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Open Service
Catalog Manager

Microsoft Azure Integration

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Contents

About this Manual

This manual describes the integration of Microsoft Azure with Open Service Catalog Manager (OSCM) .

This manual is structured as follows:

Readers of this Manual

This manual is intended for technology managers and providers who want to offer virtual systems controlled by Azure through services on a marketplace provided by OSCM. It assumes that you have access to an existing OSCM installation and that you have an Azure Account and subscription. In addition, you should have basic knowledge of the Azure Resource Manager (ARM) and JavaScript Object Notation (JSON), and you should be familiar with the concepts and administration of OSCM.

Notational Conventions

This manual uses the following notational conventions:

Add	Names of graphical user interface elements.
`init`	System names, for example command names and text that is entered from the keyboard.
`<variable>`	Variables for which values must be entered.
`[option]`	Optional items, for example optional command parameters.
`one	two`	Alternative entries.
`{one	two}`	Mandatory entries with alternatives.

Abbreviations

This manual uses the following abbreviations:

ARM	Azure Resource Manager
APP	Asynchronous Provisioning Platform
DBMS	Database Management System
IaaS	Infrastructure as a Service
IdP	SAML Identity Provider
JSON	JavaScript Object Notation
OSCM	Open Service Catalog Manager
SAML	Security Assertion Markup Language
STS	Security Token Service
WSDL	Web Services Description Language
WSIT	Web Services Interoperability Technologies

Available Documentation

The following documentation on OSCM is available:

- *Overview:* A PDF manual introducing OSCM. It is written for everybody interested in OSCM and does not require any special knowledge.
- *Operator's Guide:* A PDF manual for operators describing how to administrate and maintain OSCM.
- *Technology Provider's Guide:* A PDF manual for technology providers describing how to prepare applications for usage in a SaaS model and how to integrate them with OSCM.
- *Supplier's Guide:* A PDF manual for suppliers describing how to define and manage service offerings for applications that have been integrated with OSCM.
- *Reseller's Guide:* A PDF manual for resellers describing how to prepare, offer, and sell services defined by suppliers.
- *Broker's Guide:* A PDF manual for brokers describing how to support suppliers in establishing relationships to customers by offering their services on a marketplace.
- *Marketplace Owner's Guide:* A PDF manual for marketplace owners describing how to administrate and customize marketplaces in OSCM.
- *Microsoft Azure Integration:* A PDF manual for operators describing how to offer and use virtual systems controlled by Microsoft Azure through services in OSCM.
- *Amazon Web Services Integration:* A PDF manual for operators describing how to offer and use virtual servers controlled by the Amazon Elastic Compute Cloud Web service through services in OSCM.
- *OpenStack Integration:* A PDF manual for operators describing how to offer and use virtual systems controlled by OpenStack through services in OSCM.
- *VMware vSphere Integration:* A PDF manual for operators describing how to offer and use virtual machines provisioned on a VMware vSphere server through services in OSCM.

- *Shell Integration:* A PDF manual for operators describing how to use Shell scripts through services in OSCM.
- *Online Help:* Online help pages describing how to work with the administration portal of OSCM. The online help is intended for and available to everybody working with the administration portal.

1   Introduction

Open Service Catalog Manager (OSCM) is a set of services which provide all business-related functions and features required for turning on-premise applications and tools into 'as a Service' (aaS) offerings and using them in the Cloud. This includes ready-to-use account and subscription management, online service provisioning, billing and payment services, and reporting facilities.

Microsoft Azure is a cloud computing service for building, deploying, and managing applications and services through a global network of Microsoft-managed data centers. Apart from software as a service and platform as a service, it provides infrastructure as a service according to your needs and allows you to quickly scale these capacities as your computing requirements change.

When integrating applications with OSCM, the instance provisioning can be done in two provisioning modes: synchronous or asynchronous mode.

Asynchronous provisioning is required if provisioning operations take a long time because long-running processes or manual steps are involved. This is the case, for example, when provisioning virtual machines on a virtual machine server. OSCM supports the integration of such applications with its asynchronous provisioning platform (APP). This is a framework which provides a provisioning service as well as functions, data persistence, and notification features which are always required for integrating applications in asynchronous mode.

