

FUJITSU Software Enterprise Service Catalog Manager V19.0

A horizontal band featuring a red abstract graphic with flowing, curved lines and a bright light source, creating a sense of motion and energy.

Microsoft Azure Integration

July 2020

Trademarks

LINUX is a registered trademark of Linus Torvalds.

Microsoft, Active Directory, Azure, and Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Open Service Catalog Manager is a registered trademark of FUJITSU LIMITED.

The OpenStack Word Mark and OpenStack logo are registered trademarks/service marks or trademarks/service marks of the OpenStack Foundation in the United States and other countries.

Apache Tomcat, Tomcat, and Apache are trademarks of The Apache Software Foundation.

Java is a registered trademark of Oracle and/or its affiliates.

Other company and product names are trademarks or registered trademarks of their respective owners.

Copyright FUJITSU
ENABLING SOFTWARE
TECHNOLOGY GMBH
2020

All rights reserved, including those of translation into other languages. No part of this manual may be reproduced in any form whatsoever without the written permission of FUJITSU ENABLING SOFTWARE TECHNOLOGY GMBH.

High Risk Activity

The Customer acknowledges and agrees that the Product is designed, developed and manufactured as contemplated for general use, including without limitation, general office use, personal use, household use, and ordinary industrial use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss (hereinafter "High Safety Required Use"), including without limitation, nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system. The Customer shall not use the Product without securing the sufficient safety required for the High Safety Required Use. In addition, FUJITSU (or other affiliate's name) shall not be liable against the Customer and/or any third party for any claims or damages arising in connection with the High Safety Required Use of the Product.

Export Restrictions

Exportation/release of this document may require necessary procedures in accordance with the regulations of your resident country and/or US export control laws.

Contents

| | | |
|-----------------|---|-----------|
| | About this Manual..... | 4 |
| 1 | Introduction..... | 6 |
| 1.1 | Components Involved in the Azure Integration..... | 6 |
| 1.2 | Usage Scenarios..... | 7 |
| 2 | Creating and Publishing Services..... | 8 |
| 2.1 | Prerequisites and Preparation..... | 8 |
| 2.2 | Creating Technical Services..... | 9 |
| 2.3 | Creating and Publishing Marketable Services..... | 9 |
| 3 | Using Azure Services in ESCM..... | 10 |
| 3.1 | Subscribing to Services..... | 10 |
| 3.2 | Executing Service Operations..... | 11 |
| 3.3 | Terminating Subscriptions..... | 11 |
| 4 | Administering the Azure Integration..... | 12 |
| 4.1 | Controlling the Provisioning Process..... | 12 |
| 4.2 | Handling Problems in the Provisioning Process..... | 12 |
| 4.3 | Updating Service Controller Settings in the Database..... | 13 |
| 4.4 | Changing the Responsible Organization..... | 14 |
| | Appendix A Service Parameters and Operations..... | 15 |
| Glossary | | 19 |

About this Manual

This manual describes the integration of Microsoft Azure with) FUJITSU Software Enterprise Service Catalog Manager, hereafter referred to as ESCM.

This manual is structured as follows:

| Chapter | Description |
|---|--|
| <i>Introduction</i> on page 6 | Provides an overview of the ESCM Azure integration, the components involved, and the supported usage scenarios. |
| <i>Creating and Publishing Services</i> on page 8 | Describes how to create and publish services for Azure in ESCM. |
| <i>Using Azure Services in ESCM</i> on page 10 | Describes how to provision and deprovision virtual machines in Azure through services in ESCM. |
| <i>Administering the Azure Integration</i> on page 12 | Describes administration tasks related to the ESCM Azure integration software. |
| <i>Service Parameters and Operations</i> on page 15 | Describes the technical service parameters and service operations which are supported by the Azure service controller. |

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 ESCM. It assumes that you have access to an existing ESCM 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 ESCM.

Notational Conventions

This manual uses the following notational conventions:

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

Abbreviations

This manual uses the following abbreviations:

| | |
|-------------|--|
| ARM | Azure Resource Manager |
| APP | Asynchronous Provisioning Platform |
| ESCM | Enterprise Service Catalog Manager |
| DBMS | Database Management System |
| IaaS | Infrastructure as a Service |
| JSON | JavaScript Object Notation |
| WSDL | Web Services Description Language |
| WSIT | Web Services Interoperability Technologies |

Available Documentation

The following documentation on ESCM is available:

- *Overview*: A PDF manual introducing ESCM. It is written for everybody interested in ESCM and does not require any special knowledge.
- *Operator's Guide*: A PDF manual for operators describing how to administrate and maintain ESCM.
- *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 ESCM.
- *Supplier's Guide*: A PDF manual for suppliers describing how to define and manage service offerings for applications that have been integrated with ESCM.
- *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 ESCM.
- *Microsoft Azure Integration*: A PDF manual for operators describing how to offer and use virtual systems controlled by Microsoft Azure through services in ESCM.
- *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 ESCM.
- *OpenStack Integration*: A PDF manual for operators describing how to offer and use virtual systems controlled by OpenStack through services in ESCM.
- *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 ESCM.
- *Shell Integration*: A PDF manual for operators describing how to use Shell scripts through services in ESCM.
- *Online Help*: Online help pages describing how to work with the administration portal of ESCM. The online help is intended for and available to everybody working with the administration portal.

1 Introduction

Enterprise Service Catalog Manager (ESCM) 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.

The integration of Azure with ESCM 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 ESCM, users can request and use virtual machines in Azure. The usage costs can be calculated and charged by means of the ESCM billing and payment services.

