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OpenStack Integration

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About this Manual

This manual describes the integration of OpenStack, an open-source cloud operating system, with Open Service Catalog Manager (OSCM) .

This manual is structured as follows:

Chapter	Description
Introduction on page 6	Provides an overview of the OSCM OpenStack integration, the components involved, and the supported usage scenarios.
Creating and Publishing Services on page 9	Describes how to create and publish services for OpenStack in OSCM.
Using OpenStack Services in OSCM on page 11	Describes how to provision and deprovision virtual systems in OpenStack through services in OSCM.
Administrating the OpenStack Integration on page 13	Describes administration tasks related to the OSCM OpenStack integration software.
Controller Configuration Settings on page 18	Describes the configuration settings for the OpenStack integration software.
Service Parameters and Operations on page 20	Describes the technical service parameters and service operations which are supported by the OpenStack service controller.

The descriptions of services and usage scenarios also apply to FUJITSU Cloud Service K5, a cloud platform based on OpenStack and integrated with OSCM.

Readers of this Manual

This manual is intended for technology managers and providers who want to offer virtual systems controlled by OpenStack through services on a marketplace provided by OSCM. It assumes that you have access to an existing OSCM installation and an OpenStack Web server. In addition, you should have basic knowledge of OpenStack 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:

APP	Asynchronous Provisioning Platform
DBMS	Database Management System
IaaS	Infrastructure as a Service
IdP	SAML Identity Provider
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.
- *OpenStack Integration:* A PDF manual for operators describing how to offer and use virtual systems controlled by OpenStack 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.
- *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.

OpenStack is an open-source cloud operating system that controls large pools of processing, storage, and networking resources throughout a data center. It is managed by the OpenStack Foundation.

OpenStack allows users to deploy virtual systems which handle different tasks for managing a cloud environment. It makes horizontal scaling easy, which means that tasks which benefit from running concurrently can easily serve users by spinning up more resources. For example, a mobile application which needs to communicate with a remote server might be able to divide the work of communicating with each user across many different resources, all communicating with one another but scaling quickly and easily as the application gains more users.

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 OpenStack 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 systems in OpenStack. 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 OpenStack service controller is preconfigured and registered with the asynchronous provisioning platform (APP). This service controller can be used for integrating OpenStack services with OSCM.

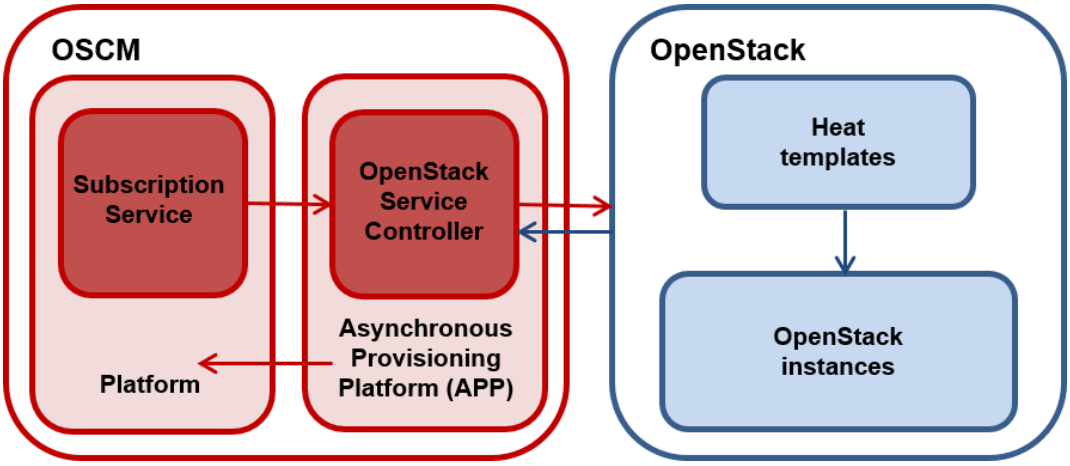
APP also includes the operation service interface for executing technical service operations on the integrated applications from the OSCM user interface.

The OpenStack service controller includes all components required for connecting an existing OSCM installation with OpenStack. This manual describes how to create and use services for OpenStack on an OSCM marketplace.