The integration of Azure with OSCM provides for an Infrastructure as a Service (IaaS) solution that leverages the features of both products: Through services, which are published on a marketplace in OSCM, users can request and use virtual machines in Azure. The usage costs can be calculated and charged by means of the OSCM billing and payment services.

When deploying the `oscm-app` container provided with OSCM, an Azure service controller is preconfigured and registered with the asynchronous provisioning platform (APP). This service controller can be used for integrating Azure services with OSCM.

APP also includes the operation service interface for executing technical service operations on the integrated applications from the OSCM user interface.

The Azure service controller includes all components required for connecting an existing OSCM installation with Azure . This manual describes how to request and use virtual machines in Azure on an OSCM marketplace.

1.1   Components Involved in the Azure Integration

The following picture provides an overview of the main components involved in the integration of OSCM and Azure:

In OSCM, customer subscriptions are managed by means of the **Subscription service**. When a customer creates or terminates creates or terminates a subscription for a virtual machine in Azure, the Subscription service asynchronously triggers the corresponding actions in a ShellAzure through the **Asynchronous Provisioning Platform (APP)** and the **Shell service controllerAzure service controller**: Scripts are executed in a ShellThe virtual machine and - if requested - additional resources are created or deleted in Azure.

APP is a framework which provides a provisioning service, an operation service, as well as functions, data persistence, and notification features which are required for integrating applications with OSCM in asynchronous mode. The actual communication with the applications is carried out by service controllers. For each application, a specific and dedicated service controller is required. Refer to the *Technology Provider's Guide* for details on APP.

In Azure, virtual machines as well as additional resources required for specific purposes can be deployed and managed with **Azure Resource Manager (ARM)**. Each virtual machine is based on a predefined **image**, which determines the operating system and other characteristics. Virtual machines and other resources that are to be managed together are organized in resource groups. Customers can define resource groups as required and control the resource deployment by means of **Resource Manager templates** in JavaScript Object Notation (JSON).

When APP is deployed, an Azure service controller is also deployed, registered, and initialized.

1.2   Usage Scenarios

The OSCM Azure integration supports the following usage scenarios:

- **Provisioning of virtual machines in existing resource groups**: When a customer subscribes to a corresponding service on an OSCM marketplace, the service controller triggers the ARM to deploy one or more virtual machines to a given resource group with a complete network configuration. Depending on the service parameters, a new storage account is created or an existing one is used.
- **Provisioning of resource groups with virtual machines**: When a customer subscribes to a corresponding service on an OSCM marketplace, the service controller triggers the ARM

to deploy a new resource group with the network configuration, storage account, and virtual machines specified by the service parameters.

- **Starting and stopping virtual machines**: By executing the respective service operation at a corresponding subscription, the customer can start and stop the virtual machines created for the subscription.

- **Deletion of resources**: When a customer terminates a subscription, the service controller triggers the ARM to delete all the resources (virtual machines, storage account, resource group) created for the subscription. The subscription is terminated in OSCM independent of whether the deletion in Azure is successful.

In Azure, the virtual machines and resource groups created for OSCM subscriptions are managed in the same way as other resources. They can be viewed and monitored with the available Azure tools.

Modifying a subscription and thereby triggering modifications of the resources in Azure is not supported. For more details on the supported usage scenarios, refer to *Using Azure Services in OSCM* on page 13.

2 Creating and Publishing Services

The following sections describe how to create and publish services in OSCM by means of which customers can request and use virtual machines in Azure.

2.1 Prerequisites and Preparation

The following prerequisites must be fulfilled before you can create and publish services in OSCM:

- To create technical services for the Shell integrationAzure integration in OSCM, you must have access to OSCM as a technology manager. You must be a member of the technology provider organization responsible for the ShellAzure service controller as specified in the configuration settings for the installation.

- Shell scripts must exist. They form the basis for the technical services in OSCM. Shell scripts can be provided in the following ways:

  - The technology provider organization responsible for the Shell service controller provides them on an external host in a location whose URL can be reached from OSCM via HTTP or HTTPS.

  - The OSCM operator provides them on an OSCM host in a location whose URL can be reached from OSCM via HTTP or HTTPS.

  - The OSCM operator provides them on the OSCM host on the file system where they will be referenced by the absolute file path.

