HP Operations Orchestration

for the Windows and Linux operating systems

Software Version: 9.00.06

HP Integrated Lights Out (iLO) Integration Guide

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Contents

1 Introduction

This section includes the following topics:

- Purpose of the iLO Integration
- Supported Versions
- Downloading OO Releases and Documents on HP Live Network

Purpose of the iLO Integration

With this integration, administrators can build HP Operations Orchestration (OO) flows that are integrated into Integrated Lights Out (iLO) management processors for HP Proliant Servers.

This document explains how this integration has been implemented and how the operations included communicate between OO and iLO.

Supported Versions

Table 1 Supported Versions

Operations Orchestration Version	Proliant iLO Version	Proliant iLO 2 Version	Proliant iLO 3 Version
9.00.06	1.94 or greater	1.60 or greater	1.20 or greater

Downloading OO Releases and Documents on HP Live Network

HP Live Network provides an **Operations Orchestration Community** page where you can find and download supported releases of OO and associated documents.

To download OO releases and documents, visit the following site:

https://www.www2.hp.com/

This site requires that you register for an HP Passport and sign-in. To register for an HP Passport ID, go to:

http://h20229.www2.hp.com/passport-registration.html

Or click the **New users - please register** link on the HP Passport login page.

On the **HP Live Network** page, click **Operations Orchestration Community**.

The Operations Orchestration Community page contains links to announcements, discussions, downloads, documentation, help, and support.

2 Getting Started with the iLO Integration

This section includes the following topics:

- iLO – OO Architecture
- iLO Use Cases

iLO — OO Integration Architecture
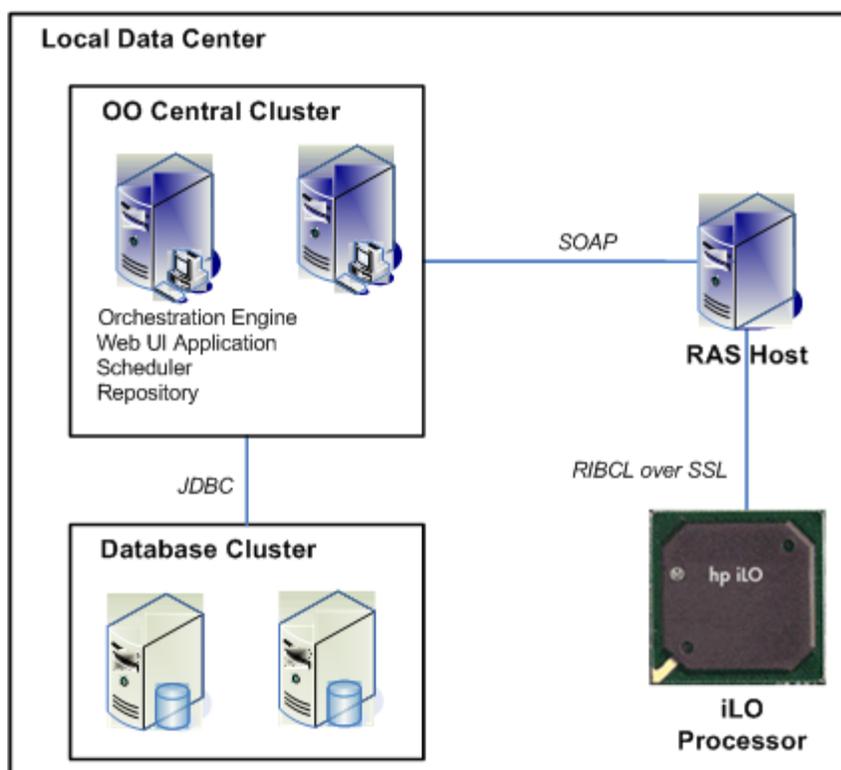
Figure 1 - HP Proliant iLO Architecture

iLO Use Cases

Following are the major use cases for the iLO integration, and the operations and flows that you can use to implement them.

