

# **HP Operations Orchestration**

For the Windows and Linux operating systems

Software Version: CP14 (9.x)

## **Application Lifecycle Management Integration Guide**

Document Release Date: May 2014

Software Release Date: May 2014



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# Introduction

This chapter includes:

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## Purpose of the Application Lifecycle Management (ALM) Integration

This integration enables administrators to create HP Operations Orchestration (OO) flows that are integrated with ALM. To learn how to create OO flows, see Studio Guide to Authoring Operations Orchestration Flows in the documentation set for the current OO release.

OO integrates with HP Application Lifecycle Management through the ALM REST API. The API is accessed through the OO HTTP Client operations, by executing HTTP GET, PUT, POST, and DELETE methods according to the specifications in the HP ALM REST API Reference document.

For more information related to the API used, see the HP ALM REST API Reference document in Application Lifecycle Management located in **Help > Documentation Library > API References > HP ALM REST API Reference**.

## Audience

This guide is intended for system administrators who establish and maintain the implementation of integration between HP OO and HP ALM. This guide assumes that you have administrative access to both systems.

## Prerequisites

To use this integration successfully, you should have basic knowledge of Application Lifecycle Management, the ALM REST API used by the integration, and the HTTP Client operations.

## Supported Versions

Operations Orchestration Version	Application Lifecycle Management
OO Content Pack 14	Application Lifecycle Management 11.00, 11.50, 11.52

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# Getting Started

This chapter includes:

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## What You Need to Know Before Using the Integration

Application Lifecycle Management is a highly configurable product, that can be customized to meet specific usability needs. Due to this, the OO-ALM Integration consists of a series of flows that are also adaptable, to address the specific configuration of your ALM project. The out of the box flows can further be authored by this integration's users, by adding additional inputs and extending the collection of fields with those that are needed in a specific environment.

The integration enables performing various operations on ALM entities. Examples of entities are a defect, a test run, a test instance, a folder, a requirement and so on. Each entity is represented in ALM as an XML string, that is compliant to the Entity Schema described in the ALM documentation.

A collection of fields is defined in ALM for each entity type, and there may be specific aspects to some fields. For example, the **defect** entity has a required field that is labeled **Summary** by default, and a field that only accepts values from a specific list labeled **Severity**. A field associated to a given entity type can be identified either by the `<name>` used internally in ALM, or by the `<label>` displayed on the left side of each field in the ALM user interface. The labels can be configured by an ALM administrator, while the names cannot be changed.

In the previous example, the same field is referred by both `<name>`, and by **summary**, where `<name>` is the field's name, and **summary** is the label. In the OO-ALM Integration, you can use choose whether to identify an entity's fields through labels, by setting the **useLabels** value to **true**, or through names.

**Note:** When using the labels, the general performance is decreased, since this requires additional processing for translating the labels to internal names.

To specify specific field values for a given entity, you may add additional inputs either at step level, or at flow level (when you wish to have a template used in all steps based on the specific flow). The extra inputs must comply to the following naming convention, otherwise they will be ignored:

- When **useLabels** is set to **false**, or is left unassigned and it is the default value in the flow, then the name of the input must be the exact internal name of the ALM field. For example, you may

add an input named `creation-time` to specify the defect's field internally named **creation-time** and labeled **Detected on Date** by default in ALM.

- When **useLabels** is set to **true**, or is left unassigned and it is the default value in the flow, then the input's name must be obtained by eliminating the spaces in the ALM field's label, and converting it to camel case. For example, you may add an input named `detectedOnDate` to specify the defect's field internally named **creation-time** and labeled **Detected on Date** by default in ALM.

Before using any of the ALM Integration flows for performing operations on entities, you must authenticate by obtaining a Lightweight SSO Token (LWSSO Token). This can be accomplished by running the **/Library/Integrations/Hewlett-Packard/Application Lifecycle Management/Basic/Session Management/Get Lightweight SSO Token** flow, which retrieves a value for the token input that is required by all the other flows in this integration

We recommend authoring your flows to use a single token for several requests, instead of performing multiple authentications inside the same flow.

