Hewlett Packard Enterprise

HPE iLO Federation User Guide

Abstract

This guide explains how to configure and use the HPE iLO 4 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 iLO 4, HPE ProLiant Gen8 and Gen9 servers, and HPE Synergy servers.

Acknowledgments

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Revision History

Revision 2.50	October 2016
Updated for iLO 4 2.50	

Contents

1 iLO Federation overview

iLO Federation features

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 an iLO Federation group.

When an iLO Federation page loads, 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 4 firmware version 1.40 and later supports the following features:

- Group health status—View server health and model information.
- Group Virtual Media—Connect scripted media for access by the servers in an iLO Federation group.
- Group power control—Manage the power status of the servers in an iLO Federation group.
- Group power capping—Set dynamic power caps for the servers in an iLO Federation group.
- Group firmware update—Update the firmware of the servers in an iLO Federation group.

iLO 4 firmware version 2.00 and later supports the following features:

- Group license installation—Enter a license key to activate iLO licensed features on the servers in an iLO Federation group.
- 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. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.

iLO Federation features in HP Smart Update Manager

HP SUM is the Hewlett Packard Enterprise deployment engine for updating firmware, drivers, agents, and configuration tools on Hewlett Packard Enterprise servers.

HP SUM 7.1.0 and later supports the following iLO Federation features:

- Discover, view, and edit iLO Federation groups.
- Perform inventory on iLO Federation groups.
- View the installed versions of the following firmware types for each server in an iLO Federation group: iLO, BIOS, PMC, and CPLD.
- Deploy the following firmware types to the servers in an iLO Federation group: iLO, BIOS, PMC, and CPLD. Online and offline deployments are supported.

More information

Using iLO Federation with other HPE utilities

2 Configuring iLO Federation

Prerequisites for using the iLO Federation features

- 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.

  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.

- 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

- Servers that will be used with iLO Federation must use the iLO Dedicated Network Port configuration. The iLO Federation features cannot be used with the iLO Shared Network Port configuration.

- Optional: iLO Federation supports both IPv4 and IPv6. If both options have valid configurations, and you want an iLO system to use IPv4 instead of IPv6, clear the **iLO Client Applications use IPv6 first** check box on the **Network→iLO Dedicated Network Port→IPv6** page.

- Configure the network to forward multicast traffic if you want to manage iLO systems in multiple locations.

- Ensure that multicast traffic is enabled if the switches in your network include the option to enable or disable it. 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.

Configuring the multicast options for one iLO system at a time

Use the following procedure to configure the multicast options for each iLO system that will be added to an iLO Federation group. If you use the default values, configuration is not required.

You can use RIBCL scripts to view and configure multicast options for multiple iLO systems.

Prerequisites

Configure iLO Settings privilege

Configuring the multicast options

1. Navigate to the **Administration→iLO Federation** page.
2. For **iLO Federation Management**, select **Enabled** or **Disabled**.
3. For **Multicast Discovery**, select **Enabled** or **Disabled**.
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.

More information

Multicast options
Using RIBCL scripts with iLO Federation

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.

- **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 servers. To limit the impact of multicast traffic on a network with Synergy servers, adjust the **IPv6 Multicast Scope** and **Multicast Time To Live (TTL)** settings.

- **Multicast Announcement Interval (seconds/minutes)**—Sets the frequency at which the iLO system announces itself on the network. Each multicast announcement is approximately 300 bytes. Select a value of 30 seconds to 30 minutes. The default value is 10 minutes. Selecting **Disabled** disables the iLO Federation features for the local iLO system.

- **IPv6 Multicast Scope**—The size of the network that will send and receive multicast traffic. Valid values are **Link**, **Site**, and **Organization**. The default value is **Site**.

- **Multicast Time To Live (TTL)**—Specifies the number of switches that can be traversed before multicast discovery stops. The default value is 5.

iLO Federation groups

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 **Administration→iLO Federation** page.

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

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 of the servers in the group.

You can add group memberships for multiple iLO systems on the **iLO Federation→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 an iLO system added to a group, the group can be granted the following privileges:

- **Login Privilege**—Group members can log in to iLO.

- **Remote Console Access**—Group members can remotely access the managed server Remote Console, including video, keyboard, and mouse control.

- ⊟ **Virtual Media**—Group members can use scripted Virtual Media with the managed server.
- ⏻ **Virtual Power and Reset**—Group members can power-cycle or reset the managed server.
- ⚬ **Configure iLO Settings**—Group members can configure most iLO settings, including security settings, and can remotely update firmware.
- ⚬ **Administer User Accounts**—Group members can add, edit, and delete iLO user accounts.

iLO Federation group characteristics

iLO Federation groups allow iLO systems to encrypt and sign messages to other iLO systems in the same group.

