Virtuozzo

Virtuozzo Hybrid Infrastructure 6.0

Integration Guide for CloudBlue Connect

12/26/2023

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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.

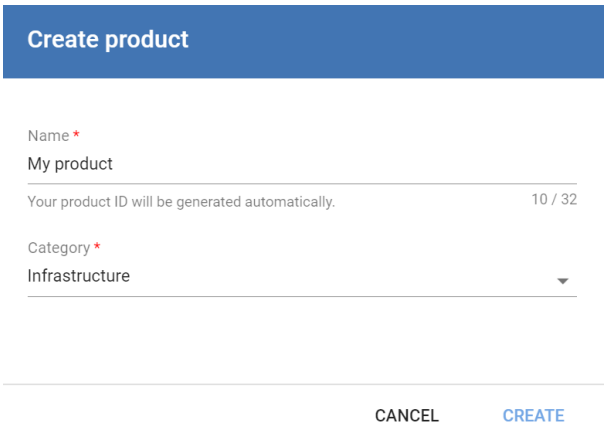
3. Test creating and managing assets, that are customer projects, in the CloudBlue Connect vendor portal.

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.

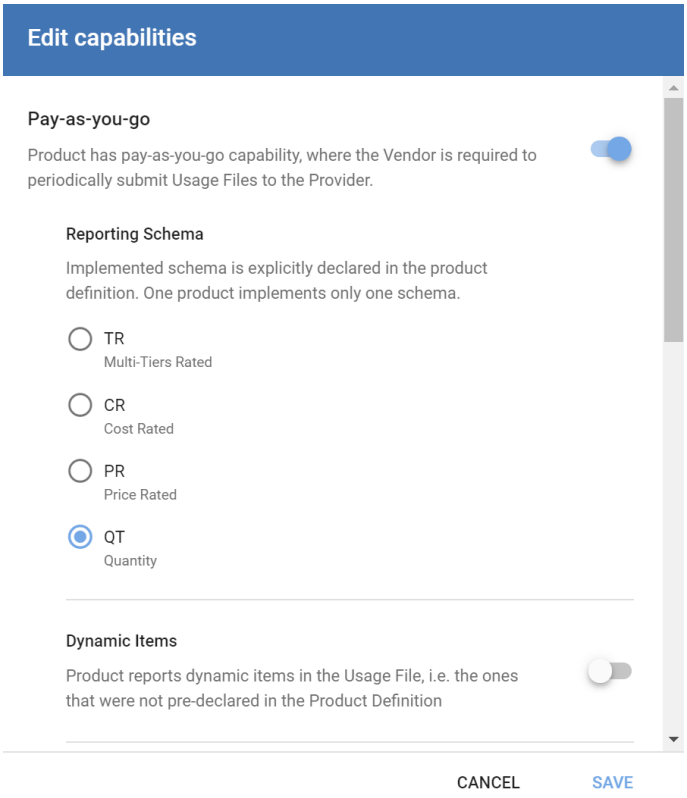
Configuring general information

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.



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.

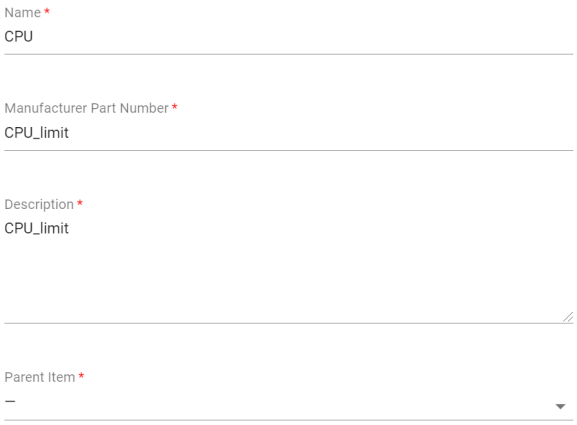
For the reservation model, do the following:

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.

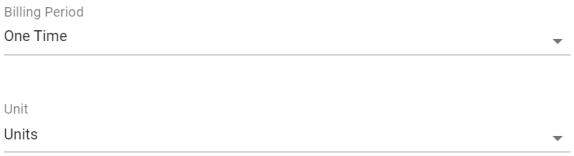
Resource	Manufacturer part number
CPU	CPU_limit
RAM	RAM_limit

Storage	Storage_limit
Floating IP addresses	floating_ip
Load balancers	lbaas_limit
Kubernetes clusters	k8saas_limit