1   Samples to show how to use the **Execute RIBCL** operation:

— Activate iLO License

— Deactivate iLO License

— Get Auto Power On

— Get iLO Firmware Version

— Set Unit ID Light State

2   Manipulate iLO user accounts from a flow:

— Create User

— Delete User

— Modify User

3   Manipulate the physical system's power state:

— Host Power Status

— Power On Host

— Get Power Cap Values

— Restart Host

— Restart iLO Processor

— Set Auto Power On

— Set Power Saver Mode

  Enables you to set low power, dynamic power, high power, and OS controlled power on supported hardware.

— Set Power Cap

4 Manipulate iLO virtual media:

— Insert Virtual Media

— Eject virtual media

5 Manipulate host data:

— Get Host Data

6 Run RIBCL script:

— Execute RIBCL Script

3 Using the iLO – OO Integration

This section includes the following topics:

- Location of iLO Integration Operations and Flows in OO Studio
- Common Inputs in the Integration
- Descriptions of iLO Integration Operations and Flows

Location of iLO Integration Operations and Flows in OO Studio

The HP Proliant iLO integration includes the following operations and flows in the OO Studio Library/Integrations/Hewlett-Packard/Proliant iLO/ folder.

The operations and flows apply to the original iLO version, iLO 2, and iLO 3 unless otherwise noted.
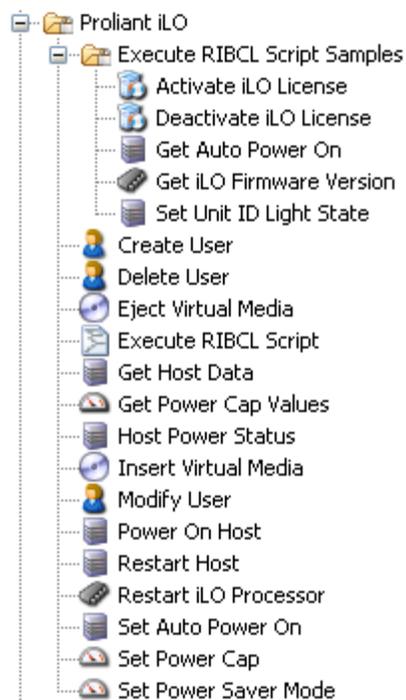
Figure 2 – Location of iLO Integration Operations and Flows

Common Inputs in the Integration

The following inputs are used consistently throughout the integration's operations and flows.

host
The hostname or IP address that is assigned to the target iLO processor.

username
The login name for the user account that has privileges on the target iLO processor.

password
The password for the iLO user account.

port
The SSL port to connect to on the target iLO processor. This is the same SSL port that is used for the iLO Web interface. The default is **443**.

Descriptions of iLO Integration Operations and Flows

This section describes the HP Proliant iLO integration's operations and flows, including any operation- and flow-specific inputs.

Execute RIBCL Script Samples

The following sample flows are examples of how to use the **Execute RIBCL Script** operation.

Activate iLO License

The **Activate iLO License** flow applies a license key to enable iLO advanced features using the **Execute RIBCL Script** operation.

Inputs

All of the flow's inputs except the following are described in *Common Inputs in the Integration*.

licenseKey
The license key to apply to the iLO processor.

Results

The flow returns the following results:

returnResult
The task or operation result.

Deactivate iLO License

The **Deactivate iLO License** flow deactivates iLO advanced features on a Proliant iLO processor using the **Execute RIBCL Script** operation.

Inputs

All of the flow's inputs are described in *Common Inputs in the Integration*.

Results

The flow returns the following results:

returnResult
The task or operation result.

Get Auto Power On

The **Get Auto Power On** flow retrieves the current auto power on (APO) setting for the host via a Proliant iLO processor using the **Execute RIBCL Script** operation.

Inputs

All of the flow's inputs are described in *Common Inputs in the Integration*.

Results

The flow returns the following results:

autoPowerOn

The current auto power on setting for the host.

Get iLO Firmware Version

The **Get iLO Firmware Version** flow retrieves the current running firmware version of a Proliant iLO processor using the **Execute RIBCL Script** operation.