In addition, explicit session management is enabled through the **/Library/Integrations/Hewlett-Packard/Application Lifecycle Management/Basic/Session Management/Create Session**, **/Library/Integrations/Hewlett-Packard/Application Lifecycle Management/Basic/Session Management/Extend Session** and **/Library/Integrations/Hewlett-Packard/Application Lifecycle Management/Basic/Session Management/Close Session** flows.

Another important aspect of this integration is that the current implementation does not offer a mapping between entity id and its name, the entity identification being based only on the entity id.

## ALM Use Cases

The following are the major use cases for the ALM integration, and the operations and flows that you can use to implement them.

1. Basic:
  - Entity Management
    - Check In Entity
    - Check Out Entity
    - Create Entity
    - Delete Entity
    - Describe Entity Fields
    - Get Entity Fields
    - Get Entity Lists

- Get Entity Versions
- Lock Entity
- Query Entities Collection
- Read Entity
- Undo Entity Checkout
- Unlock Entity
- Update Entity
- Session Management
  - Close Session
  - Create Session
  - Extend Session
  - Get Lightweight SSO Token
- ALM REST Delete
- ALM REST Get
- ALM REST Post
- ALM REST Put

2. Defects:

- Create Defect
- Create Defect Link
- Delete Defect
- Delete Defect Link
- Query Defects
- Read Defect
- Read Defect Links
- Update Defect
- Update Defect Link

3. Entities:

- Create Entity
- Delete Entity
- Import Entities from Excel
- Query Entities
- Read Entity
- Update Entity

4. Requirements:

- Create Requirement
- Import Requirements from Excel

5. Test Lab:

- Runs
  - Create Run
  - Delete Run
  - Read Run
  - Update Run
- Test Instances
  - Add Test Instance to Test Set
  - Delete Test Instance from Test Set
  - Update Test Instance
- Test Sets
  - Create Test Set
  - Create Test Set Folder
  - Delete Test Set Folder
  - Query Test Sets

- Read Test Set
- Read Test Set Folder
- Update Test Set
- Update Test Set Folder

6. Test Plan:

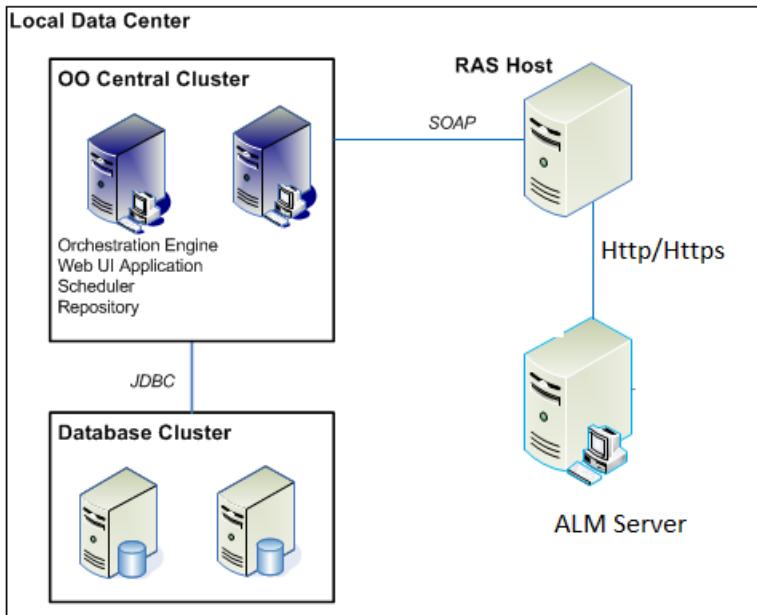
- Create Test
- Create Test Configuration
- Create Test Folder
- Delete Test
- Delete Test Configuration
- Delete Test Folder
- Import Tests from Excel
- Query Test Folders
- Query Tests
- Read Test
- Read Test Configuration
- Read Test Folder
- Update Test
- Update Test Configuration
- Update Test Folder