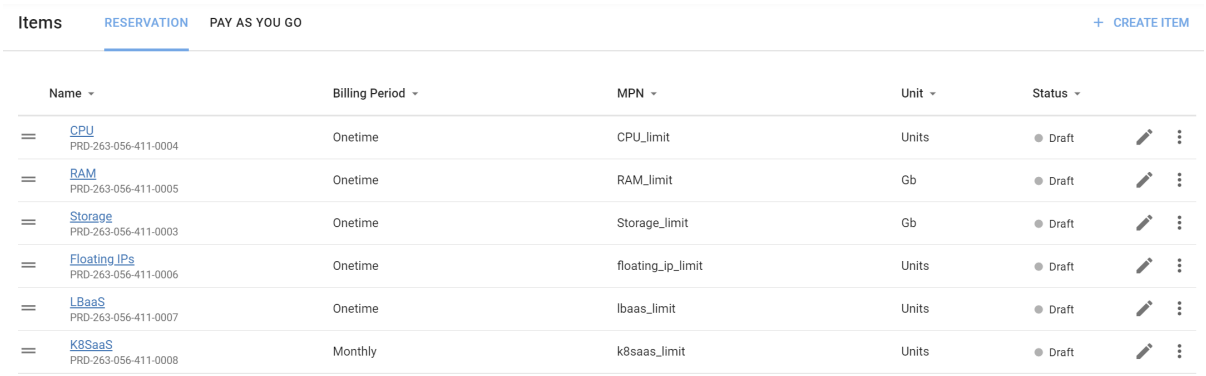
Leave the default value in the **Parent item** field and click **Next**.

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.



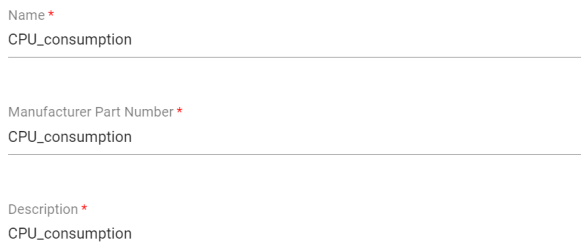
For the pay-as-you-go model, do the following:

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.

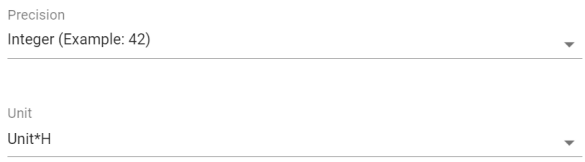
2. In **Create item - Step 1 General**, enter an item name, manufacturer part number, and description.
   For the manufacturer part number, refer to the table below.

Resource	Manufacturer part number
CPU	CPU_consumption
RAM	RAM_consumption
Storage	Storage_consumption
Floating IP addresses	Floating_ip_consumption
Load balancers	LB_consumption
Kubernetes clusters	K8S_consumption



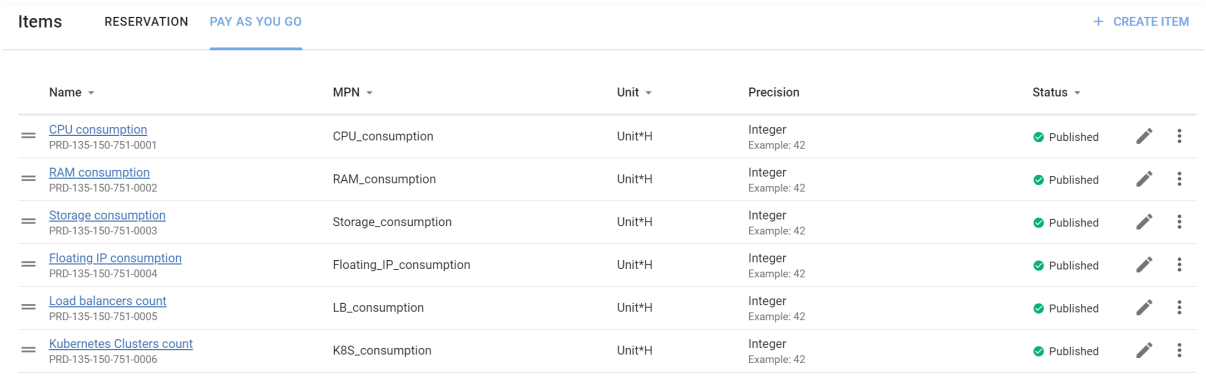
   Click **Next**.

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.



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:

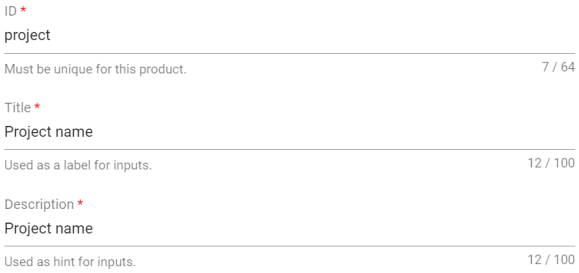
Parameter	ID	Phase
Item limit	item_limit	Configuration
Project name	project	Ordering
User name	user	Ordering
User password	password	Ordering
Domain name	domain_name	Fulfillment
Domain ID	domain_id	Fulfillment
Project ID	project_id	Fulfillment
User ID	user_id	Fulfillment

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**.

