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This guide is updated based on features, improvements, and fixes implemented for VCD within the latest OnApp version that is OnApp 6.4. For earlier versions of the documentation, refer to Previous Versions.

This guide contains information on the VMware Cloud Director and OnApp integration. Refer to one of the following guides for information on managing VCD entities in OnApp:

- The Get Started guide contains information on how to configure the VCD and OnApp integration.
- The Administration Guide includes sections on managing VCD-related resources available to administrator users.
- The User Guide includes sections on managing VCD-related resources available to users.
- The API Guide includes API requests you can use to manage VSs, vApps, and other entities.
1 Get Started

The Get Started guide contains information on how to configure the VCD and OnApp integration; provides details about the VCD implementation, supported functionality, settings, and OnApp dashboard. For information on managing VCD entities in OnApp, refer to the Administration Guide or User Guide. For the API requests for managing VCD entities, refer to the API Guide.

This guide is updated based on features, improvements, and fixes implemented for VCD within the latest OnApp version.

1.1 Configure VMware Cloud Director Integration

The VMware Cloud Director integration is included by default into the OnApp installer. Perform the following steps to install the Cloud Director:

- RabbitMQ and OnApp Control Panel Connection
- Import of VMware Cloud Director resources into OnApp

As initial import of VMware Cloud Director into OnApp might take a considerable amount of time, you may consider increasing the Idle session timeout parameter in the VMware Cloud Director at Administration > General, to avoid the possible import failure.

You may also check the Versions Compatibility to see which OnApp and vCloud versions are compatible.

On this page:

- RabbitMQ And OnApp Control Panel Connection
- Import of VMware Cloud Director resources into OnApp

See also:

- Quick VMware Cloud Director Integration
- VMware Cloud Director Integration Details

1.1.1 RabbitMQ And OnApp Control Panel Connection

OnApp VCD integration requires the use of RabbitMQ to keep VCD and OnApp synchronized. If you plan using the RabbitMQ server installed by OnApp by default, there is no need for additional configuration in OnApp Control Panel. Though, it is required that you edit the AMQP settings in VCD.

To specify RabbitMQ settings in VCD:

1. Go to your OnApp Control Panel server.
2. Open the `/onapp/interface/config/on_app.yml` file.

3. Find the RabbitMQ parameters:
   - rabbitmq_login
   - rabbitmq_password
   - rabbitmq_vhost
   - rabbitmq_host - make sure it is reachable by VMware Cloud Director

4. Edit your AMQP settings in VCD with the RabbitMQ details found at step 3:
   a. Navigate to the Administration tab of your System Organization, expand System Settings, and select Extensibility.
   b. Click Enable Notifications.
   c. Add the details from OnApp.
   d. Specify your VMware Cloud Director AMQP Exchange name that you should later use in the corresponding AMQP Exchange Name box while creating compute resources in OnApp.

   - You can use the Shovel plugin to reliably and continually move messages from your own RabbitMQ instance to the OnApp’s RabbitMQ instance. For more information refer to Using the Shovel plugin with RabbitMQ for VMware Cloud Director.
   - Remember that rabbitmq_host must be reachable by VMware Cloud Director.

If you are running your own RabbitMQ server, it is required that you add the RabbitMQ details through the OnApp Control Panel.

**To specify RabbitMQ settings in OnApp Control Panel:**

If you want to use a separate RabbitMQ instance for VMware Cloud Director, specify the following VMware Cloud Director RabbitMQ parameters in the `/onapp/configuration/rabbit_mq/vcloud/credentials.yml` file:

- :host: - RabbitMQ server IP address
- :port: - RabbitMQ port
- :vhost: - the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.
- :user: - RabbitMQ login
- :password: - RabbitMQ password

If you want to use the same Rabbit MQ instance both for VMware Cloud Director and OnApp engine:

1. Go to your Control Panel's Settings menu, and click the Configuration icon.
2. Click the System tab to change the following application settings:
   - RabbitMQ
     - Host - RabbitMQ server IP address
     - Virtual Host - the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.
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- **Login** - RabbitMQ login
- **Password** - RabbitMQ password

You have to restart OnApp daemon after changing RabbitMQ credentials.

