

# HP Operations Orchestration Software

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## *Amazon Elastic Compute Cloud Integration Guide*

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# 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
- HP Live 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.

## HP Live Network

For support information, including patches, troubleshooting aids, support contract management, product manuals and more, visit the following site: <https://www.www2.hp.com/>.

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  - 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**.
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4. 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.

**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.

# Table of Contents

Warranty .....	ii
Restricted Rights Legend .....	ii
Trademark Notices .....	ii
On the Web: Finding OO support and documentation .....	iii
Support .....	iii
HP Live Network .....	iii
In OO: How to find Help, PDFs, and tutorials .....	iv
Overview of Amazon Elastic Compute Cloud integration .....	1
Use cases and scenarios .....	1
Installation and configuration instructions .....	3
Versions .....	3
Architecture .....	3
EC2 integration operation and flow infrastructure .....	4
Common inputs in the integration .....	5
Operation and flow specifics .....	5
Availability zones and regions .....	6
Enumerate Availability Zones .....	6
Enumerate Regions .....	6
Elastic block store .....	8
Snapshots .....	8
Volumes .....	13

Elastic IPs .....	18
Allocate New Elastic IP .....	18
Associate Elastic IP .....	18
Disassociate Elastic IP .....	18
Enumerate Elastic IPs .....	19
Release Elastic IP .....	20
Images .....	20
Create Image .....	20
Enumerate Images.....	21
Get Image Details .....	23
Modify Image Attribute .....	24
Register Image .....	25
Remove Image .....	25
Reset Image Attribute .....	26
Instances.....	26
Describe Instances.....	26
Get Instance Details.....	28
Get System Log.....	30
Modify Instance Attribute .....	30
Monitor Instance .....	31
Reset Instance Attribute.....	32
Restart Instance.....	32
Run Instances .....	32
Run Instances From Template .....	35
Start Instance.....	36
Stop Instance .....	36
Terminate Instance.....	37
Unmonitor Instance.....	37
Key Pairs .....	38
Allocate New Key Pair.....	38
Delete Key Pair .....	38
Enumerate Key Pairs.....	39
Import Key Pair .....	40
Security groups.....	40
Allow Access To Security Group .....	40
Create Security Group .....	42
Delete Security Group .....	42
Describe Security Groups .....	43
Get Security Group Details .....	44
Revoke Access To Security Group.....	45
Spot Instances.....	47
Cancel Spot Instance Requests.....	47
Create Spot Datafeed Subscription .....	47
Delete Spot Datafeed Subscription .....	48
Describe Spot Datafeed Subscription .....	48

Describe Spot Instance Requests .....	49
Describe Spot Price History .....	51
Request Spot Instances .....	52
Windows .....	55
Bundle Windows Instance .....	55
Cancel Bundle Task .....	56
Enumerate Bundle Tasks .....	57
Get Bundle Task Details .....	58
EC2 Dashboard .....	59
Tags .....	59
Create Tags .....	59
Delete Tags .....	60
Enumerate Tags .....	61
<b>Troubleshooting .....</b>	<b>62</b>
General troubleshooting procedures and tools .....	62
Error messages .....	62
<b>Security .....</b>	<b>64</b>
<b>Tools .....</b>	<b>64</b>

# Overview of Amazon Elastic Compute Cloud integration

With this integration, you can 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 08/31/2010 to integrate with OO. To use this integration successfully, you should have knowledge of the EC2 technology.

This document will explain how this integration has been implemented and how the operations included communicate between OO and EC2.

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

## Use cases and scenarios

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
  - Create Snapshot
  - Delete Snapshot
  - Describe Snapshots
  - Get Snapshot Details
  - Modify Snapshot Attribute
  - Reset Snapshot Attribute
- Volumes
  - Attach Volume
  - Create Volume
  - Delete Volume
  - Describe Volumes
  - Detach Volume
  - Get Volumes Details

3. Work with elastic IPs:

- Allocate New Elastic IP
- Associate Elastic IP
- Disassociate Elastic IP
- Enumerate Elastic IPs
- Release Elastic IP

4. Manage images:

- Create Image
- Enumerate Images



- Get Image Details
  - Modify Image Attribute
  - Register Image
  - Remove Image
  - Reset Image Attribute
5. Manage instances:
- Describe Instances
  - Get Instance 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
6. Manage key pairs:
- Allocate New Key Pair
  - Delete Key Pair
  - Enumerate Key Pairs
  - Import Key Pair
7. Manage security groups:
- Allow Access To Security Group
  - Create Security Group
  - Delete Security Group
  - Describe Security Groups
  - Get Security Group Details
  - Revoke Access To Security Group
8. 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
9. Manage Windows bundle tasks:
- Bundle Windows Instance
  - Cancel Bundle Task
  - Enumerate Bundle Tasks
  - Get Bundle Task Details

10. Display the EC2 Dashboard information

- EC2 Dashboard

11. Manage tags:

- Create Tags
- Delete Tags
- Enumerate Tags

## Installation and configuration instructions

No special installation and configuration instructions are required for the Amazon EC2 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.

## Versions

Operations Orchestration Version	Amazon EC2 Version
9.00.05	EC2 API Version 2010-08-31

## Architecture

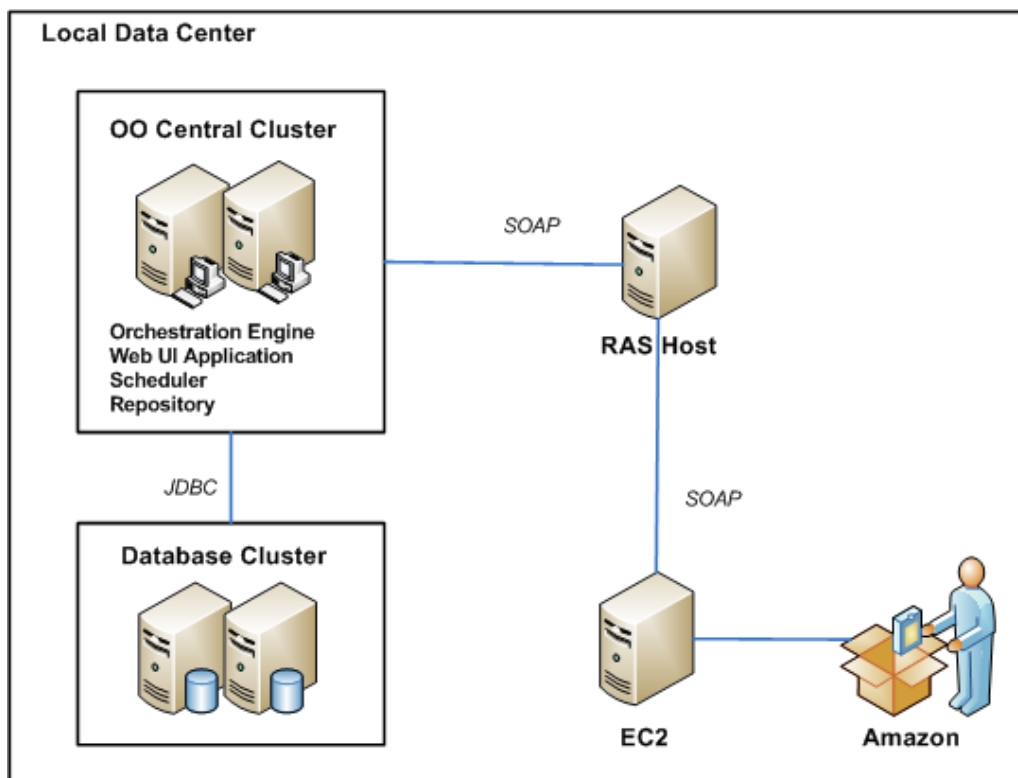


Figure 1 - Amazon EC2 architecture

# EC2 integration operation and flow infrastructure

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

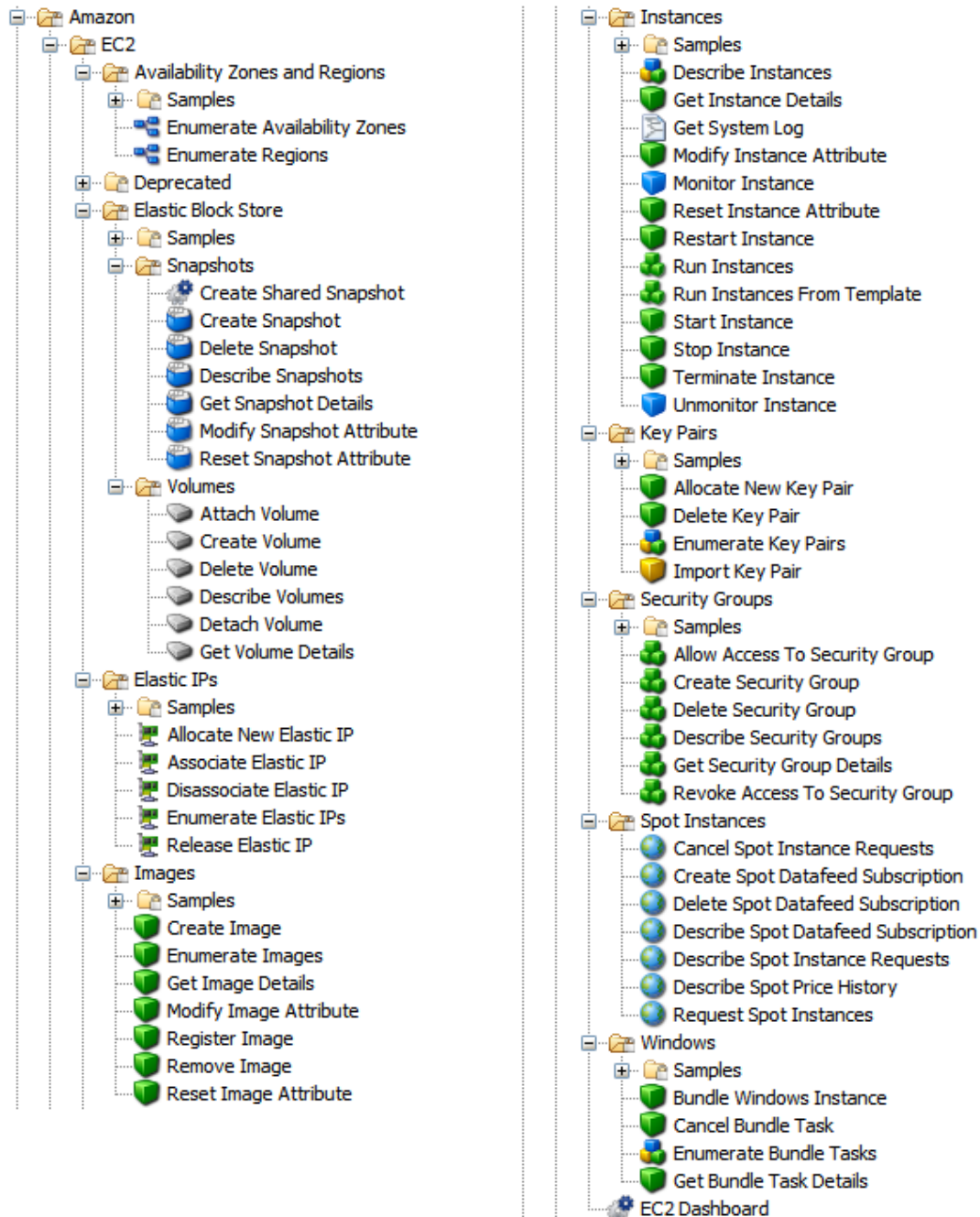


Figure 2 – Amazon EC2 integration operation and flow infrastructure

## Common inputs in the integration

OO flows and operations use inputs to specify how they obtain the data that they need and when the data is obtained. The following inputs are used consistently throughout the EC2 integration's operations and flows.

### **accessKeyId**

The ID of the access key that uniquely identifies the user account. This can be obtained from the Amazon console.

### **accessKey**

The secret access key that uniquely identifies the user. This can be obtained from the Amazon console.

### **proxyHost**

The proxy server used to connect to Amazon.

### **proxyPort**

The port to connect to the proxy server. You must specify a value for both the **proxyHost** and **proxyPort** inputs or leave both of them empty.

