

HP Operations Orchestration Software

Software Version: 9.00

HP Server Automation Integration Guide

Document Release Date: June 2010

Software Release Date: June 2010



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For information on open-source and third-party software acknowledgements, see in the documentation set for this release, Open-Source and Third-Party Software Acknowledgements (3rdPartyOpenNotices.pdf).

On the Web: Finding OO support and documentation

There are two Web sites where you can find support and documentation, including updates to OO Help systems, guides, and tutorials:

- The OO Support site
- BSA Essentials Network

Support

Documentation enhancements are a continual project at Hewlett-Packard Software. You can obtain or update the HP OO documentation set and tutorials at any time from the HP Software Product Manuals Web site. You will need an HP Passport to log in to the Web site.

To obtain HP OO documentation and tutorials

1. Go to the HP Software Product Manuals Web site (<http://support.openview.hp.com/selfsolve/manuals>).
2. Log in with your HP Passport user name and password.

OR

If you do not have an HP Passport, click **New users – please register** to create an HP Passport, then return to this page and log in.

If you need help getting an HP Passport, see your HP OO contact.

3. In the **Product** list box, scroll down to and select **Operations Orchestration**.
4. In the **Product Version** list, click the version of the manuals that you're interested in.
5. In the **Operating System** list, click the relevant operating system.
6. Click the **Search** button.
7. In the **Results** list, click the link for the file that you want.

BSA Essentials Network

For support information, including patches, troubleshooting aids, support contract management, product manuals and more, visit the following site: <http://www.hp.com/go/bsaessentialsnetwork>

This is the **BSA Essentials Network** Web page. To sign in:

1. Click **Login Now**.
2. On the **HP Passport sign-in** page, enter your HP Passport user ID and password and then click **Sign-in**.
3. If you do not already have an HP Passport account, do the following:
 - a. On the **HP Passport sign-in** page, click **New user registration**.
 - b. On the **HP Passport new user registration** page, enter the required information and then click **Continue**.
 - c. On the confirmation page that opens, check your information and then click **Register**.
 - d. On the **Terms of Service** page, read the Terms of use and legal restrictions, select the **Agree** button, and then click **Submit**.
4. On the **BSA Essentials Network** page, click **Operations Orchestration Community**.

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

Note: Contact your OO contact if you have any difficulties with this process.

In OO: How to find Help, PDFs, and tutorials

The HP Operations Orchestration software (HP OO) documentation set is made up of the following:

- Help for Central

Central Help provides information to the following:

- Finding and running flows
- For HP OO administrators, configuring the functioning of HP OO
- Generating and viewing the information available from the outcomes of flow runs

The Central Help system is also available as a PDF document in the HP OO home directory, in the \Central\docs subdirectory.

- Help for Studio

Studio Help instructs flow authors at varying levels of programming ability.

The Studio Help system is also available as a PDF document in the HP OO home directory, in the \Studio\docs subdirectory.

- Animated tutorials for Central and Studio

HP OO tutorials can each be completed in less than half an hour and provide basic instruction on the following:

- In Central, finding, running, and viewing information from flows
- In Studio, modifying flows

The tutorials are available in the Central and Studio subdirectories of the HP OO home directory.

- Self-documentation for operations and flows in the Accelerator Packs and ITIL folders

Self-documentation is available in the descriptions of the operations and steps that are included in the flows.

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Overview

This integration allows administrators to build HP Operations Orchestration (OO) flows that are integrated with HP Server Automation (SA).

This document explains the integration's implementation and how to use the operations of the integration to provision, patch, update software and perform audits on servers, as well as other tasks.

Please note that in the OO integration and documents, the abbreviations SA and SAS both refer to HP Server Automation.

The SA operations are found in the Central repository in the /Library/Integrations/Hewlett-Packard/Server Automation/ folder.

Use cases and scenarios

Integrating SA and OO makes it possible to use many features of SAS in higher-level processes, including the following supported SAS use cases:

1. OS provisioning, including "bare-metal" provisioning
2. Administering SA-managed servers:
 - Managing patch levels and patch policies
 - Managing software updates and software policies
 - Patch and software compliance scans
 - Remediating servers
 - Managing device groups
3. Reporting:
 - Compliance reports
 - Audit reports
4. Virtualization:
 - Creating virtual machines

Flows and operations

OO operations for SA are provided in the following OO groups:

- **Audits**
Operations that allow you to retrieve information about Audit Tasks and Audit Results.
- **Custom Attributes**
Operations that allow you to attach custom attributes to various SA objects.
- **Custom Fields**
Operations that allow you to attach custom fields to various SA objects.
- **Customers**
Operations that allow you to retrieve information about customers in the SAS system.