### 1.1.2 Import of VMware Cloud Director resources into OnApp

#### Before you start

- Your VCD should be v10.1 or later
- VCD public addresses should be configured properly
- All VCD users should have a valid email, or else they won’t be imported
- Currently fast-provisioned virtual datacenters are not supported for vApp provisioning
- VCD users should be assigned one of the default or custom VMware Cloud Director roles.
- vApps that have “system” owner will be imported under "System Owner" in OnApp.
- VSs currently cannot be connected to network during provisioning
- VS passwords are not imported into OnApp
- VMware Cloud Director system admins are not imported into OnApp and all management tasks are performed via the VMware Cloud Director web interface.
- VMware Cloud Director compute resource passwords are encrypted by default.

#### Import

To import your VMware Cloud Director resources into OnApp:

1. Log in to OnApp CP as an administrator.
2. Set Rabbit MQ credentials for the OnApp CP and your VMware Cloud Director.
3. Create a compute zone in which the VMware Cloud Director compute resource will reside.

   To create a compute zone:
   a. Go to your Control Panel's **Settings** menu and click the **Compute Zones** icon.
   b. Press "+" or click the **Add New Compute Zone** button.
   c. On the screen that follows:
      i. **Label** - give your compute zone a name
      ii. **Server type** - select a type for your zone. For VMware Cloud Director compute zones select the Virtual Private Cloud type.
      iii. **Location group** - select the location group to which this Compute zone will be assigned
      iv. **Failover timeout** - set the time period for which the iterations will run during the failover if the compute resource does not respond
   d. Click the **Save** button.
4. Create a compute resource of a vCloud type and specify VMware Cloud Director global system admin credentials and API URL of your VMware Cloud Director.

When importing VCD resources you can choose whether you wish your users to be associated with one or several VMware Cloud Director instances. If you wish your users to have access to multiple VMware Cloud Director instances, you can set up several organizations from different VCD instances to be associated in OnApp with a single user group and have access to resources across multiple VCD instances.

- **single vCloud Director mode** - all resources are imported from the VCD instance. Each organization is imported as a separate user group which can be associated with one VCD instance.
- **multiple vCloud Director mode** - only system level entities are imported (provider VDCs, external networks, etc.). Organizations are imported but are empty, i.e. do not contain resources and users. After the initial import you can select which organization you wish to import and associate with a certain user group. Users imported in this mode can be configured to have access to multiple VCD instances.

To create a compute resource:

a. Go to your Control Panel **Settings** menu.

b. Click the **Compute Resources** icon.

c. Press + button or click the **Add New Compute Resource** button underneath the list of compute resources on the screen.

d. On the screen that appears:
   - **Label** - enter a compute resource name.
   - **Compute resource type** - choose a compute resource type. Select vcloud.
   - **Compute zone** - select the compute zone you added on Step 3.
   - **Operation mode** - select whether you wish to import the zone in the single or multiple VMware Cloud Director mode. If you select the multiple VMware Cloud Director, you need to later import the resources of an organization and its users.
   - **Login** - specify the VMware Cloud Director system admin login
   - **Password** - specify the VMware Cloud Director system admin password
   - **API URL** - set the VMware Cloud Director API URL - e.g. [https://example.com](https://example.com)
   - **AMQP Exchange Name** - specify your VMware Cloud Director AMQP exchange name (this can be taken in your VMware Cloud Director instance Extensibility > Settings > Exchange)

e. Click the **Save** button. The compute resource will be added to the system and the import will start automatically.

You can later switch from single VMware Cloud Director mode to the multiple VMware Cloud Director mode if required. In this case, the new organizations will no longer be synchronized from VCD to OnApp. It will be required to import each new organization.

You cannot switch from multiple to single VMware Cloud Director mode.
5. The import will start automatically. After the transaction is successfully completed, all your VMware Cloud Director resources will be shown in OnApp. You can view log output of transaction Import vCloud to Control Panel for more import details.

6. Import the users and resources of the required organization. This step is only applicable if you have selected the multiple VMware Cloud Director mode for your compute resource in step 4.
   a. Go to Control Panel > Settings > Compute Resources > Label.
   b. The page that loads shows the details of your VCD compute resource. Click Tools and select Import Organization from vCloud.
   c. Move the Import slider to the right next to the organization(s) you wish to import.
   d. Select a user group to which you wish to assign the organization in the Assign to User Group field. If you do not select a user group but enable the Import slider, a new user group will be created for this organization. If you select a user group that is already associated with one or several organizations, the users from the new organization will be created in the already present organizations and the users from the already present organizations will be created in the new user group.
   e. Click Submit to import the organizations.