### **proxyUsername**

A username to use when connecting to the proxy if it requires authentication.

### **proxyPassword**

A password to use when connecting to the proxy if it requires authentication.

### **serviceEndpoint**

The endpoint to which the requests are sent. The default value is **ec2.amazonaws.com** which corresponds to the United States region (another equivalent endpoint for the United States is **ec2.us-east-1.amazonaws.com**). The default value for Europe is **ec2.eu-west-1.amazonaws.com**. (These values may change in the future).

## Operation and flow specifics

This section describes the Amazon EC2 integration's operations and flows, including any operation- or flow-specific inputs. The flows and operations are grouped by their basic functionality:

- Availability zones and regions
- Elastic block store—snapshots and volumes
- Elastic IPs
- Images
- Instances
- Key pairs
- Security groups
- Spot instances
- Windows bundle tasks
- EC2 Dashboard
- Tags

The sample flows in the OO Library/Integrations/Amazon/EC2/ folder perform some of the most common tasks that need to be automated when using EC2, such as starting instances, allocating

elastic IPs, and working with images. Each of these sample flows has a description that describes in detail what it does. You can use these flows as they are or as templates for new operations.

## Availability zones and regions

### Enumerate Availability Zones

The **Enumerate Availability Zones** operation retrieves a list of your Amazon EC2 availability zones.

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

#### **filterName1**

The first filter name for the operation. The valid values are **message**, **region-name**, **state**, and **zone-state**.

#### **filterValues1**

A first value or values list for the corresponding filter name.

#### **filterName[number]**

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

#### **filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

#### **delimiter**

The delimiter used for the results lists and the filter values list. The default is a comma (,).

The operation returns the following:

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **returnResult**

A delimiter-separated list of your availability zones.

#### **notAvailableZones**

A delimiter-separated list of availability zones which are not available for use, but are visible to you (this list usually has no elements).

#### **Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.
- Availability zones are not the same across accounts. The availability zone **us-east-1a** for account A is not necessarily the same as **us-east-1a** for account B.
- You can find more details about the filters that can be applied on this operation in the **DescribeAvailabilityZones** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.

### Enumerate Regions

The **Enumerate Regions** operation lists the regions that are currently available to you.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**rowDelimiter**

The delimiter to place between the rows of the results table. The default is the line separator character for the current operating system.

**colDelimiter**

The delimiter to be placed between the columns of the results table. The default is a comma (,).

**filterName1**

The first filter name for the operation. The valid values are **endpoint** and **region-name**.

**filterValues1**

A first value or values list for the corresponding filter name.

**filterName[number]**

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

**filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

**delimiter**

The delimiter used for the lists of volume IDs results and filter values. The default is a comma (,).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The available regions in a table having the following columns: **Region name** and **Region endpoint**.

**Example:**

```
eu-west-1,ec2.eu-west-1.amazonaws.com
us-east-1,ec2.us-east-1.amazonaws.com
```

**Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.
- You can find more details on the filters that can be applied on this operation in the **DescribeRegions** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.

## Elastic block store

### Snapshots

#### *Create Shared Snapshot*

The **Create Shared Snapshot** flow creates a snapshot of an EBS volume and makes the snapshot public or grants permission to it for a given user. The flow returns the ID of the generated snapshot. If you enter a value of **all** for the **groups** input, the snapshot is shared publicly. Otherwise, the snapshot is private and only the developers whose account numbers are supplied through the **userIds** input are granted access to it.

All of the flow's inputs except the following are described in [Common inputs in the integration](#).

##### **volumeId**

The ID of the volume from which the snapshot is generated.

##### **userIds**

A list of the users to whom you grant access. This list can only contain IDs, which must be numeric.

##### **groups**

A list of the groups to which you grant access (according to Amazon, currently the only supported value is **all**; other values may be supported in the future).

##### **delimiter**

The delimiter for the elements of the inputs that contain lists.

The flow returns the following:

##### **returnResult**

The ID of the generated snapshot.

**Note:** At least one of the **userIds** or **groups** inputs should not be empty.

#### *Create Snapshot*

The **Create Snapshot** operation creates a snapshot of an EBS volume and stores it in S3. It returns the ID of the generated snapshot.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

##### **volumeId**

The ID of the volume from which to generate the snapshot.

##### **snapshotDescription**

The description of the snapshot to create.

The operation returns the following:

##### **returnCode**

The ID of the generated snapshot.

##### **requestId**

The Amazon request ID.

##### **volumeId**

The ID of the volume from which the snapshot is generated.

**status**

The snapshot state.

**startTime**

The timestamp when the snapshot was initiated.

**progress**

The progress of the snapshot, in percentage.

**ownerId**

The ID of the snapshot's owner.

**volumeSize**

The size of the volume from which the snapshot is generated.

**description**

The description of the snapshot.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

### ***Delete Snapshot***

The **Delete Snapshot** operation deletes a snapshot of an Amazon EBS volume. It returns **true** on success and **false** on failure.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**snapshotId**

The ID of the snapshot to be deleted.

The operation returns the following:

**returnCode**

**true** on success and **false** on failure.

**requestId**

The Amazon request ID.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

### ***Describe Snapshots***

The **Describe Snapshots** operation describes the status of Amazon EBS snapshots. If you provide a list of snapshot IDs, only those snapshots are described. Otherwise, all of the existing snapshots are described.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**snapshotIds**

An optional list of snapshot IDs. If you provide this list, only these snapshots are described.

**filterName1**

The first filter name for the operation. The valid values are:

- **description**
- **owner-alias**
- **owner-id**
- **progress**



- **snapshot-id**
- **start-time**
- **status**
- **tag-key**
- **tag-value**
- **volume-id**
- **volume-size**
- **tag: <tag-name>** where *<tag-name>* is the name of a tag that a snapshot may have. See the notes below for an example of filtering the snapshot based on a specific tag/value combination.

#### **filterValues1**

A first value or values list for the corresponding filter name.

#### **filterName[number]**

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

#### **filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

#### **delimiter**

The delimiter to place between the elements of the **snapshotIds**, **snapshotOwners**, and **restorableBy** inputs. The default is a comma (,).

#### **rowDelimiter**

The delimiter to place between the rows of the output table. The default is the line separator of the current operating system.

#### **colDelimiter**

The delimiter to place between the columns of the output table. The default is a comma (,).

#### **snapshotOwners**

The owner of the snapshots to return. You can specify multiple owners using the delimiter value specified in the **delimiter** input. The valid values are **self**, **amazon**, and **AWS Account ID**.

#### **restorableBy**

A list of restorable users separated by the delimiter specified in the **delimiter** input. If you specify values for this input, only users who have create snapshot permissions for the snapshots are returned.

The operation returns the following:

#### **returnResult**

A table containing the following columns: the snapshot ID, the ID of the volume from which the snapshot was created, the volume size, the snapshot status (**pending**, **completed**, or **error**), the owner ID, the owner alias, description, the timestamp when the snapshot was initiated, and the progress of the snapshot creation process, in percentage. Each row in the table corresponds to a snapshot. If a column's result is empty, 'null' is returned instead.

#### **requestId**

The Amazon request ID.

## Notes:

- Like all Amazon EC2 operations, the results might not be visible instantly.
- To list the resources assigned tag Purpose=X or Purpose=Y specify:  
`filterName1=tag:Purpose`  
`filterValues1=X,Y`
- You can find more details on the filters that can be applied on this operation in the **DescribeSnapshots** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- If you assign a value of **start-time** to a filterName input, the timestamps supplied to the corresponding filterValues must have the local timezone and must use the format *yyyy/MM/dd HH:mm:ss*. In this case, you cannot use wildcards for filterValues.

## Get Snapshot Details

The **Get Snapshot Details** operation describes the status of an EBS snapshot.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **snapshotId**

The ID of the snapshot to be described.

### **delimiter**

The delimiter for the elements of the results that are lists.

The operation returns the following:

### **requestId**

The ID of the request sent to Amazon by using this operation.

### **returnResult**

The snapshot identifier.

### **snapshotId**

The snapshot identifier.

### **status**

The status of the snapshot (for example, **pending**, **completed**, or **error**).

### **volumeId**

The ID of the volume from which the snapshot was created.

### **startTime**

The timestamp when the snapshot was initiated.

### **progress**

The progress of the snapshot creation process, in percentage.

### **ownerId**

The AWS account ID of the user who owns the required snapshot.

### **ownerAlias**

The AWS account alias or AWS account ID that owns the AMI (for example, **amazon**, **redhat**, or **self**.)

### **description**

The description of the snapshot.

## tags

The tags assigned to the resource. Each tag is present in the format `tagKey=tagValue` in the returned list (for example, **Owner=DbAdmin,Stack=Production**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## *Modify Snapshot Attribute*

The **Modify Snapshot Attribute** operation modifies the (permissions) attribute of a snapshot. You can make your snapshots public or grant permission to them for a given user.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **snapshotId**

The ID of the snapshot you want to modify.

### **attribute**

The attribute to modify. Currently, the only attribute you can modify is **createVolumePermission**.

### **operationType**

The operation to perform on the attribute. The valid values are **add** and **remove**. You should specify this input only if the **attribute** input is set to **createVolumePermission**.

### **userIds**

A list of users you want to grant to or revoke access from. This list can only contain IDs that are numeric. You should only specify this input if the **attribute** input is set to **createVolumePermission**.

### **groups**

A list of the groups you want to grant to or revoke access from. According to Amazon, the only currently supported value is **all**. Other values may be supported in the future. You should specify this input only if the **attribute** input is set to **createVolumePermission**.

### **delimiter**

The delimiter for the elements of the inputs that are lists.

The operation returns the following:

### **requestId**

The ID of the request sent to Amazon by this operation.

### **returnResult**

Returns **true** if the operation completed successfully or **false** if it fails.

### **Notes:**

- If the **attribute** input is set to **createVolumePermission**, the **operationType** input and at least one of the **userIds** or **groups** inputs should not be empty.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## *Reset Snapshot Attribute*

The **Reset Snapshot Attribute** operation resets an attribute of a snapshot to its default value.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **snapshotId**

The ID of the snapshot you want to modify.

**attribute**

The attribute to reset. The only currently supported value is **createVolumePermission**. Other values may be supported in the future.

The operation returns the following:

**requestId**

The ID of the request sent to Amazon by this operation.

**returnResult**

Returns **true** if the operation completed successfully or **false** if it fails.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Volumes

### *Attach Volume*

The **Attach Volume** operation attaches an Amazon EBS volume to a running instance and exposes it as the specified device.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**volumeId**

The ID of the Amazon EBS volume. The volume must not be attached to any instance.

**instanceId**

The ID of the instance to which the volume attaches. The volume and instance must be within the same availability zone, and the instance must be running.

**deviceName**

Specifies how the device is exposed to the instance (for example, **/dev/sdh**, **/dev/sdi**, **xvdh**, or **xvdi**).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The status of the attaching process (for example, **attaching**).

**attachTime**

The time the process was launched.

**Notes:**

- The Windows devices are **xvda** through **xvdp**. **xvda** and **xvdb** are reserved by the operating system and **xvdc** is assigned to drive C:\. For some instance types, devices **xvdd** through **xvde** might also be reserved by the instance stores.
- The Linux and UNIX devices are **/dev/sdf** through **/dev/sdl**. The devices **/dev/sda1**, **/dev/sda2**, **/dev/sdb**, **/dev/sdc**, **/dev/sdd**, and **/dev/sde** are reserved.
- Like all Amazon EC2 operations, the results might not be visible instantly.
- If the response of the operation is **attaching**, this does not guarantee that the volume attached. Use the **Get Volume Details** operation to check the status of the volume. If the volume has not attached it may be because you specified an invalid device name.

## Create Volume

The **Create Volume** operation creates a new Amazon EBS volume.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### size

A positive integer that represents the size of the volume, in GBs. This input is required if you are not creating a volume from a snapshot.

### snapshotId

The snapshot from which to create the new volume. This input is required if you do not specify the **size** input.

### availabilityZone

The availability zone in which to create the new volume.

The operation returns the following:

### requestId

The ID of the request you have sent to Amazon by using this operation.

### returnResult

The ID of the newly created volume.