When ESCM is deployed, it includes all components required to connect with Azure. This manual describes how to request and use virtual machines in Azure on an ESCM marketplace.

1.1 Components Involved in the Azure Integration

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



In ESCM, customer subscriptions are managed by means of the **Subscription service**. When a customer creates or terminates a subscription for a virtual machine in Azure, the Subscription service asynchronously triggers the corresponding actions in Azure through the **Asynchronous Provisioning Platform (APP)** and the **Azure service controller**: The 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 ESCM in asynchronous mode. The actual communication with the applications is carried out by service controllers. When APP is deployed (`oscm-app` container), an Azure service controller is also deployed and initialized. It is preconfigured and registered with APP. This service controller

can be used for integrating Azure services with ESCM. 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).

1.2 Usage Scenarios

The ESCM 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 ESCM 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 ESCM 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 ESCM independent of whether the deletion in Azure is successful.

In Azure, the virtual machines and resource groups created for ESCM 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 ESCM* on page 10.

2 Creating and Publishing Services

The following sections describe how to create and publish services in ESCM 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 ESCM:

- To create technical services for the Azure integration in ESCM, you must have access to ESCM as a technology manager. You must be a member of the technology provider organization responsible for the Azure service controller as specified in the configuration settings for the installation.
- 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 created, 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-app/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 ESCM 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-app/tree/master/oscm-app-azure/resources/`

Template file name: `SampleTemplate.json`

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

- To create marketable services for the Azure integration in ESCM, you must have access to ESCM 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 ESCM in your service manager role.

2.2 Creating Technical Services

The first step in providing ESCM services for Azure 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/tree/master/oscm-app-azure/resources>.

In the technical service definition, be sure to specify:

- The asynchronous provisioning type
2. Log in to the ESCM 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 ESCM.

2.3 Creating and Publishing Marketable Services

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

Proceed as follows:

1. Log in to the ESCM administration portal with your service manager account.
2. Define one or more marketable services based on the technical services you created for Azure.
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 ESCM.

3 Using Azure Services in ESCM

The following sections describe how users can subscribe to and work with the services you have created for Azure in ESCM. You will find details of the supported usage scenarios outlined in *Usage Scenarios* on page 7.

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 ESCM 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 ESCM 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 ESCM.

3.2 Executing Service Operations

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

- **Start:** Starts all servers in the Azure instance that were stopped.
- **Stop:** Stops all servers in the Azure instance that were started.
- **Suspend:** Suspends the Azure instance.
- **Resume:** Resumes the Azure 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 ESCM marketplace.

3.3 Terminating Subscriptions

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

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

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 Azure integration provides you with the following feature for controlling the

In the definition of the technical services for Azure, 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 Azure 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 ESCM 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 Azure or in the communication. For example, you could remove an incomplete resource, or you could restore a missing connection.

After solving the problem, the Azure integration components and ESCM 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 by opening its URL in a Web browser.

The access URL has the following format:

```
https://<host_fqdn>:8881/oscm-app/controller/?controllerid=ess.azureARM
```

<host_fqdn> is the fully qualified name or IP address of the host used to access

ESCM, 8881 is the port of APP. Omit the port if ESCM is operated with its proxy.

oscm-app/controller/?controllerid=ess.azureARM 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 an Azure instance in APP.
- `DELETE` - to terminate the subscription in ESCM 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 ESCM, 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 ESCM. ESCM 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 ESCM. ESCM 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 the deployment of ESCM, 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. The platform operator is responsible for taking care that the initial settings are correct. Refer to the *Operator's Guide* for details on the initial configuration in the `var.env` configuration 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.

To update the controller configuration settings in the APP database:

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

The access URL has the following format:

```
https://<host_fqdn>:8881/oscm-app-azure
```

<host_fqdn> is the fully qualified name or IP address of the host used to access ESCM, 8881 is the port of APP. Omit the port if ESCM is operated with its proxy. `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 (`BSS_USER_ID` and `BSS_USER_PWD`) or as another technology manager registered for the same organization.
3. The following settings can be changed:
 - **User ID:** The identifier of the user responsible for the Azure service controller.
 - **User Key:** The user key for accessing ESCM. You receive this key with the confirmation email for your user account. The user must have the technology manager role in ESCM 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 ESCM.
 - **Password:** The password of the user for accessing ESCM.
4. 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://<host_fqdn>:8881/oscm-app
```

<host_fqdn> is the fully qualified name or IP address of the host used to access ESCM, 8881 is the port of APP. Omit the port if ESCM is operated with its proxy. `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, `ess.azureARM`.
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 ESCM must be changed in the controller configuration settings.

Appendix A: 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-app/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 may 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 ESCM 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.

Example:

```
https://github.com/servicecatalog/oscm-app/tree/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 ESCM 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 ESCM, 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 ESCM to provide their services to customers.

Marketplace Owner

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

Marketplace Manager

A privileged user role within a marketplace owner organization.

OIDC

An authentication mode of ESCM where users are managed and authenticated by means of OpenID Connect in an external system such as Microsoft Azure Active Directory, the so-called OIDC provider.

OIDC Tenant

An entity in ESCM representing a configuration of settings and parameters required to connect to a specific tenant at an OIDC provider, for example, a specific domain and directory in Microsoft Azure Active Directory.

Operator

An organization or person responsible for maintaining and operating ESCM.

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 ESCM; 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. ESCM 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 ESCM. 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 ESCM for offering applications provisioned by technology providers to customers.

Technical Service

The representation of an application in ESCM. 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 ESCM.