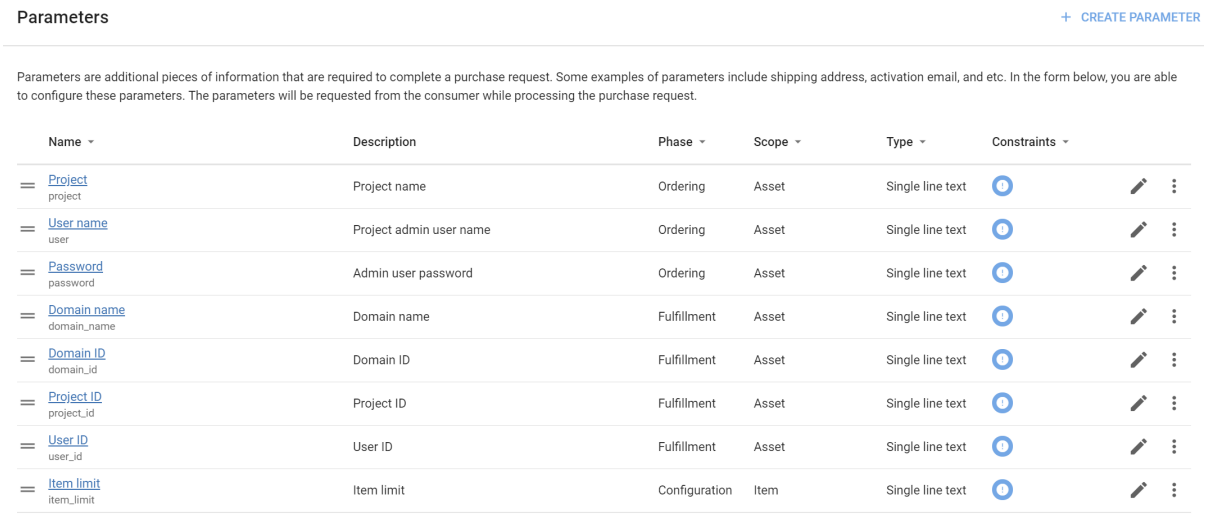
   For the parameter phase, refer to the table above.
4. In **Create parameter — Step 3 Scope**, select **Asset** and click **Next**.

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.



   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:

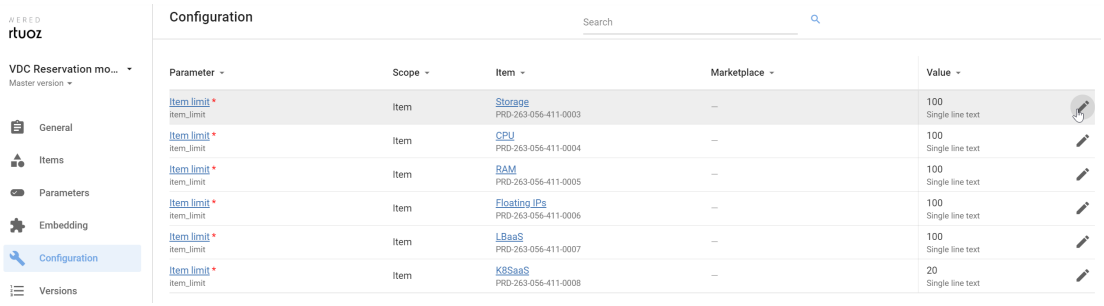


Defining configuration parameters

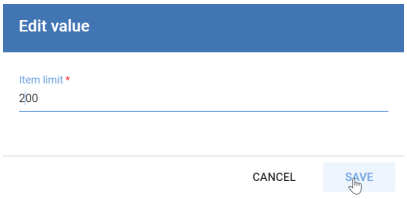
On the product's **Configuration** page, you can manage parameters associated with the configuration phase. Virtuozzo Hybrid Infrastructure has only one configuration parameter, item limit, which enables defining maximum resource limits for the reservation model.

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.

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. Add the following repository:

```
cat << EOF > /etc/yum.repos.d/hci.repo
[hci-base]
name=Hybrid Infrastructure Base Repo
baseurl=http://repo.virtuozzo.com/vz-platform/releases/5.4/x86_64/os/
priority=51
enabled=1
gpgcheck=0

EOF
```

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==20.2
```

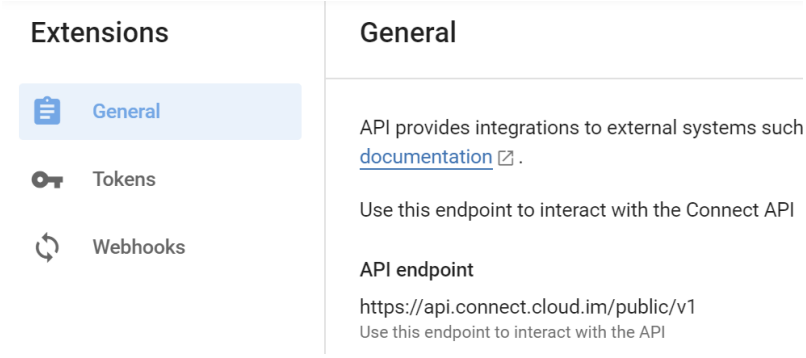
If you want to use flat billing, do the following:

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

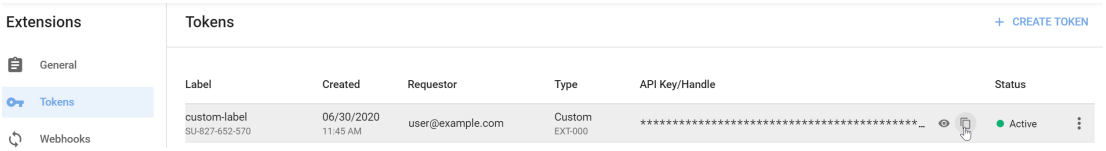
```
cp /etc/cloudblue-connector/config.json.example /etc/cloudblue-connector/config.json
vi /etc/cloudblue-connector/config.json
{
    "infraKeystoneEndpoint": "https://192.168.1.40:5000/v3",
    "infraDomain": "Default",
    "infraProject": "admin",
    "infraUser": "vstorage-service-user",
    "infraPassword": "***********",
    "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.