- Shell Scripts used for provisioning are subject to the following restrictions:

  - The Script must return the following command at the end of execution: `Write-Output "END_OF_SCRIPT"`. Otherwise the Script execution will run into a timeout.

  - Terminate Scripts without calling `exit`. When calling `exit`, the Shell is no longer available for other Scripts and will be removed from the pool. This is not a problem, just an ineffective way of using the Shell pool.

  - Interactive Scripts will cause a timeout. Remove all interactive command from the Script, such as `Out-GridView`, `Read-Host`, `ShowDialog`, `-Confirm`, `PromptForChoice`, and `Prompt`.

- In Azure, the following is required:

  - A subscription on the account of which the virtual machines are to be created.

  - An application (service principal) with at least Contributor permissions to the subscription if new resource groups are to be crate, or at least Contributor permissions for the resource groups to which new virtual machines are to be added. You need to know the ID of the Azure Active Directory (tenant ID) hosting the application and the application ID (client ID), and have a valid authentication key. For details on how to create and obtain these items, refer to the Microsoft documentation on *creating applications and service principles*.

  - Appropriate images for the virtual machines to be created.

  - Optionally, resource groups with network configuration to which virtual machines are to be added.

  - Optionally, storage accounts to be used with the virtual machines to be created.

- Templates in JSON format for the ARM must exist in the environment of the Azure integration software. A template defines the virtual machines as well as other resources to be deployed and the dependencies between them. For each resource manager template, a corresponding

parameter definition file in JSON format must exist. It is used to pass the parameter values a user specifies at subscription time to the resource manager template.

You can find sample resource manager templates and parameter definition files on *https://github.com/servicecatalog/oscm/tree/master/oscm-app-azure/resources*. You can use these files as a basis and adapt them as required. Additional templates can be defined with ARM. For details, refer to the Microsoft documentation.

The templates and parameter definition files need to be available in a location that can be accessed from OSCM and the Azure integration software by HTTP or HTTPS at runtime.

It is important to end the base template URL with a slash (/) since the template file name is concatenated with this base URL. For example:

Base URL:

`https://github.com/servicecatalog/oscm/tree/master/oscm-app-azure/resources/`

Template file name: `SampleTemplate.json`

Template parameters file name: `SampleTemplate.parameters.json`

- To create marketable services for the ShellAzure integration in OSCM, you must have access to OSCM as a service manager of an organization with the supplier role. This may be the same organization as the technology provider organization or a different one.
- To publish your marketable services, you must have access to an appropriate marketplace in OSCM in your service manager role.

2.2 Creating Technical Services

The first step in providing OSCM services for Shell script execution is to create one or more technical services.

Proceed as follows:

1. Define one or more technical services in an XML file.

   As a basis, you can use the technical service sample provided on *https://github.com/servicecatalog/oscm-app-shell/tree/master/src/main/resources*.

   A technical service specifies Shell scripts as parameter options. Sample scripts are available *here*.

   In the technical service definition, be sure to specify:
   - The asynchronous provisioning type
   - The USER access type
   - Service parameters which correspond to the parameters specified in the Shell scripts. For details on the supported service parameters, refer to *Service Parameters and Operations*.

2. Log in to the OSCM administration portal with your technology manager account.

3. Import the technical services you created and appoint one or more supplier organizations for them.

For details on these steps, refer to the *Technology Provider's Guide* and to the online help of OSCM.

2.3 Creating and Publishing Marketable Services

As soon as the technical services for the ShellAzure integration exist in OSCM, you can define and publish marketable services based on them. Your cost calculation for the services should include any external costs for operating any provisioned system, etc.the resources in Azure.

Proceed as follows:

1. Log in to the OSCM administration portal with your service manager account.
2. Define one or more marketable services based on the technical services you created for the ShellAzure.
3. Define price models for your marketable services.
4. Publish the services to a marketplace.

For details on these steps, refer to the *Supplier's Guide* and to the online help of OSCM.

3 Using Azure Services in OSCM

The following sections describe how users can subscribe to and work with the services you have created for Azure in OSCM. You will find details of the supported usage scenarios outlined in *Usage Scenarios* on page 8.

3.1 Subscribing to Services

Users of customer organizations can subscribe to the services you have created for Azure on the marketplace where you have published them. This results in the provisioning of virtual machines in Azure, as defined in the underlying technical service.

