HPE iLO Federation User Guide for iLO 5

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HPE iLO Federation User Guide for iLO 5

Abstract

This guide explains how to configure and use the HPE iLO Federation features. It 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 5.

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Revision history

Part Number	Publication date	Edition	Summary of changes
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30-8B6612FA-001	April 2021	1	• Added support for GPU firmware updates. • New troubleshooting topic: iLO Federation Setup tab add and edit group controls disabled.
880724-005	December 2019	1	Added information about how the password complexity setting affects group memberships.
880724-004	February 2019	1	Added information about the Read-Only check box for Group Virtual Media (Virtual Floppy only). Other minor updates
880724-003	June 2018	1	Added information about using the iLO RESTful API and RESTful Interface Tool.

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iLO Federation

iLO Federation enables you to manage multiple servers from one system using the iLO web interface.

When configured for iLO Federation, iLO uses multicast discovery and peer-to-peer communication to enable communication between the systems in iLO Federation groups.

When you navigate to one of the iLO Federation pages, a data request is sent from the iLO system running the web interface to its peers, and from those peers to other peers until all data for the selected iLO Federation group is retrieved.

iLO supports the following features:

- Group health status—View server health and model information.
- Group virtual media—Connect URL-based media for access by a group of servers.
- Group power control—Manage the power status of a group of servers.
- Group firmware update—Update the firmware of a group of servers.
- Group license installation—Enter a license key to activate iLO licensed features on a group of servers.
- Group configuration—Add iLO Federation group memberships for multiple iLO systems.

Any user can view information on iLO Federation pages, but a license is required for using the following features: Group virtual media, Group power control, Group power capping, Group configuration, and Group firmware update.

Configuring iLO Federation in the iLO web interface

Subtopics

Prerequisites for using the iLO Federation features
iLO Federation network requirements
Configuring the iLO Federation multicast options
iLO Federation groups
Managing iLO Federation group memberships (local iLO system)
Adding iLO Federation group memberships (multiple iLO systems)
Configuring Enclosure iLO Federation Support

Prerequisites for using the iLO Federation features

Procedure

- The network configuration meets the iLO Federation requirements.
- The multicast options are configured for each iLO system that will be added to an iLO Federation group.

  You can configure these settings with the iLO web interface, the iLO RESTful API, or RIBCL scripts.

  If you use the default multicast option values, configuration is not required.
- iLO Federation group memberships are configured.

  All iLO systems are automatically added to the **DEFAULT** group.

  You can manage groups with the iLO web interface, the iLO RESTful API, or RIBCL scripts.
- Enclosure support for iLO Federation is configured in the Onboard Administrator software (ProLiant server blades only).

  This setting is enabled by default.

iLO Federation network requirements

- (Optional) iLO Federation supports both IPv4 and IPv6. If both options have valid configurations, you can configure iLO to use IPv4 instead of IPv6. To configure this setting, disable the **iLO Client Applications use IPv6 first** option on the **IPv6 Settings** page.

  For more information, see the HPE iLO 5 User Guide.
- Configure the network to forward multicast traffic if you want to manage iLO systems in multiple locations.
- If the switches in your network include the option to enable or disable multicast traffic, ensure that it is enabled. This configuration is required for iLO Federation and other Hewlett Packard Enterprise products to discover the iLO systems on the network.
- For iLO systems that are separated by Layer 3 switches, configure the switches to forward SSDP multicast traffic between networks.
- Configure the network to allow multicast traffic (UDP port 1900) and direct HTTP (TCP default port 80) communication between iLO systems.
- For networks with multiple VLANs, configure the switches to allow multicast traffic between the VLANs.

- For networks with Layer 3 switches:
  - For IPv4 networks: Enable PIM on the switch and configure it for PIM Dense Mode.
  - For IPv6 networks: Configure the switch for MLD snooping.
- If you want to use server blades in a BladeSystem c-Class enclosure with iLO Federation, the **Enable Enclosure iLO Federation Support** setting must be enabled in the Onboard Administrator web interface. This setting is enabled by default.

More information

Configuring Enclosure iLO Federation Support

Configuring the iLO Federation multicast options

Prerequisites

Configure iLO Settings privilege

About this task

Use the following procedure to configure the multicast options for the systems you will add to iLO Federation groups. If you use the default values, configuration is not required.

Procedure

1. Click **iLO Federation** in the navigation tree.

   The **Setup** tab is displayed.
2. Enable or disable the **iLO Federation Management** option.
3. Enable or disable the **Multicast Discovery** option.
4. Enter a value for **Multicast Announcement Interval (seconds/minutes)**.
5. Select a value for **IPv6 Multicast Scope**.

   To ensure that multicast discovery works correctly, make sure that all iLO systems in the same group use the same value for **IPv6 Multicast Scope**.
6. Enter a value for **Multicast Time To Live (TTL)**.

   To ensure that multicast discovery works correctly, make sure that all iLO systems in the same group use the same value for **Multicast Time to Live (TTL)**.

7. Click **Apply**.

   Network changes and changes you make on this page take effect after the next multicast announcement.

Subtopics

Multicast options

Multicast options

iLO Federation Management

Enables or disables the iLO Federation features. The default setting is **Enabled**. Selecting **Disabled** disables the iLO Federation features for the local iLO system.

This property is called `iLOFederationManagement` in the iLO RESTful API.

Multicast discovery

Enables or disables multicast discovery. The default setting is **Enabled**. Selecting **Disabled** disables the iLO Federation features for the local iLO system.

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.

This property is called `MulticastDiscovery` in the iLO RESTful API.

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. Selecting **Disabled** disables the iLO Federation features for the local iLO system.

The possible values are:

- 30, 60, or 120 seconds
- 5, 10, 15, or 30 minutes
- Disabled

This property is called `MulticastAnnouncementInterval` in the iLO RESTful API. Enter the value in seconds when you configure this setting with the RESTful Interface Tool.

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**.

This property is called `IPv6MulticastScope` in the iLO RESTful API.

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.

This property is called `MulticastTimeToLive` in the iLO RESTful API.

iLO Federation groups

Subtopics

iLO Federation group memberships for local iLO systems
iLO Federation group memberships for a set of iLO systems
iLO Federation group privileges
iLO Federation group characteristics

iLO Federation group memberships for local iLO systems

When you configure group memberships for a local iLO system, you specify the privileges that members of a group have for configuring the local managed server.

For example, if you add the local iLO system to **group1** and assign the Virtual Power and Reset privilege, the users of other iLO systems in **group1** can change the power state of the managed server.

If the local iLO system does not grant the Virtual Power and Reset privilege to **group1**, the users of other iLO systems in **group1** cannot use the group power control features to change the power state of the managed server.

If the system maintenance switch is set to disable iLO security on the local iLO system, the users of other iLO systems in **group1** can change the state of the managed server, regardless of the assigned group privileges.

Group memberships for the local iLO system are configured on the **iLO Federation** page **Setup** tab.

You can perform the following tasks for a local iLO system:

- View group memberships.
- Add and edit group memberships.
- Remove group memberships.

More information

Managing iLO Federation group memberships (local iLO system)

iLO Federation group memberships for a set of iLO systems

When you add group memberships for multiple iLO systems at one time, you specify the privileges that members of the group have for configuring the other members of the group.

For example, if you configure **group2** based on the **DEFAULT** group, and you assign the Virtual Power and Reset privilege, the users of iLO systems in **group2** can change the power state of all the servers in the group.

You can add group memberships for multiple iLO systems on the **Group Configuration** page.

You can perform the following tasks for a group of iLO systems:

- Create a group with the same members as an existing group, but with different privileges.
- Create a group with members that you select by using the iLO Federation filters.

More information

Adding iLO Federation group memberships (multiple iLO systems)

iLO Federation group privileges

When a system is added to a group, the group can be granted the following privileges:

- **Login**— Group members can log in to iLO.
- **Virtual Power and Reset**—Group members can power-cycle or reset the host system. These activities interrupt the system availability.
- **Virtual Media**—Group members can use URL-based virtual media with the managed server.
- **Configure iLO Settings**—Group members can configure iLO settings and remotely update firmware.

In addition, the following privileges can also be granted to the group. However, the current iLO Federation feature set does not support actions that require them:

- **Administer User Accounts**—Supports actions that require the Administer User Accounts privilege.
- **Remote Console**—Supports actions that require the Remote Console privilege.
- **Host BIOS**—Supports actions that require the Host BIOS privilege.

- **Host NIC**—Supports actions that require the Host NIC privilege.
- **Host Storage**—Supports actions that require the Host Storage privilege.
- **Recovery Set**—Supports actions that require the Recovery Set privilege.

iLO Federation group characteristics

- All iLO systems are automatically added to the **DEFAULT** group, which is granted the Login privilege for each group member. You can edit or delete the **DEFAULT** group membership.
- iLO Federation groups can overlap, span racks and data centers, and can be used to create management domains.
- Each iLO system can be a member of up to 10 iLO Federation groups.
- There is no limit on the number of iLO systems that can be in a group.
- You must have the Configure iLO Settings privilege to configure group memberships.
- You can use the iLO web interface to configure group memberships for a local iLO system or a group of iLO systems.
- You can use RIBCL XML scripts to view and configure group memberships.
- You can use the iLO RESTful API to configure group memberships.
- Hewlett Packard Enterprise recommends installing the same version of the iLO firmware on iLO systems that are in the same iLO Federation group.

Managing iLO Federation group memberships (local iLO system)

Subtopics

Adding iLO Federation group memberships
Editing iLO Federation group memberships
Removing a group membership from a local iLO system
Viewing iLO Federation group memberships (local iLO system)

Adding iLO Federation group memberships

Prerequisites

- Configure iLO Settings privilege
- The **Minimum Password Length** setting on the **Access Settings** page is set to 31 or fewer characters.

Procedure

1. Click **iLO Federation** in the navigation tree.

   The **Setup** tab is displayed.

2. Click **Join Group**.

3. Enter a **Group Name**.

   This value can be 1 to 31 characters long.

4. Enter the **Group Key** and **Group Key Confirm** values.

   The group key (password) can be from the configured minimum password length to 31 characters long.

   If **Password Complexity** is enabled on the local iLO system, the group key must meet the password complexity requirements.

5. Select the privileges to assign to the group.

   The privileges granted to the group by the local iLO system control the tasks that users of other iLO systems in the group can perform on the managed server.

6. Click **Join Group**.

   If you entered the name and key of an existing group, the local iLO system is added to that group.

   If you entered the name and key of a group that does not exist, the group is created and the local iLO system is added to it.

More information

iLO Federation group memberships for local iLO systems
iLO Federation group privileges
iLO Federation group characteristics

Editing iLO Federation group memberships

Prerequisites

- Configure iLO Settings privilege
- If you want to edit the group key, the **Minimum Password Length** setting on the **Access Settings** page is set to 31 or fewer characters.

Procedure

1. Click **iLO Federation** in the navigation tree.

   The **Setup** tab displays the existing group memberships for the local iLO system.

2. Select a group membership, and then click **Edit**.
3. To change the group name, enter a new name in the **Group Name** box.

   The group name can be 1 to 31 characters long.

4. To change the group key, select the **Change Group Key** check box, then enter a new value in the **Group Key** and **Group Key Confirm** boxes.

   The group key can be from the configured minimum password length to 31 characters long.