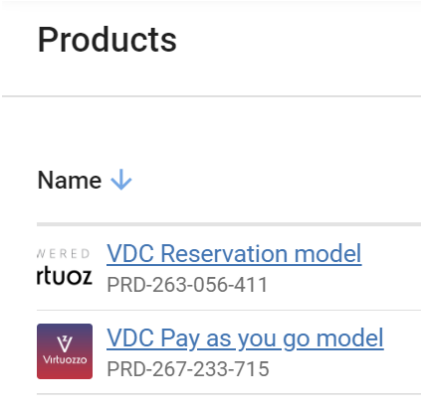
- In `"infraDomain"`, `"infraProject"`, `"infraUser"`, and `"infraPassword"`, change the domain, project, and user credentials to the ones of a Virtuozzo Hybrid Infrastructure system administrator.
- In `"apiEndpoint"`, specify the API endpoint to interact with the Connect API copied from the vendor portal on the **Extensions** > **General** page.



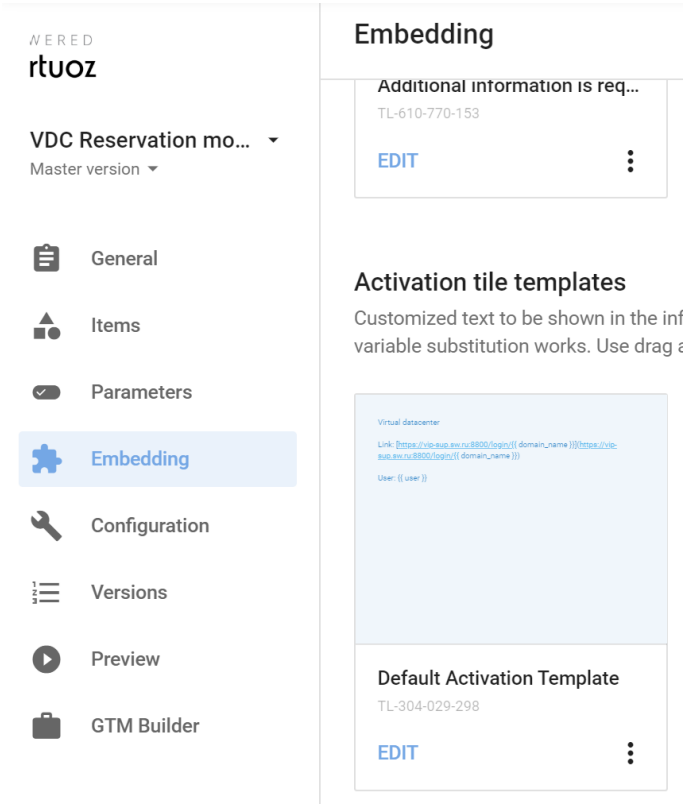
- In `"apiKey"`, specify the API key copied from the vendor portal on the **Extensions** > **Tokens** page.



- 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
{
    "infraKeystoneEndpoint": "https://192.168.1.40:5000/v3",
    "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"},
```

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been revoked"}
    }
}
```

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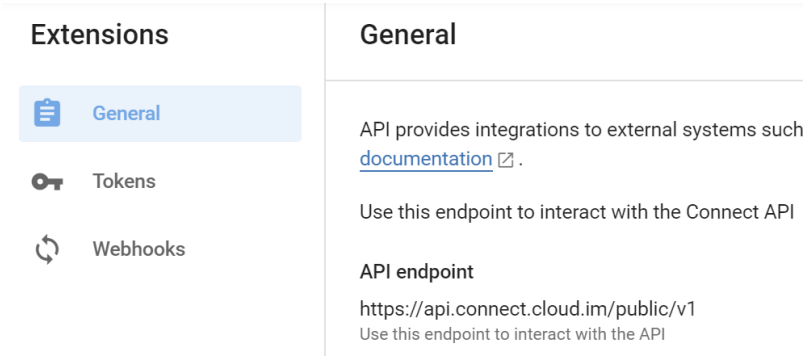
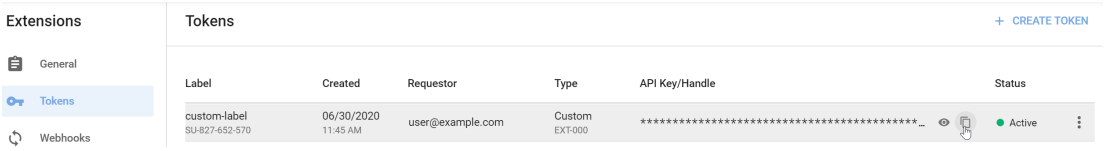
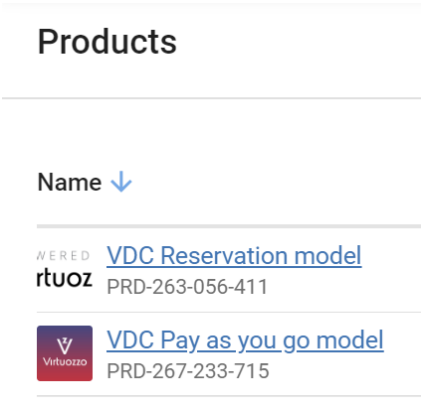


   - In `"apiKey"`, specify the API key copied from the vendor portal on the **Extensions** > **Tokens** page.