The following scenarios are supported:

- **Provisioning of virtual machines in existing resource groups**: When a customer subscribes to a corresponding service, the ARM is triggered to deploy one or several virtual machines to a given resource group. Within the resource group, the virtual machines are assigned to a network and subnet which must already exist. Depending on the service parameters, a new storage account can be created for the virtual machines, or an existing one can be used.

  The customer can enter a name for the virtual machines, and - if applicable - the storage account. If more than one virtual machine is to be provisioned, a consecutive number is appended to this name, for example, `mymachine1`, `mymachine2`, etc.

  Other parameters, such as the resource group or network to which the new virtual machines are to be added, are usually specified in the technical service only or provided as options for the customer to select.

  If all steps are completed successfully, the subscription and the new virtual machines are ready to use. The IP addresses of the virtual machines and the initial user IDs and passwords for accessing them are output in the subscription details on the marketplace.

- **Provisioning of resource groups with virtual machines**: When a customer subscribes to a corresponding service, the ARM is triggered to deploy a new resource group with the specified network configuration, storage account, and virtual machines.

  The customer can enter names for the resource group, storage account, network, subnet, and virtual machines. If more than one virtual machine is to be provisioned, a consecutive number is appended to the given name, for example, `mymachine1`, `mymachine2`, etc.

  Technical parameters, such as network interfaces, are specified only in the resource manager template that belongs to the underlying technical service and are used for provisioning of the resources.

  If all steps are completed successfully, the subscription and the resources are ready to use. The IP addresses of the virtual machines and the initial user IDs and passwords for accessing them are output in the subscription details on the marketplace.

The provisioning operations are carried out in asynchronous mode. As long as the provisioning is not complete, the status of the subscription is **pending**. The status changes to **ready** as soon as the provisioning has been finished successfully.

The users assigned to the subscription in OSCM can access the virtual machines using the information indicated in the subscription details. Azure provides different ways to access the virtual machines. For details, refer to the Microsoft documentation.

In Azure, the virtual machines, resource groups, and storage accounts created for OSCM subscriptions are managed in the same way as other resources. They can be viewed and

monitored with the standard Azure tools. Changes, however, should not be made as this may cause problems and inconsistencies between Azure and OSCM.

3.2 Executing Service Operations

Customers can explicitly start and stop servers and suspend and resume instances in OpenStack from OSCM. To do this, they execute the appropriate service operation from the subscription for the virtual system:

- **Start**: Starts all servers in the OpenStack instance that were stopped.
- **Stop**: Stops all servers in the OpenStack instance that were started.
- **Suspend**: Suspends the OpenStack instance.
- **Resume**: Resumes the OpenStack instance if it was suspended.

As a prerequisite, the service operations must be defined in the technical service underlying the subscribed service.

Customers can view the status of all operations they started in their account information on the OSCM marketplace.

3.3 Terminating Subscriptions

A customer can at any time terminate a subscription for a virtual system in OpenStack.

OpenStack is triggered to delete the virtual system. The subscription is terminated in OSCM independent of whether the deletion is successful in OpenStack.

4   Administrating the Azure Integration

The following sections describe administration tasks you may need to perform in your role as an operator of the Azure integration software.

4.1   Controlling the Provisioning Process

The ShellAzure integration provides you with the following feature for controlling the execution of Shell scripts:

In the definition of the technical services for ShellAzure, you can specify the `MAIL_FOR_COMPLETION` parameter. This is an address to which emails are to be sent in case manual steps are required to complete an operation.

If you specify this parameter, the ShellAzure service controller interrupts the processing of each operation before its completion and waits for a notification about the execution of a manual action. This notification consists in opening the link given in the email.

Omit the `MAIL_FOR_COMPLETION` parameter if you do not want to interrupt the processing.

4.2   Handling Problems in the Provisioning Process

If the provisioning of resources fails on the Azure side or if there are problems in the communication between the participating systems, the corresponding subscription in OSCM remains pending. The Azure service controller informs the technology managers of its responsible technology provider organization by email of any incomplete operation in Azure.

You can then take the appropriate actions to solve the problem in or in the communication. For example, you could remove an incomplete , or you could restore a missing connection.