- 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.
- An 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.

  For more information, see the iLO RESTful API documentation at the following website: **http://www.hpe.com/support/restfulinterface/docs**.

- 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)

Viewing iLO Federation group memberships (local iLO system)

Navigate to the **Administration→iLO Federation** page.

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.

More information

Using RIBCL scripts with iLO Federation
iLO Federation group privileges

Adding iLO Federation group memberships (local iLO system)

Prerequisites

Configure iLO Settings privilege

Adding a group membership

1. Navigate to the **Administration→iLO Federation** page.
2. Click **Join Group**.
3. Enter the following information on the **Add/Edit Federation Group** page:

   - **Group Name**—The group name, which can be 1 to 31 characters long.

   - **Group Key**—The group password, which can be from the configured minimum password length to 31 characters long.

     For more information about the minimum password length, see the iLO user guide.

   - **Group Key Confirm**—Confirm the group password.

   If you enter the name and key for an existing group, the local iLO system is added to that group. If you enter the name and key for a group that does not exist, the group is created and the local iLO system is added to the new group.

4. Select from the following privileges:

   - **Administer User Accounts**

   - **Remote Console Access**

   - **Virtual Power and Reset**

   - **Virtual Media**

   - **Configure iLO Settings**

   - **Login Privilege**

   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.

5. Click **Join Group**.

More information

Adding iLO Federation group memberships (multiple iLO systems)
Using RIBCL scripts with iLO Federation
iLO Federation groups

Editing iLO Federation group memberships (local iLO system)

Prerequisites

Configure iLO Settings privilege

Editing a group membership

1. Navigate to the **Administration→iLO Federation** page.
2. Select a group membership, and then click **Edit** to open the **Add/Edit Federation Group** page.
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, 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.

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**.

More information

Using RIBCL scripts with iLO Federation
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Removing a local iLO system from an iLO Federation group

Prerequisites

Configure iLO Settings privilege

Removing a group membership

1. Navigate to the **Administration→iLO Federation** page.
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 **OK**.

More information

Using RIBCL scripts with iLO Federation

Adding iLO Federation group memberships (multiple iLO systems)

Adding an iLO Federation group based on an existing group

Use this procedure to create an iLO Federation group with the same members as an existing group. For example, you might want to create a group that contains the same systems that are in the DEFAULT group, but with additional privileges.

Prerequisites

- Configure iLO Settings privilege

- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.

Adding a group membership

1. Navigate to the **iLO Federation→Group Configuration** page.

   If no iLO Federation groups exist, this page displays the following message: `There are no configured groups.` Use the **Administration→iLO Federation** page to create a group.

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 on this page.

3. Enter the following information:

- **Group Name**—The group name, which can be 1 to 31 characters long.

- **Group Key**—The group password, which can be from the configured minimum password length to 31 characters long.

  For more information about the minimum password length, see the iLO user guide.

- **Group Key Confirm**—Confirm the group password.

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

4. Select from the following privileges:

- **Administer User Accounts**

- **Remote Console Access**

- **Virtual Power and Reset**

- **Virtual Media**

- **Configure iLO Settings**

- **Login Privilege**

  This step defines the privileges that members of the group have for configuring the other members of the group.

5. 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 does not have 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.

6. 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

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Creating a group from a filtered set of servers

Use this procedure to create an iLO Federation group from a list of filtered servers. For example, you might want to create a group that contains all of the servers with a specific version of the iLO 4 firmware.

When you create a group from a list of filtered servers, only the servers listed in the **Affected Systems** list at the time the group is created are added to the group. If you configure servers that meet the filter criteria after the group is created, they are not added to the group.

Prerequisites

- Configure iLO Settings privilege

- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.

Creating a group

1. Create a set of systems by using the filters on the **iLO Federation** pages.
2. Navigate to the **iLO Federation→Group Configuration** page.

   The filters you apply when you create a set of systems are listed at the top of the page. To remove a filter, click the X icon.
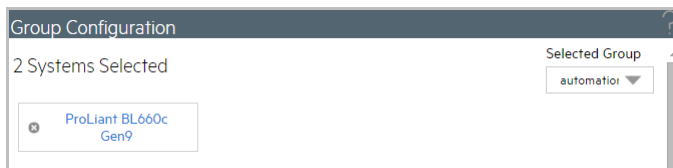
   If no iLO Federation groups exist, this page displays the following message: `There are no configured groups`. Use the **Administration→iLO Federation** page to create a group.

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. Enter the following information:

   - **Group Name**—The group name, which can be 1 to 31 characters long.
   - **Group Key**—The group password, which can be from the configured minimum password length to 31 characters long.