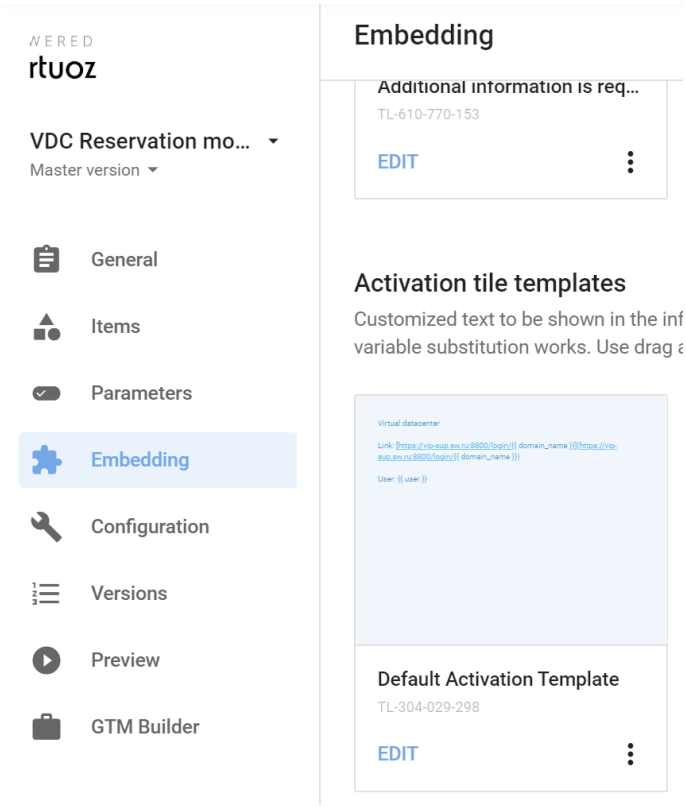


   - In `"products"`, specify the ID of the product with the pay-as-you-go billing model. Copy the product ID from the vendor portal on the **Products** page.



   - 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. Enable and start the `cloudblue-usage` service:

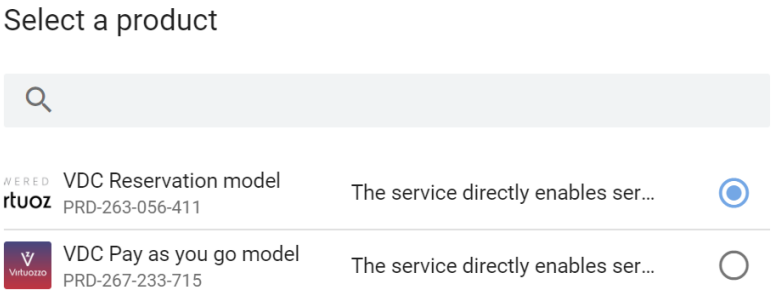
```
systemctl enable cloudblue-usage
systemctl start cloudblue-usage
```

Creating assets

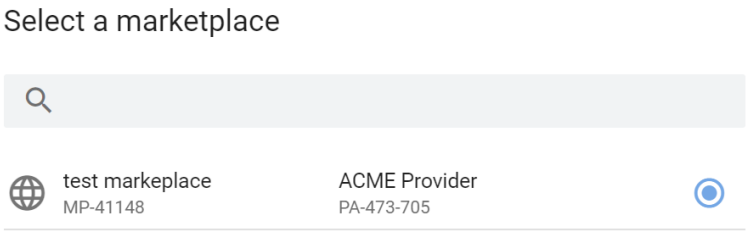
An asset represents a product instance provisioned to a customer. In this case, it is a customer project with defined quotas in Virtuozzo Hybrid Infrastructure.

You can create an asset for testing purposes as follows:

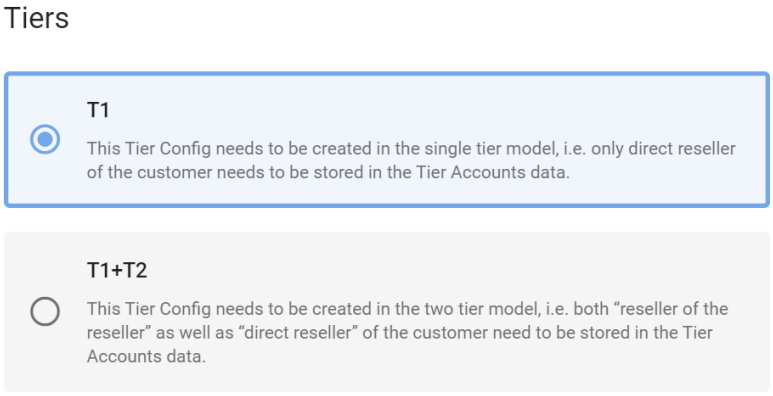
1. In the vendor portal, go to the **Assets** page and click **+ Create asset**.
2. In **Create Asset — Step 1 Introduction**, read about assets and click **Next**.
3. In **Create Asset — Step 2 Product**, select a product and click **Next**.



