

HP Operations Orchestration

For the Windows and Linux operating systems

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Amazon Elastic Compute Cloud Integration Guide

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Chapter 1

Introduction

This chapter includes:

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Purpose of the Amazon Elastic Compute Cloud (EC2) Integration

This integration enables you to build HP Operations Orchestration (OO) flows that are integrated into the Amazon Elastic Compute Cloud (EC2).

The EC2 integration uses the EC2 Query API released on 2011-12-15 to integrate with OO. To use this integration successfully, you should have knowledge of the EC2 technology.

This document explains how this integration has been implemented and how the operations included communication between OO and EC2.

The Amazon EC2 operations provide support for the following regions: US East, US West, EU West, and Asia Pacific.

Amazon EC2 Supported Versions

Operations Orchestration Version	Amazon Elastic Compute Cloud Version
OO Content Pack 8	EC2 API 2011-12-15

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://hpln.hp.com/>

Note: This site requires that you register for an HP Passport and sign-in.

To register for an HP Passport ID:

1. Go to: <http://h20229.www2.hp.com/passport-registration.html>

Or

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4. In the **Operations Orchestration Content Packs** box, click **Content**. The HP Passport and sign-in page appears.
5. Enter your user ID and Password to access to continue.
6. Click **HP Operations Orchestration 9.00**.
7. Search for the required HP Operations Orchestration Content Pack.

Chapter 2

Getting Started with the Amazon EC2 Integration

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Installing and Configuring the Integration

To access the Amazon EC2 console, go to <http://aws.amazon.com/console/> and use your EC2 credentials to log on. Amazon has created specialized plug-ins for several browsers, such as Elasticfox for Firefox, that allow easy interaction with Amazon EC2.

For the Import Instance Operation in the **Virtual Machine Import** folder, you need to download and install the Amazon EC2 API Tools. They can be found at the following location:

http://docs.amazonwebservices.com/AWSEC2/latest/UserGuide/SettingUp_CommandLine.html. This Web site contains all the instructions necessary for the installation.

Amazon EC2 Use Cases

The following are the major use cases for the Amazon EC2 integration, and the operations and flows that you can use to implement them.

1. Enumerate availability zones and regions:
 - Enumerate Availability Zones
 - Enumerate Regions
2. Manage elastic block store:
 - Snapshots
 - Create Shared Snapshot
 - Delete Snapshot
 - Describe Snapshots
 - Get Snapshot Details
 - Modify Snapshot Attribute
 - Reset Snapshot Attribute

- Volumes
 - Attach Volume
 - Create Volume
 - Delete Volume
 - Describe Volume
 - Detach Volume
 - Get Volume Details
- 3. Work with elastic IPs:
 - Allocate New Elastic IP
 - Associate Elastic IP
 - Disassociate Elastic IP
 - Enumerate Elastic IPs
 - Release Elastic IP
- 4. Work with elastic network interfaces:
 - Attach Network Interface
 - Create Network Interface
 - Delete Network Interface
 - Describe Network Interface Attribute
 - Detach Network Interface
 - Enumerate Network Interfaces
 - Get Network Interface Details
 - Modify Network Interface Attribute
 - Reset Network Interface Attribute
- 5. Manage images:
 - Create Image
 - Enumerate Images
 - Modify Image Attribute
 - Get Image Details
 - Register Image
 - Remove Image
 - Reset Image Attribute
- 6. Manage instances:

- Describe Instances
 - Get Instance Details
 - Get Instance Status Details
 - Get System Log
 - Modify Instance Attribute
 - Monitor Instance
 - Reset Instance Attribute
 - Restart Instance
 - Run Instances
 - Run Instances From Template
 - Start Instance
 - Stop Instance
 - Terminate Instance
 - Unmonitor Instance
7. Manage key pairs:
- Allocate New Key Pair
 - Delete Key Pair
 - Enumerate Key Pairs
 - Import Key Pair
8. Work with cluster placement groups:
- Create Placement Group
 - Delete Placement Group
 - Describe Placement Groups
9. Manage security groups:
- Allow Access To Security Group
 - Create Security Group
 - Delete Security Group
 - Describe Security Group
 - Get Security Group Details
 - Revoke Access To Security Group
10. Manage spot instances:
- Cancel Spot Instance Requests
 - Create Spot Datafeed Subscription