### volumeId

The ID of the newly created volume.

### size

The size of the newly created volume, in GBs.

### status

The volume state (for example, **creating**, **available**, **in-use**, **deleting**, or **error**).

### createTime

The timestamp when volume creation was initiated.

### availabilityZone

The availability zone in which the volume was created.

### snapshotId

The snapshot from which the volume was created, if applicable.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Delete Volume

The **Delete Volume** operation deletes an Amazon EBS volume.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### volumeId

The ID of the Amazon EBS volume. The volume must not be attached to any instance.

The operation returns the following:

### requestId

The ID of the request you have sent to Amazon by using this operation.

## returnResult

The status of the process (for example, **deleting**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Describe Volumes

The **Describe Volumes** operation describes the status of your Amazon EBS volumes. If you specify a list of volume IDs, only those volumes are described. Otherwise, all volumes that you own are described.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### volumeIds

An optional list of volume IDs. If you specify a list of volume IDs, only those volumes will be described.

### filterName1

The first filter name for the operation. The valid values are **attachment.attach-time**, **attachment.delete-on-termination**, **attachment.device**, **attachment.instance-id**, **attachment.status**, **availability-zone**, **create-time**, **size**, **snapshot-id**, **status**, **tag-key**, **tag-value**, **volume-id**, and **tag:<tag-name>** where **<tag-name>** stands for the name of a tag that a volume may have. See the notes below for an example of filtering the volumes based on a specific tag/value combination.

### filterValues1

A first value/values list for the corresponding filter name.

### filterName[number]

To add additional filters, you must add extra inputs using the following naming convention: **filterName[number]** where you replace **[Number]** with increasing numbers (for example, **filterName2**, **filterName3**).

### filterValues[number]

To add additional values, you must add extra inputs using the following naming convention: **filterValues[number]** where you replace **[Number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

### delimiter

The delimiter for the list of volume IDs and the list of filter values. The default is a comma (,).

### rowDelimiter

The delimiter used between rows in the output table. The default is the line separator of the current operating system.

### colDelimiter

The delimiter used between columns in the output table. The default is a comma (,).

The operation returns the following:

### requestId

The ID of the request you have sent to Amazon by using this operation.

### returnResult

A table with the following columns: the volume ID, the volume size, the ID of the snapshot from which the volume was created, the availability zone, the volume's status (for example, **creating**, **available**, **in-use**, **deleting**, or **error**), and the attachment status (for example,

**attaching, attached, or detached**). Each row corresponds to a different volume. If a column is empty, the result is null.

**Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.
- To list the resources assigned tag Purpose=X or Purpose=Y, specify:  
`filterName1=tag:Purpose`  
`filterValues1=X,Y`
- You can find more details on the filters that can be applied on this operation in the **DescribeVolumes** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- If you assign a value to a **filterName** input of **attachement.attach-time** or **create-time**, the timestamps supplied to the corresponding **filterValues** must have the local timezone and be in the format `yyyy/MM/dd HH:mm:ss`. In this situation, you cannot use wildcards for **filterValues**.

## ***Detach Volume***

The **Detach Volume** operation detaches an Amazon EBS volume from an instance.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**volumeId**

The ID of the Amazon EBS volume to be detached.

**instanceId**

The ID of the instance to which the volume is attached.

**deviceName**

Specifies how the device is exposed to the instance (for example, **/dev/sdh**, **/dev/sdi**, **xvdh**, or **xvdi**).

**force**

Set to **true** if a previous detachment attempt did not occur cleanly. This option can lead to data loss or a corrupted file system. The default value is **false**. If you leave this input blank, it uses the default value.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The status of the process (for example, **detaching**).

**attachTime**

The time the association was created.

**Notes:**

- The Windows devices are **xvda** through **xvdp**. **xvda** and **xvdb** are reserved by the operating system, and **xvdc** is assigned to drive C:\.
- The Linux and UNIX devices are **/dev/sdf** through **/dev/sdl**. The devices **/dev/sda1**, **/dev/sda2**, **/dev/sdb**, **/dev/sdc**, **/dev/sdd**, and **/dev/sde** are reserved.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## ***Get Volume Details***

The **Get Volume Details** operation describes the status of an EBS volume.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **volumeId**

The ID of the volume to describe.

### **rowDelimiter**

The delimiter used between rows in the **attachmentSet** output table. The default is the line separator of the current operating system.

### **colDelimiter**

The delimiter used between columns in the **attachmentSet** output table. The default is a comma (,).

### **delimiter**

The delimiter for the elements of results that are lists. The default value is a comma (,).

The operation returns the following:

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

### **returnResult**

The volume ID.

### **volumeId**

The volume ID.

### **size**

The volume size.

### **snapshotId**

The snapshot from which the volume was created. This field may be empty.

### **availabilityZone**

The availability zone in which the volume was created.

### **status**

The volume state (for example, **creating**, **available**, **in-use**, **deleting**, or **error**).

### **createTime**

The timestamp from when the volume was created. This is converted to the RAS machine timezone.

### **attachmentSet**

A table that lists the instances to which the volume is attached. Currently, you can attach a volume to just one instance, but this result is in a table in case this changes in the future. The table has the following columns: the instance ID, the device through which the volume is exposed to the instance (for example, **/dev/sdf** on a Linux system or **xvdf** on a Windows system), the attachment state, the timestamp when the volume was attached, and the volume ID. Each row corresponds to a different instance.

### **tags**

The tags assigned to the resource. Each tag is present in the format **tagKey=tagValue** in the returned list (for example, **Owner=DbAdmin,Stack=Production**).



**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Elastic IPs

### Allocate New Elastic IP

The **Allocate New Elastic IP** operation acquires an elastic IP address for use with your Amazon EC2 account.

All of the operation's inputs are described in [Common inputs in the integration](#).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Your new elastic IP address.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

### Associate Elastic IP

The **Associate Elastic IP** operation associates an elastic IP address with an instance. If the IP address is currently assigned to another instance, it is reassigned to the new instance. The old instance will not have a public DNS name for a few minutes. If you call this operation more than once with the same inputs, Amazon EC2 does not return an error.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**ipAddress**

The elastic IP address to use for your instance.

**instanceId**

The ID of the instance.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** if the operation completes successfully.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

### Disassociate Elastic IP

The **Disassociate Elastic IP** operation disassociates the specified elastic IP address from the instance to which it is assigned. If the IP address is not currently assigned to an instance, the operation succeeds but does nothing. The instance to which the address was associated will not have a public DNS name for a few minutes.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**ipAddress**

The elastic IP address you want to disassociate.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** if the operation completes successfully.

**Notes:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Enumerate Elastic IPs

The **Enumerate Elastic IPs** operation lists the elastic IPs addresses assigned to your account. All of the flow's inputs except the following are described in [Common inputs in the integration](#).

**rowDelimiter**

The row delimiter in the results table. The default value is the line separator for the current operating system.

**colDelimiter**

The column delimiter in the results table. The default value is a comma (,).

**filterName1**

The first filter name for the operation. The valid values are **instance-id** and **public-ip**.

**filterValues1**

A first value/values list for the corresponding filter name.

**filterName[number]**

To add additional filters, you must add extra inputs using the following naming convention: **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

**filterValues[number]**

To add additional values, you must add extra inputs using the following naming convention: **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

**delimiter**

The delimiter for the list of filter values. The default is a comma (,).

The flow returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Your elastic IPs in a table with the following columns: the IP Address and the Instance ID associated to that address.

**Example:**

```
174.129.17.27,i-c0ad46a8
174.129.17.39,null
```

**Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.

- You can find more details about the filters that can be applied on this operation in the **DescribeAddresses** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.

## Release Elastic IP

The **Release Elastic IP** operation releases an elastic IP address associated with your Amazon EC2 account. If you run this operation on an elastic IP address that you do not own (maybe you have released it already), the operation fails. Releasing an IP address automatically disassociates it from any instance with which it is associated. To disassociate an IP address without releasing it, use the **Disassociate Elastic IP** operation. The instance will not have a public DNS name for a few minutes.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **ipAddress**

The IP address to release from your account.

The operation returns the following:

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

### **returnResult**

Returns **true** if the operation completes successfully.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Images

### Create Image

The **Create Image** operation creates an AMI that uses an Amazon EBS root device from a **running** or **stopped** instance.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **instanceId**

The ID of the instance.

### **imageName**

The name of the AMI you want to create.

### **description**

The description of the AMI you want to create.

### **noReboot**

By default this property is set to false, which means Amazon EC2 attempts to cleanly shut down the instance before image creation and reboots the instance afterwards. When set to true, Amazon EC2 does not shut down the instance before creating the image. When this option is used, file system integrity on the created image cannot be guaranteed.

The operation returns the following:

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

## **returnResult**

The ID of the AMI you have created.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## **Enumerate Images**

The **Enumerate Images** operation returns a list of the Amazon EC2 images that are accessible to you. Images include AMIs (Amazon Machine Images), AKIs (Amazon Kernel Images), and ARIs (Amazon RAM disk Images). You can filter the results to include only images:

- Of a certain platform
- Published by a particular user
- Based on the criterion that they are accessible only to you or that they are public

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **imageOwners**

A list of the IDs of the owners whose images you want to see (for example, **099720109477,3272169288991**). If you leave this input empty, all of the images are returned.

### **executableBy**

The accessibility of the images (for example, **all** or **self**).

### **colDelimiter**

The column delimiter for the results table.

### **rowDelimiter**

The row delimiter for the results table.

### **filterName1**

The first filter name for the operation. The valid values are:

- **architecture**
- **block-device-mapping.delete-on-termination**
- **block-device-mapping.device-name**
- **block-device-mapping.snapshot-id**
- **block-device-mapping.volume-size**
- **description**
- **image-id**
- **image-type**
- **is-public**
- **kernel-id**
- **manifest-location**
- **name**
- **owner-alias**
- **owner-id**
- **platform**
- **product-code**
- **ramdisk-id**
- **root-device-name**
- **root-device-type**

- **state**
- **state-reason-code**
- **state-reason-message**
- **tag-key**
- **tag-value**
- **virtualization-type**
- **tag: <tag-name>** where *<tag-name>* is the name of a tag that an image may have. See the notes below for an example of filtering images based on a specific tag/value combination.

#### **filterValues1**

A first value or values list for the corresponding filter name.

#### **filterName[number]**

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

#### **filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

#### **delimiter**

The delimiter for the items in the filter value lists and the elements of the results that are lists.

The operation returns the following:

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **returnResult**

The images in a table with the following columns: **AMI ID**, **AMI name**, **Manifest Location**, **Description**, **Visibility**, **Architecture**, **OwnerID**, **Owner Alias Name**, **Image Type**, **Image State**, **Kernel ID**, **Ramdisk ID**, **Platform**, **State Reason Name**, **Root Device Name**, and **Root Device Type**.

#### **Example:**

```
aki-00806369,null,karmic-kernel-zul/ubuntu-kernel-2.6.31-300-ec2-i386-20091001-
test-04.manifest.xml,null,true,i386,099720109477,null,available,kernel,null,
null,null,null,null,instance-store
aki-00896a69,null,karmic-kernel-zul/ubuntu-kernel-2.6.31-300-ec2-i386-20091002-
test-04.manifest.xml,null,true,i386,099720109477,null,available,kernel,null,
null,null,null,null,instance-store
aki-008b6869,null,redhat-cloud/RHEL-5-Server/5.4/x86_64/kernels/kernel-2.6.18-
164.x86_64.manifest.xml,null,true,x86_64,432018295444,null,available,kernel,null,
null,null,null,null,instance-store
aki-00f41769,null,karmic-kernel-zul/ubuntu-kernel-2.6.31-301-ec2-i386-20091012-
test-06.manifest.xml,null,true,i386,099720109477,null,available,kernel,null,
null,null,null,null,instance-store
```

#### **Notes:**

- Visibility is **true** if the image is public and **false** if it only has implicit and explicit launch permissions. Platform is not always specified.
- Like all Amazon EC2 operations, the results might not be visible instantly.

- To list the resources assigned tag **Purpose=X** or **Purpose=Y**, specify:  
`filterName1=tag:Purpose`  
`filterValues1=X,Y`
- You can find more details on the filters that can be applied on this operation in the **DescribeImages** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.