   If **Password Complexity** is enabled on the local iLO system, the group key must meet the password complexity requirements.

5. Select or clear the check boxes for the privileges you want to update.

   The privileges granted to the group by the local iLO system control the tasks that users of other iLO systems in the group can perform on the managed server.

6. Click **Update Group**.
7. If you updated the group name or group key, update them on the other systems in the affected group.

More information

iLO Federation group memberships for local iLO systems
iLO Federation group privileges
iLO Federation group characteristics

Removing a group membership from a local iLO system

Prerequisites

Configure iLO Settings privilege

Procedure

1. Click **iLO Federation** in the navigation tree.

   The **Setup** tab shows the group memberships for the local iLO system.

2. Select the check box next to the group membership that you want to delete.
3. Click **Delete**.
4. When prompted to confirm the request, click **Yes, delete**.

Viewing iLO Federation group memberships (local iLO system)

Procedure

Click **iLO Federation** in the navigation tree.

The **Group Membership for this iLO** table lists the name of each group that includes the local iLO system, and the privileges granted to the group by the local iLO system. Assigned privileges are displayed with a check mark icon and unassigned privileges are displayed with an X icon.

More information

iLO Federation group privileges

Adding iLO Federation group memberships (multiple iLO systems)

Subtopics

Adding a group based on an existing group
Creating a group from a filtered list of servers
Servers affected by a group membership change

Adding a group based on an existing group

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**.
- At least one iLO Federation group exists.

About this task

Use this procedure to create a group with the same members as an existing group. For example, you could create a group with the same systems as the DEFAULT group, but with different privileges.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Configuration** tab.
2. Select a group from the **Selected Group** menu.

   All of the systems in the selected group will be added to the group you create.
3. Click **Create Group on Affected Systems**.

   The **Create Group** interface opens.
4. Enter a **Group Name**.

   This value can be 1 to 31 characters long.

   If you enter the name of a group that exists, iLO prompts you to enter a unique group name.
5. Enter the **Group Key** and **Group Key Confirm** values.

   The group key (password) can be from the configured minimum password length to 31 characters long.

   If **Password Complexity** is enabled on systems in the existing group, and the group key does not meet the password complexity requirements, those systems cannot be added to the new group.
6. (Optional) Enter the **Login Name** and **Password** for a user account on the remote systems you want to manage.

   This information is required if the selected group is not assigned the Configure iLO Settings privilege on the remote systems you want to manage.

   To enter credentials for multiple remote systems, create a user account with the same login name and password on each system.

For more information, see the iLO user guide.

7. Select the privileges to assign to the group.

   To select all available privileges, click the **select all** check box.

8. Click **Create Group**.

   The group creation process takes a few minutes. The group will be fully populated within the amount of time configured for the **Multicast Announcement Interval**.

More information

iLO Federation group privileges
iLO Federation group characteristics
iLO Federation group memberships for a set of iLO systems
Selected Group list

Creating a group from a filtered list of servers

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**.
- At least one iLO Federation group exists.

About this task

Use this procedure to create a group from a filtered list of servers. For example, you might want to create a group that contains all servers with a specific version of the iLO firmware.

When you create a group from a filtered list of servers, the group includes only the servers in the **Affected Systems** list during the group creation process. Servers that meet the filter criteria later, after the group is created, are not added to the group.

Procedure

1. Create a set of systems by using the filters on the **iLO Federation** pages.
2. Click **iLO Federation** in the navigation tree, and then click the **Group Configuration** tab.

   The active filters are listed above the **Affected Systems** list.

3. Select a group from the **Selected Group** menu.

   All of the systems in the selected group that meet the selected filter criteria will be added to the new group.

4. Click **Create Group on Affected Systems**.

5. Enter a **Group Name**.

   This value can be 1 to 31 characters long.

   If you enter the name of a group that exists, iLO prompts you to enter a unique group name.

6. Enter the **Group Key** and **Group Key Confirm** values.

   The group key (password) can be from the configured minimum password length to 31 characters long.

   If there are systems in the filtered list that have **Password Complexity** enabled, and the group key does not meet the password complexity requirements, those systems cannot be added to the new group.

7. (Optional) Enter the **Login Name** and **Password** for a user account on the remote systems you want to manage.

   This information is required if the selected group is not assigned the Configure iLO Settings privilege on the remote systems you want to manage.

   To enter credentials for multiple remote systems, create a user account with the same login name and password on each system.

   For more information, see the HPE iLO 5 User Guide.

8. Select the privileges to assign to the group.

   To select all available privileges, click the **select all** check box.

9. To save the configuration, click **Create Group**.

   The group creation process takes a few minutes. The group will be fully populated within the amount of time configured for the **Multicast Announcement Interval**.

More information

Selected Group list
iLO Federation group privileges
iLO Federation group memberships for a set of iLO systems
iLO Federation group characteristics

Servers affected by a group membership change

The **Affected Systems** section on the **Group Configuration** page provides the following details about the servers affected when you make a group membership change:

- **Server Name**—The server name defined by the host operating system.
- **Server Power**—The server power state (**ON** or **OFF**).
- **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**.
- **iLO Hostname**—The fully qualified network name assigned to the iLO subsystem. To open the iLO web interface for the server, click the link in the **iLO Hostname** column.
- **IP Address**—The network IP address of the iLO subsystem. To open the iLO web interface for the server, click the link in the **IP Address** column.

Click **Next** or **Prev** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

Configuring Enclosure iLO Federation Support

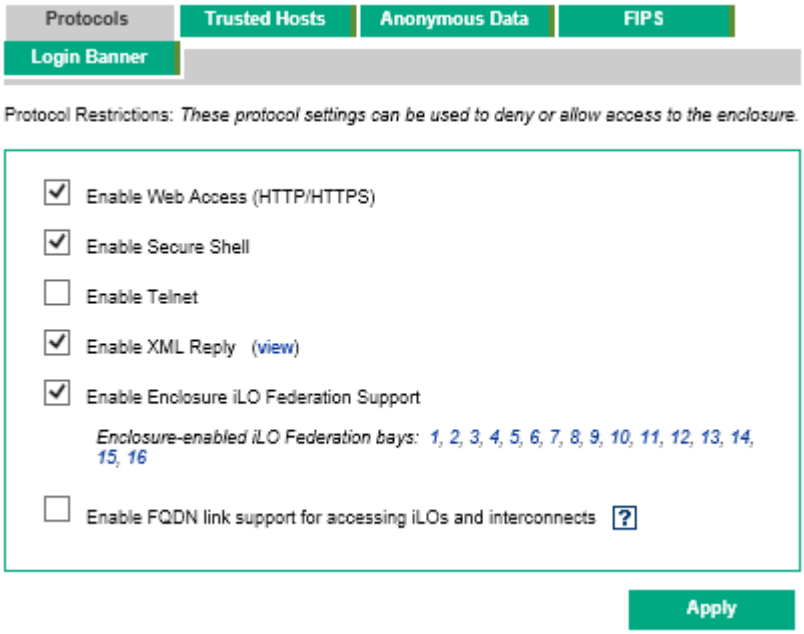
About this task

If you want to use iLO Federation with server blades in a BladeSystem c-Class enclosure, the **Enable Enclosure iLO Federation Support** option must be enabled in the Onboard Administrator software. This setting is required to allow peer-to-peer communication between the server blades in an enclosure. The **Enable Enclosure iLO Federation Support** option is enabled by default.

Procedure

1. Log in to the Onboard Administrator web interface (https://<OA hostname or IP address>).
2. Select **Enclosure Information > Enclosure Settings > Network Access** in the navigation tree.

   The **Protocols** tab is displayed.
3. Select the **Enable Enclosure iLO Federation Support** check box, and then click **Apply**.



You can also use the CLI to enable or disable the **Enable Enclosure iLO Federation Support** option. To enable the option, enter `ENABLE ENCLOSURE_ILO_FEDERATION_SUPPORT`. To disable the option, enter `DISABLE ENCLOSURE_ILO_FEDERATION_SUPPORT`. For more information, see the Onboard Administrator CLI user guide.

Subtopics

Verifying server blade support for iLO Federation

Verifying server blade support for iLO Federation

Procedure

1. Log in to the Onboard Administrator web interface (https://<OA hostname or IP address>).
2. Select **Device Bays > <Device Name> > iLO** in the navigation tree.
3. Verify that **iLO Federation Capable** is set to **Yes**.

Using the iLO Federation features in the iLO web interface

The iLO Federation features are available from the **iLO Federation** branch of the iLO web interface navigation tree.

Subtopics

Selected Group list
Exporting iLO Federation information to a CSV file
iLO Federation Multi-System view
Viewing the iLO Federation multi-system map
iLO Federation group virtual media
iLO Federation group power
Configuring group power capping
iLO Federation group firmware update
Installing license keys (iLO Federation group)

Selected Group list

All of the iLO Federation pages except for **Setup** have a **Selected Group** list.

When you select a group from the **Selected Group** list:

- The servers affected by a change on the **Group Virtual Media**, **Group Power**, **Group Firmware Update**, **Group Licensing**, and **Group Configuration** pages are listed in the **Affected Systems** table.
- The information displayed on iLO Federation pages applies to all the servers in the selected group.
- The changes you make on iLO Federation pages apply to all the servers in the selected group.
- The selected group is saved in a cookie and remains persistent, even when you log out of iLO.

After you select a group, you can filter the servers in the list to view server information or perform actions on a subset of the servers in the group.

Subtopics

Selected Group list filters
Selected Group list filter criteria

Selected Group list filters

When you filter the list of servers:

- The information displayed on iLO Federation pages applies to all the servers in the selected group that meet the filter criteria.
- The changes you make on iLO Federation pages apply to all the servers in the selected group that meet the filter criteria.
- The filter settings are saved in a cookie and remain persistent, even when you log out of iLO.
- You can remove a filter by clicking the X icon or the filter name.

Selected Group list filter criteria

You can use the following criteria to filter the servers in a group:

- **Health status**—Click a health status link to select servers with a specific health status.
- **Model**—Click a server model number link to select servers matching the selected model.
- **Server name**—Click a server name to filter by an individual server.
- **Firmware Information**—Click a firmware version or flash status to select servers matching the selected firmware version or status.
- **TPM or TM Option ROM Measuring**—Click an Option ROM Measuring status to include or exclude servers matching the selected Option ROM Measuring status.
- **License usage**—If an error message related to a license key is displayed, click the license key to select servers that use that license key.
- **License type**—Click a license type to select servers with the selected license type installed.
- **License status**—Click a license status to select servers with an installed license matching the selected status.

Exporting iLO Federation information to a CSV file

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

About this task

The following **iLO Federation** pages allow you to export information to a CSV file:

- **Multi-System View**—Export the **Systems with critical or degraded status** list.
- **Multi-System Map**—Export the iLO peers list.
- **Group Virtual Media**—Export the **Affected Systems** list.
- **Group Power**—Export the **Affected Systems** list.
- **Group Firmware Update**—Export the **Affected Systems** list.
- **Group Licensing**—Export the **Affected Systems** list.
- **Group Configuration**—Export the **Affected Systems** list.

Procedure

1. Navigate to a page that supports the file export feature.
2. Click **View CSV**.
3. In the **CSV Output** window, click **Save**, and then follow the browser prompts to save or open the file.