- Delete Spot Datafeed Subscription
 - Describe Spot Datafeed Subscription
 - Describe Spot Instance Requests
 - Describe Spot Price History
 - Request Spot Instances
11. Import Windows 2008 R2 machines from VMware virtualization environments to Amazon:
- Check Import Status
 - Create Temp Dir
 - Export VM
 - Get Taskid by Description
 - Import Virtual Machine
 - Set Preconditions for Import VM
12. Manage and create conversion tasks:
- Cancel Conversion Task
 - Describe Conversion Task
 - Import Instance
 - Import Volume
13. Manage Windows bundle tasks:
- Bundle Windows Instance
 - Cancel Bundle Task
 - Enumerate Bundle Tasks
 - Get Bundle Task Details
14. Display the EC2 Dashboard information
- EC2 Dashboard

Other Use Cases

In the **Library\ Integrations\ Amazon\ EC2** folder you can find a number of sample flows that show you how to use some of the available operations:

- **Elastic Network Interfaces\ Samples\ Wait for Network Interface Status.** The flow waits until the given network interface reaches the requested status. It gets the network interface status and if it does not match the required one, it sleeps for the given number of seconds and then retries. If, after the given number of retries the network interface does not have the requested status, the flow fails.
- **Elastic Network Interfaces\ Samples\ Network Interface Lifecycle.** The flow first creates a network interface. It then launches a single instance that has two network interfaces: one is the previously created one and the second is a default one. The following steps wait until the

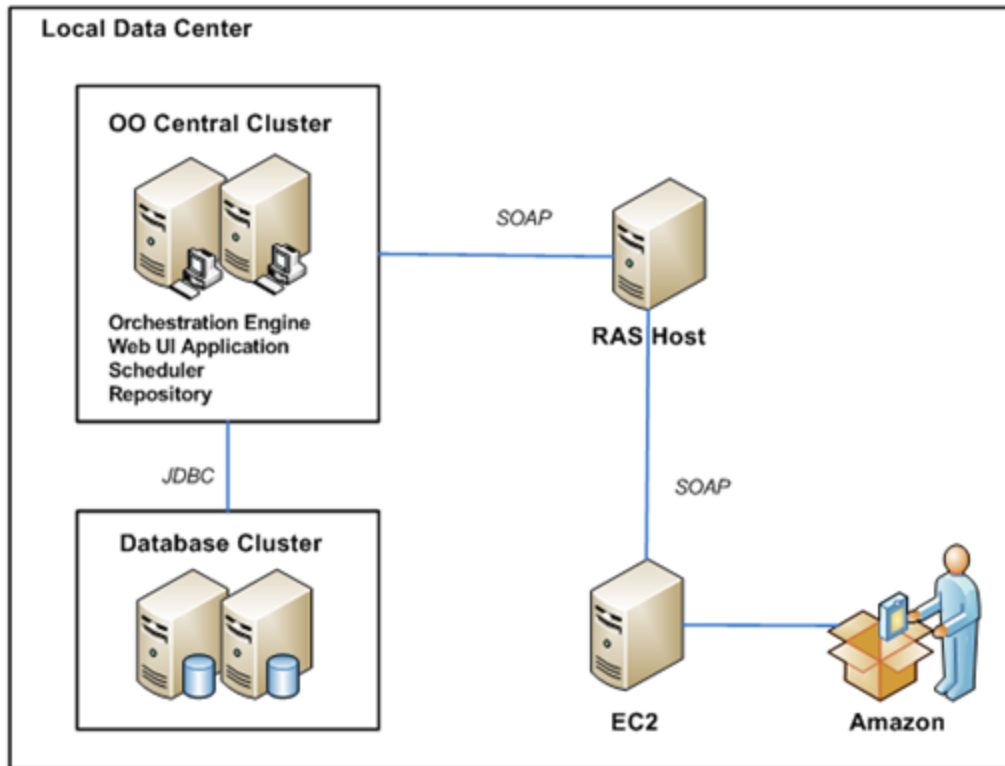
instance is launched and reaches the running state, get details about the network interface, detach it from the instance and wait until the network interface is detached. The two final steps clean the environment by deleting the network interface and the instance.