     For more information about the minimum password length, see the iLO user guide.

   - **Group Key Confirm**—Confirm the group password.

5. Select from the following privileges:

   - **Administer User Accounts**
   - **Remote Console Access**
   - **Virtual Power and Reset**
   - **Virtual Media**
   - **Configure iLO Settings**
   - **Login Privilege**

   This step defines the privileges that members of the group have for configuring the other members of the 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 does not have 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. 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 filters
Adding iLO Federation group memberships (local iLO system)

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 **Previous** (if available) to view more servers in the list.

More information

Configuring Enclosure iLO Federation Support

If you want to use the iLO Federation features with server blades in a BladeSystem c-Class enclosure, the **Enclosure iLO Federation Support** setting 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. **Enclosure iLO Federation Support** is enabled by default.

Prerequisites

Onboard Administrator 4.11 or later is installed.

Configuring Enclosure iLO Federation Support

1. Log in to the Onboard Administrator web interface (https://<OA hostname or IP address>).
2. Navigate to the **Enclosure Information**→**Enclosure Settings**→**Network Access** page, and then click the **Protocols** tab.
3. Select the **Enable Enclosure iLO Federation Support** check box, and then click **Apply**.

Verifying server blade support for iLO Federation

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

Management Processor Information	
Name	
Address	
MAC Address	
Model	[Unknown]
Firmware Version	2.50
iLO Federation Capable	Yes

3 Using the iLO Federation features

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

Make sure that your environment meets the prerequisites for using iLO Federation. For more information, see .

Selected Group list

All of the iLO Federation pages under **iLO Federation** in the navigation tree have a **Selected Group** list.
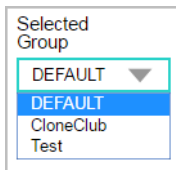
When you select a group from the **Selected Group** list:

- 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 of the servers in the selected group.

- The changes you make on iLO Federation pages apply to all of 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.

Selected Group list filters

When you filter the list of servers:

- The information displayed on iLO Federation pages applies to all of the servers in the selected group that meet the filter criteria.

- The changes you make on iLO Federation pages apply to all of 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.

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

All of the pages in the **iLO Federation** navigation tree menu, except for the **Group Power Settings** page, allow you to export information to a CSV file.

For Internet Explorer users only: This feature is supported with Internet Explorer 11 and later.

1. Navigate to a page in the **iLO Federation** menu 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.

    When you export the list, the CSV file contains only the servers displayed on the iLO Federation page.

    If multiple pages of servers are included in the list, the CSV file will contain 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.

iLO Federation information export options

You can export the following information from the **iLO Federation** pages:

- Systems with critical or degraded status—Export this list from the **Multi-System View** page.

- iLO peers list—Export this list from the **Multi-System Map** page.

- Affected systems list—Export the list of systems affected by an iLO Federation action on the following pages:

    ◦ **Group Virtual Media**

    ◦ **Group Power**

    ◦ **Group Firmware Update**

    ◦ **Group Licensing**

    ◦ **Group Configuration**

The export feature is not supported on the **Group Power Settings** page.

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.

Viewing server health and model information

1. Navigate to the **iLO Federation**→**Multi-System View** page.
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.

Server health and model details
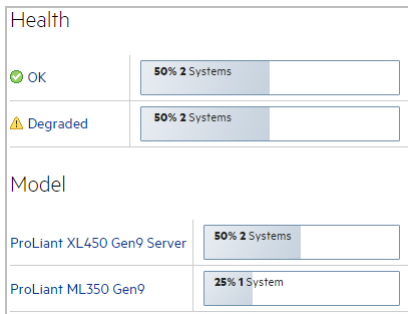
- **Health**—The number of servers in each listed health status. The percentage of the total number of servers in each listed health status is also displayed.

  For more information about health status values, see the iLO user guide.

- **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

1. Navigate to the **iLO Federation→Multi-System View** page.
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.

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
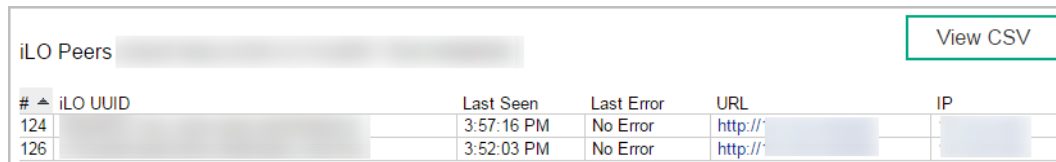
Viewing the iLO Federation Multi-System Map

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 an iLO Federation page loads, 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 of the data for the selected group is retrieved.