## Get Image Details

The **Get Image Details** operation returns details about a particular Amazon image. The image can be AMI (Amazon Machine Image), AKI (Amazon Kernel Image), or ARI (Amazon RAM disk Image). All of the operation's inputs except the following are described in *Common inputs in the integration*.

### **imageId**

The ID of the image you want details about. If you specify a nonexistent ID, the operation fails.

### **delimiter**

The delimiter for the elements of the result which are lists. The default value is a comma (,).

The operation returns the following:

### **returnResult**

The image ID of the Amazon image you want details about.

### **name**

The name of the Amazon image.

### **description**

The description of the Amazon image.

### **imageLocation**

The location of the image.

### **kernelId**

The operating system kernel associated with the image (only for AMIs, this is optional).

### **ramdiskId**

The RAM disk associated with the image (only for AMIs, this is optional).

### **platform**

The operating system platform (optional).

### **architecture**

The architecture of the image (for example, **i386** or **x86\_64**).

### **ownerId**

The account number of the image owner.

### **status**

The status of the image. If the operation returns **available**, the image is successfully registered and available for launching. If the operation returns **deregistered**, the image is deregistered and no longer available for launching.

### **imageType**

The type of the image (for example, **machine**, **kernel**, or **ramdisk**).

**isPublic**

Returns **true** if this image has public launch permissions and **false** if it only has implicit and explicit launch permissions.

**productCodes**

The product codes of the image.

**rootDeviceType**

The root device type used by the AMI. The AMI can use an Amazon EBS or instance store root device.

**rootDeviceName**

The root device name (for example, `/dev/sda1`).

**stateReason**

The message for the reason for the state change.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**tags**

The tags assigned to the resource. Each tag is present in the format `tagKey=tagValue` in the returned list (for example, **Owner=DbAdmin,Stack=Production**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Modify Image Attribute

The **Modify Image Attribute** operation modifies an attribute of an AMI (Amazon Machine Image). This allows you to make your AMIs public, grant permission to an AMI for a given user, or associate a product code with an AMI.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**amiId**

The ID of the AMI you want to modify.

**attribute**

The attribute to modify (the valid values are **launchPermission** and **productCode**).

**operationType**

The operation to perform (the valid values are **add** and **remove**). Specify this input only if the **attribute** input is set to **launchPermission**.

**userIds**

A list of users to whom you want to grant or revoke access. The list can only contain numeric IDs. Specify this input only if the **attribute** input is set to **launchPermission**.

**groups**

The groups to which you want to grant or revoke access (according to Amazon, the only currently supported value is **all**; other values may be supported in the future). Specify this input only if the **attribute** input is set to **launchPermission**.

**productCode**

The product code to associate with your AMI. Specify this input only if the **attribute** input is set to **productCode**. According to Amazon, each AMI can have a single product code associated with it. The user must be the owner of the AMI to associate a product code with it.

**delimiter**

The delimiter for the elements of the inputs that are lists.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** if the operation completes successfully and **false** if it does not.

**Notes:**

- If the **attribute** input is set to **productCode**, the **productCode** input cannot be empty.
- If the **attribute** input is set to **launchPermission**, the **operationType** input and at least one of the **userIds** or **groups** inputs should not be empty.
- An Amazon DevPay account is needed in order to be able to change the **productCode**.
- Like all Amazon EC2 operations, the results might not be visible instantly.

**Important:** Once set, you cannot change or remove the **productCode**.

## Register Image

The **Register Image** operation registers an AMI with Amazon EC2. Images must be registered before they can be launched. You can register an image more than once, and have multiple AMI IDs for the same image at the same time.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**imageLocation**

The full path to your AMI manifest in Amazon S3 storage (for example, **/mybucket/myimage.manifest.xml**).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The unique ID of the newly registered machine image (an AMI ID).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Remove Image

The **Remove Image** operation deregisters the specified Amazon Machine Image (AMI). Once deregistered, the AMI cannot be used to launch new instances. The image is not deleted from Amazon S3.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**amiId**

The ID of the AMI you want to deregister.

The flow returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.



**returnResult**

Returns **true** if the operation completes successfully.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Reset Image Attribute

The **Reset Image Attribute** operation resets an attribute of an Amazon Machine Image (AMI) to its default value.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**amiId**

The ID of the AMI you want to modify.

**attribute**

The attribute to reset. Currently, the only valid value is **launchPermission**.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** if the operation completes successfully and **false** if it does not.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Instances

### Describe Instances

The **Describe Instances** operation returns a list of your Amazon EC2 instances.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceIds**

A list of the instance IDs to describe. If you leave this input empty, all instances are described. The instances are returned in the order that the IDs are given in this input. If you leave this input empty, the instance IDs are returned in the order the instances are stored by Amazon EC2; this is the same order in which the inputs can be seen in the user interface provided by Amazon.

**filterName1**

The first filter name for the operation. The valid values are:

- **architecture**
- **availability-zone**
- **block-device-mapping.attach-time**
- **block-device-mapping.delete-on-termination**
- **block-device-mapping.device-name**
- **block-device-mapping.status**
- **block-device-mapping.volume-id**
- **client-token**
- **dns-name**

- **group-id**
- **image-id**
- **instance-id**
- **instance-lifecycle**
- **instance-state-code**
- **instance-state-name**
- **instance-type**
- **ip-address**
- **kernel-id**
- **key-name**
- **launch-index**
- **launch-time**
- **monitoring-state**
- **owner-id**
- **placement-group-name**
- **platform**
- **private-dns-name**
- **private-ip-address**
- **product-code**
- **ramdisk-id**
- **reason**
- **requester-id**
- **reservation-id**
- **root-device-name**
- **root-device-type**
- **spot-instance-request-id**
- **state-reason-code**
- **state-reason-message**
- **subnet-id**
- **tag-key**
- **tag-value**
- **virtualization-type**
- **vpc-id**
- **tag: <tag-name>** where *<tag-name>* is the name of a tag that an instance may have. See the notes below for an example of filtering the instances based on a specific tag/value combination.

#### **filterValues1**

A first value/values list for the corresponding filter name.

#### **filterName[number]**

To add additional filters, you must to add extra inputs using the following naming convention: **filterName[number]** where you replace **[Number]** with increasing values (for example, **filterName2**, **filterName2**).

**filterValues[number]**

To add additional values, you must add extra inputs using the following naming convention: **filterValues[number]** where you replace **[Number]** with increasing values (for example, **filterValues2**, **filterValues3**).

**delimiter**

The delimiter used for the list of filter values, the **instanceIds** list and for the list of security groups in the response string. The default value is a comma(,).

**rowDelimiter**

The delimiter that separates two instance descriptions in the output string. The default is the line separator for the current operating system.

**colDelimiter**

The delimiter that separates the fields that describe an instance in the result string. The default is a semicolon (;).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Your EC2 instances in a table with the following columns: **Instance Id**, **AMI ID**, **Machine type**, **Status**, **Public DNS**, **Key pair name**, **Ramdisk ID**, **Platform**, **Kernel ID**, **Monitoring**, **Root Device Name**, **Root Device Type**, **State Transition Reason**, **Availability Zone**, **Security groups**, **Subnet Id**, **Vpc Id**, **Private Ip Address**, and **Block Device Mapping**. Column fields are separated by the **colDelimiter** input. If you have no instances, an empty string is returned.

**Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.
- To list the resources assigned tag Purpose=X or Purpose=Y, specify:  
`filterName1=tag:Purpose`  
`filterValues1=X,Y`
- You can find more details on the filters that can be applied on this operation in the **DescribeInstances** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- If you assign a value of **block-device-mapping.attach-time** or **launch-time** to a **filterName** input, the timestamps supplied to the corresponding **filterValues** must have the local timezone and must use the format `yyyy/MM/dd HH:mm:ss`. In this case, you cannot use wildcards for **filterValues**.

## Get Instance Details

The **Get Instance Details** operation returns details about a specific Amazon EC2 instance.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceIdentifier**

The ID of the instance you want details about. If you specify a nonexistent ID, the operation fails.

**delimiter**

The delimiter used for the results that are lists. The default value is a comma (,).

The operation returns the following:

**returnResult**

The **instanceId** of the specified instance.

**imageId**

The ID of the Amazon Machine Image (AMI) used for this instance.

**kernelId**

The operating system kernel associated with the instance (optional).

**platform**

The operating system platform (optional).

**publicDns**

The public hostname of the instance (contactable from outside the Amazon EC2 network).

**privateDns**

The private hostname of the instance (can only be used inside the Amazon EC2 network).

**launchTime**

The time the instance was launched.

**status**

The status of the instance (for example, **running**, **pending**, or **terminated**).

**transitionReason**

The reason the instance entered this state.

**availabilityZone**

The availability zone in which the instance is located.

**machineType**

The type of the instance (for example, **m1.small** or **c1.xlarge**).

**ownerId**

The account number of the AMI owner.

**ramdiskId**

The RAM disk associated with the image (optional).

**keyPairName**

The key pair name if this instance was launched with an associated key pair.

**launchIndex**

The order in which the instance was launched when launching more than one instance in one reservation.

**monitoring**

The monitoring status.

**reservationId**

The reservation ID used to launch the instance.

**productCodes**

The list of product codes.

**groupSet**

A list of the security groups to which the instance belongs, separated by the **delimiter** input.

**requestId**

The ID of the request sent to Amazon.

**subnetId**

The ID of the subnet.

**vpcId**

The VPC ID.

**privateIpAddress**

The private IP address that is assigned to the instance.

**block Device Mapping**

The block device mapping set.

**tags**

The tags assigned to the resource. Each tag is present in the format `tagKey=tagValue` in the returned list (for example, **Owner=DbAdmin,Stack=Production**).

**Notes:**

- Instances that are terminated or starting up may not have a public DNS name or other attributes.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Get System Log

The **Get System Log** operation retrieves the console output (the system log) of a running instance. Instance console output is buffered and posted shortly after instance boot, reboot, and termination. Amazon EC2 preserves the most recent 64 KB of output which is available for at least one hour after the most recent post.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceId**

The ID of the instance you want to query.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The console output.

**updateTime**

The time the output was last updated.

**Notes:**

- This operation may also work on instances which were terminated a few days before. Use the **Get Instance Details** operation to verify that the queried instance is still alive.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Modify Instance Attribute

The **Modify Instance Attribute** operation modifies an attribute of an instance. The instance must be in a **stopped** state.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceId**

The ID of the instance.

**attribute**

Specifies the attribute to modify. The valid values are **instanceType**, **kernel**, **ramdisk**, **userData**, **disableApiTermination**, **instanceInitiatedShutdownBehavior**, and **blockDeviceMapping**.

**value**

The value of the attribute to be modified.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** if successful. Otherwise, it returns an error.

**Notes:**

- If the value **blockDeviceMapping** is assigned to the **attribute** input, then the **value** input should have one of the following formats:
  - *DeviceName=VolumeId:DeleteOnTermination*  
**Examples:** `/dev/sda1=vol-c2acb5ab:false`, `/dev/sdc=vol-959felfe:true`
  - *DeviceName=VolumeId*  
If the **DeleteOnTermination** flag is not explicitly specified, then the value **true** is used by default.  
**Example:** `/dev/sda1=vol-959felfe`
- By default, EBS volumes created and attached to an instance at instantiation are destroyed when the EC2 instance is terminated. This operation can be used to change this behavior by passing the **blockDeviceMapping** value to the **attribute** input and setting the **false** value to the **DeleteOnTermination** flag for the device and volume specified through the **value** input.
- If the value **blockDeviceMapping** is assigned to the **attribute** input but the instance does not have a block device with the **DeviceName** and **VolumeId** specified through the value input, then the operation succeeds but no changes are made to the instance.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Monitor Instance

The **Monitor Instance** operation enables Amazon CloudWatch monitoring for a running instance.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceIdentifier**

The ID of the instance you want to monitor.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

## returnResult

The state of the monitoring after the execution of this operation (for example, **pending**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Reset Instance Attribute

The **Reset Instance Attribute** operation resets an attribute of an instance to its default value. The instance must be in a **stopped** state.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### instanceId

The ID of the instance.