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



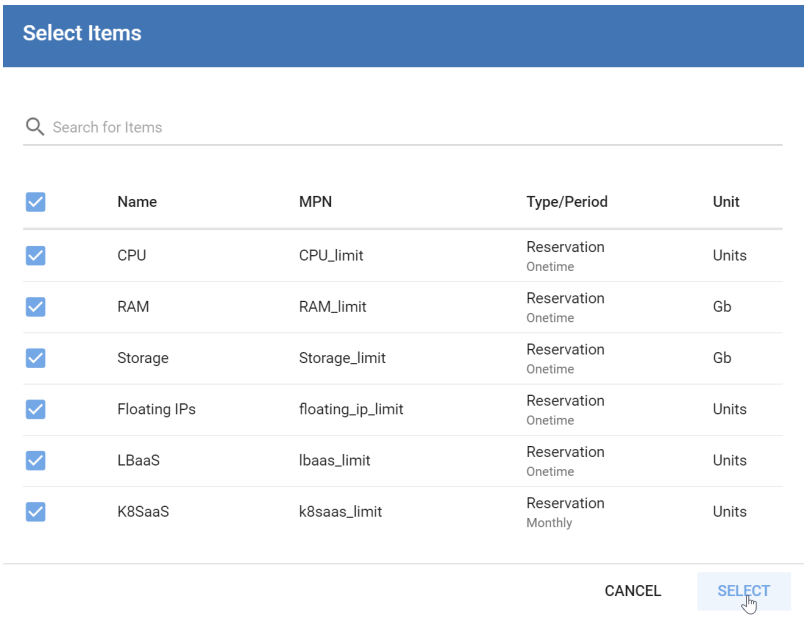
5. In **Create Asset — Step 4 Tiers**, select the tier configuration depending on the tier model of your marketplace and click **Next**.



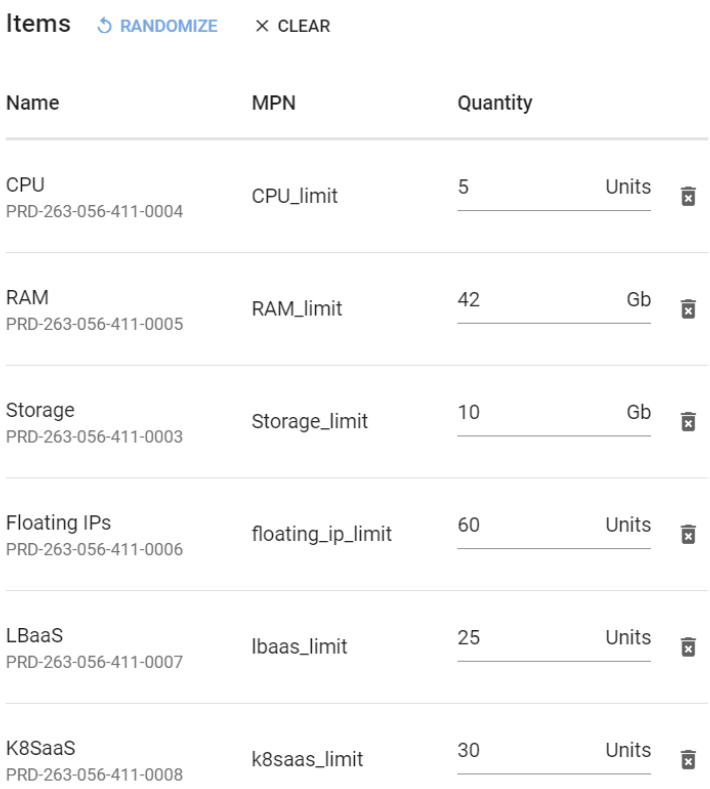
6. (Optional, appears only if you have chosen T1+T2 reseller tiers model) In **Create Asset — Step 5 T2 Account**, choose a T2 reseller account from the drop-down list or create a new one by clicking **New**. Then click **Next**.

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**.