FUJITSU Cloud Service K5 is a cloud platform based on OpenStack and integrated with OSCM. The descriptions of services and usage scenarios also apply to this platform.

1.1 Components Involved in the OpenStack Integration

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



In OSCM, customer subscriptions are managed by means of the **Subscription service**. When a customer creates or terminates a subscription for a virtual system in OpenStack, the Subscription service asynchronously triggers the corresponding actions in OpenStack through the **Asynchronous Provisioning Platform (APP)** and the **OpenStack service controller**: Virtual systems are created or deleted in OpenStack. Refer to the *Technology Provider's Guide* for details on APP.

Heat, the orchestration component provided by OpenStack, offers template-based mechanisms for describing cloud applications. Through both an OpenStack REST API and a CloudFormation-compatible Query API, Heat provides compatibility with existing template formats. The integration of OpenStack with OSCM supports the AWS CloudFormation Template and the Heat Orchestration Template.

A template enables application developers to describe and automate the deployment of infrastructure, services, and applications. Collections of resources (e.g. networks, servers, or storage) can be deployed from a single template. The template serves as an orchestration document that details everything needed to carry out the orchestration. Once instantiated, the resources are also referred to as stacks.

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

1.2 Usage Scenarios

The OSCM OpenStack integration supports the following usage scenarios:

- **Provisioning of a virtual system**: When a customer subscribes to a corresponding service on an OSCM marketplace, the service controller triggers OpenStack to create an OpenStack instance based on a specific template.
- **Suspending and resuming a virtual system**: A customer can explicitly suspend and resume an OpenStack instance by executing a service operation at the corresponding subscription.

- **Starting and stopping servers**: A customer can explicitly start and stop all the servers in an OpenStack instance by executing a service operation at the corresponding subscription.
- **Deletion of a virtual system**: When a customer terminates a subscription for an OpenStack instance, the service controller triggers OpenStack to delete the instance. The subscription is terminated in OSCM independent of whether the deletion is successful in OpenStack.

In OpenStack, the virtual systems created for OSCM subscriptions are managed in the same way as other virtual systems. They can be viewed and monitored with the available OpenStack tools.

Modifying a subscription and thereby triggering modifications of the virtual system in OpenStack is not supported. For more details on the supported usage scenarios, refer to *Using OpenStack Services in OSCM* on page 11.

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 systems in OpenStack.

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 OpenStack 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 OpenStack service controller as specified in the configuration settings for the installation.
- Templates for the virtual systems to be provisioned must exist. They form the basis for the technical services in OSCM.

  Templates can be provided by the technology provider organization responsible for the OpenStack service controller by importing the templates into the <codeph>bssapp</codeph> database.

  Refer to *Providing Templates for the Provisioning of Resources* on page 16 for details.
- The user specified in the configuration settings for the installation must have the necessary credentials to create and configure virtual systems for your organization based on these templates in OpenStack.

  In FUJITSU Cloud Service K5, the `cpf_systemowner` role is required.
- To create marketable services for the OpenStack 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 OpenStack is to create one or more technical services.

Proceed as follows:

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

   Templates can be specified as parameter options in the technical service definitions. You need to make them available as described in *Providing Templates for the Provisioning of Resources* on page 16.

   In the technical service definition, be sure to specify:

   - The asynchronous provisioning type
   - The direct access type
   - Service parameters which correspond to the parameters specified in the template defined in OpenStack. For details on the supported service parameters, refer to *Service Parameters and Operations* on page 20.
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 OpenStack 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 the virtual systems.

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 OpenStack.
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 OpenStack Services in OSCM

The following sections describe how users can subscribe to and work with the services you have created for OpenStack in OSCM. 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 OpenStack on the marketplace where you have published them. This results in the provisioning of a virtual system in OpenStack, as defined in the underlying technical service.

To enable the provisioning of an OpenStack instance, the customer has to enter the name of the key pair of the virtual system when subscribing to the corresponding service in OSCM. The key pair name and the associated private key are used to securely access the OpenStack instance. For details on creating key pairs, refer to the user documentation of OpenStack.

When subscribing to a service, the customer also has to enter a name for the stack to be instantiated. Before the provisioning operation is started, the name is checked against the OpenStack conventions or a pattern specified in the technical service definition. OpenStack generates a random number that is appended to this stack name to make it unique.