7. Utilities:

- Add to Name Value Lists
- Append Field Value To Fields List
- Create Defect Link Xml
- Create Entity Xml
- Create Entity Xml List

- Determine Content Type
- Encode Parameter
- Get Cookie Header
- Get Field Inputs
- Get Label By Name
- Get Name By Label
- Get Test Set Elements Number
- Get Used Session
- Process Defect Links Xml
- Process Entity Xml
- Process Search Response
- Select Http Client Error
- Translate Fields Clause
- Translate Restrictions

## HP ALM Architecture



## ALM Terminology

The following terms are used in the ALM Integration Guide.

**Entity.** An ALM entity is a complete functional unit of information. Entities are members of collections. Collections are presented by data in XML format that conforms to the [Entities Collection Schema](#). Examples of entity types are defect, requirement, test, run, and folder. An individual entity is identified by the collection it belongs to and its ID. For example, /tests/23/.

---

**Entity Schema.** The properties of an entity are presented by data in XML format that conforms to the [Entity Schema](#).

---

**Light Weight Single Sign On.** To receive services from the ALM Platform, an application must pass an LW-SSO (Light Weight Single Sign On) cookie in the request header. This cookie is returned from the server after the user is authenticated. This LW-SSO token is self-contained. By default, the token times out after one hour of inactivity.

---

**Session.** After authentication, an application can either use the default ALM Platform [sessions](#) or manage sessions explicitly.

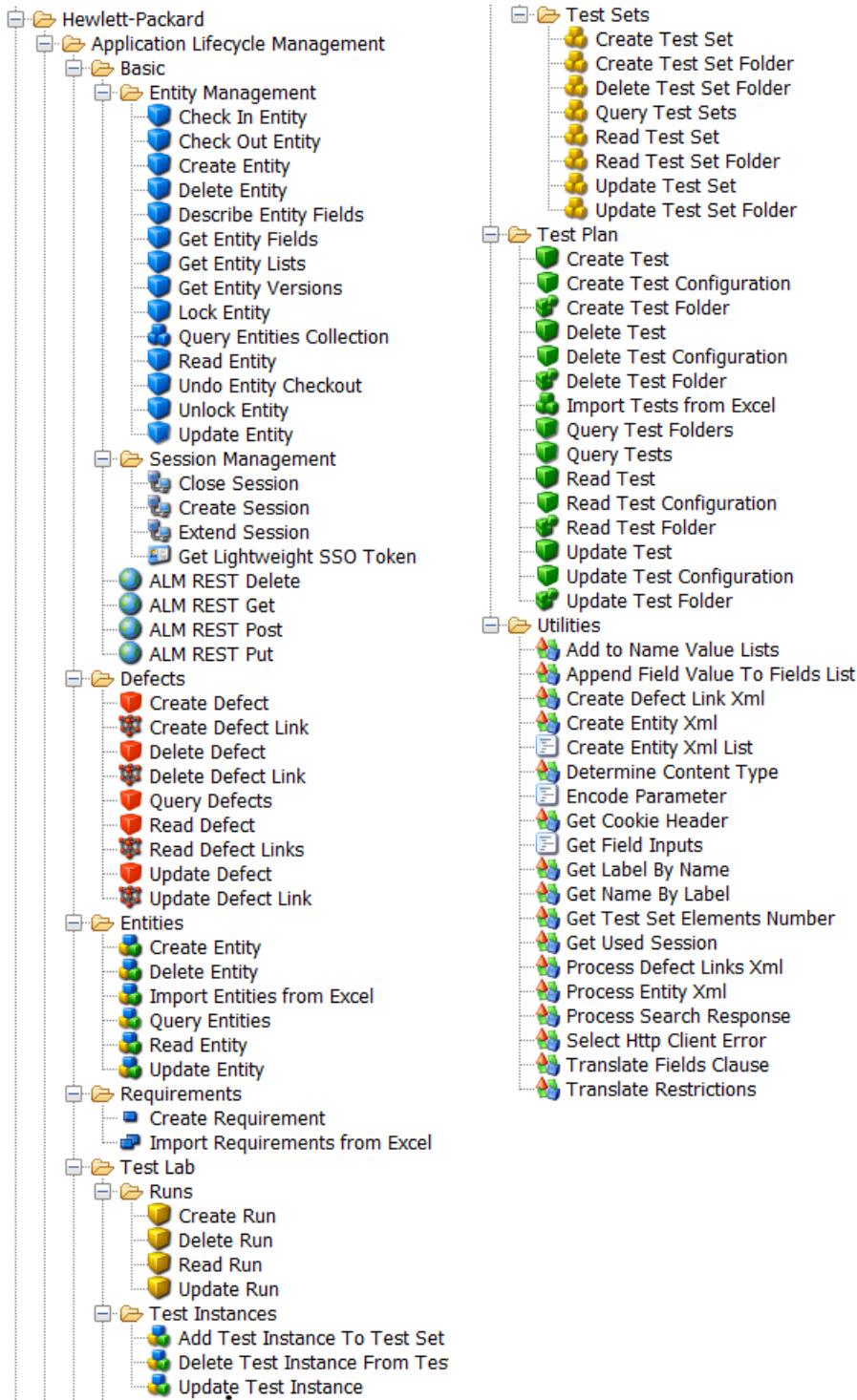
## ALM Interfaces You May Need to Access

