDUs. This status is displayed when one of the following conditions occurs:
  - An iPDU link is not established for all power supplies.
  - Two or more power supplies are connected to the same iPDU.

    The iPDU MAC address and serial number are identical for power supplies whose input power comes from the same iPDU. If one power supply is waiting for a connection to be established, the iPDU is listed as Not Redundant.
- Waiting for connection—This Informational status indicates one or more of the following conditions:
  - The wrong power cord was used to connect the power supply to the iPDU.
  - The iPDU and the iLO processor are in the process of connecting. This process can take up to 2 minutes after the iLO processor or the iPDU is reset.

- The iPDU module does not have a network (or IP) address.

Part Number

The iPDU part number.

Serial

The iPDU serial number.

MAC Address

The MAC address of the iPDU network port. This value helps you to identify each connected iPDU because each iPDU has a unique MAC address.

iPDU Link

The iPDU HTTP address (if available). To open the Intelligent Modular PDU web interface, click the link in this column.

Power Readings

This section is displayed for server blades and Synergy compute modules.

Present Power Reading

The most recent power reading from the server.

Although this value is typically equal to the sum of all active power supply outputs, there might be some small variance as a result of reading the individual power supplies. This value is a guideline value and is not as accurate as the values presented on the Power Management pages.

Power Microcontroller

This section is displayed for server blades and Synergy compute modules. This feature is available on supported servers only.

Firmware Version

The firmware version of the power microcontroller.

The server must be powered on for the iLO firmware to determine the power microcontroller firmware version.

Battery Backup Unit details

The following details are displayed on nonblade servers that support a battery backup unit:

- Bay—The bay where the battery backup unit is installed.
- Present—Whether a battery backup unit is installed. The possible values are OK and Battery Failed, and Replace Battery.
- Status—The battery backup unit status. The possible values are OK, Degraded, Failed, or Other.
- Charge—The battery backup unit charge level (percent). The possible charging status values are Fully Charged, Discharging, Charging, Slow Charging, and Not Charging.
- Serial Number—The battery backup unit serial number.
- Capacity—The battery backup unit capacity (watts).
- Firmware—The installed battery backup unit firmware version.

Smart Storage Energy Pack list

The Power Information page displays the following information on servers that support the Smart Storage Energy Pack.

Index

The energy pack index number.

Present

The energy pack installation status. The possible values are OK and Not Installed.

Status

The energy pack health status. The possible values are OK, Degraded, Failed, or Other.

Model

The model number.

Spare

The part number of the spare energy pack.

Serial Number

The energy pack serial number.

Type

The energy pack type.

Firmware

The installed energy pack firmware version.

Power monitoring

iLO monitors the power supplies in the server to ensure the longest available uptime of the server and operating system. Brownouts and other electrical conditions might affect power supplies, or AC cords might be unplugged accidentally. If redundant power supplies are configured, these conditions result in a loss of redundancy. If redundant power supplies are not used, these conditions result in a loss of operation. If a power supply hardware failure is detected or the AC power cord is disconnected, events are recorded in the IML and LED indicators are used.

The iLO processor is an essential component of the Power Discovery Services infrastructure. The iLO processor communicates with the iPDU attached to each Platinum Plus power supply to determine rack and data center power redundancy. When the iLO processor is part of the Power Discovery Services infrastructure, it intelligently reports external server input power redundancy status and individual (internal) power supply status.

For more information, see the following website: **https://www.hpe.com/info/rackandpower**.

High Efficiency Mode

High Efficiency Mode improves the power efficiency of the server by placing the secondary power supplies in standby mode. When the secondary power supplies are in standby mode, primary power provides all DC power to the system. The power supplies are more efficient (more DC output watts for each watt of AC input) at higher output levels, and the overall power efficiency improves.

High Efficiency Mode does not affect power redundancy. If the primary power supplies fail, the secondary power supplies immediately begin supplying DC power to the system, preventing any downtime. You can configure redundant power supply modes only through the UEFI System Utilities. You cannot modify these settings through the iLO firmware.

If High Efficiency Mode is configured to use an unsupported mode, you might experience decreased power supply efficiency.

Power settings

The Power Settings page enables you to view and control the power management features of the server. The power management features on this page vary based on the server configuration.

Subtopics

Configuring the Power Regulator settings

Prerequisites

- Configure iLO
- Configure iLO Settings privilege
- A license that supports this feature is installed.

  For information about the available license types and the features they support, see the licensing documentation at the following website: https://-WWWDOC-

About this task

The Power Regulator feature enables iLO to modify processor frequency and voltage levels based on operating conditions to provide power savings with minimal effect on performance.

Procedure

1. Click Host on the left navigation pane and click Hardware .

   The Hardware page appears.

2. Click Power.

   The Power page appears.

3. Click Settings.

   The Power Settings page appears.

4. Click on Power Regulator section.

   The Power Regulator window appears.

5. Select a Regulator Mode.

   Only supported modes are listed. Select from the following:

   - Dynamic Power Savings Mode—Intel systems only
   - Static Low Power Mode—Intel systems only
   - Static High Performance Mode—Intel and AMD systems
   - OS Control Mode—Intel and AMD systems

6. Click Update.

   On Intel systems, if the server is off or in POST, the changes will not take effect until POST is complete.

   > **NOTE**
   >
   > Power Regulator mode can be modified irrespective of the workload profile set in the ROM-based system utility.

   - When you click Update on an Intel system:
     - If you changed to Dynamic Power Savings Mode, Static Low Power Mode, or Static High Performance Mode, iLO notifies you that the Power Regulator settings changed.
     - If you changed to OS Control Mode, or changed from OS Control Mode to any other mode, iLO notifies you that you must reboot the server to complete the change.
7. If a reboot is required, reboot the server.
8. Click ✕ to close the Power Regulator window.
9. Click Cancel to cancel the operation.

Subtopics

Power Regulator modes

Power Regulator modes

Choose from the following modes when you configure the Power Regulator settings:

- Dynamic Power Savings Mode—Automatically varies processor speed and power usage based on processor utilization. This option allows the reduction of overall power consumption with little or no impact to performance. It does not require OS support.
- Static Low Power Mode—Reduces processor speed and power usage. This option guarantees a lower maximum power usage value for the system. Performance impacts are greater for environments with higher processor utilization.
- Static High Performance Mode—Processors will run at maximum power and performance at all times, regardless of the OS power management policy
- OS Control Mode—Processors will run at maximum power and performance at all times, unless the OS enables a power management policy.

Configuring battery backup unit settings

Prerequisites

Configure iLO Settings privilege

About this task

When the power supplies cannot provide power to a server with a battery backup unit, the server runs on power provided by the battery backup unit.

Use the following procedure to choose the action iLO takes when a server is running on a battery backup unit.

Procedure

1. Click Host on the left navigation pane and click Hardware > Power.

The Power page appears.

2. In the Battery Backup Unit Settings section, select the action you want iLO to take when the server runs on the battery backup unit.
3. Click Update.

   iLO notifies you that the change was successful.

Subtopics

Battery backup unit options

Battery backup unit options

You can configure iLO to take one of the following actions when a server is running on battery power:

- No Action (default)—Do nothing when the server is running on battery power. If power is not restored, the server will lose power when the battery is depleted.
- Momentary Power Button Press—When iLO detects that the server is running on battery power for at least 10 seconds, it sends a momentary power button press to the server. If the operating system is configured to react to the power button press, the operating system initiates a shutdown.

  Send Shutdown Message to OS—When iLO detects that the server is running on battery power for at least 10 seconds, it sends a shutdown message to the host operating system. If the required server management software is installed, the operating system initiates a shutdown.

To verify server support for a battery backup unit, see the server specifications at the following website: **https://www.hpe.com/info/quickspecs**.

Configuring Power Caps

Prerequisites

- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- The server model supports power capping.

  See the server specifications for support information.
- The power capping feature is enabled in the ROM-based system utility.

  When you reset the BIOS settings to the default values, power capping is disabled in the ROM-based system utility. You must enable the feature before you can use it.
- The server does not have a mismatched power supply configuration.

Procedure

1. Click Host on the left navigation pane and click Hardware .

   The Hardware page appears.
2. Click Power.

   The Power page appears.

3. Click Settings.

   The Power Settings page appears.

4. Click Edit.

   The Edit page appears.

5. Select the Enable power capping check box.

6. Enter the Power Cap Value in watts, BTU/hr, or as a percentage.

   The percentage is the difference between the maximum and minimum power values.

   The power cap value cannot be set lower than the server minimum power value.

7. (Optional) When values are displayed in watts, click Show values in BTU/hr to change the display to BTU/hr. When values are displayed in BTU/hr, click Show values in Watts to change the display to watts.

8. Click Update.

   iLO notifies you that the change was successful.

9. Click ✕ to close the Edit window.

10. Click Cancel to cancel the operation.

NOTE

To achieve the power cap, HPE ProLiant ML/DL servers control only the CPU. Depending on the IO devices installed, the overall power consumption might be more than the power cap value.

For example, if GPU consumes more power, then no action is taken to reduce the GPU power consumption and power capping cannot be achieved.

Subtopics

Power capping considerations

Power capping considerations

- During POST, the ROM runs two power tests that determine the peak and minimum observed power values.

  Consider the values in the Power Capping Settings table when determining your power capping configuration.

  - Maximum Available Power—The Maximum Power Cap threshold (the highest power cap that can be set).

    For server blades, this value is the initial power-on request value.

    For nonblade servers, this value is the power supply capacity.

  - Peak Observed Power—The maximum observed power for the server. This value is also the Minimum High-Performance Cap threshold. It is the lowest power cap value that can be set without affecting server performance.

  - Minimum Observed Power—The minimum observed power for the server. This value is also the Minimum Power Cap threshold. It represents the minimum power that the server uses. A power cap set to this value reduces the server power usage to the minimum, which results in server performance degradation.

- When a power cap is set, the average power reading of the server must be at or lower than the power cap value.

- Power capping settings are disabled when the server is part of an Enclosure Dynamic Power Cap.

  These values are set and modified by using Insight Control power management.

- Power capping is not supported on all servers. For more information, check the server specifications.
- Power capping settings for some servers must be managed outside of the iLO web interface with tools such as:
  - HPE Advanced Power Manager

  See the server specifications at **https://www.hpe.com/info/quickspecs** for information about the power management features your server supports.
- The power capping feature is disabled on servers with mismatched power supplies.

Configuring the persistent mouse and keyboard setting

Prerequisites

Configure iLO Settings privilege

About this task

The Other Settings section on the Power Settings page allows you to enable or disable the persistent keyboard and mouse settings.

Procedure

1. Click Host on the left navigation pane and click Hardware .

   The Hardware page appears.
2. Click Power.

   The Power page appears.
3. Click Settings.

   The Power Settings page appears.
4. Configure the Enable persistent mouse and keyboard on the Other Settings section.

   iLO notifies you that the settings changed.

SNMP alert on breach of power threshold

About this task

Procedure

1. Click Host on the left navigation pane and click Hardware .

   The Hardware page appears.
2. Click Power.

   The Power page appears.
3. Click Settings.

   The Power Settings page appears.
4. Click in the SNMP Alert on Breach of Power Threshold section.

   The SNMP Alert on Breach of Power Threshold window appears.

5. Select one of the following options for Warning Trigger:
   - Warning Disabled
   - Peak Power Consumption
   - Average Consumption
6. (For Peak Power Consumption or Average Consumption only) Set a value for Warning Threshold(Watts).
7. (For Peak Power Consumption or Average Consumption only) Set a value for Duration(minutes).
8. Click Update to save the configuration.
9. Click Cancel to cancel the operation.
10. Click ✕ to close the window.

Subtopics

SNMP Alert on breach of power threshold options

SNMP Alert on breach of power threshold options

- Warning Trigger—Determines whether warnings are based on peak power consumption, average power consumption, or if they are disabled.
- Warning Threshold—Sets the power consumption threshold, in watts. If power consumption exceeds this value for the specified time duration, an SNMP alert is triggered.
- Duration—Sets the length of time, in minutes, that power consumption must remain above the warning threshold before an SNMP alert is triggered. When an SNMP alert is generated, it is based on the power consumption data sampled by iLO. It is not based on the exact date and time that the Duration value was changed. Enter a value from 5 to 240 minutes. The value must be a multiple of 5.

Fans

The iLO firmware, in conjunction with the hardware, controls the operation and speed of the fans. Fans provide essential cooling of components to ensure reliability and continued operation. The fans react to the temperatures monitored throughout the system to provide sufficient cooling with minimal noise.

Monitoring the fan subsystem includes the sufficient, redundant, and nonredundant fan configurations. If one or more fans fail, the server still provides sufficient cooling to continue operation.

Fan operation policies might differ from server to server based on fan configuration and cooling demands. Fan control monitors the internal temperature of the system, increasing the fan speed to provide more cooling, and decreasing the fan speed when cooling is sufficient. If a fan failure occurs, fan operation policies might increase the speed of the other fans, record the event in the IML, or turn on LED indicators.

In nonredundant configurations, or redundant configurations where multiple fan failures occur, the system might be incapable of providing sufficient cooling to protect the server from damage and to ensure data integrity. In this case, in addition to the cooling policies, the system might start a graceful shutdown of the operating system and server.

Subtopics

Viewing fan information
Configuring the minimum fan speed

Viewing fan information

About this task

The information displayed on the Fan page varies depending on the server configuration.

If the server is powered off, the system health information on this page is current as of the last power off. Health information is updated only when the server is powered on and POST is complete.

Procedure

1. Click Host in the left navigation pane and click Hardware > Thermal and Cooling.

   The Thermal and Cooling page appears.
   The tab name depends on the features the server supports.

2. (Optional) On servers that support fan redundancy, empty fan bays are hidden. To view the empty fan bays, click show empty bays.
   When empty fan bays are displayed, click hide empty bays to hide them.

Subtopics

Fan summary details

Overall Status

The summarized health status for the installed fans.

Redundancy

The fan redundancy status.

Minimum Fan Speed

The minimum speed for all installed fans (0-100%). When the server is running, the fans run at the configured speed or higher.

Thermal Configuration

The thermal configuration value.

Acoustic Mode Scenario

The acoustic mode scenario value.

Fan details

The following details are displayed for each fan:

- Fan—The fan name.
- Location— The location in the server chassis is listed.
- Redundant—Whether there is a backup component for the fan.
- State—The current state for the fan.
- Health—The fan health status.
- Speed—The fan speed (percent).

Viewing HPE Liquid Cooling Module information

About this task

The information displayed on this page varies depending on the server configuration.

> **NOTE**
> Liquid cooling information appears only for supported platforms.

If the server is powered off, the system health information on this page is current as of the last power off. Health information is updated only when the server is powered on and POST is complete.

Procedure

1. Click Host on the left navigation pane and click Hardware .

   The Hardware page appears.

2. Click Thermal and Cooling.

   The Thermal and Cooling page appears.

Subtopics

HPE Liquid Cooling Module summary details

Overall Status

The summarized health status for the installed cooling pumps.

Redundancy

The cooling pump redundancy status.

HPE Liquid Cooling Module details

The following details are displayed for each HPE Liquid Cooling Module:

- Cooling Module—The cooling pump name.
- Location—The cooling pump location.
- Redundant—Whether there is a backup component for the cooling pump rotor.
- State—The cooling pump status.
- Health—The cooling pump health status.
- Speed—The cooling pump speed (percent).

NOTE

A single pump module will have two rotors.

Clearing the HPE Liquid Cooling Module leakage status

About this task

If the liquid cooling modules have leakage, the server will power off and iLO logs an IML for leakage detection. Hewlett Packard Enterprise recommends removing the AC power. Once the leakage is fixed, restore the AC power and use iLO RESTful API or iLO web interface to clear the leakage status.

CAUTION

Clearing the leakage status without cleaning the liquid on the board and replacing the module (if required) can result in damage to the server.

Procedure

1. Click Host in the left navigation pane and click Hardware > Thermal and Cooling.

   The Thermal and Cooling page appears.

2. In the Cooling Pumps section, click Clear.

   A confirmation dialog box appears.

3. Click Yes, Clear.

Temperature information

The Temperature Information page displays the location, status, temperature, and threshold settings of temperature sensors in the server chassis. It also displays the temperature details of the available PCIe subcomponents.

The name of the PCIe subcomponent is derived from the auxiliary sensor name. If the auxiliary sensor name is not available, then the name is derived from the entity type. If the entity type is also not available, then the name of the PCIe subcomponent appears as NA.

Any PLDM reported adapter temperature sensors (subcomponents) appears in the Temperature Information page in aggregation with the main sensors. The main sensor that has subcomponents will display the details from one of the subcomponent with asterisk (*) character.

If the server is powered off, the system health information on this page is current as of the last power off. Health information is updated only when the server is powered on and POST is complete.

Subtopics

Viewing the temperature graph

Procedure

1. Click Host in the left navigation pane and click Hardware > Thermal and Cooling

The Thermal and Cooling page appears. The Ambient Temperature History Graph is displayed in the Temperature section.
The Ambient Temperature History Graph displays the ambient temperature sensor data for one hour. This feature is available only with iLO Advanced license.

2. (Optional) Customize the graph display. To display the sensors at the front or back of the server, select Front View or Back View.
3. (Optional) To view individual sensor details, move the mouse over a circle on the graph.

   The sensor ID, status, and temperature reading are displayed.

Subtopics

Temperature graph details

Temperature graph details

When you view the temperature graph, the circles on the graph correspond to the sensors listed in the Sensor Data table.

The color on the graph is a gradient that ranges from green to red. Green represents a temperature of 0°C and red represents the critical threshold. As the temperature measured by a sensor increases, the graph changes from green to amber, and then to red if the temperature approaches the critical threshold.

Viewing temperature sensor data

Procedure

1. Click Host in the left navigation pane and click Hardware > Thermal and Cooling

   The Thermal and Cooling page appears.
2. (Optional) To expand or collapse details about a sub component, click > or ⌄.
3. (Optional) The ambient temperature graph units depend on the Temperature Units selected in the User Preferences section. The temperature is displayed either in Celsius or Fahrenheit.

   When temperature is displayed in Celsius, click °F to change the display to Fahrenheit.

   When temperature is displayed in Fahrenheit, click °C to change the display to Celsius.
4. (Optional) By default, sensors that are not installed are hidden. To view the missing sensors, click show missing sensors. When missing sensors are displayed, click hide missing sensors to hide them.
5. (Optional) To sort by a table column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

   The sub components are prefixed by numbers which are then sorted based on internal calculation.

Temperature sensor details

- Sensor—The ID of the temperature sensor, which also gives an indication of the sensor location.
- Location—The area where the temperature is being measured. In this column, Memory refers to the following:
  - Temperature sensors on physical memory DIMMs.

- Temperature sensors located close to the memory DIMMs, but not on the DIMMs. These sensors are located further down the airflow cooling path, near the DIMMs, to provide additional temperature information.

The ID of the temperature sensor in the Sensor column helps to pinpoint the location, providing detailed information about the DIMM or memory area.

- Coordinates—The x and y coordinate of the temperature sensor.
- State—The current state of the sensors. The possible values are Enabled and Absent
- Health—The temperature status.
- Reading—The temperature recorded by the temperature sensor. If a temperature sensor is not installed, the Reading column shows the value N/A.
- Caution—The temperature thresholds for the warning for Caution.
- Critical—The temperature thresholds for the warning for Critical.

If a temperature sensor is not installed, the Thresholds column shows the value N/A. Devices with vendor-controlled threshold also show the value N/A

NOTE

In addition to reporting the CPU temperature, iLO also reports the CPU package temperature.

iLO normally displays the CPU temperature between 40–70°C. When the package temperature increases, iLO displays the corresponding increased CPU temperature. But, if the CPU is idle for a longer time, for example, due to a lower workload, then iLO displays the CPU temperature as 40°C even if the temperature is lower than 40°C. This is an expected behavior.

Configuring the minimum fan speed

Prerequisites

Configure iLO Settings privilege

About this task

iLO supports a minimum fan speed (percentage) that prevents the installed fans from running at a speed lower than the configured setting. When the server is running, the fans run at the configured speed or higher.

The thermal configuration setting can override the minimum fan speed settings. Depending on the selected thermal configuration, the fan may operate at a speed lower than the minimum set in the fan speed settings.

Procedure

1. Click Host in the left navigation pane and click Hardware > Thermal and Cooling

   The Thermal and Cooling page appears.
   The tab name depends on the features the server supports.

2. Click Settings.

   The Fan Settings page appears.

3. Enter the Minimum Fan Speed (%) for all installed fans.
4. Click Update to save the changes.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the Fan Settings window.

Subtopics

Configuring the thermal configuration setting

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Host in the left navigation pane and click Hardware > Thermal and Cooling

   The Thermal and Cooling page appears.
   The tab name depends on the features that the server supports.

2. Click Settings.

   The Fan Settings page appears.

3. Select a Thermal Configuration value.

4. (Optional) If you have selected Acoustic Mode for Thermal Configuration, then set the Acoustic Mode Scenario:

   - Steady without Max Fan Cap
   - Loud
   - Moderate
   - Quiet

5. Click Update.

   iLO notifies you that a reset is required to apply the change.

6. Click Yes, apply and reset.

   iLO saves the change and resets.

   It might take several minutes before you can re-establish a connection.

Subtopics

Thermal configuration options

Optimal Cooling

Provides the most efficient solution by configuring fan speeds to the minimum required to provide adequate cooling.

Enhanced Cooling

Provides adequate cooling to the processors.

Increased Cooling

Operates fans at a higher speed.

Maximum Cooling

Provides the maximum cooling available for the system.

The thermal configuration setting overrides the minimum fan speed setting if the thermal configuration value is greater than the minimum fan speed value.

Smooth Cooling

Provides a smooth fan response to reduce fan speed variations.

Acoustic Mode

Provides a smooth fan response to ensure a quiet operation. This feature is available on supported servers only.

Acoustic mode options

Steady without Max. Fan Cap

Minimizes the system noise while dynamically adjusting cooling to handle any temperature changes.

Loud, Moderate, and Quiet

Reduces system noise by limiting the cooling.

NOTE

If you select Loud, Moderate, or Quiet mode, ensure proper cooling, workload, and temperature conditions to avoid performance issues.

Configuring user defined threshold using the RESTful Interface Tool

Procedure

1. Open a text editor and create a file to define the User Defined Temperature threshold value.

   Use the following example as a template.

   ```
   {
   "path":"/redfish/v1/Chassis/1/Thermal/Actions/Oem/Hpe/HpeThermalExt.SetUserTem
   pThreshold/",
   "body": {"SensorNumber": Supported Temperature Sensor,
   "ThresholdValue": Desired threshold temperature,
   "AlertType": "Warning" or "Critical"
   }
   }
   ```

   For more information see, **HPE iLOrest** User Guide.

2. Save the file as *filename*.json.
3. Start the RESTful Interface Tool.
4. Enter
   ilorest
   .
5. Log in to an iLO system:

   iLOrest > login *iLO host name or IP address* -u *iLO user name* -p *iLO password*

6. Enter the command to configure the alert:

```
rawpost filename.json
```

Using the performance management features

Subtopics

- Performance monitoring

Performance monitoring

Performance management features are applicable to Intel platforms only.

The Performance - Monitoring page provides performance data collected from the following sensors.

CPU Utilization

This sensor reports the utilization of all processors installed in the system. The measurement is based on a percentage of the maximum compute capacity of the processor. It considers how slow or fast the processor runs when doing work. This measurement might differ from the values that some OS report for utilization, which is often calculated by how often the processor is not idle.

Memory Bus Utilization

This sensor reports the utilization of the total bandwidth of the memory bus. The measurement is based on a percentage of the maximum memory bandwidth of the configuration. This measurement might differ from the values that some OS report for memory utilization, which is often calculated by how much of the available system memory is being used or allocated.

This option is available for supported servers.

I/O Bus Utilization

This sensor reports the utilization of all processors connected to I/O buses (total PCI-e bus bandwidth). The measurement is based on a percentage of the maximum total bandwidth of these buses. This measurement is not an indication of how busy an I/O device might be, but rather how much PCI-e bandwidth the device is using.

This option is available for supported servers.

Average CPU Frequency

This sensor reports the average overall processor frequency. A value of zero means that the processor is idle. This value is different from the "running frequency" often seen under some OS that measures frequency only when the processor is not idle.

This option is available for supported servers.

CPU Power

This sensor reports the power consumed by the processor. It is based on an energy accumulator within the processor and is the value that the processor uses to regulate power limits internally.

The information on this page might differ from the Total CPU power data on the Power Meter page.

Subtopics

- Viewing performance data
- Performance data details
- Performance monitoring graph display options
- Configuring performance alerts
- Workload advisor

Viewing performance data

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

  If a license is not installed, a message is displayed, and only the 10 minute graph is available.
- MCTP Discovery is enabled.
- The iLO Date/Time is set correctly to ensure collection of valid performance telemetry samples.

About this task

When the server is in POST, the following message is displayed:

MCTP Discovery is disabled on the server. Enable MCTP Discovery to view or edit information on this page.

When the server is powered off the measured performance values display the value 0. Performance data is updated when the server is powered on and POST is complete. After a reset, there might be 0 values in the graph where data was not collected when the server was off or in POST. To confirm that these values are due to a server reset, check the IML.

When iLO is reset:

- Performance data for the 10 min and 1 hr intervals is cleared.
- Data from the 24 hr and 1 week graphs is saved, and can be viewed after a reset is complete.
- Hourly data might be missing when you view the 24 hr and 1 week graphs after a reset is complete.

Procedure

1. Click Host in the left navigation pane and click Performance.

   The Performance page appears.
2. Select the required metric from the Select Metric drop-down list. You can select multiple metrics. Based on the selected metrics, correlation between other compatible metrics is performed.
3. Click one of the following options to select a graph interval:
   - 10 min
   - 1 hr
   - 24 hr
   - 1 week

   The graph is populated with data for the selected interval.

   When you select the CPU Power graph, the units are displayed either in Watts or BTU/hr based on the Power Settings in the User preference section.

   When the power unit is displayed in Watts, click BTU/hr to change the display to BTU/hr.

   When the power unit is displayed in BTU/hr, click Watts to change the display to Watts.

   NOTE

   For iLO Standard license, the available graph interval is 10 min only.

Performance data details

The Performance Data section shows the following details for each CPU:

Sensor

The name of the selected sensor.

Maximum

The maximum measured value.

Minimum

The minimum measured value.

Performance monitoring graph display options

Selected Sensor menu

To view performance data for a sensor, select the sensor from the drop-down.

Graph Type

To specify the graph time period, click a graph type name:

- 10 min—Displays performance data for the last 10 minutes. The iLO firmware collects performance data for this graph every 20 seconds. The maximum number of samples displayed in the graph is 30.
- 1 hr—Displays the performance data for the last hour. The iLO firmware collects performance data for this graph every 20 seconds. The maximum number of samples displayed in the graph is 180.
- 24 hr—Displays the performance data for the last 24 hours. The iLO firmware collects performance data for this graph every 5 minutes. The maximum number of samples displayed in the graph is 288.
- 1 week—Displays the performance data for the last week. The iLO firmware collects performance data for this graph every 30 minutes. The maximum number of samples displayed in the graph is 336.

Configuring performance alerts

Prerequisites

- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- MCTP discovery is enabled.
- The iLO Date/Time is set correctly to ensure collection of valid performance telemetry samples.

About this task

You can configure performance alerts that will post an event in the IML when a configured threshold is reached.

Upper and lower thresholds are supported for the CPU Utilization, Memory Bus Utilization, and I/O Bus Utilization sensors.

Upper thresholds are supported for CPU Power.

Procedure

1. Click Host in the left navigation pane and click Performance.

   The Performance page appears.

2. Select a sensor that supports performance alerts.
3. Click on Alert Settings section.
4. Enter the threshold settings and dwell time, and click Update

   To disable an alert, set the dwell time to 0.
5. Click Cancel to cancel the operation.
6. Click to close the window.

Subtopics

Performance alert settings options

Performance alert settings options

Lower Threshold

The lowest value the sensor can report before an event is posted in the IML.

Enter a percentage of utilization.

Upper Threshold

The highest value the sensor can report before an event is posted in the IML.

- For utilization sensors, enter a percentage of utilization for the selected sensor.
- For CPU Power, enter a value in watts.

Dwell Time

The number of seconds the sensor reading is higher or lower than the configured value before the threshold is violated. When a threshold is violated, an event is posted in the IML.

For example, if you set an upper threshold to 70% with a dwell time of 40 seconds, an event is posted when the sensor reports readings over 70% for more than 40 seconds.

- To enable an alert, set the dwell time to a valid value in multiples of 20, between 20 and 64800 (20 seconds to 18 hours). If you enter a value that is not a multiple of 20, the value is rounded up to the next multiple of 20.
- To disable an alert, set the dwell time to 0.

Workload advisor

iLO monitors selected server workload characteristics and provides recommended performance tuning settings based on the monitored data.

This feature is available for supported servers.

Subtopics

Viewing server workload details
Server workload details
Configuring the performance tuning options

Viewing server workload details

Prerequisites

- Host BIOS privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- The server is powered on and POST is complete.

  Make sure that the server was powered on for the time interval you want to monitor. For example, data for the 24-hour interval is not available until the server has been powered on for 24 hours.
- MCTP discovery is enabled.
- The iLO Date/Time is set correctly to ensure collection of valid performance telemetry samples.

Procedure

1. Click Host in the left navigation pane and click Performance.

   The Performance page appears.
2. Review the details in the Server Workload section.

   If iLO was reset, information for the 10 min and 1 hr intervals will be available after the server has been powered on for 10 minutes or 1 hour.
3. (Optional) To update the table with the latest information, click .

Server workload details

Workload characteristics are qualitative assessments of how the workload is using system resources. They are based on the quantitative measurements from the performance monitoring events and are useful as a reference when making tuning decisions. These observed characteristics are typically needed for making intelligent tuning decisions.

The following workload characteristics are displayed:

- CPU Utilization—How busy the processors are in the server.
- Memory Bus Utilization—The amount of memory traffic observed by the server.
- I/O Bus Utilization— The amount of I/O traffic observed by the server.

The possible values are High, Medium, and Low.

Server workload data for the 10 min and 1 hr intervals is cleared when iLO is reset.

Configuring the performance tuning options

Prerequisites

- Host BIOS privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- The server is powered on and POST is complete.

  Make sure that the server was powered on for the time interval you want to monitor. For example, data and recommendations for the 24 hr interval are not available until the server has been powered on for 24 hours.

- MCTP discovery is enabled.
- The iLO Date/Time is set correctly to ensure collection of valid performance telemetry samples.

Procedure

1. Click Host in the left navigation pane and click Performance.

   The Performance page appears.

2. Select a value from the from the drop down.

   You can review recommended settings based on data collected in 10 min, 1 hr, or 24 hr intervals.

3. Review the recommendations in the Recommended column.

   If iLO was reset, information for the 10 min and 1 hr intervals will be available after the server has been powered on for 10 minutes or 1 hour.

4. To change one or more settings, click Edit.
5. Change the tuning options as needed, and then click Update.

   iLO notifies you that changing the tuning options will change the Workload Profile setting to Custom.

   iLO saves the settings and notifies you that a server reboot is required for the changes to take effect.

6. Reboot the server.

   You can click the link in the status banner to navigate to the Server Power page.

Subtopics

Performance tuning settings

Performance tuning settings

Uncore Frequency Scaling

This option controls the frequency scaling of the internal processor buses (the uncore). Setting this option to Auto enables the processor to dynamically change frequencies based on workload. Setting the Maximum or Minimum frequency enables tuning for latency or power consumption.

Memory Refresh Rate

This option controls the refresh rate of the memory controller. It might affect the performance and resiliency of the server memory. Hewlett Packard Enterprise recommends using the default value (1x Refresh) unless changing this value is recommended in other documentation for the server.

Power Regulator

Use this option to configure Power Regulator support. The following values are available:

- Dynamic Power Savings Mode —Automatically varies processor speed and power usage based on processor utilization. This option allows the reduction of overall power consumption with little or no impact to performance. It does not require OS support.
- Static Low Power Mode —Reduces processor speed and power usage. This option guarantees a lower maximum power usage value for the system. Performance impacts are greater for environments with higher processor utilization.
- Static High Performance Mode —Processors will run at maximum power and performance at all times, regardless of the OS power management policy.
- OS Control Mode OS Control Mode

NOTE

The Power Regulator setting displayed on the Workload Performance Advisor page reflects the static boot time configuration. It does not reflect run-time changes to this setting that have been applied since system power-on. Applying recommended settings changes on the Workload Performance Advisor page changes only the boot time configuration of this setting. A system reboot is required for the change to take effect.

Minimum Processor Idle Power Package C-state

Use this option to select the lowest idle power state (C-state) of the processor that the operating system uses. The higher the C-state, the lower the power usage of that idle state. C6 State is the lowest power idle state supported by the processor.

Energy/Performance Bias

Use this option to configure several processor subsystems to optimize the performance and power usage of the processor. The following values are available:

- Maximum Performance—This setting is for environments that require the highest performance and lowest latency, but are not sensitive to power consumption.
- Balanced Performance—This setting provides optimum power efficiency. Hewlett Packard Enterprise recommends this setting for most environments.
- Balanced Power—Provides optimum power efficiency based on server utilization.
- Power Savings Mode—This setting is suitable for environments that are power sensitive and can accept reduced performance.

Configuring iLO network settings

Subtopics

iLO Network Settings

To access the network settings, you can select the active NIC in the iLO Dedicated Network Port or iLO Shared Network Port page.

If you select the inactive NIC, a message notifies you that iLO is not configured to use that NIC.

Viewing the network configuration summary

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears. You can view the network settings on the following sections:

- General Information
- IPv4 Settings
- IPv6 Settings
- SNTP Settings

2. Depending on your network configuration, click iLO Dedicated Network Port or iLO Shared Network Port.

   Based on your selection, iLO Dedicated Network Port or iLO Shared Network Port page appears with details of the network configured.

Subtopics

Network general information

The General Information section displays the following details:

> **NOTE**
> You can configure the iLO hostname and NIC settings on the Network General Settings page.
> You can configure the 802.1X Support setting on the Access page.

- NIC In Use—The name of the active iLO network interface (iLO Dedicated Network Port or iLO Shared Network Port).
- iLO Hostname—The fully qualified network name assigned to the iLO subsystem. By default, the hostname is ILO, followed by the system serial number and the current domain name. This value is used for the network name and must be unique.
- iLO Hostname—The fully qualified network name assigned to the iLO subsystem. This value is used for the network name and must be unique.
- MAC Address—The MAC address of the selected iLO network interface.
- Link Status
- Current Link Speed—The link speed of the network interface in megabits per second.

  The iLO Shared Network Port connection can operate up to a maximum speed of 100 Mbps.

  When the iLO Shared Network Port is used, network-intensive tasks such as data transfer through iLO virtual media might be slower than the same tasks performed in a configuration that uses the iLO Dedicated Network Port.
- VLAN Status
- MTU Size—The Maximum Transmission Unit (MTU) size of the network interface. For the iLO Shared Network Port, this value is fixed at the default (1500) and cannot be edited.
- Current Duplex—Full-duplex or Half-duplex.
- Link Setting—The link setting of the selected iLO network interface. The default value is Auto-Negotiate.

  This value is not displayed when:

  - The server is configured to use the Shared Network Port. This value must be managed in the host operating system when the Shared Network Port is enabled.
  - The server is configured to use the iLO Dedicated Network Port, and the server model does not support changing this value.
- Duplex Setting—The link duplex setting for the selected iLO network interface. The default value is Auto-Negotiate.

This value is not displayed when:

  - The server is configured to use the Shared Network Port. This value must be managed in the host operating system when the Shared Network Port is enabled.
  - The server is configured to use the iLO Dedicated Network Port, and the server model does not support changing this value.

- 802.1X Support—Whether 802.1X Support is enabled or disabled.

IPv4 summary details

- DHCPv4 Status—Indicates whether DHCP is enabled for IPv4.
- Address—The IPv4 address currently in use. If the value is `0.0.0.0`, the IPv4 address is not configured.
- Subnet Mask—The subnet mask of the IPv4 address currently in use. If the value is `0.0.0.0`, no address is configured.
- Default Gateway—The default gateway address in use for the IPv4 protocol. If the value is `0.0.0.0`, the gateway is not configured.

IPv6 summary details

DHCPv6 Status

Indicates whether DHCP is enabled for IPv6.

IPv6 Stateless Address Auto-Configuration (SLAAC)

Indicates whether SLAAC is enabled for IPv6. When SLAAC is disabled, the SLAAC link-local address for iLO is still configured because it is required.

IPv6 address list

This table shows the currently configured IPv6 addresses for iLO. It provides the following information:

Source

The address type.

IPv6

The IPv6 address.

Prefix Length

The address prefix length.

Status

The address status. The possible values follow:

- Active—The address is in use by iLO.
- Pending—Duplicate address detection is in progress.
- Failed—Duplicate address detection failed. The address is not in use by iLO).
- Invalid—The RA (Router Advertised) valid lifetime for the address prefix was not renewed, and it expired. This address is no longer in use.

General network settings

Use the iLO Dedicated Network Port or iLO Shared Network Port General Information section to configure the iLO Hostname and NIC settings.

Subtopics

Configuring the iLO Hostname Settings

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.

2. Click iLO Dedicated Network Port or iLO Shared Network Port.

   Based on your selection, iLO Dedicated Network Port or iLO Shared Network Port page appears.

3. Click  on the General Information section.

   The General Information window appears.

4. Enter the iLO Subsystem Name (Hostname).

   The hostname is the DNS name of the iLO subsystem. This name can be used only if DHCP and DNS are configured to connect to the iLO subsystem name instead of the IP address.

   The hostname is the DNS name of the iLO subsystem. This name can be used only if DHCP and DNS are configured to connect to the iLO subsystem name instead of the IP address.

5. Enter the iLO Domain Name if DHCP is not configured.

   To use a static domain name, disable the Use DHCPv4 Supplied Domain Name and Use DHCPv6 Supplied Domain Name settings on the IPv4 Settings and IPv6 Settings pages.

6. Click Update to save the changes.

   iLO notifies you that an iLO reset is required for one or more pending changes to take effect. If your account is assigned the Configure iLO Settings privilege, the Reset iLO button is included in the message.

   This message is displayed on all iLO Dedicated Network Port or iLO Shared Network Port tabs until an iLO reset is complete.

7. Click Cancel to cancel the operation.

8. Click  to close the edit window.

9. (Optional) Configure other network settings on the IPv4 and IPv6 sections.

10. When you are finished configuring the iLO network settings, click Reset iLO.

    It might take several minutes before you can re-establish a connection.

Subtopics

iLO hostname and domain name limitations

When you configure the iLO Hostname Settings, note the following:

- **Name service limitations**—The subsystem name is used as part of the DNS name.
  - DNS allows alphanumeric characters and hyphens.
  - Name service limitations also apply to the Domain Name.
- **Namespace issues**—To avoid these issues:
  - Do not use the underscore character.
  - Limit subsystem names to 15 characters.

    iLO allows up to 49 characters in the hostname, but using a shorter name can help you to avoid interoperability issues with other software products in your environment.
  - Verify that you can ping the iLO processor by IP address and by DNS name.
  - Verify that NSLOOKUP resolves the iLO network address correctly and that no namespace conflicts exist.
  - If you are using DNS verify that they resolve the iLO network address correctly.
  - Flush the DNS name if you make any namespace changes.
- If you will use Kerberos authentication, ensure that hostname and domain name meet the prerequisites for using Kerberos.

  For more information, see the iLO user guide.

NIC settings

Enable the iLO Dedicated Network Port or the iLO Shared Network Port and configure the associated NIC settings in the NIC Settings section of the General Information section.

The NIC settings section is not available on Synergy compute modules.

Subtopics

Enabling the iLO Dedicated Network Port through the iLO web interface

Prerequisites

- Configure iLO Settings privilege
- If the default server configuration does not support remote management, an optional iLO network enablement module is installed.

Procedure

1. Connect the iLO Dedicated Network Port to a LAN from which the server is managed.
2. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.
3. Click iLO Dedicated Network Port or iLO Shared Network Port.

   Based on your selection, iLO Dedicated Network Port or iLO Shared Network Port page appears.
4. Click  on the General Information section.

   The General Information window appears.
5. Select the Use iLO Dedicated Network Port check box.
6. Select a Link Setting.
7. To use a VLAN, set the Enable VLAN option to enabled.
8. If you enabled the VLAN option, enter a VLAN Tag.

   Enter a value between 1 to 4096.
9. Enter a value for the MTU Size. The valid range is 1280–10000 (The default value is 1500).

   iLO Advanced License is required to customize this value.

   NOTE

   Router Advertisements (RA) may dynamically adjust the operational MTU. iLO uses the RA value when it is lower than the configured MTU.
10. Click Update to save the changes.

    iLO notifies you that an iLO reset is required for one or more pending changes to take effect. If your account is assigned the Configure iLO Settings privilege, the Reset iLO button is included in the message.

    This message is displayed on all iLO Dedicated Network Port or iLO Shared Network Port sections until an iLO reset is complete.
11. (Optional) Configure other network settings on the IPv4 and IPv6 sections.
12. When you are finished configuring the iLO network settings, click Reset iLO.

    It might take several minutes before you can re-establish a connection.

Subtopics

Dedicated Network Port General settings

Dedicated Network Port General settings

Link Setting

This value controls the speed and duplex settings of the iLO network transceiver.

Choose from the following values:

- Automatic (default)—Enables iLO to negotiate the highest supported link speed and duplex settings when connected to the network.
- 1000BaseT, Full-duplex—Forces a 1 Gb connection that uses full duplex (supported servers only).
- 100BaseT, Full-duplex—Forces a 100 Mb connection using full duplex.

- 100BaseT, Half-duplex—Forces a 100 Mb connection using half duplex.
- 10BaseT, Full-duplex—Forces a 10 Mb connection using full duplex.
- 10BaseT, Half-duplex—Forces a 10 Mb connection using half duplex.

Some server models prevent changing the link speed and duplex setting when the Dedicated Network Port is enabled.

Enable VLAN

When VLAN is enabled, the iLO Dedicated Network Port becomes part of a VLAN. All network devices with different VLAN tags will appear to be on separate LANs, even if they are physically connected to the same LAN.

VLAN Tag

All network devices that you want to communicate with each other must have the same VLAN tag. The VLAN tag can be any number between 1 and 4094.

Enabling the iLO Shared Network Port through the iLO web interface

Prerequisites

- Configure iLO Settings privilege
- If the default server configuration does not support remote management, an optional iLO network enablement module is installed.
- Supported network cards are available in the system.

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.
2. Click iLO Shared Network Port.

   The iLO Shared Network Port page appears.
3. Click  on the General Information section.

   The General Information window appears.
4. Select the Use Shared Network Port check box.
5. Select a network card from the list of available options.
6. Select a value from the Port menu.
7. To use a VLAN, set the Enable VLAN option to enabled.
8. If you enabled the VLAN feature, enter a VLAN Tag.
9. Click Update to save the changes.

   iLO notifies you that an iLO reset is required for one or more pending changes to take effect. If your account is assigned the Configure iLO Settings privilege, the Reset iLO button is included in the message.

   This message is displayed on all iLO Dedicated Network Port or iLO Shared Network Port page until a iLO reset is complete.
10. (Optional) Configure other network settings on the IPv4 and IPv6 sections.
11. When you are finished configuring the iLO network settings, click Reset iLO.

    It might take several minutes before you can re-establish a connection.

    After iLO resets, the Shared Network Port is active. Any network traffic going to or originating from iLO is directed through the

available network port .

Subtopics

Shared Network Port General settings

Shared Network Port General settings

NIC

The server NIC type.

Port

Selecting a port number other than port 1 works only if the server and the network adapter both support this configuration. If you enter an invalid port number, port 1 is used.

Enable VLAN

When VLAN is enabled, the iLO Shared Network Port becomes part of a VLAN. All network devices with different VLAN tags will appear to be on separate LANs, even if they are physically connected to the same LAN.

VLAN Tag

All network devices that you want to communicate with each other must have the same VLAN tag. The VLAN tag can be any number between 1 and 4094.

iLO network port configuration options

The iLO subsystem provides the following options for network connection:

- iLO Dedicated Network Port—Uses an independent NIC that is dedicated to iLO network traffic only. When supported, this port uses an RJ-45 jack on the back of the server.

  The RJ-45 jack is labeled iLO.

  On some servers, this option is provided by installing an optional iLO network enablement module .

  A dedicated management network is the preferred iLO network configuration.

- Shared Network Port—Depending on your configuration, the following Shared Network Port options are available:
  - Shared Network Port OCP Slot A —Uses an optional Open Compute Project NIC installed in OCP slot 1. This NIC normally handles server network traffic. It can be configured to handle iLO network traffic at the same time through a common SFP or RJ-45 connector.
  - Shared Network Port OCP Slot B —Uses an optional Open Compute Project NIC installed in OCP slot 2. This NIC normally handles server network traffic. It can be configured to handle iLO network traffic at the same time through a common SFP or RJ45 connector.
  - Shared Network Port Embedded NIC —Uses a permanently installed NIC that is built into the server. This NIC normally handles server network traffic. It can be configured to handle iLO network traffic at the same time through a common RJ45 connector.

For information about the NICs your server supports, see the server specifications at the following website: https://www.hpe.com/info/quickspecs.

Subtopics

Shared network port consideration

Shared network port consideration

There are some drawbacks to using a Shared Network Port option:

- With a shared network connection, traffic can hinder iLO performance.
- During server startup, and when the OS NIC drivers are loading and unloading, there are brief periods of time (2–8 seconds) when you cannot access iLO from the network. After these short periods, iLO communication is restored and iLO will respond to network traffic.

  When this situation occurs, the Remote Console and connected iLO Virtual Media devices might be disconnected.
- Network controller firmware updates or resets can also cause iLO to be unreachable over the network for a brief period.
- The iLO Shared Network Port connection can operate up to a maximum speed of 100 Mbps. Network-intensive tasks such as data transfer through iLO virtual media might be slower than the same tasks performed in a configuration that uses the iLO Dedicated Network Port.

For more information about the Shared network port consideration, see iLO 7 Troubleshooting guide.

iLO network connection considerations

- Only one of the Dedicated Network Port or Shared Network Port options can be enabled at a time because iLO supports only one active NIC connection.
- By default, the iLO Shared Network Port uses port 1 on the server NIC. Depending on the server configuration, this NIC might be a LOM, FlexibleLOM, or FlexibleLOM/OCP adapter. The port number corresponds to the label on the NIC, which might be different from the numbering in the operating system.

  If both the server and the NIC support port selection, the iLO firmware allows you to select a different port number. If a port other than port 1 is selected for Shared Network Port use, and your server does not support that configuration, iLO switches back to port 1 when it starts.
- On servers that do not include a Dedicated Network Port, the standard hardware configuration provides iLO network connectivity only through the iLO Shared Network Port connection. On these servers, the iLO firmware defaults to the Shared Network Port.
- Due to server auxiliary-power budget limitations, some 1Gb/s copper network adapters used for iLO Shared Network Port functionality might run at 10/100 speed when the server is powered off. To avoid this issue, Hewlett Packard Enterprise recommends configuring the switch that the iLO Shared Network Port is connected to for auto-negotiation, or using the Dedicated Network Port. For more information about network connectivity, see the iLO specifications document at the following website: **https://www.hpe.com/info/quickspecs**.

  If the switch port that iLO is connected to is configured for 1Gb/s, some copper iLO Shared Network Port adapters might lose connectivity when the server is powered off. Connectivity will return when the server is powered back on.
- Disabling the iLO Shared Network Port does not completely disable the system NIC—server network traffic can still pass through the NIC port. When the iLO Shared Network Port is disabled, any traffic going to or originating from iLO will not pass through the Shared Network Port.
- If the Shared Network Port is enabled, you cannot modify the link setting or duplex setting. When using Shared Network Port configurations, these settings must be managed in the operating system.
- Some servers require an optional iLO network enablement module to add support for remote management through a dedicated management network (default) or a shared network connection. If an iLO network enablement module is not installed, iLO access is supported only through host-based (in-band) access methods. Some examples of the supported host-based access methods include the iLO RESTful API, UEFI System Utilities, iLO Service Port (if available), and the Virtual NIC.

Configuring IPv4 settings

Prerequisites

Configure iLO Settings privilege

About this task

When you configure the IPv4 settings, do not enter special use IPv4 addresses such as 192.0.2.0/24. These addresses are not supported. For more information, see the documentation for RFC5735 on the IETF website.

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.

2. Depending on your network configuration, click iLO Dedicated Network Port or iLO Shared Network Port.

   Based on your selection, iLO Dedicated Network Port or iLO Shared Network Port page appears.

3. Click IPv4 section.

   The IPv4 page appears.

4. Click  the following sections to configure the settings:

   - DHCPv4 Configuration
   - DNS Configuration
   - Static Route Configuration
   - Ping Gateway on Startup

   The static IPv4 configuration are displayed on the Static IPv4 Address Configuration section.

5. Click Update after making the necessary changes.

   iLO notifies you that an iLO reset is required for one or more pending changes to take effect. If your account is assigned the Configure iLO Settings privilege, the Reset iLO button is included in the message.

   This message is displayed on all iLO Dedicated Network Port or iLO Shared Network Port tabs until an iLO reset is complete.

6. Click Cancel to cancel the operation.
7. Click  to close the edit window.
8. (Optional) Configure other network settings on the General or IPv6 sections.
9. When you are finished configuring the iLO network settings, click Reset iLO.

   It might take several minutes before you can re-establish a connection.

Subtopics

DHCPv4 Configuration settings

The DHCPv4 settings are enabled by default.

Enable DHCPv4

Enables iLO to obtain its IP address (and many other settings) from a DHCP server.

Use DHCPv4 Supplied Gateway

Specifies whether iLO uses the DHCP server-supplied gateway. If DHCP is not used, enter a gateway address in the Gateway IPv4 Address box.

Use DHCPv4 Supplied Static Routes

Specifies whether iLO uses the DHCP server-supplied static routes. If not, enter the static route destination, mask, and gateway addresses in the Static Route #1 , Static Route #2 , and Static Route #3 boxes.

Use DHCPv4 Supplied Domain Name

Specifies whether iLO uses the DHCP server-supplied domain name. If DHCP is not used, enter a domain name in the Domain Name box on the Network General Settings page.

Use DHCPv4 Supplied DNS Servers

Specifies whether iLO uses the DHCP server-supplied DNS server list. If not, enter the DNS server addresses in the Primary DNS Server, Secondary DNS Server, and Tertiary DNS Server boxes.

Use DHCPv4 Supplied Time Settings

Specifies whether iLO uses the DHCPv4-supplied NTP service locations.

NOTE

To create a reservation in a DHCP server, a DHCP client identifier (unique identifier) is required. For iLO 7 systems, the DHCP client identifier is the hardware MAC address followed by three bytes (six characters) of zero. For example, if the iLO 7 MAC address is 00-53-00-AA-BB-CC, then the associated DHCP client identifier is `005300AABBCC000000`.

Static IPv4 Address Configuration settings

IPv4 Address

The iLO IP address. If DHCP is used, the iLO IP address is supplied automatically. If DHCP is not used, enter a static IP address.

Subnet Mask

The subnet mask of the iLO IP network. If DHCP is used, the subnet mask is supplied automatically. If DHCP is not used, enter a subnet mask for the network.

Gateway IPv4 Address

The iLO gateway IP address. If DHCP is used, the iLO gateway IP address is supplied automatically. If DHCP is not used, enter the iLO gateway IP address.

