IBM SmartCloud Orchestrator V2.3.0.1

IBM Cloud Orchestrator Development Kit for Integration Toolkits V1.0.0

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Note

Before using this information and the product it supports, read the information in “Notices” on page 11.

Contents

Preface

This publication documents how to use the IBM Cloud Orchestrator Development Kit for Integration Toolkits.

Audience

This information is intended for content developers of SmartCloud Orchestrator who implement or customize the IBM Cloud Orchestrator Development Kit for Integration Toolkits.

IBM Cloud Orchestrator Development Kit for Integration Toolkits

Using the IBM Cloud Orchestrator Development Kit for Integration Toolkits, you can easily create a content pack. This software development kit (SDK) is an Eclipse plug-in that you can run on your Eclipse installation

Creating new content packs for IBM SmartCloud Orchestrator might be challenging because it requires specific knowledge of both IBM Business Process Manager and IBM SmartCloud Orchestrator. This content pack helps you create new content packs in a quick, reliable, and repeatable way.

You can create integration APIs in Business Process Manager through a user interface or automatically, relying on declarative API definitions that are compliant to common open standards. It creates processes that wrap the integration APIs and make them compliant to IBM Cloud Orchestrator standards. It creates basic user interfaces, for example, human services, to drive the created processes.

It also creates the corresponding self-service offerings that expose the created artifacts in the IBM SmartCloud Orchestrator self-service catalog.

Current release capabilities

- Generation of the integration APIs

Planned release capabilities

- Generation of the processes and human services starting from the integration APIs
- Generation of the catalog offerings definition

Supported versions

- IBM SmartCloud Orchestrator version 2.3.0.1
- Eclipse version 3.8.2, 32-bit on Windows operating systems
- Java Runtime Environment (JRE) version 1.7

Installing

You can download and install the content pack.

Perform the following steps:

1. Download the content pack from the IBM Cloud Orchestrator Catalog: `SDK_Content_Pack.zip`.
2. To install the content pack, decompress the file into the eclipse `plugins` directory: `<ECLIPSE_HOME>/plugins`
3. Start Eclipse. You see **Cloud Orchestrator** in the menu.

Attention:

Ensure that you use the correct level of JRE and Eclipse. If you are not using the correct levels, you might not see the **Cloud Orchestrator** menu item after installation.

To identify the problem, open the **Plug-in development** perspective in Eclipse and from the Console view, run **Host osgi console**. You can use the osgi command prompt to list the available plug-ins ("lb" command) and run the SDK service using the related service ID ("start" command). In case of failure, the osgi framework details the error.

Toolkit scenarios

There are a number of scenarios that are immediately available from the toolkit.

Start the following scenarios from the **Cloud Orchestrator** menu:

- "Saving the settings"
- "Opening the IBM Cloud Orchestrator Catalog"
- "Opening the Developers Corner"
- "Creating a content pack from integration APIs"

Saving the settings

You can save settings on the Business Process Manager server where the content pack is installed.

To enter or change settings, click **Settings...** in the **Cloud Orchestrator** menu.

You can add or change the following settings:

- Business Process Manager server IP address
- User name of the user who has permissions to access the Business Process Manager server
- Password of the user who has permissions to access the Business Process Manager server
- User name of the user who has permissions to import toolkits into the Business Process Manager server
- Password of the user who has permissions to import toolkits into the Business Process Manager server

To save the configuration file in the Eclipse workspace, click **OK**.

Opening the IBM Cloud Orchestrator Catalog

You can open the IBM Cloud Orchestrator Catalog in a browser.

To open the IBM Cloud Orchestrator Catalog in a browser, click **Cloud Marketplace** in the **Cloud Orchestrator** menu.

Opening the Developers Corner

You can open the Developers Corner in a browser.

To open the Developers Corner in a browser, click **Developers Corner** in the **Cloud Orchestrator** menu.