### attribute

Specifies the attribute to modify. The valid values are **kernel** and **ramdisk**.

The operation returns the following:

### requestId

The ID of the request you have sent to Amazon by using this operation.

## returnResult

Returns **true** if successful. Otherwise, it returns an error.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Restart Instance

The **Restart Instance** operation requests a reboot of one instance. The operation succeeds if the instance is valid and belongs to you. Requests to reboot terminated instances are ignored.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### instanceIdentifier

The ID of the instance you want to reboot.

The operation returns the following:

### requestId

The ID of the request you have sent to Amazon by using this operation.

## returnResult

Returns **true** if the instance is being restarted. This may take some time and the instance's status may remain **running** while it is being restarted.

### Notes:

- We recommend that you verify (for instance, using the **Get Instance Details** operation) that the instance you want to restart exists and that it is in the **running** state. Otherwise, the operation's **returnResult** may be **true** but nothing may have happened.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Run Instances

The **Run Instances** operation launches a specified number of instances of an Amazon Machine Image (AMI) for which you have permissions. If Amazon EC2 cannot launch the minimum number

AMIs you request, no instances are launched. If there is insufficient capacity to launch the maximum number of AMIs you request, Amazon EC2 launches the minimum number specified for each AMI and allocates the remaining available instances using round robin.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**amiId**

The unique ID of the Amazon Machine Image you want to launch.

**minCount**

The minimum number of instances you want to launch from the specified AMI.

**maxCount**

The maximum number of instances you want to launch from the specified AMI.

**kernelId**

The ID of the kernel with which to launch the instance (for example, **aki-12345678**).

**instanceType**

The instance type. The valid values are **m1.small**, **m1.large**, **m1.xlarge**, **c1.medium**, and **c1.xlarge**. If the **amiId** input specifies a 64 bit image, then this input should be provided with one of the following values: **m1.large**, **m1.xlarge**, or **c1.xlarge**. If the **amiId** input specifies a 32 bit image, then this input can be left empty or given one of the following values: **m1.small** or **c1.medium**. In this case, if the input is left empty, a small instance is created by default.

**placementZone**

The placement constraints (availability zones) for launching the instances. By default, Amazon selects an availability zone automatically (for example, **us-east-1a**, **us-east-1b**).

**monitoring**

Specifies whether the instance should be monitored after its launch. The valid values are **true** or **enabled** if the instance should be monitored after launch and **false** or **disabled** if not. The default is **false**. If you do not specify a value, the instance is not monitored after starting.

**ramdiskId**

The ID of the RAM disk with which to launch the instance, required by some kernels (for example, **ari-12345678**).

**keyName**

The name of one of your existent key pairs, used to access your instance. Launching public images without a key pair ID leaves them inaccessible.

**securityGroups**

The name of the security group or groups of which your instances will be part. If you do not specify a security group, the **default** group is used.

**delimiter**

The delimiter for returned lists of IDs and the **securityGroups** input. The default is a comma (,).

**subnetId**

The Amazon VPC subnet ID within which to launch the instance(s) for Amazon Virtual Private Cloud.

**privateIpAddress**

The IP address from the VPC subnet that is assigned to the instance (for example, **10.0.0.25**). If you specify an IP address, you can launch a single instance. By default, Amazon VPC selects an IP address from the subnet.



### **disableApiTermination**

Specifies whether the instance can be terminated using the APIs. You must modify this attribute before you can terminate any "locked" instances from the APIs. The valid values are **true** and **false**. A value of **false** means the instance is unlocked. The valid values are **true** and **false**.

### **instanceInitiatedShutdownBehavior**

Specifies whether the instance's Amazon EBS volumes are stopped or terminated when a shutdown is issued from with the instance. The valid values are **stop** and **terminate**.

### **deviceName1**

The device name (for example, **/dev/sdh**).

### **deviceName[number]**

To define more than one block device mapping, you should add extra inputs using the following naming convention: **deviceName[number]** where you replace **[number]** with an increasing number for each combination (for example, **deviceName2**, **deviceName3**).

### **virtualName1**

The virtual device name (for example, **ephemeral0**).

### **virtualName[number]**

To define more than one block device mapping, you must add extra **virtualName** inputs using the naming convention **virtualName[number]** where you replace **[number]** with an increasing number for each combination (for example, **virtualName2**, **virtualName3**).

### **volumeSize1**

The size of the volume in GBs.

### **volumeSize[number]**

To define more than one block device mapping, you must add extra **volumeSize** inputs using the naming convention **volumeSize[number]** where you replace **[number]** with an increasing number for each combination (for example, **virtualSize2**, **virtualSize3**).

### **snapshotId1**

The ID of the snapshot (for example, **snap-c02745a8**).

### **snapshotId[number]**

To define more than one block device mapping, you must add extra **snapshotId** inputs using the naming convention **snapshotId[number]** where you replace **[number]** with an increasing number for each combination (for example, **snapshotId2**, **snapshotId3**).

### **deleteOnTermination1**

Specifies whether the Amazon EBS volume is deleted on instance termination. The valid values are **true** and **false**. The default value is **true**.

### **deleteOnTermination[number]**

To define more than one block device mapping, you must add extra **deleteOnTermination** inputs using the naming convention **deleteOnTermination[number]** where you replace **[number]** with an increasing number for each combination (for example, **deleteOnTerminated2**, **deleteOnTerminated3**).

### **clientToken**

A unique identifier you provide to ensure idempotency of the request. If the operation timesout or connection errors occur, you can rerun the operation and be sure you haven't launched more instances than you intended. The token must be a unique, case-sensitive string of up to 64 ASCII characters. If you repeat the request with the same client token, the same response is returned for each repeated request. The client token is valid for at least 24 hours after the termination of the instance. You should not reuse a client token for another call later on. You

can use the same client token for the same request across different regions (for example, **this is a token**).

The operation returns the following:

**returnResult**

A list containing the IDs of your newly started instances separated by the **delimiter** input value.

**reservationID**

The reservation ID used to launch the instances.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**requesterId**

The ID of the requester who sent this request to Amazon.

**Notes:**

- The block device mappings exposed to the instance are made up of a virtual name (**virtualName**) and a device name (**deviceName**). Virtual names include **none** and **ephemeral[0-3]**. Virtual names are used together with device names (for example, **/dev/sdb=none**, **/dev/sdc=ephemeral0**).
- A set of **deviceName**, **virtualName**, **volumesize**, **snapshotId**, and **deleteOnTermination** values represent a block device mapping item. Each item specifies whether the device is mapped to a virtual device (for instance, a local instance store), an Amazon EBS volume, or to nothing. For a device mapped to a virtual device, the block device mapping specifies the name of the store (for instance, **ephemeral0**). For a device mapped to an Amazon EBS volume (which is available only for Amazon EBS-backed AMIs), the block device mapping specifies the following items: **snapshotId** to use for the volume, **volumeSize** (in GB), and **deleteOnTermination** flag (whether to delete the volume on instance termination).
- If you do not specify a value for the **minCount** and **maxCount** inputs, one instance is launched.
- The architecture of your AMI, RAM disk, and kernel must match. Even then, there is no guarantee that a given combination will function correctly or boot successfully if they weren't designed to be used together.
- Instances usually enter the **pending** state after this operation. They do not have DNS names and other attributes for at least a few minutes.
- Like all Amazon EC2 operations, the results might not be visible instantly.
- If any of the AMIs has a product code attached for which the user has not subscribed, the operation fails.

## Run Instances From Template

The **Run Instances From Template** flow launches a specified number of instances with the same configuration as a given one. If Amazon EC2 cannot launch the minimum number of instances you request, no instances are launched. If there is insufficient capacity to launch the maximum number of instances you request, Amazon EC2 launches the minimum number specified and allocates the remaining available instances using round robin.

All of the flow's inputs except the following are described in [Common inputs in the integration](#).

**instanceIdentifier**

The ID of the template instance. The following configuration characteristics of the instance are used when launching the new instances: AMI ID, availability zone, machine type, kernel ID, ramdisk ID, monitoring, key pair name, and security groups.

**minCount**

The minimum number of instances you want to launch.

**maxCount**

The maximum number of instances you want to launch.

The flow returns the following:

**returnResult**

A list containing the IDs of your newly started instances.

**Notes:**

- If you do not specify a value for the **minCount** and **maxCount** inputs, one instance is launched.
- Instances usually enter the **pending** state after this flow. They do not have DNS names and other attributes for at least a few minutes.
- Like all Amazon EC2 operations, the results might not be visible instantly.
- If any of the AMIs has a product code attached for which the user has not subscribed, the operation fails.

## Start Instance

The **Start Instance** operation starts an instance that uses an Amazon EBS volume as its root device. When an instance is stopped, the compute resources are released and you are not billed for hourly instance usage. However, the root partition Amazon EBS volume remains, continuing to persist the data, and you are charged for Amazon EBS volume usage. You can restart the instance at any time.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceId**

The instance ID.

The operation returns the following:

**returnResult**

The result of the request.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**name**

The state of the instance.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Stop Instance

The **Stop Instance** operation stops an instance that uses an Amazon EBS volume as its root device. Instances that use Amazon EBS volumes as their root devices can be quickly stopped and started. When an instance is stopped, the compute resources are released and you are not billed

for hourly instance usage. However, your root partition Amazon EBS volume remains, continuing to persist your data, and you are charged for Amazon EBS volume usage. You can restart your instance at any time.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceIdentifier**

The ID of the instance you want to stop.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The state of the instance after the operation (for example, **shutting-down**).

**previousState**

The state the instance was in before you stopped it (for example, **running**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Terminate Instance

The **Terminate Instance** operation shuts down an instance. If you terminate an instance more than once, each call succeeds. Terminated instances remain visible (for instance, when using the **Describe Instances** operation) after termination for approximately one hour.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceIdentifier**

The ID of the instance you want to terminate.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The state of the instance after the operation (for example, **shutting-down**).

**previousState**

The state the instance was in before you stopped it (for example, **running**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Unmonitor Instance

The **Unmonitor Instance** operation disables Amazon CloudWatch monitoring for a running instance.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**instanceIdentifier**

The ID of the instance for which you want to disable monitoring.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The state of the monitoring after the execution of this operation (for example, **disabling**).

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Key Pairs

### Allocate New Key Pair

The **Allocate New Key Pair** operation creates a new 2048-bit RSA key pair with the specified name. The private key is returned as an unencrypted PEM encoded PKCS#8 private key. If a key with the specified name already exists, Amazon EC2 returns an error.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**keyName**

The name of the new key pair.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The key material of your RSA private key.

**keyFingerprint**

An SHA-1 digest of the DER encoded private key.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

### Delete Key Pair

The **Delete Key Pair** operation deletes the specified key pair by removing the public key from Amazon EC2. You must own the key pair. The operation succeeds if you call it more than once on a given key and even if the key does not exist. We recommend that you check that the key you want to delete exists by using the **Enumerate Key Pairs** operation.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**keyName**

The name of the key pair you want to delete.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** if the operation succeeds.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Enumerate Key Pairs

The **Enumerate Key Pairs** operation lists the key pairs that are available to you.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **rowDelimiter**

The row delimiter in the results table. The default value is the line separator for the current operating system.

### **colDelimiter**

The column delimiter in the results table. The default value is a comma (,).

### **filterName1**

The first filter name for the operation. The valid values are **fingerprint** and **key-name**.

### **filterValues1**

A first value or values list for the corresponding filter name.

### **filterName[number]**

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

### **filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

### **delimiter**

The delimiter used for the list of volume IDs and the list of filter values. The default is a comma (,).

The operation returns the following:

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

### **returnResult**

Your key pairs in a table with the following columns: **Key name** and **Fingerprint**.

#### **Example:**

```
testkey2,8c:0a:1a:c8:a5:07:cb:3d:0e:60:3f:00:7d:a1:e9:c4:4f:28:e4:7b
minFedora,8b:79:f0:6d:6d:4c:73:80:c0:1a:9e:e3:81:f3:cc:3f:33:20:cf:89
```

### **Notes:**

- In case no key pair exists, the operation succeeds but **returnResult** is empty.
- Like all Amazon EC2 operations, the results might not be visible instantly.
- You can find more details on the filters that can be applied on this operation in the **DescribeKeyPairs** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.