1. Navigate to the **iLO Federation→Multi-System Map** page.
2. Select a group from the **Selected Group** menu.

iLO peer details

# ▲	iLO UUID	Last Seen	Last Error	URL	IP
124		3:57:16 PM	No Error	http://	
126		3:52:03 PM	No Error	http://	

iLO Peers [View CSV]

- **#**—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.

- **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 scripted media for access by the servers in an iLO Federation group.

- Scripted media only supports 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, eject, or boot from scripted media. When you use scripted 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.

  Using the iLO Virtual Floppy to boot a remote host server is supported only on ProLiant Gen8 servers. It is not supported on ProLiant Gen9 or Synergy servers.

- Before you use the Virtual Media feature, review the Virtual Media operating system considerations.

  For more information, see the iLO user guide.

Connecting scripted media for groups

Prerequisites

- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.
- Each member of the selected iLO Federation group has granted the Virtual Media privilege to the group.

Connecting scripted media

1. Navigate to the **iLO Federation→Group Virtual Media** page.
2. Select a group from the **Selected Group** menu.

   The scripted media you connect will be available to all of the systems in the selected group.

3. Enter the URL for the scripted media disk image in the **Scripted 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 disk 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 disk image will remain connected until it is ejected manually, and the servers will boot to it on all subsequent server resets, if the system boot options are configured accordingly.

   If a server in the group is in POST when you use the **Boot on Next Reset** check box, an error occurs because you cannot modify the server boot order during POST. Wait for POST to finish, and then try again.

5. Click **Insert Media**.

   iLO displays the command results.

Viewing scripted media status for groups

Navigate to the **iLO Federation→Group Virtual Media** page.

Scripted media details

When scripted media is connected to the systems in an iLO Federation group, the following details are listed in the **Virtual Floppy Status** section and **Virtual CD/DVD-ROM Status** section:

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

The **Virtual Floppy Status** and **Virtual CD/DVD-ROM Status** sections are displayed only when media is connected.

Ejecting a scripted media device

Prerequisites

- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.
- Each member of the selected iLO Federation group has granted the Virtual Media privilege to the group.

Ejecting a scripted media device

1. Navigate to the **iLO Federation→Group Virtual Media** page.
2. Select a group from the **Selected Group** menu.

   The scripted media device that you eject will be disconnected from all of the systems in the selected group.

3. Click **Eject Media** in the **Virtual Floppy Status** section or the **Virtual CD/DVD-ROM Status** section.

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 **Previous** (if available) to view more servers in the list.

More information

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

The **Virtual Power Button** section on the **Group Power** page displays a summary of the current power state of the grouped servers, including 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.

Prerequisites

- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.
- Each member of the selected iLO Federation group has granted the Virtual Power and Reset privilege to the group.

Changing the power state for a group

1. Navigate to the **iLO Federation→Group Power** page.
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.
4. When prompted to confirm the request, click **OK**.

   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.

Virtual Power Button options

- **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.

- **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.

- **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.

Servers affected by the Virtual Power Button

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 **Previous** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

Configuring group power capping

Prerequisites

- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.
- Each member of the selected iLO Federation group has granted the Configure iLO Settings privilege to the group.

Configuring a power cap

1. Navigate to the **iLO Federation→Group Power Settings** page.
2. Select a group from the **Selected Group** menu.

    Changes you make on this page affect all of the systems in the selected group.

3. Select the **Enable power capping** check box.
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 below the server minimum power value.

    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.

5. Click **Apply**.

Power capping considerations

The Group Power Settings 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 servers that are idle.
- 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 **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 the **Maximum Power Cap** threshold. The servers in a group must not exceed this value.

  ○ **Peak Observed Power**—The maximum observed power for all servers in a group. This value is the **Minimum High-Performance Cap** threshold, and it represents the maximum power that the servers in a group use in their current configuration. A power cap set to this value does not affect server performance.

  ○ **Minimum Observed Power**—The minimum observed power for all servers in a group. This value is the **Minimum Power Cap** threshold, and 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 servers with an installed Flex Slot Battery Backup Unit.

- Power capping is not supported on Synergy servers.

- You cannot use the iLO web interface to configure group power capping settings for SL servers and some XL servers. Use one of the following tools to configure the power capping settings for these servers:

  ○ HPE ProLiant Power Interface Control Utility

  ○ HPE Advanced Power Manager

  To verify the power management features your XL server supports, see the server Quickspecs at **http://www.hpe.com/info/quickspecs**.

Viewing group power capping information

Prerequisites

An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.

Viewing group power capping information

1. Navigate to the **iLO Federation→Group Power Settings** page.
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.

Power capting 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.