Creating a content pack from integration APIs

You can create a content pack with integration services.

To create a content pack, click **Create a Content Plug-in...**. A wizard guides you through the process of creating a new content pack. In the wizard, you can see

what the content pack and artifacts are. The wizard implements the create of the integration services that execute REST API calls.

The final page of the wizard is where you enter information about creating the toolkit. Complete the following fields:

Name The name used to identify the toolkit in the Business Process Manager designer.

Acronym
The unique identifier of the toolkit.

Endpoint
The endpoint that provides the REST APIs. This field is optional. It is used for test purposes because it is the default value assigned to the endpoint variable in the generated integration service.

Endpoint user
The user who has permissions to access the endpoint services. This field is optional. It is used for test purposes because it is the default value assigned to the endpoint variable in the generated integration service.

Endpoint password
The password of the user. This field is optional. It is used for test purposes because it is the default value assigned to the endpoint variable in the generated integration service.

REST APIs
A table containing the definition of the REST APIs. For each row, an integration service is created that executes a REST API.

The REST APIs table contains the following columns:

REST API Name
The name of the integration service that is created in the new toolkit for that REST API.

Method
The standard HTTP methods, for example, GET, PUT, POST, or DELETE.

URI The base URI. It can be parametric, for example: /resources/{vSysId}, in which case a private variable is created for the integration service, and the URI contains the value of the variable.

Accept
The internet media type for the response data. This can be a JSON or an XML or other valid internet media type. The fields contains a list of possible values, but the user is free to insert other values.

ContentType
The internet media type for the request data. This can be a JSON or an XML or other valid internet media type. The fields contains a list of possible values, but the user is free to insert other values.

Content

The content that is sent for PUT and POST requests. It can be parametric.

For example, {body}. In this case, an input variable named body is created in the integration service and the actual content has the value of the variable.

It is also possible to define templates for the content where a predefined value including parameter can be assigned. For example, the text below is a template for Keystone authentication based on a user ID and password:

```
\{
    "auth": \{
        "identity": \{
            "methods": [
                "password"
            ],
            "password": \{
                "user": \{
                    "id": "{user_id}",
                    "password": "{psw}"
                \}
            \}
        \},
        "scope": \{
            "project": \{
                "domain": \{
                    "name": "Default"
                \},
                "name": "admin"
            \}
        \}
    \}
\}
```

In this case, the input variables named *user_id* and *psw* are created in the integration service and their value is used to fill the template before submitting it. Because '{' and '}' are reserved keywords, the template uses the escaping character '\' to represent them.

Credentials
If checked, the REST API uses Base Authentication. Two private variables are created in the toolkit: one for the user and another for the password.

To manage the REST API table, you have the following options:

Import from file
Click to browse for a Web Application Description Language (WADL) file. The WADL file must contains the definition of the REST APIs. For each resource path section, a new row is created.

Add REST API
Click to add a new row.

Remove REST API
Click to remove selected rows.

Advanced...

Click to set the header, cookies, and query parameter values of a REST API. They are managed as a couple, for example, <name, value>.

In a query parameter, the name is used to create a private variable. The value is the default value of the variable. In header and cookies, both name and value are simply strings, for example, `name = "X-IBM-Workload-Deployer-API-Version", value = "3.1"`. If you want to use variables instead of a hard-coded string, the variable name must be enclosed in “{“ and “}”. So, for example, in the case of `name = "X-IBM-Workload-Deployer-API-Version"` and `value = "{version}"`, the integration service has a private variable called *version* and the value of the variable is entered in the header.

After completing the page, to create the toolkit, click **Create Toolkit**. You are prompted to save the toolkit locally or to import it to the Business Process Manager server. If you import it to a server, a remote connection is created to copy the file onto that machine and import it into Business Process Manager.

Importing REST APIs from WADL

You can import REST APIs from a WADL file.