- **Instances\ Samples\ Describe Instances Status.** The flow demonstrates how to get a list of your instances' status. It takes an optional list of instance identifiers, uses **Describe Instances** in order to get the complete list of instance identifiers, iterates over the list, and retrieves the status of each instance.
- **Instances\ Samples\ Check Instance Status.** The sample flow validates whether the instance is already in the expected status or if it reaches that status in a given period of time.
- **Instances\ Samples\ Modify Instance Capacity.** This sample flow demonstrates how to modify the capacity of an instance. If the instance is in a 'running' state, the instance is stopped first so the update can be performed.
- **Virtual machine Import\ VMware Windows Import\ Import Virtual Machine.** This flow implements the whole process necessary to import a **Imports a Windows 2008 R2** virtual machine from VMware to the given Amazon account.

It starts by setting all the import preconditions on the virtual machine, which should be powered on. Afterwards, it exports this machine as OVF to obtain the .vmdk file used in the actual import operation. It launches the import task and in the end, it schedules a **Check Import Status** flow that deletes all the created files after the import tasks are completed.

As preconditions for this flow, you need to download and install the **Amazon EC2 API Tool**. We also recommend to use `localhost` for the `rasHost` where you have installed the EC2 Tools, and to take a snapshot of your virtual machine before running the operation. The snapshot is recommended because the flow modifies some registry values in order to obtain the following settings: enable Remote desktop, set Windows firewall to allows public RDP traffic, disables Autologon and disables automatic updates installation.