## Import Key Pair

The **Import Key Pair** operation imports the public key from an RSA key pair that you created with a third-party tool to your EC2 account. Only the public key is transmitted to Amazon.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **keyName**

A name for the key pair. Make sure there is no other key with the same name.

### **publicKeyMaterial**

The path (including file name) to the public key file.

The operation returns the following:

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

### **returnResult**

The key pair name that was provided.

### **keyFingerprint**

An MD5 public key fingerprint.

### **Notes:**

- The supported formats are the following:
  - OpenSSH public key format.
  - Base64 encoded DER format.
  - SSH public key file format as specified in RFC4716.
  - DSA keys are not supported.
- The supported lengths are:
  - 1024
  - 2048
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Security groups

### Allow Access To Security Group

The **Allow Access To Security Group** operation adds new permissions to the specified security group. You can specify the new permissions by providing the IP protocol, start and end of port range, and the CIDR range or source group.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **groupName**

The name of the group to modify.

### **ipProtocol1**

The IP protocol used. The valid values are **tcp**, **udp**, and **icmp**.

### **ipProtocol[number]**

If you need more than one combination of **ipProtocol**, **fromPort**, and **toPort** when adding access permissions, you must add extra **ipProtocol** inputs (one for each combination) following

the naming convention **ipProtocol[number]** where you replace **[number]** with increasing numbers (for example, **ipProtocol2**, **ipProtocol3**).

#### **fromPort1**

The start of the port range for the TCP and UDP protocols, and the type number for ICMP. For ICMP, **-1** indicates a wildcard (any ICMP type number).

#### **fromPort[number]**

If you need more than one combination of **ipProtocol**, **fromPort**, and **toPort** when adding access permissions, you must add extra **fromPort** inputs (one for each combination) following the naming convention **fromPort[number]** where you replace **[number]** with increasing numbers (for example, **fromPort2**, **fromPort3**).

#### **toPort1**

The end of the port range for the TCP and UDP protocols, and the type number for ICMP. For ICMP, **-1** indicates a wildcard (any ICMP type number).

#### **toPort[number]**

If you need more than one combination of **ipProtocol**, **fromPort**, and **toPort** when adding access permissions, you must add extra **toPort** inputs (one for each combination) following the naming convention **toPort[number]** where you replace **[number]** with increasing numbers (for example, **toPort2**, **toPort3**).

#### **sourceSecurityGroupNames1**

A list containing the names of the source security groups. This is required when giving access to one or more source security groups.

#### **sourceSecurityGroupNames[number]**

If you need more than one list of source security groups when adding access permissions, you must add extra **sourceSecurityGroupNames** inputs (one for each combination) following the naming convention **sourceSecurityGroupNames[number]** where you replace **[number]** with increasing numbers (for example, **sourceSecurityGroupNames2**, **sourceSecurityGroupNames3**).

#### **sourceSecurityGroupOwnerIds1**

A list containing the user IDs of each of the source security group's owners. This is required when giving access to one or more source security groups.

#### **sourceSecurityGroupOwnerIds[number]**

If you need more than one list of source security groups when adding access permissions, you must add extra **sourceSecurityGroupOwnerIds** inputs (one for each combination) following the naming convention **sourceSecurityGroupOwnerIds[number]** where you replace **[number]** with increasing numbers (for example, **sourceSecurityGroupOwnerIds2**, **sourceSecurityGroupOwnerIds3**).

#### **cidrIps1**

A list containing the source IPs in CIDR format. This is required when giving access to one or more IP address ranges.

#### **cidrIps[number]**

If you need more than one list of CIDR ranges when adding access permissions, you must add extra **cidrIps** inputs (one for each combination) following the naming convention **cidrIps[number]** where you replace **[number]** with increasing numbers (for example, **cidrIps2**, **cidrIps3**).

#### **delimiter**

The delimiter used to separate the source security group names and source security group owner ID, or CIDR IPs. The default value is a comma (,).



The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** when the operation is successful and **false** when it is not.

**Notes:**

- If a permission is specified through the source group and the **ipProtocol**, **fromPort**, and **toPort** inputs are not specified, then all the following permissions are added:
  - **tcp** protocol, from port 0, to port 65535, specified source group
  - **udp** protocol, from port 0, to port 65535, specified source group
  - **icmp** protocol, from port -1, to port -1, specified source group
- If you add a combination of access parameters that already exists, the operation fails.
- In case the new permissions are specified by a source group name, any machine from **sourceSecurityGroupName** can connect to any machine from **groupName**, using any of the TCP, UDP or ICMP protocols.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Create Security Group

The **Create Security Group** operation creates a new security group.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**groupName**

The name of the new group. This name must be unique per account.

**groupDescription**

The description of the group. This is only informational, and can contain alphanumeric characters, spaces, dashes, and underscores.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

Returns **true** when the operation is successful or **false** if it is not.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Delete Security Group

The **Delete Security Group** operation deletes a security group.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**groupName**

The name of the security group you want to delete.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

## returnResult

Returns **true** when the operation is successful or **false** if it is not.

## Notes:

- If you attempt to delete a security group which used to exist but has been recently deleted, the operation might go to **Success**. This may happen because Amazon remembers a deleted security group for a certain amount of time.
- If you attempt to delete a security group that contains instances, a fault is returned.
- If you attempt to delete a security group that is referenced by another security group, a fault is returned. For example, if Security Group B has a rule that allows access from Security Group A, Security Group A cannot be deleted until you remove the rule.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Describe Security Groups

The **Describe Security Groups** operation describes the security groups that you own. By default, this operation returns information about all of your security groups, but you can specify a list of group names to restrict the results to only those specified.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### groupNames

The names of the groups that you want to describe. If you leave this input blank, all of your owned groups are described.

### rowDelimiter

The delimiter used between rows in the output table. The default is the line separator of the current operating system.

### colDelimiter

The delimiter used between columns in the output table. The default is a comma (,).

### filterName1

The first filter name for the operation. The valid values are:

- **description**
- **group-name**
- **ip-permission.cidr**
- **ip-permission.from-port**
- **ip-permission.group-name**
- **ip-permission.protocol**
- **ip-permission.to-port**
- **ip-permission.user-id**
- **owner-id**

### filterValues1

A first value or values list for the corresponding filter name.

### filterName[number]

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).

**filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

**delimiter**

The delimiter used for the list of group names. The default is a comma (,).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

A table listing the security groups, one in each row. The table has the following columns: **group name**, **group owner id**, and **group description**.

**groupNames**

A list of the group names of your security groups.

**Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.
- You can find more details on the filters that can be applied on this operation in the **DescribeSecurityGroups** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.

## Get Security Group Details

The **Get Security Group Details** operation returns information about a specific security group that you own.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**groupName**

The name of the security group you want to describe.

**rowDelimiter**

The delimiter used between rows in the output table. The default is the line separator of the current operating system.

**colDelimiter**

The delimiter used between columns in the output table. The default is a comma (,).

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The name of the group.

**groupName**

The name of the group.

**ownerId**

The ID of the owner of the group.

## groupDescription

The description of the group.

## ipPermissions

A table describing the permissions for this group, one in each row. The table has the following columns:

- **ip protocol**
- **from port** The start of the port range for the TCP and UDP protocols, or an ICMP type number (an ICMP type number of **-1** indicates a wildcard—any ICMP type number).
- **to port** The end of the port range for the TCP and UDP protocols, or an ICMP code (**-1** indicates a wildcard).
- **source security group** The name of the source security group.
- **user id** The user ID of the owner of the source security group.
- **source IP in CIDR notation**

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Revoke Access To Security Group

The **Revoke Access To Security Group** operation removes permissions from the specified security group. You can specify the permissions by giving the IP protocol, start and end of port range, and the CIDR range or source group.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

## groupName

The name of the group to modify.

## ipProtocol1

The IP protocol used. The valid values are **tcp**, **udp**, and **icmp**.

## ipProtocol[number]

If you need additional combinations of **ipProtocol**, **fromPort**, and **toPort** to remove access permissions, you must add extra **ipProtocol** inputs for each combination following the naming convention **ipProtocol[number]**, where you replace **[number]** with increasing numbers (for example, **ipProtocol2**, **ipProtocol3**).

## fromPort1

The start of the port range for the TCP and UDP protocols, and the type number for ICMP. If you do not specify a value for ICMP, port **0** is used by default. For ICMP, **-1** indicates a wildcard (any ICMP type number).

## fromPort[number]

If you need additional combinations of **ipProtocol**, **fromPort**, and **toPort** to remove access permissions, you must add extra **fromPort** inputs for each combination following the naming convention **fromPort[number]** where you replace **[number]** with increasing numbers (for example, **fromPort2**, **fromPort3**).

## toPort1

The end of the port range for the TCP and UDP protocols, and the type number for ICMP. If you do not specify a value for ICMP, port **0** is used by default. For ICMP, **-1** indicates a wildcard (any ICMP type number).

## toPort[number]

If you need additional combinations of **ipProtocol**, **fromPort**, and **toPort** to remove access permissions, you must add extra **toPort** inputs for each combination following the naming

convention **toPort[*number*]** where you replace **[*number*]** with increasing numbers (for example, **toPort2**, **toPort3**).

#### **sourceSecurityGroupNames1**

A list containing the names of the source security groups. This is required when revoking access to one or more source security groups.

#### **sourceSecurityGroupNames[*number*]**

If you need more than one list of source security groups when removing access permissions, you must add extra **sourceSecurityGroupNames** inputs (one for each list) following the naming convention **sourceSecurityGroupNames[*number*]** where you replace **[*number*]** with increasing numbers (for example, **sourceSecurityGroupNames2**, **sourceSecurityGroupNames3**).

#### **sourceSecurityGroupOwnerIds1**

A list containing the user IDs of each of the owner of the source security group's owners. This is required when revoking access to one or more source security groups.

#### **sourceSecurityGroupOwnerIds[*number*]**

If you need more than one list of source security groups when removing access permissions, you must add extra **sourceSecurityGroupOwnerIds** inputs (one for each list) following the naming convention **sourceSecurityGroupOwnerIds[*number*]** where you replace **[*number*]** with increasing numbers (for example, **sourceSecurityGroupOwnerIds2**, **sourceSecurityGroupOwnerIds3**).

#### **cidrIps1**

A list containing the source IPs in CIDR format. This is required when revoking access to one or more IP address ranges.

#### **cidrIps[*number*]**

If you need more than one list of CIDR ranges when removing access permissions, you must add extra **cidrIps** inputs (one for each list) following the naming convention **cidrIps[*number*]** where you replace **[*number*]** with increasing numbers (for example, **cidrIps2**, **cidrIps3**).

#### **delimiter**

The delimiter used to separate the source security group names and source security group owner IDs, or CIDR IPs. The default value is a comma (,).

The operation returns the following:

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **returnResult**

Returns **true** when the operation is successful or **false** if it is not.

#### **Notes:**

- This operation goes to success even in situations when no permission is revoked or the permission does not exist. The only situation when a permission is actually revoked is when the inputs match exactly the inputs used to create the permission (for example, the inputs given to the **Allow Access To Security Group** operation).
- If a permission is specified through the source group, and the **IpProtocol**, **fromPort** and **toPort** are not assigned, the operation attempts to remove all the following permissions:
  - **tcp** protocol, from port 0, to port 65535, specified source group
  - **udp** protocol, from port 0, to port 65535, specified source group
  - **icmp** protocol, from port -1, to port -1, specified source group

- Like all Amazon EC2 operations, the results might not be visible instantly.

## Spot Instances

### Cancel Spot Instance Requests

The **Cancel Spot Instance Requests** operation cancels one or more spot instance requests.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

#### **spotInstanceRequestIds**

A list of spot instance request IDs separated by the **delimiter** input value.

#### **rowDelimiter**

The delimiter that separates two instance request descriptions in the output string. The default value is the line separator for the current operating system.

#### **colDelimiter**

The delimiter that separates the fields in an instance description in the result string. The default value is a semicolon (;).

#### **delimiter**

The delimiter used to separate the spot instance request IDs in the **spotInstanceRequestIds** input.