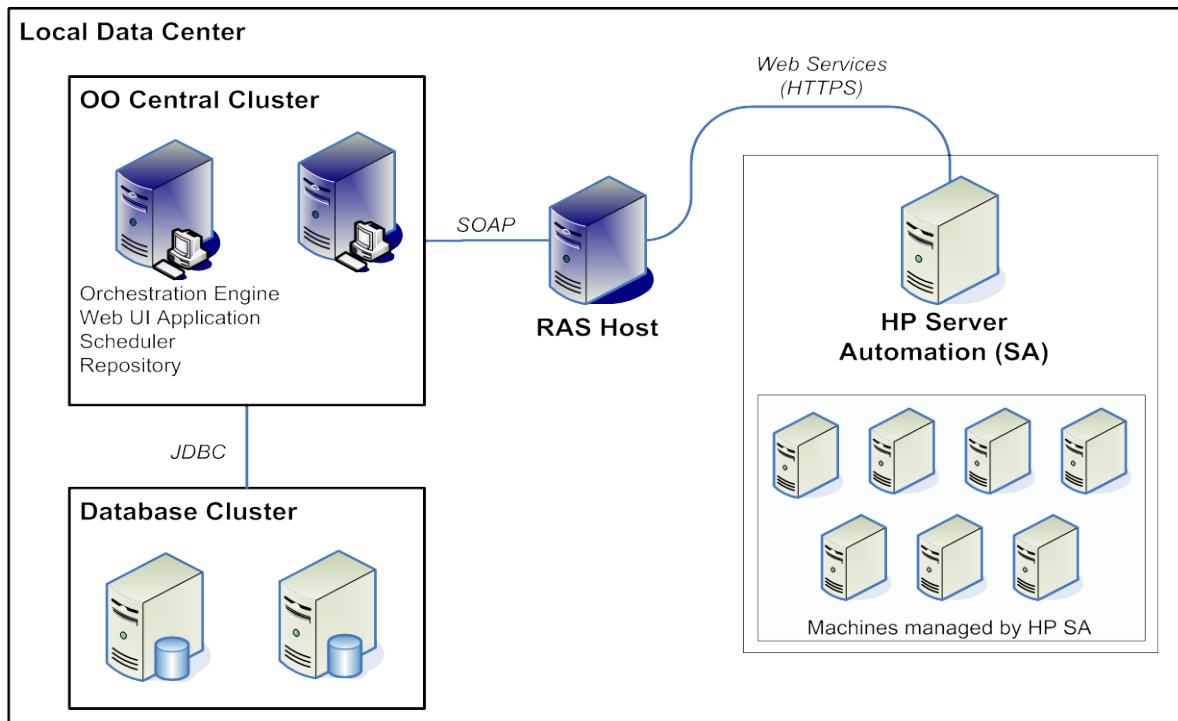
- **Device Groups**
Operations that allow you to create, modify, and remove device groups.
- **Folders**
Operations that allow you to create, delete, and retrieve information about folders in the SAS file system.
- **Jobs**
Operations related to SA jobs that are run asynchronously (such as audits and scans).
- **OS Sequences**
Operations that allow you to retrieve and start OS sequences.
- **Patch Policies**
Operations that allow you to create and delete patch policies, and attach them to and detach them from servers, and to perform compliance scans.
- **Patches**
Operations for retrieving information about installing, uninstalling, and policy overrides for patches.
- **Platforms**
Operations that allow you to retrieve information about platforms.
- **Scripts**
Operations that allow you to retrieve information about existing scripts, and run them.
- **Servers**
Operations that allow you to retrieve information about or from devices such as SA-managed servers and remediating servers.
- **Software Policies**
Operations that allow you to create, modify, and destroy software policies, attach them to and detach them from servers, and to perform compliance scans.
- **Units**
Operations that allow you to retrieve information about unit objects.
- **Virtualization**
Operations that allow you to create virtual machines on a Hypervisor.

The sample flows in the OO Library/Integrations/Hewlett-Packard/Server Automation/Samples/ folder perform some of the most common tasks that need to be automated in SA, such as remediating servers, installing patches, and creating virtual machines. Each of these sample flows has a description that describes in detail what it does.

Versions

Operations Orchestration version	HP Server Automation (SA) versions
9.00	6.x , 7.0, & 7.5

Architecture



Installation and configuration instructions

The HP SA integration with OO does not require any special installation. The only information you need to know is the URL, username, and password to connect to SA. If the port and protocol for the connection have been changed from their defaults, retrieve that information from your SA administrator. You also need to know the version of SA to which you are connecting.

Operation specifics

The SA integration operations support multiple versions of SAS (unless otherwise specified in the **Description** tab of an operation). The **coreVersion** input in each SA integration operation allows you to choose the SAS version from the **SAS Version** selection list, and then passes the selected SAS version to the OO operation. If the version you require is not provided in the selection list, OO will use the latest supported version by default.

Some operations are run asynchronously, returning information about the SA jobs they represent. Often users will have to query these jobs to see if they are completed or wait for them to complete. Certain operations may also need approval, in which case a job can only continue after it has been approved.

Operations related to OS provisioning, virtualization and other functions may need certain preparation or setup using the SA user interface or other SA tools.