   If multiple pages of servers are included in the list, the CSV file contains only the servers that are currently displayed on the iLO web interface page.

   If a query error occurred, the systems that did not respond to the query are excluded from the iLO web interface page and the CSV file.

More information

Prerequisites for using the iLO Federation features

iLO Federation Multi-System view

The **Multi-System View** page provides a summary of the server models, server health, and critical and degraded systems in an iLO Federation group.

Subtopics

Viewing server health and model information
Viewing servers with critical and degraded status

Viewing server health and model information

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Multi-System View** tab.
2. Select a group from the **Selected Group** menu.
3. (Optional) To filter the list of servers, click a health status, server model, or server name link.

Subtopics

Server health and model details

More information

Selected Group list
Prerequisites for using the iLO Federation features

Server health and model details

- **Health**—The number of servers in each listed health status. The percentage of the total number of servers in each listed health status is also displayed.
- **Model**—The list of servers, grouped by model number. The percentage of the total number of servers for each model number is also displayed.
- **Critical and Degraded Systems**—The list of servers in the critical or degraded state.

Viewing servers with critical and degraded status

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Multi-System View** tab.
2. Select a group from the **Selected Group** menu.
3. (Optional) To filter the list of servers, click a health status, server model, or server name link.
4. Click **Next** or **Previous** (if available) to view more servers in the **Critical and Degraded Systems** list.

Subtopics

Critical and degraded server status details

More information

Selected Group list
Prerequisites for using the iLO Federation features

Critical and degraded server status details

- **Server Name**—The server name defined by the host operating system.
- **System Health**—The server health status.
- **Server Power**—The server power status (**ON** or **OFF**).
- **UID Indicator**—The state of the server 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**.
- **System ROM**—The installed System ROM version.
- **iLO Hostname**—The fully qualified network name assigned to the iLO subsystem. To open the iLO web interface for the server, click the link in the **iLO Hostname** column.
- **IP Address**—The network IP address of the iLO subsystem. To open the iLO web interface for the server, click the link in the **IP Address** column.

More information

Exporting iLO Federation information to a CSV file

Viewing the iLO Federation multi-system map

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

About this task

The **Multi-System Map** page displays information about the peers of the local iLO system. The local iLO system identifies its peers through multicast discovery.

When you navigate to one of the iLO Federation pages, a data request is sent from the iLO system running the web interface to its peers, and from those peers to other peers until all the data for the selected group is retrieved.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Multi-System Map** tab.
2. Select a group from the **Selected Group** menu.

Subtopics

iLO peer details

More information

Selected Group list
Prerequisites for using the iLO Federation features

iLO peer details

- **#**—The peer number.
- **iLO UUID**—The iLO system UPnP UUID.
- **Last Seen**—The time stamp of the last communication from the server.
- **Last Error**—A description of the most recent communication error between the listed peer and the local iLO system.
- **Query Time** (seconds)—When a timeout occurs, this value can be used to identify systems that are not responding quickly. This value applies to the most recent query.
- **Node Count**—When an error occurs, this value can indicate how much data might be missing. A value of zero indicates that the most recent query timed out. This value applies to the most recent query.

- **URL**—The URL for starting the iLO web interface for the listed peer.
- **IP**—The peer IP address.

More information

Exporting iLO Federation information to a CSV file

iLO Federation group virtual media

Group virtual media enables you to connect URL-based media for access by a group of servers.

- The following types of URL-based virtual media are supported: 1.44 MB floppy disk images (IMG) and CD/DVD-ROM images (ISO). The image must be on a web server on the same network as the grouped iLO systems.
- Only one of each type of media can be connected to a group at the same time.
- You can view, connect, and eject URL-based media, and you can boot from CD/DVD-ROM disk images. When you use URL-based media, you save a floppy disk or CD/DVD-ROM disk image to a web server and connect to the disk image by using a URL. iLO accepts URLs in HTTP or HTTPS format. iLO does not support FTP.
- Before you use the virtual media feature, review the virtual media operating system considerations.

  For more information, see the iLO user guide.

Subtopics

Connecting URL-based virtual media for groups
Viewing URL-based virtual media status for groups
Ejecting a URL-based virtual media device
Servers affected by a group virtual media action

Connecting URL-based virtual media for groups

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**.

- Each member of the selected iLO Federation group has granted the Virtual Media privilege to the group.
- The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Virtual Media** tab.
2. Select a group from the **Selected Group** menu.

   The URL-based media you connect will be available to all systems in the selected group.
3. Enter the disk image URL in the **Virtual Media URL** box in the **Connect Virtual Floppy** section (IMG files) or the **Connect CD/DVD-ROM** section (ISO files).
4. Select the **Boot on Next Reset** check box if you want the servers in the group to boot to this disk image only on the next server reboot.

   The image will be ejected automatically on the second server reboot so that the servers do not boot to it twice.

   If this check box is not selected, the image remains connected until it is manually ejected. The servers will boot to the image on all subsequent server resets, if the system boot options are configured accordingly.

   If a server in the group is in POST when you enable the **Boot on Next Reset** check box, an error occurs. You cannot modify the server boot order during POST. Wait for POST to finish, and then try again.
5. For virtual floppy devices 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 enabled by default.
6. Click **Insert Media**.

   iLO displays the command results.

More information

Selected Group list
Prerequisites for using the iLO Federation features

Viewing URL-based virtual media status for groups

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Virtual Media** tab.
2. (Optional) To filter the displayed information, click a **Read-Only Status** or an **Image URL** link.

Subtopics

URL-based virtual media details

More information

Prerequisites for using the iLO Federation features

URL-based virtual media details

When URL-based virtual media is connected, the details are listed in the following sections:

Virtual Floppy/USB Key/Virtual Folder Status

- **Media Inserted**—The virtual media type that is connected. **Scripted Media** is displayed when URL-based media is connected.
- **Connected**—Indicates whether a virtual media device is connected.
- **Read-Only Status**—Indicates whether the virtual media device is connected with **Read-Only** or **Read/Write** permission.
- **Image URL**—The URL that points to the connected URL-based media.

Virtual CD/DVD-ROM Status

- **Media Inserted**—The virtual media type that is connected. **Scripted Media** is displayed when URL-based media is connected.
- **Connected**—Indicates whether a virtual media device is connected.
- **Image URL**—The URL that points to the connected URL-based media.

Ejecting a URL-based virtual media device

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**.
- Each member of the selected iLO Federation group has granted the Virtual Media privilege to the group.
- The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Virtual Media** tab.
2. Select a group from the **Selected Group** menu.

   The URL-based virtual media device that you eject will be disconnected from all the systems in the selected group.
3. Click **Eject Media** in the **Virtual Floppy Status** section or the **Virtual CD/DVD-ROM Status** section.

More information

Selected Group list
Prerequisites for using the iLO Federation features

Servers affected by a group virtual media action

The **Affected Systems** section provides the following details about the servers affected when you initiate a group virtual media action:

- **Server Name**—The server name defined by the host operating system.
- **Server Power**—The server power state (**ON** or **OFF**).
- **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**.
- **iLO Hostname**—The fully qualified network name assigned to the iLO subsystem. To open the iLO web interface for the server, click the link in the **iLO Hostname** column.

- **IP Address**—The network IP address of the iLO subsystem. To open the iLO web interface for the server, click the link in the **IP Address** column.

Click **Next** or **Prev** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

iLO Federation group power

The group power feature enables you to manage the power of multiple servers from a system running the iLO web interface. Use this feature to do the following:

- Power off, reset, or power-cycle a group of servers that are in the **ON** or **Reset** state.
- Power on a group of servers that are in the **OFF** state.
- View the list of servers that will be affected when you click a button in the **Virtual Power Button** section of the **Group Power** page.

Changing the power state for a group of servers

Prerequisites

- Virtual Power and Reset 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**.
- Each member of the selected iLO Federation group has granted the Virtual Power and Reset privilege to the group.
- The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

About this task

The **Virtual Power Button** section on the **Group Power** page summarizes the current power state of the servers in a group. The summary information includes the total number of servers that are in the **ON**, **OFF**, or **Reset** state. The **System Power** summary indicates the state of the server power when the page is first opened. Use the browser refresh feature to update the **System Power** information.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Power** tab.
2. Select a group from the **Selected Group** menu.

   iLO displays the grouped servers by power state with a counter that shows the total number of servers in each state.
3. To change the power state of a group of servers, do one of the following:
   - For servers that are in the **ON** or **Reset** state, click one of the following buttons:
     - **Momentary Press**
     - **Press and Hold**
     - **Reset**
     - **Cold Boot**
   - For servers that are in the **OFF** state, click the **Momentary Press** button.

     The **Press and Hold**, **Reset**, and **Cold Boot** options are not available for servers that are in the **OFF** state.

   iLO prompts you to confirm the request.
4. Click **Yes, <action>**.

   For example, if you clicked **Reset**, the button label is **Yes, reset**. The name of the button to click depends on the group power option that you initiated.

   iLO displays a progress bar while the grouped servers respond to the virtual power button action. The progress bar indicates the number of servers that successfully processed the command.

   The **Command Results** section displays the command status and results, including error messages related to the power state change.

More information

Selected Group list
Prerequisites for using the iLO Federation features

Power state options for groups

- **Momentary Press**—The same as pressing the physical power button.

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.

- **Press and Hold**—The same as pressing the physical power button for 5 seconds and then releasing it.

  The servers in the selected group are powered off as a result of this operation. Using this option might circumvent a graceful operating system shutdown.

  This option provides the ACPI functionality that some operating systems implement. These operating systems behave differently, depending on a short press or long press.

- **Cold Boot**—Immediately removes power from the servers in the selected group. Processors, memory, and I/O resources lose main power. The servers will restart after approximately 6 seconds. Using this option circumvents a graceful operating system shutdown.

- **Reset**—Forces the servers in the selected group to warm-boot: CPUs and I/O resources are reset. Using this option circumvents a graceful operating system shutdown.

Servers affected by a group power state change

The **Affected Systems** list provides the following details about the servers affected when you initiate a virtual power button action:

- **Server Name**—The server name defined by the host operating system.
- **Server Power**—The server power state (**ON** or **OFF**).
- **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**.
- **iLO Hostname**—The fully qualified network name assigned to the iLO subsystem. To open the iLO web interface for the server, click the link in the **iLO Hostname** column.
- **IP Address**—The network IP address of the iLO subsystem. To open the iLO web interface for the server, click the link in the **IP Address** column.

Click **Next** or **Prev** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

Configuring group power capping

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**.
- Each member of the selected iLO Federation group has granted the Configure iLO Settings privilege to the group.
- The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Power Settings** tab.
2. Select a group from the **Selected Group** menu.

   Changes you make on this page affect all systems in the selected group.
3. Set the **Enable power capping** option to enabled.
4. 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.
5. (Optional) When values are displayed in watts, select **BTU/hr** in the **Power Unit** menu to change the display to BTU/hr. When values are displayed in BTU/hr, select **Watts** to change the display to watts.
6. Click **Apply**.

More information

Selected Group list
Prerequisites for using the iLO Federation features

Group power capping considerations

The group power capping feature enables you to set dynamic power caps for multiple servers from a system running the iLO web interface.

- When a group power cap is set, the grouped servers share power to stay below the power cap. More power is allocated to busy servers and less power is allocated to idle servers.