After solving the problem, the Azure integration components and OSCM need to be synchronized accordingly. You do this by triggering a corresponding action in the APP component. Proceed as follows:

1. Work as a technology manager of the technology provider organization responsible for the Azure service controller.

2. Invoke the instance status interface of APP for the service controller of the application by opening its URL in a Web browser.

   The access URL has the following format:

   `https://<hostname.fqdn>:<port>/oscm-app/controller/?controllerid=ess.`

   `<hostname.fqdn>` is the name and the fully qualified domain name of the machine where the `oscm-app` container has been deployed, `<port>` is the port to address the machine (default: `8881`), `oscm-app/controller/?controllerid=ess.azure` is the default context root of the service controller and cannot be changed.

   The Web page shows all subscriptions for the application, including detailed information such as the customer organization, the ID of the related application instance, and the provisioning status.

3. Find the subscription for which you solved the problem in the most recent provisioning or delete operation.

4. In the **Action** column, select the action for the Azure integration components to execute next. Possible actions are the following:

   • `RESUME` - to resume the processing of a provisioning operation in APP which was suspended.

- `SUSPEND` - to suspend the processing of a provisioning operation in APP, for example when Azure does not respond.
- `UNLOCK` - to remove the lock for Azure instance in APP.
- `DELETE` - to terminate the subscription in OSCM and remove the instance in APP, but keep the resources in Azure for later use. The service manager role is required for this action.
- `DEPROVISION` - to terminate the subscription in OSCM, remove the instance in APP, and delete the resources in Azure. The service manager role is required for this action.
- `ABORT_PENDING` - to abort a pending provisioning operation in OSCM. OSCM is notified to roll back the changes made for the subscription and return it to its previous state. In Azure, no actions are carried out.
- `COMPLETE_PENDING` - to complete a pending provisioning operation in OSCM. OSCM is notified to complete the changes for the subscription and set the subscription status to **ready** (or **suspended** if it was suspended before). This is possible only if the operations of the service controller are already completed.

5. Click **Execute** to invoke the selected action.

The instance status interface provides the following additional functionality that is useful for problem-solving purposes:

- You can display service instance details for each subscription by clicking the corresponding entry in the table. This displays all subscription-related information that is stored in the `bssapp` database.

4.3 Updating Service Controller Settings in the Database

During deployment, several configuration settings are written to the `bssapp` database. This configuration is used for the initial setup of the Azure service controller and its registration with APP. It is up to the platform operator for taking care that the initial settings are correct. Refer to the *Operator's Guide* for details on the initial configuration using a `var.env` file.

A technology provider can define service parameters in the technical service definition. If such a parameter has the same ID as a controller configuration setting stored in the APP database, it overrules the configuration setting in the database when the marketable service based on such a technical service is subscribed to. By default the values in the controller configuration settings are used. Refer to the *Technology Provider's Guide* for details on defining technical services.

In addition, a supplier can define custom attributes for subscriptions and for customers. If such an attribute has the same ID as a controller configuration setting stored in the APP database as well as a corresponding technical service parameter, it overrules the technical service parameter as well as the configuration setting in the database when the marketable service based on such a technical service is subscribed to.

The controller configuration settings are evaluated as follows:

1. Configuration setting as stored in the APP database.
2. Technical service parameter. If defined, it overrules 1.
3. Custom attribute for customer. If defined, it overrules 1. and 2.
4. Custom attribute for subscription. If defined, it overrules 1. and 2. and 3.

1. Invoke the instance status interface of APP for the Azure service controller of the application by opening it's URL in a Web browser.

   The access URL has the following format:

   ```
   https://<hostname.fqdn>:<port>/oscm-app-azure
   ```

`<hostname.fqdn>` is the name and the fully qualified domain name of the machine where the `oscm-app` container has been deployed, `<port>` is the port to address the machine (default: `8881`), `oscm-app-azure` is the default context root of the service controller and cannot be changed.

2. Log in with the ID and password of the user specified in the configuration settings for the Azure service controller by the platform operator in the `BSS_USER_ID` and `BSS_USER_PWD` configuration settings, or as another technology manager registered for the same organization.
3. Save the settings.

