Virtuozzo

Virtuozzo Hybrid Infrastructure 4.5

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.

![Create product window](image)

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.

### 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 defined 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

Storage_limit
floating_ip
lbaas_limit
k8saas_limit

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 interface](image)

   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:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Phase</th>
<th>Scope</th>
<th>Type</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>project</td>
<td>Project name</td>
<td>Ordering</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>user</td>
<td>Project admin user name</td>
<td>Ordering</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>password</td>
<td>Admin user password</td>
<td>Ordering</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>domain.name</td>
<td>Domain name</td>
<td>Fulfillment</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>domain.id</td>
<td>Domain ID</td>
<td>Fulfillment</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>project_id</td>
<td>Project ID</td>
<td>Fulfillment</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>user_id</td>
<td>User ID</td>
<td>Fulfillment</td>
<td>Asset</td>
<td>Single line text</td>
<td></td>
</tr>
<tr>
<td>item_limit</td>
<td>Item limit</td>
<td>Configuration</td>
<td>Item</td>
<td>Single line text</td>
<td></td>
</tr>
</tbody>
</table>

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>.v17.noarch.rpm
   ```

3. Install the Connect SDK:

   ```
   easy_install connect-sdk==20.2
   ```

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
   
   
   {
   "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:

```bash
cloudblue-fulfillments
```

4. Enable and start the cloudblue-fulfillments service:

```bash
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:

```bash
cp /etc/cloudblue-connector/config-usage.json.example /etc/cloudblue-connector/config-usage.json
vi /etc/cloudblue-connector/config-usage.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"],
    "templates": {
        "PRD-263-056-411": {"grant": "TL-304-029-298", "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

   ![Extensions and General settings](image)

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

   ![Tokens settings](image)

   - 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

   ![Products settings](image)

   - 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:

```
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](image)

   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.
Items  RANDOMIZE  CLEAR

<table>
<thead>
<tr>
<th>Name</th>
<th>MPN</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>CPU_limit</td>
<td>5</td>
<td>Units</td>
</tr>
<tr>
<td>RAM</td>
<td>RAM_limit</td>
<td>42</td>
<td>0b</td>
</tr>
<tr>
<td>Storage</td>
<td>Storage_limit</td>
<td>10</td>
<td>Gb</td>
</tr>
<tr>
<td>Floating IPs</td>
<td>floating_ip_limit</td>
<td>60</td>
<td>Units</td>
</tr>
<tr>
<td>LBaaS</td>
<td>lbaaS_limit</td>
<td>25</td>
<td>Units</td>
</tr>
<tr>
<td>K8SaaS</td>
<td>k8sas_limit</td>
<td>30</td>
<td>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 ID</th>
<th>Product</th>
<th>Marketplace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>AS-9322-9160-3675</td>
<td>VDC Reservation model</td>
<td>test marketplace</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.
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:

<table>
<thead>
<tr>
<th>Items</th>
<th>Old Quantity</th>
<th>New Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>20</td>
<td>100 Gb</td>
</tr>
<tr>
<td>PRD-263-056-411-0003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU</td>
<td>20</td>
<td>30 Units</td>
</tr>
<tr>
<td>PRD-263-056-411-0004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAM</td>
<td>20</td>
<td>60 Gb</td>
</tr>
<tr>
<td>PRD-263-056-411-0005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floating IPs</td>
<td>20</td>
<td>20 Units</td>
</tr>
<tr>
<td>PRD-263-056-411-0006</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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:

```
NOTES   CO-599-212-631   >>
```

July 12, 2020

Test user

Request PR-4056-1015-0856-001 created. State set to Pending.

5:32 AM

Test user

State changed to failed

5:33 AM

Reason: ERROR: REQUESTED LIMITS ARE HIGHER THEN HARD LIMITS