- The power caps that you set for a group operate concurrently with the power caps that you can set on the **Power Settings** page for an individual server.
- If a power cap configured at the enclosure or individual server level or by another iLO Federation group affects a server, other group power caps might allocate less power to that server.
- When a power cap is set, the average power reading of the grouped servers must be at or below the power cap value.
- During POST, the ROM runs two power tests that determine the peak and minimum observed power values.

  Consider the values in the **HPE Automatic Group Power Capping Settings** table when determining your power capping configuration.

  - **Maximum Available Power**—The total power supply capacity for all servers in a group. This value is also the **Maximum Power Cap** threshold. It is the highest power cap that can be set.
  - **Peak Observed Power**—The maximum observed power for all servers in a group. This value is also the **Minimum High-Performance Cap** threshold. It is the lowest power cap value that can be set without affecting the performance of the servers in a group.
  - **Minimum Observed Power**—The minimum observed power for all servers in a group. This value is also the **Minimum Power Cap** threshold. It represents the minimum power that the servers in a group use. A power cap set to this value reduces the server power usage to the minimum, which results in server performance degradation.
- Power capping is not supported on all servers. For more information, check the server specifications.
- For some servers, power capping settings must be managed outside of the iLO web interface. You can use tools such as:

  - HPE Advanced Power Manager

  See the server specifications at **https://www.hpe.com/info/qs** for information about the power management features your server supports.

Viewing group power capping information

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 iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Power Settings** tab.
2. Select a group from the **Selected Group** menu.
3. (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.

More information

Selected Group list
Prerequisites for using the iLO Federation features

Power capping details

HPE Automatic Group Power Capping Settings

This section shows the following details:

- **Measured Power Values**—The maximum available power, peak observed power, and minimum observed power.
- **Power Cap Value**—The power cap value, if one is configured.

Current State

This section includes the following details:

- **Present Power Reading**—The current power reading for the selected group.
- **Present Power Cap**—The total amount of power allocated to the selected group. This value is 0 if a power cap is not configured.

Group Power Allocations for this system

The group power caps that affect the local iLO system, and the amount of power allocated to the local iLO system by each group power cap. If a power cap is not configured, the allocated power value is 0.

More information

Selected Group list
Prerequisites for using the iLO Federation features

iLO Federation group firmware update

The group firmware update feature enables you to view firmware information and update the firmware of multiple servers from a system running the iLO web interface.

The group firmware update feature supports the following firmware types. You can update these firmware types only if your servers and environment support them:

- iLO firmware
- System ROM (BIOS)
- Chassis firmware (Power Management)
- Power Management Controller
- System Programmable Logic Device (CPLD)
- NVMe Backplane Firmware
- Innovation Engine (IE)
- Server Platform Services (SPS)
- 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 on the **Access Settings** page.
- GPU

  The following GPUs are supported:

  - NVIDIA A100 x4/x8 SXM4
  - AMD MI100 GPU

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.

Subtopics

Updating the firmware for multiple servers
Servers affected by a group firmware update
Viewing group firmware information

Updating the firmware for multiple servers

Prerequisites

- Configure iLO Settings privilege
- Each member of the selected iLO Federation group has granted the Configure iLO Settings privilege to the group.
- 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 iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Download the supported firmware from the Hewlett Packard Enterprise Support Center: **https://www.hpe.com/support/hpesc**.
2. Save the firmware file to a web server.
3. Click **iLO Federation** in the navigation tree, and then click the **Group Firmware Update** tab.
4. Select a group from the **Selected Group** menu.

   All of the systems in the selected group will be affected when you initiate a firmware update on this page.
5. (Optional) To filter the list of affected systems, click a firmware version, flash status, or TPM or TM Option ROM Measuring status link.

   CAUTION

   If you attempt to perform a system ROM or iLO firmware update on a server with a TPM or TM installed, iLO prompts you to suspend or back up software that stores information on the TPM or TM. For example, 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.
6. If you will update the Innovation Engine (IE) or Server Platform Services (SPS) firmware, power off the servers you want to update, and then wait 30 seconds.

The IE and SPS firmware cannot be updated when the server OS is running.

> **IMPORTANT**
>
> If you plan to update both the IE firmware and the SPS firmware, update the IE firmware first, followed by the SPS firmware.

7. In the **Firmware Update** section, enter the URL to the firmware file on your web server, and then click **Update Firmware**.

   The URL to enter is similar to the following: `http://<server.example.com>/<subdir>/iLO 5_<yyy>.bin`, where `<yyy>` represents the firmware version.

   iLO prompts you to confirm the request.

8. Click **Yes, update**.

   Each selected system downloads the firmware image and attempts to flash it.

   The **Flash Status** section is updated and iLO notifies you that the update is in progress. When the update is complete, the **Firmware Information** section is updated.

   If a firmware image is not valid for a system or has a bad or missing signature, iLO rejects the image and the **Flash Status** section shows an error for the affected system.

   Some firmware update types might require a system reset, iLO reset, or a server reboot for the new firmware to take effect.

Subtopics

Obtaining the iLO firmware image file
Obtaining supported server firmware image files

More information

Obtaining the iLO firmware image file
Obtaining supported server firmware image files
Prerequisites for using the iLO Federation features

Obtaining the iLO firmware image file

About this task

You can download the iLO firmware image file and use it to update a single server or multiple servers in a group.

The BIN file from the iLO Online Flash Component is required for updating the iLO firmware with the **Flash Firmware** or **Group Firmware Update** features.

Procedure

1. Navigate to the following website: **https://www.hpe.com/support/hpesc**.
2. To locate and download the iLO Online Flash Component file, follow the onscreen instructions.

   Download a Windows or Linux component.
3. Extract the BIN 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:
     - `#./<firmware_file_name>.scexe -unpack=/tmp/`
     - `#rpm2cpio <firmware_file_name>.rpm | cpio -id`

   The name of the iLO firmware image file is similar to `iLO 5_<yyy>.bin`, where `<yyy>` represents the firmware version.

Obtaining supported server firmware image files

Procedure

1. Navigate to the following website: **https://www.hpe.com/support/hpesc**.
2. To locate and download an Online Flash Component file, follow the onscreen instructions.
3. If you downloaded a Windows component:
   a. Double-click the downloaded file, and then click the **Extract** button.
   b. Select a location for the extracted files, and then click **OK**.
4. If you downloaded a Linux component:
   a. For Linux components, depending on the file format, enter one of the following commands:
      - `#./<firmware_file_name>.scexe -unpack=/tmp/`
      - `#rpm2cpio <firmware_file_name>.rpm | cpio -id`

b. (Optional) If you are working with an Innovation Engine or Server Platform Services (SPS) firmware component, locate the `<firmware_file_name>.zip` file, and extract the binary file.

Subtopics

Server firmware file type details

Server firmware file type details

- When you update the system ROM, you must use a signed image or the signed ROMPAQ image:
  - **Signed image example**:

    http://<server.example.com:8080>/<wwwroot>/P79_1.00_10_25_2013.signed.flash
  - **Signed ROMPAQ image example**:

    http://<server.example.com>/<wwwroot>/CPQPJ0612.A48
- The Power Management Controller, chassis firmware, and NVMe backplane files use the file extension `.hex`. For example, the file name might be similar to `ABCD5S95.hex`.
- The System Programmable Logic Device (CPLD) firmware file uses the file extension `.vme`.
- The Innovation Engine (IE) and Server Platform Services (SPS) firmware files use the file extension `.bin`.
- Language Pack files use the extension `.lpk`.

Servers affected by a group firmware update

The **Affected Systems** list provides the following details about the servers affected by a group firmware update:

- **Server Name**—The server name defined by the host operating system.
- **System ROM**—The installed System ROM (BIOS).
- **iLO Firmware Version**—The installed iLO firmware version.
- **iLO Hostname**—The fully qualified network name assigned to the iLO subsystem. To open the iLO web interface for the server, click the link in the **iLO Hostname** column.

- **IP Address**—The network IP address of the iLO subsystem. To open the iLO web interface for the server, click the link in the **IP Address** column.

Click **Next** or **Prev** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

Viewing group firmware information

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Firmware Update** tab.
2. Select a group from the **Selected Group** menu.
3. (Optional) To filter the list of displayed systems, click a firmware version, flash status, or TPM or TM Option ROM Measuring status link.

Subtopics

Firmware details

More information

Selected Group list
Prerequisites for using the iLO Federation features

Firmware details

The **Firmware Information** section displays the following information:

- The number of servers with each supported iLO firmware version. The percentage of the total number of servers with the listed firmware version is also displayed.
- The flash status for the grouped servers. The percentage of the total number of servers with the listed status is also displayed.

- The TPM or TM Option ROM Measuring status for the grouped servers. The percentage of the total number of servers with the listed status is also displayed.
- The number of servers with each system ROM version. The percentage of the total number of servers with the listed system ROM version is also displayed.

Installing license keys (iLO Federation group)

Prerequisites

- Configure iLO Settings privilege
- Each member of the iLO Federation group has granted the Configure iLO Settings privilege to the group.
- Your iLO license is supported on the selected servers.
- You obtained an iLO license activation key that is authorized for the number of selected servers.
- The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

About this task

The **Group Licensing** page displays the license status for members of a selected iLO Federation group. Use the following procedure to enter a key to activate iLO licensed features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Licensing** tab.
2. (Optional) To filter the list of affected systems, click a license type or status link.

   For example: If you install a license key on a server that already has a key installed, the new key replaces the installed key. If you do not want to replace existing licenses, click **Unlicensed** in the **Status** section to install licenses only on servers that are unlicensed.
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.

   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 is installed and the **License Information** section is updated to show the new license details for the selected group.

More information

Prerequisites for using the iLO Federation features
iLO licensing
Selected Group list

Servers affected by a license installation

The **Affected Systems** section provides the following details about the servers that will be affected when you install a license key:

- **Server Name**—The server name defined by the host operating system.
- **License**—The installed license type.
- **iLO Firmware Version**—The installed iLO firmware version.
- **iLO Hostname**—The fully qualified network name assigned to the iLO subsystem. To open the iLO web interface for the server, click the link in the **iLO Hostname** column.
- **IP Address**—The network IP address of the iLO subsystem. To open the iLO web interface for the server, click the link in the **IP Address** column.

Click **Next** or **Prev** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

Viewing iLO Federation group license information

Prerequisites

The iLO configuration and the network configuration meet the prerequisites for using the iLO Federation features.

Procedure

1. Click **iLO Federation** in the navigation tree, and then click the **Group Licensing** tab.
2. Select a group from the **Selected Group** menu.

3. (Optional) To filter the list of servers, click a license type or status link in the **License Information** section.

More information

Selected Group list
Prerequisites for using the iLO Federation features

iLO Federation group license details

- **Type**—The number of servers with each listed license type. The percentage of the total number of servers with each listed license type is also displayed.
- **Status**—The number of servers with each listed license status. The percentage of the total number of servers with each license status is also displayed. The possible status values follow:
  - **Evaluation**—A valid evaluation license is installed.
  - **Expired**—An expired evaluation license is installed.
  - **Perpetual**—A valid iLO license is installed. This license does not have an expiration date.
  - **Unlicensed**—The factory default (iLO Standard) features are enabled.