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 following firmware types are supported with iLO Federation:

- iLO firmware
- System ROM (BIOS)
- Chassis firmware (Power Management)
- Power Management Controller
- System Programmable Logic Device (CPLD)
- NVMe Backplane Firmware

Obtaining the iLO firmware image file

The BIN file from the iLO Online ROM Flash Component is required for updating the iLO firmware on the **Group Firmware Update** page.

1. Navigate to the Hewlett Packard Enterprise Support Center: **http://www.hpe.com/support/hpesc**.
2. To locate and download the iLO Online ROM Flash Component file, follow the onscreen instructions.

   To extract the BIN file, 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:

     o `#sh ./CP00XXXX.scexe –unpack=/tmp/`

     o `#rpm2cpio hp-firmware-ilo4-2.xx-1x1.i386.rpm | cpio -id`

   The name of the iLO firmware image file is similar to `ilo4_<yyy>.bin`, where `<yyy>` represents the firmware version.

   The URL to enter for the iLO firmware image file is similar to `http://<server.example.com>/<subdir>/ilo4_240.bin`.

Obtaining supported server firmware image files

1. Navigate to the Hewlett Packard Enterprise Support Center: **http://www.hpe.com/support/hpesc**.
2. To locate and download an Online ROM Flash Component file, follow the onscreen instructions.
3. Double-click the downloaded file, and then click the **Extract** button.
4. Select a location for the extracted files, and then click **OK**.

Server firmware file type details

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

  o **Signed image example**:

    http://<server.example.com:8080>/<wwwroot>/P79_1.00_10_25_2013.signed.flash

  o **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`.

Updating the firmware for multiple servers

Prerequisites

- Each member of the selected iLO Federation group has granted the Configure iLO Settings privilege to the group.
- An iLO license that supports this feature is installed. For more information, see the following website: **http://www.hpe.com/info/ilo/licensing**.

Updating firmware

1. Download the supported firmware from the Hewlett Packard Enterprise Support Center: **http://www.hpe.com/support/hpesc**.
2. Save the firmware file to a web server.
3. Navigate to the **iLO Federation→Group Firmware Update** page.
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 option ROM update on a server with Option ROM Measuring enabled, iLO prompts you to cancel the update, verify that you have a recovery key, and suspend BitLocker before the update. Failure to follow these instructions might result in losing access to your data.

---

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

   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/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.

More information

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

Viewing firmware information

1. Navigate to the **iLO Federation→Group Firmware Update** page.
2. Select a group from the **Selected Group** menu.

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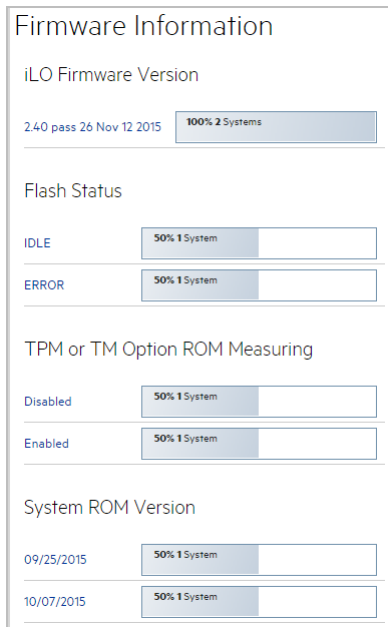
The **Firmware Information** section displays the following information:

- The number of servers with each supported 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 flash 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 Option ROM Measuring status is also displayed.

Servers affected by a Group Firmware Update

The **Affected Systems** list provides the following details about the servers affected by a 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 **Previous** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

Using iLO Federation group licensing

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

Viewing license information

1. Navigate to the **iLO Federation→Group Licensing** page.
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.

iLO Federation group license details

License Information

Type

iLO Advanced — 100% 1 System

Status

Perpetual — 100% 1 System

- **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.

Installing license keys

Prerequisites

- You must have the Configure iLO Settings privilege to perform this procedure.

- Each member of the iLO Federation group has granted the Configure iLO Settings privilege to the group.

- The license key is authorized for the number of selected servers.

Installing a license key

1. Navigate to the **iLO Federation→Group Licensing** page.
2. Optional: To filter the list of affected systems, click a license type or status link.

   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 **License Information Status** table to install licenses only on servers that are unlicensed.

3. Enter the 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.

4. Click **Install**.

   The EULA confirmation dialog box opens. The EULA details are available in the License Pack option kit.

5. Click **OK**.

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

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 **Previous** (if available) to view more servers in the list.

More information

Exporting iLO Federation information to a CSV file

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 functionality such as graphical Remote Console with multiuser collaboration, video record/playback, and many more features.