   After adding/deleting vCloud compute resource you need to restart OnApp service on the Control Panel for the correct statistics gathering and resources synchronization.

1.2 OnApp with VMware Cloud Director Installation Guide

Please note than OnApp 6.3 does not support any VMware Cloud Director version before 10.1.

If you wish to deploy only the VCD integration model, you only need to install the Control Panel server, configure Rabbit MQ, and import VMware Cloud Director:

- Install/Update Control Panel Server
- Configure RabbitMQ and OnApp Control Panel Connection
- Import of VMware Cloud Director Resources into OnApp

- As initial import of VMware Cloud Director into OnApp might take a considerable amount of time, you may consider increasing the Idle session timeout parameter in the VMware Cloud Director at Administration > General, to avoid the possible import failure.
- It is recommended to have VMware Cloud Director and OnApp Control Panel in one network.
- If you already have RabbitMQ installed on another box or you already have VCD login and password, please run the installer with additional Rabbit MQ and VCD options.
On App and VMware Cloud

6.5 Edge 4

Director Configuration Guide

On this page:

- Install/Update Control Panel Server
- Configure RabbitMQ and OnApp Control Panel Connection
- Import of VMware Cloud Director Resources into OnApp

See also:

- Configure VMware Cloud Director Integration

1.2.1 Install/Update Control Panel Server

To install/update control panel server:

1. Update your server:
   
   ```
   # yum update
   ```

2. Download OnApp YUM repository file:
   
   ```
   # rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-6.4.noarch.rpm
   ```

3. Install OnApp Control Panel installer package:
   
   ```
   #> yum install onapp-cp-install
   ```

4. Edit the `/onapp/onapp-cp.conf` file to set Control Panel custom values. Custom values must be set before the installer script runs.
   
   ```
   # vi /onapp/onapp-cp.conf
   ```

5. Run the Control Panel installer:
   
   ```
   #> /onapp/onapp-cp-install/onapp-cp-install.sh -i SNMP_TRAP_IPS
   ```

   Ensure that the `SNMP_TRAPS_IP` should be the management IP of your CP server.

**VCD and Rabbit MQ options**

The installer will automatically install/upgrade RabbitMQ server on the CP’s box and configure it if no options are specified.
Consider the options below for Rabbit MQ configuration if it is already installed on server separate from CP.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>--rbthost RBT_HOST</td>
<td>IP address/FQDN where RabbitMQ Server runs. The RabbitMQ will be installed and configured on the current box if localhost/127.0.0.1 or box's public IP address (enlisted in SNMP_TRAP_IPS) Default values is 127.0.0.1.</td>
</tr>
<tr>
<td>VCD_*</td>
<td>These options are useful if VMware Cloud Director/RabbitMQ is already installed and configured.</td>
</tr>
<tr>
<td>--VCDlogin VCD_LOGIN</td>
<td>RabbitMQ/VMware Cloud Director user. Default value is 'rbtVCD'.</td>
</tr>
<tr>
<td>--VCDpasswd VCD_PASSWD</td>
<td>RabbitMQ/VMware Cloud Director user password. The random password is generated if isn't specified.</td>
</tr>
<tr>
<td>--VCDvhost VCD_VHOST</td>
<td>RabbitMQ/VMware Cloud Director vhost. Default value is '/'</td>
</tr>
<tr>
<td>RBT_*</td>
<td>These options are used to configure RabbitMQ manager account. If local RabbitMQ server.</td>
</tr>
<tr>
<td>--rbtlogin RBT_LOGIN</td>
<td>RabbitMQ manager login. The default value is 'rbtmgr'.</td>
</tr>
<tr>
<td>--rbtpasswd RBT_PASSWD</td>
<td>RabbitMQ manager password. The random password is generated if isn't specified.</td>
</tr>
</tbody>
</table>

6. Install OnApp license to activate the Control Panel:
   Enter a valid license key via the Web UI (you'll be prompted to do so). Once you have entered a license it can take up to 15 minutes to activate.

7. Restart the OnApp service:
   ```
   #> service onapp restart
   ```

8. Once the installation of the Control Panel is complete, your default OnApp login will be admin/changeme. The password can be changed via the Control Panel's Users menu. You can now proceed to RabbitMQ and OnApp Control Panel connection.

   - Installer output is redirected to ./onapp-cp-install.log
   - All installer critical errors are in /var/log/messages

If you are using the OnApp High Availability CP and VMware Cloud Director integration:
You need to perform the following steps to be able to use OVA and ISO functionality in your cloud.

1. Change the path to upload templates and media for using the shared directory:
   ```
   ...
   iso_path_on_cp: "/path_to_shared_directory"
   ova_path: "/path_to_shared_directory"
   ...
   ```
   You should specify the shared directory for ISO and OVA variables.
2. Unmanage `onapp-frontend-httpd-group-cluster` and `onapp-engine-group-cluster` resources and restart services to apply the new configuration:

```
#crm resource unmanage onapp-frontend-httpd-group-cluster &&
crm resource unmanage onapp-engine-group-cluster
```

3. Restart the OnApp engine and httpd services on all nodes:

```
# service onapp restart && service httpd restart
```

4. Ensure that the services have been restarted correctly.

5. Manage unmanaged resources from step 2:

```
#crm resource manage onapp-frontend-httpd-group-cluster &&
crm resource manage onapp-engine-group-cluster
```

### 1.2.2 Configure RabbitMQ and OnApp Control Panel Connection

OnApp VCD integration requires the use of RabbitMQ to keep VCD and OnApp synchronized. If you plan using the RabbitMQ server installed by OnApp by default, there is no need for additional configuration in OnApp Control Panel. Though, it is required that you edit the AMQP settings in VCD.

**To specify RabbitMQ settings in VCD:**

1. Go to your OnApp Control Panel server.
2. Open the `/onapp/interface/config/on_app.yml` file.
3. Find the RabbitMQ parameters:
   - `rabbitmq_login`
   - `rabbitmq_password`
   - `rabbitmq_vhost`
   - `rabbitmq_host` - make sure it is reachable by VMware Cloud Director
4. Edit your AMQP settings in VCD with the RabbitMQ details found at step 3:
   a. Navigate to the Administration tab of your System Organization, expand System Settings, and select Extensibility.
   b. Click Enable Notifications.
   c. Add the details from OnApp.
   d. Specify your VMware Cloud Director AMQP Exchange name that you should later use in the corresponding AMQP Exchange Name box while creating compute resources in OnApp.

- You can use the Shovel plugin to reliably and continually move messages from your own RabbitMQ instance to the OnApp’s RabbitMQ instance. For more information refer to Using the Shovel plugin with RabbitMQ for VMware Cloud Director.
- Remember that `rabbitmq_host` must be reachable by VMware Cloud Director.
If you are running your own RabbitMQ server, it is required that you add the RabbitMQ details through the OnApp Control Panel.

**To specify RabbitMQ settings in OnApp Control Panel:**

If you want to use a separate RabbitMQ instance for VMware Cloud Director, specify the following VMware Cloud Director RabbitMQ parameters in the `/onapp/configuration/rabbit_mq/vcloud/credentials.yml` file:

- `host`: RabbitMQ server IP address
- `port`: RabbitMQ port
- `vhost`: the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.
- `user`: RabbitMQ login
- `password`: RabbitMQ password

If you want to use the same RabbitMQ instance both for VMware Cloud Director and OnApp engine:

1. Go to your Control Panel’s **Settings** menu, and click the **Configuration** icon.
2. Click the **System** tab to change the following application settings:
   - **RabbitMQ**
     - `Host`: RabbitMQ server IP address
     - `Virtual Host`: the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.
     - `Login`: RabbitMQ login
     - `Password`: RabbitMQ password

You have to restart OnApp daemon after changing RabbitMQ credentials.

Remember that `rabbitmq_host` must be reachable by VMware Cloud Director.

### 1.2.3 Import of VMware Cloud Director Resources into OnApp

**Before you start**

- Your vCD should be v8.0 or later
- VCD **public addresses** should be configured properly
- All VCD users should have a valid email, or else they won’t be imported
- Currently, fast-provisioned virtual datacenters are not supported for vApp provisioning
• VCD users should be assigned one of the default or custom VMware Director roles.
• vApps that have “system” owner will be imported under "System Owner" in OnApp.
• VSs currently cannot be connected to the network during provisioning
• VS passwords are not imported into OnApp
• VMware Director system admins are not imported into OnApp and all management tasks are performed via the VMware Director web interface.
• VMware Director compute resource passwords are encrypted by default.

Import
To import your VMware Director resources into OnApp:
1. Log in to OnApp CP as an administrator.
2. Set Rabbit MQ credentials for the OnApp CP and your VMware Director.
3. Create a compute zone in which the VMware Director compute resource will reside.

To create a compute zone:
   a. Go to your Control Panel’s Settings menu and click the Compute Zones icon.
   b. Press "+" or click the Add New Compute Zone button.
   c. On the screen that follows:
      i. Label - give your compute zone a name
      ii. Server type - select a type for your zone. For VMware Director compute zones select the Virtual Private Cloud type.
      iii. Location group - select the location group to which this Compute zone will be assigned
      iv. Failover timeout - set the time period for which the iterations will run during the failover if the compute resource does not respond
   d. Click the Save button.

4. Create a compute resource of a vcloud type and specify VMware Director global system admin credentials and API URL of your VMware Director.

When importing VCD resources you can choose whether you wish your users to be associated with one or several VMware Director instances. If you wish your users to have access to multiple VMware Director instances, you can set up several organizations from different VCD instances to be associated in OnApp with a single user group and have access to resources across multiple VCD instances.

   o single vCloud Director mode - all resources are imported from the VCD instance. Each organization is imported as a separate user group which can be associated with one VCD instance.
   o multiple vCloud director mode - only system level entities are imported (provider VDCs, external networks, etc.). Organizations are imported but are empty, i.e. do not contain resources and users. After the initial import, you can select which organization you wish to import and associate with a certain user group. Users imported in this mode can be configured to have access to multiple VCD instances.

To create a compute resource:
   a. Go to your Control Panel Settings menu.
   b. Click the Compute Resources icon.
c. Press + button or click the **Add New Compute Resource** button underneath the list of compute resources on the screen.

d. On the screen that appears:
   - **Label** - enter a compute resource name.
   - **Compute resource type** - choose a compute resource type. Select vcloud.
   - **Compute zone** - select the compute zone you added on Step 3.
   - **Operation mode** - select whether you wish to import the zone in the single or multiple VMware Director mode. If you select the multiple VMware Director, you need to later import the resources of an organization and its users.
   - **Login** - specify the VMware Director system admin login
   - **Password** - specify the VMware Director system admin password
   - **API URL** - set the VMware Director API URL - e.g. https://example.com
   - **AMQP Exchange Name** - specify your VMware Director AMQP exchange name (this can be taken in your VMware Director instance [Extensibility > Settings > Exchange]

5. The import will start automatically. After the transaction is successfully completed, all your VMware Director resources will be shown in OnApp. You can view log output of transaction *Import vCloud to Control Panel* for more import details.

6. Import the users and resources of the required organization. This step is only applicable if you have selected the multiple VMware Director mode for your compute resource in step 4.
   - a. Go to **Control Panel** > **Settings** > **Compute Resources** > **Label**.
   - b. The page that loads shows the details of your VCD compute resource. Click **Tools** and select **Import Organization from vCloud**.
   - c. Move the *Import* slider to the right next to the organization(s) you wish to import.
   - d. Select a user group to which you wish to assign the organization in the *Assign to User Group* field. If you do not select a user group but enable the *Import* slider, a new user group will be created for this organization. If you select a user group that is already associated with one or several organizations, the users from the new organization will be created in the already present organizations and the users from the already present organizations will be created in the new user group.
   - e. Click **Submit** to import the organizations.

After adding/deleting vCloud compute resource you need to restart OnApp service on the Control Panel for the correct statistics gathering and resources synchronization.
Please note

- At the moment, vCloud system admins are not imported into OnApp and all management tasks are performed via the VMware Cloud Director web interface.
- VS passwords are not imported into OnApp.
- vCloud compute resource passwords are encrypted by default.

1.3 VMware Cloud Director Integration Details

OnApp gives you a possibility to import multiple VCDs into OnApp. The integration with VMware enables existing VMware Cloud Director installations to use the OnApp CP as their front-end UI. With the integration, OnApp provides UI options for VMware Cloud Direc users (VS monitoring), and expands VMware Cloud Director capabilities with integrated buckets.

OnApp CP and the VMware Cloud Director are synchronized on a daily basis to update the data.

- Control Panel with VMware Cloud Director integration should have at least 3 onapp instances (vcloud L1, vcloud L2 and another one).
- OnApp supports both default and custom VCD roles. Default vCloud roles are mapped using the label, therefore, please do not change the labels of the default user roles in VMware Cloud Director. The custom role will not appear in the user creation wizard if the role does not exist in all organizations under a certain user group. Custom roles are not synchronized between the organizations in a user group, therefore, you will be required to add the same custom role in VCD for all organizations in a user group.

On this page:

- Versions Compatibility
- Implementation
- VMware Cloud Director Instance
- Networks
- Storage Policies
- Users
- Roles

1.3.1 Versions Compatibility
To use **NSX-V** with OnApp, vCloud Director v9.7 or higher is required.

Below you can find the compatibility matrix for VMware Cloud Director and OnApp versions:

<table>
<thead>
<tr>
<th>Versions</th>
<th>vCD 9.1</th>
<th>vCD 9.5</th>
<th>vCD 9.7</th>
<th>vCD 10.0</th>
<th>VCD 10.1</th>
<th>VCD 10.2</th>
<th>VCD 10.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>OnApp v6.5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edge 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.5</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edge 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.5</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edge 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.5</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edge 1</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.4</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.3</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.2</td>
<td>✓ ✓ ✓ ✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp v6.1</td>
<td>✓ ✓ ✓ ✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1.3.2 Implementation**

OnApp and VMware Cloud Director connection is supported with RabbitMQ. To integrate OnApp with the VMware Cloud Director, you must specify RabbitMQ credentials both on the OnApp CP and the VMware Cloud Director (in beta version, RabbitMQ will be delivered with the OnApp RPMs. RabbitMQ will be synchronizing OnApp and the VMware Cloud Director: it will get the list of actions happen in the VCD and report it to the CP).

After that, add the VMware Cloud Director instance as an OnApp compute resource (vcloud type) and specify the VMware Cloud Director URL and VMware Cloud Director system admin credentials. After that, all the existing VMware Cloud Director resources will be shown in OnApp.

Starting with OnApp 5.5 version, vCloud administrator is imported into OnApp as "System owner" together with VSs and vApps, which belong to this user. "System owner" user can not be edited in OnApp, but cloud administrator has a possibility to reassign "System owner"s VSs or vApps to other owners.
At the moment, importing a VMware Cloud Director into OnApp includes the following components:

- VMware Cloud Director instance (as an OnApp compute resource)
- vApps
- VSs
- Catalogues
- Organizations (added as OnApp user groups)
- Networks (organization vDC networks, external networks and vApp networks)
- Storage policies
- Users and their roles (except system administrators)

The import of other VMware Cloud Director components into OnApp is scheduled for the following releases.

When importing VCD resources you can choose whether you wish your users to be associated with one or several VMware Cloud Director instances. If you wish your users to have access to multiple VMware Cloud Director instances, you can set up several organizations from different VCD instances to be associated in OnApp with a single user groups and have access to resources across multiple VCD instances. There the following two variants of importing VCD into OnApp:

- **single vCloud Director mode** - all resources are imported from the VCD instance. Each organization is imported as a separate user group which can be associated with one VCD instance.
- **multiple vCloud director mode** - only system level entities are imported (provider VDCs, external networks, etc.). Organizations are imported but are empty, i.e. do not contain resources and users. After the initial import you can select which organization you wish to import and associate with a certain user group. Users imported in this mode can be configured to have access to multiple VCD instances.

If in VCD you delete a user from a user group with which several organizations from different VCDs are associated, the user will be removed but will be recreated after the synchronization. The reason is that the user exists in all organizations within one user group. If you delete such users in OnApp, they are removed from all organizations in the user group.
1.3.3 VMware Cloud Director Instance

1.3.3.1 Virtual Servers
Virtual servers, built on a guest operating system, can be used to install and run software compatible with that operation system.

VSs between VMware Cloud Director and vCenter are mapped using MoRef ID.

1.3.3.2 vApps
vApp consists of one or more virtual servers that communicate over a network and use resources and services in a deployed environment.

1.3.3.3 vApp Templates
A vApp template is a virtual server image that is loaded with an operating system, applications, and data. VApp templates are added to catalogs.

1.3.3.4 Catalogs
A catalog is a container for vApp templates and media files. You can view the list of catalogs at OnApp Control Panel > Cloud > Catalogs menu of your OnApp Cloud.

1.3.3.5 Edge Gateways
Edge Gateway is a virtual router for organization vDC (virtualDataCenter) networks. You can view the list of edge gateways (together with firewall rules, NAT rules and VPN service) at OnApp Control Panel > Cloud > Edge Gateways menu of your OnApp Cloud.

1.3.3.6 VMware Cloud Director Resource Pools
Resource pool is an allocation model which determines how and when the provider virtual data center compute and memory resources are committed to the organization virtual data center. There are three types of resource pools:
- Allocation Pool
- Pay-As-You-Go
- Reservation Pool

1.3.3.7 Orchestration Models
Orchestration models enable you to provide your customers with a ready environment which they can use to deploy virtual servers.

1.3.3.8 Organizations
VCD Organizations are associated with OnApp user groups. You can view individual organizations at Control Panel > Cloud > Organizations or the user groups the organizations are associated with at Control Panel > Cloud > Groups. If several organizations are associated with one user group, the users from each organization will be created in the other
organizations in the group. In this case the users in the user group will have access to multiple VCD instances.

1.3.3.9 Buckets
A bucket is a set of limits and prices for the resources used by VMware Cloud Director organizations imported as user groups into OnApp.

1.3.4 Networks
External, organization and vApp network types, as well as network pools, are imported into OnApp as networks and network zones of the VPC type. Below are the details on how different VCD networks are imported:

<table>
<thead>
<tr>
<th>Network Zone Isolated</th>
<th>Network Zone Routed</th>
<th>Network Zone External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated Org Networks</td>
<td>Routed Org Networks</td>
<td>External Network</td>
</tr>
<tr>
<td>Isolated vApp Networks</td>
<td>Routed vApp Networks</td>
<td>Direct Org Networks</td>
</tr>
<tr>
<td>Direct vApp Networks</td>
<td>Direct vApp Networks</td>
<td>Direct vApp Networks</td>
</tr>
</tbody>
</table>

**Network Pools**
Each network pool is imported into OnApp as two network zones:

- **Isolated network zone** - this zone contains isolated organization and vApp networks imported from VMware Cloud Director.

- **Routed network zone** - this zone contains routed organization and vApp networks imported from VMware Cloud Director.

**External Networks**
External networks are imported both as a network zone and as a network within that zone. Importing external networks as network zones enables administrators to configure billing for external network usage.

**Organization Networks**
Organization networks are imported into OnApp as Org networks and are associated with a network zone. Depending on the type of the organization network, it will be associated with a certain zone.

- **Routed organization networks** are associated with their network pool imported as a routed network zone.

- **Isolated organization networks** are associated with their network pool imported as an isolated network zone.

- **Direct organization networks** are associated with their external network imported as a network zone.

**vApp Networks**
vApp networks are imported into OnApp as networks and are associated with a network zone. Depending on the type of the vApp network, it will be associated with a certain zone.
- *Routed vApp networks* are associated with their network pool imported as a routed network zone.
- *Isolated vApp networks* are associated with their network pool imported as an isolated network zone.
- *Direct vApp networks* are associated with their parent organization network and are assigned to the network zone to which their parent networks are assigned. So depending on the parent network, they can be imported to Isolated, Routed, or External network zone.

### 1.3.5 Storage Policies

Provider storage policies are imported to OnApp as data store zones of the VPC type. Storage policies appear in the OnApp UI as data stores. You can select them during vApp creation. To view storage policies and the list of disks and VSs associated with them, go to the *Admin > Settings > Data Stores* menu.

### 1.3.6 Users

Users are imported with their existing roles. These roles are mapped using the label. OnApp imports the username and creates that user in OnApp. From that point forward, changes to the user should be made inside OnApp. OnApp will generate a random password for each imported user. The user will be emailed with the instructions to change this password to be able to log into OnApp. After the log in, user will be asked to confirm the VMware Cloud Director password.

Also, vCloud users can log in using [SAML authentication](#). The process is the same as for usual OnApp users.

### 1.3.7 Roles

OnApp supports predefined and custom user roles imported from VMware Cloud Director. The custom roles are associated with the user group in which the organization that includes the role resides. Custom VCD roles in OnApp have the following appearance: *User Group Label-vCD Role Label*. You can view the organization with which the role is associated at Control Panel > *Cloud > Roles > Label* in the *Assigned Organizations* field.