Inputs

All of the flow's inputs are described in *Common Inputs in the Integration*.

Results

The flow returns the following results:

firmwareVersion

The running firmware version of a Proliant iLO processor.

managementProcessor

The management processor style (for example, iLO).

Set Unit ID Light State

The **Set Unit ID Light State** flow sets the Unit ID (UID) light state on a Proliant iLO processor using the **Execute RIBCL Script** operation.

Inputs

All of the flow's inputs except the following are described in *Common Inputs in the Integration*.

uidState

Specifies whether to turn the UID light on. The valid values are **Yes** and **No**.

Results

The flow returns the following results:

returnResult

The task or operation result.

Create User

The **Create User** operation creates a new user on a Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

userFullName

The full name (real name) of the new user.

userLogin

The login name of the new user.

userPassword

The password for the new user login.

adminPrivilages

Specifies whether to allow the new user to administer user accounts. The valid values are **Yes** and **No** (the default is **No**).

remoteConsolePrivilages

Specifies whether to allow the new user to access the remote console. The valid values are **Yes** and **No** (the default is **No**).

resetServerPrivilages (optional)

Specifies whether to allow the new user to switch server power and reset the server. The valid values are **Yes** and **No** (the default is **No**).

virtualMediaPrivilages (optional)

Specifies whether to allow the new user to access virtual media. The valid values are **Yes** and **No** (the default is **No**).

configureIloPrivilages (optional)

Specifies whether to allow the new user to configure other iLO settings (such as global settings and networking). The valid values are **Yes** and **No** (the default is **No**).

Results

The operation returns the following results:

returnResult

The task or operation result.

Delete User

The **Delete User** operation deletes an existing user on a Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

userLogin

The login name of the user to delete.

Results

The operation returns the following results:

returnResult

The task or operation result.

Eject Virtual Media

The **Eject Virtual Media** operation ejects the virtual media for the selected virtual media device on a Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

device

The virtual media device to eject. The valid values are **CDROM** and **FLOPPY**.

Results

The operation returns the following results:

returnResult

The task or operation result.

Execute RIBCL Script

The **Execute RIBCL Script** operation executes an RIBCL script on a Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

ribclScript

The XML of the script to execute without the **RIBCL** or **LOGIN** elements. This operation wraps the script with the **RIBCL** and **LOGIN** elements based on the username and password inputs.

Results

The operation returns the following results:

returnResult

The RIBCL script result if the operation fails.

rawResponse

The raw XML response from the Proliant iLO processor.

▶ RIBCL is XML scripting for iLO processors. For more information about RIBCL scripting, read the *HP Integrated Lights-Out Management Processor Scripting and Command Line Resource Guide* available here:

http://bizsupport1.austin.hp.com/bc/docs/support/SupportManual/c00294268/c00294 268.pdf

Sample scripts can be found here:

ftp://ftp.hp.com/pub/softlib2/software1/pubsw-windows/p1507541202/v60710/windows-LOsamplescripts3.00.0-2.zip

Get Host Data

The **Get Host Data** operation gets host data about the Proliant server from the Proliant iLO processor.

Inputs

All of the operation's inputs are described in *Common Inputs in the Integration*.

Results

The operation returns the following results:

returnResult

The task or operation result.

biosDate

The date of the running BIOS image.

biosFamily

The BIOS family for the host.

productName

The descriptive model name of the host.

embedNIC1MAC

The MAC address of the first embedded NIC.

embedNIC2MAC

The MAC address of the second embedded NIC.

iloNICMAC

The MAC address of the iLO NIC.

serialNumber

The serial number of the host.

uuid

The UUID of the host.

Get Power Cap Values

The **Get Power Cap Values** operation gets the minimum and maximum values of the power supply for a Proliant iLO 2 managed host and the current power cap value for iLO 2 and iLO 3 hosts. Note that the minimum and maximum values of the power supply are not available for iLO 3.

Inputs

All of the operation's inputs are described in *Common Inputs in the Integration*.