The operation returns the following:

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **returnResult**

A table containing descriptions of the instance requests. The table has the following columns: **spot instance request ID** and **state**. The column fields are separated by the **colDelimiter** input value.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

### Create Spot Datafeed Subscription

The **Create Spot Datafeed Subscription** operation creates the data feed subscription for spot instances, allowing you to view spot instance usage logs. You can create one data feed per account.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

#### **storageBucket**

The Amazon S3 bucket in which to store the spot instance data feed. This must be a valid bucket associated with your account, and you must have FULL\_CONTROL over the bucket.

#### **prefix**

The prefix that is prepended to data feed file names. The spot instance data feed file name uses the following format (with the date and hour in UTC):

```
{Bucket}.s3.amazonaws.com/{Optional Prefix}{Distribution ID}.{YYYY}-{MM}-{DD}-{HH}.{Unique ID}.gz
```

The operation returns the following:

**returnResult**

The state of the spot instance request. The valid values are **open**, **closed**, **canceled**, and **failed**.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**ownerId**

The AWS account ID of the account.

**bucket**

The Amazon S3 bucket where the spot instance data feed is located.

**prefix**

The prefix that is prepended to data feed file names.

**state**

The state of the spot instance request. The valid values are **open**, **closed**, **canceled**, and **failed**.

**code**

The reason code for the spot instance state change.

**message**

The message for the spot instance state change.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Delete Spot Datafeed Subscription

The **Delete Spot Datafeed Subscription** operation deletes the data feed for spot instances.

All of the operation's inputs are described in [Common inputs in the integration](#).

The operation returns the following:

**returnResult**

The state of the execution; **true** if the operation executes successfully, otherwise an error message.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Describe Spot Datafeed Subscription

The **Describe Spot Datafeed Subscription** operation describes the data feed for spot instances.

All of the operation's inputs are described in [Common inputs in the integration](#).

The operation returns the following:

**returnResult**

The state of the spot instance request. The valid values are **open**, **closed**, **canceled**, and **failed**.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**ownerId**

The AWS account ID of the account.

**bucket**

The Amazon S3 bucket where the spot instance data feed is located.

**prefix**

The prefix that is prepended to data feed file names.

**state**

The state of the spot instance request. The valid values are **open**, **closed**, **canceled**, and **failed**.

**code**

The reason code for the spot instance state change.

**message**

The message for the spot instance state change.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Describe Spot Instance Requests

The **Describe Spot Instance Requests** operation describes spot instance requests.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**spotInstanceRequestIds**

A list of spot instance request IDs separated by the **delimiter** input value. If you do not specify any list values, all of your requests are returned.

**rowDelimiter**

The delimiter that separates the instance descriptions in the result string. The default is the line separator for the current operating system.

**colDelimiter**

The delimiter that separates the fields in an instance description in the result string. The default is a semicolon (;).

**filterName1**

The first filter name for the operation. The valid values are:

- **availability-zone-group**
- **create-time**
- **fault-code**
- **fault-message**
- **instance-id**
- **launch-group**
- **launch.block-device-mapping.delete-on-termination**
- **launch.block-device-mapping.device-name**
- **launch.block-device-mapping.snapshot-id**
- **launch.block-device-mapping.volume-size**
- **launch.group-id**



- **launch.image-id**
- **launch.instance-type**
- **launch.kernel-id**
- **launch.key-name**
- **launch.monitoring-enabled**
- **launch.ramdisk-id**
- **product-description**
- **spot-instance-request-id**
- **spot-price**
- **state**
- **tag-key**
- **tag-value**
- **type**
- **valid-from**
- **valid-until**
- **tag:<tag-name>** where <tag-name> stands for the name of a tag that a spot instance request may have. See the notes below for an example of filtering the spot instance requests based on a specific tag/value combination.

#### **filterValues1**

The first value or values list for the corresponding filter name.

#### **filterName[number]**

To add more filters, you must add extra **filterName** inputs using the naming convention **filterName[number]** where you replace **[Number]** with an increasing number (for example, **filterName2**, **filterName3**).

#### **filterValues[number]**

To add more values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[Number]** with an increasing number (for example, **filterValues2**, **filterValues3**).

#### **delimiter**

The delimiter used to separate the spot instance request IDs and items in the lists of filter values. It is also used to separate the security group ID. The default value is a comma (,).

The operation returns the following:

#### **returnResult**

Descriptions of the instances in a table with the following columns:

- **spotInstanceRequestId**
- **spotPrice**
- **type**
- **state**
- **code**
- **message**
- **validFrom**
- **validUntil**
- **launchGroup**
- **availabilityZoneGroup**

- **imageId**
- **keyName**
- **group Id(s)** (separated by **delimiter**)
- **addressingType**
- **instanceType**
- **placement**
- **kernelId**
- **ramdiskId**
- **subnetId**
- **instanceId**
- **createTime**
- **productDescription**

The column fields are separated by the **colDelimiter** input value.

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **Notes:**

- Like all Amazon EC2 operations, the results might not be visible instantly.
- To list the resources assigned tag Purpose=X or Purpose=Y specify:  
`filterName1=tag:Purpose`  
`filterValues1=X,Y`
- You can find more details on the filters that you can apply on this operation in the **DescribeSpotInstanceRequests** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- If the value assigned to a **filterName** input is **create-time**, **valid-from**, or **valid-until**, the timestamps supplied to the corresponding **filterValues** must have the local time zone and must use the following format: yyyy/MM/dd HH:mm:ss. You cannot use wildcards for **filterValues**.

## **Describe Spot Price History**

The **Describe Spot Price History** operation describes spot price history.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

#### **startDate**

The start date and time of the spot instance price history data. The format of the date can be yyyy/MM/dd HH:mm:ss or yyyy/MM/dd. For the last format, 00:00:00 is the time considered.

#### **endDate**

The end date and time of the spot instance price history data. The format of the date can be yyyy/MM/dd HH:mm:ss or yyyy/MM/dd. For the last format, 00:00:00 is the time considered.

#### **instanceType**

Specifies the instance types to return. Separate the types with the **delimiter** input value. The available instance types are **m1.small**, **m1.large**, **m1.xlarge**, **c1.medium**, **c1.xlarge**, **m2.xlarge**, **m2.2xlarge**, **m2.4xlarge**, and **t1.micro**.

#### **filterName1**

The first filter name for the operation. The valid values are **instance-type**, **product-description**, **spot-price**, and **timestamp**.

**filterValues1**

A first value/values list for the corresponding filter name.

**filterName[number]**

To add more filters, you must add extra inputs using the naming convention **filterName[number]** where you replace **[Number]** with increasing numbers (for example, **filterName2**, **filterName3**).

**filterValues[number]**

To add more values, you must add extra inputs using the naming convention **filterValues[number]** where you replace **[Number]** with increasing numbers (for example, **filterValue2**, **filterValue3**).

**delimiter**

The delimiter used to separate the instance types and the items in the list of filter values. The default value is a comma (,).

**description**

The product description. The valid values are **Linux/UNIX**, **SUSE/Linux**, and **Windows**.

**rowDelimiter**

The delimiter that separates two descriptions in the output string. The default value is the line separator for the current operating system.

**colDelimiter**

The delimiter that separates the fields in a description in the result string. The default is a comma (;).

The operation returns the following:

**returnResult**

Descriptions in a table with the following columns: **Instance Type**, **Product Description** (description of the AMI), **Spot Price**, and **Timestamp**.

Column fields are separated by the **colDelimiter** input value. If the price history is empty, an empty string is returned.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**Notes:**

- This operation returns all the prices that are active in the given interval between **startDate** and **endDate** and not the prices which were issued in this interval.
- Like all Amazon EC2 operations, the results might not be visible instantly.
- You can find more details on the filters that can be applied on this operation in the **DescribeSpotPriceHistory** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- If the value assigned to a **filterName** input is **timestamp**, then the timestamps supplied to the corresponding **filterValues** must have the local time zone and must use the following format: yyyy/MM/dd HH:mm:ss. In this case, you cannot use wildcards for **filterValues**.

## Request Spot Instances

The **Request Spot Instances** operation creates a spot instance request.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**spotPrice**

Specifies the maximum hourly price for any spot instance launched to fulfill the request. The price is in US dollars.

**instanceCount**

The maximum number of spot instances to launch. The default is **1**.

**type**

The type of the spot instances to launch. The available types are **one-time** and **persistent**. The default is **one-time**.

**validFrom**

The start date of the request. The format of the date is "yyyy/MM/dd HH:mm:ss".

**validUntil**

The end date of the request. The format of the date is "yyyy/MM/dd HH:mm:ss".

**launchGroup**

Specifies the instance launch group. Launch groups are spot instances that launch together and terminate together.

**availabilityZoneGroup**

Specifies the availability zone group. If you specify the same Availability Zone group for all spot instance requests, all spot instances are launched in the same Availability Zone.

**imageId**

The AMI ID.

**keyName**

Specifies the name of one of your existent key pairs used to access your instance. Launching public images without a key pair ID will leave them inaccessible.

**securityGroups**

The name of the security group or groups of which your spot instances will be part. If you do not specify a security group or groups, the **default** group is used.

**userData**

MIME, Base 64-encoded user data sent to the spot instances at launch time.

**instanceType**

Specifies the instance type. The available types are **m1.small**, **m1.large**, **m1.xlarge**, **c1.medium**, **c1.xlarge**, **m2.xlarge**, **m2.2xlarge**, and **m2.4xlarge**.

**kernelId**

The ID of the kernel with which to launch the instance(s).

**ramdiskId**

The ID of the RAM disk with which to launch the instance(s). This is required by some kernels.

**subnetId**

The Amazon VPC subnet ID within which to launch the instance(s) for Amazon Virtual Private Cloud.

**availabilityZone**

Specifies the placement constraints (availability zones) for launching the instance(s).

**deviceName1**

The device name (for instance, **/dev/sdh**).

**virtualName1**

The virtual device name (for instance, **ami**, **root**, **swap**, or **ephemeralN**).

**snapshotId1**

The ID of the snapshot.

**volumeSize1**

The size of the volume in GBs. This is required if you are not creating a volume from a snapshot.

**deleteOnTermination1**

Set this to **true** if the Amazon EBS volume should be deleted on instance termination; otherwise, set it to **false**. The default is **true**.

**monitoring**

Set this to **true** if the instance should be monitored after launch; otherwise, set it to **false**. The default is **false**. If you do not provide a value, the instance is not monitored after starting.

**rowDelimiter**

The delimiter that separates two request descriptions in the output string. The default is the line separator for the current operating system.

**colDelimiter**

The delimiter separates the fields in a request description in the result string. The default is a comma (;).

**delimiter**

The delimiter used to separate the security groups. The default is a comma (,).

The operation returns the following:

**returnResult**

Descriptions of the instances in a table with the following columns:

- **spotInstanceRequestId**
- **spotPrice**
- **type**
- **state**
- **code**
- **message**
- **validFrom**
- **validUntil**
- **launchGroup**
- **availabilityZoneGroup**
- **imageId**
- **keyName**
- **group Id(s)** (separated by **delimiter**)
- **instanceType**
- **placement**
- **kernelId**
- **ramdiskId**
- **subnetId**
- **instanceId**

- **createTime**
- **productDescription**

The column fields are separated by the **colDelimiter** input value.

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **Notes:**

- If this is a one-time request, the request becomes active at the start date and time and remains active until all instances launch, the request expires (the end date is reached), or the request is canceled. If the request is persistent, the request becomes active at this date and time and remains active until it expires or is canceled.
- If the user data (**userData**) is not correctly encoded, the operation goes to success but the request fails.
- The block device mappings exposed to the instance are made up of a device name (**deviceName1**) and a virtual name (**virtualName1**), and an Amazon EBS volume. Virtual names include:
  - **ami** - The root file system device, as seen by the instance.
  - **root** - The root file system device, as seen by the kernel.
  - **swap** - The swap device, as seen by the instance.
  - **ephemeralN** - The Nth ephemeral store.
- The Amazon EBS volume is specified by its snapshot ID (**snapshotId1**). If you do not specify a snapshot ID, a new EBS volume is created with the given size (**volumeSize1**).
- If more than one block device mapping is required, you should add extra inputs using the following naming convention: **deviceName[number]**, **virtualName[number]**, **snapshotId[number]**, **volumeSize[number]**, and **deleteOnTermination[number]** where you replace **[number]** with increasing numbers such as 2, 3, ... The success of the operation does not guarantee the success of the request. For the request to succeed, the inputs should be valid according to the rules stated by Amazon regarding block device mapping.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## **Windows**

### **Bundle Windows Instance**

The **Bundle Windows Instance** operation bundles the Windows instance. The bundling process creates a new image from a running instance and stores the AMI data in S3. Once it is bundled, you must register the image using the **Register Image** operation prior to launching it.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

#### **instanceId**

The ID of the instance you want to bundle.