The following is an example of the WADL file that creates the integration Sservices, "getActionsForVirtualSystem" and "getVirtualSystemInfo".

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<application xmlns="http://wadl.dev.java.net/2009/02">
  <grammars/>
  <resources base="https://172.17.46.3">
     <resource path="/resources/">
     <resource path="/instances/{vsysId}/">
  <method name="GET" id="getActionsForVirtualSystem">
    <request>
       <param xmlns:xs="http://www.w3.org/2001/XMLSchema" type="xs:string"
                    style="query" name="operation_type" default="pattern_mgmt"/>
       <param xmlns:xs="http://www.w3.org/2001/XMLSchema" type="xs:string"
                    style="query" name="name" default="Register Unlinked IEM Agents"/>
       <param xmlns:xs="http://www.w3.org/2001/XMLSchema" type="xs:string"
                    style="header" name="X-IBM-Workload-Deployer-API-Version" default="3.1"/>
           <representation mediaType="application/json"/>
         </request>
   <response>
       <representation mediaType="application/json"/>
   </response>
  </method>
      </resource>
      <resource path="/virtualSystems/{vsysId}">
  <method name="GET" id="getVirtualSystemInfo">
    <request>
      <param xmlns:xs="http://www.w3.org/2001/XMLSchema" type="xs:string"
                    style="header" name="X-IBM-Workload-Deployer-API-Version" default="3.1"/>
          <representation mediaType="application/json"/>
         </request>
   <response>
       <representation mediaType="application/json"/>
   </response>
  </method>
 </resource>
     </resource>
   </resources>
</application>
```

OpenStack Subnet WADL

The standard WADL descriptors from GitHub have been modified to include the authentication header required by all the OpenStack APIs (X-Auth-Token).

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- (C) 2013-2014 OpenStack Foundation, All Rights Reserved -->
<!--~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~-->
<!--         Import Common XML Entities                                       -->
<!--                                                                          -->
<!--     You can resolve the entites with xmllint                             -->
<!--                                                                          -->
<!--        xmllint -noent os-subnets.wadl                                    -->
<!--~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~-->
<!DOCTYPE application [<!ENTITY % common  SYSTEM "common.ent">
%common;]>
```

```
<application xmlns="http://wadl.dev.java.net/2009/02"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:xlink="http://www.w3.org/1999/xlink"
    xmlns:linkend="http://www.w3.org/1999/linkend"
    xmlns:xsdxt="http://docs.rackspacecloud.com/xsd-ext/v1.0"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:wadl="http://wadl.dev.java.net/2009/02"
    xmlns:csapi="http://docs.openstack.org/compute/api/v1.1">
    <!--------------------------------------------------------->
    <!--             All Resources                           -->
    <!--------------------------------------------------------->
    <resources base="https://neutron.example.com/"
        xml:id="os-subnets-v2">
        <resource id="version" type="#VersionDetails" path="//v2.0">
            <resource id="Subnets" type="#SubnetList" path="subnets">
               <param xmlns:xs="http://www.w3.org/2001/XMLSchema" type="xs:string"
                    style="header" name="X-Auth-Token" default="{token_id}"/>
                <method href="#listSubnets"/>
                <method href="#createSubnet"/>
                <method href="#bulkCreateSubnet"/>
                <resource path="{subnet_id}" id="subnet_id">
                    <param name="subnet_id" style="template"
                        type="csapi:UUID">
                        <wadl:doc
                            xmlns="http://docbook.org/ns/docbook"
                            xml:lang="EN" title="Subnet ID">
                            <para>The UUID for the subnet of interest
                                to you.</para>
                        </wadl:doc>
                    </param>
                    <method href="#showSubnet"/>
                    <method href="#updateSubnet"/>
                    <method href="#removeSubnet"/>
                </resource>
            </resource>
        </resource>
    </resources>
    <!--------------------------------------------------------->
    <!--               All Methods                           -->
    <!--------------------------------------------------------->
    <method name="GET" id="listSubnets">
        <wadl:doc xmlns="http://docbook.org/ns/docbook" xml:lang="EN"