Results

The operation returns the following results:

returnResult

The operation result.

maxWatts

The maximum power cap value (iLO 2 only).

minWatts

The minimum power cap value (iLO 2 only).

currentPowerCap

The current power cap value.

Host Power Status

The **Host Power Status** operation retrieves the host power state using Proliant.

Inputs

All of the operation's inputs are described in *Common Inputs in the Integration*.

Results

The operation returns the following results:

returnResult

The task or operation result.

Insert Virtual Media

The **Insert Virtual Media** operation inserts and configures the mount behavior of virtual media images on a Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

url

The HTTP URL of the virtual media image.

Examples:

- **http://hostname/image.iso**

- **http://username:password@hostname:port/image.bin**

device

The virtual media device to use. The valid values are **CDROM** and **FLOPPY**. Use **FLOPPY** for USB key drive images.

virtualMediaBootOption

Specifies how virtual media behaves during the boot phase of the server. The following options are available:

- **CONNECT** – The virtual media is connected immediately and stays connected through subsequent server boot cycles (this is the default).

- **BOOT_ALWAYS** – The virtual media device is connected on the next and subsequent server boot cycles.

- **BOOT_ONCE** – The virtual media device is connected on the next server boot cycle and disconnected on subsequent boot cycles.

virtualMediaWriteProtect

Specifies whether to Write-protect the virtual media. This is only applicable to a **FLOPPY** device. The valid values are **Yes** and **No** (the default is **Yes**).

Results

The operation returns the following results:

returnResult

The task or operation result.

Modify User

The **Modify User** operation modifies an existing user on a Proliant iLO processor. Optional parameters that are left empty are not modified for the target user.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

userLogin

The login name of the user to modify.

userFullName

The new full name (real name) of the user.

userPassword

The new password for the user.

adminPrivilages

Specifies whether to allow the user to administer user accounts. The valid values are **Yes** and **No**.

remoteConsolePrivilages

Specifies whether to allow the user access to the remote console. The valid values are **Yes** and **No**.

resetServerPrivilages

Specifies whether to allow the user to switch server power and reset the server. The valid values are **Yes** and **No**.

virtualMediaPrivilages

Specifies whether to allow the user access to virtual media. The valid values are **Yes** and **No**.

configureIloPrivilages

Specifies whether to allow the user to configure other iLO settings (such as global settings, and networking). The valid values are **Yes** and **No**.

Results

The operation returns the following results:

returnResult

The task or operation result.

Power On Host

The **Power On Host** operation switches the host power on or off via a Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

hostPower

The desired power state for the host. The valid values are **Yes** (on) and **No** (off). If the power is on and hostPower is no, an ACPI signal is initiated to start a graceful shutdown of the operating system (the same as momentary press of the power button).

force

Specifies whether to force the power state change by using the virtual power press and hold method. The valid values are **Yes** and **No (t**he default value is **No**).

Results

The operation returns the following results:

returnResult

The task or operation result.

Restart Host

The **Restart Host** operation performs a warm boot of the server if it is currently on via the Proliant iLO processor.

Inputs

All of the flow's inputs are described in *Common Inputs in the Integration*.

Results

The operation returns the following results:

returnResult

The task or operation result.

Restart iLO Processor

The **Restart iLO Processor** operation restarts the Proliant iLO processor.

Inputs

All of the flow's inputs are described in *Common Inputs in the Integration*.

Results

The operation returns the following results:

returnResult

The task or operation result.

Set Auto Power On

The **Set Auto Power On** operation sets automatic power on and power on delay settings for the host via a Proliant iLO processor. This configures whether or not the host automatically powers on when power has been restored after a power outage. This can be configured with a variable delay for hosts with iLO 2.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

autoPowerOn

The desired auto power on setting. Possible values include:

- **yes** – Enables automatic power on with a minimum delay.
- **no** – Disables automatic power on.
- **15** – Enables automatic power on with a 15-second delay.
- **30** – Enables automatic power on with a 40-second delay.
- **45** – Enables automatic power on with a 45-second delay.
- **60** – Enables automatic power on with a 60-second delay.
- **random** – Enables automatic power on with a random delay of up to 60 seconds

The original iLO firmware only supports **yes** and **no** values.