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.
- If you lose a license key, follow the lost license key instructions in the HPE iLO Licensing Guide.
- See the HPE iLO 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.

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 the iLO RESTful API with iLO Federation

You can view and configure iLO Federation settings by using server management tools and the iLO RESTful API. This guide provides instructions for using the RESTful Interface Tool.

For information about using the iLO RESTful API, see the following website: **https://www.hpe.com/info/redfish**.

For help with the RESTful Interface Tool, enter the `-help` command within the tool, or see the following website: **https://www.hpe.com/support/restfulinterface/docs**.

Subtopics

Configuring the multicast options (iLOREST)
Viewing iLO Federation group memberships (iLOREST)
Adding an iLO Federation group membership (iLOREST)
Modifying an iLO Federation group key (iLOREST)
Modifying iLO Federation group privileges (iLOREST)
Deleting an iLO Federation group membership (iLOREST)
Viewing group power capping information (iLOREST)
Viewing the peers of an iLO system (iLOREST)

Configuring the multicast options (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. To view the available resource types, enter the following command: **`types`**.

   This procedure uses the `Manager` resource type.

4. Find the `Manager` resource type in the list, and then enter a command similar to the following: `select Manager.v1_1_0`.

   Your input might be different, depending on your version of the Manager schema.

5. To view the current settings, enter the following command: **`list -j`**.

   Use the `-j` parameter to view the list in JSON format.

   The output includes text that shows the current settings:

   ```
   "FederationConfig": {
     "MulticastDiscovery": "Enabled",
     "IPv6MulticastScope": "Site",
     "MulticastAnnouncementInterval": 600,
     "MulticastTimeToLive": 5,
     "iLOFederationManagement": "Enabled"
   ```

6. To update a property, enter a command similar to the following:

   ```
   set Oem/Hpe/FederationConfig/Property name=Property value
   ```

7. Repeat step 6 for all the multicast options that you want to change.
8. To save the changes and logout, enter the following command: **`commit`**.
9. (Optional) Repeat steps 2 through 5 to verify the changes.

More information

Multicast options

Viewing iLO Federation group memberships (iLOREST)

Prerequisites

The RESTful Interface Tool is installed.

About this task

Use this procedure to view information about all the iLO Federation groups that contain an iLO system.

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. Enter the following command:

   ```
   iLOrest > ilofederation
   ```

   The output lists the name of each group that includes the iLO system, and the privileges granted to the group by the iLO system.

More information

iLO Federation group privileges

Adding an iLO Federation group membership (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.

2. Log in to an iLO system:

```
iLOrest > login iLO host name or IP address -u iLO user name -p iLO
password
```

3. To add an iLO Federation group membership, do one of the following:

   - To add a group membership with all available privileges, enter a command similar to the following:

     ```
     iLOrest > ilofederation add iLO Federation group name iLO Federation
     group key
     ```

   - To add a group membership with one or more privileges excluded, enter a command similar to the following:

     ```
     iLOrest > ilofederation add iLO Federation group name iLO Federation
     group key
     --noremoteconsolepriv
     ```

     In this example, the Remote Console privilege is excluded. For more information, see privilege parameters.

   The group name can be 1-31 characters long.

   The group key (password) can be from the configured minimum password length to 31 characters long.

   If **Password Complexity** is enabled on the iLO system, the group key must meet the password complexity requirements.

   If you entered the name and key of an existing group, the iLO system is added to that group.

   If you entered the name and key of a group that does not exist, the group is created and the iLO system is added to it.

Subtopics

iLO Federation privilege parameters

More information

iLO Federation group memberships for local iLO systems
iLO Federation group privileges
iLO Federation group characteristics

iLO Federation privilege parameters

When you use the RESTful Interface Tool to add iLO Federation groups, all available privileges are enabled unless you specify privileges to disable.

`--noremoteconsolepriv`

Disable the Remote Console privilege.

`--noiloconfigpriv`

Disable the Configure iLO Settings privilege.

`--novirtualmediapriv`

Disable the Virtual Media privilege.

`--nouserconfigpriv`

Disable the Administer User Accounts privilege.

`--novirtualprpriv`

Disable the Virtual Power and Reset privilege.

`--nologinpriv`

Disable the Login privilege.

`--nobiosconfigpriv`

Disable the Host BIOS privilege.

`--nonicconfigpriv`

Disable the Host NIC privilege.

`--nohoststorageconfigpriv`

Disable the Host Storage privilege.

`--nosysrecoveryconfigpriv`

Disable the Recovery Set privilege.

Modifying an iLO Federation group key (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. To change a group key, enter a command similar to the following:

   ```
   iLOrest > ilofederation changekey iLO Federation group name new group key
   ```

   The group key can be from the configured minimum password length to 31 characters long.

   If **Password Complexity** is enabled on the iLO system, the group key must meet the password complexity requirements.

4. Update the group key on the other systems in the affected group.

More information

iLO Federation group memberships for local iLO systems
iLO Federation group characteristics

Modifying iLO Federation group privileges (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. Enter the following command to view information about a specific group:

   ```
   iLOrest > rawget /redfish/v1/Managers/1/FederationGroups/group name
   ```

   The output is similar to the following:

```
[200] The operation completed successfully.
{
  "@odata.type": "#HpeiLOFederationGroup.v2_0_0.HpeiLOFederationGroup",
  "Name": "DEFAULT",
  "Privileges": {
    "HostNICConfigPriv": false,
    "HostStorageConfigPriv": false,
    "RemoteConsolePriv": false,
    "iLOConfigPriv": false,
    "VirtualMediaPriv": false,
    "UserConfigPriv": false,
    "HostBIOSConfigPriv": false,
    "VirtualPowerAndResetPriv": false,
    "LoginPriv": true,
    "SystemRecoveryConfigPriv": false
  },
  "@odata.id": "/redfish/v1/Managers/1/FederationGroups/DEFAULT/",
  "@odata.context": "/
redfish/v1/$metadata#HpeiLOFederationGroup.HpeiLOFederationGroup",
  "Id": "DEFAULT",
  "@odata.etag": "W/\"A1508BC0\""
}
```

4. Open a text editor and create a file to update the privileges the iLO system grants to the iLO Federation group.

   Use the following example as a template.

```
{
    "path": "/redfish/v1/Managers/1/FederationGroups/DEFAULT/",
    "body": {
        "Privileges": {
            "VirtualMediaPriv": true,
            "SystemRecoveryConfigPriv": true
        }
    }
}
```

5. Save the file as a TXT file. For example, `privileges.txt`.

6. Enter the command to submit the file

```
ilorest > rawpatch file name
```

7. (Optional) To view the changes, enter the following command:

```
iLOrest > rawget /redfish/v1/Managers/1/FederationGroups/group name
```

More information

[iLO Federation group memberships for local iLO systems]
[iLO Federation group privileges]
[iLO Federation group characteristics]

Deleting an iLO Federation group membership (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. To remove an iLO Federation group membership, enter a command similar to the following:

   ```
   iLOrest > ilofederation delete <iLO Federation group name>
   ```

Viewing group power capping information (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. To view the available resource types, enter the following command: **`types`**.

   This procedure uses the `HpeiLOFederatedGroupCapping` resource type.

4. Find the `HpeiLOFederatedGroupCapping` resource type in the list, and then enter a command similar to the following: **`select HpeiLOFederatedGroupCapping.v2_0_0`**.

   Your input might be different, depending on your version of the `HpeiLOFederatedGroupCapping` schema.

5. To view the group power capping configuration, enter the following command: **`list -j`**.

   The output is similar to the following:

```
{
  "@odata.context": "/
redfish/v1/$metadata#HpeiLOFederatedGroupCapping.HpeiLOFederatedGroupCapp
ing",
  "@odata.id": "/redfish/v1/Chassis/1/Power/FederatedGroupCapping/",
  "@odata.type":
"#HpeiLOFederatedGroupCapping.v2_0_0.HpeiLOFederatedGroupCapping",
  "CapWatts": 0,
  "CapacityWatts": 1600,
  "Groups": {
    "DEFAULT": {
      "CapLimitWatts": 0,
      "AllocatedPowerWatts": 0,
      "CapLimitPctTenths": null
    }
  },
  "Id": "FederatedGroupCapping",
  "Name": "iLO Federated Group Power Capping",
  "Throttle": "Low"
}
```

More information

Power capping details

Viewing the peers of an iLO system (iLOREST)

Prerequisites

- The RESTful Interface Tool is installed.
- Configure iLO Settings privilege

Procedure

1. Start the RESTful Interface Tool.
2. Log in to an iLO system:

   ```
   iLOrest > login iLO host name or IP address -u iLO user name -p iLO password
   ```

3. To view the available resource types, enter the following command: **`types`**.

   This procedure uses the `HpeiLOFederationPeers` resource type.

4. Find the `HpeiLOFederationPeers` resource type in the list, and then enter a command similar to the following: `select HpeiLOFederationPeers.v2_0_0`.

   Your input might be different, depending on your version of the `HpeiLOFederationPeers` schema.

5. To view the peers of the iLO system you logged into, enter the following command: **`list`**.

   The output is similar to the following:

   ```
   @odata.context=/
   redfish/v1/$metadata#HpeiLOFederationPeers.HpeiLOFederationPeers
   @odata.etag=W/"F7D353FC"
   @odata.id=/redfish/v1/Managers/1/FederationPeers/DEFAULT/
   @odata.type=#HpeiLOFederationPeers.v2_0_0.HpeiLOFederationPeers
   Id=DEFAULT
   Name=DEFAULT
   Peers=
          URL=http://XX.XX.XXX.XXX:XX/
          ManagerIPAddress=XX.XX.XXX.XXX
          HttpErrorCode=0
          UUID=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
          Time=2018-06-14T20:47:48Z

          URL=http://XX.XX.XXX.XXX:XX/
          ManagerIPAddress=XX.XX.XXX.XXX
          HttpErrorCode=0
   ```

```
        UUID=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
        Time=2018-06-14T20:48:19Z
```

More information

iLO peer details

Using RIBCL scripts with iLO Federation

You can view and configure iLO Federation settings by using RIBCL scripts.

For information about using the HPQLOCFG utility to send RIBCL scripts to a group of servers, see the iLO scripting and command-line guide. To use another tool to send scripts to a group of servers, see the tool documentation.

This chapter describes the available iLO Federation scripts. You can download sample scripts from the following website: **https://www.hpe.com/support/ilo5**.

Subtopics

GET_FEDERATION_MULTICAST
This module describes the GET_FEDERATION_MULTICAST command
SET_FEDERATION_MULTICAST
This module describes the SET_FEDERATION_MULTICAST command
GET_FEDERATION_ALL_GROUPS
This module describes the GET_FEDERATION_ALL_GROUPS command
GET_FEDERATION_ALL_GROUPS_INFO
GET_FEDERATION_GROUP
ADD_FEDERATION_GROUP
MOD_FEDERATION_GROUP
DELETE_FEDERATION_GROUP
This module describes the DELETE_FEDERATION_GROUP command

GET_FEDERATION_MULTICAST

This module describes the GET_FEDERATION_MULTICAST command

Use the GET_FEDERATION_MULTICAST command to retrieve the current federation multicast options. The response includes values for Multicast Discovery, Multicast Announcement Interval, IPv6 Multicast Scope, and Multicast TTL. The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `read`.