License information

- For information about purchasing, registering, and redeeming a license key, see the iLO licensing guide at the following website: **http://www.hpe.com/info/ilo/docs**.

- One iLO license is required for each server on which the product is installed and used. Licenses are not transferable.

- You cannot license a nonblade server by using a BladeSystem license.

- If you lose a license key, follow the lost license key instructions. For more information, see "Lost license key recovery" (page 50).

- A free iLO evaluation license key is available for download from the following website: **http://www.hpe.com/info/tryilo**. For more information, see the iLO licensing guide.

Using the iLO Federation Group Configuration feature

For information about using the features on the **iLO Federation→Group Configuration** page, see "Adding iLO Federation group memberships (multiple iLO systems)" (page 12).

4 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: **http://www.hpe.com/support/iLO4**.

GET_FEDERATION_MULTICAST

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>
```

GET_FEDERATION_MULTICAST parameters

None

GET_FEDERATION_MULTICAST runtime errors

None

GET_FEDERATION_MULTICAST 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'
     />
<GET_FEDERATION_MULTICAST>
    <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

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.

SET_FEDERATION_MULTICAST 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

Some possible SET_FEDERATION_MULTICAST error messages include the following:

- `The MULTICAST_ANNOUNCEMENT_INTERVAL VALUE is invalid.`

- `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

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>
```

GET_FEDERATION_ALL_GROUPS parameters

None

GET_FEDERATION_ALL_GROUPS runtime errors

None

GET_FEDERATION_ALL_GROUPS 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)

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>
```

GET_FEDERATION_ALL_GROUPS_INFO parameters

None.

GET_FEDERATION_ALL_GROUPS_INFO runtime errors

None

GET_FEDERATION_ALL_GROUPS_INFO return 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>
```

GET_FEDERATION_GROUP 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

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

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 associated 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.

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>
```

ADD_FEDERATION_GROUP 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.

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

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.`

- `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>
```

MOD_FEDERATION_GROUP 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.