#### **storageBucket**

The Amazon S3 bucket in which to store the AMI. You must specify a bucket that you already own. If you specify a bucket that belongs to someone else, Amazon EC2 returns an error.

#### **storagePrefix**

A prefix that specifies the beginning of the file name of the AMI. Your image is stored in the bucket specified by the **storageBucket** input under the name **<storagePrefix>.manifest.xml**.

**s3AccessKeyId**

The ID of the secret access key associated with your S3 AWS account, if it is different from the EC2 account. If you do not specify the **s3AccessKeyId** input, the operation uses the EC2 access key ID.

**s3AccessKey**

The secret access key associated with your S3 AWS account, if it is different from the EC2 account. If you do not specify the **s3AccessKey** input, the operation uses the EC2 access key.

The operation returns the following:

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**returnResult**

The Bundle ID by that identifies the bundle task.

**status**

The state of the bundle task (for example, **pending**).

**startTime**

The time the bundle task started.

**Notes:**

- You cannot start another bundle task on an instance until the running task is terminated. Also, if the path you specified for the image already exists, any images under that name may be overwritten.
- The **s3AccessKeyId** and **s3AccessKey** inputs work together. Therefore, you must specify values for both of them or leave them both.
- The operation succeeds for an invalid **s3AccessKey** creating a bundle task, but during the bundling process, the task fails with the following error message:  
"SignatureDoesNotMatch(403)- The request signature we calculated does not match the signature you provided. Check your key and signing method."
- Like all Amazon EC2 operations, the results might not be visible instantly.

## Cancel Bundle Task

The **Cancel Bundle Task** operation aborts a bundle task.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**bundleId**

The ID of the bundle task. If you specify a nonexistent ID, the operation fails. If you specify the ID of an already terminated bundle task, the operation may succeed but nothing will happen.

The operation returns the following:

**returnResult**

The instance ID of the instance that was being bundled.

**startTime**

The time the task was launched.

**updateTime**

The time the status of the task was last updated.

**status**

The status of the task (for example, **canceling** or **failed**).

**progress**

The progress of the task (**0%** - **100%**).

**bucket**

The S3 bucket where the image would have been placed.

**prefix**

The name under which the image would have been placed in the bucket.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**Note:** Like all Amazon EC2 operations, the results might not be visible instantly.

## Enumerate Bundle Tasks

The **Enumerate Bundle Tasks** operation returns a list of your bundle tasks in a table.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**rowDelimiter**

The row delimiter in the results table. The default value is the line separator for the current operating system.

**colDelimiter**

The column delimiter in the results table. The default value is a comma (,).

**filterName1**

The first filter name for the operation. The valid values are:

- **bundle-id**
- **error-code**
- **error-message**
- **instance-id**
- **progress**
- **s3-aws-access-key-id**
- **s3-bucket**
- **s3-prefix**
- **start-time**
- **state**
- **update-time**

**filterValues1**

A first value or values list for the corresponding filter name.

**filterName[number]**

To add additional filters, you must add extra **filterName** inputs using the convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filterName3**).



### **filterValues[number]**

To add additional values, you must add extra **filterValues** inputs using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues2**, **filterValues3**).

### **delimiter**

The delimiter used for the list of filter values. The default is a comma (,).

The operation returns the following:

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

### **returnResult**

Your bundle tasks in a table having the following columns: **Bundle ID**, **Instance ID**, **Status**, **Start time**, and **Progress**. The column fields are separated by **colDelimiter** and the rows by **rowDelimiter**.

#### **Example:**

```
bun-49789d20,i-d63cd5be    complete,2009-08-25T10:04:55.000Z,null
bun-4f789d26,i-d63cd5be    failed,2009-08-25T10:58:57.000Z,null
```

### **Notes:**

- Terminated bundle tasks appear in this list for an undetermined interval of time after they are terminated.
- Like all Amazon EC2 operations, the results might not be visible instantly.
- More details on the filters that can be applied on this operation can be found in the **DescribeBundleTasks** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- If you assign a value of **start-time** or **update-time** to a **filterName** input, the timestamps supplied to the corresponding **filterValues** must have the local timezone and must use the format *yyyy/MM/dd HH:mm:ss*. In this case, you cannot use wildcards for **filterValues**.

## **Get Bundle Task Details**

The **Get Bundle Task Details** operation returns details about a specified bundle task.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **bundleId**

The ID of the bundle task. If you specify a nonexistent ID, the operation fails.

The operation returns the following:

### **returnResult**

The instance ID of the instance that is being bundled.

### **startTime**

The time the task was launched.

### **updateTime**

The time the status of the task was last updated.

### **status**

The status of the task (for example, **running**, **complete**, or **failed**).

**progress**

The progress of the task (**0%** - **100%**).

**bucket**

The S3 bucket where the image will be placed.

**prefix**

The name under which the image will be placed in the bucket.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**Notes:**

- Terminated bundle tasks can be queried for an undetermined interval of time after they are terminated.
- Like all Amazon EC2 operations, the results might not be visible instantly.

## EC2 Dashboard

The **EC2 Dashboard** flow displays the EC2 dashboard information: the number of instances running or stopped, elastic IPs, EBS volumes, EBS snapshots, key pairs, and security groups.

All of the flow's inputs except the following are described in [Common inputs in the integration](#).

**notifyMethod**

The method of notification. The valid values are **Write to File**, **Email**, **Display**, and **None**.

The flow returns the following:

**returnResult**

The dashboard information.

## Tags

### Create Tags

The **Create Tags** operation adds or overwrites one or more tags for the specified resource or resources. If one of the specified resources already has a tag with a key specified in one of the **tagKey** inputs, that tag's value is overwritten with the value of the corresponding **tagValue** input. Otherwise, a new tag with the specified **tagKey** and **tagValue** is created for the resource.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**resourceId1**

The ID of a resource to tag (for example, **i-78248215**).

**resourceId[number]**

To tag more than one resource, you must add extra **resourceId** inputs for each resource using the naming convention **resourceId[number]** where you replace **[number]** with increasing numbers (for example, **resourceId2**, **resourceId3**).

**tagKey1**

The key for a tag. Tag keys are case sensitive and must be unique per resource (for example, **Owner**).

**tagValue1**

The value for a tag. If you do not specify a value for this input, the corresponding tag will not have a value. Tag values are also case sensitive (for example, **DbAdmin**).

**tagKey[number]**

To create more than one tag, you must add extra **tagKey** inputs (there must be a pair of **tagKey** and **tagValue** inputs for each tag) using the naming convention **tagKey[number]** where you replace **[number]** with increasing numbers (for example, **tagKey2**, **tagKey3**).

**tagValue[number]**

To create more than one tag, you must add extra **tagValue** inputs (there must be a pair of **tagKey** and **tagValue** inputs for each tag) using the naming convention **tagValue[number]** where you replace **[number]** with increasing numbers (for example, **tagValue2**, **tagValue3**).

The operation returns the following:

**returnResult**

Returns **true** if the operation is successful or **false** if it fails.

**requestId**

The ID of the request you have sent to Amazon by using this operation.

**Notes:**

- Each resource can have a maximum of ten tags.
- Each of the tags you specify using pairs of **tagKey[number]** and **tagValue[number]** input values is added to each of the resources specified through the **resourceId[number]** input values.
- Like all Amazon operations, the results might not be visible instantly.

## Delete Tags

The **Delete Tags** operation deletes a specific set of tags from a specific set of resources.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

**resourceId1**

The ID of a resource from which to delete a tag (for example, **i-78248215**).

**resourceId[number]**

To delete tags from more than one resource, you must add extra **resourceId** inputs for each resource using the naming convention **resourceId[number]** where you replace **[number]** with increasing numbers (for example, **resourceId2**, **resourceId3**).

**tagKey1**

The key for a tag to delete (for example, **Owner**).

**tagValue1**

The value for a tag to delete. If you do not specify a value for this input, the corresponding **tagKey** input value is deleted only if its value is an empty string. If you assign the value **allvalues** to this input, all tags with the corresponding key are deleted regardless of their values (for example, **DbAdmin**).

**tagKey[number]**

To delete more than one tag, you must add extra **tagKey** inputs (there must be a pair of **tagKey** and **tagValue** inputs for each tag) using the naming convention **tagKey[number]** where you replace **[number]** with increasing numbers (for example, **tagKey2**, **tagKey3**).

### **tagValue[number]**

To delete more than one tag, you must add extra **tagValue** inputs (there must be a pair of **tagKey** and **tagValue** inputs for each tag) using the naming convention **tagValue[number]** where you replace **[number]** with increasing numbers (for example, **tagValue2**, **tagValue3**).

The operation returns the following:

### **returnResult**

Returns **true** if the operation is successful or **false** if it fails.

### **requestId**

The ID of the request you have sent to Amazon by using this operation.

### **Notes:**

- Each of the tags you specify using pairs of **tagKey[number]** and **tagValue[number]** input values is deleted from each of the resources specified through the **resourceId[number]** input values if the specified resources have the tags specified as inputs in the operation.
- Like all Amazon operations, the results might not be visible instantly.

## **Enumerate Tags**

The **Enumerate Tags** operation retrieves a list of your Amazon tags.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

### **filterName1**

The first filter name for the operation. The valid values are **key**, **value**, **resource-id**, and **resource-type** (for example, **key**).

### **filterValues1**

A first value or list of values for the corresponding **filterName** input value (for example, **Owner,Stack**).

### **filterName[number]**

To specify more than one filter, you must add extra **filterName** inputs (there must be a pair of **filterName** and **filterValues** inputs for each filter) using the naming convention **filterName[number]** where you replace **[number]** with increasing numbers (for example, **filterName2**, **filter Name3**).

### **filterValues[number]**

To specify more than one filter, you must add extra **filterValues** inputs (there must be a pair of **filterName** and **filterValues** inputs for each filter) using the naming convention **filterValues[number]** where you replace **[number]** with increasing numbers (for example, **filterValues1**, **filterValues2**).

### **delimiter**

The delimiter used to separate items in the list of **filterValues** input values. The default value is a comma (,).

### **rowDelimiter**

The delimiter used to separate the rows in the results table. The default value is the line separator for the current operating system.

### **colDelimiter**

The delimiter for the columns in the results table. The default value is a semicolon (;).

The operation returns the following:

#### **returnResult**

Your Amazon tags in a table with the columns **resource type**, **resource id**, **tag key**, and **tag value**. Each row corresponds to a different tag. If a column is empty, it contains a null character.

#### **requestId**

The ID of the request you have sent to Amazon by using this operation.

#### **Example:**

```
instance;i-1c892b71;Owner;DbAdmin
instance;i-1c892b71;Stack;Production
instance;i-04278169;Stack;Test
```

#### **Notes:**

- In the case where no tags exist, the operation goes to success but the **returnResult** is empty.
- If you specify a value of **resource-type** for a **filterName** input, the valid values for the corresponding **filterValues** input are **customer-gateway**, **dhcp-options**, **image**, **instance**, **snapshot**, **spot-instances-request**, **subnet**, **volume**, **vpc**, **vpn-connection**, and **vpn-gateway**.
- You can find more details on the filters that can be applied on this operation in the **DescribeTags** section at <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>.
- Like all Amazon operations, the results might not be visible instantly.

## Troubleshooting

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, there are several steps that you should verify:

1. Verify that the same operation works when it is performed through the EC2 console using the same parameters.
2. Verify that 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: size.

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.

## 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 2 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 use 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**.

## Tools

Following are OO tools that you can use with the Amazon EC2 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/.