4.4   Changing the Responsible Organization

You can change the technology provider organization responsible for the Azure service controller using the Web interface of APP:

1. In a Web browser, access the Web interface (base URL) of APP.

    The access URL has the following format:

    `https://<hostname.fqdn>:<port>/oscm-app`

    `<hostname.fqdn>` is the name and the fully qualified domain name of the machine where the `oscm-app` container has been deployed, `<port>` is the port to address the machine (default: `8881`), `oscm-app` is the default context root of APP and cannot be changed.

2. Log in with the ID and password of the user specified for `BSS_USER_KEY` in the configuration settings for APP or as another administrator of the same organization.
3. Specify the technology provider organization for the Azure service controller, .
4. Save the settings.
5. Make sure that the configuration settings for the Azure service controller are updated.

    Any technology manager registered for the technology provider organization you specified can log in to the graphical user interface for updating the controller configuration settings (see above). At least the ID and password of the user to be used for accessing OSCM must be changed in the controller configuration settings.

Appendix A: Controller Configuration Settings

This appendix describes the controller configuration settings as stored in the `bssapp` database. For details on how to update them, refer to *Updating Service Controller Settings in the Database* on page 16 and *Changing the Responsible Organization* on page 17.

CONTROLLER_ID

`CONTROLLER_ID=ess.azureARM`

The identifier of the service controller. This setting cannot be changed.

BSS_ORGANIZATION_ID

`BSS_ORGANIZATION_ID=<organizationID>`

The ID of the organization in OSCM responsible for the service controller. The organization must have the technology provider role. It is created and initially assigned to the Azure service controller by the platform operator.

BSS_USER_ID

`BSS_USER_ID=<userId>`

The identifier of the user specified in `BSS_USER_KEY` for accessing OSCM.

BSS_USER_KEY

`BSS_USER_KEY=<userKey>`

The user key for accessing OSCM. You receive this key with the confirmation email for your user account. The user must have the technology manager role in OSCM and belong to the technology provider organization responsible for the service controller.

It is recommended that the user account is used only for carrying out actions on behalf of the service controller in OSCM.

BSS_USER_PWD

`BSS_USER_PWD=_crypt:<password>`

The password of the user for accessing OSCM.

Appendix B: Service Parameters and Operations

The following sections describe the technical service parameters and service operations which are supported by the Azure service controller.

You find a sample service on GitHub:
https://github.com/servicecatalog/oscm/tree/master/oscm-app-azure/resources.

Service Parameters

The Azure service controller supports the parameters below.

Note: All parameters defined in the technical service definition must be one-time parameters, since the modification of parameters is not supported. Be sure to set their `modificationType` to `ONE_TIME`.

APP_CONTROLLER_ID

Mandatory. The ID of the service controller as defined in its implementation. The ID is set during the installation of the Azure integration software.

Default (must not be changed): `ess.azureARM`

SUBSCRIPTION_ID

Mandatory. The ID of the subscription in Azure on the account of which the virtual machines and other resources are to be created.

Users should not be able to enter a value for this parameter. This means the parameter should not be configurable for customers.

Example: `1234a5d6-a7c8-909a-912b-34cd56e78901`

TENANT_ID

Mandatory. The ID of the tenant in Azure on the account of which the virtual machines and other resources are to be created. This is the directory ID of the Active Directory of the user or organization who owns the subscription specified in `SUBSCRIPTION_ID`.

Users should not be able to enter a value for this parameter. This means the parameter should not be configurable for customers.

Example: `9e8d7cb6-5432-1098-7654-3210a9876f54`

CLIENT_ID

Mandatory. The application ID of the application used to carry out the resource operations in Azure. For creating new resource groups, the application must have at least the Contributor role for the subscription specified in `SUBSCRIPTION_ID`. For creating virtual machines in existing resource groups, at least the Contributor role for these resource groups is required.

Users should not be able to enter a value for this parameter. This means the parameter should not be configurable for customers.

Example: `3cd456e7-890f-12ab-3c4d-5efa6b789c01`

CLIENT_SECRET

Mandatory. The authentication key generated in Azure for the application specified in
`SUBSCRIPTION_ID`. The key is only visible at the time it is created.

Users should not be able to enter a value for this parameter. This means the parameter should
not be configurable for customers.

Example: `XaNvrzqRRVFkjV5pVBG4CEwOPFERfakZaP2kKZf67t9`

REGION

Mandatory. The full name of the Azure region where the resource groups are or are to be
located.