Depending on the service parameters, the technical service either maps to one specific template or the customer can choose from different templates that specify the resource orchestration in OpenStack.

Depending on the parameters defined for the technical service, the customer can additionally choose from different options to configure the resources for the instance to be provisioned, for example, the instance type, the number of CPUs, or the storage size.

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.

As soon as the provisioning is complete, the users assigned to the subscription can access the virtual system provided by OpenStack using the access information indicated in the subscription details on the marketplace in OSCM.

In OpenStack, the virtual systems created for OSCM subscriptions are managed in the same way as other instances. They can be viewed and monitored with the standard OpenStack tools. Changes, however, should not be made as this may cause problems and inconsistencies between OpenStack 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 OpenStack Integration

The following sections describe administration tasks you may need to perform in your role as an operator of the OpenStack service controller.

4.1 Controlling the Provisioning Process

The OpenStack integration provides you with the following feature for controlling the provisioning and deprovisioning of virtual systems:

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

If you specify this parameter, the OpenStack 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 a virtual system fails on the OpenStack side or if there are problems in the communication between the participating systems, the corresponding subscription in OSCM remains pending. The OpenStack service controller informs the technology managers of its responsible technology provider organization by email of any incomplete provisioning or delete operation in OpenStack.

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

After solving the problem, the OpenStack 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 OpenStack service controller.
2. Invoke the instance status interface of APP for the 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/controller/?controllerid=ess.openstack`

   `<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.openstack` 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 OpenStack 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 OpenStack does not respond.
   - `UNLOCK` - to remove the lock for an OpenStack instance in APP.
   - `DELETE` - to terminate the subscription in OSCM and remove the instance in APP, but keep the virtual system in OpenStack 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 virtual system in OpenStack. 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 OpenStack, 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 OpenStack service controller and its registration with APP. It is up to the platform operator for taking care that the initial settings are correct.

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 settings in the APP database:

1. Invoke the instance status interface of APP for the OpenStack 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-openstack`

   `<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-openstack` 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 OpenStack 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. The following settings can be changed:
   - **User ID**: The identifier of the user responsible for the OpenStack service controller.
   - **User Key**: 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.

   - **Password**: The password of the user for accessing OSCM.
   - **API User**: The user name to be used to access the tenant for your organization in OpenStack. Once authenticated, this user is authorized to access the Heat API.

     The user must have the necessary credentials to create and configure virtual systems for the tenant. In FUJITSU Cloud Service K5, the `cpf_systemowner` role is required.

   - **API Password**: The password of the user for accessing the tenant in OpenStack.
   - **Keystone API URL**: The URL of the Keystone API for authenticating the user specified in `API_USER_NAME`. Keystone is the identity service used by OpenStack.

     The URL of the Keystone API can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

   - **Tenant ID**: The identifier of the tenant for your organization in OpenStack. The tenant is specified in each request to the Heat API.

     The tenant ID can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

   - **Domain Name**: The name of the Keystone domain to use. A domain is a container for projects, users, and groups in the OpenStack environment. If not specified, the default Keystone domain is used (name: `default`).

     The domain name can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

   - **Template Base URL**: The URL leading to the templates that are mapped to technical service definitions. The file names of the templates to be used are specified when customers subscribe to a corresponding service on an OSCM marketplace.

     The template URL can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

- **Service templates**: Click **Browse** and import the template files to be used for the provisioning of virtual resources into the `bssapp` database. Refer to *Providing Templates for the Provisioning of Resources* on page 16 for details.

4. Save the settings.

4.4 Providing Templates for the Provisioning of Resources

Templates for the provisioning of virtual resources can be imported into the `bssapp` database so that they can be referenced in technical service definitions.

To provide templates:

1. Invoke the instance status interface of APP for the Openstack 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-openstack`

   `<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-openstack` 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 OpenStack service controller (`BSS_USER_ID` and `BSS_USER_PWD`) or as another technology manager registered for the same organization.
3. Click in the **File name** field or click **Browse**, and select the file containing the desired template.
4. Click **Import**.

If a template with the same name is imported twice, the original (first) one is replaced by the second one.

The OpenStack integration software looks for the template with the name specified in the technical service definition (`TEMPLATE_NAME` service parameter) as follows:

1. The template is searched for in the `bssapp` database.
2. If it is not found, the template is searched for in the location specified in the `TEMPLATE_BASE_URL` controller configuration setting.