            title="List subnets">
            <para role="shortdesc">Lists subnets to which the
                specified tenant has access.</para>
            <para>Default policy settings returns exclusively subnets
                owned by the tenant submitting the request, unless the
                request is submitted by an user with administrative
                rights. You can control which attributes are returned
                by using the fields query parameter. You can filter
                results by using query string parameters. For
                information, see <link
                    xlink:href="http://docs.openstack.org/api/openstack-network/
                         2.0/content/filtering.html"
                    >Filtering and Column Selection</link> in the
                    <citetitle>OpenStack Networking API v2.0
                    Reference</citetitle>.</para>
        </wadl:doc>
        <response status="200">
            <representation mediaType="application/json">
                <wadl:doc xmlns="http://docbook.org/ns/docbook"
                    xml:lang="EN">
                    <xsdxt:code
                        href="api_samples/subnets-get-resp.json"/>
                </wadl:doc>
            </representation>
            <representation mediaType="application/xml">
```

```
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnets-get-resp.xml"/>
            </wadl:doc>
        </representation>
    </response> &fault401; </method>
<method name="POST" id="createSubnet">
    <wadl:doc xmlns="http://docbook.org/ns/docbook" xml:lang="EN"
        title="Create subnet">
        <para role="shortdesc">Creates a subnet on a specified
            network.</para>
        <para>By default, OpenStack Networking creates IP v4
            subnets. To create an IP v6 subnet, you must specify
            the value 6 for the <code>ip_version</code> attribute
            in the request body. OpenStack Networking does not try
            to derive the correct IP version from the provided
            CIDR. If the parameter for the gateway address,
                <code>gateway_ip</code>, is not specified,
            OpenStack Networking allocates an address from the
            cidr for the gateway for the subnet.</para>
        <para>To specify a subnet without a gateway, specify the
            value null for the <code>gateway_ip</code> attribute
            in the request body. If allocation pools attribute,
                <code>allocation_pools</code>, is not specified,
            OpenStack Networking automatically allocates pools for
            covering all IP addresses in the CIDR, excluding the
            address reserved for the subnet gateway. Otherwise,
            you can explicitly specify allocation pools as shown
            in the following example.</para>
        <para>When <code>allocation_pools</code> and
                <code>gateway_ip</code> are both specified, it is
            up to the user to ensure that the gateway IP does not
            overlap with the specified allocation pools; otherwise
            a 409 Conflict error occurs.</para>
    </wadl:doc>
    <request> &subnetCreateParameters; <representation
            mediaType="application/json">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnet-create-req.json"/>
            </wadl:doc>
        </representation>
        <representation mediaType="application/xml">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnet-create-req.xml"/>
            </wadl:doc>
        </representation>
    </request>
    <response status="201"> &subnetListParameters; <representation
            mediaType="application/json">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnet-create-resp.json"/>
            </wadl:doc>
        </representation>
        <representation mediaType="application/xml">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnet-create-resp.xml"/>
            </wadl:doc>
        </representation>
```

```
    </response> &fault400; &fault401; &fault403; &fault404;
    &fault409conflict; </method>
<method name="POST" id="bulkCreateSubnet">
    <wadl:doc xmlns="http://docbook.org/ns/docbook" xml:lang="EN"
        title="Bulk create subnet">
        <para role="shortdesc">Creates multiple subnets in a
            single request. Specify a list of subnets in the
            request body.</para>
        <para>The bulk create operation is always atomic. Either
            all or no subnets in the request body are
            created.</para>
    </wadl:doc>
    <request> &subnetCreateParameters; <representation
            mediaType="application/json">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnets-post-create-bulk-req.json"
                />
            </wadl:doc>
        </representation>
        <representation mediaType="application/xml">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnets-post-create-bulk-req.xml"
                />
            </wadl:doc>
        </representation>
    </request>
    <response status="201"> &subnetListParameters; <representation
            mediaType="application/json">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnets-create-bulk-resp.json"
                />
            </wadl:doc>
        </representation>
        <representation mediaType="application/xml">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
                <xsdxt:code
                    href="api_samples/subnets-create-bulk-resp.xml"
                />
            </wadl:doc>
        </representation>
    </response> &fault400; &fault401; &fault403; &fault404;
    &fault409conflict; </method>
<method name="GET" id="showSubnet">
    <wadl:doc xmlns="http://docbook.org/ns/docbook" xml:lang="EN"
        title="Show subnet">
        <para role="shortdesc">Shows information for a specified
            subnet.</para>
        <para>You can control which attributes are returned by
            using the fields query parameter. For information, see
                <link
                xlink:href="http://docs.openstack.org/api/openstack-network/
                    2.0/content/filtering.html"
                >Filtering and Column Selection</link> in the
                <citetitle>OpenStack Networking API v2.0
                Reference</citetitle>.</para>
    </wadl:doc>
    <response status="201"> &subnetListParameters; <representation
            mediaType="application/json">
            <wadl:doc xmlns="http://docbook.org/ns/docbook"
                xml:lang="EN">
```

```
                    <xsdxt:code
                        href="api_samples/subnet-show-resp.json"/>
                </wadl:doc>
            </representation>
            <representation mediaType="application/xml">
                <wadl:doc xmlns="http://docbook.org/ns/docbook"
                    xml:lang="EN">
                    <xsdxt:code
                        href="api_samples/subnet-show-resp.xml"/>
                </wadl:doc>
            </representation>
        </response> &fault401; &fault404; </method>
    <method name="PUT" id="updateSubnet">
        <wadl:doc xmlns="http://docbook.org/ns/docbook" xml:lang="EN"
            title="Update subnet">
            <para role="shortdesc">Updates a specified subnet.</para>
            <para>Some attributes, such as IP version (ip_version),
                and CIDR (cidr) cannot be updated. Attempting to
                update these attributes results in a <code>400 Bad
                    Request</code> error.</para>
        </wadl:doc>
        <request> &subnetUpdateParameters; <representation
                mediaType="application/json">
                <wadl:doc xmlns="http://docbook.org/ns/docbook"
                    xml:lang="EN">
                    <xsdxt:code
                        href="api_samples/subnet-update-req.json"/>
                </wadl:doc>
            </representation>
            <representation mediaType="application/xml">
                <wadl:doc xmlns="http://docbook.org/ns/docbook"
                    xml:lang="EN">
                    <xsdxt:code
                        href="api_samples/subnet-update-req.xml"/>
                </wadl:doc>
            </representation>
        </request>
        <response status="201"> &subnetListParameters; <representation
                mediaType="application/json">
                <wadl:doc xmlns="http://docbook.org/ns/docbook"
                    xml:lang="EN">
                    <xsdxt:code
                        href="api_samples/subnet-update-resp.json"/>
                </wadl:doc>
            </representation>
            <representation mediaType="application/xml">
                <wadl:doc xmlns="http://docbook.org/ns/docbook"
                    xml:lang="EN">
                    <xsdxt:code
                        href="api_samples/subnet-update-resp.xml"/>
                </wadl:doc>
            </representation>
        </response> &fault400; &fault401; &fault403; &fault404; </method>
    <method name="DELETE" id="removeSubnet">
        <wadl:doc xmlns="http://docbook.org/ns/docbook" xml:lang="EN"
            title="Delete subnet">
            <para role="shortdesc">Deletes a specified subnet.</para>
            <para>The operation fails if subnet IP addresses are still
                allocated.</para>
        </wadl:doc>
        <response status="204"/> &fault401; &fault404;
        &fault409conflict; </method>
</application>
```

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