Results

The operation returns the following results:

returnResult

The task or operation result.

Set Power Cap

The **Set Power Cap** operation sets the power cap for the hosts via the Proliant iLO 2 or iLO 3 processor. Use the **Get Power Cap Values** operation to determine a valid range for the watts input for this operation in iLO 2. For iLO 3, the value is submitted to the iLO processor without validation. iLO 3 returns an invalid error message if the value is out of range or is not acceptable.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

watts

The desired power cap value. The valid values are numeric. Use zero (**0**) to disable the power cap.

Results

The operation returns the following results:

returnResult

The task or operation result.

Set Power Saver Mode

The **Set Power Saver Mode** operation sets the power saver mode for the host via the Proliant iLO processor.

Inputs

All of the operation's inputs except the following are described in *Common Inputs in the Integration*.

powerSaverMode

The desired power saver mode. The valid values are:

- **1** – Operating system control mode (disables the power saver).
- **2** – HP static low power mode.
- **3** – HP dynamic power savings mode.
- **4** – HP static high performance mode (not valid for the original iLO processor).

Results

The operation returns the following results:

returnResult

The task or operation result.

4 Troubleshooting

This section includes the following topics:

- Troubleshooting Overview
- General Troubleshooting Procedures and Tools
- Error Messages

Troubleshooting Overview

This section provides troubleshooting procedures and tools that you can use to solve problems you may encounter while using this integration. It also includes a list of the error messages you may receive while using the integration and offers descriptions and possible fixes for the errors.

General Troubleshooting Procedures and Tools

The best troubleshooting tools are the iLO Web interface and the iLO online configuration utility (HPONCFG). This integration uses the same protocol and scripting language as the HPONCFG utility.

Error Messages

Failed to Connect

Could not establish a connection to the iLO system with the provided host name.

Invalid Login

The specified iLO username and/or password are incorrect.

This feature requires an installed license key

Virtual media and power cap features are enabled with the Proliant iLO Advanced Pack.

An invalid Virtual Media option has been given

The only valid options are **CDROM** and **FLOPPY**.

Unsupported Feature

The feature requested is not supported for the specified system. Different generations of HP Proliant systems have different power saving capabilities.

The Value specified is invalid.

The submitted value for the **Set Power Cap** operation is not acceptable or is out of range. .

5 Security

This section includes the following topic:

- About iLO Security

About iLO Security

HP Proliant iLO and iLO 2 are accessed via the RIBCL XML Scripting interface over SSL. HP Proliant iLO 3 is accessed via the RIBCL XML Scripting interface over HTTP/1.1 using SSL. The SSL server certificates on the iLO processor are not verified. This is the same method used by the HPONCFG utility that is included with the Proliant Support Pack.

6 OO Tools

This section includes the following topic:

- OO Tools You Can Use with the iLO Integration

OO Tools You Can Use with the iLO Integration

Following are OO tools that you can use with the iLO integration:

- **RSFlowInvoke.exe and JRSFlowInvoke.jar**

  RSFlowInvoke (RSFlowInvoke.exe or the Java version, JRSFlowInvoke.jar) is a command-line utility that allows you to start a flow without using Central (although the Central service must be running). RSFlowInvoke is useful when you want to start a flow from an external system, such as a monitoring application that can use a command line to start a flow.

- **Web Services Wizard (wswizard.exe)**

  When you run the Web Services Wizard, you provide it with the WSDL for a given Web service. The WSDL string you provide as a pointer can be a file's location and name or a URL. The Web Services Wizard displays a list of the methods in the API of the Web service that you specify. When you run the wizard, pick the methods you want to use, and with one click for each method you have selected, the wizard creates an HP OO operation that can execute the method. This allows you to use the Web Services Wizard to create operations from your monitoring tool's API.

These tools are available in the Operations Orchestration home folder in /Studio/tools/.