4.5 Changing the Responsible Organization

You can change the technology provider organization responsible for the OpenStack 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 OpenStack service controller, `ess.openstack`.

4. Save the settings.
5. Make sure that the configuration settings for the OpenStack 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 14.

CONTROLLER_ID

`CONTROLLER_ID=ess.openstack`

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 OpenStack 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.

API_USER_NAME

`API_USER_NAME=<userName>`

The user name to be used to access the tenant for your organization in OpenStack. Once authenticated, this user is authorized to access the Heat API.

The user must have the necessary credentials to create and configure virtual systems for the tenant. In FUJITSU Cloud Service K5, the `cpf_systemowner` role is required.

API_USER_PWD

`API_USER_PWD=_crypt:<password>`

The password of the user for accessing the tenant in OpenStack.

Replace `<password>` with the plain text password which is valid for the user given in `API_USER_NAME`. The password is encrypted when it is stored in the database.

KEYSTONE_API_URL

`KEYSTONE_API_URL=https://<keystone endpoint>/<version>/auth`

The URL of the Keystone API for authenticating the user specified in `API_USER_NAME`. Keystone is the identity service used by OpenStack.

Replace `<keystone endpoint>` with the URL leading to the Keystone API. Replace `<version>` with the API version to use, currently `v3`. HTTP and HTTPS are supported.

The URL of the Keystone API can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

TEMPLATE_BASE_URL

`TEMPLATE_BASE_URL=https://<app>/templates/`

The URL leading to the templates that are mapped to technical service definitions. The file names of the templates to be used are specified when customers subscribe to a corresponding service on an OSCM marketplace.

Replace `<app>` with an URL that can be reached from OSCM by HTTP or HTTPS (when stored on an external host).

The template URL can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

Note: First, the `bssapp` database is searched for the template specified with the `TEMPLATE_NAME` service parameter in the technical service definition. Only if the template is not found in the database, the `TEMPLATE_BASE_URL` setting is evaluated.

TENANT_ID

`TENANT_ID=<tenant>`

The identifier of the tenant for your organization in OpenStack. The tenant is specified in each request to the Heat API.

The tenant ID can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

DOMAIN_NAME

`DOMAIN_NAME=<domain>`

Optional. The name of the Keystone domain to use. A domain is a container for projects, users, and groups in the OpenStack environment. If not specified, the default Keystone domain is used (name: `default`).

The domain name can also be specified as a parameter in technical service definitions. The technical service parameter overrides the setting you specify here.

Appendix B: Service Parameters and Operations

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

Service Parameters

The OpenStack 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.

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

ACCESS_INFO_PATTERN

Mandatory. The access information to be output in the subscription details on the marketplace as soon as the provisioning is complete. This information must give all the details the customer needs to access a provisioned instance, e.g. an IP address and a key pair name.

The information must correspond to the output parameters specified in the template file. If the values do not match, the subscription is rejected.

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

Example: `Key pair name: {KP_Out}; IP: {IP_Out}`

MAIL_FOR_COMPLETION

Optional. The address to which emails are to be sent that describe manual steps required to complete an operation. If you specify this parameter, the service controller interrupts the processing of each operation before its completion and waits for a notification about the execution of a manual action. Omit this parameter if you do not want to interrupt the processing.

Example: `info@company.com`

STACK_NAME

Mandatory. The name of the virtual system to be instantiated. This name must be specified by customers when they subscribe to a corresponding service.

The name is restricted to 30 characters. It must start with a letter and only contain the following characters: Letters `A-Z` and `a-z`, numbers `0-9`, hyphen `-`, underscore `_`, period `.`

OpenStack generates a random number that is appended to the name to make it unique.

Example: `MySystem`

STACK_NAME_PATTERN

Optional. A regular expression specifying a pattern for the stack names entered by the users when they subscribe to a corresponding service. If the names do not match the pattern, the subscription is rejected.

Stack names must comply with both, the pattern specified here and the general naming conventions (see the description of `STACK_NAME`). If no pattern is given, the general conventions apply.