Examples:

`Central US, Japan East, West Europe`

RESOURCE_GROUP_NAME

Mandatory. The name of the resource group that is to be created or in which virtual machines
are to be deployed. In the latter case, the resource group must exist with a complete network
configuration in Azure and be associated with the subscription specified in `SUBSCRIPTION_ID`.

Resource group names may consist of up to 64 alphanumeric characters, hyphen (-), and
underscore (_).

Example: `myservice-context-rg`

VIRTUAL_NETWORK

Mandatory. The name of the virtual network within the resource group specified in
`RESOURCE_GROUP` to which the virtual machines are to be assigned.

Virtual network names are case-insensitive. They may consist of 2-64 alphanumeric characters,
hyphen (-), underscore (_), and period (.).

Example: `myservice.vnet`

SUBNET

Mandatory. The name of the subnet within the virtual network specified in `VIRTUAL_NETWORK` to
which the virtual machines are to be assigned.

Subnet names are case-insensitive. They may consist of 2-80 alphanumeric characters, hyphen
(-), underscore (_), and period (.).

Example: `myservice-vnet-subnet1`

VIRTUAL_MACHINE_IMAGE_ID

Mandatory. The identifier of the virtual machine image that is to be used as the basis for provisioning the virtual machines. The image determines the operating system and other characteristics of the virtual machines.

The identifier must have the following format and components, separated by blanks:

`<publisher> <offer> <SKU>`

`<publisher>` is the identifier of the organization or person who provides the virtual machine image, `<offer>` is the offer by which it is made available, and `<SKU>` the commercial name of the image.

Users should not be able to enter a value for this parameter. This means the parameter should not be configurable for customers or, in case you specify more than one image, have fixed parameter options for selection.

Default:

`WindowsServer 2012-R2-Datacenter`

STORAGE_ACCOUNT

Mandatory. The name of the storage account to be used with the virtual machines.

Storage account names my consist of 3-24 lowercase letters and numbers. They must be unique within Azure.

Example: `mycompanyaccount2`

TEMPLATE_NAME

Mandatory. The name or relative path and name of the template to be used by Azure Resource Manager for provisioning the virtual machines and additional resources. The template must be in JSON format and detail everything needed to carry out the resource orchestration in Azure. The `TEMPLATE_NAME` is added to the `TEMPLATE_BASE_URL`.

Users should not be able to enter a value for this parameter. This means the parameter should not be configurable for customers or, in case you specify more than one template, have fixed parameter options for selection.

Default: `SampleTemplate.json`

TEMPLATE_PARAMETERS_NAME

Mandatory. The name or relative path and name of the parameter definition file to be used for passing the parameter values a user specifies at subscription time to the resource manager template. The file must be in JSON format and contain all the parameters required for provisioning the virtual machines and additional resources. The `TEMPLATE_PARAMETER_NAME` is added to the `TEMPLATE_BASE_URL`.

Users should not be able to enter a value for this parameter. This means the parameter should not be configurable for customers or, in case you specify more than one definition file, have fixed parameter options for selection.

Example: `SampleTemplate.parameters.json`

TEMPLATE_BASE_URL

Mandatory. The URL leading to the Resource Manager templates specified in the `TEMPLATE_NAME` and `TEMPLATE_PARAMETERS_NAME` parameters. Specify a URL that can be reached from OSCM by HTTP or HTTPS.

Users should not be able to enter a value for this parameter, i.e. it should not be configurable for customers.

Default:

```
https://raw.githubusercontent.com/servicecatalog/oscm/master/oscm-app-azure/resources/
```

VM_NAME

Mandatory. The name of the virtual machine to be provisioned. If more than one virtual machine is to be created, this name is used for all of them with a consecutive number appended to it, for example, `mymachine1`, `mymachine2`.

The name must be specified by customers when they subscribe to a corresponding service. It may consist of up to 15 alphanumeric characters, hyphen (-), and underscore (_).

Example: `mymachine`

INSTANCE_COUNT

Mandatory. The number of virtual machines to be provisioned.

Default: `1`

Service Operations

The Azure service controller supports the service operations below for virtual machines.