For example:

```
<RIBCL VERSION="2.0">
  <LOGIN USER_LOGIN="adminname" PASSWORD="password">
    <RIB_INFO MODE="read">
      <GET_FEDERATION_MULTICAST/>
    </RIB_INFO>
  </LOGIN>
</RIBCL>
```

Subtopics

GET_FEDERATION_MULTICAST parameters
This module describes the GET_FEDERATION_MULTICAST command parameters
GET_FEDERATION_MULTICAST runtime errors
This module describes the GET_FEDERATION_MULTICAST command runtime errors
GET_FEDERATION_MULTICAST return messages
This module describes the GET_FEDERATION_MULTICAST command return messages

GET_FEDERATION_MULTICAST parameters

This module describes the GET_FEDERATION_MULTICAST command parameters

None

GET_FEDERATION_MULTICAST runtime errors

This module describes the GET_FEDERATION_MULTICAST command runtime errors

None

GET_FEDERATION_MULTICAST return messages

This module describes the GET_FEDERATION_MULTICAST command return messages

The following response is typical of the data returned from the GET_FEDERATION_MULTICAST command:

```
<?xml version="1.0"?>
<RIBCL VERSION="2.23">
```

```
<RESPONSE
    STATUS="0x0000"
    MESSAGE='No error'
     />
    <MULTICAST_FEDERATION_ENABLED VALUE="Yes"/>
    <MULTICAST_DISCOVERY_ENABLED VALUE="Yes"/>
    <MULTICAST_ANNOUNCEMENT_INTERVAL VALUE="60"/>
    <IPV6_MULTICAST_SCOPE VALUE="Site"/>
    <MULTICAST_TTL VALUE="255"/>
</GET_FEDERATION_MULTICAST>
</RIBCL>
```

SET_FEDERATION_MULTICAST

This module describes the SET_FEDERATION_MULTICAST command

Use SET_FEDERATION_MULTICAST to enable or disable iLO Federation, and to set the iLO Federation multicast options, including Multicast Discovery, Multicast Announcement Interval, IPv6 Multicast Scope, and Multicast TTL.

For example:

```
<RIBCL VERSION="2.0">
  <LOGIN USER_LOGIN="adminname" PASSWORD="password">
    <RIB_INFO MODE="write">
      <SET_FEDERATION_MULTICAST>
        <MULTICAST_FEDERATION_ENABLED VALUE="Yes"/>
        <MULTICAST_DISCOVERY_ENABLED VALUE="Yes"/>
        <MULTICAST_ANNOUNCEMENT_INTERVAL VALUE="30"/>
        <IPV6_MULTICAST_SCOPE VALUE="Site"/>
        <MULTICAST_TTL VALUE="255"/>
      </SET_FEDERATION_MULTICAST>
    </RIB_INFO>
  </LOGIN>
</RIBCL>
```



NOTE

Disabling multicast discovery or announcements disables the iLO Federation features.

All devices in an iLO Federation group must have the same scope and TTL to properly enable peer discovery.

Subtopics

SET_FEDERATION_MULTICAST parameters
This module describes the SET_FEDERATION_MULTICAST command parameters
SET_FEDERATION_MULTICAST runtime errors
This module describes the SET_FEDERATION_MULTICAST command runtime errors

More information

Multicast options

SET_FEDERATION_MULTICAST parameters

This module describes the SET_FEDERATION_MULTICAST command parameters

MULTICAST_FEDERATION_ENABLED enables or disables iLO Federation. The value must be either `Yes` (enabled) or `No` (disabled). When disabled, iLO federation management features are unavailable.

MULTICAST_DISCOVERY_ENABLED enables or disables multicast discovery. The value must be either `Yes` (enabled) or `No` (disabled). When enabled, this parameter makes the iLO discoverable as federated on the network. When disabled, iLO Federation features are unavailable.

MULTICAST_ANNOUNCEMENT_INTERVAL sets the number of seconds between each multicast availability announcement on the network. Valid values are `Disabled`, `30`, `60`, `120`, `300`, `600`, `900`, and `1800` seconds. When disabled, iLO Federation features are unavailable.

IPV6_MULTICAST_SCOPE sets the scope of multicast discovery. Valid values are `Link` (link-local), `Site` (site-local), and `Organization` (organization-local). All devices in an iLO Federation group must have the same scope to properly enable peer discovery.

MULTICAST_TTL sets the time to live, limiting the number of switches that can be traversed before the multicast discovery is stopped. Valid values are between `1` and `255`. All devices in a federated group must have the same TTL to properly enable peer discovery.

SET_FEDERATION_MULTICAST runtime errors

This module describes the SET_FEDERATION_MULTICAST command runtime errors

Some possible SET_FEDERATION_MULTICAST error messages include the following:

- `The MULTICAST_ANNOUNCEMENT_INTERVAL VALUE is invalid. The valid values are "Disabled", "30", "60", "120", "300", "600", "900", and "1800".`
- `The IPV6_MULTICAST_SCOPE VALUE is invalid.`
- `The MULTICAST_TTL VALUE is invalid. Valid values are between 1 and 255.`
- `User does not have correct privilege for action. CONFIG_ILO_PRIV required.`

GET_FEDERATION_ALL_GROUPS

This module describes the GET_FEDERATION_ALL_GROUPS command

Use the GET_FEDERATION_ALL_GROUPS command to retrieve a list of all iLO Federation group names. The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `read`.

For example:

```
<RIBCL VERSION="2.0">
   <LOGIN USER_LOGIN="adminname" PASSWORD="password">
      <RIB_INFO MODE="read">
         <GET_FEDERATION_ALL_GROUPS/>
      </RIB_INFO>
   </LOGIN>
</RIBCL>
```

Subtopics

GET_FEDERATION_ALL_GROUPS parameters
This module describes the GET_FEDERATION_ALL_GROUPS command parameters
GET_FEDERATION_ALL_GROUPS runtime errors
This module describes the GET_FEDERATION_ALL_GROUPS command runtime errors
GET_FEDERATION_ALL_GROUPS return messages
This module describes the GET_FEDERATION_ALL_GROUPS command return messages

GET_FEDERATION_ALL_GROUPS parameters

This module describes the GET_FEDERATION_ALL_GROUPS command parameters

None

GET_FEDERATION_ALL_GROUPS runtime errors

This module describes the GET_FEDERATION_ALL_GROUPS command runtime errors

None

GET_FEDERATION_ALL_GROUPS return messages

This module describes the GET_FEDERATION_ALL_GROUPS command return messages

The following response is typical of the data returned from the GET_FEDERATION_ALL_GROUPS command:

```
<?xml version="1.0"?>
<RIBCL VERSION="2.23">
<RESPONSE
    STATUS="0x0000"
    MESSAGE='No error'
     />
<GET_FEDERATION_ALL_GROUPS>
    <GROUP_NAME VALUE="Group1"/>
    <GROUP_NAME VALUE="Group2"/>
</GET_FEDERATION_ALL_GROUPS>
</RIBCL>
```

GET_FEDERATION_ALL_GROUPS_INFO

Use GET_FEDERATION_ALL_GROUPS_INFO to retrieve a list of all iLO Federation group names and the associated privileges for each group. To retrieve the privileges of a specific group, use GET_FEDERATION_GROUP. In addition to the group name, the returned group privileges include:

- User Account Administration (ADMIN_PRIV)

- Remote Console Access (REMOTE_CONS_PRIV)
- Virtual Power and Reset (RESET_SERVER_PRIV)
- Virtual Media (VIRTUAL_MEDIA_PRIV)
- iLO Setting Configuration (CONFIG_ILO_PRIV)
- Login Privilege (LOGIN_PRIV)

> **NOTE**
>
> GET_FEDERATION_ALL_GROUPS_INFO has not been enhanced to support the extended group privileges available from the iLO 5 web interface. For more information about setting group privileges in iLO 5, see the HPE iLO 5 User Guide.

The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `read`.

For example:

```
<RIBCL VERSION="2.0">
   <LOGIN USER_LOGIN="adminname" PASSWORD="password">
      <RIB_INFO MODE="read">
         <GET_FEDERATION_ALL_GROUPS_INFO/>
      </RIB_INFO>
   </LOGIN>
</RIBCL>
```

Subtopics

GET_FEDERATION_ALL_GROUPS_INFO parameters
This module describes the GET_FEDERATION_ALL_GROUPS_INFO command parameters
GET_FEDERATION_ALL_GROUPS_INFO runtime errors
This module describes the GET_FEDERATION_ALL_GROUPS_INFO command runtime errors
GET_FEDERATION_ALL_GROUPS_INFO return messages
This module describes the GET_FEDERATION_ALL_GROUPS_INFO command returns messages

More information

iLO Federation group privileges

GET_FEDERATION_ALL_GROUPS_INFO parameters

This module describes the GET_FEDERATION_ALL_GROUPS_INFO command parameters

None.

GET_FEDERATION_ALL_GROUPS_INFO runtime errors

This module describes the GET_FEDERATION_ALL_GROUPS_INFO command runtime errors

None

GET_FEDERATION_ALL_GROUPS_INFO return messages

This module describes the GET_FEDERATION_ALL_GROUPS_INFO command returns messages

The following response is typical of the data returned from the GET_FEDERATION_ALL_GROUPS_INFO command:

```
<?xml version="1.0"?>
<RIBCL VERSION="2.23">
<RESPONSE
    STATUS="0x0000"
    MESSAGE='No error'
     />
<GET_FEDERATION_ALL_GROUPS_INFO>
    <FEDERATION_GROUP>
        <GROUP_NAME VALUE="Group1"/>
        <ADMIN_PRIV VALUE="Yes"/>
        <REMOTE_CONS_PRIV VALUE="Yes"/>
        <RESET_SERVER_PRIV VALUE="Yes"/>
        <VIRTUAL_MEDIA_PRIV VALUE="Yes"/>
        <CONFIG_ILO_PRIV VALUE="Yes"/>
        <LOGIN_PRIV VALUE="Yes"/>
    </FEDERATION_GROUP>
    <FEDERATION_GROUP>
        <GROUP_NAME VALUE="Group2"/>
        <ADMIN_PRIV VALUE="Yes"/>
        <REMOTE_CONS_PRIV VALUE="Yes"/>
        <RESET_SERVER_PRIV VALUE="No"/>
        <VIRTUAL_MEDIA_PRIV VALUE="No"/>
        <CONFIG_ILO_PRIV VALUE="Yes"/>
        <LOGIN_PRIV VALUE="Yes"/>
    </FEDERATION_GROUP>
```

```
</GET_FEDERATION_ALL_GROUPS_INFO>
</RIBCL>
```

GET_FEDERATION_GROUP

Use GET_FEDERATION_GROUP to retrieve the privileges granted to a specified Federated group. To retrieve the privileges granted to all groups, use GET_FEDERATION_ALL_GROUPS_INFO. In addition to the group name, the return includes the following group privileges:

- User Account Administration (ADMIN_PRIV)
- Remote Console Access (REMOTE_CONS_PRIV)
- Virtual Power and Reset (RESET_SERVER_PRIV)
- Virtual Media (VIRTUAL_MEDIA_PRIV)
- iLO Setting Configuration (CONFIG_ILO_PRIV)
- Login Privilege (LOGIN_PRIV)

The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `read`.