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

Example: `(host_[0-9]*){1,30}`

TEMPLATE_BASE_URL

Optional. The URL leading to the template file or files specified in the `TEMPLATE_NAME` parameter. Specify a URL that can be reached from OSCM by HTTP or HTTPS (when stored on an external host).

If not specified, the URL is obtained from the controller configuration settings.

Note: First, the `bssapp` database is searched for the template specified with the `TEMPLATE_NAME` service parameter in the technical service definition. Only if the template is not found in the database, the `TEMPLATE_BASE_URL` setting is evaluated.

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

Example: `https://myserver:8881/oscm-app/docroot/templates/`

TEMPLATE_NAME

Mandatory. The name or relative path and name of the template file which forms the basis for the OpenStack instance to be instantiated. The `TEMPLATE_NAME` is added to the `TEMPLATE_BASE_URL` specified in the technical service definition or in the controller configuration settings.

The template file details everything needed to carry out the resource orchestration in OpenStack. The template must be specified by customers when they subscribe to a corresponding service.

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.

Example: `MyTemplate.json`

TENANT_ID

Optional. The identifier of the tenant for your organization in OpenStack. The tenant is specified in each request to the Heat API.

If not specified, the tenant ID is obtained from the controller configuration settings.

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

Example: `6f4c1e4cbfef4d5a8a1345882fbca110`

KEYSTONE_API_URL

Optional. The URL of the Keystone API for authenticating the user specified to access the tenant for your organization in OpenStack. Keystone is the identity service used by OpenStack.

Specify the URL according to the following format:

`https://<keystone endpoint>/<version>/auth`

`<keystone endpoint>` is the URL leading to the Keystone API, `<version>` the API version to use, currently `v3`.

If not specified, the URL is obtained from the controller configuration settings.

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

Example: `https://my.keystone.com:5000/v3/auth`

DOMAIN_NAME

Optional. The name of the Keystone domain to use. A domain is a container for projects, users, and groups in the OpenStack environment.

If not specified, the domain is obtained from the controller configuration settings. If it is not specified there either, the default Keystone domain is used (name: `default`).

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

Example: `mydomain`

TP_ImageId

Mandatory. The virtual machine image for the instance to be instantiated. Any valid OpenStack image can be specified.

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.

Example: `cedarish` for a cedar image.

TP_InstanceType (OpenStack) / **TP_flavor** (FUJITSU Cloud Service K5)

Mandatory. The flavor for the instance to be instantiated. The flavor defines the compute, memory, and storage capacity. Any valid OpenStack flavor can be specified.

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 flavor, have fixed parameter options for selection.

Example: `m1.small`

TP_KeyName

Mandatory. The key pair name of the instance to be instantiated.

The key pair name must be specified by the customer when subscribing to an OpenStack service. To log in to the instance, the customer must enter the key pair name and the associated private key.

For details on creating key pairs, refer to the user documentation of OpenStack.

Example: `my-key-pair`

TP_*

Optional. Any number of parameters that are mapped from the parameters defined in the template file. The parameters in the template file detail everything needed to carry out the resource orchestration in OpenStack. For each parameter in the template file, there must be a corresponding parameter in the technical service definition.

The parameter names must correspond to the names in the template file. The string `TP_` must be prepended to the name. If the names do not match this pattern, the subscription is rejected.

Service Operations for OpenStack Instances

The OpenStack service controller supports the service operations below for the OpenStack instances.

The `actionURL` for each operation is:

`https://oscm-app:8881/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 OpenStack service controller is deployed.

SUSPEND_VIRTUAL_SYSTEM

Suspends the OpenStack instance.

RESUME_VIRTUAL_SYSTEM

Resumes the OpenStack instance if it was suspended.

START_VIRTUAL_SYSTEM

Starts all servers in the OpenStack instance that were stopped. For this operation, a timeout value can be configured in the controller configuration settings.

STOP_VIRTUAL_SYSTEM

Stops all servers in the OpenStack instance that were started. For this operation, a timeout value can be configured in the controller configuration settings.

Note: If you provision virtual systems that do not support some of these operations or do not contain servers that can be started and stopped, make sure that you remove the corresponding service operations from the technical service definition.

FUJITSU Cloud Service K5 does not support the `SUSPEND_VIRTUAL_SYSTEM` and `RESUME_VIRTUAL_SYSTEM` operations.

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.