IPv4 DNS Configuration settings

Primary DNS Server

If Use DHCPv4 Supplied DNS Servers is enabled, this value is supplied automatically. If not, enter the Primary DNS Server address.

Secondary DNS Server

If Use DHCPv4 Supplied DNS Servers is enabled, this value is supplied automatically. If not, enter the Secondary DNS Server address.

Tertiary DNS Server

If Use DHCPv4 Supplied DNS Servers is enabled, this value is supplied automatically. If not, enter the Tertiary DNS Server address.

Enable DDNS Server Registration

Enable or disable this option to specify whether iLO registers its IPv4 address and name with a DNS server.

This option is enabled by default.

IPv4 Static Route Configuration settings

Static Route #1 Setting, Static Route #2 Setting, and Static Route #3 Setting

The iLO static route destination, mask, and gateway addresses. If Use DHCPv4 Supplied Static Routes is enabled, these values are supplied automatically. If not, enter the static route values.

Other IPv4 settings

Ping Gateway on Startup

Enable this option to configure iLO to send four ICMP echo request packets to the gateway when the iLO processor initializes. This activity ensures that the ARP cache entry for iLO is up-to-date on the router responsible for routing packets to and from iLO.

This option is enabled by default.

Configuring IPv6 settings

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.

2. Depending on your network configuration, click iLO Dedicated Network Port or iLO Shared Network Port.

   Based on your selection, iLO Dedicated Network Port or iLO Shared Network Port page appears.

3. Click IPv6 section.

   The IPv6 page appears.

4. Click the following sections to configure the settings:

   - DHCPv6 Configuration
   - Global IPv6 Configuration
   - DNS Configuration
   - Static IPv6 Address Configuration
   - Static Route Configuration

5. Click Update after making the necessary changes.

   iLO notifies you that an iLO reset is required for one or more pending changes to take effect. If your account is assigned the Configure iLO Settings privilege, the Reset iLO button is included in the message.

   This message is displayed on all iLO Dedicated Network Port or iLO Shared Network Port tabs until an iLO reset is complete.

6. Click Cancel to cancel the operation.
7. Click ✕ to close the edit window.
8. (Optional) Configure other network settings on the General or IPv4 sections.
9. When you are finished configuring the iLO network settings, click Reset iLO.

   It might take several minutes before you can re-establish a connection.

Subtopics

DHCPv6 Configuration settings

Enable DHCPv6 in Stateful Mode (Address)

Enable this option to allow iLO to request and configure IPv6 addresses provided by a DHCPv6 server.

This option is enabled by default.

- Use DHCPv6 Rapid Commit—Select this check box to instruct iLO to use the Rapid Commit messaging mode with the DHCPv6 server. This mode reduces DHCPv6 network traffic, but might cause problems when used in networks where more than one DHCPv6 server can respond and provide addresses.

  This option is disabled by default.

Enable DHCPv6 in Stateless Mode (Other)

Enable this option to configure iLO to request settings for NTP and DNS service location from the DHCPv6 server.

This option is enabled by default.

- Use DHCPv6 Supplied Domain Name—Select this check box to use the DHCPv6 server-supplied domain name.

  This option is enabled by default.

- Use DHCPv6 Supplied DNS Servers—Select this check box to use IPv6 addresses provided by the DHCPv6 server for DNS server locations. This setting can be enabled at the same time as the IPv4 DNS server location options.

  This option is enabled by default.

- Use DHCPv6 Supplied NTP Servers—Select this check box to use IPv6 addresses provided by the DHCPv6 server for NTP server locations. This setting can be enabled at the same time as the IPv4 NTP server location options.

  This option is enabled by default.

When Enable DHCPv6 in Stateful Mode (Address) is enabled, Enable DHCPv6 in Stateless Mode (Other) is enabled by default because it is implicit in the DHCPv6 Stateful messages that are required between iLO and the DHCPv6 server.

Global IPv6 Configuration settings

iLO Client Applications use IPv6 first

When both IPv4 and IPv6 service addresses are configured for iLO client applications, this option specifies which protocol iLO tries

first when it accesses a client application. This setting also applies to lists of addresses received from the name resolver when using FQDNs to configure NTP.

- Enable this option if you want iLO to use IPv6 first.
- Disable this option if you want iLO to use IPv4 first.

If communication fails using the first protocol, iLO automatically tries the second protocol.

This option is enabled by default.

Enable Stateless Address Auto Configuration (SLAAC)

Enable this option to configure iLO to create IPv6 addresses for itself from router advertisement messages.

iLO creates its own link-local address even when this option is not enabled.

This option is enabled by default.

IPv6 DNS Configuration settings

Primary DNS Server, Secondary DNS Server, and Tertiary DNS Server

Enter the IPv6 addresses for the DNS service.

When DNS server locations are configured on both the IPv4 and IPv6 pages, both sources are used. Preference is given according to the iLO Client Applications use IPv6 first configuration option, primary sources, then secondary, and then tertiary.

Enable DDNS Server Registration

Enable or disable this option to specify whether iLO registers its IPv6 address and name with a DNS server.

This option is enabled by default.

Static IPv6 Address Configuration settings

Static IPv6 Address 1, Static IPv6 Address 2, Static IPv6 Address 3, and Static IPv6 Address 4

Enter up to four static IPv6 addresses and prefix lengths for iLO. Do not enter link-local addresses.

Status information is displayed for each address.

Static Default Gateway

Enter a default IPv6 gateway address for cases in which no router advertisement messages are present in the network.

IPv6 Static Route Configuration settings

Static Route #1 (Destination), Static Route #2 (Destination), and Static Route #3 (Destination)

Enter static IPv6 route destination prefix and gateway address pairs. Specify the prefix length for the destination. Link-local addresses are not allowed for the destination, but are allowed for the gateway.
Status information is displayed for each Static Route value.

iLO features that support IPv6

The IETF introduced IPv6 in response to the ongoing depletion of the IPv4 address pool. In IPv6, addresses are increased to 128 bits in

length, to avoid an address shortage problem. iLO supports the simultaneous use of both protocols through a dual-stack implementation.

Configuring iLO SNTP settings

Prerequisites

Configure iLO Settings privilege

- At least one NTP server is available on your management network.
- If you will use a DHCPv4-provided NTP service configuration, DHCPv4 is enabled on the IPv4 page.
- If you will use a DHCPv6-provided NTP service configuration, DHCPv6 Stateless Mode is enabled on the IPv6 page.

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.
2. Click SNTP section.
3. Do one of the following:
   - To use DHCP-provided NTP server addresses, enable Use DHCPv4 Supplied Time Settings, Use DHCPv6 Supplied Time Settings, or both.
   - Enter NTP server addresses in the Primary Time Server and Secondary Time Server box.
4. iLO timezone information is not fetched automatically from the DHCP server. Select the timezone manually from the Time Zone list.
5. If you selected only Use DHCPv6 Supplied Time Settings, or if you entered a primary and secondary time server, select the server time zone from the Time Zone list.
6. Configure the NTP time propagation setting.

   On nonblade servers, this setting is called Propagate NTP Time to Host.
7. Click Update to save the changes.

   iLO notifies you that an iLO reset is required for one or more pending changes to take effect. If your account is assigned the Configure iLO Settings privilege, the Reset iLO button is included in the message.

   This message is displayed on all iLO Dedicated Network Port or iLO Shared Network Port pages until iLO reset is complete.
8. Click Cancel to cancel the operation.
9. Click ✕ to close the edit window.
10. (Optional) Configure other network settings on the General, IPv4, IPv6, and SNTP pages.
11. When you are finished configuring the iLO network settings, click Reset iLO.

    It might take several minutes before you can re-establish a connection.

Subtopics

SNTP options

SNTP options

Use DHCPv4 Supplied Time Settings

Configures iLO to use a DHCPv4-provided NTP server address.

This option is enabled by default.

Use DHCPv6 Supplied Time Settings

Configures iLO to use a DHCPv6-provided NTP server address.

This option is enabled by default.

NTP time propagation setting

The name of this setting differs depending on the server type.

- Propagate NTP Time to Host —Determines whether the server time is synchronized with the iLO time during the first POST after AC power is applied or iLO is reset to default settings.

  For all servers the setting will be effective only when #PRODABR# is able to obtain time from an NTP time source.

  NTP time source can be HPE OneView for Synergy servers.

- Propagate NTP —Determines whether the server time is synchronized with the iLO time during the first POST after AC power is applied or iLO is reset to the default settings.

This option is disabled by default.

NOTE

- When BIOS Time Format is set to UTC, then along with the server time, the server time zone setting is also synchronized with the iLO time zone setting.
- During the first POST after AC power is applied, if iLO is not able to obtain time from the configured NTP server, then iLO synchronizes its time and time zone with the time and time zone configured in the BIOS.

Primary Time Server

Configures iLO to use a primary time server with the specified address. You can enter the server address by using the server FQDN, IPv4 address, or IPv6 address.

Secondary Time Server

Configures iLO to use a secondary time server with the specified address. You can enter the server address by using the server FQDN, IPv4 address, or IPv6 address.

Time Zone

Determines how iLO adjusts UTC time to obtain the local time, and how it adjusts for Daylight Savings Time (Summer Time). In order for the entries in the iLO logs to display the correct local time, you must specify the server location time zone, and select Show Local Time in the log display filters.

If you want iLO to use the time the SNTP server provides, without adjustment, select a time zone that does not apply an adjustment to UTC time. In addition, that time zone must not apply a Daylight Savings Time (Summer Time) adjustment. There are several time zones that fit this requirement. One example that you can select in iLO is Greenwich (GMT). If you select this time zone, the iLO web interface pages and log entries display the exact time provided by the SNTP server.

NOTE

Configure the NTP servers to use Coordinated Universal Time (UTC).

iLO clock synchronization

SNTP allows iLO to synchronize its clock with an external time source. Configuring SNTP is optional because the iLO date and time can also be synchronized from the System ROM during POST.

Primary and secondary NTP server addresses can be configured manually or through DHCP servers. If the primary server address cannot be contacted, the secondary address is used.

DHCP NTP address selection

When you use DHCP servers to provide NTP server addresses, the iLO Client Applications use IPv6 first setting on the IPv6 page controls the selection of the primary and secondary NTP values. When iLO Client Applications use IPv6 first is selected, a DHCPv6-provided NTP service address (if available) is used for the primary time server and a DHCPv4-provided address (if available) is used for the secondary time server.

To change the protocol-based priority behavior to use DHCPv4 first, clear the iLO Client Applications use IPv6 first check box.

If a DHCPv6 address is not available for the primary or secondary address, a DHCPv4 address (if available) is used.

Viewing iLO LLDP settings

Prerequisites

- iLO Configuration privilege

About this task

The Link Layer Discovery Protocol (LLDP) Settings page displays the LLDP Transmit and Receive information. LLDP settings are available only in supported platforms.

Procedure

1. Click iLO Settings on the left navigation pane and click iLO Network Ports.

   The iLO Network Ports page appears.

2. Click iLO Dedicated Network Port.

   The iLO Dedicated Network Port page appears.

3. Click the Link Layer Discovery Protocol (LLDP) section.

   The Link Layer Discovery Protocol (LLDP) page appears.

4. Click  on the Overview section to view the LLDP settings.

   The Overview window appears.

5. Click LLDP Status check box to enable LLDP. This option is disabled by default.

   The LLDP status is enabled and iLO displays the following LLDP Transmit Information and Network Neighbor Information:

   - Chassis ID
   - Chassis ID Sub-type
   - IPv4 Address
   - IPv6 Address
   - MAC Address
   - VLAN ID

- Port ID
- Port ID Sub-type
- System Name
- System Description
- System Capabilities

Viewing iLO systems in the Windows Network folder

About this task

If UPnP is configured, iLO systems on the same network as a Windows system are displayed in the Windows Network folder.

Procedure

- To start the web interface for an iLO system, right-click the icon in the Windows Network folder, and then select **View device webpage**.
- To view the properties of an iLO system, right-click the icon in the Windows Network folder, and then select Properties.

  The Properties window includes the following:

  - Device Details—iLO manufacturer and version information. To start the iLO web interface, click the Device webpage link.
  - Troubleshooting Information—The serial number, MAC address, UUID, and IP address.

Using the iLO administration features

Subtopics

iLO User Accounts

iLO enables you to manage user accounts stored locally in secure memory.

You can create up to 12 local user accounts with custom login names and advanced password encryption. Privileges control individual user settings, and can be customized to meet user access requirements.

If a supported application that works with iLO requires a service account, you can add a user account and designate it as a service account. You can also add service accounts by using a supported application or the iLO RESTful API.

To support more than 12 users, configure iLO to use a directory service to authenticate and authorize its users.

Subtopics

Application account

Application account is a service account in iLO which is used by the host applications to securely authenticate and communicate with iLO. If a supported application that works with iLO requires an application account, you can create an application account from the host OS application. The session created using the application account works only through an inband channel over a virtual NIC.

iLO Administer User Accounts privileges are required to create an application account. For more information on the account privileges, see account privileges section.

The App Account Inactivity Time Period(months) specifies how long a host application account can remain unused before its session automatically ends. Once inactive, the host application can no longer use the account.

An account becomes inactive if it is not used within the specified time period. The default inactivity period is 6 months. The following values are valid: 1 month, 3 months, 6 months, 12 months or infinite.

You can view and delete (an active or inactive) the application account using iLO web interface. Hewlett Packard Enterprise recommends deleting the application account from the host application CLI commands.

For more information about Application Token, see **HPE iLO Redfish** documentation.

Application accounts are applicable only for HPE applications.

Subtopics

Viewing application account details

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.

2. Click Users.

   The Users page appears.
   The Application Account section shows the Application Name and Application ID, and Status for each application account.

NOTE

- If the Status is marked as Inactive, it means the application account has not been used for the defined App Account Inactivity Time Period (months). You can reactivate the account through the host application. If the application is no longer required, delete it manually.
- If the iLO system time is manually adjusted to a future date that exceeds the configured inactivity time period, the application account will also be marked as Inactive.

Assigned privileges are displayed with a check mark icon and unassigned privileges are displayed with an X icon.

iLO user account roles

Administrator

Enables all privileges except Recovery Set.

Operator

Enables all privileges except Configure iLO Settings, Administer User Accounts, and Recovery Set.

ReadOnly

Enables only the Login privilege.

User (default)

Allows the user to define a custom privilege set.

iLO User Account Privileges

The following privileges apply to user accounts:

- Login— Enables a user to log in to iLO.
- Remote Console—Enables a user to access the host system remote console, including video, keyboard, and mouse control.

  Users with this privilege can access the BIOS, and therefore might be able to perform host-based BIOS, iLO, storage, and network tasks.
- Virtual Power and Reset—Enables a user to power-cycle or reset the host system. These activities interrupt the system availability. A user with this privilege can diagnose the system by using the Generate NMI to System button.
- Virtual Media—Enables a user to use the virtual media feature on the host system.
- Host BIOS—Allows configuration of the host BIOS settings by using the UEFI System Utilities.

  This privilege does not affect configuration through host-based utilities.
- Configure iLO Settings—Enables a user to configure most iLO settings, including security settings, and to update the iLO firmware. This privilege does not enable local user account administration.

  After iLO is configured, revoking this privilege from all users prevents reconfiguration from the following interfaces:

  - iLO web interface
  - iLO RESTful API

  Users who have access to the following interfaces can still reconfigure iLO:

  - UEFI System Utilities

  Only a user who has the Administer User Accounts privilege can enable or disable this privilege.
- Administer User Accounts—Enables a user to add, edit, and delete local iLO user accounts. A user with this privilege can change privileges for all users. If you are not assigned this privilege, you can view your own settings and change your own password.

  (For Application Account only) Administer User Accounts privilege are required to create application account, but the application account will have only the privileges of the user account that was used to create the account.
- Host NIC—Enables a user to configure the host NIC settings.

  This privilege does not affect configuration through host-based utilities.

- Host Storage—Enables a user to configure the host storage settings.

  This privilege does not affect configuration through host-based utilities.

- Recovery Set—Enables a user to manage the Recovery Set.

  By default, the Recovery Set privilege is assigned to the default Administrator account. This privilege can be added to a user account only by creating or editing the account with an account that already has this privilege.

  If there is no user account with the Recovery Set privilege, and an account with this privilege is required, reset the management processor to the factory default settings. The factory default reset creates a default Administrator account with the Recovery Set privilege.

The following privileges are not available through the iLO 7 Configuration Utility in the UEFI System Utilities:

- Recovery Set
- Login

User Management settings

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears. You can navigate to the following pages:

2. Click next to Settings section.

   The Settings window appears.

3. Click Update after making the required changes.
4. Click Cancel to cancel the operation.
5. Click to close the Settings window.

Subtopics

Account Service access settings options

Account Service access settings options

You can configure the following settings in the User Management > Settings page.

Authentication Failures Before Delay

Enables you to configure the number of failed login attempts that are allowed before iLO imposes a login delay.
The following values are valid:

- Every failure causes delay—A login delay occurs after the first failed login attempt.
- 1 failure causes no delay (default)—A login delay is not imposed until the second failed login attempt.
- 3 failures cause no delay—A login delay is not imposed until the fourth failed login attempt.
- 5 failures cause no delay—A login delay is not imposed until the sixth failed login attempt.

Authentication Failure Delay Times

Enables you to configure the duration of the iLO login delay after a failed login attempt.
The following values are valid: 2, 5, 10, and 30 seconds. The default value is 10 seconds.

Authentication Failure Logging

Enables you to configure logging criteria for failed authentications. All login types are supported; each login type works independently.
The following settings are valid:

- Enabled-Every Failure—A failed login log entry is recorded after every failed login attempt.
- Enabled-Every 2nd Failure—A failed login log entry is recorded after every second failed login attempt.
- Enabled-Every 3rd Failure (default)—A failed login log entry is recorded after every third failed login attempt.
- Enabled-Every 5th Failure—A failed login log entry is recorded after every fifth failed login attempt.
- Disabled—No failed login log entry is recorded.

Minimum Password Length

Specifies the minimum number of characters allowed when a user password is set or changed.
The character length must be a value from 8 to 39 characters long. The default value is 8.

Password complexity

Controls the password complexity check behavior when you create or edit user accounts.
After you enable this setting, new or updated user account passwords must include three of the following characteristics:

- At least one uppercase ASCII character
- At least one lowercase ASCII character
- At least one ASCII digit
- At least one other type of character (for example, a symbol, special character, or punctuation)

When this setting is disabled (default), these password characteristics are not enforced.

Idle Connection Timeout (Minutes)

The Idle Connection Timeout specifies how long a user can be inactive before a session ends automatically. This value does not affect remote console sessions when a virtual media device is connected.
The following values are valid: 5, 15, 30, 60, 120 minutes, and Infinite.

NOTE

The Idle Connection Timeout settings do not apply to sessions initiated through RBSU, The sessions initiated through RBSU remain active beyond the configured timeout value. This is an expected behavior.

App Account Inactivity Time Period(months)

Enables you to configure the application account inactivity period. An application account is considered unused if the host application does not use the account to perform any actions within the specified inactivity period.

The default inactivity period is 6 months. The following values are valid: 1 month, 3 months, 6 months, 12 months or infinite.

iLO Configure privilege is required to update the application account inactivity time period.

IPMI/DCMI users

The iLO firmware follows the IPMI 2.0 specification. When you add IPMI/DCMI users, the login name must be a maximum of 16 characters, and the password must be a maximum of 20 characters.

When you select iLO user privileges, the equivalent IPMI/DCMI user privilege is displayed in the IPMI/DCMI Privilege based on above settings box.

- User—A user has read-only access. A user cannot configure or write to iLO, or perform system actions.

  For IPMI User privileges: Disable all privileges. Any combination of privileges that does not meet the Operator level is an IPMI User.

- Operator—An operator can perform system actions, but cannot configure iLO or manage user accounts.

  For IPMI Operator privileges: Enable Remote Console, Virtual Power and Reset, and Virtual Media. Any combination of privileges greater than Operator that does not meet the Administrator level is an IPMI Operator.

- Administrator—An administrator has read and write access to all features.

  For IPMI Administrator privileges: Enable all privileges.

Viewing user accounts

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.

2. Click Users.

   The Users page appears.
   The Local Users table shows the Login Name, User Name, Status, Role, CAC/Smart Card Certificate Thumb Print , and SSH Public Key for each local user.

   If service accounts are configured, the Service Account table shows the Login Name, User Names, Status, and assigned privileges of each service account. If no service accounts exist, this table is not displayed.

   If application accounts are configured, the Application Account table shows the Application Name and Application ID of each service account. If no application account exist, this table is not displayed.

Managing User Accounts

You can perform the following tasks from the Actions menu:

- Edit User
- Import CAC/Smart Card Certificate
- Authorize New SSH Key
- Disable User
- Delete User
- Delete CAC/Smart Card Certificate
- Delete SSH Key

Enabling a user account

Prerequisites

Administer User Accounts privilege

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.

2. Click Users

   Users page appears

3. Select a user account that you want to enable, and click Actions > Enable User.

   Enable User window appears.

4. When prompted to confirm the request, click Yes, enable.

   iLO notifies you that the selected account is enabled.

5. Click Cancel to cancel the operation.

6. Click ✕ to close the Enable User window.

Disabling a user account

Prerequisites

Administer User Accounts privilege

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.

2. Click Users

   Users page appears

3. Select a user account that you want to disable, and click Actions > Disable User.

   Disable User window appears.

4. When prompted to confirm the request, click Yes, disable.

   iLO notifies you that the selected account is disabled.

5. Click Cancel to cancel the operation.

6. Click ✕ to close the Disable User window.

Adding local user accounts

Prerequisites

Administer User Accounts privilege

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.

2. Click Users

Users page appears.

3. Click Users > + Add .

   Users window appears.

4. Enter the following details:

   - Login Name
   - User Name
   - New Password and Confirm Password

5. (Optional) To select a predefined set of user privileges, select a role in the Role menu.

   If you want to manually select privileges, use the default role (Custom).

6. If you selected Custom in step 4, select from the following privileges:

   - Login
   - Remote Console
   - Virtual Power and Reset
   - Virtual Media
   - Host BIOS
   - Configure iLO Settings
   - Administer User Accounts
   - Host NIC
   - Host Storage
   - Recovery Set

   To select all available user privileges, click the select all check box.

7. (Optional) If the account will be used as a service account for a supported application, select the Service Account check box.

   You can configure the service account property only during the initial user account creation. You cannot edit this setting for existing user accounts.

8. To save the new user, click Add.

   iLO notifies you that the account was added.

9. Click Cancel to cancel the operation.

10. Click ✕ to close the Add User window.

Subtopics

iLO user account options

- Login Name is the name that you use when logging in to iLO. It appears in the user list on the User Administration page, on the Session List page, in the menu that is displayed when you click the user icon, and in logs. The Login Name does not have to be the same as the User Name. The maximum length for a login name is 39 characters. The login name must use printable characters.

- User Name appears in the user list on the User Administration page. It does not have to be the same as the Login Name.

  The maximum length for a user name is 39 characters. The user name can contain any special character and must contain at least one printable character. White spaces are also allowed for user name, but you cannot use all white spaces as user name. Assigning descriptive user names can help you to identify the owner of each login name.

- New Password and Confirm Password set and confirm the password that is used for logging in to iLO.

  Password can contain special characters and white spaces. You cannot use all white spaces as password.

- Role allows you to select a predefined set of user privileges when you add or edit a user account. You can use the custom option to define a customized privilege set.

- Service Account designates the account as a service account. Service accounts are used by supported products that work with iLO.

  You can configure the service account property only during the initial user account creation. You cannot edit this setting for existing user accounts.

Password guidelines

Hewlett Packard Enterprise recommends that you follow these password guidelines when you create and update user accounts.

- When working with passwords:
  - Do not write down or record passwords.
  - Do not share passwords with others.
  - Do not use passwords that are made up of words found in a dictionary.
  - Do not use passwords that contain obvious words. Examples include the company name, product name, user name, or login name.
  - Change passwords regularly.
  - Keep the iLO default credentials in a safe place.
- Use strong passwords with at least three of the following characteristics:
  - At least one uppercase ASCII character
  - At least one lowercase ASCII character
  - At least one ASCII digit
  - At least one other type of character (for example, a symbol, special character, or punctuation).
- The minimum length for a user account password is set on the User Management > Settings page. Depending on the configured Minimum Password Length value, the password can have a minimum of 8 (default) characters and a maximum of 39 characters.

Editing local user accounts

Prerequisites

Administer User Accounts privilege

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.

2. Click Users.

   The Users page appears

3. Select a user account, and then click Actions > Edit User.

   Edit User window appears.

4. Update the following values, as needed:

   - User Name
   - Login Name

5. To change the password, click the Change password check box, and then update the New Password and Confirm Password values.

6. (Optional) If you want to change the user account privileges, do one of the following:

   - To manually select privileges, select Custom from the Role menu, and then select privileges from the list.

     To select all available user privileges, click the select all check box.

   - To select a predefined set of user privileges, select Administrator, Operator, or ReadOnly from the Role menu.

7. click Update to save the user account changes.

   iLO notifies you that the selected account was updated.

8. Click Cancel to cancel the operation.

9. Click ✕ to close the Edit User window.

Deleting a user account

Prerequisites

Administer User Accounts privilege

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.

2. Click Users

   Users page appears.

3. Select a user account that you want to disable, and click Actions > Delete User.

   Delete User window appears.

4. When prompted to confirm the request, click Yes, delete.

   iLO notifies you that the selected account is deleted.

5. Click Cancel to cancel the operation.

6. Click ✕ to close the Delete User window.

iLO directory groups

iLO directory groups are used with Kerberos authentication and schema-free directory integration. iLO supports up to six directory groups.

Subtopics

Directory group options

Each directory group includes a DN, SID, and account privileges. For Kerberos login, the SIDs of groups are compared to the SIDs for directory groups configured for iLO. If a user is a member of multiple groups, the user account is granted the privileges of all the groups.

You can use global and universal groups to set privileges. Domain local groups are not supported.

When you add a directory group to iLO, configure the following values:

- Group DN (Security Group DN)—Members of this group are granted the privileges set for the group. The specified group must exist in the directory, and users who need access to iLO must be members of this group. Enter a DN from the directory (for example, CN=Group1, OU=Managed Groups, DC=domain, DC=extension).

  Shortened DNs are also supported (for example, Group1). The shortened DN is not a unique match. Hewlett Packard Enterprise recommends using the fully qualified DN.

- Group SID (Security ID)—Microsoft Security ID is used for Kerberos and directory group authorization. This value is required for Kerberos authentication. The required format is S-1-5-2039349.

- Role (Security ID)—Role of the memebrs of the group.

Directory group privileges

- Login—Enables directory users to log in to iLO.
- Remote Console—Enables directory users to access the host system remote console, including video, keyboard, and mouse control.

  Users with this privilege can access the BIOS, and therefore might be able to perform host-based BIOS, iLO, storage, and network configuration tasks.

- Virtual Power and Reset—Enables directory users to power-cycle or reset the host system. These activities interrupt the system availability. A user with this privilege can diagnose the system by using the Generate NMI to System button.
- Virtual Media—Enables directory users to use the virtual media feature on the host system.
- Host BIOS—Enables directory users to configure the host BIOS settings by using the UEFI System Utilities.

  This privilege does not affect configuration through host-based utilities.

- Configure iLO Settings—Enables directory users to configure most iLO settings, including security settings, and to update the iLO firmware. This privilege does not enable local user account administration.

  After iLO is configured, revoking this privilege from all users prevents reconfiguration with the iLO web interface, iLO RESTful API, or the CLI. Users who have access to the UEFI System Utilities can still reconfigure iLO. Only a user who has the Administer User Accounts privilege can enable or disable this privilege.

- Administer User Accounts—Enables directory users to add, edit, and delete local iLO user accounts.

- Host NIC—Enables directory users to configure the host NIC settings.

  This privilege does not affect configuration through host-based utilities.

- Host Storage—Enables directory users to configure the host storage settings.

  This privilege does not affect configuration through host-based utilities.

- Recovery Set—Enables directory users to manage the System Recovery Set.

  By default, this privilege is assigned to the default Administrator account. To assign this privilege to another account, log in with an account that already has this privilege.

  This privilege is not available if you start a session when the system maintenance switch is set to disable iLO security.

Viewing directory groups

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.

2. Click Directory Groups

   Directory Groups page appears.
   The Directory Groups table shows the group DN, group SID, and the role for each group.

Adding directory groups

Prerequisites

- Administer User Accounts privilege
- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.

2. Click Directory Groups

   Directory Groups page appears.

3. Click Directory Groups > + Add .

   The Add Directory Group window appears.

4. Provide the following details:

   - Group DN
   - Group SID (Kerberos authentication and Active Directory integration only)
   - Role

5. Select from the following privileges:
    - Login
    - Remote Console
    - Virtual Power and Reset
    - Virtual Media
    - Host BIOS
    - Configure iLO Settings
    - Administer User Accounts
    - Host NIC
    - Host Storage
    - Recovery Set
6. click Update to save the new directory group.
7. Click ✕ to close the Add Directory Group window.

Editing directory groups

Prerequisites

- Administer User Accounts privilege
- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.
2. Click Directory Groups

   Directory Groups page appears.
3. Select a group in the Directory Groups section, and click Actions > Edit.

   Edit Directory Group window appears.
4. Provide the following details:
    - Group DN
    - Group SID (Kerberos authentication and Active Directory integration only)
5. Select from the following privileges:
    - Login
    - Remote Console
    - Virtual Power and Reset
    - Virtual Media

- Host BIOS
- Configure iLO Settings
- Administer User Accounts
- Host NIC
- Host Storage
- Recovery Set

6. click Update to save the directory group changes.
7. Click ✕ to close the Edit Directory Group window.

Deleting a directory group

Prerequisites

- Administer User Accounts privilege
- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management tab appears.
2. Click Directory Groups

   Directory Groups page appears.
3. Select a group in the Directory Groups section, and click Actions > Delete.

   Delete Directory Group window appears.
4. When prompted to confirm the request, click Yes, delete.
5. iLO notifies you that the group was deleted.

Installing a license key

Prerequisites

- Configure iLO Settings privilege
- Your iLO license is supported on the server on which you want to install it.

  For more information, see the HPE iLO 7 Licensing Guide.

Procedure

1. Click iLO Settings in the left navigation pane and click Licensing.

   The Licensing page appears.

2. Click Install License.

   The Install License window appears.

3. Enter a license key in the Activation Key box.

   To move the cursor between the segments in the Activation Key box, press the Tab key or click inside a segment of the box. The cursor advances automatically when you enter data into the segments of the Activation Key box.

   If you install a license key on a server that already has a key installed, the new key replaces the installed key.

   After you install a license key, only the last five digits are displayed in iLO. Hewlett Packard Enterprise recommends recording and saving your license key information in case it is needed later.

4. Click Install.

   iLO prompts you to confirm that you have read and accept the EULA.

   The EULA details are available in the License Pack option kit.

5. Click I agree.

   The license key is now enabled.

Subtopics

Viewing an installed license in the iLO web interface

Viewing an installed license in the iLO web interface

Procedure

Click iLO iLO Settings in the left navigation pane and click Licensing.

The Licensing page appears.
You can view the current license status and also install license from this page.

Subtopics

iLO licensing

iLO licensing

iLO standard features are included with every server to simplify server setup, perform health monitoring, monitor power and thermal control, and facilitate remote administration.

iLO licenses activate features such as the graphical remote console with multiuser collaboration, video record and playback, and many more features.

- An iLO license is required for each server on which the product is installed and used.
- Licenses are not transferable.
- The iLO Advanced license is automatically included with HPE Compute Ops Management Advanced license.
- The iLO Advanced license is automatically included with Synergy compute modules.
- If you lose a license key, follow the lost license key instructions in the HPE iLO 7 Licensing Guide.
- See the HPE iLO 7 Licensing Guide at **https://www.hpe.com/support/ilo-docs** for information about:
  - Obtaining a free iLO trial license.

- Purchasing, registering, and redeeming a license key.

- For information about purchasing, registering, and redeeming a license key, see the following website: **https://www.hpe.com/support/ilo-docs**.

Benefits of registering iLO license keys

Registering your license is an important step. Benefits include:

- Accessing the **Hewlett Packard Enterprise Support Center**
- Accessing software updates through the **My HPE Software Center**
- Tracking of all your Hewlett Packard Enterprise product licenses in one convenient place through the **My HPE Software Center**.
- Receiving important product alerts.
- Activating your unique Hewlett Packard Enterprise Support Agreement ID (SAID).

  Your SAID identifies you and tracks your products so that Hewlett Packard Enterprise can provide fast, personalized support.

  NOTE

  At this time, the **My HPE Software Center** portal does not track SAID agreements.

Using remote key managers with iLO

iLO 7 supports remote key managers, which can be used in conjunction with HPE Storage Controllers.

A remote key manager generates, stores, serves, controls, and audits access to data encryption keys. It enables you to protect and preserve access to business-critical, sensitive, data-at-rest encryption keys.

iLO manages the key exchange between the remote key manager and the other products. iLO uses a unique user account based on its own MAC address for communicating with the remote key manager. For the initial creation of this account, iLO uses a deployment user account that pre-exists on the remote key manager with administrator privileges. For more information about the deployment user account, see the remote key manager documentation.

Subtopics

Supported key managers

iLO supports the following key managers:

- Utimaco Enterprise Secure Key Manager (ESKM) 4.0 and later

  ESKM 5.0 or later is required when the FIPS security state is enabled.

CAUTION

If you use ESKM, ensure that you install the software update that includes updated code signing certificates. If you do not install the required update, your ESKM will enter an error state when restarted after January 1, 2019. For more information, see the **ESKM documentation**.

- Thales TCT KeySecure for Government G350v (previously known as SafeNet AT KeySecure G350v 8.6.0)
- Thales KeySecure K150v (previously known as SafeNet KeySecure 150v 8.12.0)
- Thales CipherTrust Manager 2.19.0, K170v (virtual) and K570 (physical) appliances

NOTE

Using a key manager is not supported when iLO is configured to use the CNSA security state.

Configuring remote key management

Procedure

1. Install and configure the key management software on the key server.
   a. Create a local user.
   b. Create local groups.
   c. Create a master key.

   For more information, see the supported key manager software documentation.
2. Configure iLO to support remote key management.
   a. Configure key manager servers.
   b. Add key manager configuration details.
   c. (Optional) Test the key manager configuration.
3. Configure supported devices to operate in remote key management mode.
   - For NVMe drives, see the UEFI System Utilities user guide.
   - For MRXXX Storage Controllers, see HPE MegaRAID MR Controller User Guide.

   These documents are available at the following website: **https://www.hpe.com/support/hpesc**.

Configuring key manager servers

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- Configure iLO Settings privilege
- iLO is not configured to use the CNSA security state.

Procedure

1. Click Security in the left navigation pane and click Remote Key Manager.

   The Remote Key Manager page appears.

2. Click  in the Servers section.

   The Servers window opens.

3. Enter the following information:

   - Primary Key Server Address
   - Primary Key Server Port
   - Secondary Key Server Address
   - Secondary Key Server Port

4. (Optional) To check for server redundancy in configurations with a primary and secondary key server, enable the Require Redundancy option.

   Hewlett Packard Enterprise recommends enabling this option.

5. Click Update.

   For more information about Thales CipherTrust Manager 2.2.0, see **Remote Key Manager Support for Cipher Trust Manager** Configuration guide.

Subtopics

Key manager server options

Key manager server options

Primary Key Server Address

The primary key server hostname, IP address, or FQDN. This string can be up to 79 characters long.

Primary Key Server Port

The primary key server port.

Secondary Key Server Address

The secondary key server hostname, IP address, or FQDN. This string can be up to 79 characters long.

Secondary Key Server Port

The secondary key server port.

Require Redundancy

When this option is enabled, iLO verifies that the encryption keys are copied to both of the configured key servers.

When this option is disabled, iLO will not verify that encryption keys are copied to both of the configured key servers.

Hewlett Packard Enterprise recommends enabling this option.

Adding key manager configuration details

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- Configure iLO Settings privilege
- iLO is not configured to use the CNSA security state.
- At least one key manager server is configured.

Procedure

1. Click Security in the left navigation pane and click Remote Key Manager.

   The Remote Key Manager page appears.

2. Click  in the Configuration section.

   The Configuration window opens.

3. Enter the following information in the iLO Account on Key Manager section:

   - Account Group
   - (Optional) Key Manager Local CA Certificate Name
   - (Optional) Remote Password

     The following rules apply when you create a new password:

     - Minimum password length is 8 and maximum password length is 16
     - The password should be a combination of a small case character, an upper case character, a number, and a special character

   The Account Name value is read-only.

4. Enter the following information in the Key Manager Administrator Account section:

   - Login Name
   - Password

5. Click Update.

   iLO sends an information request to the key manager server.

   - If the ilo-<iLO MAC address> account name does not exist:
     - The user account that you entered in the Key Manager Administrator Account section creates the account name and associates it with the key manager local user and its generated password.
     - The account name is added to the account group that you entered in step 3.
   - If the ilo-<iLO MAC address> account name exists:
     - The user account that you entered in the Key Manager Administrator Account section associates the account name with the key manager local user, and a new password is generated.

       You can also change the password using the RESTful API PATCH command:

       `"/redfish/v1/Managers/1/SecurityService/ESKM/"`

       The following rules apply when you create a new password:

       - Last 6 passwords cannot be used
       - Minimum password length is 8 and maximum password length is 16
       - The password should be a combination a small case character, an upper case character, a number, and a special character
     - If the user account you entered in the Key Manager Administrator Account section is not a member of the account group

associated with the ilo-<iLO MAC address> account, it is added to the account group.

- If the ilo-<iLO MAC address> is already a member of a key manager local group, the group you entered in step 3 is ignored. The existing group assignment on the key manager is used, and it is displayed in the iLO web interface. If a new group assignment is needed, you must update the key manager before updating the iLO settings.

If you entered the Key Manager Local CA Certificate Name in step 3, certificate information is listed in the Imported Certificate section of the Remote Key Manager page.

Subtopics

Key manager configuration details

Key manager configuration details

Account Name

The listed iLO Account on Key Manager account name is ilo-<iLO MAC address>. The account name is read-only and is used when iLO communicates with the key manager.

Account Group

The local group created on the key manager for use with iLO user accounts and the keys iLO imports into the key manager. When keys are imported, they are automatically accessible to all devices assigned to the same group.

See the Secure Encryption installation and user guide for more information about groups and their use with key management.

Key Manager Local CA Certificate Name

To ensure that iLO is communicating with a trusted key manager server, enter the name of the local certificate authority certificate in the key manager. It is typically named Local CA and is listed in the key manager under local CAs. iLO will retrieve the certificate and use it to authenticate the key manager servers for all future transactions.

Secure Encryption does not support using a third-party trusted or intermediate CA.

Remote Password

The remote password managed by Enterprise Secure Key Manager (ESKM) server.

Login Name

The local user name with administrator permissions that is configured on the key manager. This user name is the key manager deployment user.

The deployment user account must be created before you add key manager configuration details in iLO.

Password

The password for the local user name with administrator permissions that is configured on the key manager.

Testing the key manager configuration

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- A key manager is set up and the key manager configuration is complete in iLO.

About this task

To verify the configured settings, test the key manager configuration. The following tests are attempted:

- Confirm that the key manager software version is compatible with iLO.

- Connect to the primary key manager server (and secondary key manager server, if configured) by using TLS.
- Authenticate to the key manager by using the configured credentials and account.

Procedure

1. Click Security in the left navigation pane and click Remote Key Manager.

   The Remote Key Manager page appears.

2. Click Test Connection.

   The test results are displayed in the Events table. A success or failure message is displayed at the top of the iLO web interface window.

Viewing key manager events

Prerequisites

A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

Procedure

1. Click Security in the left navigation pane and click Remote Key Manager.

   The Remote Key Manager page appears.

2. Scroll to the Events section.

   Each event is listed with a time stamp and description.

Clearing the key manager log

Prerequisites

- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

Procedure

1. Click Security in the left navigation pane and click Remote Key Manager.

   The Remote Key Manager page appears.

2. Click Delete Event Logs.

   iLO prompts you to confirm the request.

3. Click Yes, delete.

Language packs

Language packs enable you to change the iLO web interface from English to a supported language of your choice. Language packs provide

translations for the iLO web interface and the integrated remote console.

Consider the following when using language packs:

- The following language packs are available: Japanese and Simplified Chinese.
- The English language cannot be uninstalled.
- You can install multiple language packs.

  If a language pack is installed, installing a newer language pack of the same language replaces the installed language pack.
- The integrated remote console uses the language of the current iLO session.
- If an installed language pack does not include the translation for a text string, the text is displayed in English.
- When you update the iLO firmware, Hewlett Packard Enterprise recommends downloading the latest language pack to ensure that the language pack contents match the iLO web interface.

How iLO determines the session language

iLO uses the following process to determine the language of a web interface session:

1. If you previously logged in to the iLO web interface on the same computer using the same browser, and you have not cleared the cookies, the language setting of the last session with that iLO processor is used.
2. If there is no cookie, the current browser language is used if iLO supports it and the required language pack is installed.
3. If there is no cookie, and the browser or OS language is not supported, iLO uses the configured default language.

Subtopics

Installing language packs

Prerequisites

Configure iLO Settings privilege

Procedure

1. Download a language pack from the following website: **https://www.hpe.com/support/ilo7**.
2. Extract the language pack `LPK` file.
   - For Windows components: Double-click the downloaded file, and then click the Extract button. Select a location for the extracted files, and then click OK.
   - For Linux components: Depending on the file format, enter one of the following commands:
     - `#rpm2cpio <language_pack_file_name>.rpm | cpio -id`

   The language pack file name is similar to the following: `lang_<language>_<version>.lpk`.
3. Navigate to the Update Firmware page using any of the following steps:
   - Click Firmware in the left navigation pane and click Update Firmware from the Quick Actions menu.

     or

- Click Firmware in the left navigation pane and click Firmware Inventory > Update Firmware
  or
- Click iLO Settings in the left navigation pane and click Language. From the Language page, click Install Language Pack link to navigate to Firmware Inventory > Update Firmware page.

If the Update Firmware option is not displayed, click the ellipsis icon in the top-right corner of Firmware page.

4. Depending on the browser you use, click Browse or Choose File.
5. Select the `lang_<language>_<version>.lpk` file, and then click Open.
6. (Optional) To save a copy of the language pack file to the iLO Repository, select the Also store in iLO Repository check box.
7. Click Update.

   iLO prompts you to confirm the installation request.

Selecting a language pack

About this task

Procedure

1. Click iLO Settings in the left navigation pane and click Language.

   The Language page appears.
2. Click the required language in the Installed Languages list to select the language pack.

Configuring the default language settings

Prerequisites

- Configure iLO Settings privilege
- The language pack for the language you want to use is installed.
- The language you want to use is installed in the browser and it is set to take priority over the other installed browser languages.

About this task

Use this procedure to configure the default language.

Procedure

1. Click iLO Settings in the left navigation pane and click Language.

   The Language page appears.
2. Click Set Default Langauge on the Langaugae page.

   iLO Default Language window appears.
3. Select a value from the Language drop-down.

   The available languages are English and any other language for which a language pack is installed.
4. Click Update.

iLO notifies you that the default language was changed.

In subsequent iLO web interface sessions, if there is no browser cookie from a previous session and the browser or OS language is not supported, the iLO web interface uses the configured default language.

5. Click Cancel to cancel the operation.
6. Click ✕ to close the Set Default Langauge window.

Configuring the current iLO web interface session language

Prerequisites

The language pack for the language you want to use is installed.

Procedure

1. Click iLO Settings in the left navigation pane and click Language.

   The Language page appears.

2. Click the name of a language in the Installed Languages list.

   The iLO web interface for the current browser session changes to the selected language.

Uninstalling a language pack

Prerequisites

- Configure iLO Settings privilege
- The language you want to remove is not configured as the default language.
- The language you want to remove was installed as a language pack. You cannot remove the English language.

Procedure

1. Click iLO Settings in the left navigation pane and click Language.

   The Language page appears.

2. Click 🗑 next to the language you want to remove.
3. When prompted to confirm the request, click Yes, remove.

   iLO removes the selected language pack, reboots, and closes your browser connection.

   It might take several minutes before you can re-establish a connection.

Using Smart Update Manager to create a custom ISO on Windows

About this task

NOTE

Smart Update Manager (SUM) starts an HTTP server and initiates a browser to communicate to that server. Do not block Ports 63001–63002.

For more information, see the **Smart Update Manager User Guide**.

Smart Update Manager (SUM) does not support HPE ProLiant RL3xx Gen 11 platforms.

Procedure

1. Download a supported HPE Service Pack for ProLiant, HPE Synergy Service Pack, or HPE Synergy Custom SPP to use as a baseline. Mount the firmware bundle to a virtual CD drive.
2. Download all your required additional components (firmware and drivers) along with any required signature files.
3. Copy the downloaded files to a single local folder.
4. From the top-level folder of the mounted firmware bundle, run `.\launch_sum.bat` command. The Smart Update Manager opens in a browser.
5. Select Baseline Library from the main menu. The baseline inventory starts automatically. Wait for the inventory of the baseline to finish (the first inventory of this bundle from your local system takes more time).

   If the baseline inventory did not start automatically:

   a. Click Add Baseline and in the Location Details, enter the packages path from the mounted firmware bundle. (For example, F:\packages).

   b. Click Add. The baseline inventory is added.
6. Click Add Baseline to add the additional components folder as a Baseline (not Custom).
7. In the Location Details, enter the location of the additional components folder and then click Add.

   Confirm that all the expected additional components and versions are present.
8. Choose Actions and Create Custom option from the menu.
9. Enter the following options:
   - Description
   - Version
   - Output Location (requires an empty folder)
   - Make Bootable ISO file (yes-checked)
   - Extracted Source ISO Location (the top-level folder of the starting firmware bundle virtual CD)

   NOTE

   Date is mandatory in the version string. Click the date to edit the date.
10. Ensure both the original and additional baselines are selected under Step 1–Baseline Sources.
11. **IMPORTANT**

    Do not remove other components as that may result in the custom ISO unusable.

    Optionally, under Step 3– Review, click Apply Filters to confirm that your additional firmware and drivers are selected. If there are conflicting packages in the original baseline, you may clear them.
12. Click Create ISO and then click Save Baseline. The process will take significant time to complete.

    When the process is complete, the following message appears:

```
Baseline has been saved successfully.  ISO creation was successful.
Baseline has been added successfully.
```

You may close the dialog box without losing any changes. After the ISO file is created:

- SUM will inventory the newly created firmware bundle.
- The ISO file name will be bp-date-version.iso. You may rename the resulting ISO file. You do not have to retain the contents. The title of the mounted ISO will retain the original firmware bundle name.
- You can locate the ISO file in the Output Location along with its comprising contents. Optionally, search on a keyword or version to confirm that your additional components are part of the ISO inventory.

  At this point, you can mount a virtual CD to inspect the contents. You can also boot the ISO using an appropriate Compute module.

Using the iLO security features

Subtopics

Security guidelines

When you set up and use iLO, consider the following guidelines for maximizing security:

- Set up iLO on a dedicated management network.

  Hewlett Packard Enterprise recommends establishing a private management network that is separate from your data network. Configure the management network so that it can be accessed only by administrators.

  If you connect iLO devices to a shared network, consider the iLO devices as separate servers and include them in security and network audits.

- Do not connect iLO directly to the Internet.

  The iLO processor is a management and administration tool, not an Internet gateway. Connect to the Internet by using a corporate VPN

that provides firewall protection.

> **IMPORTANT**
>
> Change the iLO user account passwords immediately if iLO has been connected directly to the Internet.

- Replace the default self-signed certificate by installing an TLS certificate that is signed by a Certificate Authority (CA).

  You can perform this task on the TLS Certificate page.

- Install trusted CA certificates to enable certificate validation for external services such as LDAP.
- Change the password for your user accounts, including the default user account.

  Change the iLO management passwords according to the same guidelines as the server administrative passwords.

  You can perform this task on the User Management > Settings page.

  > **IMPORTANT**
  >
  > Follow the iLO user account password guidelines when you create and update user accounts.

- Instead of creating user accounts with all privileges, create multiple accounts with fewer privileges.
- Keep your iLO and server firmware up to date.
- Use an authentication service (for example, Active Directory or OpenLDAP), preferably with two-factor authentication.

  This feature allows authentication and authorization using the same login process throughout the network. It provides a way to control multiple iLO devices simultaneously. Directories provide role-based access to iLO with specific roles and privileges based on time and location.

- Implement two-factor authentication.

  This feature provides additional security, especially when you make connections remotely or outside the local network.

- Protect SNMP traffic.

  Reset the community strings according to the same guidelines as the administrative passwords. Also set firewalls or routers to accept only specific source and destination addresses. Disable SNMP at the server if you do not need it.

- Disable ports and protocols that you do not use (for example, SNMP or IPMI/DCMI over LAN).

  You can perform this task on the Access page in iLO Settings.

- Disable features that you do not use (for example, remote console).

  You can perform this task on the Remote Console page under Host tab.

- Configure the remote console to automatically lock the server OS console.

  To configure this option, configure the Remote Console Computer Lock setting on the Remote Console page.

- Disable the iLO 7 Configuration Utility in the UEFI System Utilities or configure iLO to require login credentials when users access it.

  You can perform this task on the Access page in iLO Settings.

- Disable the ROM-based configuration utility in the UEFI System Utilities or configure iLO to require login credentials when users access it.

  You can perform this task on the Access page in iLO Settings.

- Configure iLO to log authentication failures.

  You can perform this task on the Access page in iLO Settings.

- Enable firmware verification scans.

  You can perform this task on the Firmware Verification page.

- Use the Security page to monitor security risks and recommendations.
- Use the Security Log to monitor security-related events.
- Set the Downgrade Policy to Downgrade requires Recovery Set privilege.

  You can perform this task on the Firmware > Firmware Settings page.

- Keep the Recovery Set up to date.
- Configure iLO to avoid access over an HTTP connection.

  To configure this behavior, install a trusted TLS certificate that is signed by a Certificate Authority (CA) and enable the IRC requires a trusted certificate in iLO setting.

  You can complete these configuration steps on the TLS Certificate page in Security and the Remote Console page in Host .

  In this configuration, when you access the iLO web interface, iLO returns an HTTP Strict Transport Security (HSTS) flag in the response header, which enables the browser to automatically redirect any HTTP request to HTTPS.

Key security features

Configure iLO security features on the following web interface pages.

iLO Service Port

Configure iLO Service Port availability, authentication, and supported devices.

Secure Shell Key

To provide stronger security, add SSH keys to iLO user accounts.

CAC Smartcard

Configure CAC Smartcard authentication and configure smartcard certificates for local users.

TLS Certificate

Install X.509 CA signed certificates to enable encrypted communications.

Directory & LDAP

Configure Kerberos authentication and Directory integration.

You can configure iLO to use a directory service to authenticate and authorize its users. This configuration enables an unlimited number of users and easily scales to the number of iLO devices in an enterprise. The directory also provides a central point of administration for iLO devices and users, and the directory can enforce a strong password policy.

Encryption and Security

Implement a higher security environment by changing the iLO security state from the default value (Secure Standard) to a stronger setting.

HPE SSO

Configure supported tools for single-sign-on with iLO.

Login Security Banner

Add a security notice that is displayed when you:

- Navigate to the iLO web interface login page.
- Start the HTML5 standalone remote console.
- Connect to iLO through an SSH connection.

Ports used by iLO features

NOTE

For the protocol type UDP and TCP, the ports mentioned in the table are for inbound iLO services.

Table 1. Network settings and ports in iLO

Description	Default Setting or Port	Protocol type
IPMI/DCMI over LAN port	623	UDP
IPMI/DCMI over LAN Specifies whether to allow IPMI/DCMI communications over the LAN with iLO.	Disabled	
IPMI over KCS	Enabled	
Remote Console Allows you to enable or disable access through the iLO remote consoles.	Enabled	
Secure Shell (SSH) Port	22	TCP
Secure Shell (SSH) Allows you to enable or disable the SSH feature. SSH provides encrypted access to the iLO command-line protocol (CLP).	Enabled	
SNMP Port	161	UDP
SNMP Trap Port	162 for SNMP alerts (outgoing only).	UDP
SNMP Specifies whether iLO responds to external SNMP requests.	Enabled	
Virtual Media Enables you to specify whether virtual media is enabled or disabled.	Enabled	

Other outgoing ports

Security administrators might need to know the ports listed in **Other ports used by iLO**. These ports are for outgoing third-party services.

Table 2. Other ports used by iLO

Description	Default port	Protocol type
DNS Resolution	53	UDP
SSDP Multicast	1900	UDP
DHCPv4	67, 68	UDP
DHCPv6	547	UDP
NTP	123	UDP
Kerberos KDC Server Port	88	TCP, UDP
Directory Server LDAP TLS Port	636	TCP
AlertMail SMTP Port	25	TCP
Remote Syslog Port	514	UDP
Key Manager Port	9000	TCP
Remote Support Port	7906	TCP

Ports not supported by iLO

iLO does not support the commonly used ports listed in the **Unsupported ports**.

Table 3. Unsupported ports

Description	Port	Protocol type	Notes
LDAP-unsecured • Connection (TCP) • Connectionless (UDP)	389	TCP/UDP	iLO uses secure port 636 for outgoing LDAP connections.
Global Catalog LDAP-unsecured • Connection (TCP) • Connectionless (UDP)	3268	TCP/UDP	iLO uses secure LDAP connections.

Secure Protocol and Data Model

iLO uses the Secure Protocol and Data Model (SPDM) to verify the integrity of components and authenticate the Option Cards. All the components do not support SPDM. If SPDM is enabled, an unsupported or non-authentic component will change the iLO security status to Risk.

iLO supports the SPDM specification v1.0, v1.0.1, v1.1, and v1.2 for authentication. For devices not supporting any of the SPDM versions, iLO logs Security log events for SPDM failures.

You can check the status of each component authentication in the Security Log.

Subtopics

Global component integrity
Component integrity policy

Global component integrity

Global component integrity option allows iLO to authenticate the components in the server using SPDM. When the option is enabled, iLO will verify and authenticate all the applicable components in the server using SPDM.

The option is Disabled by default. When disabled, iLO does not validate the components for SPDM authentication and even the SPDM supported cards are reported as Not Supported.

You can enable this option on the Policy page.

Subtopics

Configuring Policy settings Enabling Global Component Integrity

Configuring Policy settings Enabling Global Component Integrity

Prerequisites

- Option Cards supporting SPDM
- CA of the Option Cards is available in the iLO firmware
- UBM supporting SPDM

Procedure

1. Click iLO Settings in the left navigation pane and click Policy.

   The Policy page appears.
2. Click  on the Security section.

   The Security window appears.
3. Click  on General section.

   The General window appears.
4. Click Update after making the required changes.
5. Select Global Component Integrity check box to enable the option.
6. Select a Component Integrity Policy.
7. Click Update to save the configuration.
8. Click Cancel to cancel the operation.
9. Click  to close the Security window.

Subtopics

Policy settings options

Policy settings options

Global Component Integrity

Enables or disables authentication to all applicable components in the server using SPDM.

This setting is disabled by default.

Enabling the option allows iLO to validate the components on the servers using SPDM.

Component Integrity Policy

Specifies the system boot policy based on the device component integrity policy settings. The two policies are:

- Halt Boot On SPDM Failure —Select the option to halt the system boot during SPDM Authentication failure.
- No Policy—Select the option to boot the system in normal mode.

> **NOTE**
> Component integrity policy is also applicable for Host Processor Module in an MHS based system.

General settings

You can also enable or disable the following settings from the Policy page:

Anonymous Data

This setting controls the following:

- The XML object iLO provides in response to an anonymous request for basic system information.
- The information provided in response to an anonymous Redfish call to `/redfish/v1`

When this setting is enabled (default):

- Other software is allowed to discover and identify the iLO system on the network. To view the XML response that iLO provides, click View XML.
- An anonymous Redfish call to `/redfish/v1` includes information similar to the following:

```
"ManagerFirmwareVersion": "1.11.00",
"ManagerType": "iLO 7",
"Status": {"Health": "OK"}
```

- When the iLO health status is Degraded, the iLO health status and a description of the issue are displayed on the login page. The iLO health status is based on the combined results of the iLO diagnostic self-tests. Self-test failures that could compromise security are not displayed in the description.

When this option is disabled:

- iLO responds to requests with an empty XML object.
- iLO version information is not displayed on the login page.
- An anonymous Redfish call to `/redfish/v1` excludes the following information: `ManagerFirmwareVersion`, `ManagerType`, and `Status`.

Show iLO IP during POST

Enables the display of the iLO network IP address during host server POST.

- When this setting is enabled (default), the iLO IP address is displayed during POST.
- When this setting is disabled, the iLO IP address is not displayed during POST.

Show Server Health on External Monitor

Enables the display of the Server Health Summary screen on an external monitor.

- When this setting is enabled, you can press and release the server UID button to display the Server Health Summary screen on an external monitor.
- When this setting is disabled, the Server Health Summary screen does not open when you press and release the server UID button.

CAUTION

To use this feature, press and release the UID button. Holding it down at any time for more 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.

This feature is not supported on Synergy compute modules.

For more information about the Server Health Summary screen, see the HPE iLO 7 Troubleshooting Guide.

For more information about the Server Health Summary screen, see the iLOTroubleshooting Guide.

VGA Port Detect Override

Controls how devices connected to the system video port are detected. Dynamic detection protects the system from abnormal port voltages.

- When this setting is enabled (default), the iLO firmware detects connected devices before activating video output.
- When this setting is disabled, the iLO hardware detects connected devices before activating video output.

This setting can be used for troubleshooting cases when there is no video output to displays, KVM concentrators, or active dongles.

This setting is not supported on Synergy compute modules.

Component integrity policy

Component integrity policy controls the system boot policy based on the SPDM authentication results of the devices in the server. Component integrity policy is also applicable for Host Processor Module in an MHS based system.

Subtopics

Supported policies

Supported policies

The two supported policies are:

- Halt Boot On SPDM Failure —Select the option to halt the system boot during SPDM Authentication failure.
- No Policy—Select the option to boot the system in normal mode.

To set the desired Component Integrity Policy settings, navigate to Access settings page, click  on the iLO settings.

Server identity

Server Identity (DevID) is a standard (based on IEEE 802.1AR) way to uniquely identify a server across networks. DevID is uniquely bound to a server that enables a server to prove its identity in various industry standards and protocols that authenticate, provision, and authorize communicating devices.

iLO supports factory provisioned server identity (iLO IDevIDPCA) and user defined server identity (iLO LDevID). iLO also stores the system certificates (System IDevID and System IAK).

Following are the different server management identities:

- iLO IDevIDPCA
- iLO LDevID

Subtopics

iLO LDevID

IDevID can be supplemented by a user-defined server identity, called iLO LDevID. iLO LDevID is unique in the administrative domain, in which the server is used. HPE servers can be securely on boarded into a customer network using the LDevID for 802.1X authentication. Hewlett Packard Enterprise recommends using LDevID always to assure the privacy of iLO IDevID.

LDevID helps in facilitating the enrollment (authentication and authorization of credentials) by local network administrators. iLO allows to import, view, and delete LDevID outside the factory.

Subtopics

Importing LDevID certificate

About this task

Procedure

1. Generate a Certificate Signing Request (CSR) for LDevID. iLO allows creation of a CSR in PEM format for LDevID using the RESTful API POST command:

   `"/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR"`

   ```
   {
      "Action": "CertificateService.GenerateCSR",
      "CertificateCollection": {
         "@odata.id": "/redfish/v1/Managers/1/SecurityService/iLOLDevID/Certificates/"
      }
   }
   ```

2. Send this CSR to Certificate Authority to obtain a trusted certificate.

3. Import the trusted LDevID certificate into iLO. iLO allows import of LDevID certificate in PEM format using the RESTful API POST command:

   `"/redfish/v1/Managers/1/SecurityService/iLOLDevID/Certificates/"`

   ```
   {
      "CertificateType": "PEM",
      "CertificateString": <Contents of the trusted certificate>
   }
   ```

   Before importing, iLO validates the input certificate with the following parameters:

   - The public key in the certificate matches the one generated with its corresponding CSR.
   - The signing and hashing algorithms used in the certificate are FIPS compliant.

NOTE

iLO supports import of LDevID certificates upto 16 KB size.

Viewing the imported LDevID certificate

To view the imported LDevID certificate, use the following RESTful API GET command:

`"/redfish/v1/Managers/1/SecurityService/iLOLDevID/Certificates/1"`

Deleting the imported LDevID certificate

To delete the imported LDevID certificate, use the following RESTful API DELETE command:

`"/redfish/v1/Managers/1/SecurityService/iLOLDevID/Certificates/1"`

Replacing LDevID certificate

You cannot update a LDevID certificate. To replace a certificate, you must delete the existing LDevID certificate and generate a new certificate. See Importing LDevID certificate.

NOTE

In case LDevID certificate is lost due to one-button secure erase, you can restore it using the Backup and Restore feature or replace it.

iLO IDevIDPCA

iLO can be provisioned with server identity in the factory. This factory provisioned server identity is called iLO IDevIDPCA. HPE servers can be securely on boarded into a customer network using the IDevIDPCA for 802.1X authentication. iLO IDevIDPCA has life time validity and is immutable.

Subtopics

iLO IDevIDPCA features

iLO IDevIDPCA features

iLO does not allow you to update or delete IDevIDPCA since it is immutable.

You can view the iLO IDevIDPCA certificate using the RESTFul API GET command:

`"/redfish/v1/Managers/1/SecurityService/BMCIDevIDPCA/Certificates/1"`

System IAK certificate

iLO is provisioned with the System Initial Attestation Key (IAK) certificate in the factory. This is similar to System IDevID but used for TPM-based attestation. The corresponding private key is stored in TPM. System IAK follows the TCG proposal for TPM2.0 implementation of an IDevID.

iLO does not allow you to update or delete the certificate. You can only view the certificate using the RESTful API GET command:

"/redfish/v1/Managers/1/SecurityService/SystemIAK/Certificates/1"

NOTE

iLO IDevID, iLO LDevID, System IDevID, and System IAK certificate are preserved across iLO security state transitions, reset to factory defaults.

Platform certificate

iLO can be provisioned with the platform certificate which is an attribute certificate that functions as a signed manifest for the hardware chassis or configuration used to detect supply chain tampering. This certificate is TCG compliant.

iLO does not allow you to update or delete the certificate. You can only view the certificate using the RESTful API GET command:

"/redfish/v1/Managers/1/SecurityService/PlatformCert/Certificates/1"

One-button secure erase for DevIDs and System IAK

iLO LDevID, iLO LDevID, iLO LAK, System LDevID, and System LAK are removed after one-button secure erase. iLO IDevIDPCA, iLO IAK, System IDEVID, and System IAK certificate is not removed after one-button secure erase.

Hewlett Packard Enterprise recommends to perform a manual backup of iLO to minimize the impact of loss of and iLO LDevID, after one button secure erase. In manual backup, iLO includes all the certificates in its backup service. You can restore these certificates from the backup file.

System board replacement

Once the board is replaced, iLO LDevID, iLO LAK, System IDevID, System IAK, System LDevID, and System LAK become invalid, but iLO IDevIDPCA and iLO IAK will be valid as it uses the PCA serial number in the certificate. You have to replace all of the invalid identities on the new board. The factory provisioned certificates (iLO LDevID, iLO LAK, System IDevID, System IAK, System LDevID, and System LAK) cannot be replaced on the new board outside the factory.

In the event of the board replacement, you can either restore a previously backed up iLO IDevIDPCA and LDevID, or create a new LDevID. For more information see, Importing LDevID certificate. On the new board, HPE iLO IDevIDPCA and HPE iLO LDevID will be the server identity for IEEE 802.1X authentication.

802.1X authentication

IEEE 802.1X is a mechanism for port-based network access control, which regulates access to the network and protect against unidentified and unauthorized parties accessing the network.

802.1X uses the the Extensible Authentication Protocol (EAP) for message exchange during the authentication process. EAP-Transport Layer Security (EAP-TLS) is an EAP type which uses certificates or smart cards for authentication.

HPE iLO 7 supports EAP-TLS based authentication for onboarding into an 802.1X access-controlled network. Using IDevIDPCA, the factory

provisioned server identity, an HPE server can securely onboard and establish its identity for unattended autonomous operation. iLO also supports user-provisioned server identity (iLO LDevID) for 802.1X authentication. When both iLO IDevIDPCA and iLO LDevID is present in the system, iLO LDevID is used for EAP-TLS authentication.

The default setting for 802.1X authentication is "Enabled". But iLO 7 does not initiate the EAP-TLS authentication or respond to any authentication requests, if the system does not have iLO LDevID.

Subtopics

Prerequisites for 802.1X authentication

- Secure device identity (iLO IDevIDPCA or iLO LDevID) pre-installed.
- Configure your Authentication, Authorization, and Accounting (AAA) server to accept iLO DevID certificate (for example, configuring to support EAP-TLS and installing DevID issuer certificate in RADIUS server).

iLO access settings

The default access settings values are suitable for most environments. The values you can modify on the Access page allow customization of the iLO external access methods for specialized environments.

The values you enter on the Access page apply to all iLO users.

Subtopics

Configuring iLO access settings

About this task

This procedure is for all Access settings except iLO Functionality. To disable iLO Functionality, see Disabling the iLO functionality section.

Procedure

1. Click iLO Settings in the left navigation pane and click Access.

   The Access page appears.

2. Click  next to the Access settings category that you want to update.

   Choose from the following:

   - IPMI/DCMI over LAN
   - IPMI/DCMI over LAN Port
   - IPMI over KCS
   - View Log

- Virtual Serial Port Log Over CLI
- Download Log
- Discovery
- Announcement Interval
- IPv6 Multicast Scope
- Time To Live (TTL)
- SNMP
- SNMP Request Port
- SNMP Trap Port
- Secure Shell(SSH)
- Secure Shell(SSH) Port
- Web Proxy
- Web Proxy Server
- Web Proxy Port
- Web Proxy Username
- iLO ROM-Based Setup Utility
- Virtual NIC

> **NOTE**
>
> You can only view the Remote Console and Virtual Media state from the Access page. Click the Remote Console or the Virtual Media link to navigate to the respective page and edit the settings.

The edit window appears.

3. Update the settings as needed and click Update.

   Depending on the type of setting you changed, the following might happen:

   - iLO notifies you that the update is complete.
   - iLO notifies you that pending changes require a reset to take effect.

     For some settings, you might observe an immediate impact when the setting is changed, before a reset is complete. For example, if you disable access through the remote console, you cannot start a remote console session after you click OK. A reset is required to complete the configuration change.

     Other settings that require a reset allow you to manually revert the configuration back to its original state without a reset taking place. For those settings, you can manually revert the change, and then click ✕ to dismiss the reset message.

     For example, if you enable the Virtual NIC feature, iLO notifies you that the pending change requires a reset. If you manually revert this change by resetting the Virtual NIC option to disabled, the pending reset message remains, and you can click ✕ to dismiss the message.

     Clicking ✕ dismisses the reset message, but it does not revert the iLO configuration to the previous settings. If you want to undo a change, you must revert the change manually.

4. Click Cancel to cancel the operation.
5. Click ✕ to close the edit window.
6. If a reset is required and you are done updating access settings, click Reset iLO.

iLO prompts you to confirm the request.

7. Click Yes, reset iLO.

   It might take several minutes before you can re-establish a connection.

Subtopics

Access settings options

Access settings options

The Access settings page allows you to enable and disable iLO features, and to configure the ports they use.

The TCP/IP ports used by iLO are configurable, which enables compliance with site requirements and security initiatives for port settings. These settings do not affect the host system. The range of valid port values in iLO is from 1 to 65535. If you enter the number of a port that is in use, iLO prompts you to enter a different value.

Changing these settings usually requires configuration of the web browser used for standard and TLS communication.

IPMI/DCMI over LAN

Allows you to send industry-standard IPMI and DCMI command over the LAN.

This setting is disabled by default.

When this setting is disabled, iLO disables IPMI/DCMI over the LAN. Server-side IPMI/DCMI applications are still functional when this feature is disabled.
When this setting is enabled, iLO allows you to use a client-side application to send IPMI/DCMI commands over the LAN.

When IPMI/DCMI over LAN is disabled, the configured IPMI/DCMI over LAN Port is not detected in a security audit that uses a port scanner to scan for security vulnerabilities.

IPMI/DCMI over LAN Port

Sets the IPMI/DCMI port number.

The default value is UDP 623.

IPMI over KCS

IPMI over Keyboard Controller Style (KCS) enables you for management of a computer system and monitoring the operations from within the host OS.

IPMI over KCS option allows you to enable or disable KCS interface.

This setting is Enabled by default.

While upgrading to a later version, the default value for IPMI over KCS is stored based on the previous configuration settings.

Commands to enable and disable KCS interface

Volatile configuration

Command syntax-- `0x06 command: 0x41(get)/0x40(set) interface : 0x0F(KCS) conf:0x82(enable)/0x80(disable) 0x00`
To enable the KCS interface, run `#> ipmitool -I lanplus -H <IP Address> -U <user name> -P <password> raw 0x06 0x40 0x0F 0x82 0x00` command.
To check the KCS interface status, run `#> ipmitool -I lanplus -H <IP Address> -U <user name> -P <password> raw 0x06 0x41 0x0F 0x80` command.
Response Data: 02 04

`02` --Indicates KCS is enabled

`04` -- Indicates ADMIN privileges

To disable KCS interface, run `#> ipmitool -I lanplus -H <IP Address> -U <user name> -P <password> raw 0x06 0x40 0x0F 0x80 0x00` command.

Non-Volatile configuration

Command syntax-- `0x06 command: 0x41(get)/0x40(set) interface : 0x0F(KCS) conf:0x42(enable)/0x40(disable) 0x00`

To enable KCS interface, run `#> ipmitool -I lanplus -H <IP Address> -U <user name> -P <password> raw 0x06 0x40 0x0F 0x42 0x00` command.
To check the KCS interface status, run `#> ipmitool -I lanplus -H <IP Address> -U <user name> -P <password> raw 0x06 0x41 0x0F 0x40` command.
Response Data: 02 04

`02` --Indicates KCS is enabled

`04` -- Indicates ADMIN privileges

To disable KCS interface, run `#> ipmitool -I lanplus -H <IP Address> -U <user name> -P <password> raw 0x06 0x40 0x0F 0x40 0x00` command.

NOTE

- In Volatile configuration, enable or disable of KCS interface is possible only through IPMItool.
- A change in Volatile configuration does not affect Non-Volatile configuration.
- In Nonvolatile configuration, enable or disable of KCS interface is possible through Redfish, iLO web interface, or IPMI tool.
- A change in Nonvolatile configuration also affects Volatile configuration.

View Log

Allows you to view the virtual serial port log.

This setting is enabled by default.

NOTE

The default settings will only be applied if you perform a factory reset, initiates a secure erase, or update the firmware for the first time with the View Log enabled.

Virtual Serial Port Log Over CLI

Enables or disables logging of the virtual serial port that you can view by using the CLI.

When this setting is enabled, virtual serial port activity is logged to a 150-page circular buffer in the iLO memory. Use the CLI command `vsp log` to view the logged information. The virtual serial port buffer size is 128 KB.

This setting is disabled by default.

A license is required to use this feature. If a license that supports this feature is not installed, this option is not displayed.

For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

Download Log

Enables or disables logging of the virtual serial port to a file that you can download through the iLO web interface.

When this setting is enabled, Virtual Serial port activity is logged to a file that you can download from the Access page.

This setting is disabled by default.

A license is required to use this feature. If a license that supports this feature is not installed, this option is not displayed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

Multicast discovery

Enables or disables multicast discovery. The default setting is Enabled.

Disabling multicast discovery is not supported on Synergy compute modules. To limit the impact of multicast traffic on a network with Synergy compute modules, adjust the IPv6 Multicast Scope and Multicast Time To Live (TTL) settings.

Multicast Announcement Interval (seconds/minutes)

Sets the frequency at which the iLO system announces itself on the network. Each multicast announcement is approximately 300 bytes. Select a value of 30 seconds to 30 minutes. The default value is 10 minutes.

The possible values are:

- 30, 60, or 120 seconds
- 5, 10, 15, or 30 minutes
- Disabled

IPv6 Multicast Scope

The size of the network that will send and receive multicast traffic. Valid values are Link, Site, and Organization. The default value is Site.

Multicast Time To Live (TTL)

Specifies the number of switches that can be traversed before multicast discovery stops. Valid values are from 1 to 255. The default value is 5.

SNMP

Specified whether iLO responds to external SNMP requests.

If you disable SNMP access, iLO continues to operate, and the information displayed in the iLO web interface is updated. In this state, no alerts are generated and SNMP access is not permitted.

When SNMP access is disabled, most of the boxes on the SNMP Settings page are unavailable.

SNMP Port

Sets the SNMP port.

The default value is UDP 161 for SNMP access.

If you customize the SNMP Port value, some SNMP clients might not work correctly with iLO unless those clients support the use of a nonstandard SNMP port.

If the SNMP option is disabled, you cannot update this value.

SNMP Trap Port

Sets the SNMP trap port.

The default value is UDP 162 for SNMP alerts (or traps).

If you customize the SNMP Trap Port, some SNMP monitoring applications might not work correctly with iLO unless those applications support the use of a nonstandard SNMP trap port.

If the SNMP option is disabled, you cannot update this value.

Secure Shell (SSH)

Allows you to enable or disable the SSH feature.

SSH provides encrypted access to the iLO command-line protocol (CLP).

This setting is enabled by default.

Secure Shell (SSH) Port

Sets the SSH port.

The default value is TCP 22.

Web Proxy

Specifies whether the Web proxy server is enabled or not.

Web Proxy Server

Indicates the hostname or IP address of the proxy server.

Web Proxy Port

Specifies the web proxy port number. The range of valid port values in iLO is from 1–65535.

Web Proxy User Name

Indicates web proxy user name.

iLO ROM-Based Setup Utility

Enables or disables the iLO configuration options in the UEFI System Utilities

- When this setting is enabled (default), the iLO configuration options are available when you access the UEFI System Utilities.

- When this setting is disabled, the iLO configuration options are not available when you access the UEFI System Utilities.

This setting cannot be enabled if option ROM prompting is disabled in the System BIOS.

Virtual NIC

Determines whether you can use a virtual NIC over the USB subsystem to access iLO from the host operating system.

- When this setting is enabled, you can:
  - Initiate iLO RESTful API commands from the RESTful Interface Tool or another client running in the host OS.
  - Connect to iLO with an SSH client running in the host OS.
  - Access the iLO web interface through a supported browser running in the host OS.
- When this setting is disabled, you cannot access iLO through the virtual NIC.

  The factory default Virtual NIC setting is disabled in most versions of iLO. In iLO 7, this setting is enabled by default. When you reset iLO to the factory default settings, the Virtual NIC setting returns to the default setting for the installed version of iLO. Firmware upgrades or downgrades do not change this setting.

Disabling the iLO functionality

Prerequisites

Configure iLO Settings privilege

About this task

The iLO Functionality setting controls whether iLO functionality is available.

- When this setting is enabled (default), the iLO network is available and communications with operating system drivers are active.
- When this setting is disabled, the iLO network and communications with operating system drivers are terminated.

  iLO functionality cannot be disabled on ProLiant server blades or Synergy compute modules.

Use this procedure to change the iLO Functionality setting. To update other iLO access settings, see Configuring iLO access settings.

Procedure

1. Click Security in the navigation tree.

   The Access Settings page is displayed.
2. Click  next to the iLO section.

   The Edit iLO Settings page opens.
3. Click Show Advanced Settings.
4. Click Disable in the iLO Functionality section.

   iLO prompts you to confirm the request.
5. Select the Confirm disabling of iLO Functionality check box.
6. Click Yes, disable iLO functionality.

> **CAUTION**
>
> If you click this button, iLO will be inaccessible through any interface. You can use the UEFI System Utilities to restore iLO functionality.

iLO ends your session and you cannot connect through any iLO interface until you enable the iLO Functionality setting again.

7. (Optional) To re-enable the iLO Functionality, use the UEFI System Utilities.

   Hewlett Packard Enterprise recommends using the UEFI System Utilities to perform this task.

Subtopics

Methods for enabling iLO Functionality

Methods for enabling iLO Functionality

When the iLO Functionality is disabled, you cannot re-enable it through the iLO web interface. You can use the UEFI System Utilities to re-enable the iLO Functionality.

UEFI System Utilities

Hewlett Packard Enterprise recommends using the UEFI System Utilities to re-enable iLO Functionality.

For more information, see the UEFI System Utilities documentation.

iLO login with an SSH client

When you log in to iLO with an SSH client, the number of displayed login prompts matches the value of the Authentication Failure Logging option (3 if it is disabled). Your SSH client configuration might affect the number of prompts, because SSH clients also implement delays after a login failure.

For example, to generate an SSH authentication failure log with the default value (Enabled-Every 3rd Failure), if the SSH client is configured with the number of password prompts set to three, three consecutive login failures occur as follows:

1. Run the SSH client and log in with an incorrect login name and password.

   You receive three password prompts. After the third incorrect password, the connection ends and the first login failure is recorded. The SSH login failure counter is set to 1.

2. Run the SSH client and log in with an incorrect login name and password.

   You receive three password prompts. After the third incorrect password, the connection ends and the second login failure is recorded. The SSH login failure counter is set to 2.

3. Run the SSH client and log in with an incorrect login name and password.

   You receive three password prompts. After the third incorrect password, the connection ends and the third login failure is recorded. The SSH login failure counter is set to 3.

The iLO firmware records an SSH failed login log entry, and sets the SSH login failure counter to 0.

Configuring Time settings

Procedure

1. Click iLO Settings in the left navigation pane and click Time.

   Alternatively, you can click iLO Date/Time link in the Dashboard page to navigate to the Time page.

   The Time page appears.

NOTE

If SNTP is not configured, then by default, the source of time is set to Local. if SNTP is configured, Source of time is set to Network.

2. Click on the Overview section.

   The Overview window appears.

3. Select a value for Source of Time
4. If you select Local for Source of Time, then follow the below steps to set the time:
   a. Click the in the Date box.

      A calendar is displayed.

   b. Select the date.
   c. Select the time in the iLO Time box.
   d. Select the required time zone from the Time Zone drop-down.
   e. Click Update to save the changes.
5. If you select Network for Source of Time, then follow the below steps to set the time:

   NOTE

   To enable the network time, configure a time server or use one of the DHCP options.

   a. To use DHCP-provided NTP server addresses:
      - Enable Use DHCPv4 Supplied Time Settings, Use DHCPv6 Supplied Time Settings, or both.

        or

      - Enter NTP server addresses in the Primary Time Server and Secondary Time Server box.

   b. iLO timezone information is not fetched automatically from the DHCP server. Select the timezone manually from the Time Zone list.
   c. If you selected only Use DHCPv6 Supplied Time Settings, or if you entered a primary and secondary time server, select the server time zone from the Time Zone list.
   d. Configure the NTP time propagation setting.

      On nonblade servers, this setting is called Propagate NTP Time to Host.

   e. Click Update to save the changes.

   When you are finished configuring the iLO Date/Time, iLO notifies you that an iLO reset is required for one or more pending changes to take effect.

   It might take several minutes before you can re-establish a connection.

6. Click Cancel to cancel the operation.
7. Click to close the Overview window.

Subtopics

Time settings options

Time settings options

Source of Time

Shows the source of time, either Network or Local.

iLO Time

Shows the iLO time set.

Time Display Via User Preference

Shows the time zone preferences set as per the Preferences.

Time Zone

Determines how iLO adjusts UTC time to obtain the local time, and how it adjusts for Daylight Savings Time (Summer Time). In order for the entries in the iLO logs to display the correct local time, you must specify the server location time zone, and select Show Local Time in the log display filters.

If you want iLO to use the time the SNTP server provides, without adjustment, select a time zone that does not apply an adjustment to UTC time. In addition, that time zone must not apply a Daylight Savings Time (Summer Time) adjustment. There are several time zones that fit this requirement. One example that you can select in iLO is Greenwich (GMT). If you select this time zone, the iLO web interface pages and log entries display the exact time provided by the SNTP server.

NOTE

Configure the NTP servers to use Coordinated Universal Time (UTC).

Use DHCPv4 Supplied Time Settings

Configures iLO to use a DHCPv4-provided NTP server address.

This option is enabled by default.

Use DHCPv6 Supplied Time Settings

Configures iLO to use a DHCPv6-provided NTP server address.

This option is enabled by default.

NTP time propagation setting

The name of this setting differs depending on the server type.

- Propagate NTP Time to Host —Determines whether the server time is synchronized with the iLO time during the first POST after AC power is applied or iLO is reset to default settings.

  For all servers the setting will be effective only when #PRODABR# is able to obtain time from an NTP time source.

  NTP time source can be HPE OneView for Synergy servers.

- Propagate NTP —Determines whether the server time is synchronized with the iLO time during the first POST after AC power is applied or iLO is reset to the default settings.

This option is disabled by default.

NOTE

- When BIOS Time Format is set to UTC, then along with the server time, the server time zone setting is also synchronized with the iLO time zone setting.
- During the first POST after AC power is applied, if iLO is not able to obtain time from the configured NTP server, then iLO synchronizes its time and time zone with the time and time zone configured in the BIOS.

Primary Time Server

Configures iLO to use a primary time server with the specified address. You can enter the server address by using the server FQDN, IPv4 address, or IPv6 address.

Secondary Time Server

Configures iLO to use a secondary time server with the specified address. You can enter the server address by using the server FQDN,

IPv4 address, or IPv6 address.

iLO Service Port

The Service Port is a USB port with the label **iLO** on the front of the server.

To find out if your server supports this feature, see the server specifications document at the following website: **https://www.hpe.com/info/quickspecs**.

When you have physical access to a server, you can use the Service Port to do the following:

- Download the Active Health System Log to a supported USB flash drive.

  When you use this feature, the connected USB flash drive is not accessible by the host OS.

- Connect a host system (Windows/MAC/Linux laptops or desktops) using either a standard USB Type A to Type C cable or USB Type C to Type C cable to access the following:
  - iLO web interface
  - Remote console
  - iLO RESTful API
  - CLI

  NOTE

  Connecting host system with server OS to service port is not supported.

When you use the iLO Service Port:

- Actions are logged in the iLO event log.
- The server UID flashes to indicate the Service Port status.

  You can also retrieve the Service Port status by using a REST client and the iLO RESTful API.

- You cannot use the Service Port to boot any device within the server, or the server itself.
- You cannot access the server by connecting to the Service Port.
- You cannot access the connected device from the server.

Subtopics

Unsupported USB ports

- USB Type C to USB Type A adapter is not supported.
- USB Type C to RJ45 adapter is not supported.

Downloading the Active Health System Log through the iLO Service Port

Prerequisites

The iLO Service Port and USB flash drives options are enabled on the iLO Service Port page.

Procedure

1. Create a text file named `command.txt` with the required content for downloading the Active Health System Log.
2. Save the file to the root directory of a supported USB flash drive.
3. Connect the USB flash drive to the iLO Service Port (the USB port labeled **iLO**, on the front of the server).

   The file system is mounted and the `command.txt` file is read and executed.

   The iLO Service Port status changes to Busy, and the UID flashes at a rate of four medium flashes then off for one second.

   If the command is successful, the iLO Service Port status changes to Complete, and the UID flashes at a rate of one fast flash then off for three seconds.

   If the command is not successful, the iLO Service Port status changes to Error, and the UID flashes at a rate of eight fast flashes then off for one second.

   The file system is unmounted.
4. Remove the USB flash drive.

   The iLO Service Port status changes to Ready. The UID stops flashing or flashes to indicate another state such as remote console access or a firmware update in progress.

Subtopics

Connecting a client to iLO through the iLO Service Port

Connecting a client to iLO through the iLO Service Port

Prerequisites

- The iLO Service Port and USB options are enabled on the iLO Service Port page.
- The client NIC is configured to support the Service Port feature.
- You have physical access to the server.

Procedure

1. Use supported USB Type A to Type C or Type C to Type C cables to connect a client to the Service Port. The maximum supported length of the USB cable is 1M.

   The client NIC is assigned a link-local address. This process might take several seconds.
2. Connect to iLO by using the following IPv4 address:
   `169.254.1.2`
   .

   The same IP address is used when you connect a client to any server through the Service Port. You cannot change this address.

   The Service Port status changes to Busy, and the UID flashes at a rate of four medium flashes then off for one second.

3. When you are finished, disconnect the client from the Service Port.

   The Service Port status changes to Ready. The UID stops flashing or flashes to indicate a state such as remote console access or a firmware update in progress.

Subtopics

Driver selection in Windows 10

Prerequisites

- The iLO Service Port and USB options are enabled on the iLO Service Port page.
- The client NIC is configured to support the Service Port feature.
- You have physical access to the server.

About this task

If you are using Windows 10 host to access iLO network, then follow the below procedure for each server. This is a one time configuration.

Procedure

1. Open Device Manager .
2. Navigate to Other devices.
3. Select CDC NCM.
4. From the right click menu, select Update driver.

   The Update driver window opens.
5. Click Browse my computer for drivers and select Let me pick from a list of available drivers on my computer .
6. Select Network adapters.

   Select the device driver you want to install for this hardware window appears.
7. Select Microsoft in the Manufacturer list.
8. Select UsbNcm Host Device in the Model list.

   A confirmation window appears. Click Yes to confirm. The settings are saved and Windows notifies that the driver is updated.

Configuring the iLO Service Port settings

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane

   The iLO Service Port page appears.
2. Click  next to iLO Service Port section.

iLO Service Port window appears.

3. Configure the following settings:
   - iLO Service Port
   - Mass Storage - USB Flash Drives
   - Mass Storage Require Authentication
   - Network - USB Ethernet Adapters
4. Click Update.

   The updated settings take effect immediately, and information about the configuration change is logged in the iLO event log.

Subtopics

iLO Service Port options

iLO Service Port options

- iLO Service Port—Allows you to enable or disable the iLO Service Port. The default setting is enabled. When this feature is disabled, you cannot configure the features in the Mass Storage Options or Networking Options sections on this page.

  Do not disable the iLO Service Port when it is in use. If you disable the port when data is being copied, the data might be corrupted.
- Mass Storage - USB Flash Drives—Allows you to connect a USB flash drive to the iLO Service Port to download the Active Health System Log. The default setting is enabled.

  Do not disable this setting when the iLO Service Port is in use. If you disable USB flash drives when data is being copied, the data might be corrupted.

  If you insert a USB flash drive in the iLO Service Port when this setting is disabled, the device is ignored.
- Mass Storage Require Authentication—Requires you to enter iLO user credentials in the `command.txt` file when you use the iLO Service Port to download the Active Health System Log. The default setting is disabled.
- Network - USB Ethernet Adapters—Allows you to use a USB cable to connect a laptop to the iLO Service Port to access the Integrated remote console. The default setting is enabled.

  If you connect a laptop when this setting is disabled, the device is ignored.

Configuring a client to connect through the iLO Service Port

Procedure

1. Configure the client NIC to obtain an IPv4 autoconfiguration address automatically.

   For more information, see your operating system documentation.
2. Do one of the following:
   - Add a proxy exception. Use one of the following formats:
     - Edge, Chrome: `169.254.*`
     - Firefox: `169.254.0.0/16`
   - Disable web proxy settings on the client.

For more information about proxy settings, see your operating system documentation.

iLO Service Port supported devices

Mass storage devices

The iLO Service Port supports USB keys with the following characteristics:

- High-speed USB 2.0 compatibility.
- FAT32/exFAT format, preferably with 512 byte blocks.
- One LUN.
- One partition with a maximum size of 127 GB and sufficient free space for the Active Health System Log download.
- Valid FAT32 partition table.

  If the USB key fails to mount, it probably has an invalid partition table. Use a utility such as Microsoft DiskPart to delete and recreate the partition.
- Not read-protected.
- Not bootable.

Mass storage devices are not supported on servers that do not include a NAND.

Sample text file for Active Health System Log download throughiLO Service Port

When you use the iLO Service Port to download the Active Health System Log, you create a text file called `command.txt` and save the file to a supported USB device. When you connect the USB device to a server, the `command.txt` file runs and downloads the log file.

File template for command.txt file

Use the following example as a template for your `command.txt` file:

```
{
 "/ahsdata/" : {
  "POST" : {
   "downloadAll"  : "0",
   "from"         : "2016-08-25",
   "to"           : "2016-08-26",
   "case_no"      : "ABC0123XYZ",
   "contact_name" : "My Name",
   "company"      : "My Company, Inc.",
   "phone"        : "281-555-1234",
   "email"        : "my.name@mycompany.com",
   "UserName"     : "my_username",
   "Password"     : "my_password"
  }
 }
}
```

Parameters for command.txt file

You can customize the following values:

- `downloadAll` —Controls the download scope. To download the log for a range of dates, enter

`0`. To download the entire log, enter `1`.

- `from` —The start date when you download the log for a range of dates.
- `to` —The end date when you download the log for a range of dates.
- `case_no` (optional)—The case number for an open HPE support case. This value can be up to 14 characters long. If you enter this value, it is included in the downloaded file.
- `contact_name` (optional)—The contact person for this server. If you enter this value, it is included in the downloaded file. This value can be up to 255 characters long.
- `company` (optional)—The company that owns this server. If you enter this value, it is included in the downloaded file. This value can be up to 255 characters long.
- `phone` (optional)—The phone number of a contact person for this server. If you enter this value, it is included in the downloaded file. This value can be up to 39 characters long.
- `email` (optional)—The email address of a contact person for this server. If you enter this value, it is included in the downloaded file. This value can be up to 255 characters long.
- `UserName` —If iLO is configured to require authentication for iLO Service Port actions on mass storage devices, enter your iLO account user name.
- `Password` —If iLO is configured to require authentication for iLO Service Port actions on mass storage devices, enter the password for the user name you entered.

File requirements for command.txt file

- The file must be in valid JSON format.

  Hewlett Packard Enterprise recommends using an online JSON formatter to verify the file syntax. A free utility is available at the following website: **https://www.freeformatter.com/json-formatter.html**.
- Do not include comments in the file.
- The text in the file is case-sensitive.
- The file supports plain text only. Do not create the file with an application that embeds additional formatting properties.

Managing SSH keys

About this task

Subtopics

Authorizing a new SSH key by using the web interface

Prerequisites

Administer User Accounts privilege

Procedure

1. Generate either a 2,048-bit, 3072 bit, or 4,096 bit RSA key by using `ssh-keygen`, `puttygen.exe`, or another SSH key utility.

   NOTE

   - In CNSA mode, the minimum key length allowed for RSA is 3072 bits.
   - In FIPS and Secure Standard mode, the minimum key length allowed is 2048 bits.
   - The maximum key length allowed in all the security modes is 4096 bits.
   - The key length for ECDSA in all the security modes is 384 bits.
   - SSH-ed25519 is supported only in Secure Standard mode.

2. Save the public key as `key.pub`.
3. Copy the contents of the `key.pub` file.
4. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.
5. Click Users.

   Users page appears
6. Select the check box to the left of the user account to which you want to add an SSH key.

   Each user account can have only one key assigned.
7. Click Authorize New SSH Key from the Actions drop down list.
8. Paste the PEM encoded public key to the Public key box.
9. Click Import .

   The The SSH Host Key section in the Users page shows the SSH public key associated with the user account.
10. Click Cancel to cancel the operation.
11. Click ✕ to close the window.

Deleting SSH keys

Prerequisites

Administer User Accounts privilege

About this task

Use the following procedure to delete SSH keys from one or more user accounts.

When an SSH key is deleted from iLO, an SSH client cannot authenticate to iLO by using the corresponding private key.

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.

2. Click Users

   Users page appears.
   The Local Users section displays the user accounts with SSH key configured.

3. Select the check box next to the user account for which the SSH key needs to be removed.

4. Select Delete SSH Key from the Actions. drop down list.

   iLO prompts you to confirm the request.

5. Click Yes, delete.

   The selected SSH keys are removed from iLO.

Viewing the SSH host key

About this task

Use the following procedure to view the SSH host key reported by iLO.

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears. The SSH Host Key is displayed on the page.

2. Click Copy Key to Clipboard.

   The SSH Key is copied.

3. (Optional) Add the hostname/IP address and the SSH host key to the SSH client configuration file.

   For example:

   - For OpenSSH users on Linux: Update the `.ssh/known_hosts` file.
   - For PuTTY users on Windows: Update the Windows registry (`HKEY_CURRENT_USER\SoftWare\SimonTatham\PuTTY\SshHostKeys`).

4. (Optional) To verify that your connection is secure, compare the SSH Host Key value to the value reported by your SSH client.

   For example:

```
Linux-client:~ # grep ilo.example.com .ssh/known_hosts
ilo.example.com,[redacted] ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQC9E/XDH9xPU+NdMyTu5Oylw9AN6mJlH7woMqcf791da6DeS1D+vX1I
Wg3GwDKFUobabQ+gZtkBrxWFzwAf51CPitsybQCK2hvLztsypb/W3p+MPZ9zU6/voCHzL2v0bAxeXuX8ack/8RA
w011agB5xY6B3pjP/qaeFJb29sGqPwoaXps6g5t/YFhxIQ8is8N+LnfuTzMtQDj74rfq6pcXGnXq+ErmbkcfHn
AdSMveT6rXPM1U+Je1B9VOVS23fUL7mfoshLnSHrJJtP7XkZ1rKf1QPKCChWLfpdmTprsaJrxDrwCNxX4+pPh
UXqHYLTlvPA8xsqaPxPZfHxZWTZrCp
```

5. If the keys do not match, make sure that you understand why before you continue.

   Some possible reasons include:

   - The iLO system you viewed in step 1 is not the same system that you connected to with the SSH client.
   - The SSH connection is being redirected. Ask an administrator if your network is configured to redirect the connection. If the network is not configured to redirect the connection, the network security might be compromised.

- The iLO SSH host key on the system you want to access changed because iLO was reset to the factory default settings. You did not change your SSH client configuration.

Viewing authorized SSH keys

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.

2. Click Users

   Users page appears.
   The Authorized SSH Keys table displays the hash of the SSH public key associated with each user account.

SSH keys

When you add an SSH key to iLO, the iLO firmware associates the key with a local user account.

Supported SSH key formats

- RFC 4716
- OpenSSH key format
- iLO legacy format

For examples of these formats, see the iLO user guide.

Working with SSH keys

- The supported SSH key formats are supported with the iLO web interface and the CLI.
- Any SSH connection authenticated through the corresponding private key is authenticated as the owner of the key and has the same privileges.
- The iLO firmware can import SSH keys with a maximum length of 1,366 bytes. If the key length exceeds 1,366 bytes, the authorization might fail. If a failure occurs, use the SSH client software to generate a shorter key.
- If you use the iLO web interface to enter the public key, you select the user associated with the public key.
- If you use the iLO RESTful API to enter the public key, the user name is provided with the public key in the POST body.
- If you use the CLI to enter the public key, the public key is linked to the user name that you entered to log in to iLO.
- If a user is removed after an SSH key is authorized for that user, the SSH key is removed.

Supported SSH key format examples

RFC 4716

```
---- BEGIN SSH2 PUBLIC KEY ----
Comment: "rsa-key-20250307"
```

```
AAAAB3NzaC1yc2EAAAADAQABAAABAQCMobxxIAk0i313m4/U69BxRwSrSPZBy545
ArQBMYw+VI0kKFH9XgMwC5TN6RL+b6T1c6bg+YuUrruqgk06Q6GJy7mvfOobcsGb
9ABvjoekIKnidRZj6uE4zPtPwkK1tQtNhkdMOPuPDdLbz7PIQAAVkOX9zsZShp21
8Q/5cN+AyvItZNgbnkeSklJh8VdGaqFbHx25W4qHpYI4C52YFMt+dhkjeUGiS6LQ
NmQSuDqPGwI5fbO/Dt/Ei9dJrBtkarI1CUlmjwM+0f3MiPWyyGYMyVrG2cqq7JMP
KY9aIsiU0cpicYmn+FlOh3Rh06pybaF6nIs/v5qXc6ws4d5a0yeB
---- END SSH2 PUBLIC KEY ----
```

OpenSSH key format

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCMobxxIAk0i313m4/U69BxRwSrSPZBy545ArQBMYw+VI0
kKFH9XgMwC5TN6RL+b6T1c6bg+YuUrruqgk06Q6GJy7mvfOobcsGb9ABvjoekIKnidRZj6uE4zP
tPwkK1tQtNhkdMOPuPDdLbz7PIQAAVkOX9zsZShp218Q/5cN+AyvItZNgbnkeSklJh8VdGaqFbH
x25W4qHpYI4C52YFMt+dhkjeUGiS6LQNmQSuDqPGwI5fbO/Dt/Ei9dJrBtkarI1CUlmjwM+0f3M
iPWyyGYMyVrG2cqq7JMPKY9aIsiU0cpicYmn+FlOh3Rh06pybaF6nIs/v5qXc6ws4d5a0yeB
rsa-key-20250307
```

CAC Smartcard Authentication

A common access card (CAC) is a United States Department of Defense (DoD) smartcard for multifactor authentication. Common access cards are issued as standard identification for active-duty military personnel, reserve personnel, civilian employees, non-DoD government employees, state employees of the National Guard, and eligible contractor personnel. In addition to its use as an ID card, a common access card is required for access to government buildings and computer networks.

Each CAC carries a smartcard certificate that must be associated with your local user account in the iLO web interface. Upload and associate your smartcard certificate with your account by using the controls on the User Management > Users page.

CAC authentication with LDAP directory support uses a service account to authenticate to the directory service, and the user account must be present in the same domain as the configured directory server. Additionally, the user account must be a direct member of the configured groups or extended schema Roles. Cross-domain authentication and nested groups are not supported.

CAC authentication with LDAP directory support uses a service account to authenticate to the directory service, and the user account must be present in the same domain as the configured directory server. Additionally, the user account must be a direct member of the configured groups. Cross-domain authentication and nested groups are not supported.

Two-factor authentication

Part of the requirement necessary to satisfy Federal Government Certification is two-factor authentication. Two-factor authentication is the dual authentication of the CAC. For example, the CAC satisfies two-factor authentication by mandating that you have the physical card and you know the PIN number associated with the card. To support CAC authentication, your smartcard must be configured to require a PIN.

Subtopics

Configuring CAC Smart Card authentication settings
Managing trusted certificates for CAC Smartcard Authentication

Configuring CAC Smart Card authentication settings

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: https://www.hpe.com/support/ilo-docs
- (Optional) The LDAP server CA certificates for directory integration are installed.
- (Optional) LDAP directory integration in directory default schema mode is configured.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click CAC/Smartcard

   The CAC/Smartcard page appears.

3. Import a trusted CA certificate.

   This certificate is used to validate certificates that are presented to iLO. The certificate must be compliant with the configured iLO security state.

4. Configure the following in the Settings under CAC/Smartcard page.

   a. Enable CAC Smartcard Authentication.

   b. (Optional) Enable CAC Strict Mode.

5. (Optional) For additional security when CAC Strict Mode is enabled, Hewlett Packard Enterprise recommends enabling the following:

   - FIPS security state—You can configure this setting on the Encryption and Security page.

6. (Optional) If you are using directory integration, select an option in the Directory User Certificate Name Mapping section.

   This setting identifies which portion of your user certificate will be used to identify your directory user account.

7. Click Update to save the changes in CAC/Smartcard > Settings page .

   If you enabled CAC Strict Mode, iLO prompts you to confirm the request, which requires an iLO reset.

   If you did not enable CAC Strict Mode, iLO notifies you that the changes were saved.

8. If iLO prompted you to confirm the changes and initiate a reset, click Yes, apply and reset.

9. (Optional) Import a Certificate Revocation List (CRL).

10. (Optional) To check user certificates using the Online Certificate Status Protocol (OCSP), enter an HTTPS URL for the OSCP URL field under CAC/Smartcard > Settingsand click Update.

11. Upload and map smart card certificates to local iLO user accounts (when using iLO with local user authentication only).

Subtopics

CAC smart card authentication settings

CAC Smartcard Authentication

Enables and disables authentication through a common access smart card.

CAC Strict Mode

Enables or disables CAC Strict Mode, which requires a client certificate for every connection to iLO. When this mode is enabled, iLO will not accept user names or passwords, and only key-based authentication methods are allowed.

NOTE

If you do not have a trusted certificate, you cannot access iLO. Attempts to browse to the iLO web interface will generate an error.

Directory User Certificate Name Mapping

The For Directory Username setting allows you to select the portion of the user certificate to use as your directory user name:

- Use Certificate SAN UPN—Uses the first subject alternative name (SAN) field of type userPrincipalName (UPN), which contains the user and domain names in an email address format, as the user name. For example, `upn:testuser@domain.com` produces `testuser@domain.com`.
- Use Certificate Subject CN—Uses only the CN or CommonName portion of the subject as the user name. For example, in the following DN: `cn=test user, ou=users,dc=domain,dc=com` the common name is `test user`.
- Use Full Certificate Subject DN—Uses the complete distinguished name as the user name when searching for the user in the directory service. For example, a distinguished name appears as follows: `cn=test user, ou=users,dc=domain,dc=com`.
- Use Certificate SAN RFC822 Name—Uses the first SAN field of type rfc822Name, which contains an email address as the username. For example, `rfc822Name:testuser@domain.com` produces `testuser@domain.com` as the username.

OCSP URL

Use this feature to check user certificates by using the Online Certificate Status Protocol (OCSP).

HTTPS URLs are accepted.

A response of `Unknown` or `Revoked` causes authentication to fail.

Authorizing a new local user certificate

Prerequisites

- Administer User Accounts privilege
- You have a smart card or other common access card (CAC) with an embedded certificate.

  The certificate must be compliant with the configured iLO security state.
- CAC Smartcard Authentication is enabled on the Settings section in the CAC/Smartcard page.
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.
2. Click Users.

   The Users page appears and the local user accounts details are displayed on the Local Users table.
3. Select a user account by clicking the check box next to the Login Name.
4. Click ActionsImport CAC/Smart Card Certificate.

   The Import CAC/Smart Card Certificate window appears.
5. Paste the certificate for the selected user account in PEM encoded Base64 format in the Certificate box.

6. Click Import to import the certificate.
7. Click Cancel to cancel the operation.
8. Click ✕ to close the Import CAC/Smart Card Certificate window.

Deleting local user certificates

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- One or more local user accounts with associated certificates exist on the system.

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.
2. Click Users.

   The Users page appears and the local user accounts details are displayed on the Local Users table.
3. Select a user account by clicking the check box next to the Login Name.
4. Click ActionsDelete CAC/Smart Card Certificate.

   A confirmation window appears.
5. Click yes, delete to confirm the deletion.

   The certificate is removed and the system displays the message `Certificate(s) deleted`.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the Delete CAC/Smart Card Certificate(s) window.

Viewing authorized certificates

Procedure

1. Click iLO Settings in the left navigation pane and click User Management.

   The User Management page appears.
2. Click Users.

   The Users page appears and the Local Userstable displays the certificate thumbprint associated with each user account.
   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.

Managing trusted certificates for CAC Smartcard Authentication

Subtopics

Importing a trusted CA certificate

Prerequisites

- Configure iLO Setting privilege
- You obtained a trusted CA certificate.
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**
- The certificate must be in PEM encoded Base64 format.
- iLO supports upto 3 CAC CA certificates and the maximum supported size is 6 KB in DER format and 8 KB in PEM format.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click CAC/Smartcard

   The CAC/Smartcard page appears.

3. Click Import.

   The Import Trusted CA Certificates window appears.

4. Paste a trusted CA certificate in the Certificate text box.
5. Click Import.

   If the operation does not appear to have worked, scroll to the top of the page to see if any error messages displayed.

6. Click Cancel to cancel the operation.
7. Click ✕ to close the Import Trusted CA Certificates window.

Deleting a trusted CA certificate

Prerequisites

- Configure iLO Setting privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click CAC/Smartcard

The CAC/Smartcard page appears.

3. Scroll to the Manage Trusted CA Certificates section.
4. Select the check box next to the certificate to be deleted.
5. Click .

   A confirmation window appears and iLO prompts you to confirm the request.
6. Click Yes, delete.

   The certificate is deleted.

   If the operation does not appear to have worked, look for error messages at the top of the page.
7. Click Cancel to cancel the operation.
8. Click to close the confirmation window.

Importing a certificate revocation list (CRL) from a URL

Prerequisites

- Configure iLO Settings privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.

About this task

To invalidate previously issued certificates that have been revoked, import a CRL.

Procedure

1. Click Security in the navigation pane and click Authentication.

   The Authentication page appears.
2. Click CAC/Smartcard.

   The CAC/Smartcard page appears.
3. Click Import on the Certificate Revocation List (CRL) section.

   The Import CRL window appears.
4. Type or paste the HTTPS URL in the Import CRL box.

   The CRL size limit is 100 KB and the CRL must be in DER format.
5. Click Import.

   The CRL changes will be applied to future CAC login sessions.

   To enforce the CRL changes on existing CAC login sessions, do one of the following:

   - Reset iLO.
   - Identify the CAC sessions in the active session list, and then disconnect them.

   The CRL description and serial number are displayed in the Certificate Revocation List (CRL) section.

Deleting a certificate revocation list

Prerequisites

- Configure iLO Setting privilege
- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: https://www.hpe.com/support/ilo-docs

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click CAC/Smartcard

   The CAC/Smartcard page appears.

3. Scroll to the Certificate Revocation List (CRL) section.

4. Click Delete.

   iLO prompts you to confirm the request.

5. Click Yes, delete.

Administering TLS certificates

The TLS protocol is a standard for encrypting data so that it cannot be viewed or modified while in transit on the network. A TLS certificate is a small computer file that digitally combines a cryptographic key (the server public key) with the server name. Only the server itself has the corresponding private key, allowing for authenticated two-way communication between a user and the server.

A certificate must be signed to be valid. If it is signed by a Certificate Authority (CA), and that CA is trusted, all certificates signed by the CA are also trusted. A self-signed certificate is one in which the owner of the certificate acts as its own CA.

By default, iLO creates a self-signed certificate for use in TLS connections. This certificate enables iLO to work without additional configuration steps.

IMPORTANT

Using a self-signed certificate is less secure than importing a trusted certificate. Hewlett Packard Enterprise recommends importing a trusted certificate to protect the iLO user account credentials.

Certificates are included when you use the iLO backup and restore feature.

Subtopics

Viewing TLS certificate details

Viewing TLS certificate details

Procedure

Click Security in the left navigation pane and click TLS Certificate.

The TLS Certificate page appears.
You can view the current Certificate Enrollment Strategy and Certificate Type in the Overview section.

The TLS Certificate Server section displays the current TLS server configuration. For more information about TLS server configuration, see Enabling automatic certificate enrollment section.

Subtopics

TLS certificate details

- Issued To—The entity to which the certificate was issued.

  When you view the iLO self-signed certificate, this value displays information related to the Hewlett Packard Enterprise Houston office.

- Issued By—The CA that issued the certificate.

  When you view the iLO self-signed certificate, this value displays information related to the Hewlett Packard Enterprise Houston office.

- Valid From—The first date that the certificate is valid.
- Valid Until—The date that the certificate expires.
- Serial Number—The serial number assigned to the certificate. This value is generated by iLO for the self-signed certificate, and by the CA for a trusted certificate.

Trusted TLS certificate

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.

2. Click Configure Certificate.

   The Configure Certificate page appears.

3. Select one of the following options:

   - Manage TLS Certificate Automatically —Use this option to import a Trusted TLS Certificate that can be managed automatically.
   - Import an TLS Certificate & Private Key —Use this option to manually import a Trusted TLS Certificate and corresponding Private Key.
   - Generate CSR & Import TLS Certificate —Use this option to create a Certificate Signing Request (CSR) that you can send to a Certificate Authority (CA) to obtain a trusted TLS certificate to import into iLO.

     For more information on generating CSR and importing TLS Certificate, see Generate CSR and Import a TLS Certificate .

Removing a TLS certificate

Prerequisites

Configure iLO Settings privilege

About this task

Use this feature to remove a TLS certificate and regenerate the iLO self-signed certificate.

You might want to remove a certificate for the following reasons:

- The certificate expired.
- The certificate contains invalid information.
- There are security concerns related to the certificate.
- An experienced support organization recommended that you remove the certificate.

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.
2. Click  on the Certificate Information section.

   A confirmation window appears.

   iLO prompts you to confirm that you want to delete the existing certificate, reset iLO, and generate a new self-signed certificate.
3. Click Yes, Remove and Reset.

   iLO removes the TLS certificate, resets, and then generates a new self-signed certificate.

   It might take several minutes for iLO to generate the new certificate.
4. Recommended: Obtain and import a trusted certificate.

   Hewlett Packard Enterprise recommends importing a trusted certificate.
5. Click Cancel to cancel the operation.
6. Click  to close the window.

Automatic certificate enrollment

HPE iLO 7 now supports obtaining and renewing TLS certificate automatically using the Automatic Certificate Management Environment (ACME) protocol. iLO supports automated certificate enrollment and renewal via ACMEv2-compliant (RFC 8555) Certificate Authorities.

ACME server can validate iLO's domain only by `http-01` challenge. Since only `http-01` challenge is supported, wildcard certificates cannot be obtained.

By default the feature is disabled. For more information on enabling the feature, see Enabling automatic certificate enrollment section.

Enabling automatic certificate enrollment

Prerequisites

- Configure iLO Settings privilege.
- iLO Advanced License. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.
- Ensure that the Date and Time of iLO is set correctly.
- Configure DNS server.
- Configure Web proxy, if iLO server needs proxy to access ACME server.
- iLO must be accessible using the Common Name (iLO FQDN) configured in the CSR via port 80 from certificate enrollment server for

ACME challenge verification.

- URL of the certificate enrollment server.
- Root CA certificate of the certificate enrollment server.
- (Optional) ACME External Account Binding (EAB) credentials. ACME protocol defines an EAB field that iLO can use to access a specific account on the certificate authority (CA). If your ACME server enforces EAB, obtain EAB Key ID and Key Value from the CA operating the ACME server. iLO requires these credentials when requesting certificate from ACME server.
- Since iLO uses HS384 for signing in all security modes, ensure that ACME server configuration also uses the HS384 as signature verification algorithm for EAB request.

About this task

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.

2. Click Configure Certificate.

   The TLS Certificate page appears.

3. Select Manage TLS certificate automatically.
4. Enter the following values for ACME Certificate Enrollment Settings:

   NOTE

   iLO supports storing up to 10 ACME CA certificates. For more information on how to remove an ACME CA certificates, see the **Redfish API** documentation.

   - Server URL—The URL of the ACME certificate enrollment server.
   - ACME Server Account Contact Information—(Optional) The email id of the server administrator.
   - EAB ID—(Optional) The ASCII string to identify your account key.
   - EAB Value—(Optional) The MAC key used to encrypt and authenticate your account key.
   - CA Certificate— The CA certificate of the Certificate Enrollment server. CA certificate is used to establish the trust between iLO and Certificate Enrollment Server.

5. Enter the following values for Certificate Signing Request Details:

   - Country (C)—The two-character country/region code that identifies the country/region where the company or organization that owns this iLO subsystem is located. Enter the two-letter abbreviation in capital letters.
   - State (ST)—The state where the company or organization that owns this iLO subsystem is located.
   - City or Locality (L)—The city or locality where the company or organization that owns this iLO subsystem is located.
   - Organization Name (O)—The name of the company or organization that owns this iLO subsystem.
   - Organizational Unit (OU)—(Optional) The unit within the company or organization that owns this iLO subsystem.
   - Common Name (CN)—The FQDN of this iLO subsystem.

     The FQDN is entered automatically in the Common Name (CN) box.

     To enable iLO to enter the FQDN in the CSR, configure the Domain Name on the Network General Settings page.

CAUTION

In case ACME server is not able to resolve iLO's FQDN present in the Common Name of the CSR or not accessible through Port 80, then the ACME server cannot perform challenge verification. In this case, iLO will time out after 40 minutes.

- Renewal Window (1 - 30) days — (Optional) Specifies how many days before a TLS certificate's expiration iLO will automatically attempt renewal. The default value is 7 days. The valid range is 1-30 days before expiration.
- Subject Alternative Name—(Optional) Additional domain names (use comma to separate the domain names). If additional domains are not specified, the Common Name is included in the Subject Alternative Name field by default.

NOTE

- With ACME, CSRs with Subject Alternative Name entries are limited to hostname and FQDN are supported.
- iLO supports import of CA certificate (in PEM format) that are up to 6 KB in size.
- iLO supports CA certificates of the following types:
  - **Secure Standard and FIPS**— RSA public key length 2048 bits and above or ECDSA curves P-256, P-384, or P-521.
  - **CNSA**—RSA public key length 3072 and above or ECDSA curves P-384 only.
- CSR fields are not common for both manual import and automatic import of TLS certificate.

6. If you are initiating the automatic certificate enrollment for the first time, click Configure to initiate the enrollment process.

   If automatic certificate enrollment is present but disabled, then click Enable to enable it.

   As soon as the certificate enrollment service is enabled, the certificate enrollment status will be In-progress.

   Certificate enrollment status will be Success when the enrollment is successful. You must reset iLO manually after successful enrollment. The newly trusted certificate will be in use only after iLO reset.

   Certificate enrollment status will be Failed when the enrollment failed. For more information on the cause of failure and recommended actions, see the Security Logs page.

   NOTE

   If Enrollment Service is enabled, manually generating the CSR, removing and importing of the certificate is not allowed.

7. Click Cancel to cancel the operation.
8. Click ✕ to close the window.

Edit automatic certificate enrollment settings

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.

2. Click the ellipsis icon in the top-right corner of the TLS Certificate Server section.

   Use the following options for editing the settings:

   - Click Update Configuration to update the TLS server configuration. For more information about configuration options, see Enabling automatic certificate enrollment section.

- Click Update Contact Information to edit only the ACME Server Account Contact Information.

3. Click Update after making the required changes.
4. Click Cancel or ✕ to close the window.

> **NOTE**
>
> - Updating the settings does not initiate the certificate enrollment. To start the enrollment, first disable the service and enable it again.
>   - To disable automatic certificate enrollment, see Disabling automatic certificate enrollment section.
>   - To enable automatic certificate enrollment, see Enabling automatic certificate enrollment section.
> - iLO resets automatically after the TLS certificate type is changed when ACME is enabled. After the reset, iLO will generate a new self-signed TLS certificate with the updated certificate type. iLO uses the new certificate to start the web services.
>
>   iLO automatically requests a TLS certificate with the updated certificate type from the ACME server. Until iLO installs the ACME-issued certificate, the webserver continues to use the self-signed certificate. On successful enrollment, iLO logs the success in the Security Log and sends a Redfish alert. No user action is required.

Renewing automatically managed TLS certificate

About this task

When the certificate enrollment service is enabled and the certificate is about to expire #PRODABR# will initiate automatic certificate renewal according to the Renewal Window configured by the user.

For example, If you have configured the renewal window value as 20, iLO initaties certificate renewal automatically 20 days before the certificate expiry date.

As soon as #PRODABR# initiates certificate renewal, the certificate enrollment status will be In-progress.

Certificate enrollment status will be Success when the renewal is successful. For information on renewal status, see the Security Logs page. You must reset iLO manually after successful renewal. The newly trusted certificate will be in use only after iLO reset.

Certificate enrollment status will be Failed when the renewal failed. For more information on cause of failure and recommended actions, see the Security Logs page.

If the renewal fails, iLO will try renewing the certificate once a day until it is successful.

Initiating a forced TLS certificate renewal

About this task

You might want to initiate a forceful renewal of the TLS certificate for the following reasons:

- The certificate contains invalid information.
- There are security concerns related to the certificate.
- An experienced support organization recommended that you renew the certificate.

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.

2. Click ↻ Force Renew in the Certificate Information section.

   iLO prompts you to confirm the request.

3. Click Yes, Renew.
4. Click Cancel or ✕ to close the window.

Disabling automatic certificate enrollment

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.
2. Click the ellipsis icon in the top-right corner of the TLS Certificate Server section.
3. Click Disable Automatic Certificate Management Enrollment .

   iLO prompts you to confirm the request.
4. Click Yes, Disable.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the window.

Generate CSR and Import a TLS Certificate

Prerequisites

Configure iLO Settings privilege

About this task

iLO allows you to create a Certificate Signing Request (CSR) that you can send to a Certificate Authority (CA) to obtain a trusted TLS certificate to import into iLO.

iLO supports import of TLS certificate chains (in PEM format) that are up to 20 KB in size.

iLO supports import of web server certificate up to 3 KB in DER format (about 4 KB in PEM format).

A TLS certificate works only with the keys generated with its corresponding CSR. If iLO is reset to the factory default settings, or another CSR is generated before the certificate that corresponds to the previous CSR is imported, the certificate does not work. In that case, a new CSR must be generated to obtain a new certificate from a CA.

Procedure

1. Obtain a trusted certificate from a CA.
2. Import the trusted certificate to iLO.

Obtaining a trusted certificate from a CA

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.
2. Click Configure Certificate.

   The TLS Certificate window appears.
3. Select Generate CSR & Import TLS Cetificate .
4. Select Generate CSR under Select a Strategy.
5. Enter values for the following:

- Country (C)
- State (ST)
- City or Locality (L)
- Organization Name (O)
- Organizational Unit (OU)
- Common Name (CN)

6. (Optional) To include the iLO IP addresses in the CSR, select the include iLO IP Address(es) check box.

   NOTE

   Many certificate authorities (CAs) cannot accept this input. Do not select this option if you are not sure that the CA you are using can accept this input.

   When this option is enabled, the iLO IP addresses will be included in the CSR Subject Alternative Name (SAN) extension.

7. Click Generate CSR.

   The TLS Certificate window is closed. A message notifies that a CSR is being generated.

   It might take several minutes for iLO to generate the new certificate.

8. After a few minutes (up to 10), the CSR is displayed on the Certificate Signing Request section in the TLS Certificate page.
9. Click to copy the CSR text.
10. Open a browser window and navigate to a third-party CA.
11. Follow the onscreen instructions and submit the CSR to the CA.
    - When prompted to select a certificate purpose, make sure that you select the option for a server certificate.
    - When you submit the CSR to the CA, your environment might require the specification of Subject Alternative Names. If necessary, enter the iLO DNS name.

    The CA generates a certificate. The certificate signing hash is determined by the CA.
12. After you obtain the certificate, make sure that:
    - The CN matches the iLO FQDN. This value is listed as the iLO Hostname on the Overview page.
    - The certificate is a Base64-encoded X.509 certificate.
    - The first and last lines are included in the certificate.

    NOTE

    If you delete the iLO TLS Certificate issued by a trusted CA Certificate and proceed with an unsecure certificate, then clear the browning cache or cookies from the current browser to navigate to the iLO login screen. If you are using Incognito mode, re open the mode to access iLO.

CSR input details

When you create a CSR, enter the following details:

- Country (C)—The two-character country code that identifies the country where the company or organization that owns this iLO subsystem is located. Enter the two-letter abbreviation in capital letters.
- State (ST)—The state where the company or organization that owns this iLO subsystem is located.
- City or Locality (L)—The city or locality where the company or organization that owns this iLO subsystem is located.

- Organization Name (O)—The name of the company or organization that owns this iLO subsystem.
- Organizational Unit (OU)—(Optional) The unit within the company or organization that owns this iLO subsystem.
- Common Name (CN)—The FQDN of this iLO subsystem.

  The FQDN is entered automatically in the Common Name (CN) box.

  To enable iLO to enter the FQDN in the CSR, configure the Domain Name on the Network General Settings page.
- Include iLO IP Address(es)—Select this check box to include the iLO IP addresses in the CSR.

> **NOTE**
>
> Many CAs cannot accept this input. Do not select this option if you are not sure that the CA you are using can accept this input.

Certificate signing requests

A CSR contains a public and private key pair that validates communications between the client browser and iLO. iLO generates a 4096-bit RSA key signed using SHA-256 or a CNSA-compliant key signed using SHA-384. The generated CSR is held in memory until a new CSR is generated, iLO is reset to the factory default settings, or a certificate is imported.

Importing a trusted certificate

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.
2. The TLS Certificate page appears.
3. From the TLS Certificate page, navigate to the Import TLS Certificate section using one of the following methods:
   - Click Import Certificate.

     or
   - Click Configure Certificate and Import Certificate from Select a Strategy section.
4. In the Import TLS Certificate window, paste the certificate into the text box and click Import.

   iLO prompts you to confirm the request and reset iLO.
5. Click Yes, apply and reset.

   iLO imports the certificate, and then resets.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the Import TLS Certificate window.

Import a TLS Certificate and Private Key

Prerequisites

Configure iLO Settings privilege

About this task

iLO allows you to import a trusted TLS certificate and its corresponding private key.

The total size of the certificate and private key can be 20 KB or less.

Ensure both the certificate and private key are in PEM format and the certificate can be used as TLS Server certificate.

NOTE

- In CNSA mode, the minimum key length allowed for RSA is 3072 bits.
- In FIPS and Secure Standard mode, the minimum key length allowed is 2048 bits.
- The maximum key length allowed in all the security modes is 4096 bits.
- The key length for ECDSA in all the security modes is 384 bits.

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.

2. Select Configure Certificate.

   The Configure Certificate window appears.

3. Select Select Import a TLS Certificate & Private Key for Select a Strategy option.

4. In the Import a TLS Certificate and Private Key window, paste the certificate and the private key into the box, and then click Import.

   iLO prompts you to confirm the request and reset iLO.

5. Click Yes, apply and reset.

   iLO imports the certificate and the private key, and then resets.

Regenerating TLS certificate

Prerequisites

Configure iLO Settings privilege

About this task

Use this feature to remove a TLS certificate and regenerate the iLO self-signed certificate.

From HPE iLO 7 v1.17.00 onwards, iLO supports generating RSA 4K CSR. If you are generating the 4K certificate for the first time, Hewlett Packard Enterprise recommends to manually generate the CSR.

You might want to remove a certificate for the following reasons:

- The certificate expired.
- The certificate contains invalid information.
- There are security concerns related to the certificate.
- An experienced support organization recommended that you remove the certificate.

Procedure

1. Click Security in the left navigation pane and click the TLS Certificate.

   The TLS Certificate page appears.

2. Click Regenerate.

   A pop up window appears.

3. The Generate CSR is selected by default for Select a Strategy option.

4. Follow step 4 to 7 in the Obtaining a trusted certificate from a CA section.

5. Click Cancel to cancel the operation.

6. Click ✕ to close the pop up window.

Removing a TLS certificate

Prerequisites

Configure iLO Settings privilege

About this task

Use this feature to remove a TLS certificate and regenerate the iLO self-signed certificate.

You might want to remove a certificate for the following reasons:

- The certificate expired.
- The certificate contains invalid information.
- There are security concerns related to the certificate.
- An experienced support organization recommended that you remove the certificate.

Procedure

1. Click Security in the left navigation pane and click TLS Certificate.

   The TLS Certificate page appears.
2. Click  on the Certificate Information section.

   A confirmation window appears.

   iLO prompts you to confirm that you want to delete the existing certificate, reset iLO, and generate a new self-signed certificate.
3. Click Yes, Remove and Reset.

   iLO removes the TLS certificate, resets, and then generates a new self-signed certificate.

   It might take several minutes for iLO to generate the new certificate.
4. Recommended: Obtain and import a trusted certificate.

   Hewlett Packard Enterprise recommends importing a trusted certificate.
5. Click Cancel to cancel the operation.
6. Click  to close the window.

Directory authentication and authorization settings in iLO

The iLO firmware supports Kerberos authentication with Microsoft Active Directory. It also supports directory integration with an Active Directory or OpenLDAP directory server. You can also setup Two Factor Authentication for Microsoft Active Directory login users.

When two factor authentication is enabled, basic authorization through REST API is not be supported for Active Directory users. HTTP 401 error stating Unauthorized login attempt is displayed.

When you configure directory integration, you choose between the schema-free and HPE Extended Schema configurations. The HPE Extended Schema is supported only with Active Directory. The iLO firmware connects to directory services by using TLS connections to the directory server LDAP port.

When you configure directory integration, you use the schema-free option in iLO. The iLO firmware connects to directory services by using TLS connections to the directory server LDAP port.

You can enable the directory server certificate validation feature by importing a CA certificate. This feature ensures that iLO connects to the correct directory server during LDAP authentication.

Configuring the authentication and directory server settings in iLO is one step in the process of configuring iLO to use a directory or Kerberos authentication. Additional steps are required to set up your environment to use these features.

Subtopics

Prerequisites for configuring authentication and directory server settings

Procedure

1. Verify that your iLO user account has the Configure iLO Settings privilege.
2. Install a license that supports this feature.
3. Configure your environment to support Kerberos authentication or directory integration.

Configuring Kerberos authentication settings in iLO

Prerequisites

- Your environment meets the prerequisites for using this feature.
- The `Kerberos keytab` file you created during the environment setup tasks is available.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.
2. Click Directory & LDAP.

   The Directory & LDAP page appears.
3. Click  on the Kerberos Settings section.

   The Kerberos Settings window appears.
4. Enter the Kerberos KDC Server Address.
5. Enter the Kerberos KDC Server Port.
6. Enter the Kerberos Realm name.
7. Set the required keytab file location in the Keytab File Location box.
8. To add the `Kerberos Keytab` file, click Browse or drag the file (depending on your browser) to Local File box and follow the onscreen instructions.
9. Click Update.
10. Click Cancel to cancel the operation.

11. Click ✕ to close the Kerberos Settings window.

Subtopics

Kerberos settings

Kerberos settings

- Kerberos Authentication—Enables or disables Kerberos login. If Kerberos login is enabled and configured correctly, the Zero Sign In button appears on the login page.
- Kerberos Realm—The name of the Kerberos realm in which the iLO processor operates. This value can be up to 127 characters. The realm name is usually the DNS name converted to uppercase letters. Realm names are case-sensitive.
- Kerberos KDC Server Address —The IP address or DNS name of the KDC server. This value can be up to 127 characters. Each realm must have at least one Key Distribution Center (KDC) that contains an authentication server and a ticket grant server. These servers can be combined.
- Kerberos KDC Server Port—The TCP or UDP port number on which the KDC is listening. The default value is 88.
- Kerberos Keytab—A binary file that contains pairs of service principal names and encrypted passwords. In the Windows environment, you use the `ktpass` utility to generate the keytab file.

Configuring schema-free directory settings in iLO

Prerequisites

Your environment meets the prerequisites for using this feature. To configure OpenLDAP based directory server, see the OpenLDAP Software Administrator's Guide.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click Directory & LDAP.

   The Directory & LDAP page appears.

3. Select ✎ next to Authentication Options.

   The Authentication Options window appears.

4. Select Use HPE Directory Default Schema from the LDAP Directory Authentication menu.

5. Set Local User Accounts to enabled if you want to use local user accounts at the same time as directory integration.

6. For configurations with CAC/Smartcard authentication enabled, click ✎ next to Directory Server Settings.

   The Directory Server Settings window appears.

7. OpenLDAP users only: Enable Generic LDAP.

   This setting is available only if Use Directory Default Schema is selected and Two Factor Authentication is disabled.

8. Enter the CAC LDAP service account and password in the iLO Object Distinguished Name CAC LDAP Service Account and iLO Object Password boxes.

9. Enter the FQDN or IP address of a directory server in the Server Address box.

10. Enter the directory server port number in the Directory Server LDAP Port box.
11. Click Add User Context.

    The Directory User Contexs text box is added to the Directory Server Settings window.
12. (Optional) Click Add User Context to add more directory user contexts.
13. Enter a valid search context in the Directory User Contex box.
14. Click Update to save the settings.
15. (Optional) Import a new CA certificate.
    a. Click the up arrow in the Directory Server CA Certificate section.

       The Import a CA Certificate window appears.
    b. Paste the Base64-encoded X.509 certificate data into the CA Certificate window and click Import.
16. To test the communication between the directory server and iLO, click Test Connection in the Directory Tests section.

> **NOTE**
>
> See the following table for the special character allowed for LDAP User Name and Distinguished Name (DN). Attribute values containing a combination of special characters are not supported.

User Name	Distinguished Name
+	+
-	-
<	<
>	>
,	,
;	;
"	"
#	#
/	/
	\
	)
	(

Subtopics

Schema-free directory settings

Schema-free directory settings

- Use Directory Default Schema—Selects directory authentication and authorization by using user accounts in the directory. User accounts and group memberships are used to authenticate and authorize users.

  This configuration supports Active Directory and OpenLDAP.
- Generic LDAP—Specifies that this configuration uses the OpenLDAP supported BIND method.

- iLO Object Distinguished Name/CAC LDAP Service Account —Specifies the CAC LDAP service account when CAC/Smartcard authentication is configured and used with the schema-free directory option.

  User search contexts are not applied to the iLO object DN when iLO accesses the directory server.

- iLO Object Password—Specifies the CAC LDAP service account password when CAC/Smartcard authentication is configured and used with the schema-free directory option.
- Server Address—Specifies the network DNS name or IP address of the directory server. The directory server address can be up to 127 characters.

  If you enter the FQDN, ensure that the DNS settings are configured in iLO.

  Hewlett Packard Enterprise recommends using DNS round-robin when you define the directory server.

- Server LDAP Port—Specifies the port number for the secure LDAP service on the server. The default value is 636. If your directory service is configured to use a different port, you can specify a different value. Make sure that you enter a secured LDAP port. iLO cannot connect to an unsecured LDAP port.
- Directory User Contexts—These boxes enable you to specify common directory subcontexts so that users do not need to enter their full DNs at login. There is a 1904 character limit for the sum of all the directory user contexts.

  Click Add User Context to add the Directory User Contexs box on the Directory Server Settings window.

- Directory Server CA Certificate —Specifies whether a directory server CA certificate is loaded.

  If the status is Loaded, click View to display the CA certificate details. If no CA certificate is loaded, the status Not Loaded is displayed. iLO supports TLS certificates up to 7 KB in size.

- CRL Check—Specifies whether iLO checks the LDAP server certificate against a certificate revocation list.

  iLO uses a certificate revocation list that you import on the CAC/Smartcard page. It does not check the certificate revocation list from the LDAP server certificate.

Configuring HPE Extended Schema directory settings in iLO

Prerequisites

Your environment meets the prerequisites for using this feature.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click Directory & LDAP.

   The Directory & LDAP page appears.

3. Select next to Authentication Options.

   The Authentication Options window appears.

4. Select Use HPE Extended Schema from the LDAP Directory Authentication menu.
5. Set Local User Accounts to enabled if you want to use local user accounts at the same time as directory integration.
6. For configurations with CAC/Smartcard authentication enabled, click next to Directory Server Settings.

   The Directory Server Settings window appears.

7. OpenLDAP users only: Enable Generic LDAP.

This setting is available only if Use Directory Default Schema is selected and Two Factor Authentication is disabled.

8. Enter the location of this iLO instance in the directory tree in the iLO Object Distinguished Name box.
9. Enter the FQDN or IP address of a directory server in the Server Address box.
10. Enter the directory server port number in the Server LDAP Port box.
11. Click Add User Context.

    The Directory User Contexs text box is added to the Directory Server Settings window.
12. (Optional) Click Add User Context to add more directory user contexts.
13. Enter a valid search context in the Directory User Contex box.
14. Click Update to save the settings.
15. (Optional) Import a new CA certificate.
    a. Click the up arrow in the Directory Server CA Certificate section.

       The Import a CA Certificate window appears.
    b. Paste the Base64-encoded X.509 certificate data into the CA Certificate window and click Import.
16. Enter valid search contexts in one or more of the Directory User Context boxes.
17. Click Apply Settings.
18. To test the communication between the directory server and iLO, click Test Settings.

Subtopics

HPE Extended Schema directory settings

HPE Extended Schema directory settings

- Use HPE Extended Schema—Selects directory authentication and authorization by using directory objects created with the HPE Extended Schema. Select this option when the directory has been extended with the HPE Extended Schema. The HPE Extended Schema works only with Microsoft Windows. This configuration supports Active Directory.
- iLO Object Distinguished Name/CAC LDAP Service Account —For the HPE Extended Schema configuration, this setting specifies where this iLO instance is listed in the directory tree. For example:

  ```
  cn=Mail Server iLO,ou=Management Devices,o=ab
  ```

  User search contexts are not applied to the iLO object DN when iLO accesses the directory server.
- Directory Server Address—Specifies the network DNS name or IP address of the directory server. The directory server address can be up to 127 characters.

  If you enter the FQDN, ensure that the DNS settings are configured in iLO.

  Hewlett Packard Enterprise recommends using DNS round-robin when you define the directory server.
- Directory Server LDAP Port—Specifies the port number for the secure LDAP service on the server. The default value is 636. If your directory service is configured to use a different port, you can specify a different value. Make sure that you enter a secured LDAP port. iLO cannot connect to an unsecured LDAP port.
- Certificate Status—Specifies whether a directory server CA certificate is loaded.

  If the status is Loaded, click View to display the CA certificate details. If no CA certificate is loaded, the status Not Loaded is displayed. iLO supports TLS certificates up to 7 KB in size.

- Directory User Contexts—These boxes enable you to specify common directory subcontexts so that users do not need to enter their full DNs at login. There is a 1904 character limit for the sum of all the directory user contexts.

Directory user contexts

You can identify the objects listed in a directory by using unique DNs. However, DNs can be long, users might not know their DNs, or users might have accounts in different directory contexts. When you use user contexts, iLO attempts to contact the directory service by DN, and then applies the search contexts in order until login is successful.

- **Example 1**—If you enter the search context
  `ou=engineering,o=ab`
  , you can log in as
  `user`
  instead of logging in as `cn=user,ou=engineering,o=ab`.
- **Example 2**—If the IM, Services, and Training departments manage a system, the following search contexts enable users in these departments to log in by using their common names:
  - `Directory User Context 1:ou=IM,o=ab`
  - `Directory User Context 2:ou=Services,o=ab`
  - `Directory User Context 3:ou=Training,o=ab`

  If a user exists in both the `IM` organizational unit and the `Training` organizational unit, login is first attempted as `cn=user,ou=IM,o=ab`.
- **Example 3 (Active Directory only)**—Microsoft Active Directory allows an alternate user credential format. A user can log in as `user@domain.example.com`. Entering the search context
  `@domain.example.com`
  allows the user to log in as `user`. Only a successful login attempt can test search contexts in this format.
- **Example 4 (OpenLDAP user)**—If a user has the DN `UID=user,ou=people,o=ab`, and you enter the search context
  `ou=people,o=ab`
  , the user can log in as
  `user`
  instead of entering the DN.
  To use this format, you must enable Generic LDAP on the Security - Directory page.

Directory Server CA Certificate

During LDAP authentication, iLO validates the directory server certificate if the CA certificate is already imported. For successful certificate validation, make sure that you import the correct CA certificate. If certificate validation fails, iLO login is denied and an event is logged. If no CA certificate is imported, the directory server certificate validation step is skipped.

To verify TLS communication between the directory server and iLO, click Test Connections.

Deleting a Directory Server CA certificate

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click Directory & LDAP.

   The Directory & LDAP page appears. Directory Server CA certificate section lists the available certificates.

3. Click next to the certificate that you want to remove

   Confirm the deletion when prompted.
   iLO notifies you that the certificate is deleted.

Local user accounts with Kerberos authentication and directory integration

Local user accounts can be active when you configure iLO to use a directory or Kerberos authentication. In this configuration, you can use local and directory-based user access.

Consider the following:

- When local user accounts are enabled, configured users can log in by using locally stored user credentials.
- When local accounts are disabled, user access is limited to valid directory credentials.
- Do not disable local user access until you have validated access through Kerberos or a directory.
- When you use Kerberos authentication or directory integration, Hewlett Packard Enterprise recommends enabling local user accounts and configuring a user account with administrator privileges. This account can be used if iLO cannot communicate with the directory server.
- Access through local user accounts is enabled when directory support is disabled or a license is revoked.

Enabling Two Factor Authentication in iLO

Prerequisites

- Enable SMTP for Two Factor Authentication option is enabled in iLO Settings > Alert & Logging > Mail Settings page.
- Generic LDAP is disabled.
- Your environment meets the prerequisites for using this feature.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click Directory & LDAP

   The Directory & LDAP page appears.

3. Click on Authentication Options section.

   The Authentication Options window opens.

4. Select Two Factor Authentication check box.

5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the Authentication Options window.

Disabling Two Factor Authentication in iLO

Prerequisites

- Generic LDAP is disabled.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.
2. Click Directory & LDAP

   The Directory & LDAP page appears.
3. Click ✎ on Authentication Options section.

   The Authentication Options window opens.
4. Clear the Two Factor Authentication check box.
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the Authentication Options window.

Running directory tests

About this task

Directory tests enable you to validate the configured directory settings. The directory test results are reset when directory settings are saved, or when the directory tests are started.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.
2. Click Directory & LDAP.

   The Directory & LDAP page appears.
3. Click Test Connection on Directory Tests section.

   iLO displays the results of a series of simple tests designed to validate the directory settings. After your directory settings are configured correctly, you do not need to rerun these tests. The Directory Tests page does not require you to log in as a directory user.

   The Directory Test Controls window appears.
4. Enter a test user name and password in the Test User Name and Test User Password boxes.

5. Enter the DN and password of a directory administrator in the Directory Administrator Distinguished Name and Directory Administrator Password boxes.

   Hewlett Packard Enterprise recommends to use the same credentials that you used when creating the iLO objects in the directory. iLO does not store these credentials; they are used to verify the iLO object and user search contexts.

6. Click Start Test.

   Several tests begin in the background, starting with a network ping of the directory user by establishing a TLS connection to the server and evaluating user privileges.

   While the tests are running, the page refreshes periodically. You can stop the tests or manually refresh the page at any time.

7. Click Cancel to cancel the operation.
8. Click ✕ to close the Directory Test Controls window.

Subtopics

Directory test input values

Enter the following values when you run directory tests:

- Directory Administrator Distinguished Name—Searches the directory for iLO objects, roles, and search contexts. This user must have the right to read the directory.
- Directory Administrator Password—Authenticates the directory administrator.
- Test User Name and Test User Password—Tests login and access rights to iLO. This name does not need to be fully distinguished because user search contexts can be applied. This user must be associated with a role for this iLO.

  Typically, this account is used to access the iLO processor being tested. It can be the directory administrator account, but the tests cannot verify user authentication with a superuser account. iLO does not store these credentials.

NOTE

- The maximum length for Directory Administrator Distinguished Name and Test User Name is 128 characters.
- The maximum length for Directory Administrator Password and Test User Password is 64 characters.

Directory test status values and controls

iLO displays the following status values for directory tests:

- In Progress—Indicates that directory tests are currently being performed in the background.

  Click Stop Test to cancel the current tests, or click Refresh to update the contents of the page with the latest results. Using the Stop Test button might not stop the tests immediately.

- Not Running—Indicates that directory tests are current, and that you can supply new parameters to run the tests again.

Use the Start Test button to start the tests and use the current test control values. Directory tests cannot be started after they are already in progress.

- Stopping—Indicates that directory tests have not yet reached a point where they can stop. You cannot restart tests until the status changes to Not Running. Use the Refresh button to determine whether the tests are complete.

Directory test results

The Directory Test Results section shows the directory test status with the date and time of the last update.

- Overall Status—Summarizes the results of the tests.
  - Not Run—No tests were run.
  - Inconclusive—No results were reported.
  - Passed—No failures were reported.
  - Problem Detected—A problem was reported.
  - Failed—A specific subtest failed. To identify the problem, check the onscreen log.
  - Warning—One or more of the directory tests reported a Warning status.
- Test—The name of each test.
- Result—Reports status for a specific directory setting or an operation that uses one or more directory settings. These results are generated when a sequence of tests is run. The results stop when:
  - The tests run to completion.
  - A test failure prevents further progress.
  - The tests are stopped.

  Possible test results follow:
  - Passed—The test ran successfully. If more than one directory server was tested, all servers that ran this test were successful.
  - Not Run—The test was not run.
  - Failed—The test was unsuccessful on one or more directory servers. Directory support might not be available on those servers.
  - Warning—The test ran and reported a warning condition, for example, a certificate error. Check the Notes column for suggested actions to correct the warning condition.
- Notes—Indicates the results of various phases of the directory tests. The data is updated with failure details and information such as the directory server certificate subject and the roles that were evaluated.

iLO directory tests

Directory Server DNS Name

If the directory server is defined in FQDN format (directory.company.com), iLO resolves the name from FQDN format to IP format, and queries the configured DNS server.

If the test is successful, iLO obtained an IP address for the configured directory server. If iLO cannot obtain an IP address for the directory server, this test and all subsequent tests fail.

If the directory server is configured with an IP address, iLO skips this test.

Ping Directory Server

iLO initiates a ping to the configured directory server.

The test is successful if iLO receives the ping response; it is unsuccessful if the directory server does not reply to iLO.

If the test fails, iLO will continue with the subsequent tests.

Connect to Directory Server

iLO attempts to negotiate an LDAP connection with the directory server.

If the test is successful, iLO was able to initiate the connection.

If the test fails, iLO was not able to initiate an LDAP connection with the specified directory server. Subsequent tests will stop.

Connect using TLS

iLO initiates TLS handshake and negotiation and LDAP communications with the directory server through port 636.

If the test is successful, the TLS handshake and negotiation between iLO and the directory server were successful.

LDAP server certificate validation errors are reported in the results for this test.

Bind to Directory Server

This test binds the connection with the user name specified in the test controls. If no user is specified, iLO does an anonymous bind.

If the test is successful, the directory server accepted the binding.

Directory Administrator Login

If Directory Administrator Distinguished Name and Directory Administrator Password were specified, iLO uses these values to log in to the directory server as an administrator. Providing these values is optional.

User Authentication

iLO authenticates to the directory server with the specified user name and password.

If the test is successful, the supplied user credentials are correct.

If the test fails, the user name and/or password is incorrect.

User Authorization

This test verifies that the specified user name is part of the specified directory group, and is part of the directory search context specified during directory services configuration.

Directory User Contexts

If Directory Administrator Distinguished Name was specified, iLO tries to search the specified context.

If the test is successful, iLO found the context by using the administrator credentials to search for the container in the directory.

User login is the only way that you can test contexts that begin with the @ symbol.

A failure indicates that the container could not be located.

LOM Object Exists

This test searches for the iLO object in the directory server by using the iLO Object Distinguished Name configured on the Security - Directory page.

If the test is successful, iLO found the object that represents itself.

This test is run even if LDAP Directory Authentication is disabled.

iLO encryption settings

HPE iLO Standard that comes with every Gen12 server gives customers the ability to configure servers in one of the three security states. With an iLO Advanced license, customers that need the highest-level encryption capabilities of CNSA have a fourth security state available to them.

As you move up the scale in security, the server enforces stronger encryption rules for web pages, SSH, and network communications. Both ends of each network connection must support the encryption rules otherwise, communication is not possible and certain interfaces are disabled to reduce potential security risks.

The Encryption and Security page shows the current security settings and an overview of iLO security states.

The Overview section in the Encryption and Security page shows the following current settings:

- Current Negotiated cipher—The current negotiated cipher appears.
- Security State—The selected security state appears.
- Enabled TLS Versions—The enabled TLS versions appears.

You can update the certificate type using the Update Certificate Type option.

For FIPS and Secured Standard mode, the default value is RSA. For CNSA mode, the default value is ECDSA.

1. Click Update Certificate Type. The Update Certificate Type page appears.
2. Select the Certificate Type from the drop-down.
3. Click Update to save the changes.
4. Click Cancel to cancel the operation.

For updating the security state, see Updating the security state section.

The iLO Security States section in the Encryption and Security page lists the iLO security states. Expand each security state to view the onscreen information about the security states.

Subtopics

iLO security states

Secure Standard

When iLO is set to this security state:

- iLO enforces the use of AES ciphers over the secure channels, including secure HTTP transmissions through the following:
  - Browser
  - SSH port
  - iLO RESTful API

  Use a supported cipher to connect to iLO through these secure channels. This security state does not affect communications and connections over less-secure channels.
- User name and password restrictions for the following commands executed from the host system are enforced:
  - iLO RESTful API
- Remote console data uses AES-128 bidirectional encryption.
- You cannot connect to the server with network-based tools that do not support TLS 1.2 and TLS 1.3.

FIPS

The FIPS security state might be required for Common Criteria compliance, Payment Card Industry compliance, or other standards.

When iLO is set to this security state:

- iLO operates in a mode intended to comply with the requirements of FIPS 140-3 level 1.

  FIPS is a set of computer security standards that are mandated for use by United States government agencies and contractors.

  The FIPS security state is not the same as FIPS validated. FIPS validated refers to software that received validation by completing the

Cryptographic Module Validation Program.

- iLO enforces the use of AES ciphers over the secure channels, including secure HTTP transmissions through the following:
  - Browser
  - SSH port
  - iLO RESTful API

  Use a supported cipher to connect to iLO through these secure channels. This security state does not affect communications and connections over less-secure channels.
- User name and password restrictions for the following commands executed from the host system are enforced:
  - iLO RESTful API
- Remote console data uses AES-128 bidirectional encryption.
- You cannot connect to the server with network-based tools that do not support TLS 1.2 and TLS 1.3.

CNSA

The CNSA security state is available only when the FIPS security state is enabled.

When iLO is set to this security state:

- iLO firmware uses CNSA 2.0 signing algorithms - Leighton-Micali Signature (LMS).
- In CNSA mode, only LMS-signed firmware can be flashed or uploaded to the repository. To flash or upload the firmware that is not LMS-signed, change the security mode to FIPS.
- iLO operates in a mode intended to comply with the CNSA requirements defined by the NSA.
- iLO operates in a mode intended to secure systems that hold United States government top secret classified data.
- You cannot connect to the server with network-based tools that do not support TLS 1.2 and TLS 1.3.
- Any software or utility that you use to connect to iLO must be CNSA-compliant.

  For example:
  - Firmware update utilities
  - SSH clients
  - HPE and third-party scripting and command-line tools
  - HPE and third-party management tools
  - AlertMail, syslog, LDAP, or key manager servers
  - Remote support software
- Make sure that you use the HTML5 remote console. This console enforces the use of AES-256 bit CNSA-compliant ciphers.

To verify compliance, check with your software vendor or use a utility such as Wireshark.

NOTE

- When iLO is configured to Secured Standard, FIPS, or CNSA security state, login credential are required even if the system maintenance switch is on.
- FIPS and CNSA security modes do not support the installation of third-party PLDM packages.

Synergy security mode

A special security state used by Composer 2. You cannot change the security state on a device that uses this mode.

Subtopics

Connecting to iLO when using CNSA mode

When iLO is configured to use the CNSA security state, an AES 256 GCM cipher is required.

Web browser

Configure the browser to support TLS 1.2, TLS 1.3, or both and an AES cipher. If the browser is not using an AES cipher, you cannot connect to iLO.

Different browsers use different methods for selecting a negotiated cipher. For more information, see your browser documentation.

Log out of iLO through the current browser before changing the browser cipher setting. Any changes made to the cipher settings while you are logged in to iLO might enable the browser to continue using a non-AES cipher.

SSH connection

For information about setting the available ciphers, see the SSH utility documentation.

iLO RESTful API

Use a utility that supports TLS 1.2, TLS 1.3, or both and an AES cipher.

Configuring a FIPS-validated environment with iLO

About this task

Use the following instructions to operate iLO in a FIPS-validated environment. To use the FIPS security state in iLO, see Enabling the FIPS and CNSA security states.

It is important to decide if a FIPS-validated version of iLO is required for your environment, or if running iLO with the FIPS security state enabled will suffice. Due to the lengthy validation process, a FIPS-validated version of iLO might have been superseded by a nonvalidated version with new features and security enhancements. In this situation, a FIPS-validated version of iLO might be less secure than the latest version.

Procedure

To set up an environment with a FIPS-validated version of iLO, follow the steps in the Security Policy document that are part of the iLO FIPS validation process.

The validated Security Policy document is available on the **NIST website**. To access iLO 7 FIPS information, enter certificate number 3122 on the validated modules search page.

Disabling the FIPS security state

Procedure

1. To disable the FIPS security state (for example, if a server is decommissioned), set iLO to the factory default settings.

You can perform this task using iLO RESTful API or the BMC Configuration Utility.

CAUTION

When you reset iLO to the factory default settings, all iLO settings are erased. The erased settings include user data, license data, configuration settings, and logs. If the server has a factory-installed license key, the license key is retained.

Events related to the reset are not logged because this step clears all the data in the iLO logs.

2. Reboot the server operating system.

   During the reset to the factory default settings, SMBIOS records are cleared. Memory and network information will not be displayed in the iLO web interface until the server OS reboot is complete.

Disabling the CNSA security state

Procedure

1. To disable the CNSA security state, do one of the following:
   - To disable the CNSA security state and continue using the FIPS security state, change the security state from CNSA to FIPS.
   - To disable the CNSA and FIPS security states, set iLO to the factory default settings.

     You can perform this task using iLO RESTful API or the iLO 7 Configuration Utility.

     CAUTION

     When you reset iLO to the factory default settings, all iLO settings are erased. The erased settings include user data, license data, configuration settings, and logs. If the server has a factory installed license key, the license key is retained.

     Events related to the reset are not logged because this step clears all the data in the iLO logs.

2. If you reset iLO to the factory default settings, reboot the server operating system.

   During the reset to the factory default settings, SMBIOS records are cleared. Memory and network information will not be displayed in the iLO web interface until the server OS reboot is complete.

SSH cipher, key exchange, and MAC support

iLO provides enhanced encryption through the SSH port for secure CLP transactions.

NOTE

- In CNSA mode, the minimum key length allowed for RSA is 3072 bits.
- In FIPS and Secure Standard mode, the minimum key length allowed is 2048 bits.
- The maximum key length allowed in all the security modes is 4096 bits.
- The key length for ECDSA in all the security modes is 384 bits.

Based on the configured security state, iLO supports the following:

Secure Standard

- aes256-ctr, aes256-gcm@openssh.com
- diffie-hellman-group-exchange-sha256, ecdh-sha2-nistp384
- hmac-sha2-256
- ssh-ed25519, rsa-sha2-512, rsa-sha2-256, ecdsa-sha2-nistp384

FIPS

- aes256-ctr, aes256-gcm@openssh.com
- diffie-hellman-group-exchange-sha256, ecdh-sha2-nistp384
- hmac-sha2-256
- rsa-sha2-512, rsa-sha2-256, ecdsa-sha2-nistp384

CNSA

- aes256-gcm@openssh.com
- ecdh-sha2-nistp384
- hmac-sha2-256
- ecdsa-sha2-nistp384, rsa-sha2-512

Synergy Security Mode

- AEAD_AES_256_GCM and AES256-GCM ciphers
- ecdh-sha2-nistp384 key exchange
- AEAD_AES_256_GCM MAC

TLS cipher and MAC support

iLO provides enhanced security for remote management in distributed IT environments. TLS encryption protects web browser data. Encryption of HTTP data provided by TLS ensures that the data is secure as it is transmitted across the network.

When you log in to iLO through a browser, the browser and iLO negotiate a cipher setting to use during the session. The negotiated cipher is displayed on the Encryption page.

The following lists of supported ciphers apply to all iLO TLS connections, including connections to LDAP servers, key manager servers, SSO servers, https:// URLs used in virtual media, the iLO RESTful API, and CLI commands.

The following lists of supported ciphers apply to all iLO TLS connections, including:

- Connections to LDAP servers
- Key manager servers
- SSO servers
- https:// URLs used in virtual media
- iLO RESTful API
- CLI commands

Based on the configured security state and the configured iLO TLS certificate key type, iLO supports the following ciphers:

Secure Standard

TLS 1.2 or TLS 1.3 is required for these security states.

- 256-bit AES-GCM with ECDSA, ECDH, and an AEAD MAC ECDHE-ECDSA-AES256-GCM-SHA384
- 128-bit AES-GCM with ECDSA, ECDH, and an AEAD MAC ECDHE-ECDSA-AES128-GCM-SHA256
- 256-bit AES-GCM with RSA, ECDH, and an AEAD MAC (ECDHE-RSA-AES256-GCM-SHA384)
- 128-bit AES-GCM with RSA, ECDH, and an AEAD MAC (ECDHE-RSA-AES128-GCM-SHA256)
- TLS1.3 256 bits AES_GCM with AEAD MAC (TLS_AES_256_GCM_SHA384)
- TLS1.3 128 bits AES_GCM with AEAD MAC (TLS_AES_128_GCM_SHA256)

FIPS

TLS 1.2 or TLS 1.3 is required for these security states.

- 256-bit AES-GCM with ECDSA, ECDH, and an AEAD MAC ECDHE-ECDSA-AES256-GCM-SHA384
- 128-bit AES-GCM with ECDSA, ECDH, and an AEAD MAC ECDHE-ECDSA-AES128-GCM-SHA256
- 256-bit AES-CBC with ECDSA, ECDH, and SHA384 MAC ECDHE-ECDSA-AES256-SHA384
- 128-bit AES-CBC with ECDSA, ECDH, and SHA256 MAC ECDHE-ECDSA-AES128-SHA256
- 256-bit AES-GCM with RSA, ECDH, and an AEAD MAC (ECDHE-RSA-AES256-GCM-SHA384)
- 256-bit AES with RSA, ECDH, and a SHA384 MAC (ECDHE-RSA-AES256-SHA384)
- 128-bit AES-GCM with RSA, ECDH, and an AEAD MAC (ECDHE-RSA-AES128-GCM-SHA256)
- 128-bit AES with RSA, ECDH, and a SHA256 MAC (ECDHE-RSA-AES128-SHA256)
- TLS1.3 256 bits AES_GCM with AEAD MAC (TLS_AES_256_GCM_SHA384)
- TLS1.3 128 bits AES_GCM with AEAD MAC (TLS_AES_128_GCM_SHA256)

CNSA

TLS 1.2 or TLS 1.3 is required for this security state.

- 256-bit AES-GCM with ECDSA, ECDH, and an AEAD MAC (ECDHE-ECDSA-AES256-GCM-SHA384)
- Client only: 256-bit AES-GCM with RSA, ECDH, and an AEAD MAC (ECDHE-RSA-AES256-GCM-SHA384)
- TLS1.3 256 bits AES_GCM with AEAD MAC (TLS_AES_256_GCM_SHA384)

Synergy Security Mode

- 256-bit AES-GCM with ECDSA, ECDH, and an AEAD MAC (ECDHE-ECDSA-AES256-GCM-SHA384)
- Client only: 256-bit AES-GCM with RSA, ECDH, and an AEAD MAC (ECDHE-RSA-AES256-GCM-SHA384)
- TLS1.3 256 bits AES_GCM with AEAD MAC (TLS_AES_256_GCM_SHA384)

SPDM supported algorithms

Based on the configured security state, iLO categorizes the SPDM algorithms as follows:

FIPS or Secure Standard

BaseAsymAlgo(4)

- TPM_ALG_RSASSA_2048
- TPM_ALG_RSAPSS_2048
- TPM_ALG_RSASSA_3072
- TPM_ALG_RSAPSS_3072

- TPM_ALG_ECDSA_ECC_NIST_P256
- TPM_ALG_RSASSA_4096
- TPM_ALG_ECDSA_ECC_NIST_P384

BaseHashAlgo (4)

- TPM_ALG_SHA_256
- TPM_ALG_SHA_384
- TPM_ALG_SHA_512

CNSA

BaseAsymAlgo(4)

- TPM_ALG_RSASSA_3072
- TPM_ALG_RSAPSS_3072
- TPM_ALG_RSASSA_4096
- TPM_ALG_ECDSA_ECC_NIST_P384

BaseHashAlgo (4)

- TPM_ALG_SHA_384

Updating the Security state

HPE iLO Standard that comes with every Gen12 server gives customers the ability to configure servers in one of the two security states. With an iLO Advanced license, customers that need the highest-level encryption capabilities of CNSA have a third security state available to them.

As you move up the scale in security, the server enforces stronger encryption rules for webpages, SSH, and network communications. Both the ends of each network connection must support the encryption rules, or they cannot communicate, and some interfaces are closed to limit potential security threats.

The following security states are available:

- Secure Standard
- FIPS
- CNSA

Subtopics

Enabling the FIPS and CNSA security states
Enabling the Secure Standard security state

Enabling the FIPS and CNSA security states

Prerequisites

- Configure iLO Settings privilege
- If you plan to enable the optional CNSA security state, a license that supports this feature is installed.
- The default iLO user credentials are available.

About this task

This procedure is for configuring the FIPS or CNSA security states. To configure iLO in a FIPS-validated environment, see Configuring a FIPS-validated environment with iLO.

Procedure

1. (Optional) Install any needed firmware and software updates.
2. Click Security in the left navigation pane and click Encryption and Security.

   The Encryption and Security page appears.
3. Click Update Security State.

   The Overview window appears.
4. Select FIPS in the Security State menu and then click Update.

   iLO prompts you to confirm the request.

   CAUTION

   Enabling the FIPS security state resets iLO to the factory default settings. All iLO settings are erased, including user data and most configuration settings. The iLO Event Log, IML, and Security Log are also erased. Installed license keys are retained.

   The only way to disable the FIPS security state is to reset iLO to the factory default settings.
5. To confirm the request to enable the FIPS security state, click Yes, apply and reset.

   iLO reboots with the FIPS security state enabled. Wait at least 90 seconds before attempting to re-establish a connection.
6. (Optional) Enable the CNSA security state.
   a. Log in to iLO by using the default user credentials.
   b. Click Security in the left navigation pane and click Encryption and Security.

      The Encryption and Security page appears.
   c. Click Update Security State.

      The Overview window appears.
   d. Select CNSA in the Security State menu and then click Update.

      iLO prompts you to confirm the request.
   e. To confirm the request to enable the CNSA security state, click Yes, apply and reset.

      iLO reboots with the CNSA security state enabled. Wait at least 90 seconds before attempting to re-establish a connection.
   f. Log in to iLO again by using the default iLO credentials.

   If your license expires or is downgraded after you enable the CNSA security state, iLO continues to operate with the configured security state. All other features activated by the expired or downgraded license will be unavailable.
7. Install a trusted certificate.

   The default self-signed TLS certificate is not allowed when the FIPS security state is enabled. Previously installed trusted certificates (either installed through Manual Import are deleted when you set iLO to use the FIPS security state.
8. Disable the IPMI/DCMI over LAN Access, Anonymous Data, and SNMP Access options on the Access Settings page.

IMPORTANT

Some iLO interfaces, such as the standards-compliant implementations of IPMI and SNMP, are not FIPS-compliant and cannot be made FIPS-compliant.

To verify that the configuration is FIPS-compliant, check your configuration against the Security Policy document that was part of the iLO FIPS validation process.

9. (Optional) If you restored the configuration, set new passwords for local iLO user accounts.
10. (Optional) If you restored the configuration, confirm that IPMI/DCMI over LAN Access, Anonymous Data, and SNMP Access are disabled on the Access page.

    These settings might be reset when you restore the configuration.
11. (Optional) Configure the Login Security Banner to inform iLO users that the system is using FIPS security state.

Enabling the Secure Standard security state

Prerequisites

Configure iLO Settings privilege

Procedure

1. (Optional) Install any needed firmware and software updates.
2. Click Security in the navigation pane and click Encryption and Security.

   The Encryption and Security page appears.
3. Click Update Security State.

   The Overview window appears.
4. Select Secure Standard in the Security State menu.
5. Click Update.

   iLO prompts you to confirm that you want to restart iLO to apply the new settings.
6. Click ✕ to close the window.
7. Click Cancel to cancel the operation.
8. To end your browser connection and restart iLO, click Yes, apply and reset.

   It might take several minutes before you can re-establish a connection.
9. Close all open browser windows.

   Any browser sessions that remain open might use the wrong cipher for the configured security state.
10. Confirm that Anonymous Data is disabled on the Access page.

HPE SSO

HPE SSO enables you to browse directly from HPE SSO-compliant applications to iLO, bypassing an intermediate login step.

To use this feature:

- You must have a supported version of an application that is HPE SSO-compliant.
- Configure iLO to trust the SSO-compliant application.
- Install a trusted certificate if CAC Strict Mode is enabled.

iLO contains support for HPE SSO applications to determine the minimum HPE SSO certificate requirements. Some HPE SSO-compliant applications automatically import trust certificates when they connect to iLO. For applications that do not perform this function automatically, use the HPE SSO page to configure the SSO settings. iLO supports SSO certificate upto 3 KB in size.

HPE SSO settings are not applicable for single sign on from HPE Compute Ops Management.

Subtopics

Configuring iLO for HPE SSO

Prerequisites

- Configure iLO Settings privilege
- Administer User Accounts privilege

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click HPE SSO.

   The HPE SSO page appears.

3. Click on Single Sign-On Settings.

   Hewlett Packard Enterprise recommends using the Trust by Certificate mode.

   The Single Sign-On Settings window appears.

4. Configure iLO privileges for each role in the Single Sign-On Settings section.
5. Click Apply.
6. If you selected Trust by Certificate or Trust by Name, add the trusted certificate or DNS name to iLO.

   For instructions, see Adding trusted certificates or Importing a direct DNS name.

7. (Optional) Log in to your HPE SSO-compliant application and browse to iLO to test the SSO connection.

   The list of trusted servers is not used when the SSO Trust Mode is set to Trust None. iLO does not enforce SSO server certificate revocation.

8. Click Cancel to cancel the operation.
9. Click to close the Single Sign-On Settings window.

Subtopics

Single Sign-On Trust Mode options

The Single Sign-On Trust Mode affects how iLO responds to HPE SSO requests.

- Trust None (SSO disabled) (default)—Rejects all SSO connection requests.
- Trust by Certificate (most secure)—Enables SSO connections from HPE SSO-compliant applications by matching a certificate previously imported to iLO.
- Trust by Name—Enables SSO connections from HPE SSO-compliant applications by matching a directly imported IP address or DNS name.
- Trust All (least secure)—Accepts any SSO connection initiated from any HPE SSO-compliant application.

SSO user privileges

When you log in to an application that is HPE SSO-compliant, you are authorized based on your HPE SSO-compliant application role assignment. The role assignment is passed to iLO when SSO is attempted.

SSO attempts to receive only the privileges assigned in the Single Sign-On Settings section. iLO directory settings do not apply.

The default privilege settings follow:

- User—Login only
- Operator—Login, Remote Console, Virtual Power and Reset, Virtual Media, Host BIOS.
- Administrator—Login, Remote Console, Virtual Power and Reset, Virtual Media, Host BIOS, Configure iLO Settings, Administer User Accounts, Host NIC, and Host Storage.

Adding trusted certificates

Prerequisites

Configure iLO Settings privilege

About this task

The certificate repository can hold five typical certificates. However, if typical certificates are not issued, certificate sizes might vary. When all allocated storage is used, no more imports are accepted.

For information about how to extract a certificate from a specific HPE SSO-compliant application, see the HPE SSO-compliant application documentation.

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click HPE SSO.
3. Click Import on Manage Trusted Certificates and Records section.

   The Import Trusted Certificate window appears.

4. Use one of the following methods to add a trusted certificate:
   - **Import From URL**—Enter the certificate URL in the text box in the Import From URL section, and then click Import.

     iLO contacts the HPE SSO-compliant application over the network, retrieves the certificate, and then saves it.
   - **Import Direct DNS Name**—Enter the DNS name or IP address in the text box in the DNS Name or IP Address section and click Import.
   - **Direct import**—Copy the Base64-encoded certificate X.509 data, paste it into the text box in the Direct Import section and click Import.

Subtopics

Viewing trusted certificates and records

Viewing trusted certificates and records

About this task

The Manage Trusted Certificates and Records table displays the status of the trusted certificates and records configured to use SSO with the current iLO management processor.

Procedure

1. Click Security in the left navigation pane and click Authentication tab.

   The Authentication page appears.
2. Click HPE SSO to view the trusted certificates and records.

Subtopics

Trusted certificate and record details

Trusted certificate and record details

Status

The status of the certificate or record. The possible status values follow:

- The certificate or record is valid.
- There is a problem with the certificate or record. Possible reasons follow:
  - The record contains a DNS name, and the trust mode is set to Trust by Certificate (only certificates are valid).
  - A certificate is configured, and the trust mode is set to Trust by Name (only directly imported IP addresses or DNS names are valid).
  - Trust None (SSO disabled) is selected.
  - The certificate is not compliant with the configured iLO security state.
- The certificate or record is not valid. Possible reasons follow:
  - The certificate is out-of-date. Check the certificate details for more information.
  - The iLO clock is not set or is set incorrectly. The iLO clock must be in the certificate Valid from and Valid until range.

Certificate

Indicates that the record contains a stored certificate. Move the cursor over the icon to view the certificate details, including subject, issuer, and dates.

Description

The server name or certificate subject.

Importing a direct DNS name

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click HPE SSO.

   The HPE SSO appears.

3. Click Import in the Manage Trusted Certificates and Records section.

   The Import Trusted Certificate window opens.

4. Select the Type value Import Direct DNS Name.

5. Enter the DNS name or IP address (up to 64 characters) in the Import Direct DNS Name section and click Update.

6. Click Cancel to cancel the operation.

7. Click ✕ to close the window.

Removing trusted certificates and records

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security in the left navigation pane and click Authentication.

   The Authentication page appears.

2. Click HPE SSO

   The HPE SSO page appears.

3. Select one or more trusted certificates or records in the Manage Trusted Certificates and Records table.

4. Click Delete.

   iLO prompts you to confirm that you want to delete the selected certificates or records.

   If you delete the certificate of a remote management system, you might experience impaired functionality when using the remote management system with iLO.

5. Click Yes, delete.

View the Login Security Banner

Prerequisites

Configure iLO Settings privilege

About this task

The Login Security Banner feature allows you to configure the security banner displayed on the iLO web interface and HTML5 standalone remote console login pages. The security banner is also displayed when you connect to iLO through an SSH connection. For example, you could enter a message with contact information for the owner of the server.

Procedure

Click Security on the left navigation pane and click Login Security Banner.

The Login Security Banner page appears.
The security message is displayed, if the Display Security Banner on login screen is Enabled.

Subtopics

Configuring the Login Security Banner

Configuring the Login Security Banner

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click Security on the left navigation pane and click Login Security Banner.

   The Login Security Banner page appears.

2. Click Set Login Security Banner.

   The Set Login Security Banner window appears.

3. Select Display Security Banner on login screen check box.

4. (Optional) To customize the security message, enter a custom message in the Security Message text box.

   The byte counter above the text box indicates the remaining number of bytes allowed for the message. The maximum is 1,500 bytes.

   Do not add blank spaces or blank lines to the security message. Blank spaces and blank lines contribute to the byte count, and they are not displayed in the security banner on the login page.

   TIP

   To restore the default text, click Use Default Message.

   iLO uses the following default text for the Login Security Banner:

   ```
   This is a private system. It is to be used solely by authorized users
   and may be monitored for all lawful purposes. By accessing this system,
   you are consenting to such monitoring.
   ```

5. Click Update.

The security message is displayed at the next login.

Host Processor Module authentication for Modular Hardware System

For Modular Hardware System (MHS), iLO will verify the integrity of the Host Processor Module(HPM) on every boot. If the HPM authentication fails, iLO logs an Integrated Management Log and the system boots according to the component integrity policy configuration.

Configuring iLO management settings

Subtopics

Agentless Management and AMS

Agentless Management uses out-of-band communication for increased security and stability. With Agentless Management, health monitoring and alerting is built into the system and begins working the moment a power cord is connected to the server.

To collect information from devices and components that cannot communicate directly with iLO, install the Agentless Management Service (AMS).

Information provided by Agentless Management with and without AMS

Component	Agentless Management without AMS	Additional information provided when AMS is installed
Server health	• Fans • Temperatures • Power supplies • Memory • CPU • NVDIMM	N/A
Storage	• Smart Array • SMART Drive Monitoring (connected to Smart Array) • Internal and external drives connected to Smart Array • Smart Storage Energy Pack monitoring (supported servers only) • NVMe drives that support MCTP	• SMART Drive Monitoring • iSCSI (Windows) • NVMe drives
Network	• MAC addresses for embedded NICs that support NC-SI over MCTP • Physical link connectivity and link up/link down traps for NICs that support NC-SI over MCTP • Fibre Channel adapters that support Hewlett Packard Enterprise vendor-defined MCTP commands	• MAC and IP address for standup and embedded NICs • Link up/link down traps • NIC teaming and bridging information (Windows and Linux) • Supported Fibre Channel adapters • VLAN information (Windows and Linux)
Other	• iLO data • Firmware inventory • Device inventory	• OS information (host SNMP MIB) • Driver/service inventory • Logging events to OS logs [1], [2], [3]
Prefailure warranty alerts	• Memory • Drives (physical and logical)	N/A

[1] AMS-based OS logging for Linux (/var/log/messages for Red Hat Enterprise Linux and SUSE Linux Enterprise Server and /var/log/syslog for VMware.
Windows System Log for Windows.

[2] Smart Array logging is supported.

[3] IML and Security Log events are included in the OS logs for Gen11 servers.

Agentless Management Service

- When you install AMS on Windows systems, the Agentless Management Service Control Panel is installed. You can use the Control Panel to configure SNMP settings, to enable or disable AMS, and to remove AMS.

- AMS writes operating system configuration information and critical events to the Active Health System Log.
- Install the iLO drivers before installing AMS.
- With iLO 7, AMS includes the optional System Management Assistant. You can use the System Management Assistant if you want to use an OS-based SNMP service to handle information provided by iLO Agentless Management and AMS.
- If AMS is not installed:
  - iLO does not display a full set of data on the component information pages, which are included in the Dashboard page.
  - iLO does not have access to OS-specific information.

Subtopics

Installing AMS

Procedure

1. Obtain AMS from one of the following sources:
   - Download the SPP (Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise Server) from the SPP download page at **https://www.hpe.com/servers/spp/download**.
   - Download the software from the Hewlett Packard Enterprise Support Center (Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware) at **https://www.hpe.com/support/hpesc**.
   - Download the software from the vibsdepot section of the Software Delivery Repository website at **https://vibsdepot.hpe.com** (VMware).

     AMS is also included in the customized Hewlett Packard Enterprise VMware ISO images (**https://www.hpe.com/info/esxidownload**).
2. Install the software.

   For instructions on using the SPP, see the SPP documentation at **https://hpe.com/support/servicepackforhpeproliant-quicklinks**.

   For other download types, follow the installation instructions provided with the software.

Verifying AMS installation

Subtopics

Verifying AMS status: iLO web interface

Procedure

Click Dashboard in the left navigation pane.

AMS is listed in the Host Overview section.

The possible values are:

- Not available—AMS is not available because it was not detected, the server is in POST or the server is powered off.
- OK—AMS is installed and running.

Verifying AMS status: Windows

Procedure

1. Open the Windows Control Panel.

   If the AMS Control Panel is present, then AMS is installed.
2. Open the AMS Control Panel.
3. Click the Service tab.

   If AMS is enabled, the following message appears:

   `Agentless Management Service(AMS) is enabled.`

Verifying AMS status: SUSE Linux Enterprise Server and Red Hat Enterprise Linux

Procedure

1. To verify that AMS is installed, enter the following command:
   `rpm -qi amsd`
   .
2. To verify that AMS is running, enter the following command:
   `systemctl status amsd smad [cpqIde cpqFca cpqScsi cpqiScsi mr_cpqScsi]`
   .

Verifying AMS status: VMware

Procedure

1. Verify that AMS is installed.
   a. Access the VMware host from the VMware vSphere Client.
   b. Navigate to the Inventory > Configuration > Health Status tab for the server.
   c. Click the plus sign (+) next to Software Components.

      The software installed on the host is listed. The AMS component includes the string `amsd`.

      The full name of the AMS component is different for each supported version of ESX/ESXi.
2. To verify that AMS is running, enter the following command:
   `/etc/init.d/amsdv status`

.

Verifying AMS status: Ubuntu

Procedure

1. To verify that AMS is installed, enter the following command:
   ```
   dpkg -l amsd
   ```
   .
2. To verify that AMS is running, enter the following command:
   ```
   sudo systemctl status smad; systemctl status amsd
   ```
   .

Restarting AMS

Procedure

- **Windows**—Navigate to the Windows Services page and restart AMS.
- **SUSE Linux Enterprise Server and Red Hat Enterprise Linux** —Enter the following command: `systemctl restart amsd smad` .
- **VMware**— Enter the following commands:
  - **For ESXi 8.x:**
    ```
    /etc/init.d/amsdv restart
    ```
  - **For ESXi 7.0 U1 and later:**
    ```
    esxcli daemon control restart -s amsd
    ```

System Management Assistant

iLO 7 does not support OS-based SNMP agents. The System Management Assistant (SMA) is an Agentless Management Service feature for users who want to run applications that obtain SNMP information from the OS.

Security

SMA communicates over secure iLO channels.

AMS modes

- **AMS (forward mode)**—The standard configuration of AMS is to pass information from the OS to iLO.
- **SMA (reverse mode)**—When SMA is enabled, information is passed from iLO to the OS.

Installation

SMA is installed as part of the AMS package, and it is disabled by default.

Enabling SMA

Use the default AMS configuration to pass information from the OS to iLO. Enable SMA to pass information from iLO to the OS. The standard configuration of AMS and SMA can be enabled at the same time.

SMA functionality

When SMA is enabled, it does the following:

- **Linux**—Proxies AgentX protocol requests between iLO and a host-based SNMP master.
- **Windows, Linux**—Proxies SNMP protocol requests between iLO and a host-based SNMP service.

  This method is used when the host-based SNMP service does not support AgentX subagents.
- **VMware**—Delivers SNMP traps from iLO and AMS to the trap destination configured through the ESXi host OS SNMP service.

SNMP master

With the default AMS configuration, AMS uses iLO as the SNMP master. SMA requires a host-based service to act as the SNMP master.

Information provided when SMA is enabled

- **Windows and Linux**—SMA provides the same information that is listed in the Agentless Management with AMS column in the Information provided by Agentless Management with and without AMS table.
- **VMware**—SMA provides only SNMP traps.

Subtopics

Using the System Management Assistant (Windows)

Prerequisites

AMS is installed.

About this task

You can choose whether to enable the SMA during an interactive AMS installation, and the SMA is not enabled during a silent installation.

To use SMA, start the SMA service and verify that the Windows SNMP service is installed and configured.

Procedure

1. Install the Windows SNMP service.
   a. Open Server Manager.
   b. Select Add roles and features.
   c. Click Next in the Before You Begin section.
   d. Click Next in Installation Type section.
   e. Click Next in Server Selection section.
   f. Click Next in Server Roles section.
   g. Expand the Remote Server Administration section.
   h. Expand Feature Administration Tools
   i. Ensure that SNMP Tools is selected.
   j. Select the check box to the left of the SNMP Service option.
   k. Click Next.

l. Click Install and wait for the installation to complete.

2. Configure the Windows SNMP service.

   a. Navigate to the Windows Services window.

   b. Right-click the SNMP service.

   c. Click the Security tab.

   d. Click Add in the Accepted Community Names section.

   e. Select an access type in the Community Rights section.

   f. Enter a community name in the Community Name section.

   g. Click Add.

   h. Click the Traps tab.

   i. Enter a community name in the Community Name section, and then click Add to list.

   j. In the Trap Destination section, click Add, and then enter the IP address of a trap destination.

   k. Click OK.

3. Start the SMA service.

   a. Navigate to the Windows Services window.

   b. Right-click the System Management Assistant, and then select Properties.

   c. Select Automatic in the Startup type menu, and then click OK.

   d. Right-click the System Management Assistant, and then select Start.

NOTE

You can also start the SMA service by:

- Navigating to `<Program Files>\OEM\AMS\Service` and then running the following command: `EnableSma.bat /f`
- Entering the following commands in a command prompt window:
  `sc config sma start=auto`
  and
  `net start sma`

Disabling the System Management Assistant (Windows)

Procedure

1. Navigate to the Windows Services window.
2. Right-click the System Management Assistant, and then select Properties.
3. Select Disabled in the Startup type menu, and then click OK.
4. Right-click the System Management Assistant, and then select Stop.

NOTE

You can also disable the SMA service by navigating to `<Program Files>\OEM\AMS\Service` and then running the following command `DisableSma.bat /f`

Using the System Management Assistant for VMware

Prerequisites

AMS is installed.

Procedure

1. Enable SNMP on the host and specify a trap destination.

   For example:

   ```
   esxcli system snmp set -e 1 -c public -t <trap dest IP address>@162/public
   ```

2. Enter the following command to verify that SNMP is enabled:

   ```
   esxcli system snmp get
   ```

3. Enter the following command to enable and start SMA:

   ```
   esxcli sma enable
   ```

4. Enter the following command to verify that SMA is running:

   ```
   esxcli sma status
   ```

5. Verify that the SMA process (`smad_rev`) is running.

Disabling the System Management Assistant (VMware)

Procedure

Run the following command: `esxcli sma disable`.

Using the System Management Assistant for Linux

Prerequisites

- AMS is installed.
- The host SNMP service is configured.
- The network is configured to pass SNMP packets between the host and the SNMP clients.

Procedure

1. Configure the host to support AgentX sub-agents by adding the following lines as the first non-comment line in the `/etc/snmp/snmpd.conf` file:

- `master agentx`
- `agentXSocket /var/agentx/master`
- `agentXPerms 777 777`
- `rocommunity <community string>`
- `trapsink 127.0.0.1 <community string>`

2. Restart `snmpd` using the following command:

```
systemctl restart snmpd
```

3. Enable the System Management Assistant.
   - **SUSE Linux Enterprise Server and Red Hat Enterprise Linux** —Enter the following commands:
     - `systemctl enable smad_rev`
     - `systemctl start smad_rev`
4. Enable and start the Agentless Management Service.
   - **SUSE Linux Enterprise Server and Red Hat Enterprise Linux** —Enter the following commands:
     - `systemctl enable amsd_rev`
     - `systemctl start amsd_rev`
5. Enable and start the other sub-agents as needed.
   - **SUSE Linux Enterprise Server and Red Hat Enterprise Linux** —Enter the following commands to start the other reverse mode sub-agents:
     - `systemctl start cpqIde_rev`
     - `systemctl start cpqScsi_rev`
     - `systemctl start mr_cpqScsi_rev`
     - `systemctl start cpqFca_rev`

Configuring SNMPv1 settings

Prerequisites

Configure iLO Settings privilege

About this task

The settings you configure on this page are for the default Agentless Management and AMS configuration. If you use the System Management Assistant and an OS-based SNMP service, similar settings must be configured on the host.

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.
2. Click SNMP Settings.

   The SNMP Settings page appears.
3. Click on SNMPv1 Settings section.

The SNMPv1 Settings window appears.

4. Enter the following values in the SNMPv1 Settings section:
   - SNMPv1 Request
   - SNMPv1 Trap
   - Read Community 1
   - Read Community 2
   - Read Community 3

   The SNMP Port and SNMP Status values are read-only on this page. You can change these values on the Access Settings page.
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the SNMPv1 Settings window.

Subtopics

SNMP options

SNMP options

- System Location—A string of up to 49 characters that specifies the physical location of the server.
- System Contact—A string of up to 49 characters that specifies the system administrator or server owner. The string can include a name, email address, or phone number.
- System Role—A string of up to 64 characters that describes the server role or function.
- System Role Detail—A string of up to 512 characters that describes specific tasks that the server might perform.
- Read Community 1, Read Community 2, and Read Community 3 —The configured SNMP read-only community strings.

  The following formats are supported:
  - A community string (for example, `public`).
  - A community string followed by an IP address or FQDN (for example, `public 192.168.0.1`).

    Use this option to specify that SNMP access will be allowed from the specified IP address or FQDN.

    You can enter an IPv4 address, an IPv6 address, or an FQDN.

  These values can be edited only if SNMPv1 Request is enabled in the SNMP Alerts section.
- Status—The status of the SNMP access setting (Enabled or Disabled).

  SNMP Port—The port used for SNMP communications.

NOTE

- Hewlett Packard Enterprise recommends enabling SNMP only when it is needed. Also use a strong and complex Community strings instead of using common community names such as public, SNMP, and so on.

Configuring SNMP alerts overview

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.

2. Click SNMP Settings.

   The SNMP Settings page appears.

3. Click  in the Overview section.

4. Configure the Trap Source Identifier by selecting iLO Hostname or OS Hostname.

5. Configure the following values:

   - System Location
   - System Contact
   - System Role
   - System Role Detail
   - SNMPv3 Request
   - SNMPv3 Trap
   - Cold Start Trap Broadcast
   - Periodic HSA Trap Configuration

6. (Optional) To generate a test alert and send it to the configured SNMP Alert Destinations, click Send Test Alert. This option is disabled if both SNMPv1 Trap and SNMPv3 Trap are disabled.

   Test alerts are used to verify the network connectivity of iLO with the configured SNMP Alert Destination addresses. After the alert is generated, check the alert destination for receipt of the alert.

7. Click Update to save the configuration.

8. Click Cancel to cancel the operation.

9. Click  to close the window.

Subtopics

SNMP alert settings
Adding SNMPv3 users
Adding SNMP Alert Destinations
Editing SNMP Alert Destinations

SNMP alert settings

Trap Source Identifier

Determines the host name that is used in the SNMP-defined sysName variable when iLO generates SNMP traps. The default setting is iLO Hostname.

The host name is an OS construct. It does not remain persistent with the server when hard drives are moved to a new server platform. The iLO sysName, however, remains persistent with the system board.

SNMPv1 Request

Enables iLO to receive external SNMPv1 requests.

SNMPv1 Trap

Enables iLO to send SNMPv1 traps to the remote management systems configured in the alert destination.

SNMPv3 Request

Enables iLO to receive external SNMPv3 requests.

SNMPv3 Trap

Enables iLO to send SNMPv3 traps to the remote management systems configured in the alert destination.

Cold Start Trap Broadcast

The Cold Start Trap is broadcast to a subnet broadcast address when any of the following conditions is met:

- SNMP Alert Destinations are not configured.
- SNMP Alert Destinations are configured, but the SNMP protocol is disabled.
- iLO failed to resolve all the SNMP Alert Destinations to IP addresses.

The subnet broadcast address for an IPv4 host is obtained by performing a bitwise logical `OR` operation between the bit complement of the subnet mask and the host IP address. For example, the host `192.168.1.1`, which has the subnet mask `255.255.252.0`, has the broadcast address `192.168.1.1 | 0.0.3.255 = 192.168.3.255`.

Periodic HSA Trap Configuration

In the default configuration, iLO sends the health status array (HSA) trap only when a component status changes (for example, the fan status changed to failed).

You can configure iLO to send the HSA trap periodically (daily, weekly, or monthly) when a supported component is in a failed or degraded state. This setting is disabled by default.

Adding SNMPv3 users

Prerequisites

Configure iLO Settings privilege

About this task

iLO supports up to eight SNMPv3 users.

Procedure

1. Click iLO Settings in the left navigation pane and select Alert & Logging

   The Alert & Logging page appears.

2. Click SNMP Settings section.

   The SNMP Settings page appears.

3. In the SNMPv3 Users section, do one of the following:

   - To add an SNMPv3 user, click Add.

4. Enter the following values:

   - Security Name

- Authentication Protocol
- Authentication Passphrase
- Privacy Protocol
- Privacy Passphrase
- User Engine ID

5. To save the user profile, do one of the following:
   - To save a new user profile, click Add.
   - To save an edited user profile, click Update.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the window.

Subtopics

SNMPv3 user options

SNMPv3 user options

- Security Name—The user profile name. Enter an alphanumeric string of 1 to 32 characters.
- Authentication Protocol—Sets the message digest algorithm to use for encoding the authorization passphrase. The message digest is calculated over an appropriate portion of an SNMP message, and is included as part of the message sent to the recipient.

  Select MD5, SHA, or SHA256.

  If iLO is configured to use the FIPS or CNSA security state, MD5 is not supported.
- Authentication Passphrase—Sets the passphrase to use for sign operations. Enter a value of 8 to 49 characters.
- Privacy Protocol—Sets the encryption algorithm to use for encoding the privacy passphrase. A portion of an SNMP message is encrypted using AES before transmission.
- Privacy Passphrase—Sets the passphrase used for encrypt operations. Enter a value of 8 to 49 characters.
- User Engine ID—Sets the user engine ID for SNMPv3 Inform packets. This value is used only for creating remote accounts used with INFORM messages.

  If this value is not set, INFORM messages are sent with the default value or the configured SNMPv3 Engine ID.

  This value must be a hexadecimal string with an even number of 10 to 64 characters, excluding the first two characters, 0x.

  For example:
  ```
  0x01020304abcdef
  ```

Adding SNMP Alert Destinations

Prerequisites

- Configure iLO Settings privilege
- SNMPv1 Trap is enabled if you want to configure SNMPv1 alert destinations.
- SNMPv3 Trap is enabled and at least one SNMPv3 user is configured if you want to configure SNMPv3 alert destinations.

About this task

iLO supports up to eight SNMP alert destinations.

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.

2. Click SNMP Settings section.

   The SNMP Settings page appears.

3. Click Add in the SNMP Alert Destinations section.

   The Add Alert Destination window appears.

4. Enter the following values:

   - SNMP Alert Destination
   - Trap Community (SNMPv1 alert destinations only)
   - SNMP Protocol
   - SNMPv3 User

5. Click Add to save the settings.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the Add Alert Destination window.

Subtopics

SNMP alert destination options

SNMP alert destination options

- SNMP Alert Destination—The IP address or FQDN of a management system that will receive SNMP alerts from iLO. This value can be up to 255 characters.

  When SNMP Alert Destinations are configured using FQDNs, and DNS provides both IPv4 and IPv6 addresses for the FQDNs, iLO sends traps to the address specified by the iLO Client Applications use IPv6 first setting on the IPv6 page. If iLO Client Applications use IPv6 first is enabled, traps will be sent to IPv6 addresses (when available). When iLO Client Applications use IPv6 first is disabled, traps will be sent to IPv4 addresses (when available).

- Trap Community—The configured SNMP trap community string.
- SNMP Protocol—The SNMP protocol to use with the configured alert destination (SNMPv1 Trap, SNMPv3 Trap, or SNMPv3 Inform).

  The SNMPv1 Trap option is available when SNMPv1 Trap is enabled in the SNMP Alerts section.

  The SNMPv3 Trap option is available when SNMPv3 Trap is enabled in the SNMP Alerts section and at least one SNMPv3 user is configured.

  The SNMPv3 Inform option is available when at least one SNMPv3 user is configured.

- SNMPv3 User—The SNMPv3 User to associate with the configured alert destination.

  This value is available only if the SNMP Protocol is set to SNMPv3 Trap or SNMPv3 Inform.

Editing SNMP Alert Destinations

Prerequisites

- Configure iLO Settings privilege
- SNMPv1 Trap option is enabled in the SNMP Alerts section, if you want to change an alert destination to use the SNMPv1 Trap protocol option.
- SNMPv3 Trap option is enabled in the SNMP Alerts section, and at least one SNMPv3 user is configured if you want to change an alert destination to use the SNMPv3 Trap protocol option.
- At least one SNMPv3 user is configured if you want to change an alert destination to use the SNMPv3 Inform protocol option.

About this task

iLO supports up to eight SNMP alert destinations.

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.
2. Click SNMP Settings section.

   The SNMP Settings page appears.
3. Select the check box next to an alert destination in the SNMP Alert Destinations section, and then click Edit.

   The edit window opens.
4. Update the following values:
   - SNMP Alert Destination
   - Trap Community (SNMPv1 alert destinations only)
   - SNMP Protocol
   - SNMPv3 User
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click to close the edit window.

Subtopics

Deleting an SNMP alert destination

Deleting an SNMP alert destination

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.

2. Click SNMP Settings section.

   The SNMP Settings page appears.

3. In the SNMP Alert Destinations section, select the check box next to the SNMP alert destination that you want to delete, and then click Delete.

4. When prompted to confirm the request, click Yes, delete.

Configuring SNMPv3 settings

Prerequisites

Configure iLO Settings privilege

About this task

Use the SNMPv3 Settings section to configure the SNMPv3 Engine ID and the SNMPv3 Inform settings.

iLO supports the industry standard SNMPv3 Inform feature. When an SNMPv3 Inform notification is sent, it is saved. The inform notification is sent again at regular intervals until the receiver sends an acknowledgment to iLO, or the maximum number of retries are reached.

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.

2. Click SNMP Settings.

   The SNMP Settings page appears.

3. Click on SNMPv3 Settings.

   The SNMPv3 Settings window appears.

4. Enter a value in the SNMPv3 Engine ID box.

   If you do not want to specify a value, you can leave this box blank.

5. To configure the SNMPv3 Inform settings, enter the following values:

   - SNMPv3 Inform Retry
   - SNMPv3 Inform Time Interval (Seconds)

   NOTE

   - Hewlett Packard Enterprise recommends enabling SNMP only when it is needed. Also use a strong and complex Community strings instead of using common community names such as public, SNMP, and so on.

6. Click Update to save the changes.

7. Click Cancel to cancel the operation.

8. Click to close the SNMPv3 Settings window.

Subtopics

SNMPv3 Settings options
SNMPv3 authentication

SNMPv3 Settings options

SNMPv3 Engine ID

The unique identifier of an SNMP engine belonging to an SNMP agent entity.

This value must be a hexadecimal string of 6 to 48 characters, not counting the preceding 0x, and must be an even number of characters (for example, `0x01020304abcdef`). If you do not configure this setting, the value is system-generated.

SNMPv3 Inform Retry

The number of times iLO will resend an alert if the receiver does not send an acknowledgment to iLO.

Enter a value from 0 to 5. The default value is 2.

SNMP Inform Time Interval

The number of seconds between attempts to resend an SNMPv3 Inform alert.

Enter a value from 5 to 120 seconds. The default value is 15 seconds.

SNMPv3 authentication

The following SNMPv3 security features enable secure data collection from iLO SNMP agents:

- Message integrity prevents tampering during packet transmission.
- Encryption prevents packet snooping.
- Authentication ensures that packets are from a valid source.

By default, SNMPv3 supports the User-based Security Model. With this model, security parameters are configured at both the SNMP agent level (iLO) and the SNMP manager level (client system). Messages exchanged between the SNMP agent and the manager are subject to a data integrity check and data origin authentication.

iLO supports eight user profiles in which you can set the SNMPv3 USM parameters.

Editing an SNMPv3 user

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and select Alert & Logging

   The Alert & Logging page appears.

2. Click SNMP Settings section.

   The SNMP Settings page appears.

3. In the SNMPv3 Users section, select the check box next to the user profile that you want to edit and click Edit.
4. Click Update to save the changes.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the window.

Deleting an SNMPv3 user

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and select Alert & Logging

   The Alert & Logging page appears.

2. Click SNMP Settings section.

   The SNMP Settings page appears.

3. In the SNMPv3 Users section, select the check box next to the user profile that you want to delete and click Delete.

   CAUTION

   If the selected SNMPv3 user profile is configured for an SNMP alert destination, the alert will not be sent after you delete the user profile.

4. When prompted to confirm the request, click Yes, delete.

Deleting an SNMP alert destination

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click Alert & Logging.

   The Alert & Logging page appears.

2. Click SNMP Settings section.

   The SNMP Settings page appears.

3. In the SNMP Alert Destinations section, select the check box next to the SNMP alert destination that you want to delete, and then click Delete.

4. When prompted to confirm the request, click Yes, delete.

Using the AMS Control Panel to configure SNMP and SNMP alerts (Windows only)

About this task

NOTE

The SNMP Settings option is not available in the AMS control panel from the subsequent releases:

- Version 2.51.4.1 for the Agentless Management Service for Microsoft Windows x64.
- Version 3.40.0.0 for the HPE Gen12 Agentless Management Service for Microsoft Windows x64.

Procedure

1. Open the Agentless Management Service Control Panel.
2. Click the SNMP tab.
3. Update the SNMP settings.
4. (Optional) To generate a test alert and send it to the configured Trap Destination(s), click Send Test Trap.

   Test alerts are used to verify the network connectivity of iLO with the Trap Destination(s) addresses. After the alert is generated, check the alert destination for receipt of the alert.
5. To save the configuration, click Apply.

SNMP traps

The following table lists the SNMP traps (with the corresponding Integrated Management Log or iLO Event Log class and code) that are supported by iLO 7 and supported ProLiant servers.

To cross reference an SNMP trap with REST alert information, see REST alerts.

To view troubleshooting information for an event, match the event class and code with the values in the IML messages and troubleshooting guide, at the following website: **https://www.hpe.com/support/ilo-docs**.

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
0	N/A	N/A	Cold Start Trap SNMP was initialized, the system completed POST, or AMS started.	N/A
4	N/A	N/A	Authentication Failure Trap SNMP detected an authentication failure.	N/A
1006	5h	3h	cpqSeCpuStatusChange An uncorrectable machine check exception was detected in a processor.	Major
1010	28h	2h	cpqSeUSBStorageDeviceReadErrorOccurred A read error occurred on an attached USB storage device.	OK
1011	28h	3h	cpqSeUSBStorageDeviceWriteErrorOccurred A write error occurred on an attached USB storage device.	OK
1012	28h	4h	cpqSeUSBStorageDeviceRedundancyLost USB storage device redundancy was lost.	Warning
1013	28h	4h	cpqSeUSBStorageDeviceRedundancyRestored USB storage device redundancy was restored.	OK

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
1014	28h	5h	cpqSeUSBStorageDeviceSyncFailed The sync operation to restore USB storage device redundancy failed.	Warning
1015	33h	5h	cpqSePCIeDiskTemperatureFailed The PCIe disk temperature crossed the upper critical threshold.	Critical
1016	33h	5h	cpqSePCIeDiskTemperatureOk The PCIe disk temperature is normal.	OK
1017	33h	2h	cpqSePCIeDiskConditionChange The PCIe disk status changed.	Critical
1018	33h	3h	cpqSePCIeDiskWearStatusChange The PCIe disk wear status changed.	Critical
1019	33h	4h	cpqSePciDeviceAddedOrPoweredOn A PCI device was added or powered on.	OK
1020	33h	5h	cpqSePciDeviceRemovedOrPoweredOff A PCI device was removed or powered off.	OK
1021	Ah	3152h	cpqSeNVMeSecureEraseFailed Secure Erase of NVMe drive failed.	Critical
1022	32h	3020h 3021h	cpqSePcieTrainingFailed PCI Express slot failed to train.	Critical
1023	Ah	3158h	cpqSePciResetFail The system is unable to perform a reset on the PCI controller in a slot.	Critical
2014	2h	2Dh	cpqSiIntrusionInstalled System intrusion hardware installed.	OK
2015	2h	2Eh	cpqSiIntrusionRemoved System intrusion hardware removed.	OK
2016	2h	30h	cpqSiHoodReplaced System hood replaced.	OK
2017	Ah	401h	cpqSiHoodRemovedOnPowerOff System hood removed when server power was off.	Major
2018	35h	1h	cpqSiSysTelemetryThresholdAlert The system telemetry metric value exceeded the upper threshold or is lower than the lower threshold.	Informational
3033	13h	12h	cpqDa6CntlrStatusChange Smart Array controller status change detected.	Critical
3034	13h	21h	cpqDa6LogDrvStatusChange Smart Array logical drive status change detected.	Critical

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
3038	13h	17h	cpqDa6AccelStatusChange Smart Array cache module status change detected.	Critical
3039	13h	23h	cpqDa6AccelBadDataTrap The Smart Array cache module lost backup power.	Critical
3040	13h	24h	cpqDa6AccelBatteryFailed The Smart Array cache module backup power failed.	Critical
3046	13h	14h	cpqDa7PhyDrvStatusChange Smart Array physical drive status change detected.	Critical
3047	13h	2Ch	cpqDa7SpareStatusChange Smart Array spare drive status change detected.	Critical
3049	13h	15h	cpqDaPhyDrvSSDWearStatusChange Smart Array physical drive SSD wear status change detected.	Critical
3903	Ah	3151h	cpqDaSmartArraySecureEraseFailed Secure Erase of Smart Array failed.	Critical
5022	13h	1Eh	cpqSasPhyDrvStatusChange AMS detected a change in the status of an SAS or SATA physical drive.	Critical
5026	13h	1Fh	cpqSasPhyDrvSSDWearStatusChange AMS detected a change in the SSD wear status of an SAS or SATA physical drive.	Critical
6026	2h	38h	cpqHe3ThermalConfirmation The server was shut down due to a thermal anomaly and is now operational.	OK
6027	Ah	101h	cpqHe3PostError One or more POST errors occurred.	Warning
6032	Bh	36h	cpqHe3FltTolPowerRedundancyLost The fault-tolerant power supplies lost redundancy for the specified chassis.	Major
6033	Bh	31h	cpqHe3FltTolPowerSupplyInserted A fault-tolerant power supply was inserted.	OK
6034	Bh	2Ch	cpqHe3FltTolPowerSupplyRemoved A fault-tolerant power supply was removed.	Major
6035	2h	1Ah	cpqHe3FltTolFanDegraded The fault-tolerant fan condition was set to Degraded.	Critical
6036	2h	17h	cpqHe3FltTolFanFailed The fault-tolerant fan condition was set to Failed.	Critical
6037	2h	23h	cpqHe3FltTolFanRedundancyLost The fault-tolerant fans lost redundancy.	Major

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
6038	2h	1Fh	cpqHe3FltTolFanInserted A fault-tolerant fan was inserted.	OK
6039	2h	1Bh	cpqHe3FltTolFanRemoved A fault-tolerant fan was removed.	Major
6040	2h	27h	cpqHe3TemperatureFailed Temperature exceeded on the server.	Critical
6041	2h	14h	cpqHe3TemperatureDegraded The temperature status was set to Degraded and the temperature is outside the normal operating range. Depending on the system configuration, this system might be shut down.	Critical
6042	2h	13h	cpqHe3TemperatureOk The temperature status was set to OK.	OK
6048	Bh	28h	cpqHe4FltTolPowerSupplyOk The fault-tolerant power supply condition was set to OK.	OK
6049	Bh	15h	cpqHe4FltTolPowerSupplyDegraded The fault-tolerant power supply condition was set to Degraded.	Critical
6050	Bh	28h	cpqHe4FltTolPowerSupplyFailed The fault-tolerant power supply condition was set to Failed.	Critical
6051	N/A	N/A	cpqHeResilientMemMirroredMemoryEngaged The Advanced Memory Protection subsystem detected a memory fault. Mirrored Memory was activated.	Major
6054	Bh	36h	cpqHe3FltTolPowerRedundancyRestore The fault-tolerant power supplies returned to a redundant state.	OK
6055	2h	23h	cpqHe3FltTolFanRedundancyRestored The fault-tolerant fans returned to a redundant state.	OK
6061	N/A	N/A	cpqHeManagementProcInReset The management processor is resetting.	Minor
6062	N/A	N/A	cpqHeManagementProcReady The management processor is ready.	Informational
6064	N/A	N/A	cpqHe5CorrMemReplaceMemModule Memory errors were corrected. Replace the memory module.	Major
6069	Bh	52h	cpqHe4FltTolPowerSupplyACpowerloss The fault-tolerant power supply in the specified chassis and bay reported AC power loss.	Critical
6070	Bh	3Eh	cpqHeSysBatteryFailed The HPE Smart Storage Battery failed.	Warning
6071	Bh	1Eh	cpqHeSysBatteryRemoved The HPE Smart Storage Battery was removed.	Warning

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
6072	27h	4h	cpqHeSysPwrAllocationNotOptimized iLO could not determine the power requirements. The server power allocation is not optimized.	Warning
6073	Bh	24h	cpqHeSysPwrOnDenied The server could not power on because the hardware cannot be identified.	Critical
6074	14h	7h	cpqHePowerFailureError A device power failure was detected.	Critical
6075	29h	1h	cpqHeInterlockFailureError A device is missing or improperly seated on the system board.	Critical
6076	Ah	340h	cpqHeNvdimmBackupError An NVDIMM backup error was detected.	Critical
6077	Ah	341h	cpqHeNvdimmRestoreError An NVDIMM restore error was detected.	Critical
6078	Ah	342h	cpqHeNvdimmUncorrectableMemoryError An uncorrectable memory error was detected.	Critical
6079	Ah	343h	cpqHeNvdimmBackupPowerError An NVDIMM backup power error occurred. Backup power is not available and a future backup is not possible.	Critical
6080	Ah	344h	cpqHeNvdimmNVDIMMControllerError An NVDIMM controller error occurred and the OS will not use the NVDIMM.	Critical
6081	Ah	345h	cpqHeNvdimmEraseError An NVDIMM could not be erased and future backups are not possible.	Critical
6082	Ah	346h	cpqHeNvdimmArmingError An NVDIMM could not be armed and future backups are not possible.	Critical
6083	Ah	355h	cpqHeNvdimmSanitizationOk This NVDIMM-N was selected for sanitizing/erasing. All data saved in the NVDIMM was erased.	OK
6084	Ah	356h	cpqHeNvdimmSanitizationError This NVDIMM-N was selected for sanitizing/erasing, but the process was unsuccessful.	Critical
6085	Ah	364h	cpqHeNvdimmControllerFirmwareError An NVDIMM controller firmware error occurred. The controller firmware is corrupted and the OS will not use the NVDIMM.	Critical
6086	Ah	374h	cpqHeNvdimmErrorInterleaveOn A memory initialization or uncorrectable error occurred. All NVDIMMs on the processor are disabled.	Critical

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
6087	Ah	375h	cpqHeNvdimmInterleaveOff A memory initialization or uncorrectable error occurred. NVDIMM is disabled.	Critical
6088	Ah	394h	cpqHeNvdimmEventNotifyError Unable to set event notification for this NVDIMM.	Critical
6089	Ah	395h	cpqHeNvdimmPersistencyLost NVDIMM persistency is lost and future data backup is not available.	Critical
6090	Ah	396h	cpqHeNvdimmPersistencyRestored NVDIMM persistency is restored and future data backup is available.	Informational
6091	Ah	397h	cpqHeNvdimmLifecycleWarning NVDIMM life cycle warning. The NVDIMM lifetime is reached.	Major
6092	Ah	430h	cpqHeNvdimmLogicalNvdimmError Logical NVDIMM errors occurred.	Major
6093	Ah	354h	cpqHeNvdimmConfigurationError NVDIMM configuration errors occurred.	Critical
6094	Ah	351h	cpqHeNvdimmBatteryNotChargedwithWait The smart battery is not sufficiently charged to support the installed NVDIMMs.	OK
6095	Ah	352h	cpqHeNvdimmBatteryNotChargedwithNoWait Smart battery is not sufficiently charged to support the installed NVDIMMs.	OK
6096	Ah	388h	cpqHeDimmMemoryMapChanged Uncorrectable Memory Error—The failed memory module could not be determined.	Warning
6098	Ah	483h	cpqHeNvdimmInitializationError One or more NVDIMMs cannot be initialized due to an internal error.	Warning
6099	Bh	54h	cpqHePwrSupplyError A system power supply error occurred.	Warning
6100	Bh	54h	cpqHePwrSupplyErrorRepaired A system power supply error was repaired.	OK
6101	Bh	55h	cpqHeBbuError A battery backup unit error occurred.	Warning
6102	Bh	55h	cpqHeBbuErrorRepaired A battery backup unit error was repaired.	OK
6103	Bh	1Ch	cpqHeNoPowerSupplyDetected No power supply or power backplane was detected.	Major

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
6104	Bh	1Bh	cpqHePowerProtectionFault A system board power protection fault occurred.	Critical
6105	14h	9h	cpqHePowerFuseDegraded A degraded power event was detected and the server system board should be replaced.	Critical
6106	Ah	3134h	cpqHeTPMSecureEraseFailed Secure Erase of Trusted Platform Module failed.	Critical
6107	Ah	3140h	cpqHeSPISecureEraseFailed Secure Erase of system firmware configuration failed.	Critical
6109	28h	6h	cpqHeNANDSecureEraseFailed Secure Erase of the management processor embedded media device failed.	Critical
6110	Ah	3143h 3145h 3146h	cpqHeSedPassphrasefail Device encryption error. Enabling or disabling encryption or modifying passphrase failed.	Critical
6111	Ah	3148h	cpqHeSedUnlockfail Three incorrect attempts were made to unlock a self-encrypting device. The device will be locked until the next reboot.	Major
6116	0xA	0x460	cpqHePMMCorrErrThreshold Correctable memory error threshold exceeded	Major
6118	2h	39h	cpqHeInletAmbientPreCautionThresAlert The Inlet Ambient sensor reading equals or exceeds the user defined value.	Minor
6119	0x2	0x3C	cpqHeCoolingModuleDegraded The cooling module condition was set to degraded for the specified chassis.	Major
6120	0x2	0x3B	cpqHeCoolingModuleFailed The cooling module condition was set to failed for the specified chassis.	Critical
6121	0x2	0x3D	cpqHeCoolingModuleRedundancyLost The cooling module lost redundancy for the specified chassis.	Major
6122	0x2	0x3D	cpqHeCoolingModuleRedundancyRestored The cooling module returned to a redundant state for the specified chassis.	Informational
6123	0xB	0x90	cpqHeUnsupportedPwrSupplyDetected Unsupported power supply configuration.	Critical
6124	0xB	0x90	cpqHeUnSupportedPwrSupplyRemoved Unsupported power supply removed.	Informational

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
6125	0x2	0x3F	cpqHeUserTempThreshWarning User defined caution temperature threshold exceeded.	Minor
6126	0x2	0x40	cpqHeUserTempThreshCritical User defined critical temperature threshold exceeded.	Critical
8029	13h	28h	cpqSs6FanStatusChange The storage enclosure fan status changed.	Critical
8030	13h	29h	cpqSs6TempStatusChange The storage enclosure temperature status changed.	Critical
8031	13h	2Ah	cpqSs6PwrSupplyStatusChange The storage enclosure power status changed.	Critical
8032	13h	2Bh	cpqSsConnectionStatusChange The storage enclosure status changed.	Critical
9001	23h	5h	cpqSm2ServerReset The server power was reset.	Critical
9003	23h	1100h	cpqSm2UnauthorizedLoginAttempts The maximum unauthorized login attempt threshold was exceeded.	Informational
9005	23h	1101h	cpqSm2SelfTestError iLO detected a self-test error.	Critical
9012	23h	104h	cpqSm2SecurityOverrideEngaged iLO detected that the security override jumper was toggled to the engaged position.	Informational
9013	23h	105h	cpqSm2SecurityOverrideDisengaged iLO detected that the security override jumper was toggled to the disengaged position.	Informational
9017	23h	3h	cpqSm2ServerPowerOn The server was powered on.	OK
9018	23h	1h	cpqSm2ServerPowerOff The server was powered off.	OK
9019	23h	1102h	cpqSm2ServerPowerOnFailure A power-on request occurred, but the server could not be powered on because of a failure condition.	Critical
9020	23h	1138h	cpqSm2IrsCommFailure Communication with Insight Remote Support failed.	Warning
9021	32h	3h	cpqSm2FirmwareValidationScanFailed Firmware validation failure (iLO, IE, or SPS firmware).	Critical
9022	32h	3h	cpqSm2FirmwareValidationScanErrorRepaired A reported firmware integrity scan issue was repaired.	OK

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
9023	32h	4h	cpqSm2FirmwareValidationAutoRepairFailed Firmware recovery failed.	Warning
9024	14h	2h	cpqSm2AutoShutdownInitiated iLO initiated an automatic operating system shutdown.	Major
9025	14h	2h	cpqSm2AutoShutdownCancelled An automatic operating system shutdown was canceled.	OK
9026	23h	448h	cpqSm2FwUpdateUploadFailed A firmware update or upload failed.	Warning
9027	23h	464h	cpqSm2SecurityStateChange The iLO security state changed.	OK
9028	23h	B3h	cpqSm2WDTimerReset iLO detected a watchdog timer timeout. The failsafe timer was not periodically addressed after it was armed in the operating system.	Major
9029	23h	491h	cpqSm2OverallSecStateAtRisk System security state at risk.	Major
9030	23h	490h	cpqSm2OverallSecStatusChange Overall security status changed.	Major
11003	1h	1h	cpqHo2GenericTrap Generic trap. Verifies that the SNMP configuration, client SNMP console, and network are operating correctly. You can use the iLO web interface to generate this alert to verify receipt of the alert on the SNMP console.	Informational
11018	23h	CEh	cpqHo2PowerThresholdTrap A power threshold was exceeded.	Major
11020	N/A	N/A	cpqHoMibHealthStatusArrayChangeTrap A server health status change occurred.	N/A
14004	13h	20h	cpqIdeAtaDiskStatusChange AMS detected an ATA disk drive status change.	Critical
14007	Ah	3150h	cpqIdeAtaSecureEraseFailed Secure erase of SATA drive failed.	Critical
16028	11h	Bh	cpqFca3HostCntlrStatusChange AMS detected a Fibre Channel host controller status change.	Critical
18011	11h	Ah	cpqNic3ConnectivityRestored Connectivity was restored to a logical network adapter.	OK
18012	11h	Ah	cpqNic3ConnectivityLost The status of a logical network adapter changed to Failed.	Warning

Trap ID	Event Class	Event Code	Trap name and Description	Trap Severity
18013	11h	Ch	cpqNic3RedundancyIncreased AMS detected that a previously failed physical adapter in a connected logical adapter group returned to OK status.	OK
18014	11h	Ch	cpqNic3RedundancyReduced AMS detected that a physical adapter in a logical adapter group changed to Failed status, but at least one physical adapter remains in OK status.	Warning
18015	11h	Dh	cpqNicAllLinksDown All links are down on a network adapter.	Major
18016	Bh	Eh	cpqNicAllLinksDownRepaired One or more links on a network adapter were repaired.	OK
18017	32h	3023h	cpqNicFlexLomTrainingFailed Flexlom slot failed to train.	Critical
169001	12h	1h	cpqiScsiLinkUp The iSCSI link is up.	OK
169002	12h	2h	cpqiScsiLinkDown The iSCSI link is down.	Major

For more information about these SNMP traps, see the following MIB files in the Insight Management MIB update kit for HPE SIM:

cpqida.mib	Drive array
cpqhost.mib	Server host system details
cpqhlth.mib	Server health system
cpqsm2.mib	Remote Insight/Integrated Lights-Out
cpqide.mib	IDE subsystem
cpqscsi.mib	SCSI system
cpqiscsi.mib	iSCSI system
cpqnic.mib	System NIC
cpqstsys.mib	Storage systems
cpqstdeq.mib	Server standard equipment
cpqfca.mib	Fibre Channel array
cpqsinfo.mib	System Information
cpqstsys.mib	Smart Array storage

REST alerts

The following table lists the REST alerts supported by iLO 7 and supported HPE ProLiant Compute servers. To cross reference a REST alert with SNMP trap information, see SNMP traps.

Trap ID	REST Alert ID	REST Severity
0	N/A	N/A
4	SNMPAuthenticationFailure	OK
1006	ProcessorStatusUnknown	Warning
	ProcessorStatusOK	OK
	ProcessorStatusDegraded	Warning
	ProcessorStatusDisabled	Warning
	ProcessorStatusFailed	Critical
1010	USBStorageDeviceReadError	OK
1011	USBStorageDeviceWriteError	OK
1012	USBStorageDeviceRedundancyLost	Warning
1013	USBStorageDeviceRedundancyRestored	OK
1014	USBStorageDeviceSyncFailed	Warning
1015	PCIeDiskTemperatureFailed	Critical
1016	PCIeDiskTemperatureOk	OK
1017	PCIeDriveConditionOk	OK
	PCIeDriveConditionDegraded	Warning
	PCIeDriveConditionFailed	Critical
1018	PCIeDriveWearStatusOk	OK
	PCIeDriveWearStatusFiftySixDayThreshold	Warning
	PCIeDriveWearStatusFivePercentThreshold	Warning
	PCIeDriveWearStatusTwoPercentThreshold	Warning
	PCIeDriveWearStatusWearOut	Critical
1019	PCIeDriveAddedOrPowerOn	OK
1020	PCIeDriveRemovedOrPowerOff	OK
1021	NVMeSecureEraseFailed	Critical
1022	N/A	N/A
1023	PciResetFail	Critical
1193	BIOSSafeModeEngaged	OK
1194	N/A	N/A
1197	IntelligentDiagnosticsEnabled	OK
1198	IntelligentDiagnosticsExit	OK
1328	BIOSSafeModeExit	OK

Trap ID	REST Alert ID	REST Severity
1329	N/A	N/A
2014	IntrusionHWInstalled	OK
2015	IntrusionHWRemoved	OK
2016	HoodReplaced	OK
2017	HoodRemovedOnPowerOff	Warning
2018	MetricValueExceededUpperThreshold	Warning
	MetricValueBelowLowerThreshold	Warning
3033	DrvArrControllerFailed	Critical
	DrvArrControllerOK	OK
3034	DrvArrLogDrvFailed	Critical
	DrvArrLogDrvUnconfigured	Critical
	DrvArrLogDrvRecovering	Warning
	DrvArrLogDrvReadyRebuild	Warning
	DrvArrLogDrvRebuilding	Warning
	DrvArrLogDrvWrongDrive	Critical
	DrvArrLogDrvBadConnect	Critical
	DrvArrLogDrvOverheating	Warning
	DrvArrLogDrvShutdown	Critical
	DrvArrLogDrvExpanding	OK
	DrvArrLogDrvNotAvailable	Warning
	DrvArrLogDrvQueuedForExpansion	Warning
	DrvArrLogDrvMultiPathAccessDegraded	Warning
	DrvArrLogDrvErasing	Warning
	DrvArrLogDrvPredictiveSpareRebuildReady	OK
	DrvArrLogDrvRapidParityInitializationInProgress	Warning
	DrvArrLogDrvRapidParityInitializationPending	Warning
	DrvArrLogDrvNoAccessEncryptedMissingKey	Critical
	DrvArrLogDrvUnencryptedToEncryptedTransformationInProgress	Warning
	DrvArrLogDrvRekeyInProgress	Warning
	DrvArrLogDrvNoAccessEncryptedWithControllerEncryptionNotEnabled	Critical
	DrvArrLogDrvUnencryptedToEncryptedTransformationNotStarted	OK
	DrvArrLogDrvNewLogDrvKeyRekeyRequestReceived	OK
	DrvArrLogDrvOK	OK

Trap ID	REST Alert ID	REST Severity
3038	DrvArrayAccBoardInvalid	Warning
	DrvArrayAccBoardEnabled	OK
	DrvArrayAccBoardTempDisabled_BadConfiguration	Critical
	DrvArrayAccBoardTempDisabled_LowBatteryPower	Critical
	DrvArrayAccBoardTempDisabled_DisableCommandIssued	Warning
	DrvArrayAccBoardTempDisabled_NoResourcesAvailable	Warning
	DrvArrayAccBoardTempDisabled_BoardNotConnected	Critical
	DrvArrayAccBoardPermDisabled_BadMirrorData	Warning
	DrvArrayAccBoardPermDisabled_ReadFailure	Warning
	DrvArrayAccBoardPermDisabled_WriteFailure	Warning
	DrvArrayAccBoardPermDisabled_ConfigCommand	Warning
	DrvArrayAccBoardTempDisabled_ExpandInProgress	OK
	DrvArrayAccBoardTempDisabled_SnapshotInProgress	OK
	DrvArrayAccBoardTempDisabled_RedundantLowBattery	OK
	DrvArrayAccBoardTempDisabled_RedundantSizeMismatch	OK
	DrvArrayAccBoardTempDisabled_RedundantCacheFailure	Warning
	DrvArrayAccBoardPermDisabled_ExcessiveECCErrors	Critical
	DrvArrayAccBoardTempDisabled_RAID_ADG_EnablerModuleMissing	Critical
	DrvArrayAccBoardPermDisabled_PostECCErrors	OK
	DrvArrayAccBoardPermDisabled_BackupPowerSourceHotRemoved	Critical
	DrvArrayAccBoardPermDisabled_CapacitorChargeLow	Critical
	DrvArrayAccBoardPermDisabled_NotEnoughBatteries	Warning
	DrvArrayAccBoardPermDisabled_NotSupportedByFirmware	Warning
	DrvArrayAccBoardPermDisabled_BatteryNotSupported	Critical
	DrvArrayAccBoardPermDisabled_NoCapacitorAttached	Critical
	DrvArrayAccBoardPermDisabled_FlashBackedBackupFailed	Warning
	DrvArrayAccBoardPermDisabled_FlashBackedRestoreFailed	Critical
	DrvArrayAccBoardPermDisabled_FlashBackedHardwareFailure	Critical
	DrvArrayAccBoardPermDisabled_CapacitorFailedToCharge	Critical
	DrvArrayAccBoardPermDisabled_IncompatibleCacheModule	Critical
	DrvArrayAccBoardPermDisabled_ChargerCircuitFailure	Critical
	DrvArrayAccBoardTempDisabled_MegaCellNotCabled	Critical
	DrvArrAcceleratorFlashMemoryNotAttached	Warning
3039	DrvArrayAccBoardBadData	Critical
3040	DrvArrayAccBoardBatteryFailed	Critical

Trap ID	REST Alert ID	REST Severity
3046	DrvArrPhysDrvFailed	Critical
	DrvArrPhysDrvPredictiveFailure	Warning
	DrvArrPhysDrvWearOut	Warning
	DrvArrPhysDrvErasing	Warning
	DrvArrPhysDrvNotAuthenticated	Warning
	DrvArrPhysDrvEraseDone	Warning
	DrvArrPhysDrvEraseQueued	Warning
	DrvArrPhysDrvOK	OK
3047	DrvArrSpareDriveFailed	Critical
	DrvArrSpareDriveInactive	OK
	DrvArrSpareDriveBuilding	Critical
	DrvArrSpareDriveActive	OK
3049	DrvArrSolidStateDiskFiftySixDayThresholdPassed	Warning
	DrvArrSolidStateDiskFivePercentThresholdPassed	Warning
	DrvArrSolidStateDiskTwoPercentThresholdPassed	Warning
	DrvArrSolidStateDiskWearOut	Critical
	DrvArrSolidStateDiskWearOK	OK
3903	SmartArraySecureEraseFailed	Critical
5022	N/A	N/A
5026	N/A	N/A
6026	ServerOperational	Warning
6027	POSTErrorsOccurred	Warning
6032	PowerRedundancyLost	Warning
6033	PowerSupplyInserted	OK
6034	PowerSupplyRemoved	Warning
6035	FanDegraded	Critical
6036	FanFailed	Critical
6037	FanRedundancyLost	Warning
6038	FanInserted	OK
6039	FanRemoved	Warning
6040	ThermalStatusFailure	Critical
6041	ThermalStatusDegradedSysShutdown	Critical
	ThermalStatusDegradedSysContinue	Critical
6042	ThermalStatusOK	OK
6048	PowerSupplyOK	OK

Trap ID	REST Alert ID	REST Severity
6049	PowerSupplyDegraded	Critical
6050	PowerSupplyFailed	Critical
6051	MirroredMemoryEngaged	Warning
6054	PowerRedundancyRestored	OK
6055	FanRedundancyRestored	OK
6061	N/A	N/A
6062	N/A	N/A
6064	CorrectableOrUncorrectableMemoryErrors	Warning
6069	PowerSupplyACPowerLoss	Critical
6070	SystemBatteryFailed	Warning
6071	SystemBatteryRemoved	Warning
6072	SystemPowerAllocationNotOptimized	Critical
6073	SystemPowerOnDenied	Critical
6074	PowerFailureErrorTempAboveCritical	Critical
	PowerFailureErrorInputPowerLoss	Critical
	PowerFailureErrorBadFuse	Critical
	PowerFailureStandby	Critical
	PowerFailureRuntime	Critical
	PowerFailurePowerOn	Critical
	PowerFailureUnknown	Critical
	PowerFailureCpuThermalTrip	Critical
6075	InterlockFailureErrorStandby	Critical
	InterlockFailureErrorRuntime	Critical
	InterlockFailureErrorPowerOn	Critical
	InterlockFailureErrorUnknown	Critical
6076	NvdimmBackupError	Critical
6077	NvdimmRestoreError	Critical
6078	NvdimmUncorrectableMemoryError	Critical
6079	NvdimmBackupPowerError	Critical
6080	NvdimmControllerError	Critical
6081	NvdimmEraseError	Critical
6082	NvdimmArmingError	Critical
6083	HeNvdimmSanitizationOk	Warning
6084	NvdimmSanitizationError	Critical

Trap ID	REST Alert ID	REST Severity
6085	HeNvdimmControllerFirmwareError	Critical
6086	NvdimmInterleaveOn	Critical
6087	NvdimmInterleaveOff	Critical
6088	NvdimmEventNotifyError	Critical
6089	NvdimmPersistencyLost	Critical
6090	NvdimmPersistencyRestored	OK
6091	HeNvdimmLifecycleWarning	Warning
6092	NvdimmLogicalNvdimmError	Warning
6093	NvdimmConfigurationError	Critical
6094	NvdimmBatteryNotChargedwithWait	Warning
6095	NvdimmBatteryNotChargedwithNoWait	Warning
6096	NvdimmMemoryMapChanged	Warning
6097	NvdimmPersistantMemoryAddressError	Critical
6098	NvdimmInitializationError	Warning
6099	PwrSupplyError	Warning
6100	PwrSupplyErrorRepaired	OK
6101	BatteryBackupUnitError	Critical
6102	BatteryBackupUnitErrorRepaired	OK
6103	NoPowerSupplyDetected	Critical
6104	PowerProtectionFault	Critical
6105	PowerDegradedEventDetected	Critical
6106	TPMSecureEraseFailed	Critical
6107	SPISecureEraseFailed	Critical
6108	AEPSecureEraseFailed	Critical
6109	EmbeddedMediaSecureEraseFailed	Critical
6110	SEDPassPhraseFailed	Critical
6111	SEDUnlockFailed	Warning
6118	InletAmbientPreCautionThresAlert	OK
6125	cpqHeUserTempThreshWarning	Warning
6126	cpqHeUserTempThreshCritical	Critical

Trap ID	REST Alert ID	REST Severity
8029	StorageSystemFanFailed	Critical
	StorageSystemNoFan	Warning
	StorageSystemFanDegraded	Critical
	StorageSystemFanOK	OK
8030	StorageSystemTemperatureFailed	Critical
	StorageSystemTemperatureDegraded	Critical
	StorageSystemNoTemperature	Warning
	StorageSystemTemperatureOK	OK
8031	StorageSystemPwrSupplyDegraded	Critical
	StorageSystemNoPwrSupply	Warning
	StorageSystemPwrSupplyOK	OK
8032	N/A	N/A
9001	ServerResetDetected	Warning
9003	UnauthorizedLoginAttempts	OK
9005	N/A	N/A
9012	SecurityOverrideEngaged	OK
9013	SecurityOverrideDisengaged	OK
9017	ServerPoweredOn	OK
9018	ServerPoweredOff	OK
9019	ServerPowerOnFailure	Critical
9020	ILOToInsightRemoteSupportCommunicationFailure	Warning
9021	FirmwareValidationScanFailed	Critical
9022	FirmwareValidationScanErrorRepaired	OK
9023	FirmwareValidationAutoRepairFailed	Warning
9024	AutoShutdownInitiated	Critical
9025	AutoShutdownCancelled	OK
9026	N/A	N/A
9027	N/A	N/A
9028	IPMIWatchdogTimerReset	Warning
9029	OverallSecStateAtRisk	Warning
9030	OverallSecStatusChange	Warning
11003	TestAlert	OK
11018	PowerThresholdBreach	Warning

Trap ID	REST Alert ID	REST Severity
11020	N/A	N/A
14004	N/A	N/A
14007	IdeAtaSecureEraseFailed	Critical
16028	N/A	N/A
18011	NicConnectivityRestored	OK
18012	NicConnectivityLost	Warning
18013	N/A	N/A
18014	N/A	N/A
18015	NicAllLinksDown	Critical
18016	NicAllLinksDownRepaired	OK
18017	N/A	N/A
169001	N/A	N/A
169002	N/A	N/A
999927	EnclosureManagerFirmwareMismatch	Critical
80321	StorageSystemNotConnected	Critical
80323	StorageSystemConnected	OK
80322	StorageSystemNotSupported	Warning
6120	LiquidCoolingModuleFailed	Critical
6119	LiquidCoolingModuleDegraded	Critical
6121	LiquidCoolingModuleRedundancyLost	Warning
6122	LiquidCoolingModuleRedundancyRestored	OK
6123	UnsupportedPowerSupplyUnitDetected	Critical
6124	UnsupportedPowerSupplyUnitRemoved	OK
140083	DriveSmartError	Critical
140084	DriveFailed	Critical
140085	DriveWearOut	Warning
140082	DriveOk	OK
140086	DriveRemoved	Warning
140087	DriveInserted	Warning
140096	SsdWearOut	Critical

IPMI alerts

#	Name	IPMI SEL Event (Y/N)	IPMI SEL Event Details	SNMP support? (Y/N)	OID
1	CPU failure	Y	IERR | Asserted Uncorrectable Machine check exception | Asserted Configuration Error | Asserted	Y	cpqSeCpuUncorrectableError cpqSeCpuStatusChange
3	Memory ECC error	Y	Uncorrectable ECC | Asserted	Y	cpqHe5CorrMemReplaceMemModule
4	Correctable memory error	Y	Correctable ECC | Asserted	N	N/A
5	Memory failure	Y	Memory Device Disabled | Asserted Configuration Error | Asserted	Y	cpqHe5CorrMemReplaceMemModule
9	Power supply failure	Y	Failure detected | Asserted Power Supply AC lost | Asserted	Y	cpqHe4FltTolPowerSupplyFailed cpqHePwrSupplyError cpqHe4FltTolPowerSupplyACpowerloss cpqHeNoPowerSupplyDetected
10	Power supply removed	Y	Presence detected | Deasserted	Y	cpqHe3FltTolPowerSupplyRemoved
14	Hard disk failure	Y	Drive Fault | Asserted Predictive Failure | Asserted In Failed Array | Asserted	Y	cpqDa7PhyDrvStatusChange
16	Fan failure	Y	Transition to OK | Asserted Transition to Non-Critical from OK | Asserted Transition to Non-Recoverable from less severe | Asserted Transition to Non-Critical from more severe | Asserted	Y	cpqHe3FltTolFanDegraded cpqHe3FltTolFanFailed cpqHe3FltTolFanRedundancyLost cpqHe3FltTolFanInserted
17	Fan removed	N	–	Y	cpqHe3FltTolFanRemoved

iLO Mail

iLO Mail enables you to configure iLO to send alert conditions detected independently of the host operating system to one or more email addresses, and to enable SMTP for Two Factor Authentication. iLO AlertMail messages include major host system events that appear in the IML. For example, if a fan failure occurs, an event is recorded in the IML and an email message with the details is sent to the configured email addresses.

Some email service providers establish filters and rules to block problem emails such as spam, commercial content, and unwanted volume. These tools might block the receipt of messages generated by iLO. To work around this issue, Hewlett Packard Enterprise recommends enabling a secure SMTP connection (TLS) and configuring a sender email address that is recognized by the configured SMTP server.

Subtopics

Enabling AlertMail

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: https://-WWWDOC-
- Configure iLO Settings privilege
- For configurations with Enable SMTP Authentication enabled, you have the user name and password of an email account on the SMTP Server.
- For configurations with Enable SMTP Secure Connection (TLS) enabled, TLS is enabled on the server.
- If you use a public or ISP SMTP server, make sure that the email addresses you will use for the recipient addresses are configured to allow less secure applications.

Procedure

1. Click iLO Settings in the left navigation pane and click the Alert & Logging.
2. The Alert & Logging page appears.
3. Click the ellipsis icon next to Mail Settings and select Edit Settings.

   The Mail Settings page appears.
4. Set the Enable iLO AlertMail option to enabled.
5. Enter the following information:
   - Recipient Email Address
   - Sender Domain or Email Address
   - SMTP Port

     If the Enable SMTP Secure Connection (TLS) option will be used, Hewlett Packard Enterprise recommends setting this value to 587.
   - SMTP Server
6. To send AlertMail messages over a secure connection, enable the Enable SMTP Secure Connection (TLS) option.
7. To authenticate the SMTP connection with an email account user name and password, enable the Enable SMTP Authentication option.
8. If Enable SMTP Secure Connection (TLS) and Enable SMTP Authentication are enabled:
   a. Enter the user name for an email account on the configured SMTP server in the SMTP Username box.
   b. Select the Change SMTP Password check box.
   c. Enter the password for the email account user name in the New SMTP Password and Confirm SMTP Password boxes.
9. Click Update to save the changes.
10. Click Cancel to cancel the operation.
11. Click ✕ to close the window.

12. (Optional) To send a test alert mail to the configured email addresses, click Send Test AlertMail.

    This button is available only when AlertMail is enabled.

    The test AlertMail is initiated.

13. (Optional) If you sent a test message, check the iLO event log to confirm that it was sent successfully.

Subtopics

AlertMail options

AlertMail options

Recipient Email Address

One or more destination email addresses to receive iLO email alerts. You can enter multiple email addresses separated by a Comma or Semicolon. Enter the addresses in standard email address format. You can enter up to 260 characters in the Recipient Email Address box.

If you use a public or ISP SMTP server, make sure that the email addresses you enter are configured to allow less secure applications.

Sender Domain or Email Address

The sender (from) email address (up to 63 characters). This value can be formed by using the following methods:

- Enter a sender domain to be combined with the iLO Hostname. When you use this method, the sender email address is < iLO Hostname>@<Sender Domain>.
- Enter a custom email address that includes your internal network domain. For example, <name>@<internal domain>.com.
- Enter a custom email address that uses a public email server. For example, <name>@<email provider>.com.

  This address must be a valid email address that is recognized by the configured SMTP server.

SMTP Port

The port the SMTP server will use for authenticated or unauthenticated SMTP connections. The default value is 25. For secure connections, Hewlett Packard Enterprise recommends port 587.

SMTP Server

The IP address or DNS name of the SMTP server or the mail submission agent. This server cooperates with the mail transfer agent to deliver the email. You can enter an IPv4 address, an IPv6 address, or an FQDN. This string can be up to 63 characters.

Enable SMTP Secure Connection (TLS)

Enable this option to send AlertMail messages over a secure connection. When a message is sent, iLO and the configured SMTP Server negotiate to select a common TLS connection.

iLO supports only explicit/opportunistic TLS SMTP servers (STARTTLS SMTP servers).

This value is enabled by default.

Enable SMTP Authentication

Enable this option to authenticate against the configured SMTP Server after connecting through a secure connection. To use this option, Enable SMTP Secure Connection (TLS) must be enabled and you must provide the user name and password for an email account on the SMTP server.

SMTP Username

The username (up to 63 characters) for an account on the configured SMTP Server. This value is required if Enable SMTP Authentication is enabled.

To clear this value, disable the Enable SMTP Authentication option, delete the text in this box, and then click Apply.

Change SMTP Password

Click this check box to enter or update and confirm the password for the SMTP Username account. This value is required if Enable SMTP Authentication is enabled, and it can be up to 63 characters long.

The password value cannot be viewed or copied from the iLO web interface.

To clear the password, disable the Enable SMTP Authentication option, apply blank password and password confirmation values, and then click Apply.

Disabling AlertMail

Prerequisites

- A license that supports this feature is installed. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://-WWWDOC-**
- Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click the Alert & Logging.
2. The Alert & Logging page appears.
3. Click the ellipsis icon next to Mail Settings and select Edit Settings.

   The Mail Settings page appears.
4. Set the Enable iLO AlertMail option to disabled.
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the window.

Enabling SMTP for Two Factor Authentication

Prerequisites

- Configure iLO Settings privilege
- Configure SMTP server

Procedure

1. Click iLO Settings in the left navigation pane and click the Alert & Logging.
2. The Alert & Logging page appears.
3. Click the ellipsis icon next to Mail Settings and select Edit Settings.

   The Mail Settings page appears.
4. Set the Enable SMTP for Two Factor Authentication option to enabled.
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the window.

Disabling SMTP for Two Factor Authentication

Prerequisites

- Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click the Alert & Logging.
2. The Alert & Logging page appears.
3. Click the ellipsis icon next to Mail Settings and select Edit Settings.

   The Mail Settings page appears.
4. Set the Enable SMTP for Two Factor Authentication option to disabled.

   Disabling SMTP for Two Factor Authentication will disable Two factor authentication for LDAP users.
5. Click Update to save the changes.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the window.

Remote syslog

The remote syslog feature allows iLO to send event notification messages to syslog servers. The iLO firmware remote syslog includes the IML and iLO event log.

Remote syslog requires a license that supports the feature. For information about the available license types and the features they support, see the licensing documentation at the following website: **https://-WWWDOC-**

On Linux systems, a tool called syslog logs system events. You can set a syslog server on a remote system that will act as a central logging system for iLO systems. If the iLO remote syslog feature is enabled, it can send its logs to the syslog server.

The remote syslog format adheres to RFC5424. The syslog must start with the iLO time stamp followed by the iLO Hostname, the subsystem name (that generated the log), and the log text. For example:

```
2020-08-26T15:26:43Z ILO7CE712P2K6 DriveArray Smart Array – Drive is failed:
Port Box 0 Bay 0 ACTION:1. Be sure all cables are connected properly and securely.
2. Be sure all drives are fully seated. 3 Replace the defective cables, drive, or both.
```

Subtopics

Enabling iLO remote syslog

Prerequisites

- Configure iLO Settings privilege
- The remote syslog server is configured to use UDP.

Procedure

1. Click iLO Settings in the left navigation pane and click the Alert & Logging.
2. The Alert & Logging page appears.
3. Click the ellipsis icon next to Remote Syslog and select Edit Settings.

   The Remote Syslog Settings page appears.
4. Set the Enable iLO Remote Syslog option to enabled.
5. Enter the following information:
   - Remote Syslog Port
   - Remote Syslog Server
6. Click Update to save the changes.
7. Click Cancel to cancel the operation.
8. Click ✕ to close the window.
9. (Optional) To send a test message to the configured syslog server, click Send Test Syslog.

   This button is available only when iLO Remote Syslog is enabled.

Subtopics

Remote syslog options

Remote syslog options

- Remote Syslog Port—The port number through which the syslog server is listening. Only one port number can be entered in this box. When you enter multiple remote syslog servers, they must use the same port. The default value is 514.
- Remote Syslog Server—The IP address, FQDN, IPv6 name, or short name of the server running the syslog service. To enter multiple servers, separate the server IP address, FQDN, IPv6 name, or short name with a semicolon. You can enter up to 511 characters in the Remote Syslog Server box.

Disabling iLO remote syslog

Prerequisites

- Configure iLO Settings privilege

Procedure

1. Click iLO Settings in the left navigation pane and click the Alert & Logging.
2. The Alert & Logging page appears.
3. Click the ellipsis icon next to Remote Syslog and select Edit Settings.

   The Remote Syslog Settings page appears.
4. Set the Enable iLO Remote Syslog option to disabled.
5. Click Update to save the changes.

6. Click Cancel to cancel the operation.
7. Click ✕ to close the window.

Remote Syslog alert levels (Linux)

Some status values in iLO differ from the standard Linux syslog status values. The following table shows the equivalent values.

iLO status	Linux syslog status
Critical	Critical
Caution	Warning
Repaired	Notice
Informational	Informational

Viewing HPE Apps information

About this task

If the system is managed by HPE OneView, the HPE Apps menu is displayed on the left navigation pane in the iLO web interface. From the HPE Apps page links are provided to commonly used features, which help you to navigate to the related page.

Procedure

Click HPE Apps in the left navigation pane.

The HPE Apps page appears and displays HPE OneView and Intelligent Provisioning sections based on your server configuration.

Subtopics

Viewing Intelligent Provisioning details from iLO

Viewing Intelligent Provisioning details from iLO

Prerequisites

- Remote Console privilege
- Host BIOS privilege
- Intelligent Provisioning is installed on the server.

Procedure

Click HPE Apps in the left navigation pane.

The HPE Apps page appears and displays Intelligent Provisioning details.
From the iLO 7web interface, you can only view Intelligent Provisioning.

For information about using Intelligent Provisioning, see the Intelligent Provisioning documentation at https://hpe.com/support/intelligentprovisioning-quicklinks.

HPE OneView remote support

HPE iLO 7 includes the HPE OneView Remote Support (OVRS), which allows you to register supported servers for HPE remote support.

You can also use iLO to monitor service events and remote support data collections.

Connecting a device to Hewlett Packard Enterprise allows it to be remotely supported and to send diagnostic, configuration, telemetry, and contact information to Hewlett Packard Enterprise. No other business information is collected, and the data is managed according to the Hewlett Packard Enterprise privacy statement. You can view the privacy statement at the following website: **https://www.hpe.com/info/privacy**.

> **IMPORTANT**
> Use HPE OneView to register for remote support. You can only disable the remote support using the iLO web interface.

Subtopics

Viewing HPE OneView remote support details

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.

2. Click HPE OneView.

   The HPE OneView page appears.
   The Overview section displays the OneView Remote Support status.

3. (Optional) Click Launch OneView UI link to navigate to HPE OneView web interface.

4. (Optional) Click Delete to remove the HPE OneView session and navigate to the Dashboard page.

Disabling HPE OneView remote support

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.

2. Click HPE OneView.

   The HPE OneView page appears.

3. Click Disable on the Overview section.

A confirmation window appears.

4. Select Yes, I understand and click Disable.
5. Click Cancel to cancel the operation.
6. Click ✕ to close the confirmation window.

Setting maintenance mode

Prerequisites

- Configure iLO Settings privilege
- The server is registered for remote support.

About this task

Use maintenance mode when you perform maintenance on a server. This feature helps Hewlett Packard Enterprise to determine whether to open a support case.

Procedure

1. Click Hewlett Packard Enterprise Apps in the left navigation pane.

   The Hewlett Packard Enterprise Apps page appears.
2. Click ✎ in the Maintenance Mode section.

   The System Maintenance Mode Settings window appears.
3. Select the Maintenance Mode check box.
4. Select a time from the Expires in menu.
5. Click Save.

   iLO notifies you that maintenance mode is set.

   Maintenance mode ends automatically when the specified time period has passed. If needed, you can clear maintenance mode manually.

   An event is recorded in the iLO event log when maintenance mode is set, expired, or cleared.
6. Click Cancel to cancel the operation.
7. Click ✕ to close the The System Maintenance Mode Settings window.

Subtopics

Viewing system maintenance mode status

Prerequisites

The server is registered for remote support.

Procedure

Click Hewlett Packard Enterprise Apps in the left navigation pane.

The Hewlett Packard Enterprise Apps page appears. The Maintenance Mode section shows the current maintenance mode status. If maintenance mode is enabled, the remaining time is displayed. The remaining time is updated when you refresh the browser window or send a test service event.

Editing the maintenance mode expiration time

Prerequisites

- Configure iLO Settings privilege
- The server is registered for remote support.
- Maintenance mode is enabled.

Procedure

1. Click Hewlett Packard Enterprise Apps in the left navigation pane.

   The Hewlett Packard Enterprise Apps page appears.

2. Click  in the Maintenance Mode section.

   The System Maintenance Mode Settings window appears.

3. Select a new value in the Expires in menu, and then click Save.

   iLO notifies you that maintenance mode is set.

   Maintenance mode ends automatically when the specified time period has passed. If needed, you can clear maintenance mode manually.

   An event is recorded in the iLO event log when maintenance mode is set, expired, or cleared.

4. Click Cancel to cancel the operation.
5. Click  to close the The System Maintenance Mode Settings window.

Clearing maintenance mode

Prerequisites

- Configure iLO Settings privilege
- The server is registered for remote support.

Procedure

1. Click Hewlett Packard Enterprise Apps in the left navigation pane.

   The Hewlett Packard Enterprise Apps page appears.

2. Click  in the Maintenance Mode section.

   The System Maintenance Mode Settings window appears.

3. Clear the Maintenance Mode check box, and then click Update.

   iLO notifies you that maintenance mode is cleared and an event is recorded in the iLO event log.

4. Click Cancel to cancel the operation.

5. Click ✕ to close the The System Maintenance Mode Settings window.

Remote Support data collection

Use the Data Collections page to view information about the data that is sent to Hewlett Packard Enterprise when a server is registered for remote support. You can also use this page to send data collection information to Hewlett Packard Enterprise manually when a device configuration changes and you do not want to wait for the next scheduled data collection transmission.

Subtopics

Sending data collection information

Prerequisites

Configure iLO Settings privilege

About this task

Use the following procedure to send data collection manually, if you do not want to wait for the next scheduled transmission.

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.

2. Click HPE OneView.

   The HPE OneView page appears.

3. Click Send Data Collection.

4. When prompted to confirm the request, click Yes, send.

   When the transmission is completed, the Last Data Collection Transmission and Last Data Collection Transmission Status are updated. The date and time are based on the configured iLO time zone.

Viewing data collection status in iLO

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.

2. Click HPE OneView.

   The HPE OneView page appears. The Data Collection section displays the data collection status.

Viewing Active Health System reporting status in iLO

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.

2. Click HPE OneView.

   The HPE OneView page appears. The Active Health System reporting section displays the current status.

Remote support service events

When iLO detects a hardware failure—for example, a problem with a memory DIMM or fan—a service event is generated. When a server is registered for remote support, service event details are recorded in the service event log. When Hewlett Packard Enterprise receives a service event, a support case is opened (if warranted). Enabling the maintenance mode feature during planned maintenance prevents the opening of a support case during the planned maintenance period.

Subtopics

Viewing the service event log

Prerequisites

The server is registered for remote support.

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.

2. Click HPE OneView.

   The HPE OneView page appears. The Service Event Log section displays the event log details.

Subtopics

Service event log details

The Service Event Log displays the following information for each service event:

- Identifier—A unique string that identifies the service event.
- Time Generated—The time the service event was generated. This column shows the date and time based on the configured iLO time zone.

- Event ID—A unique number for the service event type.
- Perceived Severity—The severity of the event indication (for example, 5-Major, 7-Fatal).
- Submit Status—The status of the event submission. If the status is `No error`, the event was submitted successfully.
- Event Category—The category of the event that matches the Message ID description in the message registry.

Supported service event types

The HPE remote support solution supports the following service event types:

Event ID	Description
1	Generic Test Service Event
100	Fan Failed Service Event
101	System Battery Failed Service Event
200	Power Supply Failed Service Event
202	Power Fuse Failed Service Event
300	Physical Disk Drive Service Event
301	Smart Array Controller Accelerator Battery Failure Event
302	Smart Array Controller Accelerator Board Status Changed Event
303	Smart Array Controller Status Changed Event
304	SAS Physical Drive Status Changed Event
305	ATA Disk Drive Status Changed Event
306	Fibre Channel Host Controller Status Changed Event
307	NVMe Drive Status Change
308	NVMe Drive Wear Status Change
309	SSD Drive Wear Status Change
400	Memory Module Failed or Predicted to Fail Event
401	NVDIMM Failure
500	Storage System Fan Status Changed Event
501	Storage System Power Supply Status Changed Event
600	Uncorrectable Machine Check Exception Event
1000	Generic IML Service Event

Sending a test service event

Prerequisites

- Configure iLO Settings privilege
- The server is registered for remote support.

About this task

You can send a test event to verify that your remote support configuration is working correctly.

Procedure

1. Click Hewlett Packard Enterprise Apps in the left navigation pane.
2. Click Send Test Event.
3. When prompted to confirm the request, click Yes, send.

   When the transmission is complete, the test event is listed in the service event log.

   If the test is successful, the Submit Status in the service event log displays the text `No Error`.

   The Time Generated column in the service event log shows the date and time based on the configured iLO time zone.

Clearing the service event log

Prerequisites

- Configure iLO Settings privilege
- The server is registered for remote support.

Procedure

1. Click HPE Apps in the left navigation pane.

   The HPE Apps page appears.
2. Click HPE OneView.

   The HPE OneView page appears.
3. Click Delete Event Log.

   iLO prompts you to confirm the request.
4. Click Yes, clear.

   iLO notifies you that the service event log has been cleared.

HPE Compute Ops Management

HPE Compute Ops Management enables iLO to connect to the cloud-based management services for Gen10 and later servers.

HPE Compute Ops Management is built on a unique cloud-native architecture that abstracts and orchestrates infrastructure and compute workflows, transforming complex compute operations into a simplified experience across edge-to-cloud to accelerate agility. You can manage servers with Compute Ops Management through HPE GreenLake. For more details see, **https://hpe.com/solutions/compute-ops-management**.

Subtopics

Connecting to HPE Compute Ops Management

Prerequisites

- Configure iLO Settings privilege.
- Configure DNS server.
- Configure Web proxy.
- Ensure that the server has Serial number, Universally Unique Identifier (UUID), and Product ID.
- Ensure that the Date and Time of iLO is set correctly.

Procedure

1. From the Dashboard page, click HPE Compute Ops Management.

   HPE Compute Ops Management page appears.

   NOTE

   Hewlett Packard Enterprise recommends configuring Web proxy while connecting to HPE Compute Ops Management. You can configure or edit the Web proxy settings on the Access page or Configure Connection page. For more information, see Access settings options.

2. Click Enable to initiate a connection to HPE Compute Ops Management.

   HPE Compute Ops Management page appears and displays the following information:

   - Connection Status—Indicates the connection status between HPE iLO and HPE Compute Ops Management. For more information, see HPE Compute Ops Management connection states.
   - Connection Type—Indicates the connection type if the Connection Status is Connected. The connection types are Direct, or Secure Gateway.

     For more information, see Configuring connection type.
   - Connection Prerequisites—Indicates that the prerequisites required to connect HPE iLO and HPE Compute Ops Management:
     - iLO network configuration
     - Web Connectivity
     - Compute Ops Management connectivity

   If the system is managed by HPE OneView, enabling HPE Compute Ops Management disconnects from HPE OneView.

   After iLO is connected to **HPE Compute Ops Management**, irrespective of the connection status (Success or Failure), **HPE Compute Ops Management** will be set as Enabled.

   During reset, iLO automatically triggers a connection to **HPE Compute Ops Management**. **HPE Compute Ops Management** will be set as Disabled only if the user manually disables **HPE Compute Ops Management**.

   HPE iLO will automatically try to reconnect at the time mentioned on screen, you can also click Connect Now to retry the connection.

Configuring connection type

Prerequisites

- Configure iLO Settings privilege.

About this task

If you have errors with Web Connectivity, check if your network requires a proxy and configure the connection type.

Procedure

1. From the Dashboard page, click HPE Compute Ops Management.

   HPE Compute Ops Management page appears.

   > **NOTE**
   >
   > Hewlett Packard Enterprise recommends configuring Web proxy while connecting to HPE Compute Ops Management. You can configure or edit the Web proxy settings on the Access page or Configure Connection page. For more information, see Access settings options.

2. Click Configure Connection.

   Configure Connection page appears.

3. Select the connection type:

   - Direct Connect—Select this option if your network requires a proxy for web connectivity.
   - Secure Gateway—Select this option to connect to HPE Compute Ops Management using a secure gateway.

     > **NOTE**
     >
     > Hewlett Packard Enterprise recommends that secure gateway is used as the proxy server with a port address of 8080.

4. (Optional) If you have selected Direct Connect, enter the Web Proxy Server name, Web Proxy Port number, Web Proxy User Name, and Web Proxy Password. For more information, see Access settings options.

   Activation Key is optional. You can enter the key while configuring the connection.

5. (Optional) If you have selected Secure Gateway, enter the Activation key.

   To get the Activation key, log in to **HPE GreenLake** and launch the Compute Ops Management service. In the Overview page, in the Add server section, click Get key to generate a key.

   The Activation Key is not mandatory to initiate connection to **HPE Compute Ops Management**. If **HPE Compute Ops Management** accepts the connection request without Activation Key, the connection status will be Connected. If **HPE Compute Ops Management** needs Activation Key, the connection status will be ActivationKeyRequired. On receiving this status, the user must retry with valid Activation Key. For more information, see HPE Compute Ops Management connection states.

6. Click Save to initiate connection to HPE Compute Ops Management.

Disconnecting from HPE Compute Ops Management

Procedure

1. From the Dashboard page, click HPE Compute Ops Management.

   HPE Compute Ops Management page appears.

2. Click Disable to disconnect from the HPE Compute Ops Management.

   Disable Compute Ops Management page appears.

3. Select I confirm to disable HPE Compute Ops Management , and click Disable.

   The following actions are initiated when **HPE Compute Ops Management** is disabled:

   - iLO disconnects from **HPE Compute Ops Management**.
   - All configuration settings are cleared, except web proxy settings.
   - iLO Advanced license will be removed.

   You must reconfigure the settings to connect to **HPE Compute Ops Management**.

HPE Compute Ops Management connection states

This following table shows the connection states and errors for HPE Compute Ops Management.

Table 1. HPE Compute Ops Management connection state and description

Connection State	Description
Not Enabled	HPE Compute Ops Management is not enabled.
Initializing	Connection to the HPE Compute Ops Management is initialized after iLO reset.
In Progress	Connection to the HPE Compute Ops Management is in progress.
Connected	iLO is connected to HPE Compute Ops Management successfully.
iLO IP Address Not Set	To connect iLO to the network, follow the onscreen recommendations. For more information, see General network settings.
DNS Resolution Error	To connect iLO to the network, follow the onscreen recommendations. For more information, see General network settings.
Proxy Settings Invalid	Could not connect using the provided web proxy. Ensure that the proxy details are correct. For more information, see Configuring connection type.
Proxy or Firewall Issue	Could not connect to HPE to get an identity for the server to connect to HPE Compute Ops Management. To connect HPE to the HPE Compute Ops Management, follow the onscreen recommendations. For more information, see Configuring connection type.
Incorrect iLO Time	Could not obtain an identity for the server to connect to HPE Compute Ops Management due to an incorrect HPE system time. To update NTP configurations or time on RBSU, follow the onscreen recommendations. For more information, see Configuring iLO SNTP settings.
Activation Key Required	Follow the onscreen recommendations and generate the Activation Key. In the Enter Activation Key screen, enter the Activation Key, and click Save. If the problem persists, contact HPE Support.
Invalid Activation Key	Follow the onscreen recommendations and generate a new Activation Key. In the Enter Activation Key screen, enter the Activation Key, and click Save. If the problem persists, contact HPE Support.

Connection State	Description
Expired Activation Key	Follow the onscreen recommendations and generate a new Activation Key. In the Enter Activation Key screen, enter the Activation Key, and click Save. If the problem persists, contact HPE Support.
Unsupported iLO Version	Upgrade to the latest iLO version to use HPE Compute Ops Management. For more information, see Updating iLO or server firmware.
Device Assignment Failed	In HPE GreenLake, select Device, and ensure that the device is not already added to another Compute Ops Management instance. You can also click Edit Settings and update the Activation Key. For more information, see the following website: **https://common.cloud.hpe.com/**
Device Claim Unauthorized	Contact HPE GreenLake administrator to verify that you have the right permissions to add a device to HPE GreenLake device inventory. You can also click Edit Settings and update the Activation Key. For more information, see the following website: **https://common.cloud.hpe.com/**
Device Not Found	To resolve this issue, contact HPE Support. You can also click Edit Settings and update the Activation Key. For more information, see the following website: **https://common.cloud.hpe.com/**
Unknown Error	Reset iLO and retry connecting. Contact HPE support if the problem persists. For more information, see Resetting the iLO processor with the web interface.
External Error	Reset iLO and retry connecting. Contact HPE support if the problem persists. For more information, see Resetting the iLO processor with the web interface.
Disabled by Compute Ops Management	Check the Integrated Management Log and the Activity Dashboard in Compute Ops Management. Click Launch HPE GreenLake to enable HPE Compute Ops Management. For more information, see the following website: **https://common.cloud.hpe.com/**.

NOTE

- If iLO reset happens, the HPE Compute Ops Management status changes from Connected to Not Enabled. This is an expected behavior. It takes iLO around 120 seconds after the iLO reset to show the HPE Compute Ops Management status.
- Changing or disabling DNS configuration, Web proxy configuration values will impact the connectivity and HPE Compute Ops Management connection status.

Using the lifecycle management features

Subtopics

One-button secure erase

If you want to decommission a server or prepare it for a different use, you can use the One-button secure erase feature.

One-button secure erase follows the NIST Special Publication 800-88 Revision 1 in the Guidelines for Media Sanitization guide. The appendix recommends minimum sanitization levels for media. For more information about the specification, see Section 2.5 **Guidelines for Media Sanitization**.

One-button secure erase implements the NIST SP 800-88 Revision 1 Sanitization Recommendations for **Purging** user data and returns the

server and supported components to the default state. This feature automates many of the tasks that you follow in the Statement of Volatility document for a server.

Subtopics

One-button secure erase access methods

You can initiate the One-button secure erase process from the following products:

- iLO
- The iLO RESTful API and iLOREST

This topic describes the One-button secure erase access methods from iLO.

Prerequisites for initiating the One-button secure erase process

Prerequisites

- Hewlett Packard Enterprise recommends disconnecting or detaching the removable drives, external storage, or shared storage that you do not want to erase.
- Verify that your iLO user account is assigned all the iLO user account privileges including recovery set.
- Install an iLO license that supports this feature.

  For information about the available license types and the features they support, see the licensing documentation at the following website: **https://www.hpe.com/support/ilo-docs**.
- If the following features are enabled, disable them:
  - Server Configuration Lock

    For instructions, see the UEFI System Utilities user guide and HPE Synergy.

    For instructions, see the UEFI System Utilities User Guide.
  - Smart Array Encryption

    For instructions, see the "Clearing the encryption configuration" section in the HPE Smart Array SR Secure Encryption Installation and User Guide.

    For instructions, see the instructions for clearing the encryption configuration in the Secure Encryption installation and user guide.
  - Intel VROC Encryption

    For instructions, see the Cleaning the security and encryption configurations section in the Intel Virtual RAID on CPU User Guide.
- On HPE Synergy systems, remove HPE OneView or Virtual Connect profiles assigned to the system.

- The storage drives that you want to erase support a native sanitize method.

  Examples include the `SANITIZE` command for SATA and SAS drives and `FORMAT` for NVM Express drives. The NIST publication recommends these commands for purging data on these device types. Using these commands is more secure than using software to overwrite data on storage drives. For more information on how One-button secure erase affects supported drives, see One-button secure erase FAQ.

  If an attached storage device does not support native sanitize methods, it will not be erased during the One-button secure erase process. An Integrated Management Log (IML) entry will report an erase failure for the device.

- Hewlett Packard Enterprise recommends configuring SNMP alerts, Mail Settings, or iLO RESTful API alerts before initiating the One-button secure erase process.

  If errors occur when individual components are erased, an IML entry is logged for each error. You can review the IML log using SNMP alerts, Mail Settings, or iLO RESTful API alerts. The IML is erased later during the One-button secure erase process. After the IML is erased, high-level status information is provided in the secure erase report.

- If you use LDAP Directory Authentication with the HPE Extended Schema, you have another method for logging in to iLO to initiate the One-button secure erase process.

  Supported methods include local accounts, Kerberos authentication, CAC Smartcard, and schema-free directory accounts.

  The HPE Extended Schema does not support the user privileges required to initiate the One-button secure erase process.

- Disable Microsoft® Secured-core Support.

Initiating the One-button secure erase process

Prerequisites

Your environment meets the Prerequisites for initiating the One-button secure erase process .

> **CAUTION**
> Use this feature only when you want to decommission a system or use it for a different purpose. This process resets the server and supported components to the factory state. All data on internal and externally connected storage devices that are visible to the system will be lost. Depending on the storage capacity, securely erasing the server and components might take up to a day or more to finish. Once you initiate this process, it cannot be undone. Until the process is complete, avoid interactions with iLO or the system that involve configuration changes and powering off the system.

Procedure

1. Click Security in the left navigation pane and click Secure Erase or click iLO Settings on the left navigation pane and click Secure Erase link from Quick Links.

   The Secure Erase page appears.
   If the One-button secure erase process completed on the server, the View Last Erase Report button is available.

2. Click Secure Erase.

   iLO prompts you to confirm the request.

3. Select the I have understood the implications of Secure Erase and ready to decommission this system check box, and then click Yes, permanently erase system.

   The server restarts and the One-button secure erase process begins. During the server reboot, the BIOS deletes the data that it controls. After the BIOS deletes the data, the server is powered off. iLO then deletes the remaining data.

   The One-button secure erase progress is displayed in the banner area on all iLO web interface pages. The displayed information includes the percent complete and the estimated time left. Individual hardware or software component details are displayed in the

Secure Erase Status table.

Do not make configuration changes during the One-button secure erase process. iLO prevents firmware updates and iLO resets during this process.

When the One-button secure erase is complete, iLO is reset, and it becomes unavailable on the network.

On HPE Synergy compute modules, the iLO network settings might be reassigned after the process is complete, and the system might power on.

4. (Optional) Return the system to an operational state .
5. (Optional) View, save, or delete the One-button secure erase report.

   Hewlett Packard Enterprise recommends completing this step.
6. (Optional) If a device failed the erase process, or the device does not support a native sanitize method, do one of the following:
   - Isolate these devices and use other methods to delete the data.
   - Securely dispose of the devices according to your organization security policies.

   Hewlett Packard Enterprise recommends completing this step.

Subtopics

One-button secure erase status values

One-button secure erase status values

When you initiate the One-button secure erase process, the overall progress is displayed in the iLO banner. The status of individual components is displayed in the Secure Erase Status table.

- Idle—The process has not started.
- Initiated—The process has started.
- In Progress—Erasing is in progress.
- Success—The process completed successfully.
- Error—The process completed and errors occurred.
- Failed—The process failed.

NOTE

In the Secure Erase Status table, iLO Settings includes the results for Embedded NAND Flash. An erase failure in one of these components results in an overall failure for iLO Settings.

In the Secure Erase Status table, BIOS Settings includes the results for the UEFI configuration store and RTC (system date and time). An erase failure in one of these components results in an overall failure for BIOS Settings.

Returning a system to operational state after One-button secure erase

About this task

After a system is erased with the One-button secure erase process, use the following procedure to return it to an operational state.

Procedure

1. Configure the iLO network settings.
2. Install Intelligent Provisioning using an Intelligent Provisioning recovery image.

   For more information, see the Intelligent Provisioning user guide.
3. Install an OS.
4. Optional: Install an iLO license.
5. Configure the BIOS settings and the iLO settings that apply to your environment.
6. (Optional) Create a System Recovery Set.

Viewing the One-button secure erase report

Prerequisites

- The One-button secure erase process completed on the server.
- After the One-button secure erase process completed, iLO was configured with an IP address.

Procedure

1. Click Security in the left navigation pane and click Secure Erase or click iLO Settings on the left navigation pane and click Secure Erase link from Quick Links.

   The Secure Erase page appears.
   If the One-button secure erase process completed on the server, the View Last Erase Report button is available.
2. Click View Last Erase Report.

   The Secure Erase Report is displayed.
3. (Optional) To sort by a table column, click the column heading.

   To change the sort order to ascending or descending, click the column heading again or click the arrow icon next to the column heading.
4. (Optional) Save the One-button secure erase report .

   Hewlett Packard Enterprise recommends saving a copy of the erase report for future reference.
5. (Optional) Delete the One-button secure erase report .

   Hewlett Packard Enterprise recommends deleting the erase report before decommissioning a server or using it for a different purpose.

Subtopics

One-button secure erase report details

One-button secure erase report details

- Server Serial Number—The server serial number.
- Initiated By—The user who initiated the One-button secure erase process.

The following information is listed for each device type:

- Device Type—The device type that was erased.

For information about the affected device types, see Impacts to the system after One-button secure erase completes .

The Secure Erase Report includes only the Embedded NAND Flash status.

- Location—The location of the device in the server.
- Serial Number—The device serial number.
- Status—The One-button secure erase status for the device.
- Erase Type—The type of erase operation. For more information about the operations that were performed, see One-button secure erase FAQ.
- Start Time—The One-button secure erase start time for the specific device.
- End Time—The One-button secure erase end time for the specific device.

Saving the One-button secure erase report to a CSV file

Prerequisites

- The One-button secure erase process completed on the server.
- After the One-button secure erase process completed, iLO was configured with an IP address.

About this task

When you use the One-button secure erase feature, Hewlett Packard Enterprise recommends saving a copy of the erase report for future reference.

Procedure

1. Click Security in the left navigation pane and click Secure Erase or click iLO Settings on the left navigation pane and click Secure Erase link from Quick Links.

   The Secure Erase page appears.

2. Click Download.

   The Secure Erase report is downloaded.

Deleting the One-button secure erase report

Prerequisites

- Configure iLO Settings privilege
- The One-button secure erase process completed on the server.
- After the One-button secure erase process completed, iLO was configured with an IP address.
- If you want a copy of the One-button secure erase report for future reference, you tcan save the report.

About this task

When you decommission or repurpose a server, you might not want the One-button secure erase report to remain available in the iLO web interface.

Hewlett Packard Enterprise recommends deleting the erase report before decommissioning a server or using it for a different purpose.

Procedure

1. Click Security in the left navigation pane and click Secure Erase or click iLO Settings on the left navigation pane and click Secure Erase link from Quick Links.

   The Secure Erase page appears.
   If the One-button secure erase process completed on the server, the View Last Erase Report button is available.

2. Click View Last Erase Report.

   The Secure Erase Report is displayed.

3. Click .

   iLO securely erases the report file, and then resets immediately.

   The event log, IML, security log, and configuration settings made up to this point are reset to the factory default settings. iLO might attempt an auto-restore operation when it starts. For more information, see iLO backup and restore.

Impacts to the system after One-button secure erase completes

The One-button secure erase feature reverts the system and supported components to the factory state. To use the system, re-provision the server.

- All data on the impacted storage drives and Persistent Memory are erased and not recoverable. All RAID settings, disk partitions, and OS installations are removed.

  The following BIOS and iLO 7 settings are erased or reset to the factory default settings.

  - Factory provisioned server identity (User-defined server identity (iLO LDevID) are erased.

    > **NOTE**
    >
    > iLO IDevIDPCA, iLO IAK, System IDevID, and System IAK certificate is not erased in one-button secure erase. However, the System IDEVIDPCA and System IAK keys are erased from TPM.

  - Factory provisioned iLO LDevID, iLO LAK, System LDevID, and System LAK are erased.
  - Platform certificate and all other enrolled certificates (other than factory pre-installed UEFI Secure boot certificates are erased.
  - iLO network and other settings are erased and must be reconfigured.
  - Installed iLO licenses are removed and the license status reverts to iLO Standard.

    If the iLO Advanced license is pre-installed at the factory with the #0D1 option, the license is reinstated when the One-button secure erase process is finished. For more information about this license option, see the HPE iLO 7 Licensing Guide.
  - The System Recovery Set is removed and must be recreated.
  - iLO user accounts are removed. After the process is complete, log in with the default factory Administrator account and password.
  - The Active Health System, Integrated Management Log, Security Log, and iLO Event Log are cleared.
  - BIOS and SmartStorage Redfish API data is removed and then recreated on the next boot.
  - Secure Boot is disabled and enrolled certificates are removed (other than the factory-installed certificates).
  - Boot options and BIOS user-defined defaults are removed.
  - Passwords, pass-phrases, and encryption keys stored in the TPM or BIOS are removed.
  - The date, time, DST, and time zone are reset.
  - The system will boot with the most recent BIOS revision flashed.

- Intelligent Provisioning will not boot and must be reinstalled.

Subtopics

Hardware components that are not reverted to the factory state

One-button secure erase process does not affect the following components:

- SD cards
- iLO virtual media
- Configuration on PCI controllers
- SAS HBAs and connected drives
- SATA, SAS, and NVM Express drives that do not support native sanitize methods.
- FCoE, iSCSI storage
- GPGPUs
- Other FPGAs, accelerators, offload engines that have keys or storage

Hardware components that are reverted to the factory state

The following components are reverted to the factory state during the One-button secure erase process.

- UEFI Configuration store
- RTC (System Date and Time)
- Trusted Platform Module
- BIOS Settings
- iLO configuration settings
- iLO Event Log
- Integrated Management Log
- Security Log
- HPE MR controllers, NS controllers, and connected storage drives.

  For more information about controllers, see, Supported storage products section in the iLO User Guide.
- Intel VROC
- Drive data (for drives that support native sanitize methods).
  - SATA, SAS drives (SSD and HDD)
  - NVM Express
- Embedded Flash
  - iLO RESTful API data

- Active Health System
- Firmware repository

One-button secure erase FAQ

Does One-button secure erase purge USB devices and internal SD cards?

No. One-button secure erase does not erase USB devices and internal SD cards.

If an HDD does not support the Purge function, does One-button secure erase attempt to purge it?

No. One-button secure erase skips a drive that does not support the purge function.

Does One-button secure erase support Smart Array controllers?

HPE MR controllers and NS controllers are supported for One-button secure erase.

Does One-button secure erase erase drives that do not support Purge?

RAID controllers can wipe drives (overwrite with a pattern) that do not support the purge operation. One-button secure erase does not request the controller to perform this nonsecure wipe. To wipe data on such drives, use the Intelligent Provisioning "System Erase and Reset" feature.

Does One-button secure erase erase battery backed cache?

See the table following for more information.

How does One-button secure erase process the erase commands?

See the following table for information on how One-button secure erase purges or overwrites data.

What privileges do users need to launch One-button secure erase?

Users need all iLO privileges to launch One-button secure erase.

Does One-button secure erase remove the serial number and product ID?

No, these items are not erased by One-button secure erase.

How long does the process take?

The duration depends on the hardware. Sanitization of HDDs takes longer than SSDs.

How One-button secure erase affects supported drives

Device	Operation requested	Result
Embedded Flash (NAND)	eMMC 5.1 (JEDEC 84-B51) Secure Erase command with SECURE_REMOVAL_TYPE in Extended CSD register set to physical memory erase, if supported by the device.	Data in physical memory is erased.
Intel Optane DC PMM	Secure Erase + Overwrite DIMM	Cryptographic keys are removed and data in all physical memory blocks (both user accessible and in spare blocks) is overwritten with zeros. PCD regions containing all configuration and metadata is also overwritten.
UEFI configuration store	3-pass: Chip erase (0xff), 0x00, Chip erase (0xff)	All physical sectors are overwritten.
RTC	Reset time to 01-01-2001 00:00:00	Date, Time, Time zone, and DST are reset to defaults.
TPM	TPM Clear + Clear NV indices + Delete Platform Symmetric key	All data in TPM is cleared including any nonvolatile information.

Device	Operation requested	Result
HPE Smart Array MR controllers	Delete Logical drives + Clear Configuration Metadata + Factory Reset + Physical drive sanitize	• All array configurations, logical drives, and metadata are deleted. All controller settings are reset to their factory defaults. Encryption keys are cleared. • Flash backup is cleared and data in the DRAM write back cache is lost when the power is removed. All attached drives are requested to be sanitized. See below for operations requested on the drives.
HPE NS Boot Controller	Delete Logical drives + Clear Configuration Metadata + Factory Reset + Physical drive sanitize	• All array configurations, logical drives, and metadata are deleted. All controller settings are reset to their factory defaults. All attached drives are requested to be sanitized. See below for operations requested on the drives.
SATA HDD [1]	ATA SANITIZE with CRYPTO SCRAMBLE EXT if supported.	The CRYPTO SCRAMBLE EXT command changes the internal encryption keys that are used for user data, so the user data is irretrievable.
	A single pass of ATA SANITIZE with OVERWRITE EXT option	All physical sectors are overwritten with zeros, including physical sectors that are not user accessible. Any previous data in caches are also made inaccessible.
SATA SSD [1]	ATA SANITIZE with CRYPTO SCRAMBLE EXT if supported.	The CRYPTO SCRAMBLE EXT command changes the internal encryption keys that are used for user data, so the user data is irretrievable.
	A single pass of ATA SANITIZE with BLOCK ERASE option	Previous data in all physical memory blocks, including physical memory blocks that are not user accessible, becomes irretrievable. Any previous data in caches are also made inaccessible.
SAS HDD	A single pass of SCSI SANITIZE with OVERWRITE EXT option	All physical sectors are overwritten, including physical sectors that are not user accessible. Any data in caches are also sanitized.
SAS SSD	A single pass of SCSI SANITIZE with BLOCK ERASE option	All physical memory blocks, including physical memory blocks that are not user accessible, are set to a vendor-specific value. Any data in caches are also sanitized.
NVM Express	NVM Express FORMAT with Secure Erase Setting (SES) = 2, if supported.	This is a cryptographic erase accomplished by deleting the encryption key.

Device	Operation requested	Result
	NVM Express SANITIZE if supported (for drives supporting NVM Express version 1.3 or later)	All data and metadata associated with all namespaces is destroyed. All user content present in the NVM subsystem is erased.
	A single pass of NVM Express FORMAT with SES = 1. This option is used if the drive does not support the SANITIZE.	

1 These drives might be connected to HPE MR controllers or the Chipset SATA controller.

Supported devices that fail the erase process and unsupported devices are not erased securely. These devices might contain sensitive data. Isolate devices that are not erased and use other methods to delete the data, or securely dispose of the devices according to your organization security policies.

iLO backup and restore

Automatic backup and restore

When iLO goes through the initialization process, it backs up the configuration information. If this configuration information is corrupt, iLO attempts to restore it from the backup file. Automatic restore operation is recorded in the IML

The backup file created by the automatic backup and restore process is not user-accessible. It cannot be used to perform a manual restore operation.

NOTE

Backup and Restore functionality will not be available through iLO RESTful API, while host OS is booting up. The functionality will be available through iLO web interface irrespective of the boot state of the host.

Manual backup and restore

iLO supports manually restoring the configuration information.

Hewlett Packard Enterprise does not expect that you will have a reason to perform a restore operation. However, there are cases in which having a backup of the configuration expedites the return to a normal operating environment.

As with any computer system, backing up your data is a recommended practice to minimize the impact from failures. Hewlett Packard Enterprise recommends performing a backup each time that you update the iLO firmware.

iLO firmware requirements for backup and restore

- iLO firmware supports backup and restore operations in which the backup and restore tasks are performed on systems with the same or different iLO firmware versions.

Subtopics

Information that is restored during a backup and restore operation

The iLO configuration includes many categories such as power, network, security, license keys, and the user database. Most configuration information is stored in the battery-powered SRAM memory device, and it can be backed up and restored.

NOTE

When environment variables are restored, a server reset is required for the restored settings to take effect.

For example, the Performance settings are restored, but they do not take effect until a server reset is complete.

Information that is not restored during a backup and restore operation

Some information is not suitable to be restored during backup and restore operations. The information that cannot be restored is not part of the iLO configuration, but instead is related to the iLO or server system state.

The following information is not backed up or restored:

Security state

Allowing a restore operation to change the iLO security state would defeat the principles of security and enforcement of security.

Integrated Management Log

To preserve information about events that occurred between the backup and the event that required the restore, this information is not restored.

iLO Event Log

To preserve information about events that occurred between the backup and the event that required the restore, this information is not restored.

Security Log

To preserve information about security events that occurred between the backup and the event that required the restore, this information is not restored.

Active Health System data

To preserve the information recorded during the backup and restore process, this information is not restored.

Server state information

- Server power state (ON/OFF)
- Server UID LED states
- iLO and server clock settings

Reasons to manually restore the iLO configuration

You might want to restore the iLO configuration in the following situations:

Reset to factory defaults

In some cases, you might need to reset iLO to the factory default settings to erase settings external to iLO. Resetting iLO to the factory default settings erases the iLO configuration. To recover the iLO configuration quickly, restore the configuration from a backup file after the factory default reset is complete.

Accidental or incorrect configuration change

In some cases, the iLO configuration might be changed incorrectly, causing important settings to be lost. This situation might occur if iLO is reset to the factory default settings or user accounts are deleted. To recover the original configuration, restore the configuration from a backup file.

System board replacement

If a system board replacement is required to address a hardware issue, you can use this feature to transfer the iLO configuration from

the original system board to the new system board.

Lost license key

If a license key is accidentally replaced, or you reset iLO to the factory default settings, and you are not sure which key to install, you can restore the license key and other configuration settings from a backup file.

Backing up the iLO configuration

Prerequisites

- Configure iLO Settings privilege
- iLO is configured to use the Secured Standard security state. Backing up and restoring the configuration when iLO is configured to use a higher security state is not supported.

Procedure

1. Click Backup iLO Configuration on the Quick Actions menu.

   The Backup Configuration Settings window appears.

2. (Optional) To password protect the backup file, enter a password in the Backup file password box.

   The password can be up to 32 characters long.

3. Click Download.

   The file is downloaded and this activity is recorded in the event log.

   The file name uses the following format: `<server serial number>_<YYYYMMDD>_<HHMM>.bak`.

Restoring iLO configuration

Prerequisites

- Configure iLO Settings privilege
- Administer User Accounts privilege
- A backup file exists.
- The default iLO account credentials are available if you previously reset iLO to the factory default settings.
- The iLO security state you want to use is configured.

  When you configure a higher security state than Secure Standard, iLO is reset to the factory default settings. If you do not configure these security states before performing a restore, the restored information is deleted when you update the security state.

Procedure

1. Click iLO Settings in the left navigation pane.

   iLO page appears.

2. Click Restore iLO Configuration on the Quick Actions menu.

   The Restore iLO Configuration window appears.

3. If the backup file is password protected, enter the password in the Backup file passwordbox.

4. Drag the backup file to the Backup file box or click Browse and navigate to the backup file.
5. Click Confirm Restore.
6. Click Upload and Restore.

   iLO prompts you to confirm the request.
7. Click Restore.

   iLO reboots and closes your browser connection. It might take several minutes before you can re-establish a connection.

Subtopics

Restoring the iLO configuration after system board replacement

Prerequisites

- Configure iLO Settings privilege
- Administer User Accounts privilege
- A backup file exists.
- The default iLO account credentials are available if you previously reset iLO to the factory default settings.
- The iLO security state you want to use is configured.

  When you configure a higher security state than Secure Standard, iLO is reset to the factory default settings. If you do not configure these security states before performing a restore, the restored information is deleted when you update the security state.

About this task

When you replace a system board, you can restore the configuration from the replaced system board.

Procedure

1. Replace the system board and transfer the hardware components from the old system board to the new system board.
2. Power on the system and ensure that all components are working correctly.
3. Log in to iLO with the default user credentials for the new system board.
4. Restore the configuration from the backup file.

Using iLO with other software products and tools

Subtopics

iLO and remote management tools

iLO 7 supports remote management through supported tools such as HPE OneView.

iLO 7 supports remote management through supported tools.

The association between iLO and a remote management tool is configured by using the remote management tool. For instructions, see your remote management tool documentation.

When iLO is under the control of a remote management tool, the iLO web interface includes the following enhancements:

- A message similar to the following is displayed on the iLO login page:

  ```
  This system is being managed by <remote management tool name>. Changes
  made
  locally in iLO will be out of sync with the centralized settings.
  ```

- A page called <Remote Management Tool Name> is added to the iLO navigation tree.

Starting a remote management tool from iLO

About this task

When iLO is under the control of a remote management tool, use the following procedure to start the remote manager user interface from iLO.

Procedure

1. Click <Remote Management Tool Name> in the navigation tree.
2. Click Launch.

   The remote management tool starts in a separate browser window.

Deleting a remote manager configuration

About this task

If you discontinue the use of a remote management tool in your network, you can remove the association between the tool and iLO.

This feature is not supported on Synergy compute modules.

IMPORTANT

Hewlett Packard Enterprise recommends that you remove the server from the remote management tool before you delete the remote manager configuration in iLO. Refresh the iLO web interface window after removing the server from HPE OneView.

Do not delete the remote manager configuration for a tool that is in use on the network and is managing the server that contains the current iLO system.

Procedure

1. Click the Delete button in the Delete this remote manager configuration from this iLO section.

   iLO warns you to proceed only if the managed server is no longer managed by the remote management tool.
2. Click OK.

   The <Remote Management Tool Name> page is removed from the iLO navigation tree.

Using iLO with HPE OneView

HPE OneView interacts with the iLO management processor to configure, monitor, and manage supported servers. It configures seamless access to the iLO remote console, enabling you to launch the iLO remote console from the HPE OneView user interface in a single click. The role assigned to your appliance account determines your iLO privileges.

HPE OneView manages the following iLO settings:

- The remote management tool
- SNMP v1 trap destination
- SNMP v1 read community
- SSO certificate—A trusted certificate is added to the HPE SSO page.
- NTP (time server) configuration
- User Account—An administrative user account is added to iLO.
- Firmware version—If a supported version of the iLO firmware is not already installed when you add a server to HPE OneView, the iLO firmware is updated automatically. For more information, see the HPE OneView support matrix.
- The appliance is added as a destination for iLO RESTful API events.
- Remote Support registration

IMPORTANT

For best performance when using HPE OneView with iLO 7, Hewlett Packard Enterprise recommends that you do not delete or change these settings by using the iLO web interface. Changing the device configuration from the firmware could cause it to become out of synchronization with HPE OneView.

Subtopics

Server signatures (Synergy compute modules only)

When HPE OneView manages a Synergy compute module, iLO generates a server signature that allows HPE OneView to manage unique network settings, virtual identifiers, and adapter settings.

The server signature is refreshed and verified for compliance each time iLO starts. It includes information such as the frame bay and UUID, the HPE OneView domain IP address, and the server device signatures.

If the server is moved to a different frame or bay, or its hardware configuration changes upon insertion into a bay, the server signature changes. When this change occurs, the settings configured by HPE OneView are cleared, an event is logged in the iLO event log, and an iLO RESTful API event is generated. This process prevents duplicate addresses and helps HPE OneView ensure that the server has a unique profile.

In most cases, HPE OneView automatically rediscovers and configures the server. If this discovery and configuration does not occur, use the HPE OneView software to refresh the frame that contains the server.

The server signature data cannot be viewed or edited in the iLO web interface, but it can be read with a REST client. For more information, see **https://www.hpe.com/support/restfulinterface/docs**.

Adding hotfixes to create an HPE OneView custom firmware bundle

About this task

To add hotfixes to create an HPE OneView custom firmware bundle for using as a baseline (and optionally for SUT installation), follow the procedure:

Procedure

1. Download all the required update packages to your local system.
2. From the HPE OneView main menu, select Appliance and then select Firmware Bundles.

   The ServicePack baseline packages are listed.

   > **NOTE**
   >
   > There must be at least one ServicePack baseline loaded. If not, download a compatible Service Pack for ProLiant, HPE Synergy Custom SPP, or HPE Synergy Service Pack and load it into HPE OneView before proceeding.

3. Click Add Firmware Bundle. The Add Firmware Bundle dialog box appears.
4. On the Add Firmware Bundle dialog, click Browse and then select one of the update packages downloaded in step 1.

   You can select only one file at a time. The file type must be scexe, exe, rpm, zip, or fwpkg

   > **NOTE**
   >
   > HPE Smart Update Manager (SUM) version 8.7.0 or later supports the fwpkg file type. If you have baseline Service Pack that was released prior to October 2020, select a supported file type other than fwpkg.

5. Click OK to upload the file.
6. After the file is uploaded, HPE OneView may display an error indicating a missing signature file. This is an expected behavior for Gen10 update packages.

   To upload a missing signature file:

   a. Expand the error message and click **Upload signature** file link. Alternatively, from the menu, select Actions and then select Upload signature file. The Upload signature file dialog box appears.

   b. Click Browse and select the signature file that was included with the package. The signature file will have a .compsig extension.

      Some update packages require multiple signature files. You must upload each signature file individually.

   c. Click OK to upload the signature file.

      Wait for HPE OneView to process and associate the signature file. When the process is complete, HPE OneView validates the update files and the **Hotfix** will show a healthy status.

7. From the Firmware Bundles Actions menu, choose Create custom firmware bundle. The Create Custom Firmware Bundle dialog box appears.
8. Select a name for the custom firmware bundle, noting that a custom firmware bundle may contain one or more hotfix packages.
9. Select the base firmware bundle to which one or more hotfix packages will be added to create the custom firmware bundle.
10. Click Add Hotfix. The Add Hotfix dialog box appears.
11. Select all hotfix packages required by this custom firmware bundle. You can select multiple hotfix packages.
12. When all the required hotfix packages are selected, click Add.

    The selected hotfix packages are displayed on the Create Custom Firmware Bundle dialog box.

13. Click OK. The Create Custom Firmware Bundle dialog is dismissed and HPE OneView creates a firmware bundle. The new firmware bundle will include the base firmware bundle and the hotfix packages previously added.

After the custom firmware bundle is created, you can select it as a new logical enclosure firmware baseline. It can also be used as a firmware baseline for server profiles and server profile templates.

14. To install the updates online using HPE Smart Update Tools:

    - Set the Firmware baseline option in the server profile to the custom baseline and then select the Firmware and OS Drivers using Smart Update Tools installation method.

    This will make the driver packages available for installation on the Operating System using the HPE Smart Update Tools.

    For more information on using HPE Smart Update Tools, see HPE OneView online help and SUT documentation at **http://www.hpe.com/support/hpeproductdocs-quicklinks**.

IPMI server management

Server management through IPMI is a standard method for controlling and monitoring the server. The iLO firmware provides server management based on the IPMI version 2.0 specification, which defines the following:

- Monitoring of system information such as fans, temperatures, and power supplies
- Recovery capabilities such as system resets and power on or off operations
- Logging capabilities for abnormal events such as over-temperature readings or fan failures
- Inventory capabilities such as identification of failed hardware components

NOTE

On HPE ARM-based Gen11 servers like HPE ProLiant RL3xx Gen 11, the server `AssetTag` configured through RBSU does not impact the iLO interfaces using Redfish or IPMI, for example, postman and ipmitool. Similarly, an `AssetTag` configured through iLO interfaces using Redfish or IPMI does not impact the `AssetTag` settings in the BIOS.

IPMI communications depend on the BMC and the SMS. The BMC manages the interface between the SMS and the platform management hardware. The iLO firmware emulates the BMC functionality, and various industry-standard tools can provide the SMS functionality. For more information, see the IPMI specification on the Intel website at **https://www.intel.com**.

The iLO firmware provides the KCS interface, or open interface, for SMS communications. The KCS interface provides a set of I/O mapped communications registers. The default system base address for the I/O-mapped SMS interface is `0xCA2`, and it is byte aligned at this system address.

The KCS interface is accessible to the SMS software running on the local system. Examples of compatible SMS software applications follow:

- **IPMI version 2.0 Command Test Tool**—A low-level MS-DOS command-line tool that enables hex-formatted IPMI commands to be sent to an IPMI BMC that implements the KCS interface. You can download this tool from the Intel website at **https://www.intel.com**.
- **IPMItool**—A utility for managing and configuring devices that support the IPMI version 1.5 and version 2.0 specifications. IPMItool can be used in a Linux environment. You can download this tool from the IPMItool website at **https://ipmitool.sourceforge.net/index.html**.
- **FreeIPMI**—A utility for managing and configuring devices that support the IPMI version 1.5 and version 2.0 specifications. You can download FreeIPMI from the following website: **https://www.gnu.org/software/freeipmi/**.
- **IPMIUTIL**—A utility for managing and configuring devices that support the IPMI version 1.0, 1.5, and version 2.0 specifications. You can download IPMIUTIL from the following website: **https://ipmiutil.sourceforge.net/**

When emulating a BMC for the IPMI interface, iLO supports all mandatory commands listed in the IPMI version 2.0 specification. The SMS must use the methods described in the specification for determining which IPMI features are enabled or disabled in the BMC (for example, using the `Get Device ID` command).

If the server OS is running, and the iLO driver is enabled, any IPMI traffic through the KCS interface can affect iLO performance and system health. Do not issue any IPMI commands through the KCS interface that might have a negative effect on IPMI services. This restriction includes any command that sets or changes IPMI parameters, such as `Set Watchdog Timer` and `Set BMC Global Enabled`. Any IPMI command that simply returns data is safe to use, such as `Get Device ID` and `Get Sensor Reading`.

Subtopics

- Advanced IPMI tool usage on Linux

Advanced IPMI tool usage on Linux

The Linux IPMI tool can communicate securely with the iLO firmware by using the IPMI 2.0 RMCP+ protocol. This feature is the `ipmitool I anplus` protocol feature.

For example: To retrieve the iLO Event Log, enter:

```
ipmitool -I lanplus -H <iLO ip address> -U <username> -P <password> sel list
```

Output example:

```
1 | 03/18/2000 | 00:25:37 | Power Supply #0x03 | Presence detected | Deasserted
2 | 03/18/2000 | 02:58:55 | Power Supply #0x03 | Presence detected | Deasserted
3 | 03/18/2000 | 03:03:37 | Power Supply #0x04 | Failure detected | Asserted
4 | 03/18/2000 | 03:07:35 | Power Supply #0x04 | Failure detected | Asserted
```

Setting up Kerberos authentication and directory services

Subtopics

- Kerberos authentication with iLO
- Configuring the iLO hostname and domain name for Kerberos authentication
- Preparing the domain controller for Kerberos support
- Generating a keytab file for iLO in a Windows environment
- Verifying that your environment meets the Kerberos authentication time requirement
- Configuring supported browsers for single sign-on
- Directory integration benefits
- Choosing a directory configuration to use with iLO
- Schema-free directory authentication
- HPE Extended Schema directory authentication
- User login using directory services
- Tools for configuring multiple iLO systems at a time
- Directory services schema

Kerberos authentication with iLO

Kerberos support enables a user to log in to iLO by clicking the Zero Sign In button on the login page instead of entering a user name and password. To log in successfully, the client workstation must be logged in to the domain, and the user must be a member of a directory group for which iLO is configured. If the workstation is not logged in to the domain, the user can log in to iLO by using the Kerberos UPN and domain password.

Because a system administrator establishes a trust relationship between iLO and the domain before user sign-on, any form of authentication (including two-factor authentication) is supported. For information about configuring a user account to support two-factor authentication, see the server OS documentation.

Subtopics

- Configuring Kerberos authentication

Configuring Kerberos authentication

Procedure

1. Configure the iLO host name and domain name.
2. Install an iLO license to enable Kerberos Authentication .
3. Prepare the domain controller for Kerberos support .
4. Generate a Kerberos keytab file.
5. Verify that your environment meets the Kerberos authentication time requirement .
6. Configure the Kerberos parameters in iLO.
7. Configure iLO directory groups.
8. Configure supported browsers for single-sign-on.

Configuring the iLO hostname and domain name for Kerberos authentication

About this task

Use the following procedure if a DHCP server does not provide the domain name or DNS servers you want to use.

Procedure

1. Click iLO Dedicated Network Port in the navigation tree.
2. Click the IPv4 section.
3. Clear the following check boxes, and then click Submit.
   - Use DHCPv4 Supplied Domain Name
   - Use DHCPv4 Supplied DNS Servers
4. Click the IPv6 tab.
5. Clear the following check boxes, and then click Submit.
   - Use DHCPv6 Supplied Domain Name
   - Use DHCPv6 Supplied DNS Servers
6. Click the General section.
7. (Optional) Update the iLO Subsystem Name (Hostname).
8. Update the Domain Name.
9. Click Submit.
10. To restart iLO, click Reset.

Subtopics

iLO hostname and domain name requirements for Kerberos authentication

iLO hostname and domain name requirements for Kerberos authentication

iLO hostname and domain name requirements for Kerberos authentication

- Domain Name—The iLO domain name value must match the Kerberos realm name, which is typically the domain name converted to uppercase letters. For example, if the parent domain name is `somedomain.net`, the Kerberos realm name is `SOMEDOMAIN.NET`.
- iLO Subsystem Name (Hostname)—The configured iLO hostname must be identical to the iLO hostname that you use when you generate the keytab file. The iLO hostname is case-sensitive.

Preparing the domain controller for Kerberos support

About this task

In a Windows Server environment, Kerberos support is part of the domain controller, and the Kerberos realm name is usually the domain name converted to uppercase letters.

Procedure

1. Create and enable computer accounts in the domain directory for each iLO system.
2. Create the user account in the Active Directory Users and Computers snap-in. For example:
   - iLO hostname: `myilo`
   - Parent domain name: `somedomain.net`
   - iLO domain name (fully qualified): `myilo.somedomain.net`
3. Ensure that a user account exists in the domain directory for each user who is allowed to log in to iLO.
4. Create universal and global user groups in the domain directory.

   To set permissions in iLO, you must create a security group in the domain directory. Users who log in to iLO are granted the sum of the permissions for all groups of which they are a member. Only universal and global user groups can be used to set permissions. Domain local groups are not supported.

Generating a keytab file for iLO in a Windows environment

Procedure

1. Use the `Ktpass.exe` tool to generate a keytab file and set the shared secret.
2. (Optional) Use the `Setspn` command to assign the Kerberos SPN to the iLO system.
3. (Optional) Use the `Setspn -L <iLO name>` command to view the SPN for the iLO system.

   Verify that the `HTTP/myilo.somedomain.net` service is displayed.

Subtopics

Ktpass
Setspn

Ktpass

Syntax

`Ktpass [options]`

Description

`Ktpass` generates a binary file called the keytab file, which contains pairs of service principal names and encrypted passwords for Kerberos authentication.

Parameters

`+rndPass`

Specifies a random password.

`-ptype KRB5_NT_SRV_HST`

The principal type. Use the host service instance (KRB5_NT_SRV_HST) type.

`-princ <principal name>`

Specifies the case-sensitive principal name. For example, `HTTP/myilo.somedomain.net@SOMEDOMAIN.net`.

- The service type must use uppercase letters (`HTTP`).
- The iLO hostname must use lowercase letters (`myilo.somedomain.net`).
- The REALM name must use uppercase letters (`@SOMEDOMAIN.NET`).

`-mapuser <user account>`

Maps the principal name to the iLO system domain account.

`-out <file name>`

Specifies the file name for the `.keytab` file.

`-crypto <encryption>`

Specifies the encryption of the keys generated in the `.keytab` file.

If iLO is configured to use the Secured Standard, FIPS, or CNSA security state, use an AES Kerberos key type.

`kvno`

Override key version number.

> **IMPORTANT**
>
> Do not use this parameter. This option causes the `kvno` in the keytab file to be out of sync with the `kvno` in Active Directory.

Example command

```
Ktpass +rndPass -ptype KRB5_NT_SRV_HST -princ
HTTP/myilo.somedomain.net@SOMEDOMAIN.NET -mapuser myilo$@somedomain.net
-out myilo.keytab
```

Example output

```
Targeting domain controller: domaincontroller.example.net
Using legacy password setting method
Successfully mapped HTTP/iloname.example.net to iloname.
WARNING: pType and account type do not match. This might cause problems.
Key created.
Output keytab to myilo.keytab:
Keytab version: 0x502
keysize 69 HTTP/iloname.example.net@EXAMPLE.NET ptype 3
(KRB5 _NT_SRV_HST) vno 3 etype 0x17 (RC4-HMAC) keylength 16
```

```
(0x5a5c7c18ae23559acc2 9d95e0524bf23)
```

The `Ktpass` command might display a message about not being able to set the UPN. This result is acceptable because iLO is a service, not a user. You might be prompted to confirm the password change on the computer object. To close the window and continue creating the keytab file, click OK.

Setspn

Syntax

`Setspn [options]`

Description

The `Setspn` command displays, modifies, and deletes SPNs.

Parameters

`-A <SPN>`

Specifies an SPN to add.

`-L`

Lists the current SPN for a system.

Example command

```
SetSPN -A HTTP/myilo.somedomain.net myilo
```

The SPN components are case-sensitive. The primary (service type) must be in uppercase letters, for example, `HTTP`. The instance (iLO hostname) must be in lowercase letters, for example, `myilo.somedomain.net`.

The `SetSPN` command might display a message about not being able to set the UPN. This result is acceptable because iLO is a service, not a user. You might be prompted to confirm the password change on the computer object. Click OK to close the window and continue creating the keytab file.

Verifying that your environment meets the Kerberos authentication time requirement

About this task

For Kerberos authentication to function properly, the date and time must be synchronized between the iLO processor, the KDC, and the client workstation. Set the date and time in iLO with the server, or obtain the date and time from the network by enabling the SNTP feature in iLO.

Procedure

Verify that the date and time of the following are set to within 5 minutes of one another:

- The iLO date and time setting
- The client running the web browser
- The servers performing the authentication

Configuring supported browsers for single sign-on

Users who are allowed to log in to iLO must be members of the groups for which permissions are assigned. For Windows clients, locking and unlocking the workstation refreshes the credentials that are used to log in to iLO. Home versions of the Windows operating system do not support Kerberos login.

The procedures in this section enable login if Active Directory is configured correctly for iLO, and iLO is configured correctly for Kerberos login.

Subtopics

Enabling single sign-on in Mozilla Firefox

Procedure

1. Enter
   `about:config`
   in the browser location bar to open the browser configuration page.

   Firefox displays the following message:

   `This might void your warranty!`
2. Click the I accept the risk! button.
3. Enter
   `network.negotiate`
   in the Search box.
4. Double-click `network.negotiate-auth.trusted-uris`.
5. Enter the iLO DNS domain name (for example, `example.net`), and then click OK.
6. Verify the single sign-on configuration.

Single-sign on with Google Chrome

Configuration is not required for Google Chrome.

Enabling single sign-on in Microsoft Edge

About this task

Configuration is not required for Microsoft Edge.

Verifying the single sign-on (Zero Sign In) configuration

Procedure

1. Navigate to the iLO login page (for example, `http://iloname.example.net`).
2. Click the Zero Sign In button.

Verifying that login by name works

Procedure

1. Navigate to the iLO login page.
2. Enter the user name in the Kerberos UPN format (for example, **`user@EXAMPLE.NET`**).
3. Enter the associated domain password.
4. Click Log In.

Directory integration benefits

- **Scalability**—The directory can be leveraged to support thousands of users on thousands of iLO processors.
- **Security**—Robust user-password policies are inherited from the directory. User-password complexity, rotation frequency, and expiration are policy examples.
- **User accountability**—In some environments, users share iLO accounts, which makes it difficult to determine who performed an operation.
- **Role-based administration** (HPE Extended Schema)—You can create roles (for example, clerical, remote control of the host, complete control) and associate them with users or user groups. A change to a single role applies to all users and iLO devices associated with that role.
- **Single point of administration** (HPE Extended Schema)—You can use native administration tools like MMC to administer iLO users.
- **Immediacy**—A single change in the directory rolls out immediately to associated iLO processors. This feature eliminates the need to script this process.
- **Simpler credentials**—You can use existing user accounts and passwords in the directory without having to remember a new set of credentials for iLO.
- **Flexibility** (HPE Extended Schema)—You can create a single role for a single user on a single iLO processor, a single role for multiple users on multiple iLO processors, or a combination of roles suited to your enterprise. With the HPE Extended Schema configuration, access can be limited to a time of day or a range of IP addresses.
- **Compatibility**—iLO directory integration supports Active Directory and OpenLDAP.
- **Standards**—iLO directory support is based on the LDAP 2.0 standard for secure directory access. iLO Kerberos support is based on LDAP v3.

Choosing a directory configuration to use with iLO

Before you configure iLO for directories, choose between the schema-free and HPE Extended Schema configuration options.

Consider the following questions:

1. **Can you apply schema extensions to your directory?**

   - **Yes**—Continue to question 2.
   - **No**—You are using Active Directory, and your company policy prohibits applying extensions.

     No—You are using OpenLDAP. The HPE Extended Schema is not currently supported with OpenLDAP.

     No—Directory integration with the HPE Extended Schema does not fit your environment.

     Use group-based schema-free directory integration. Consider deploying an evaluation server to assess the benefits of directory integration with the HPE Extended Schema configuration.

2. **Is your configuration scalable?**

   The following questions can help you determine whether your configuration is scalable:

   - Are you likely to change the rights or privileges for a group of directory users?
   - Will you regularly script iLO changes?
   - Do you use more than five groups to control iLO privileges?

   Depending on your answers to these questions, choose from the following options:

   - **No**—Deploy an instance of the schema-free directory integration to evaluate whether this method meets your policy and procedural requirements. If necessary, you can deploy an HPE Extended Schema configuration later.
   - **Yes**—Use the HPE Extended Schema configuration.

Schema-free directory authentication

When you use schema-free directory authentication, users and groups reside in the directory, and group privileges reside in the iLO settings. iLO uses the directory login credentials to read the user object in the directory and retrieve the user group memberships, which are compared to the group configuration in iLO. If the directory user account is verified as a member of a configured iLO directory group, iLO login is successful.

Advantages of schema-free directory integration

- Extending the directory schema is not required.
- Minimal setup is required for users in the directory. If no setup exists, the directory uses existing users and group memberships to access iLO. For example, if you have a domain administrator named User1, you can copy the DN of the domain administrator security group to iLO, and give it full privileges. User1 would then have access to iLO.

Disadvantage of schema-free directory integration

Group privileges are administered on each iLO system. This disadvantage has minimal impact because group privileges rarely change, and the task of changing group membership is administered in the directory and not on each iLO system. Hewlett Packard Enterprise provides tools that enable you to configure multiple iLO systems at the same time.

Configuration options

The schema-free setup options are the same, regardless of the method you use to configure the directory. You can configure the directory settings for minimum login flexibility, better login flexibility, or maximum login flexibility.

- **Minimum login flexibility**—With this configuration, you can log in to iLO by entering your full DN and password. You must be a member of a group that iLO recognizes.

  To use this configuration, enter the following settings:

  - The directory server DNS name or IP address and LDAP port. Typically, the LDAP port for an TLS connection is 636.
  - The DN for at least one group. This group can be a security group (for example, `CN=Administrators,CN=Builtin,DC=EXA`

`MPLE,DC=COM` for Active Directory, or `UID=username,ou=People,dc=example,dc=com` for OpenLDAP) or any other group, as long as the intended iLO users are group members.

- **Better login flexibility**—With this configuration, you can log in to iLO by entering your login name and password. You must be a member of a group that iLO recognizes. At login time, the login name and user context are combined to make the user DN.

  To use this configuration, enter the minimum login flexibility settings and at least one directory user context.

  For example, if a user logs in as `JOHN.SMITH`, and the user context `CN=USERS,DC=EXAMPLE,DC=COM`, is configured, iLO uses the following DN: `CN=JOHN.SMITH,CN=USERS,DC=EXAMPLE,DC=COM`.

- **Maximum login flexibility**—With this configuration, you can log in to iLO by using your full DN and password, your name as it appears in the directory, the NetBIOS format (domain\login_name), or the email format (login_name@domain).

  To use this configuration, configure the directory server address in iLO by entering the directory DNS name instead of the IP address. The DNS name must be resolvable to an IP address from both iLO and the client system.

Subtopics

Configuring directory integration (schema free configuration)

Procedure

1. Verify that your environment meets the prerequisites for using schema-free directory integration.
2. Configure the iLO schema-free directory parameters.
3. Configure directory groups.

Prerequisites for using schema-free directory integration

Procedure

1. Install Active Directory and DNS.
2. Install the root CA to enable TLS.

   iLO communicates with the directory only over a secure TLS connection.

   For information about using Certificate Services with Active Directory, see the Microsoft documentation.
3. Ensure that the directory DN of at least one user and the DN of a security group that contains that user are available. This information is used for validating the directory setup.
4. Install an iLO license that enables Directory Service Authentication.
5. Verify that the correct DNS server is specified on the iLO network settings IPv4 or IPv6 page.

HPE Extended Schema directory authentication

Using the HPE Extended Schema directory authentication option enables you to do the following:

- Authenticate users from a shared, consolidated, scalable user database.
- Control user privileges (authorization) by using the directory service.
- Use roles in the directory service for group-level administration of iLO management processors and iLO users.

Advantages of HPE Extended Schema directory integration

- Groups are maintained in the directory, not on each iLO.
- Flexible access control—Access can be limited to a time of day or a certain range of IP addresses.

Subtopics

Directory services support

iLO software is designed to run with the Microsoft Active Directory Users and Computers snap-in, enabling you to manage user accounts through the directory.

iLO supports Microsoft Active Directory with the HPE Extended Schema configuration.

Configuring directory integration (HPE Extended Schema configuration)

Procedure

Plan

1. Review the following:
   - Directory-enabled remote management (HPE Extended Schema configuration)
   - Directory services schema

Install

2. Complete the following steps:
   a. Verify that your environment meets the prerequisites for configuring Active Directory with the HPE Extended Schema.
   b. Install an iLO license to enable directory service authentication.
   c. Install the required software:
      - Install HPE Management Devices Schema Extender (Schema Extender)
      - Install HPE Management Devices Directory Snap-ins (x86 and x64)

Update

3. Set directory server settings and the DN of the management processor objects in the iLO web interface.

   You can also complete this step by using the Directories Support for ProLiant Management Processors software.

Manage roles and objects

4. Use the HPE Active Directory snap-ins to configure device and role objects:

   a. Create a management device object and a role object.

   b. Assign rights to the role object, as necessary, and associate the role with the management device object.

   c. Add users to the role object.

Handle exceptions

5. For complex role associations, consider using a directory scripting utility .

   The iLO utilities are easier to use with a single role. If you plan to create multiple roles in the directory, you might want to use directory scripting utilities, like `LDIFDE` or VBScript utilities. These utilities create complex role associations.

Prerequisites for configuring Active Directory with theHPE Extended Schema configuration

Procedure

1. Install Active Directory and DNS.
2. Install the root CA to enable TLS.

   iLO communicates with the directory only over a secure TLS connection.

   For information about using Certificate Services with Active Directory, see the Microsoft documentation.

   iLO requires a secure connection to communicate with the directory service. This connection requires the installation of the Microsoft CA. For more information, see the Microsoft Knowledge Base Article 321051: How to Enable LDAP over SSL with a Third-Party Certification Authority.

3. Verify that version 3.5 or later of the .NET Framework is installed.

   The iLO LDAP component requires this software.

   The LDAP component does not work with a Windows Server Core installation.

4. Read the following Microsoft Knowledge Base article: 299687 MS01-036: Function Exposed By Using LDAP over SSL Could Enable Passwords to Be Changed.

Installing the iLO directory support software

About this task

You can download the directory support software from HPE Support Center:

- HPE Management Devices Schema Extender (Schema Extender)
- Installing HPE Management Devices Directory Snap-ins

Subtopics

Installing HPE Management Devices Schema Extender

Installing HPE Management Devices Schema Extender

About this task

Procedure

1. Download HPE Management Devices Schema Extender (Schema Extender) from **HPE Management Devices Schema Extender**.
2. In the Welcome window, click Next.
3. In the License Agreement window, select I Agree, and then click Next.
4. In the Select Installation Folder window, select the installation directory and user preference, and then click Next.
5. When prompted to confirm the installation request, click Next.

   The Click Close. Installation Complete window opens.
6. Click Close.

Installing HPE Management Devices Directory Snap-ins

About this task

Procedure

1. Download the required software from HPE Support Center:
   a. **HPE Management Devices Directory Snap-ins 32-bit(Snap-in x86)**
   b. **HPE Management Devices Directory Snap-ins 64-bit (Snap-in x64)**
2. In the Welcome window, click Next.
3. In the License Agreement window, select I Agree, and then click Next.
4. Read the details in the Information window, and then click Next.
5. When prompted to confirm the installation request, click Next.

   The Click Close. Installation Complete window opens.
6. Click Close.

   After the snap-ins are installed, you can create iLO objects and iLO roles in the directory. Install HPE Management Devices Directory Snap-ins on each computer that will be used to manage directory objects. For more information, see Directory services objects.

Directories Support for ProLiant Management Processors install options

- HPE Management Devices Schema Extender —The `.xml` files bundled with the HPE Management Devices Schema Extender contain the schemas that are added to the directory. Typically, one of these files contains a core schema that is common to all the supported directory services. The other files contain product-specific schemas. The schema installer requires the .NET Framework.
  You cannot run the schema installer on a domain controller that hosts Windows Server Core. For security and performance reasons, Windows Server Core does not use a GUI. To use the schema installer, you must install a GUI on the domain controller or use a domain controller that hosts an earlier version of Windows.
- HPE Management Devices Directory Snap-ins 64-bit or HPE Management Devices Directory Snap-ins 32-bit —HPE Management Devices Directory Snap-ins installer installs the snap-ins required to manage iLO objects in a Microsoft Active Directory Users and Computers

directory or Novell ConsoleOne directory.

iLO snap-ins are used to perform the following tasks in creating an iLO directory:

- Creating and managing the iLO objects and role objects
- Making the associations between the iLO objects and the role objects

- Directories Support for ProLiant Management Processors—This utility allows you to configure Kerberos authentication and Directory services with iLO.

  The `HPLOMIG.exe` file, the required DLLs, the license agreement, and other files are installed in the directory `C:\Program Files (x86)\Hewlett Packard Enterprise\Directories Support for ProLiant Management Processors`. You can select a different directory. The installer creates a shortcut to Directories Support for ProLiant Management Processors on the Start menu.
  If the installation utility detects that the .NET Framework is not installed, it displays an error message and exits.

Running the Schema Extender

Procedure

1. Start the Management Devices Schema Extender from the Windows Start menu.
2. Verify that Lights Out Management is selected, and then click Next.
3. Read the information in the Preparation window, and then click Next.
4. In the Schema Preview window, click Next.
5. In the Setup window, enter the following details:
   - Directory server type, name, and port.
   - Directory login information and TLS preference

   The Results window displays the results of the installation, including whether the schema was extended and the changed attributes.

Subtopics

Schema Extender required information

Schema Extender required information

Directory Server

- Type—The directory server type.
- Name—The directory server name.
- Port—The port to use for LDAP communications.

Directory Login

- Login Name—A user name to log in to the directory.

  A directory user name and password might be required to complete the schema extension.

  When you enter credentials, use the `Administrator` login along with the domain name, for example, `Administrator@domain.com` or `domain\Administrator`.
  Extending the schema for Active Directory requires a user who is an authenticated schema administrator, that the schema is not write protected, and that the directory is the FSMO role owner in the tree. The installer attempts to make the target directory

server the FSMO schema master of the forest.

- Password—A password to log in to the directory.
- Use TLS for this Session—Sets the form of secure authentication to be used. If this option is selected, directory authentication through TLS is used. If this option is not selected and Active Directory is selected, Windows authentication is used.

Directory services objects

One of the keys to directory-based management is proper virtualization of the managed devices in the directory service. This virtualization allows the administrator to build relationships between the managed device and users or groups within the directory service. User management of iLO requires the following basic objects in the directory service:

- Lights-Out Management object
- Role object
- User objects

Each object represents a device, user, or relationship that is required for directory-based management.

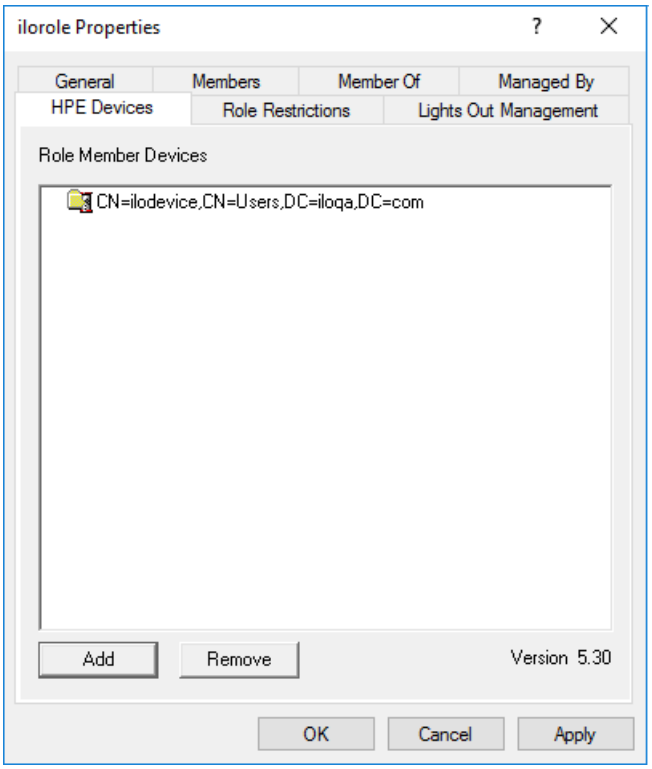
After the HPE Management Devices Directory Snap-ins are installed, iLO objects and iLO roles can be created in the directory. The following tasks are completed by using the Active Directory Users and Computers tool:

- Create iLO and role objects.
- Add users to the role objects.
- Set the rights and restrictions of the role objects.

Management options added by the HPE Active Directory snap-ins

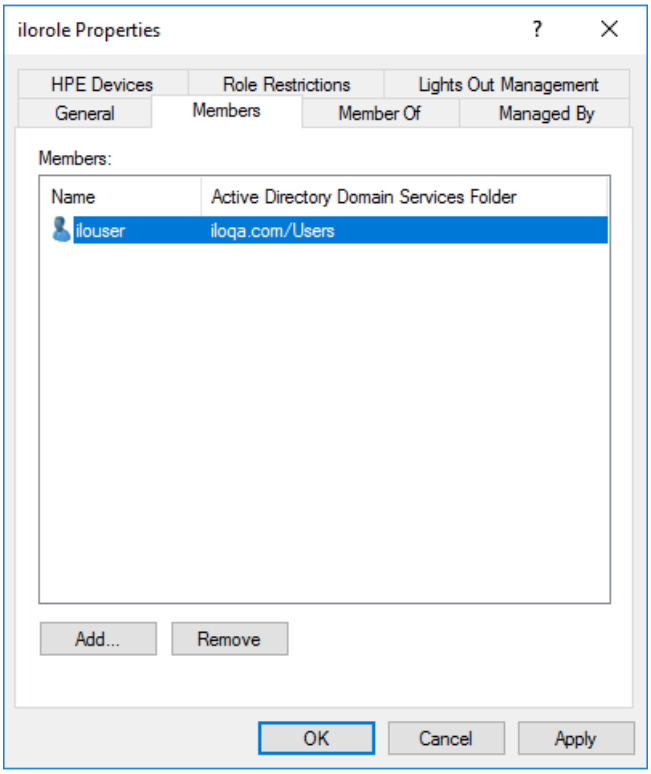
The following management options are available in Active Directory Users and Computers after you install the Hewlett Packard Enterprise snap-ins.

Devices tab



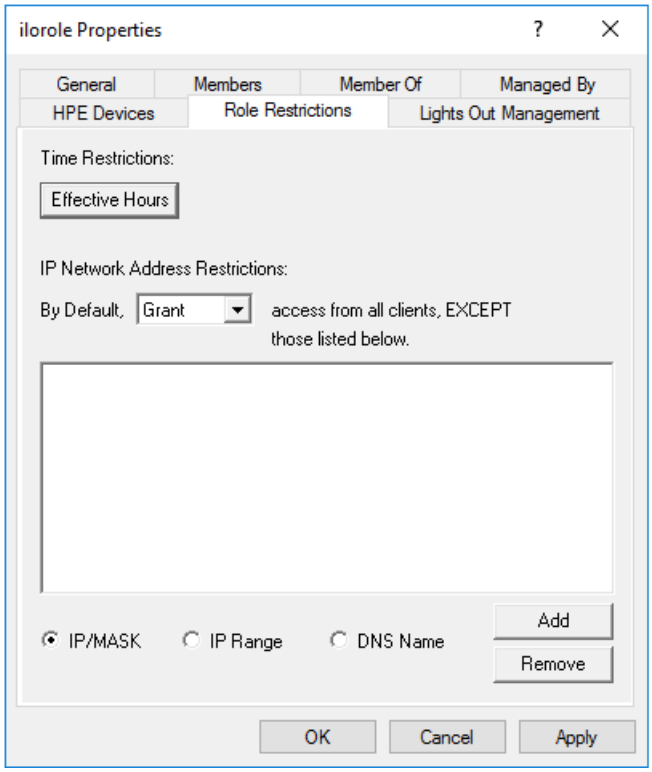
This tab enables you to add the Hewlett Packard Enterprise devices to be managed within a role. Clicking Add enables you to navigate to a device and add it to the list of member devices. Selecting an existing device and clicking Remove removes the device from the list of valid member devices.

Members tab



After user objects are created, this tab enables you to manage the users within the role. Clicking Add enables you to navigate to the user you want to add. Highlighting an existing user and clicking Remove removes the user from the list of valid members.

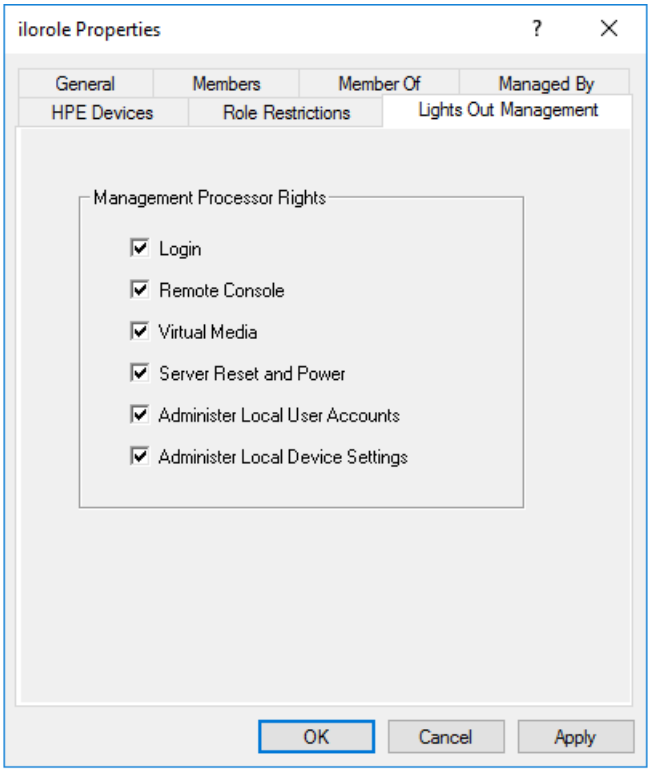
Role Restrictions tab



This tab enables you to set the following types of role restrictions:

- Time restrictions—Click Effective Hours to select the times available for logon for each day of the week, in half-hour increments. You can change a single square by clicking it. To change multiple squares, click and hold the mouse button, drag the cursor across the squares, and then release the mouse button. The default setting is to allow access at all times.
- IP network address restrictions, including IP/mask, IP range, and DNS name.

Lights Out Management tab



After you create a role, use this tab to select rights for the role. You can make users and group objects members of the role, giving the users or group of users the rights granted by the role.

User rights to any iLO system are calculated as the sum of all rights assigned by all roles in which the user is a member, and in which the iLO

is a managed device. Using the example in Creating and configuring directory objects for use with iLO in Active Directory, if a user is in both the `remoteAdmins` and `remoteMonitors` roles, they have all available rights, because `remoteAdmins` has all rights.

The available rights follow:

- Login—Controls whether users can log in to the associated devices.
- Remote Console—Enables users to access the iLO Remote Console.
- Virtual Media—Enables users to access the iLO Virtual Media feature.
- Server Reset and Power—Enables users to use the iLO Virtual Power button.
- Administer Local User Accounts—Enables users to administer user accounts. Users can modify their account settings, modify other user account settings, add users, and delete users.
- Administer Local Device Settings—Enables the user to configure the iLO management processor settings.

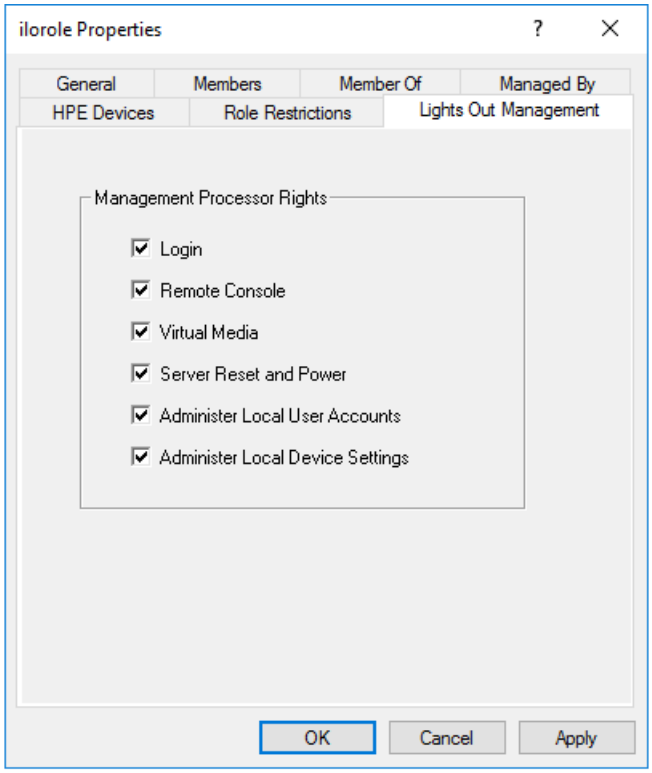
Subtopics

Setting a client IP address or DNS name restriction

Procedure

1. From the By Default list on the Role Restrictions tab, select whether to Grant or Deny access from all addresses except the specified IP addresses, IP address ranges, and DNS names.
2. Select one of the following restriction types, and then click Add.
   - DNS Name—Allows you to restrict access based on a single DNS name or a subdomain, entered in the form of `host.company.com` or `*.domain.company.com`.
   - IP/MASK—Allows you to enter an IP address or network mask.
   - IP Range—Allows you to enter an IP address range.
3. Enter the required information in the restriction settings window, and then click OK.

   The following example shows the New IP/Mask Restriction window.



4. Click OK.

   The changes are saved, and the iLORole Properties dialog box closes.

Directory-enabled remote management (HPE Extended Schema configuration)

Directory-enabled remote management enables you to do the following:

Create Lights-Out Management objects

You must create one LOM device object to represent each device that will use the directory service to authenticate and authorize users. You can use the HPE Management Devices Directory Snap-ins to create LOM objects.

Hewlett Packard Enterprise recommends using meaningful names for LOM device objects. For example, you could use the device network address, DNS name, host server name, or serial number.

Configure Lights-Out management devices

Every LOM device that uses the directory service to authenticate and authorize users must be configured with the appropriate directory settings. In general, you can configure each device with the appropriate directory server address, LOM object DN, and user contexts. The server address is the IP address or DNS name of a local directory server. To provide more redundancy, you can use a multihost DNS name.

Subtopics

Roles based on organizational structure

Often, administrators in an organization are placed in a hierarchy in which subordinate administrators must assign rights independently of

ranking administrators. In this case, it is useful to have one role that represents the rights assigned by higher-level administrators, and to allow subordinate administrators to create and manage their own roles.

Using existing groups

Many organizations have users and administrators arranged in groups. In many cases, it is convenient to use the existing groups and associate them with one or more LOM role objects. When the devices are associated with the role objects, the administrator controls access to the Lights-Out devices associated with the role by adding or deleting members from the groups.

When you use Microsoft Active Directory, you can place one group within another (that is, use nested groups). Role objects are considered groups and can include other groups directly. Add the existing nested group directly to the role, and assign the appropriate rights and restrictions. You can add new users to either the existing group or the role.

When you use trustee or directory rights assignments to extend role membership, users must be able to read the LOM object that represents the LOM device. Some environments require that the trustees of a role also be read trustees of the object to authenticate users successfully.

Using multiple roles

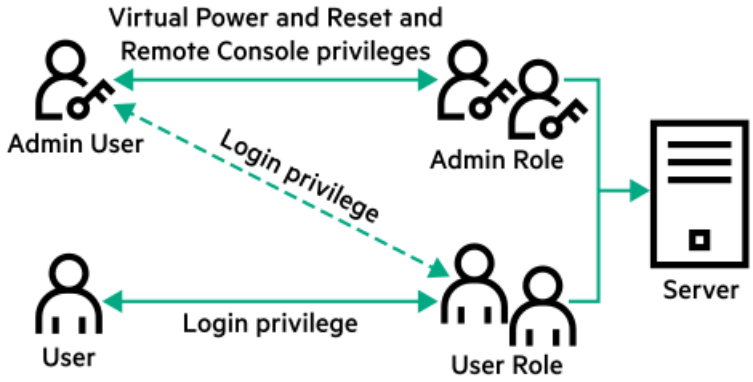
Most deployments do not require that the same user must be in multiple roles managing the same device. However, these configurations are useful for building complex rights relationships. When users build multiple-role relationships, they receive all rights assigned by every applicable role. Roles can only grant rights, never revoke them. If one role grants a user a right, then the user has the right, even if the user is in another role that does not grant that right.

Typically, a directory administrator creates a base role with the minimum number of rights assigned, and then creates additional roles to add rights. These additional rights are added under specific circumstances or to a specific subset of the base role users.

For example, an organization might have two types of users: Administrators of the LOM device or host server, and users of the LOM device. In this situation, it makes sense to create two roles, one for the administrators and one for the users. Both roles include some of the same devices but grant different rights. Sometimes it is useful to assign generic rights to the lesser role and include the LOM administrators in that role, as well as the administrative role.

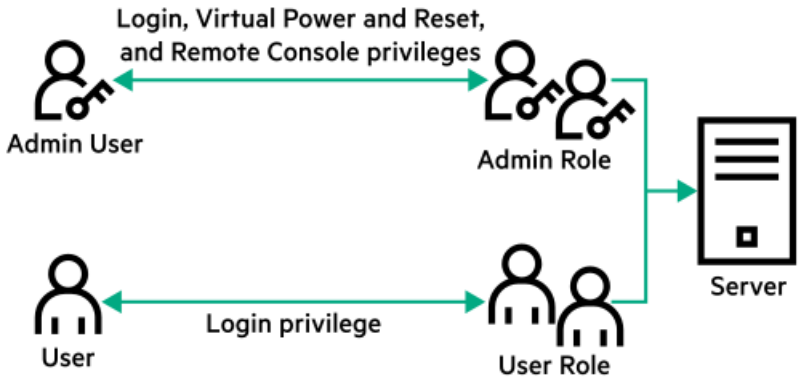
Multiple roles (overlapping) shows an example in which the Admin user gains the Login privilege from the User role, and advanced privileges are assigned through the Admin role.

Figure 1. Multiple roles (overlapping)



If you do not want to use overlapping roles, you could assign the Login, Virtual Power and Reset, and Remote Console privileges to the Admin role, and assign the Login privilege to the User role, as shown in Multiple roles (separate).

Figure 2. Multiple roles (separate)

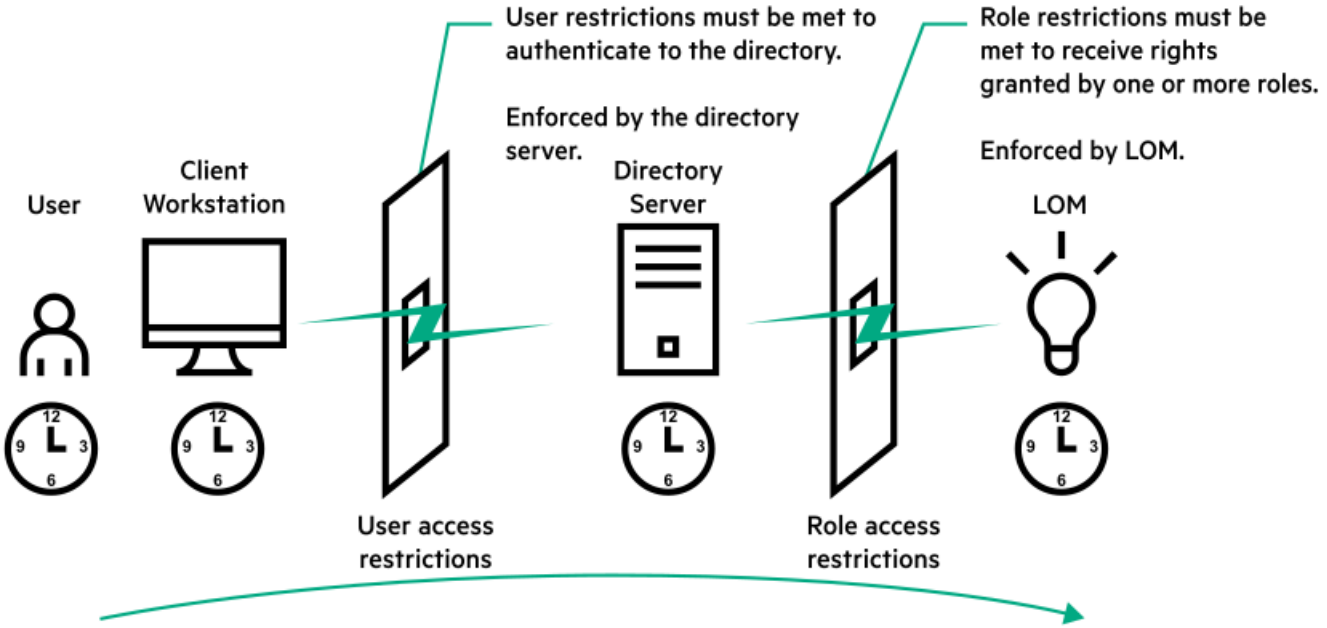


How role access restrictions are enforced

Two sets of restrictions can limit directory user access to LOM devices.

- User access restrictions limit user access to authenticate to the directory.
- Role access restrictions limit the ability of an authenticated user to receive LOM privileges based on rights specified in one or more roles.

Figure 1. Directory login restrictions



User access restrictions

Address restrictions

Administrators can place network address restrictions on a directory user account. The directory server enforces these restrictions.

For information about the enforcement of address restrictions on LDAP clients, such as a user logging in to a LOM device, see the directory service documentation.

Network address restrictions placed on a user in a directory might not be enforced as expected when a directory user logs in through a proxy server. When a user logs in to a LOM device as a directory user, the LOM device attempts authentication to the directory as that user, which means that address restrictions placed on the user account apply when the user accesses the LOM device. When a proxy server is used, the network address of the authentication attempt is that of the LOM device, not that of the client workstation.

IPv4 address range restrictions

IP address range restrictions enable the administrator to specify network addresses that are granted or denied access.

The address range is typically specified in a low-to-high range format. An address range can be specified to grant or deny access to a single address. Addresses that fall within the low-to-high IP address range meet the IP address restriction.

IPv4 address and subnet mask restrictions

IP address and subnet mask restrictions enable the administrator to specify a range of addresses that are granted or denied access.

This format is similar to an IP address range restriction, but it might be more native to your networking environment. An IP address and subnet mask range is typically specified through a subnet address and address bit mask that identifies addresses on the same logical network.

In binary math, if the bits of a client machine address, combined with the bits of the subnet mask, match the subnet address in the restriction, the client meets the restriction.

DNS-based restrictions

DNS-based restrictions use the network name service to examine the logical name of the client machine by looking up machine names assigned to the client IP addresses. DNS restrictions require a functional name server. If the name service goes down or cannot be reached, DNS restrictions cannot be matched and the client machine fails to meet the restriction.

DNS-based restrictions can limit access to a specific machine name or to machines that share a common domain suffix. For example, the DNS restriction **www.example.com** matches hosts that are assigned the domain name **www.example.com**. However, the DNS restriction ***.example.com** matches any machine that originates from the **example** company.

DNS restrictions might cause ambiguity because a host can be multihomed. DNS restrictions do not necessarily match one to one with a single system.

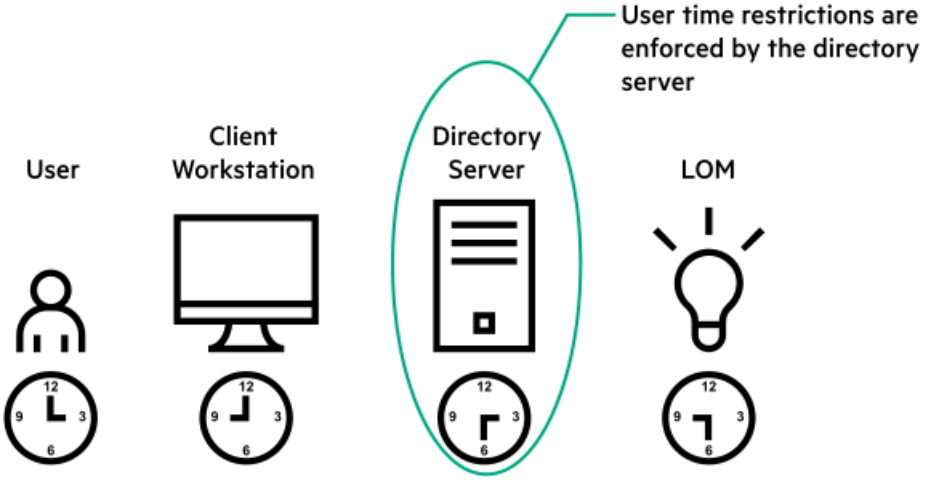
Using DNS-based restrictions might create security complications. Name service protocols are not secure. Any individual who has malicious intent and access to the network can place a rogue DNS service on the network and create a fake address restriction criterion. When implementing DNS-based address restrictions, consider your organizational security policies.

User time restrictions

Time restrictions limit the ability of a user to log in (authenticate) to the directory. Typically, time restrictions are enforced using the time at the directory server. If the directory server is located in a different time zone, or if a replica in a different time zone is accessed, time-zone information from the managed object can be used to adjust for relative time.

The directory server evaluates user time restrictions, but the determination might be complicated by time-zone changes or the authentication mechanism.

Figure 1. User time restrictions



Role access restrictions

Restrictions allow administrators to limit the scope of a role. A role grants rights only to users who satisfy the role restrictions. Using restricted roles results in users with dynamic rights that can change based on the time of day or network address of the client.

When directories are enabled, access to an iLO system is based on whether the user has read access to a role object that contains the corresponding iLO object. This includes, but is not limited to, the members listed in the role object. If the role is configured to allow inheritable permissions to propagate from a parent, members of the parent that have read access privileges will also have access to iLO.

To view the access control list, navigate to Active Directory Users and Computers, open the Properties page for the role object, and then click the Security tab. The Advanced View must be enabled in MMC to view the Security tab.

Role-based time restrictions

Administrators can place time restrictions on LOM roles. Users are granted the rights specified for the LOM devices listed in the role only if they are members of the role and meet the time restrictions for the role.

Role-based time restrictions can be met only if the time is set on the LOM device. LOM devices use local host time to enforce time restrictions. If the LOM device clock is not set, the role-based time restriction fails unless no time restrictions are specified for the role. The time is normally set when the host is booted.

The time setting can be maintained by configuring SNTP. SNTP allows the LOM device to compensate for leap years and minimizes clock drift with respect to the host. Events, such as unexpected power loss or flashing LOM firmware, can cause the LOM device clock not to be set. The host time must be correct for the LOM device to preserve the time setting across firmware flashes.

Role-based address restrictions

The LOM firmware enforces role-based address restrictions based on the client IP network address. When the address restrictions are met for a role, the rights granted by the role apply.

Address restrictions can be difficult to manage when access is attempted across firewalls or through network proxies. Either of these mechanisms can change the apparent network address of the client, causing the address restrictions to be enforced in an unexpected manner.

Multiple restrictions and roles

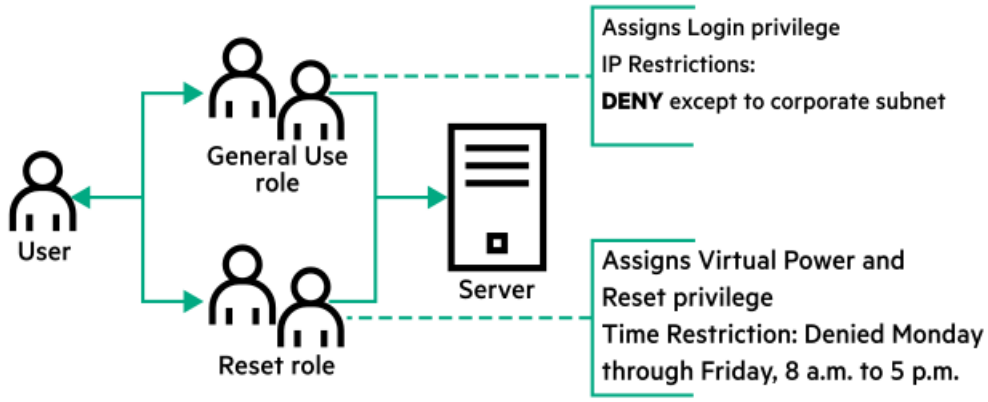
The most useful application of multiple roles is restricting one or more roles so that rights do not apply in all situations. Other roles provide different rights under different constraints. Using multiple restrictions and roles enables the administrator to create arbitrary, complex rights relationships with a minimum number of roles.

For example, an organization might have a security policy in which LOM administrators are allowed to use the LOM device from within the corporate network, but can reset the server only after regular business hours.

Directory administrators might be tempted to create two roles to address this situation, but extra caution is required. Creating a role that provides the required server reset rights and restricting it to after hours might allow administrators outside the corporate network to reset the server, which is contrary to most security policies.

Creating restrictions and roles shows a security policy that dictates that general use is restricted to clients in the corporate subnet, and server reset capability is restricted to after hours.

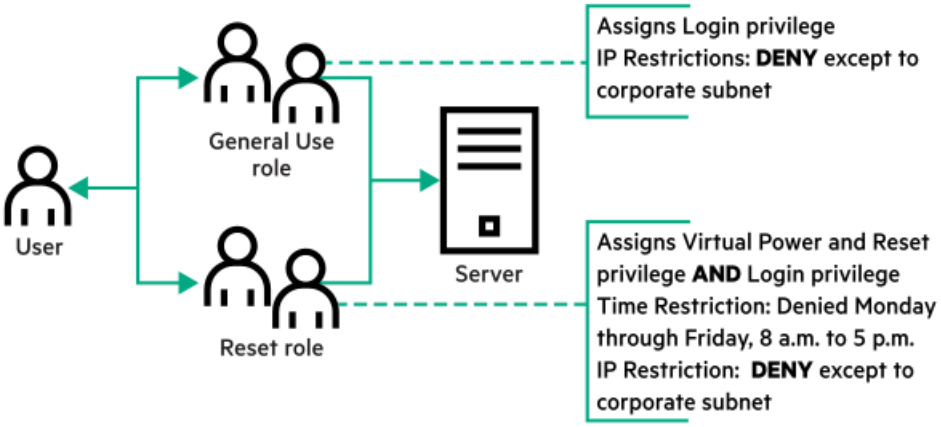
Figure 1. Creating restrictions and roles



Alternatively, the directory administrator might create a role that grants the login right and restrict it to the corporate network, and then create another role that grants only the server reset right and restrict it to after-hours operation. This configuration is easier to manage but more dangerous because ongoing administration might create another role that grants the login right to users from addresses outside the corporate network. This role might unintentionally grant the LOM administrators in the server reset role the ability to reset the server from anywhere, if they satisfy the role time constraints.

The configuration shown in Creating restrictions and roles meets corporate security requirements. However, adding another role that grants the login right can inadvertently grant server reset privileges from outside the corporate subnet after hours. A more manageable solution is to restrict the Reset role and the General Use role, as shown in Restricting the Reset and General Use roles.

Figure 2. Restricting the Reset and General Use roles



Configuring Active Directory and HPE Extended Schema (Example configuration)

About this task

This procedure provides an example of how to configure Active Directory with the HPE Extended Schema.

Procedure

1. Verify that your environment meets the prerequisites for configuring Active Directory with the HPE Extended Schema.
2. Install an iLO license to enable directory service authentication.
3. Install the iLO directory support software.
4. Running the Schema Extender
5. Configure device and role objects.
6. Log in to iLO and enter the directory settings on the Directory page.
7. Verify that the correct DNS server is specified on the iLO network settings IPv4 or IPv6 page.

Subtopics

Creating and configuring directory objects for use with iLO in Active Directory
Configuring iLO and associating it with a Lights-Out Management object

Creating and configuring directory objects for use with iLO in Active Directory

About this task

The following example procedures describe how to set up roles and Hewlett Packard Enterprise devices in an enterprise directory with the domain **testdomain.local**. This domain consists of two organizational units, **Roles** and **iLOs**. The steps in this section are completed by using the Hewlett Packard Enterprise Active Directory Users and Computers snap-ins.

Procedure

1. Create the iLOs organizational unit and add LOM objects.
2. Create the Roles organizational unit and add role objects.
3. Assign rights to the roles and associate the roles with users and devices.

Subtopics

Creating the iLOs organizational unit and adding LOM objects

Procedure

1. Create an organizational unit called iLOs that contains the iLO devices managed by the domain.
2. Right-click the iLOs organizational unit in the testdomain.local domain, and then select New HPE Object.
3. Select Device in the Create New Object dialog box.
4. Enter an appropriate name in the Name box.

   In this example, the DNS hostname of the iLO device, **rib-email-server**, is used as the name of the Lights-Out Management object.
5. Click OK.

Creating the Roles organizational unit and adding role objects

Procedure

1. Create an organizational unit called Roles.
2. Right-click the Roles organizational unit, and then select New HPE Object.
3. Select Role in the Create New Management Object dialog box.
4. Enter an appropriate name in the Name box.

   In this example, the role contains users trusted for remote server administration and is called **remoteAdmins**.
5. Click OK.
6. Repeat the process, creating a role for remote server monitors called **remoteMonitors**.

Assigning rights to the roles and associating the roles with users and devices

Procedure

1. Right-click the remoteAdmins role in the Roles organizational unit in the testdomain.local domain, and then select Properties.
2. In the remoteAdmins Properties dialog box, click the HPE Devices tab, and then click Add.
3. In the Select Users dialog box, enter the Lights-Out Management object (**rib-email-server** in folder testdomain.local/iLOs).
4. Click OK, and then click Apply.
5. Click the Members tab, and add users by using the Add button.
6. Click OK, and then click Apply.

   The devices and users are now associated.

7. Click the Lights Out Management tab.

   All users and groups within a role will have the rights assigned to the role on all the iLO devices that the role manages.

8. Select the check box next to each right, and then click Apply.

   In this example, the users in the remoteAdmins role will have full access to iLO functionality.

9. Click OK.

10. To edit the remoteMonitors role, repeat the process:

    a. Add the rib-email-server device to the list on the HPE Devices tab.

    b. Add users to the remoteMonitors role on the Members tab.

    c. Select the Login right on the Lights Out Management tab.

       With this right, members of the remoteMonitors role will be able to authenticate and view the server status.

Configuring iLO and associating it with a Lights-Out Management object

Procedure

Enter settings similar to the following on the Directory page:

```
LOM Object Distinguished Name = cn=rib-email-
server,ou=ILOs,dc=testdomain,dc=local Directory User Context 1 =
cn=Users,dc=testdomain,dc=local
```

User login using directory services

The Login Name box on the iLO login page accepts directory users and local users.

The maximum length of the login name is 39 characters for local users and 127 characters for directory users.

The maximum password length for LDAP user login is 63.

When you connect through the diagnostics port (on a blade server), Zero Sign In and directory user login are not supported and you must use a local account.

Directory users

The following formats are supported:

- LDAP fully distinguished names (Active Directory and OpenLDAP)

  Example: `CN=John Smith,CN=Users,DC=HPE,DC=COM`, or `@HPE.com`

  The short form of the login name does not notify the directory which domain you are trying to access. Provide the domain name or use the LDAP DN of your account.

- `DOMAIN\user name` format (Active Directory)

  Example: `HPE\jsmith`

- `username@domain` format (Active Directory)
  Example: `jsmith@hpe.com`

  Directory users specified using the @ searchable form might be located in one of three searchable contexts, which are configured on the Directory page.

- Username format (Active Directory)

  Example: John Smith

  Directory users specified using the username format might be located in one of three searchable contexts, which are configured on the Directory page.

Local users

Enter the Login Name of your iLO local user account.

Tools for configuring multiple iLO systems at a time

Configuring large numbers of LOM objects for Kerberos authentication and directory services is time consuming. You can use the following utilities to configure several LOM objects at a time.

Directories Support for ProLiant Management Processors

This software includes a GUI that provides a step-by-step approach to configuring Kerberos authentication and directory services with large numbers of management processors. Hewlett Packard Enterprise recommends using this tool when you want to configure several management processors.

Traditional import utilities

Administrators familiar with tools such as LDIFDE or the NDS Import/Export Wizard can use these utilities to import or create LOM device directory objects. Administrators must still configure the devices manually, but can do so at any time. Programmatic or scripting interfaces can be used to create LOM device objects in the same way as users or other objects. For information about attributes and attribute data formats when you are creating LOM objects, see the Directory services schema.

Directory services schema

The Directory services schema describes the classes and attributes that are used to store Hewlett Packard Enterprise Lights-Out management authorization data in the directory service.

Subtopics

HPE Management Core LDAP OID classes and attributes

Changes made to the schema during the schema setup process include changes to the following:

- Core classes
- Core attributes

Core classes

Class name	Assigned OID
hpqTarget	1.3.6.1.4.1.232.1001.1.1.1.1
hpqRole	1.3.6.1.4.1.232.1001.1.1.1.2
hpqPolicy	1.3.6.1.4.1.232.1001.1.1.1.3

Core attributes

Attribute name	Assigned OID
hpqPolicyDN	1.3.6.1.4.1.232.1001.1.1.2.1
hpqRoleMembership	1.3.6.1.4.1.232.1001.1.1.2.2
hpqTargetMembership	1.3.6.1.4.1.232.1001.1.1.2.3
hpqRoleIPRestrictionDefault	1.3.6.1.4.1.232.1001.1.1.2.4
hpqRoleIPRestrictions	1.3.6.1.4.1.232.1001.1.1.2.5
hpqRoleTimeRestriction	1.3.6.1.4.1.232.1001.1.1.2.6

Core class definitions

The following tables define the Hewlett Packard Enterprise Management core classes.

hpqTarget

OID	1.3.6.1.4.1.232.1001.1.1.1.1
Description	This class defines target objects, providing the basis for Hewlett Packard Enterprise products that use directory-enabled management.
Class type	Structural
SuperClasses	user
Attributes	hpqPolicyDN - 1.3.6.1.4.1.232.1001.1.1.2.1 hpqRoleMembership - 1.3.6.1.4.1.232.1001.1.1.2.2
Remarks	None

hpqRole

OID	1.3.6.1.4.1.232.1001.1.1.1.2
Description	This class defines role objects, providing the basis for Hewlett Packard Enterprise products that use directory-enabled management.
Class type	Structural
SuperClasses	group
Attributes	hpqRoleIPRestrictions - 1.3.6.1.4.1.232.1001.1.1.2.5 hpqRoleIPRestrictionDefault - 1.3.6.1.4.1.232.1001.1.1.2.4 hpqRoleTimeRestriction - 1.3.6.1.4.1.232.1001.1.1.2.6 hpqTargetMembership - 1.3.6.1.4.1.232.1001.1.1.2.3
Remarks	None

hpqPolicy

OID	1.3.6.1.4.1.232.1001.1.1.1.3
Description	This class defines policy objects, providing the basis for Hewlett Packard Enterprise products that use directory-enabled management.
Class Type	Structural
SuperClasses	top
Attributes	hpqPolicyDN - 1.3.6.1.4.1.232.1001.1.1.2.1
Remarks	None

Core attribute definitions

The following tables define the HPE Management core class attributes.

hpqPolicyDN

OID	1.3.6.1.4.1.232.1001.1.1.2.1
Description	Distinguished name of the policy that controls the general configuration of this target.
Syntax	Distinguished Name - 1.3.6.1.4.1.1466.115.121.1.12
Options	Single valued
Remarks	None

hpqRoleMembership

OID	1.3.6.1.4.1.232.1001.1.1.2.2
Description	Provides a list of hpqRole objects that belong to this object.
Syntax	Distinguished Name - 1.3.6.1.4.1.1466.115.121.1.12
Options	Multivalued
Remarks	None

hpqTargetMembership

OID	1.3.6.1.4.1.232.1001.1.1.2.3
Description	Provides a list of hpqTarget objects that belong to this object.
Syntax	Distinguished Name - 1.3.6.1.4.1.1466.115.121.1.12
Options	Multivalued
Remarks	None

hpqRoleIPRestrictionDefault

OID	1.3.6.1.4.1.232.1001.1.1.2.4
Description	A Boolean that represents access by unspecified clients and that partially specifies rights restrictions under an IP network address constraint.
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	If this attribute is `TRUE`, IP restrictions will be satisfied for unexceptional network clients. If this attribute is `FALSE`, IP restrictions will be unsatisfied for unexceptional network clients.

hpqRoleIPRestrictions

OID	1.3.6.1.4.1.232.1001.1.1.2.5
Description	Provides a list of IP addresses, DNS names, domains, address ranges, and subnets that partially specify right restrictions under an IP network address constraint.
Syntax	Octet String - 1.3.6.1.4.1.1466.115.121.1.40
Options	Multivalued
Remarks	This attribute is used only on role objects. IP restrictions are satisfied when the address matches and general access is denied. They are unsatisfied when the address matches and general access is allowed. Values are an identifier byte followed by a type-specific number of bytes that specify a network address. • For IP subnets, the identifier is <0x01>, followed by the IP network address in network order, followed by the IP network subnet mask in network order. For example, the IP subnet 127.0.0.1/255.0.0.0 would be represented as <0x01 0x7F 0x00 0x00 0x01 0xFF 0x00 0x00 0x00>. For IP ranges, the identifier is <0x02>, followed by the lower bound IP address, followed by the upper bound IP address. Both are inclusive and in network order. For example, the IP range 10.0.0.1 to 10.0.10.255 would be represented as <0x02 0x0A 0x00 0x00 0x01 0x0A 0x00 0x0A 0xFF>. • For DNS names or domains, the identifier is <0x03>, followed by the ASCII encoded DNS name. DNS names can be prefixed with an * (ASCII 0x2A), to indicate they must match all names that end with the specified string. For example, the DNS domain *.acme.com is represented as <0x03 0x2A 0x2E 0x61 0x63 0x6D 0x65 0x2E 0x63 0x6F 0x6D>. General access is allowed.

hpqRoleTimeRestriction

OID	1.3.6.1.4.1.232.1001.1.1.2.6
Description	A 7-day time grid, with 30-minute resolution, which specifies rights restrictions under a time constraint.
Syntax	Octet String {42} - 1.3.6.1.4.1.1466.115.121.1.40
Options	Single valued
Remarks	This attribute is used only on role objects. Time restrictions are satisfied when the bit that corresponds to the current local time of the device is 1 and unsatisfied when the bit is 0. • The least significant bit of the first byte corresponds to Sunday, from midnight to 12:30 a.m. • Each more significant bit and sequential byte corresponds to the next consecutive half-hour blocks within the week. • The most significant (eighth) bit of the 42nd byte corresponds to Saturday at 11:30 p.m. to Sunday at midnight.

Lights-Out Management specific LDAP OID classes and attributes

The following schema attributes and classes might depend on attributes or classes defined in the Hewlett Packard Enterprise Management

core classes and attributes.

Table 1. Lights-Out Management classes

Class name	Assigned OID
hpqLOMv100	1.3.6.1.4.1.232.1001.1.8.1.1

Lights-Out Management attributes

Class name	Assigned OID
hpqLOMRightLogin	1.3.6.1.4.1.232.1001.1.8.2.3
hpqLOMRightRemoteConsole	1.3.6.1.4.1.232.1001.1.8.2.4
hpqLOMRightVirtualMedia	1.3.6.1.4.1.232.1001.1.8.2.6
hpqLOMRightServerReset	1.3.6.1.4.1.232.1001.1.8.2.5
hpqLOMRightLocalUserAdmin	1.3.6.1.4.1.232.1001.1.8.2.2
hpqLOMRightConfigureSettings	1.3.6.1.4.1.232.1001.1.8.2.1

Lights-Out Management class definitions

The following table defines the Lights-Out Management core class.

Table 1. hpqLOMv100

OID	1.3.6.1.4.1.232.1001.1.8.1.1
Description	This class defines the rights and settings used with HPE Lights-Out Management products.
Class Type	Auxiliary
SuperClasses	None
Attributes	hpqLOMRightConfigureSettings - 1.3.6.1.4.1.232.1001.1.8.2.1 hpqLOMRightLocalUserAdmin - 1.3.6.1.4.1.232.1001.1.8.2.2 hpqLOMRightLogin - 1.3.6.1.4.1.232.1001.1.8.2.3 hpqLOMRightRemoteConsole - 1.3.6.1.4.1.232.1001.1.8.2.4 hpqLOMRightServerReset - 1.3.6.1.4.1.232.1001.1.8.2.5 hpqLOMRightVirtualMedia - 1.3.6.1.4.1.232.1001.1.8.2.6
Remarks	None

Lights-Out Management attribute definitions

The following tables define the Lights-Out Management core class attributes.

hpqLOMRightLogin

OID	1.3.6.1.4.1.232.1001.1.8.2.3
Description	Login right for Lights-Out Management products
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	Meaningful only on role objects. If `TRUE`, members of the role are granted the right.

hpqLOMRightRemoteConsole

OID	1.3.6.1.4.1.232.1001.1.8.2.4
Description	Remote Console right for Lights-Out Management products. Meaningful only on role objects.
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	This attribute is used only on role objects. If this attribute is `TRUE`, members of the role are granted the right.

hpqLOMRightVirtualMedia

OID	1.3.6.1.4.1.232.1001.1.8.2.6
Description	Virtual Media right for Lights-Out Management products
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	This attribute is only used on role objects. If this attribute is `TRUE`, members of the role are granted the right.

hpqLOMRightServerReset

OID	1.3.6.1.4.1.232.1001.1.8.2.5
Description	Remote Server Reset and Power Button right for Lights-Out Management products
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	This attribute is used only on role objects. If this attribute is `TRUE`, members of the role are granted the right.

hpqLOMRightLocalUserAdmin

OID	1.3.6.1.4.1.232.1001.1.8.2.2
Description	Local User Database Administration right for Lights-Out Management products.
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	This attribute is used only on role objects. If this attribute is `TRUE`, members of the role are granted the right.

hpqLOMRightConfigureSettings

OID	1.3.6.1.4.1.232.1001.1.8.2.1
Description	Configure Devices Settings right for Lights-Out Management products.
Syntax	Boolean - 1.3.6.1.4.1.1466.115.121.1.7
Options	Single valued
Remarks	This attribute is used only on role objects. If this attribute is `TRUE`, members of the role are granted the right.

iLO factory default reset

In some cases, you might need to reset iLO to the factory default settings. For example, you must reset iLO to the factory default settings when you disable the FIPS security state.

Factory default reset methods

- iLO 7 Configuration Utility—Access this feature through the UEFI System Utilities.
- iLO RESTful API—For more information, see the following website: **https://www.hpe.com/support/restfulinterface/docs**.
- Command line and scripting tools—For instructions, see the HPE iLO 7 Scripting and Command Line Guide.

Subtopics

Resetting iLO to the factory default settings (iLO 7 Configuration Utility)

Resetting iLO to the factory default settings (iLO 7 Configuration Utility)

About this task

CAUTION

When you reset iLO to the factory default settings, all iLO settings are erased, including user and license data, configuration settings, and logs. If the server has a factory installed license key, the license key is retained.

Events related to the reset are not logged to the iLO Event Log and Integrated Management Log because this step clears all the data in the logs.

Procedure

1. (Optional) If you access the server remotely, start an iLO remote console session.
2. Restart or power on the server.
3. Press F9 in the server POST screen.

   The UEFI System Utilities start.
4. From the System Utilities screen, click System Configuration, and then click iLO 7 Configuration Utility.
5. Select Yes in the Set to factory defaults menu.

   The iLO 7 Configuration Utility prompts you to confirm the request.
6. Click OK.
7. iLO resets to the factory default settings. If you are managing iLO remotely, the Remote Console session is automatically ended. You cannot access the iLO 7 Configuration Utility again until after the next system reboot.
8. Resume the boot process:
   a. (Optional) If you are managing iLO remotely, wait for the iLO reset to finish, and then start the iLO remote console.

      The iLO 7 Configuration Utility screen is still open from the previous session.
   b. Press Esc until the main menu is displayed.
   c. Click Exit and resume system boot.
   d. When prompted to confirm the request, click OK to exit the screen and resume the boot process.
9. (Optional) Use the default iLO account information to log in to iLO after the reset.
10. Reboot the server operating system.

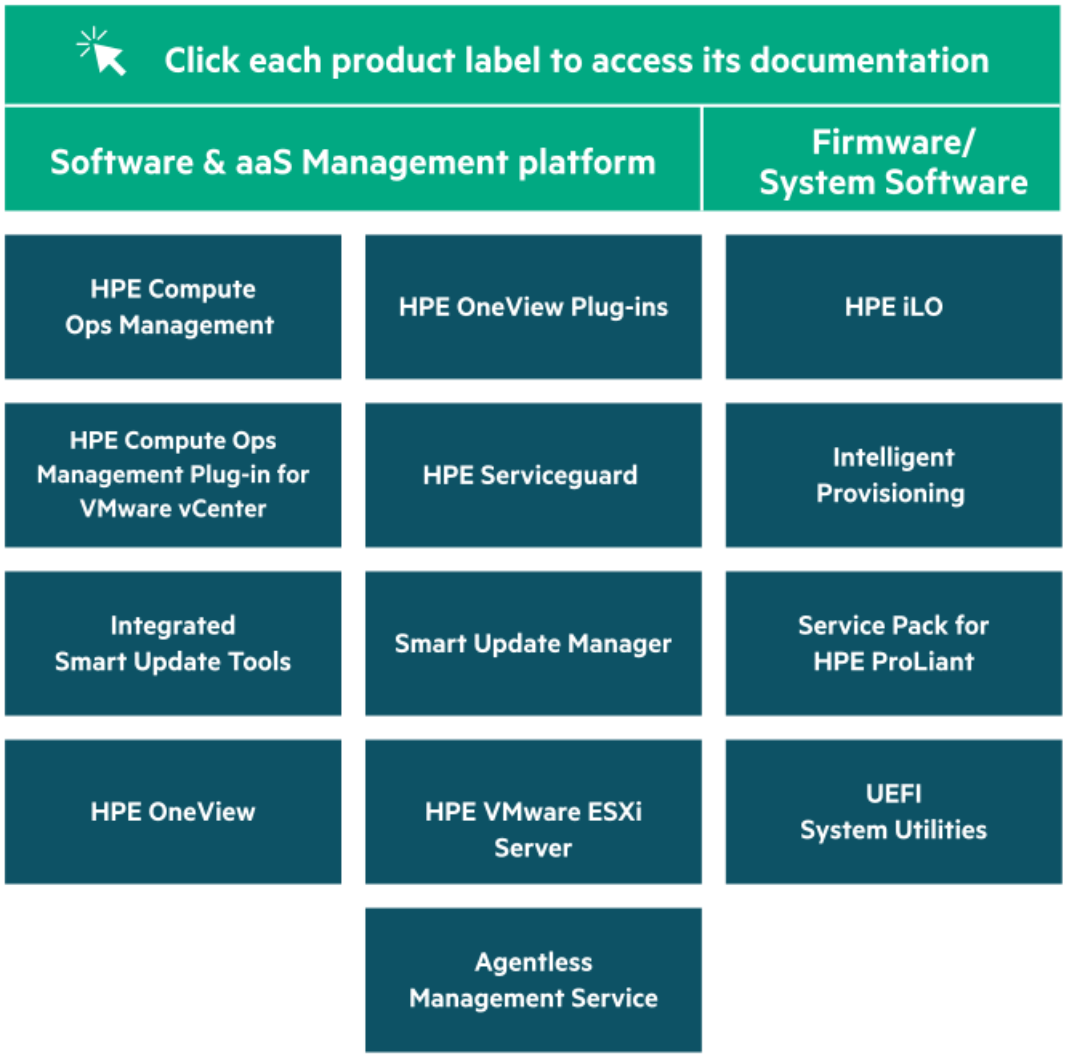
    During the reset to the factory default settings, SMBIOS records are cleared. Memory and network information will not be displayed in the iLO web interface until the server OS reboot is complete.

    The performance management Processor Jitter Control Optimization feature is unavailable until the server OS reboot is complete.

HPE Compute Software and Firmware Product Documentation Quick Links

This infographic provides quick links for documentation for the listed HPE products. It offers easy access to documentation that helps you to understand, implement, and troubleshoot your products.

Each product-specific section lists the current version, the earlier two major versions, and their revisions.



Navigating the Hewlett Packard Enterprise Support Center

- Navigation and workspace
- Search and product knowledge

Subtopics

HPE iLO Documentation Quick Links

HPE iLO Documentation Quick Links

This table is a comprehensive list of all the documents for HPE iLO. It provides quick links to all the versions of each document.

Documents	Versions		
HPE iLO User Guide	iLO 7	iLO 6	iLO 5
HPE iLO Security Technology Brief	iLO 7	iLO 6	iLO 5
HPE iLO Troubleshooting Guide	iLO 7	iLO 6	iLO 5
HPE iLO IPMI User Guide	iLO 7	iLO 6	iLO 5
HPE iLO Licensing Guide	iLO 7	iLO 6	iLO 5

Documents	Versions		
HPE iLO Scripting and Command Line Guide	iLO 7	iLO 6	iLO 5
HPE iLO Easy Setup Guide		iLO 6	iLO 5
HPE iLO Federation User Guide		iLO 6	iLO 5
Alerts - Customer Advisories	iLO 7	iLO 6	iLO 5
HPE iLO Redfish documentation	iLO 7, iLO 6, and iLO 5		
HPE iLOrest User Guide	HPE iLOrest User Guide		
Integrated Management Log Messages for HPE ProLiant Gen10, Gen10 Plus, and Gen11 servers and HPE Synergy	iLO 7, iLO 6, and iLO 5		
HPE iLO 5 Release Notes	3.00	2.45	1.48 (b)
	3.00 (b)	2.48	
	3.01	2.71 (a)	
	3.02	2.71 (b)	
	3.03	2.72 (a)	
	3.04	2.72 (b)	
	3.06	2.73	
	3.07	2.78 (a)	
	3.08	2.78 (b)	
	3.09	2.81 (b)	
	3.10	2.90 (b)	
	3.11	2.91	
	3.13	2.95 (b)	
	3.14	2.96	
	3.15	2.96 (b)	
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HPE iLO 6 Release Notes	1.11		
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	1.59		
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Documents	Versions
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	1.69
	1.70
	1.71
	1.72
HPE iLO 7 Release Notes	1.11.00
	1.12.00
	1.12.01
	1.13.00
	1.13.01
	1.14.00
	1.16.00
	1.17.00
	1.18.01

Websites

HPE iLO

https://www.hpe.com/info/ilo

HPE iLO 7 documentation

https://www.hpe.com/support/ilo7

HPE iLO documentation quick links

https://www.hpe.com/support/hpeilodocs-quicklinks

UEFI System Utilities

https://www.hpe.com/info/ProLiantUEFI/docs

HPE OneView

https://www.hpe.com/info/oneview/docs

HPE iLOrest

https://servermanagementportal.ext.hpe.com/docs/redfishclients/ilorest-userguide/

Support and other resources

Subtopics

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

  https://www.hpe.com/info/assistance

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

  https://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

HPE product registration

To gain the full benefits of the Hewlett Packard Enterprise Support Center and your purchased support services, add your contracts and products to your account on the HPESC.

- When you add your contracts and products, you receive enhanced personalization, workspace alerts, insights through the dashboards, and easier management of your environment.
- You will also receive recommendations and tailored product knowledge to self-solve any issues, as well as streamlined case creation for faster time to resolution when you must create a case.

To learn how to add your contracts and products, see https://www.hpe.com/info/add-products-contracts.

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:

  Hewlett Packard Enterprise Support Center

  https://www.hpe.com/support/hpesc

  My HPE Software Center

  https://www.hpe.com/software/hpesoftwarecenter
- To subscribe to eNewsletters and alerts:

  https://www.hpe.com/support/e-updates
- 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:

  https://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 HPE Account set up with relevant entitlements.

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 initiates a fast and accurate resolution based on the service level of your product. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

HPE Get Connected

https://www.hpe.com/services/getconnected

HPE Tech Care Service

https://www.hpe.com/services/techcare

HPE Complete Care Service

https://www.hpe.com/services/completecare

Warranty information

To view the warranty information for your product, see the **warranty check tool**.

Regulatory information

To view the regulatory information for your product, view the Safety and Compliance Information for Server, Storage, Power, Networking,

and Rack Products, available at the Hewlett Packard Enterprise Support Center:

https://www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

https://www.hpe.com/info/reach

For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

https://www.hpe.com/info/ecodata

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

https://www.hpe.com/info/environment

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, click the Feedback button on the page of an opened document on the Hewlett Packard Enterprise Support Center portal (**https://www.hpe.com/support/hpesc**). Use this feature to send any errors, suggestions, or comments. This process captures all document information.