The `actionURL` for each operation is:

```
http://oscm-app:8880/oscm-app/webservices/oscm-app/oscm-app
        /org.oscm.app.v2_0.service.AsynchronousOperationProxy?wsdl
```

`<oscm-app>` and `<8880>` are the server and port of the container where the Azure service controller is deployed.

Note:	If you provision a virtual machine that does not support start and stop operations, make sure that you remove the service operations from the technical service definition.

START_VIRTUAL_SYSTEM

Starts all virtual machines created for a subscription if they were stopped.

STOP_VIRTUAL_SYSTEM

Stops all virtual machines created for a subscription if they were started.

Glossary

Administrator

A privileged user role within an organization with the permission to manage the organization's account and subscriptions as well as its users and their roles. Each organization has at least one administrator.

Application

A software, including procedures and documentation, which performs productive tasks for users.

Billing System

A system responsible for calculating the charges for using a service.

Broker

An organization which supports suppliers in establishing relationships to customers by offering the suppliers' services on a marketplace, as well as a privileged user role within such an organization.

Cloud

A metaphor for the Internet and an abstraction of the underlying infrastructure it conceals.

Cloud Computing

The provisioning of dynamically scalable and often virtualized resources as a service over the Internet on a utility basis.

Customer

An organization which subscribes to one or more marketable services in OSCM in order to use the underlying applications in the Cloud.

Infrastructure as a Service (IaaS)

The delivery of computer infrastructure (typically a platform virtualization environment) as a service.

Marketable Service

A service offering to customers in OSCM, based on a technical service. A marketable service defines prices, conditions, and restrictions for using the underlying application.

Marketplace

A virtual platform for suppliers, brokers, and resellers in OSCM to provide their services to customers.

Marketplace Owner

An organization which holds a marketplace in OSCM, where one or more suppliers, brokers, or resellers can offer their marketable services.

Marketplace Manager

A privileged user role within a marketplace owner organization.

Operator

An organization or person responsible for maintaining and operating OSCM.

Organization

An organization typically represents a company, but it may also stand for a department of a company or a single person. An organization has a unique account and ID, and is assigned one or more of the following roles: technology provider, supplier, customer, broker, reseller, marketplace owner, operator.

Organizational Unit

A set of one or more users within an organization representing, for example, a department in a company, an individual project, a cost center, or a single person. A user may be assigned to one or more organizational units.

OU Administrator

A privileged user role within an organization allowing a user to manage the organizational units for which he has been appointed as an administrator, and to create, modify, and terminate subscriptions for these units.

Payment Type

A specification of how a customer may pay for the usage of his subscriptions. The operator defines the payment types available in OSCM; the supplier or reseller determines which payment types are offered to his customers, for example payment on receipt of invoice, direct debit, or credit card.

Platform as a Service (PaaS)

The delivery of a computing platform and solution stack as a service.

Price Model

A specification for a marketable service defining whether and how much customers subscribing to the service will be charged for the subscription as such, each user assigned to the subscription, specific events, or parameters and their options.

Reseller

An organization which offers services defined by suppliers to customers applying its own terms and conditions, as well as a privileged user role within such an organization.

Role

A collection of authorities that control which actions can be carried out by an organization or user to whom the role is assigned.

Seller

Collective term for supplier, broker, and reseller organizations.

Service

Generally, a discretely defined set of contiguous or autonomous business or technical functionality, for example an infrastructure or Web service. OSCM distinguishes between technical services and marketable services, and uses the term "service" as a synonym for "marketable service".

Service Manager

A privileged user role within a supplier organization.

Standard User

A non-privileged user role within an organization.

Software as a Service (SaaS)

A model of software deployment where a provider licenses an application to customers for use as a service on demand.

Subscription

An agreement registered by a customer for a marketable service in OSCM. By subscribing to a service, the customer is given access to the underlying application under the conditions defined in the marketable service.

Subscription Manager

A privileged user role within an organization with the permission to create and manage his own subscriptions.

Supplier

An organization which defines marketable services in OSCM for offering applications provisioned by technology providers to customers.

Technical Service

The representation of an application in OSCM. A technical service describes parameters and interfaces of the underlying application and is the basis for one or more marketable services.

Technology Manager

A privileged user role within a technology provider organization.

Technology Provider

An organization which provisions applications as technical services in OSCM.