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

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

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>
```

DELETE_FEDERATION_GROUP 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

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.`

5 Using iLO Federation with other HPE utilities

Using the iLO Federation features in HP SUM

You can use HP SUM to inventory and deploy software to the members of an iLO Federation group. Communication with the group members is facilitated by a node in the group that is called the interface iLO. This node is available with iLO 4 firmware version 1.40 and later.

ⓘ **IMPORTANT:** Do not add an iLO as an individual node if you are going to use it as part of an iLO Federation group.

When you log in to HP SUM, it automatically searches for iLO Federation groups on your connected networks. HP SUM searches each group and displays the nodes that respond to the search. Use the **Edit scalable update group** screen to enter the IP address and user credentials for one node in the iLO Federation group that HP SUM uses as the interface for inventory and deployment to the nodes in the group.

After you inventory a group, HP SUM displays information about the group, including a description, server types, number of servers, and installed firmware versions. HP SUM displays the PMC, CPLD, System ROM, and iLO firmware. HP SUM can deploy System ROM, iLO firmware, PMC firmware, and CPLD firmware to iLO Federation group nodes through the iLO maintenance network.

The HP SUM iLO Federation feature relies on proper configuration of iLO Federation groups before you launch HP SUM. Multiple iLO Federation groups with the same name or fragmented iLO Federation groups will result in HP SUM only working with a portion of the expected systems.

Disabling the automatic network search functionality:

You can change the `auto_multicast_discovery` parameter in the `hpsum.ini` file. For more information about changing the `hpsum.ini` file, see the HP SUM user guide.

NOTE: If you disable automatic updates, you can still scan for iLO Federation groups. Click the **Rescan** button on the **iLO Federated Update** screen.

Adding an iLO Federation group manually

When you start HP SUM, it discovers iLO Federation groups. Local iLO Federation groups and groups within the network scope of the host running HP SUM are discovered automatically. iLO Federation groups that are not discovered automatically due to the network configuration or firewalls can be added manually by specifying the IP address, group name, and credentials.

1. From the main menu, select **iLO Federated Update**.
2. From the **iLO Federated Update** screen, click **Add Group**.
3. Enter the **iLO Federation group name**.
4. Enter the **iLO Federation group description**.
5. Click **Add**.

Re-scanning for iLO Federation groups

When you open the **iLO Federated Update** screen, HP SUM automatically scans the network for iLO Federation groups. You can force HP SUM to re-scan the network to automatically search for iLO Federation groups.

1. From the main menu, select **iLO Federated Update**.
2. From the **iLO Federated Update** screen, click **Rescan**.

Editing an iLO Federation group

1. From the main menu, select **iLO Federated Update**.

2. From the **iLO Federated Update** screen, select **Actions→Edit**.
3. You can change the following items for the selected iLO Federation group:

   • **iLO Federation group description**

   • **Username** and **Password** credentials

   • **Baseline** and **Additional Packages** to apply

4. To save the changes, click **OK**.

Performing inventory on an iLO Federation group

If an iLO Federation group does not have an assigned baseline, you can perform inventory on the group. Use this feature if you are deploying updates in offline mode. If you perform an inventory with no assigned baseline, HP SUM does not generate the Deploy preview, Failed Dependency details, or Combined reports.

1. From the main menu, select **iLO Federated Update**.
2. From the **iLO Federated Update** screen, select an iLO Federation group, and then select **Actions→Inventory**.
3. In **Interface iLO**, select **Enter an iLO manually by IP or DNS** or **Select from discovered list of member iLO IPs**.

   If the group or the interface iLO are no longer on the network, HP SUM displays a status message indicating that the group or interface iLO is not available.

ⓘ **IMPORTANT:** Do not select an interface iLO that has been added as an individual node.

4. Do one of the following:

   • If you selected **Select from discovered list of member iLO IPs**, select an iLO IP address.

   • If you selected **Enter an iLO manually by IP or DNS**, enter the iLO IP or DNS address of the iLO you want to use.

5. In the **Credentials** section, enter the **Username** and **Password** for the interface iLO.
6. In the **Baseline to Apply** section, select a **Baseline** or **Additional Package** from the Baseline Library.

   If you assigned a baseline or additional package by editing the group or performing inventory on the group, those values are entered automatically.

   NOTE: Optional if you are deploying updates to the iLO Federation group in offline mode.

7. Click **Inventory**.

NOTE: If you are deploying updates to an iLO Federation group in offline mode, you cannot use the ISO file that includes updates to perform the inventory on the iLO Federation group. Unpack the ISO file on a drive, add it as a baseline, and then use it to perform the inventory.

Viewing iLO Federation group firmware versions

1. From the main menu, select **iLO Federated Update**.
2. Select an iLO Federation group.
3. If the group has not been inventoried, start the inventory process.

4. In the **Inventoried firmware versions of the group** section, select one of the following firmware types:

- iLO
- BIOS
- PMC
- CPLD

For each firmware type, HP SUM shows the firmware type, firmware version, and the number of systems using each firmware version.

More information

Performing inventory on an iLO Federation group

Viewing iLO Federation group members

1. From the main menu, select **iLO Federated Update**.
2. Select an iLO Federation group.
3. If the group has not been inventoried, start the inventory process.

   The **Servers** section lists the server models in the group and the total number of each server model.

iLO 4 firmware version 2.10 and later supports both IPv4 and IPv6 addresses. If you have an iLO system configured with IPv4 and IPv6, HP SUM displays that node twice in the iLO Federation group. This display issue has no impact on deployments to the affected node.

More information

Performing inventory on an iLO Federation group

Deploying software to an iLO Federation group (online)

1. From the main menu, select **iLO Federated Update**.
2. From the **iLO Federated Update** screen, select **Actions→Online Review/Deploy**.

   NOTE: Disable TPM if you have it installed on your iLO Federation group. TPM might cause issues with online deployment.

3. Select the **Installation Options**.

   NOTE: If you choose to downgrade or rewrite components, you must specify which components to downgrade or rewrite: **Firmware**, **Software**, or both.

4. In the **Filters** section, select the servers you want to update. HP SUM displays components for all nodes.