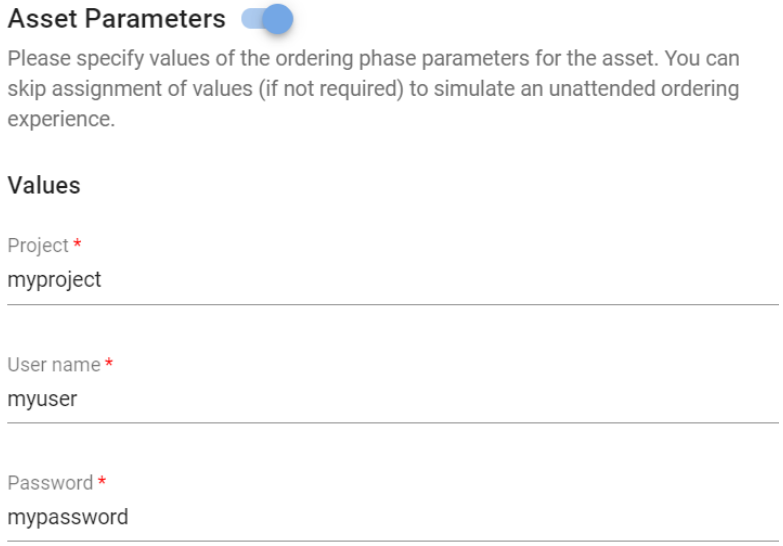
   For the reservation model, change the quantity for items you need. For the pay-as-you-go model, the item quantity cannot be defined. Then click **Next**.



Note

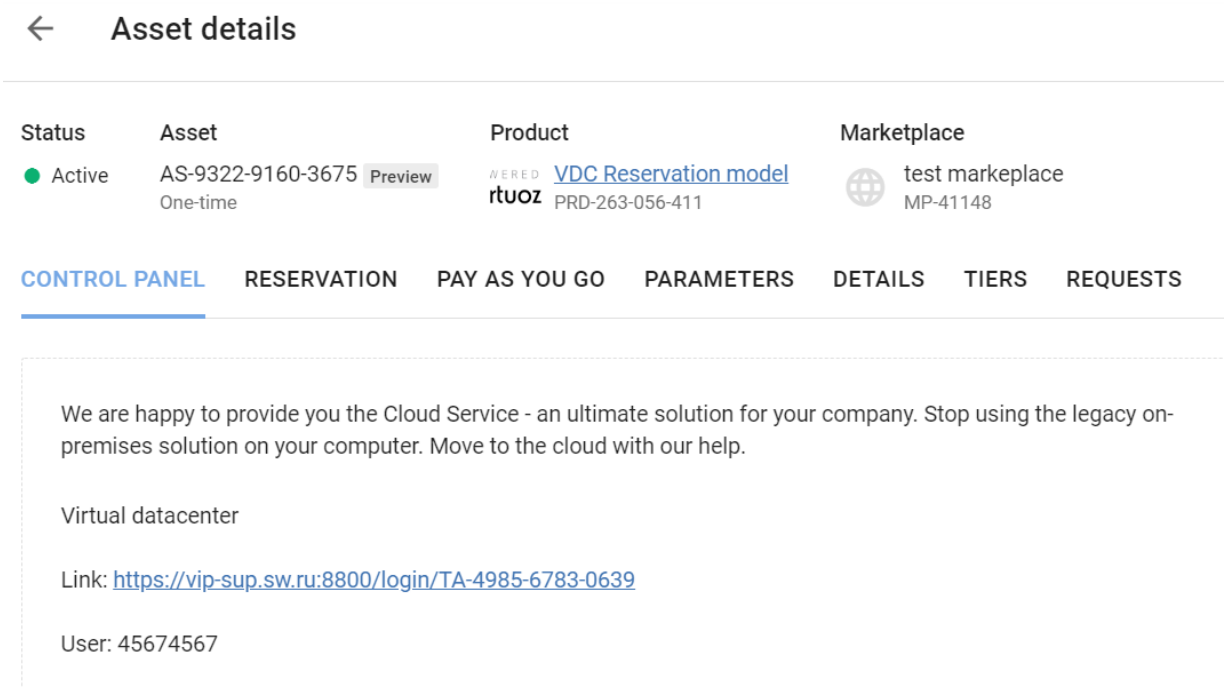
If you are not going to use all of the items, you can exclude unnecessary ones from the asset later by setting their quantity to 0.

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**.



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.



Managing assets

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.

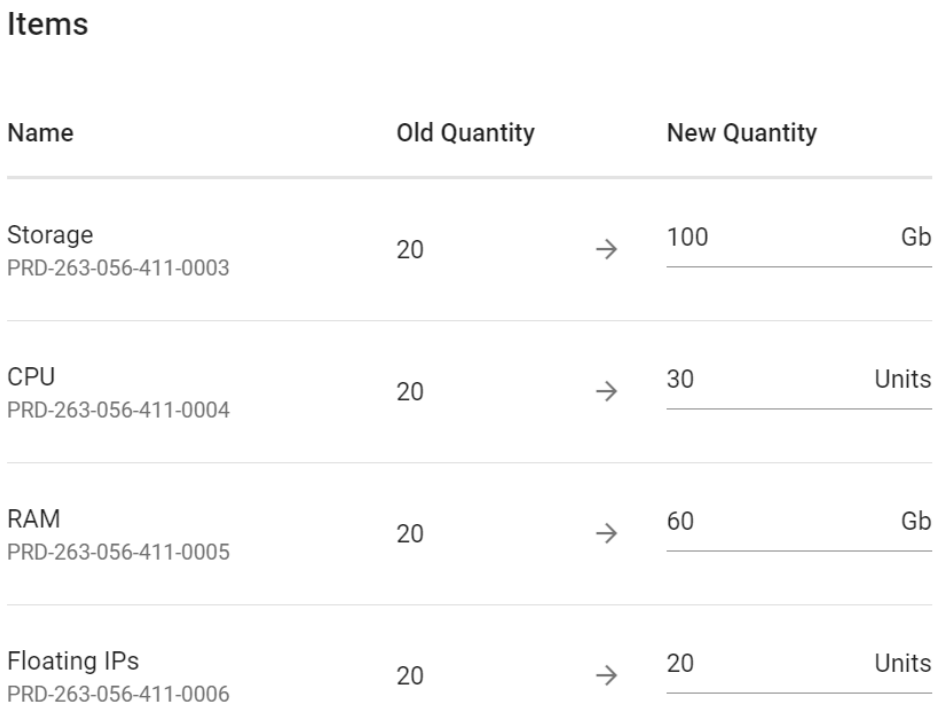
To perform any of these actions, go to the asset details page, click **Actions** and select an action from the **Provider Actions** list.