Amazon EC2 — OO Integration Architecture

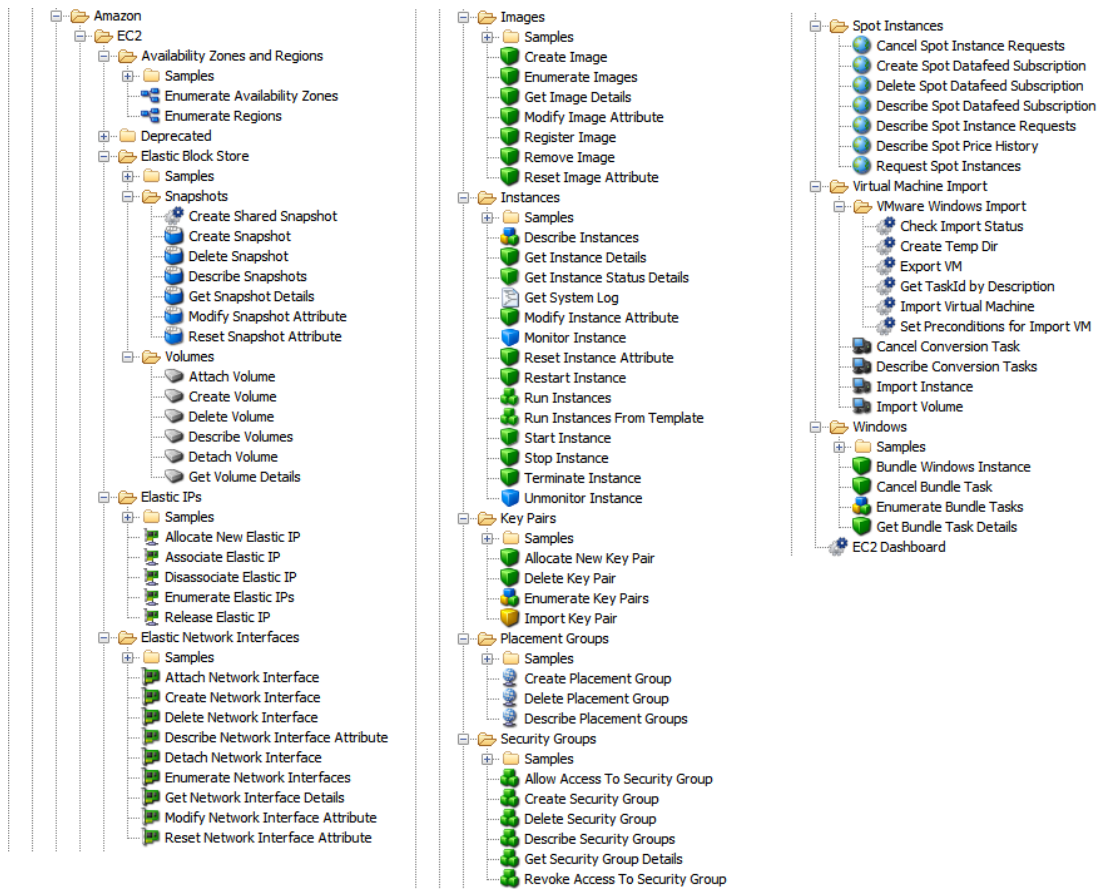


Location of Amazon EC2 Integration Operations and Flows in OO Studio

The EC2 integration includes the following operations in the **OO Studio Library/Integrations/Amazon/EC2/** folder.

Amazon Elastic Compute Cloud Integration Guide

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Chapter 3

Troubleshooting

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Troubleshooting Overview

This section provides troubleshooting procedures and tools 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

When troubleshooting issues related to the EC2 integration, verify that:

1. The same operation works when it is performed through the EC2 console using the same parameters.
2. Your access key and proxy parameters are correct.

Error Messages

This section lists the error messages you may receive while using this integration.

- `Attribute productCodes can not be reset currently.`
- `AWS was not able to validate the provided access credentials.`
- `Either both proxy port and proxy host must be null or none of them.`
- `Failed to open HTTP connection.`
- `fromPort was invalid. Must be numerical and between 0 and 65535.`
- `If attribute=productCodes, productCode must be set!`
- `Invalid attribute item value '### ' for UserGroup item type. Error code: InvalidAMIAttributeItemValue.`
- `Invalid attribute item value '###' for userId item type. Error code: InvalidAMIAttributeItemValue.`
- `Invalid attribute.`
- `Invalid bundle ids: ###. Error code: InvalidBundleID.NotFound.`
- `Invalid id: '###' (expecting "ami-..."). Error code: InvalidAMIID.Malformed.`

- Invalid id: '###' (expecting "i-..."). Error code: InvalidInstanceID.Malformed.
- Invalid manifest path: '###'. Error code: InvalidManifest.
- Invalid operationType.
- Invalid user id: '###'. Error code: InvalidUserID.Malformed.
- Must supply either only user/group pair permission inputs (SourceSecurityGroupName and SourceSecurityGroupOwnerId) or only CIDR IP permission inputs (IpProtocol, FromPort, ToPort, CidrIp).
- Not authorized for image: ###. Error code: AuthFailure.
- Possible values for input "force" are true or false.
- The address '###' does not belong to you. Error code: AuthFailure.
- The AMI ID '###' does not exist. Error code: InvalidAMIID.NotFound.
- The following input must be a valid integer: '###'.
- The given CIDR IP address is invalid. It must have the following format:
[0-255].[0-255].[0-255].[0-255]/[0-32].
- The given IP address is invalid. It must have the following format:
[0-255].[0-255].[0-255].[0-255].
- The given IpProtocol is invalid. Must be one of 'tcp', 'udp' or 'icmp'.
- The instance ID '###' does not exist. Error code: InvalidInstanceID.NotFound.
- The instance IDs '###' do not exist. Error code: InvalidInstanceID.NotFound.
- The keypair '###' already exists. Error code: InvalidKeyPair.Duplicate.
- The permission '###' has already been authorized on the specified group.
Error code: InvalidPermission.Duplicate.
- The request must contain the parameter KeyName. Error code: MissingParameter.
- The request signature we calculated does not match the signature you provided.
Check your AWS Secret Access Key and signing method. Consult the service documentation for details.
- The security group '###' already exists. Error code: InvalidGroup.Duplicate.
- The security group '###' does not exist. Error code:

`InvalidGroup.NotFound.`

- The security group '###' is reserved. Error code: `InvalidGroup.Reserved.`
- The snapshot '###' does not exist. Error code: `InvalidSnapshot.NotFound.`
- The volume '###' does not exist. Error code: `InvalidVolume.NotFound.`
- The volume size must be an integer between 1 and 1024 inclusive.
- The zone '###' does not exist. Error code: `InvalidZone.NotFound.`
- `toPort` was invalid. Must be numerical and between 0 and 65535.
- Value (###) for parameter instance is invalid. Expected: 'i-...'. Error code: `InvalidParameterValue.`
- Value ('###') for parameter snapshotId is invalid. Expected: 'snap-...'. Error code: `InvalidParameterValue.`
- Value (###) for parameter volumeId is invalid. Expected: 'vol-...'. Error code: `InvalidParameterValue.`
- The attachmentId cannot be assigned an empty string value when the `deleteOnTermination` is specified.
- The `deleteOnTermination` cannot be assigned an empty string value when the attachmentId is specified.
- The attribute name is invalid. Possible attribute values: `description`, `groupSet`, `sourceDestCheck`, `attachment`.
- Invalid value entered for `deleteOnTermination`.
- Invalid value entered for `sourceDestCheck`.
- Multiple attributes were specified for update. Please assign a value to only one of the following attributes: `termination behavior`, `security groups source/dest check`, `description`.
- No attribute was specified for update. Please assign a value to only one of the following attributes: `termination behavior`, `security groups`, `source/dest check`, `description`.
- There is no network interface with the given id.
- The value of the attribute input must not be empty.
- The given attribute input is invalid.

Chapter 4

Amazon EC2 Security

This section describes how security is handled by the Amazon EC2 integration.

The EC2 integration uses the EC2 Query API. To perform its task, each EC2 operation sends a query to Amazon. This query is sent over HTTPS and the Symphony Client library is used for sending the actual requests. Every EC2 operation has two inputs: **accessKey** and **accessKeyId**. These are provided by Amazon for every Amazon account.

According to Amazon, in addition to the name of the action and the list of parameters, you must include a signature in every Query request. The signature is created by using the **accessKey** provided by the user. The steps for creating a signature are described on the Amazon Web site at <http://docs.amazonwebservices.com/AWSEC2/2009-04-04/DeveloperGuide/index.html?using-query-api.html>, and are implemented by the operations.

The EC2 integration uses version 2 of the signature. For calculating an RFC 2104-compliant HMAC with the query string created by using the input parameters, the integration uses the secret Access Key as the key, and SHA1 as the hash algorithm. You should not perform any special configuration; just provide the **accessKey** and **accessKeyId**.

In addition to this, a new method of authentication (using temporary access credentials) is provided. Therefore, every EC2 operation has a new input **securityToken**. Security Token Service can be used to generate temporary access credentials for an IAM user, for another AWS-account, or for a federated user in order to enable access to AWS resources and services. These credentials consist of **accessKey**, **accessKeyId**, and **securityToken**. The signature used to sign the request is done as in the original authentication method and the **securityToken** input is added as a parameter in the query.

Chapter 5

OO Tools You Can Use with the Amazon Elastic Load Balancing Integration

Following are OO tools that you can use with the Amazon Elastic Load Balancing 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/**.