For example:

```
<RIBCL VERSION="2.0">
   <LOGIN USER_LOGIN="adminname" PASSWORD="password">
      <RIB_INFO MODE="read">
         <GET_FEDERATION_GROUP GROUP_NAME="groupname"/>
      </RIB_INFO>
   </LOGIN>
</RIBCL>
```



NOTE

GET_FEDERATION_GROUP has not been enhanced to support the extended group privileges available from the iLO 5 web interface. For more information about setting group privileges in iLO 5, see the HPE iLO 5 User Guide.

Subtopics

GET_FEDERATION_GROUP parameters
This module describes the GET_FEDERATION_GROUP command parameters
GET_FEDERATION_GROUP runtime errors
This module describes the GET_FEDERATION_GROUP command runtime errors

GET_FEDERATION_GROUP return messages

This module describes the GET_FEDERATION_GROUP command return messages

More information

iLO Federation group privileges

GET_FEDERATION_GROUP parameters

This module describes the GET_FEDERATION_GROUP command parameters

GROUP_NAME—The name of the group to be displayed. The name must be from 1 to 31 characters long.

GET_FEDERATION_GROUP runtime errors

This module describes the GET_FEDERATION_GROUP command runtime errors

GET_FEDERATION_GROUP returns the following message if the value specified for GROUP_NAME does not match any existing groups:

```
Group name not found.
```

GET_FEDERATION_GROUP return messages

This module describes the GET_FEDERATION_GROUP command return messages

The following response is typical of the data returned from the GET_FEDERATION_GROUP command:

```
<?xml version="1.0"?>
<RIBCL VERSION="2.23">
<RESPONSE
    STATUS="0x0000"
    MESSAGE='No error'
     />
<GET_FEDERATION_GROUP>
    <FEDERATION_GROUP>
        <GROUP_NAME VALUE="Group2"/>
        <ADMIN_PRIV VALUE="Yes"/>
        <REMOTE_CONS_PRIV VALUE="Yes"/>
        <RESET_SERVER_PRIV VALUE="No"/>
```

```
        <VIRTUAL_MEDIA_PRIV VALUE="No"/>
        <CONFIG_ILO_PRIV VALUE="Yes"/>
        <LOGIN_PRIV VALUE="Yes"/>
    </FEDERATION_GROUP>
</GET_FEDERATION_GROUP>
</RIBCL>
```

ADD_FEDERATION_GROUP

Use ADD_FEDERATION_GROUP to create a new iLO Federation group, or to include an iLO in an existing group membership while setting the privileges of that group on the iLO. The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `write`.



NOTE

ADD_FEDERATION_GROUP has not been enhanced to support the extended group privileges available from the iLO 5 web interface. For more information about setting group privileges in iLO 5, see the HPE iLO 5 User Guide.

For example:

```
<RIBCL VERSION="2.0">
   <LOGIN USER_LOGIN="adminname" PASSWORD="password">
      <RIB_INFO MODE="write">
         <ADD_FEDERATION_GROUP
             GROUP_NAME="groupname"
             GROUP_KEY="groupkey">
              <ADMIN_PRIV VALUE="Yes"/>
              <REMOTE_CONS_PRIV VALUE="Yes"/>
              <RESET_SERVER_PRIV VALUE="Yes"/>
              <VIRTUAL_MEDIA_PRIV VALUE="Yes"/>
              <CONFIG_ILO_PRIV VALUE="Yes"/>
              <LOGIN_PRIV VALUE="Yes"/>
         </ADD_FEDERATION_GROUP>
      </RIB_INFO>
   </LOGIN>
</RIBCL>
```



NOTE

A single iLO can belong to up to a maximum of 10 iLO Federation groups. To remove an iLO system from an iLO Federation group, use DELETE_FEDERATION_GROUP.

Subtopics

ADD_FEDERATION_GROUP parameters
This module describes the ADD_FEDERATION_GROUP command parameters
ADD_FEDERATION_GROUP runtime errors
This module describes the ADD_FEDERATION_GROUP command runtime errors

More information

iLO Federation group memberships for local iLO systems
iLO Federation group privileges
iLO Federation group characteristics

ADD_FEDERATION_GROUP parameters

This module describes the ADD_FEDERATION_GROUP command parameters

GROUP_NAME—The name of the group to be added. The name must be from 1 to 31 characters long.

GROUP_KEY—The password for the group to be added. The password can be from the configured minimum password length to 31 characters long. If **Password Complexity** is enabled on the iLO system, the group key must meet the password complexity requirements.

ADMIN_PRIV (Administer User Accounts)—Enables members of a group to add, edit, and delete iLO user accounts.

REMOTE_CONS_PRIV (Remote Console Access)—Enables members of a group to remotely access the host system Remote Console, including video, keyboard, and mouse control.

RESET_SERVER_PRIV (Virtual Power and Reset)—Enables members of a group to power-cycle or reset the local iLO system.

VIRTUAL_MEDIA_PRIV (Virtual Media)—Enables members of a group to use scripted Virtual Media with the local iLO system.

CONFIG_ILO_PRIV (Configure iLO Settings)—Enables members of a group to configure most iLO settings, including security settings, and to remotely update firmware.

LOGIN_PRIV (Login)—Enables members of a group to log in to iLO.

ADD_FEDERATION_GROUP runtime errors

This module describes the ADD_FEDERATION_GROUP command runtime errors

Some possible ADD_FEDERATION_GROUP error messages include the following:

- `The GROUP_NAME must not be left blank.`
- `The GROUP_NAME is too long.`
- `The GROUP_KEY must not be left blank.`
- `The GROUP_KEY is too long.`
- `The GROUP_KEY is too short. Use a longer key.`
- `Group membership already exists.`
- `Cannot add group membership. Maximum number of memberships reached : 10.`

MOD_FEDERATION_GROUP

Use MOD_FEDERATION_GROUP to modify an existing iLO Federation group membership and associated privileges. The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `write`.



NOTE

All parameters are optional. Any iLO Federation property that is not explicitly modified retains its old value.

For example:

```
<RIBCL VERSION="2.0">
   <LOGIN USER_LOGIN="adminname" PASSWORD="password">
      <RIB_INFO MODE="write">
         <MOD_FEDERATION_GROUP GROUP_NAME="groupname">
            <GROUP_NAME VALUE="newgroupname"/>
            <GROUP_KEY VALUE="newgroupkey"/>
            <ADMIN_PRIV VALUE="Yes"/>
            <REMOTE_CONS_PRIV VALUE="Yes"/>
            <RESET_SERVER_PRIV VALUE="Yes"/>
            <VIRTUAL_MEDIA_PRIV VALUE="Yes"/>
            <CONFIG_ILO_PRIV VALUE="Yes"/>
            <LOGIN_PRIV VALUE="Yes"/>
         </MOD_FEDERATION_GROUP>
      </RIB_INFO>
```

```
   </LOGIN>
</RIBCL>
```

NOTE

MOD_FEDERATION_GROUP has not been enhanced to support the extended group privileges available from the iLO 5 web interface. For more information about setting group privileges in iLO 5, see the HPE iLO 5 User Guide.

Subtopics

MOD_FEDERATION_GROUP parameters
This module describes the MOD_FEDERATION_GROUP command parameters
MOD_FEDERATION_GROUP runtime errors
This module describes the MOD_FEDERATION_GROUP command runtime errors

More information

iLO Federation group memberships for local iLO systems
iLO Federation group privileges
iLO Federation group characteristics

MOD_FEDERATION_GROUP parameters

This module describes the MOD_FEDERATION_GROUP command parameters

GROUP_NAME—The name of the group to be changed, or the new name to be given to the specified Federation group, depending on the parameters' location. The name must be from 1 to 31 characters long.

GROUP_KEY—The new password to set for the group. The password can be from the configured minimum password length to 31 characters long. If **Password Complexity** is enabled on the iLO system, the group key must meet the password complexity requirements.

ADMIN_PRIV (Administer User Accounts)—Enables members of a group to add, edit, and delete iLO user accounts.

REMOTE_CONS_PRIV (Remote Console Access)—Enables members of a group to remotely access the host system Remote Console, including video, keyboard, and mouse control.

RESET_SERVER_PRIV (Virtual Power and Reset)—Enables members of a group to power-cycle or reset the local iLO system.

VIRTUAL_MEDIA_PRIV (Virtual Media)—Enables members of a group to use scripted Virtual Media with the local iLO system.

CONFIG_ILO_PRIV (Configure iLO Settings)—Enables members of a group to configure most iLO settings, including security settings, and to remotely update firmware.

LOGIN_PRIV (Login)—Enables members of a group to log in to iLO.

MOD_FEDERATION_GROUP runtime errors

This module describes the MOD_FEDERATION_GROUP command runtime errors

Some possible MOD_FEDERATION_GROUP error messages include the following:

- `The GROUP_NAME must not be left blank.`

  NOTE

  This error appears only if the value in the `<MOD_FEDERATION_GROUP GROUP_NAME="groupname">` command is left blank. This error does not appear if “newgroupname” in the parameter setting <GROUP_NAME VALUE="newgroupname"/> is left blank or the line is omitted. In that case, the original group name is retained.

- `Group name not found.`
- `The GROUP_NAME is too long.`
- `The GROUP_KEY must not be left blank.`
- `The GROUP_KEY is too long.`
- `Group membership already exists.`
- `User does not have correct privilege for action. CONFIG_ILO_PRIV required.`

DELETE_FEDERATION_GROUP

This module describes the DELETE_FEDERATION_GROUP command

Use DELETE_FEDERATION_GROUP to remove the iLO from an iLO Federation group membership. The command must appear within a RIB_INFO command block, and RIB_INFO MODE must be set to `write`.

For example:

```
<RIBCL VERSION="2.0">
   <LOGIN USER_LOGIN="adminname" PASSWORD="password">
      <RIB_INFO MODE="write">
         <DELETE_FEDERATION_GROUP GROUP_NAME="groupname"/>
      </RIB_INFO>
```

```
   </LOGIN>
</RIBCL>
```

Subtopics

DELETE_FEDERATION_GROUP parameters
This module describes the DELETE_FEDERATION_GROUP command parameters
DELETE_FEDERATION_GROUP runtime errors
This module describes the DELETE_FEDERATION_GROUP command errors

DELETE_FEDERATION_GROUP parameters

This module describes the DELETE_FEDERATION_GROUP command parameters

GROUP_NAME—The name of the iLO Federation group to be deleted. The name must be from 1 to 31 characters long and must already exist as a membership group.

DELETE_FEDERATION_GROUP runtime errors

This module describes the DELETE_FEDERATION_GROUP command errors

Some possible runtime errors returned by DELETE_FEDERATION_GROUP include the following:

- If the value specified for GROUP_NAME does not match any existing groups: `Group name not found.`
- `User does not have correct privilege for action. CONFIG_ILO_PRIV required.`

Troubleshooting

Subtopics

Query errors occur on iLO Federation pages
A timeout error is displayed on the iLO Multi-System Map page
iLO Multi-System Map page displays a 502 error
iLO Multi-System Map page displays a 403 error
iLO peers are not displayed on iLO Federation pages

iLO peers are displayed with IPv6 addresses on IPv4 networks
iLO Federation Setup tab add and edit group controls disabled

Query errors occur on iLO Federation pages

Symptom

When you open an iLO Federation page, iLO peers and associated data might be missing from the page, and the following error is displayed:

```
Errors occurred during query, returned data may be incomplete or
inconsistent.
```

Cause

This error might occur when a network communication error, configuration problem, or failed iLO system prevents the retrieval of data from all systems in an iLO Federation group.