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:

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**.

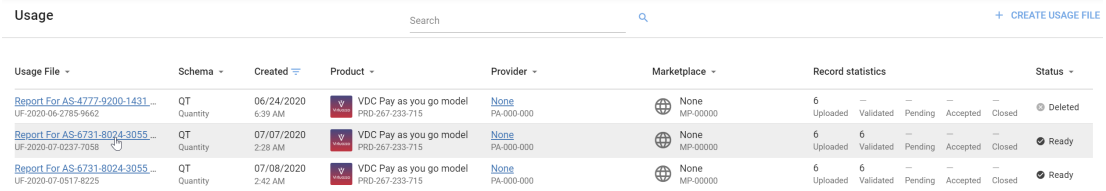
Once an asset is canceled, its status becomes **Terminated** and the asset cannot be processed. A new fulfillment request must be created in order to proceed.

In Virtuozzo Hybrid Infrastructure, the asset project is disabled after an asset is canceled.

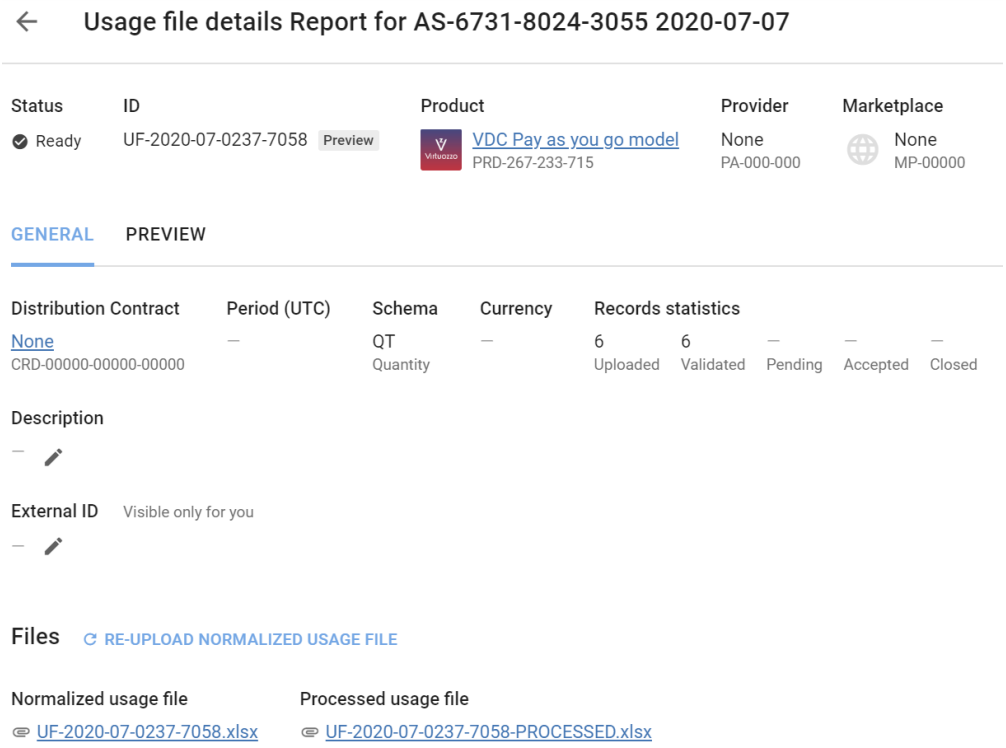
Viewing resource usage reports

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.

item_search_value	quantity	start_time_utc	end_time_utc
CPU_consumption	27	2020-07-06 00:00:00	2020-07-07 00:00:00
Storage_consumption	1260	2020-07-06 00:00:00	2020-07-07 00:00:00
RAM_consumption	54	2020-07-06 00:00:00	2020-07-07 00:00:00
Floating_IP_consumptio	0	2020-07-06 00:00:00	2020-07-07 00:00:00
LB_consumption	0.0000	2020-07-06 00:00:00	2020-07-07 00:00:00
K8S_consumption	0.0000	2020-07-06 00:00:00	2020-07-07 00:00:00

Troubleshooting

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.

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: