Virtuozzo

Virtuozzo Hybrid Infrastructure 4.0

Integration Guide for CloudBlue Connect
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1 Introduction

This guide explains how to enable and manage integration between Virtuozzo Hybrid Infrastructure and the CloudBlue billing system.

Basically, you will need to do the following:

1. Create and configure a project in the CloudBlue Connect vendor portal.
2. Create a virtual machine in a cloud. Install, configure, and start the connector service inside the virtual machine. This service integrates with the Connect API to retrieve order requests and provision ordered subscriptions for Virtuozzo Hybrid Infrastructure.

**Important**

To be able to connect to Virtuozzo Hybrid Infrastructure, the Compute API traffic type must be added to a network accessible from the created virtual machine.

3. Test creating and managing assets, that are customer projects, in the CloudBlue Connect vendor portal.
2 Creating products

A product contains all services that a vendor exposes for sale, including product items, sales models, and requirements to product orders and fulfillment phase.

To create a new product, do the following:

1. Go to **Products** and click **Create product**.
2. In the **Create product** window, enter a product name and select **Infrastructure** from the **Category** drop-down list. Then, click **Create**.

The product ID will be automatically generated.

2.1 Configuring general information

On the product's **General** page, you can do the following:

1. Click **Edit** next to the product name to change the product name and category or add a product icon and a short description.
   
   For an icon, the recommend format is `.png` with a transparent background.
2. Click **Edit** on the **Overview** tab to add a product description.
3. Click **Add** on the **Media** tab to add one or more media files for marketing purposes.
4. Click **Edit** on the **Capabilities** tab to add various capabilities that automate certain processes in the order and usage flows.
For the pay-as-you-go model, enable **Pay-as-you-go** and select the reporting schema.

![Edit capabilities](image)

2.2 Creating product items

Product items are compute resources in Virtuozzo Hybrid Infrastructure that customers order and pay for: CPU, RAM, storage, floating IP addresses, load balancers and Kubernetes clusters.

Product items can be defines for two billing models:

- A reservation model offers provisioning limited amount of compute resources.
- A pay-as-you-go model offers provisioning unlimited resources and charging them according to daily usage reports.

For the reservation model, do the following:

1. On the product page, go to the **Items > Reservation** tab, remove the default items and click **+ Create item**.
2. In **Create item - Step 1 General**, enter an item name, manufacturer part number, and description.

For the manufacturer part number, refer to the table below.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Manufacturer part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>CPU_limit</td>
</tr>
<tr>
<td>RAM</td>
<td>RAM_limit</td>
</tr>
</tbody>
</table>
Storage  
Floating IP addresses  
Load balancers  
Kubernetes clusters  

Leave the default value in the Parent item field and click Next.

3. In Create item - Step 2 Type, select One Time in the Billing period field and units in the Unit field:
   - For RAM and storage, select Gb
   - For other compute resources, select Units

   Click Create.

After adding all the six compute resources, you will have the following list.

For the pay-as-you-go model, do the following:
1. On the product page, go to the **Items> Pay as you go** tab, click **+ Create item**.

**Important**
Make sure you have the **Pay-as-you-go** capability enabled on the product's **General > Capabilities** tab.

2. In **Create item - Step 1 General**, enter an item name, manufacturer part number, and description.

For the manufacturer part number, refer to the table below.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Manufacturer part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>CPU_consumption</td>
</tr>
<tr>
<td>RAM</td>
<td>RAM_consumption</td>
</tr>
<tr>
<td>Storage</td>
<td>Storage_consumption</td>
</tr>
<tr>
<td>Floating IP addresses</td>
<td>Floating_ip_consumption</td>
</tr>
<tr>
<td>Load balancers</td>
<td>LB_consumption</td>
</tr>
<tr>
<td>Kubernetes clusters</td>
<td>K8S_consumption</td>
</tr>
</tbody>
</table>

Click **Next**.

3. In **Create item - Step 2 Type**, select **Integer (Example: 42)** in the **Precision** field and **Unit*H** in the **Unit** field.

Click **Create**.

After adding all the six compute resources, you will have the following list.
2.3 Creating product parameters

Product parameters are used to create a product order and to fulfill a product request. You can create three types of parameters:

- Configuration parameters are metadata specified during the product configuration. They can be assigned to the product in general, product item, and related marketplace.
- Order parameters are specified by customers when ordering the product.
- Fulfillment parameters are specified by the vendor when fulfilling a product request.

For Virtuozzo Hybrid Infrastructure, you need to add the following parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ID</th>
<th>Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item limit</td>
<td>item_limit</td>
<td>Configuration</td>
</tr>
<tr>
<td>Project name</td>
<td>project</td>
<td>Ordering</td>
</tr>
<tr>
<td>User name</td>
<td>user</td>
<td>Ordering</td>
</tr>
<tr>
<td>User password</td>
<td>password</td>
<td>Ordering</td>
</tr>
<tr>
<td>Domain name</td>
<td>domain_name</td>
<td>Fulfillment</td>
</tr>
<tr>
<td>Domain ID</td>
<td>domain_id</td>
<td>Fulfillment</td>
</tr>
<tr>
<td>Project ID</td>
<td>project_id</td>
<td>Fulfillment</td>
</tr>
<tr>
<td>User ID</td>
<td>user_id</td>
<td>Fulfillment</td>
</tr>
</tbody>
</table>

To create a parameter, do the following:

1. On the product page, go to Parameters and click + Create parameter.
2. In Create parameter — Step 1 Type, select Single line text to be able to enter a value for the parameter in a text line. Click Next.
3. In Create parameter — Step 2 Phase, select the phase where the parameter will be used and click Next.
   For the parameter phase, refer to the table above.
4. In Create parameter — Step 3 Scope, select Asset and click Next.
5. In **Create parameter — Step 4 Constrains**, enable **Required** to make the parameter mandatory. Click **Next**.

6. In **Create parameter — Step 5 Details**, enter the parameter ID, title, and description.
   For the parameter ID, refer to the table above.

   ![Parameter creation form]

   Click **Create**.

7. In **Create parameter — Step 6 Summary**, review the parameter summary and click **Close**.

   After adding all the product parameters, you will have the following list:

   ![Parameter list]

   **2.4 Defining configuration parameters**

   On the product’s **Configuration** page, you can manage parameters associated with the configuration phase. Virtuozzo Hybrid Infrastructure has only one configuration parameter, item limit, which enables defining maximum resource limits for the reservation model.

   To define the resource limits, do the following:
1. On the **Configuration** page, click the pencil icon next to the value you want to change.

2. In the **Edit value** window, set a new value and click **Save**.

3. Repeat the steps for each item you need to modify.
3 Enabling integration

To enable integration with CloudBlue Connect, first deploy a CentOS 7 virtual machine in any cloud environment, then install the connector service inside it as follows:

1. Install the following packages:
   
   ```
   yum install epel-release.noarch
   yum install centos-release-openstack-stein.noarch
   ```

2. Install the `cloudblue-connector` package:
   
   ```
   yum install <path_to_the_package>/cloudblue-connector-<version>.vl7.noarch.rpm
   ```

3. Install the Connect SDK:
   
   ```
   easy_install connect-sdk
   ```

If you want to use flat billing, do the following:

1. Copy the configuration file example to `config.json` and open the latter for editing:
   
   ```
   cp /etc/cloudblue-connector/config.json.example /etc/cloudblue-connector/config.json
   vi /etc/cloudblue-connector/config.json
   ```
   ```json
   {
   "infraDomain": "Default",
   "infraProject": "admin",
   "infraUser": "vstorage-service-user",
   "infraPassword": "***********",
   "apiEndpoint": "https://api.connect.cloud.im/public/v1",
   "apiKey": "ApiKey SU-469-692-689:*****************",
   "products": ["PRD-063-065-206","PRD-022-814-775"],
   "templates": {
   "PRD-022-814-775": {"grant": "TL-699-973-660", "revoke": "Access to VDC has been revoked"},
   "PRD-063-065-206": {"grant": "TL-101-949-609", "revoke": "Access to VDC has been revoked"}
   }
   }
   ```