Action

- Wait for twice the configured **Multicast Announcement Interval**, and then refresh the iLO Federation page.

  If an iLO system was reconfigured and can no longer communicate with the local iLO system, it will be dropped from its peer relationships after they expire.

- Check the **Multi-System Map** page for errors.

  This page can help you identify communication problems between iLO peers.

- If you are using server blades in a BladeSystem enclosure, verify that **Enclosure iLO Federation Support** is configured on the **Enclosure Settings > Network Access > Protocols** page in the Onboard Administrator web interface.

  You must have Onboard Administrator 4.11 or later to configure this setting.

  This configuration is required to allow peer-to-peer communication between the server blades in an enclosure.

- Verify that the switches in the network are configured to allow communication between iLO peers.

- If you changed the network routes, subnet mask, IP address, or HTTP port for an iLO peer, verify that the peer has a communication path to the local iLO system.

- Ensure that a communication path exists between the local iLO system and the peer with the error.

An intermediate firewall or a change to the iLO network configuration and HTTP port setting might block communication between the local iLO system and the peer.

A timeout error is displayed on the iLO Multi-System Map page

Symptom

The **Multi-System Map** page displays a `Timed Out` error for a peer of the local iLO system.

Cause

This error might occur in the following situations:

- A peer of the local iLO system has a peer that has failed.
- An intermediate firewall is preventing communication between the local iLO system and a peer.
- Network configuration changes are preventing communication between the local iLO system and a peer.
- The enclosure that contains the peer is not configured for iLO Federation support.

Action

- Remove or repair the failed peer.
- Verify that the network is configured to allow communication between the iLO peers.
- Verify that the enclosure that contains an iLO server blade peer is configured for iLO Federation support on the **Enclosure Settings > Network Access > Protocols** page in the Onboard Administrator web interface.

  You must have Onboard Administrator 4.11 or later to configure this setting. This configuration is required to allow peer-to-peer communication between the server blades in an enclosure.

iLO Multi-System Map page displays a 502 error

Symptom

The **Multi-System Map** page shows a 502 error.

Cause

The listed peer rejected a request from the local iLO system.

Action

Ensure that a communication path exists between the local iLO system and the peer with the error.

An intermediate firewall or a change to the iLO network configuration and HTTP port setting might block communication between the local iLO system and the peer.

iLO Multi-System Map page displays a 403 error

Symptom

The **Multi-System Map** page shows a 403 Forbidden/Authorization error.

Cause

The group key on the local iLO system does not match the group key on a peer iLO system.

Action

Ensure that the group key matches for all iLO systems that are members of the selected group.

iLO peers are not displayed on iLO Federation pages

Symptom

iLO peers (systems in the same group as the local iLO system) are not displayed on iLO Federation pages.

Action

- Ensure that the group key matches for all iLO systems that are members of the selected group.
- Wait for twice the configured multicast interval, and then refresh the iLO Federation page.

  If an iLO system was reconfigured and can no longer communicate with the local iLO system, it will be dropped from its peer relationships after they expire.
- If you are using server blades in an enclosure, verify that **Enclosure iLOFederation Support** is configured on the **Enclosure Settings > Network Access > Protocols** page in the Onboard Administrator web interface.

You must have Onboard Administrator 4.11 or later to configure this setting. This configuration is required to allow peer-to-peer communication between the server blades in an enclosure.

- Verify that the switches in the network are configured to allow communication between iLO peers.
- Ensure that a communication path exists between the local iLO system and the peer with the error.

  An intermediate firewall or a change to the iLO network configuration and HTTP port setting might block communication between the local iLO system and the peer.

iLO peers are displayed with IPv6 addresses on IPv4 networks

Symptom

iLO peers on an IPv4 network are displayed with IPv6 addresses on iLO Federation pages.

Action

Verify that the **iLO Client Applications use IPv6 first** check box is not selected on the **iLO Dedicated Network Port - IPv6** or **iLO Shared Network Port - IPv6** page.

iLO Federation Setup tab add and edit group controls disabled

Symptom

When you try to add an iLO Federation group, iLO notifies you that the configured **Minimum Password Length** exceeds the maximum group key password length. If you try to edit an existing iLO Federation group, the **Group Key** controls are disabled.

Cause

The maximum length for a group key password is 31 characters. If iLO is configured to require a minimum password length of more than 31 characters, the minimum password length requirement cannot be met.

Action

1. Click **Security** in the navigation tree.

   The **Access Settings** page is displayed.

2. Click  next to the **Account Service** category.

   The **Edit Account Service Settings** page opens.

3. Enter a **Minimum Password Length** setting that is 31 or fewer characters, and then click **OK**.

   iLO notifies you that the update is complete.

4. Add and edit iLO Federation groups, as needed.

Websites

iLO

https://www.hpe.com/info/ilo

iLO documentation

https://www.hpe.com/support/hpeilodocs-quicklinks

iLO support

https://www.hpe.com/support/ilo5

iLO helpful links and resources

https://www.hpe.com/support/ilo-resource-ref-en

HPE iLO Free Online Training

https://www.hpe.com/ww/iloBundle

HPE iLO Documentation Map

https://www.hpe.com/support/ilo-server-lifecycle-management

HPE ProLiant Gen10 servers

https://www.hpe.com/info/proliantgen10-docs

HPE ProLiant Gen10 Plus servers

https://www.hpe.com/info/proliantgen10plus-docs

HPE ProLiant training

https://www.hpe.com/ww/learnproliant

HPE Synergy

https://www.hpe.com/info/synergy-docs

Apollo systems and APM

Navigate to **https://www.hpe.com/info/docs** and then select an Apollo System in the **Products & Solutions** section.

UEFI System Utilities

https://hpe.com/support/uefisystemutilities-quicklinks

SUM

https://hpe.com/support/smartupdatemanager-quicklinks

SPP

https://hpe.com/support/servicepackforhpeproliant-quicklinks

Intelligent Provisioning

https://hpe.com/support/intelligentprovisioning-quicklinks

iLO RESTful API and RESTful Interface Tool

https://servermanagementportal.ext.hpe.com/docs/redfishclients/ilorest-userguide

Remote Support

https://www.hpe.com/info/insightremotesupport/docs

HPE OneView

https://www.hpe.com/support/hpeoneview-quicklinks

HPE SIM

https://www.hpe.com/info/insightmanagement/sim/docs

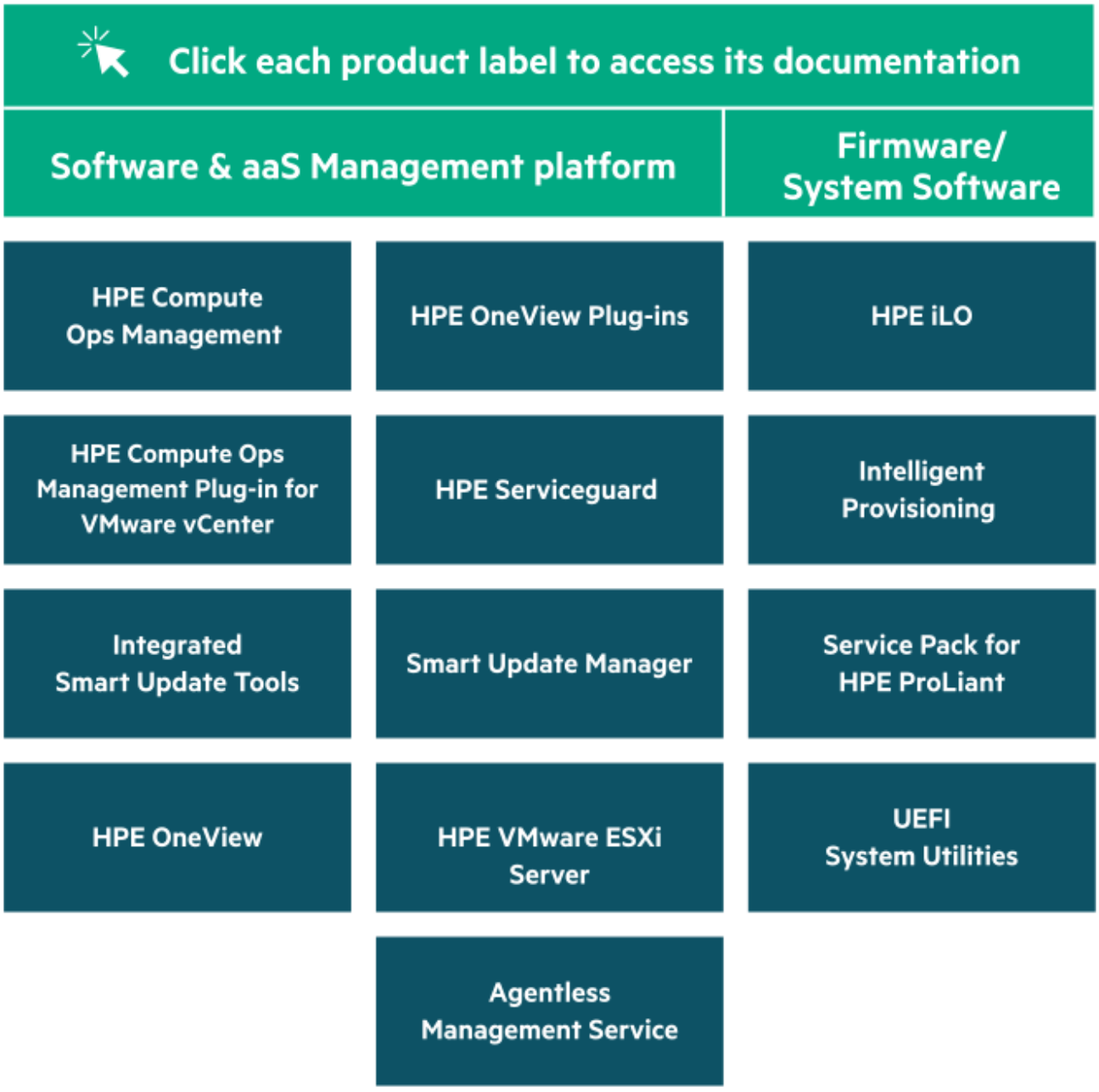
OA

http://www.hpe.com/support/BladeSystem/docs

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**
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 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)**	

Documents	Versions	
	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)
		2.97
		2.98
		2.99
HPE iLO 6 Release Notes	1.11	
	1.41	
	1.52	
	1.53	
	1.55	
	1.56	
	1.57	
	1.58	
	1.59	
	1.61	
	1.62	
	1.63	
	1.64	
	1.65	

Documents	Versions
	1.66
	1.67
	1.68
	1.69
	1.70
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

Support and other resources

Subtopics

Accessing Hewlett Packard Enterprise Support
HPE product registration
Accessing updates
Remote support
Warranty information
Regulatory information
Documentation feedback

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, use the **Feedback** button and icons (at the bottom of an opened document) on the Hewlett Packard Enterprise Support Center portal (**https://www.hpe.com/support/hpesc**) to send any errors, suggestions, or comments. This process captures all document information.