Troubleshooting

General troubleshooting procedures

When troubleshooting issues related to the SA integration occur, there are several steps that you can take:

1. Verify that the same operation works when it is performed through the SA user interface with the given parameters.
2. Verify that your connection parameters and the selected **coreVersion** input for the operation are correct.
3. If you have access to the twister Web interface of SA, you can run the underlying API call to see if it runs successfully. Twister provides a user interface for executing the API calls. The OO operations use similar API calls. Contact your SA administrator to find out where the twister Web interface is located (on default installations of SA, twister is located at: [https://\\${coreHost}:1032/twister/docs/index.html](https://${coreHost}:1032/twister/docs/index.html)).
4. The exact Web services that are used by the OO integration are exposed by SA (osapi). This allows you to run the exact service calls that are run by the operations provided by OO. SA does not provide an interface to execute these services, so use the OO Web Services Wizard (wswizard.exe) or a third party tool. You can contact your SA administrator to find out where the osapi is located (on default installations the osapi is located at: [https://\\${coreHost}/osapi/com/opsware/folder/FolderService](https://${coreHost}/osapi/com/opsware/folder/FolderService)).

Customizing the integration

You can add new operations to your SA integration in the following ways:

- By creating operations using the OO Web Services Wizard (wswizard.exe) with the exact Web services that are used by the OO integration that are exposed by SA (osapi). You can use wswizard.exe to create operations against any of the exposed Web service calls. The wswizard.exe is located in the %OO_home%/Studio/tools/ folder. Many operations created in this way exist in the current OO integration in the Library/Integrations/Hewlett-Packard/Server Automation/ folder. Contact your SA administrator to find out where the osapi is located (on default installations the osapi is located at: [https://\\${coreHost}/osapi/com/opsware/folder/FolderService](https://${coreHost}/osapi/com/opsware/folder/FolderService)).
- By running OCLI commands against SA via an SSH operation. SA has a command-line interface tool that allows you to run remote calls via SSH. Refer to the SA documentation for more information about the OCLI interface and commands. Many operations created using the OCLI exist in the Library/Integrations/Hewlett-Packard/Server Automation/ folder.

Launching flows

Using the various REST-based services, you can use the following URL syntaxes to interact with HP OO Central:

Note: Synchronous flow execution means that Central does not return a result until the flow run is complete. In asynchronous flow execution, the flow result is returned immediately after the flow is launched.

- To retrieve a list of flows from Central:
`https://<ooserver>:<port>/PAS/services/http/list`
where
`<ooserver>` is the machine on which Central is installed.
`<port>` is the port that was specified for the HTTPS (HTTP over Secure Sockets Layer [SSL]) protocol when Central was installed.
- To synchronously execute a flow identified by name and location in the Library or Central repository:
`https://<ooserver>:<port>/PAS/services/http/execute/<library_path>`
where
`<ooserver>` is the machine on which Central is installed.
`<port>` is the port that was specified for the HTTPS (HTTP over SSL) protocol when Central was installed.
`<library_path>` is the location of the flow within the Central repository, including the name of the flow.
- To synchronously execute a flow by universally unique ID (UUID):
`https://<ooserver>:<port>/PAS/services/http/execute/<flow_UUID>`
where
`<ooserver>` is the machine on which Central is installed.
`<port>` is the port that was specified for the HTTPS (HTTP over SSL) protocol when Central was installed.
`<flow_UUID>` is the universally unique ID of the flow within the Central repository.
- To asynchronously execute a flow by name:
`https://<ooserver>:<port>/PAS/services/http/execute_async/<library_path>`
where
`<ooserver>` is the machine on which Central is installed.
`<port>` is the port that was specified for the HTTPS (HTTP over SSL) protocol when Central was installed.
`<library_path>` is the location of the flow within the Central repository, including the name of the flow.
- To execute a flow by UUID (returns immediately after the flow is launched):
`https://<ooserver>:<port>/PAS/services/http/execute_async/<flow_UUID>`
where
`<ooserver>` is the machine on which Central is installed.

`<port>` is the port that was specified for the HTTPS (HTTP over SSL) protocol when Central was installed.

`<flow_UUID>` is the universally unique ID of the flow within the Central repository.

Security

Passwords and inputs sent between SA and OO are encrypted if the HTTPS protocol is used. If not, information passing between OO and SA may not be encrypted.

SA provides many out-of-the-box security features to manage users, groups, and overall security.

Tools

RSFlowInvoke.exe and JRSFlowInvoke.jar

These are command-line tools with which flows can be started from outside the OO Central Web application. These tools are available in the %OO_home%/Studio/tools/ folder. See the *HP OO Software Development Kit Guide* (SDKGuide.pdf) for more information on these tools.

wswizard.exe

This is the OO Web Services Wizard used to create operations from an arbitrary set of Web services. This tool is located in the %OO_home%/Studio/tools/ folder.