2. Change the default parameters:
   - in "infraKeystoneEndpoint", replace the example IP address with the IP address of the Virtuozzo Hybrid Infrastructure cluster that you want to connect to
   - in "infraDomain", "infraProject", "infraUser", and "infraPassword", change the domain, project, and user credentials to the ones of a Virtuozzo Hybrid Infrastructure system administrator
   - in "apiEndpoint", specify the API endpoint to interact with the Connect API copied from the
vendor portal on the **Extensions > General** page

- in "apiKey", specify the API key copied from the vendor portal on the **Extensions > Tokens** page

- in "products", specify product IDs copied from the vendor portal on the **Products** page

- in "templates", specify template IDs for each product copied from the vendor portal on the **Products > product > Embedding** page. Click the **Templates** tab and go to the **Activation tile templates** section
3. Run the command:

```
cloudblue-fulfillments
```

4. Enable and start the `cloudblue-fulfillments` service:

```
systemctl enable cloudblue-fulfillments
systemctl start cloudblue-fulfillments
```

If you want to use the pay-as-you-go model, do the following:

1. Copy the configuration usage example to `config-usage.json` and open the latter for editing:

```
cp /etc/cloudblue-connector/config-usage.json.example /etc/cloudblue-connector/config-usage.json
vi /etc/cloudblue-connector/config-usage.json
{
  "infraDomain": "Default",
  "infraProject": "admin",
  "infraUser": "vstorage-service-user",
  "infraPassword": "****",
  "apiEndpoint": "https://api.connect.cloud.im/public/v1",
  "apiKey": "ApiKey SU-469-692-689:**************************",
  "products": ["PRD-063-065-206"],
  "templates": {
    "PRD-263-056-411": {"grant": "TL-304-029-298", "revoke": "Access to VDC has been revoked"},
    "PRD-063-065-206": {"grant": "TL-101-949-609", "revoke": "Access to VDC
```
2. Change the default parameters:
- in "infraKeystoneEndpoint", replace the example IP address with the IP address of the Virtuozzo Hybrid Infrastructure cluster that you want to connect to
- in "infraDomain", "infraProject", "infraUser", and "infraPassword", change the domain, project, and user credentials to the ones of a Virtuozzo Hybrid Infrastructure system administrator
- in "apiEndpoint", specify the API endpoint to interact with the Connect API copied from the vendor portal on the Extensions > General page

<table>
<thead>
<tr>
<th>Extensions</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">General</a></td>
<td>API provides integrations to external systems such <a href="#">documentation</a>. Use this endpoint to interact with the Connect API</td>
</tr>
<tr>
<td><a href="#">Tokens</a></td>
<td>API endpoint</td>
</tr>
<tr>
<td><a href="#">Webhooks</a></td>
<td><a href="https://api.connect.cloud.im/public/v1">https://api.connect.cloud.im/public/v1</a></td>
</tr>
</tbody>
</table>

- in "apiKey", specify the API key copied from the vendor portal on the Extensions > Tokens page

<table>
<thead>
<tr>
<th>Extensions</th>
<th>Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">General</a></td>
<td><a href="#">Create Token</a></td>
</tr>
</tbody>
</table>

- in "products", specify the ID of the product with the pay-as-you-go billing model. Copy the product ID from the vendor portal on the Products page

<table>
<thead>
<tr>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">VDC Reservation model</a></td>
</tr>
<tr>
<td>PRD-263-056-411</td>
</tr>
<tr>
<td><a href="#">VDC Pay as you go model</a></td>
</tr>
<tr>
<td>PRD-267-233-715</td>
</tr>
</tbody>
</table>

- in "templates", specify template IDs for each product copied from the vendor portal on the Products > product > Embedding page. Click the Templates tab and go to the Activation
3. Enable and start the cloudblue-usage service:

```bash
systemctl enable cloudblue-usage
systemctl start cloudblue-usage
```
4 Creating assets

An asset represents a product instance provisioned to a customer. In this case, it is a customer project with defined quotas in Virtuozzo Hybrid Infrastructure.

You can create an asset for testing purposes as follows:

1. In the vendor portal, go to the Assets page and click + Create asset.
2. In Create Asset — Step 1 Introduction, read about assets and click Next.
3. In Create Asset — Step 2 Product, select a product and click Next.

4. In Create Asset — Step 3 Marketplace, select a marketplace available for the provider and click Next.

5. In Create Asset — Step 4 Tiers, select the tier configuration depending on the tier model of your marketplace and click Next.

6. (Optional, appears only if you have chosen T1+T2 reseller tiers model) In Create Asset — Step 5 T2 Account, choose a T2 reseller account from the drop-down list or create a new one by clicking New. Then click Next.
7. In **Create Asset — Step 6 T1 Account**, choose a T1 reseller account from the drop-down list or create a new one by clicking **New**. Then click **Next**.

8. In **Create Asset — Step 7 Customer**, choose a customer from the drop-down list or create a new one by clicking **New**. Then click **Next**.

9. In **Create Asset — Step 8 Asset Items**, click **+ Add Items**.
   In a window that opens, select all items that represent compute resources in Virtuozzo Hybrid Infrastructure and click **Select**.

   ![Select Items Table]

   For the reservation model, change the quantity for items you need. For the pay-as-you-go model, the item quantity cannot be defined. Then click **Next**.
<table>
<thead>
<tr>
<th>Items</th>
<th>RANDOMIZE</th>
<th>CLEAR</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>MPN</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU PRD:263:056-411-0004</td>
<td>CPU_limit</td>
<td>5 Units</td>
</tr>
<tr>
<td>RAM PRD:263:056-411-0005</td>
<td>RAM_limit</td>
<td>42 Gb</td>
</tr>
<tr>
<td>Storage PRD:263:056-411-0003</td>
<td>Storage_limit</td>
<td>10 Gb</td>
</tr>
<tr>
<td>Floating IPs PRD:263:056-411-0006</td>
<td>floating_ip_limit</td>
<td>60 Units</td>
</tr>
<tr>
<td>LBaaS PRD:263:056-411-0007</td>
<td>lbaaS_limit</td>
<td>25 Units</td>
</tr>
<tr>
<td>K8SaaS PRD:263:056-411-0008</td>
<td>k8ssaas_limit</td>
<td>30 Units</td>
</tr>
</tbody>
</table>

**Note**

If you are not going to use all of the items, you can exclude unnecessary ones from the asset later by setting their quantity to 0.

10. In **Create Asset — Step 9 Attributes**, leave the default external ID and UUID, and click **Next**.
11. In **Create Asset — Step 10 Parameters**, specify the project name and user credentials for a project and user that will be created in Virtuozzo Hybrid Infrastructure. Then click **Create**.

**Asset Parameters**

Please specify values of the ordering phase parameters for the asset. You can skip assignment of values (if not required) to simulate an unattended ordering experience.

**Values**

- **Project**
  - myproject

- **User name**
  - myuser

- **Password**
  - mypassword
12. In **Create Asset — Step 11 Summary**, review the created objects and their current statuses. Click **Close** to return to the list of assets.

After the asset is created, its status is changed to **Active**. You can view the asset details by clicking its ID. The asset page also provides the link to the VDC login page. The **Requests** tab contains all requests associated with this asset.

---

**Asset details**

<table>
<thead>
<tr>
<th>Status</th>
<th>Asset</th>
<th>Product</th>
<th>Marketplace</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active</strong></td>
<td>AS-9322-9160-3675</td>
<td><a href="#">VDC Reservation model</a></td>
<td>test marketplace</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>ituoz PRD-263-056-411</td>
<td>MP-41148</td>
</tr>
</tbody>
</table>

**CONTROL PANEL**

- **RESERVATION**
- **PAY AS YOU GO**
- **PARAMETERS**
- **DETAILS**
- **TIERS**
- **REQUESTS**

---

We are happy to provide you the Cloud Service - an ultimate solution for your company. Stop using the legacy on-premises solution on your computer. Move to the cloud with our help.

Virtual datacenter


User: 45674567
5 Managing assets

5.1 Provider actions

Providers can suspend assets due to administrative purposes or payment issues. Suspending an asset temporarily disables its items. In a suspended state, an asset item does not operate but can be resumed without any data loss. Providers can also create billing requests of assets with the reservation model. A billing request provides information about billing of item associated with the asset for a particular period.

To perform any of these actions, go to the asset details page, click Actions and select an action from the Provider Actions list.

5.2 Customer actions

Customers can change resource reservation by changing asset items and cancel subscription by canceling an asset.

To change asset items, do the following:

1. Go to the asset details page, click Actions and select Change.
2. In Change Asset - Step 1 Overview, read the information and click Next.
3. In Change Asset - Step 2 Asset Items, set new quantity values for the desired items and click Create change request.

<table>
<thead>
<tr>
<th>Items</th>
<th>Old Quantity</th>
<th>New Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>20 Gb</td>
<td>100 Gb</td>
</tr>
<tr>
<td>CPU</td>
<td>20 Units</td>
<td>30 Units</td>
</tr>
<tr>
<td>RAM</td>
<td>20 Gb</td>
<td>60 Gb</td>
</tr>
<tr>
<td>Floating IPs</td>
<td>20 Units</td>
<td>20 Units</td>
</tr>
</tbody>
</table>

4. In Change Asset - Step 3 Summary, check the asset and request status and click Close.

If an asset is no longer needed, a customer can cancel it as follows:
1. Go to the asset details page, click **Actions** and select **Cancel**.
2. In **Cancel asset — Step 1 Overview**, read the information and click **Create cancel request**.
3. In **Cancel asset — Step 2 Summary**, check the asset and fulfillment request status and click **Close**.

Once an asset is canceled, its status becomes **Terminated** and the asset cannot be processed. A new fulfillment request must be created in order to proceed.

In Virtuozzo Hybrid Infrastructure, the asset project is disabled after an asset is canceled.
6 Viewing resource usage reports

Assets created for the pay-as-you-go model generate daily usage reports and send them in the .xlsx format. You can view these reports as follows:

1. Go to the Usage page and click the needed report

2. On the report details page, download the processed usage file by clicking its name.

3. Open the file and go to the records tab. Review the usage statistics.
7 Troubleshooting

7.1 Troubleshooting integration issues

If you have encountered an integration issue, log in to the CentOS 7 virtual machine and check the status of the cloudblue-fulfillments service. It should be enabled and active. For example:

```
# systemctl status cloudblue-fulfillments
● cloudblue-fulfillments.service - Connect to backend, fulfillments service
Loaded: loaded (/usr/lib/systemd/system/cloudblue-fulfillments.service; enabled; vendor preset: disabled)
Active: active (running) since Fri 2020-07-17 07:58:21 EDT; 10s ago
```

For the pay-as-you-go model, also check the cloudblue-usage service.

The service logs can be viewed by using the journalctl utility.

7.2 Troubleshooting asset issues

If you have problems with assets in the vendor portal, you can check the corresponding failed requests. Do the following:

1. Go to the Requests tab on the asset page and click the request with the Failed status.
2. On the request details page, check the Notes panel for the problem root cause. For example:

<table>
<thead>
<tr>
<th>Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 12, 2020</td>
<td>Test user Request PR-4056-1015-0856-001 created. State set to Pending.</td>
</tr>
<tr>
<td>5:52 AM</td>
<td>Test user State changed to failed</td>
</tr>
<tr>
<td>5:33 AM</td>
<td>Reason: ERROR: REQUESTED LIMITS ARE HIGHER THEN HARD LIMITS</td>
</tr>
</tbody>
</table>