When using the ALM - OO integration, you may need to access the following ALM interface:

**ALM REST API** — The ALM REST API enables the interaction with the ALM Platform. A client application based on the API can create, read, update, and delete entities. Without any coding, browsers can also be used as clients to read information from ALM.

## Location of ALM Integration Operations and Flows in OO Studio

The ALM integration includes the following operations and flows in the **OO Studio Library/Integrations/Hewlett-Packard/Application Lifecycle Management** folder.



# Troubleshooting

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## 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

This section describes the troubleshooting procedures and tools you can use to fix problems that you may experience while using this integration.

The most common problems you may encounter are inadequately requesting ALM resources (for example, by omitting to previously authenticate, making a request to an invalid URL, and so on). To eliminate such causes for error, ensure that you do not experience the same behavior by making the request from a web browser.

For example, if the OO flow you are running returns a Failure Message such as:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?><QCRestException><Id>qcco  
re.general-error</Id><Title>Not Found</Title><StackTrace>javax.ws.rs.WebApplicat  
ionException
```

when trying to perform an entity read, try executing an HTTP GET from your browser to the following URL:

**PROTOCOL://<SERVER>:<PORT>/qcbin/rest/domains/<DOMAIN>/projects/<PROJECT>/<  
ENTITY\_COLLECTION>/<ENTITY\_ID>.**

If you receive the error code 404-Not Found, the resource you requested does not exist, and the behavior of the OO flow is as expected.

## Error Messages

This section lists the error messages you may receive while using this integration. Each error message includes possible causes and fixes for the error.

- ...An Authentication object was not found in the SecurityContext...

The flow failed to obtain a LW-SSO token for authentication prior to requesting a protected resource.

- ...Failed to authenticate user "user"...

The credentials specified when trying to obtain a LW-SSO token are invalid.

- Invalid Session Format

The provided session is not valid or it does not exist.

- <QCRestException><Id>qccore.general-error</Id><Title>Not Found</Title>...

The requested ALM resource does not exist.

## **How Security is Handled by the ALM Integration**

ALM 11.0 servers are accessed via REST over HTTP (or HTTPS, if enabled on the host). The user provides logon credentials for connecting to ALM, through the REST API, and will obtain a token that must further be used when executing requests. The username and password must be defined in the ALM system, and represent actual users of Application Lifecycle Management.

# OO Tools

Following are OO tools that you can use with the ALM 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/**.