5. Optional: In the **Baseline Library** section, select the baseline to use.
6. In the **Baseline Library** section, select the components you want to deploy. If you make changes to the default selections, click **Analysis**.
7. Click **Deploy**.

If HP SUM loses connection with the interface iLO during deployment, HP SUM prompts you for the credentials for an interface iLO.

Deploying software to an iLO Federation group (offline)

Use the **Offline Review/Deploy** action to mount an ISO image to all members of an iLO Federation group, reset the nodes to boot from the ISO image, and perform an offline update.

1. From the main menu, select **iLO Federated Update**.

2. From the **iLO Federated Update** screen, select **Actions→Offline Review/Deploy**.

    HP SUM displays the **iLO Federation group name** and **Interface iLO**.
3. Select **Use ISO on a user specified HTTP server**.
4. In the **ISO Image** box, enter the URL of an ISO image that is available via HTTP on the network.

    NOTE: Select the source ISO that contains the baseline you used to inventory the iLO Federation group.

5. Click **Validate**.

    HP SUM confirms that the path is valid.
6. In the **Filters** section, select the servers you want HP SUM to power off and deploy components.
7. Click **Power off and Deploy**.

If the ISO image does not mount, HP SUM displays an error message.

Generating reports

HP SUM generates the same reports for iLO Federation groups as it does for regular nodes. For more information about generating reports, see the HP SUM user guide.

NOTE: iLO Federation reports contain aggregate details for versions and updates only, not details for each server in the group.

Deleting an iLO Federation group

•   From the **iLO Federated Update** screen, select an iLO Federation group, and then select **Actions→Delete**.

6 Troubleshooting

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

Try the following:

- 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 recently changed the network routes, subnet mask, IP address, or HTTP port for an iLO peer, verify that the iLO 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.

More information

Viewing the iLO Federation Multi-System Map
A 502 error is displayed on the iLO Multi-System Map page
A timeout error is displayed on the iLO Multi-System Map page
A 403 error is displayed on the iLO Multi-System Map page
Configuring Enclosure iLO Federation Support
iLO Federation network requirements

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

Try one of the following:

- 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.

More information

Configuring Enclosure iLO Federation Support
iLO Federation network requirements

A 502 error is displayed on the iLO Multi-System Map page

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.

A 403 error is displayed on the iLO Multi-System Map page

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

Try the following:

- 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 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.

- 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.

More information

Configuring Enclosure iLO Federation Support
iLO Federation network requirements

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

If the network is configured to use IPv4 only, verify that the **iLO Client Applications use IPv6 first** check box is not selected on the **Network→iLO Dedicated Network Port→IPv6** page.

HP SUM offline deploy fails to start on all selected servers

Symptom

An HP SUM Offline Review/Deploy action on an iLO Federation group might not start on all of the selected servers if the management network cannot process the request.

Action

Try the following:

- Try the offline deploy request with a smaller group of servers.

  When working with multiple servers in an enclosure, Hewlett Packard Enterprise recommends limiting the group of servers to a maximum of 8.

- Try the offline deploy request with a custom ISO that includes only the updates that apply to your environment.

7 Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

  www.hpe.com/assistance

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

  www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)

- Product name, model or version, and serial number

- Operating system name and version

- Firmware version

- Error messages

- Product-specific reports and logs

- Add-on products or components

- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

- To download product updates, go to either of the following:

  ○ Hewlett Packard Enterprise Support Center **Get connected with updates** page:

    www.hpe.com/support/e-updates

  ○ Software Depot website:

    www.hpe.com/support/softwaredepot

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

  www.hpe.com/support/AccessToSupportMaterials

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

Lost license key recovery

If an iLO license key is lost, send a replacement request and your proof of purchase to one of the following email addresses:

- Americas: **licensing.ams@hpe.com**

- Europe, Middle East, and Africa: **licensing.emea@hpe.com**

- Asia-Pacific and Japan: **licensing.apj@hpe.com**

Websites

Website	Link
iLO 4	**http://www.hpe.com/info/ilo/docs**
HP SUM	**http://www.hpe.com/info/hpsum/documentation**
SPP	**http://www.hpe.com/info/spp/documentation**
Onboard Administrator	**http://www.hpe.com/support/oa/docs**
iLO RESTful API and RESTful Interface Tool	**http://www.hpe.com/info/restfulinterface/docs**
ProLiant Gen8 servers	**http://www.hpe.com/info/proliantgen8/docs**
ProLiant Gen9 servers	**http://www.hpe.com/support/proliantgen9/docs**
Synergy servers	**http://www.hpe.com/info/synergy-docs**

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

www.hpe.com/support/selfrepair

Remote support

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

For more information and device support details, go to the following website:

www.hpe.com/info/insightremotesupport/docs

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (**docsfeedback@hpe.com**). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.

Glossary

ACPI	Advanced Configuration and Power Interface.
BIOS	Basic Input/Output System.
cookie	A small, unscriptable text file placed on your hard drive by a website to preserve specific settings. When you return to the site, your system opens the cookie with the previously saved settings so they can be passed along to the site. Cookies are also used to store session data temporarily.
CPLD	Complex programmable logic device. A generic term for an integrated circuit that can be programmed in a laboratory to perform complex functions.
HP SUM	HP Smart Update Manager.
HPQLOCFG	HPE Lights-Out Configuration Utility
iLO	Integrated Lights-Out.
ISO	International Organization for Standardization.
MLD	Multicast Listener Discovery.
NVMe	Non-Volatile Memory Express.
OA	Onboard Administrator.
PIM	Protocol-Independent Multicast.
RIBCL	Remote Insight Board Command Language.
SAID	Service Agreement Identifier.
SSDP	Simple Service Discovery Protocol.
TPM	Trusted Platform Module.
UDP	User Datagram Protocol.
UID	Unit identification.
UPnP	Universal Plug and Play.
UUID	Universally unique identifier.

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