If a custom user role exists in several organizations that are under different user groups in OnApp, for each of the user groups this role is created separately. In this case there will be several separate roles with the label of the user group they reside in and the name of the VCD custom role.

Custom roles are not synchronized between the organizations in a user group, therefore, you will be required to add the same custom role in VCD for all organizations in a user group. Additionally, the permissions list is not updated in OnApp for custom roles imported from VCD.

### 1.4 VMware Cloud Director Supported Functionality

Here is the list of the current VMware Cloud Director functions you can perform by means of OnApp Control Panel:

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Supported Actions</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>vApps</td>
<td>view</td>
<td>4.0 and up</td>
</tr>
<tr>
<td>Functionality</td>
<td>Supported Actions</td>
<td>Version</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>compose</td>
<td>4.1 and up</td>
</tr>
<tr>
<td></td>
<td>create</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>start</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>stop</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>edit</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>recompose</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>add vApp to catalog</td>
<td>4.1 and up</td>
</tr>
<tr>
<td></td>
<td>add to catalog</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>change vApp owner</td>
<td>5.5 and up</td>
</tr>
<tr>
<td></td>
<td>suspend</td>
<td>5.5 and up</td>
</tr>
<tr>
<td></td>
<td>unsuspend</td>
<td>5.5 and up</td>
</tr>
</tbody>
</table>

| Virtual Servers    | view                               | 4.0 and up       |
|--------------------| shutdown                           | 4.0 and up       |
|                    | reboot                             | 4.0 and up       |
|                    | edit (label, RAM,CPU)              | 4.0 and up       |
|                    | set SSH keys                       | 4.2 and up       |
|                    | view VS console                    | 4.0 and up       |
|                    | start                              | 4.0 and up       |
|                    | delete                             | 4.1 and up       |
|                    | insert/eject media (ISO)           | 4.2 and up       |
|                    | install VMWare Tools               | 4.3 and up       |
|                    | suspend                            | 5.5 and up       |
|                    | unsuspend                          | 5.5 and up       |
|                    | resume                             | 5.5 and up       |
|                    | back up by the Veeam plugin        | 5.9 and up       |
|                    | migrate to KVM                     | 5.10 and up      |

| VS Console         | MKS                                | 4.0 and up       |

<p>| VS Snapshots       | view                               | 4.0 and up       |
|--------------------| create                             | 4.0 and up       |
|                    | restore                            | 4.1 and up       |
|                    | build                              | 4.1 and up       |
|                    | delete                             | 4.1 and up       |</p>
<table>
<thead>
<tr>
<th>Functionality</th>
<th>Supported Actions</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VS Monitoring</strong></td>
<td>view CPU statistics</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>view networking statistics</td>
<td>4.0 and up</td>
</tr>
<tr>
<td></td>
<td>view disk statistics</td>
<td>4.0 and up</td>
</tr>
<tr>
<td><strong>VS Network Interface</strong></td>
<td>view</td>
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<td></td>
<td>add</td>
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<td>create</td>
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<tr>
<td>edit</td>
<td>4.2 and up</td>
</tr>
<tr>
<td>delete</td>
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<tr>
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<td>4.0 and up</td>
</tr>
<tr>
<td>add</td>
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#### Org Networks

<table>
<thead>
<tr>
<th>Supported Actions</th>
<th>Version</th>
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<td>view</td>
<td>4.2 and up</td>
</tr>
<tr>
<td>create</td>
<td>4.3 and up</td>
</tr>
<tr>
<td>edit</td>
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<tr>
<td>delete</td>
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#### Firewall Rules

<table>
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<td>4.0 and up</td>
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<tr>
<td>add</td>
<td>4.0 and up</td>
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<tr>
<td>edit</td>
<td>4.1 and up</td>
</tr>
<tr>
<td>delete</td>
<td>4.0 and up</td>
</tr>
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</table>

#### Manage Edge Gateways

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<tr>
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<td>5.4 and up</td>
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<table>
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<tbody>
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<td>4.1 and up</td>
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<tr>
<td>create</td>
<td>4.1 and up</td>
</tr>
<tr>
<td>edit</td>
<td>5.2 and up</td>
</tr>
<tr>
<td>delete</td>
<td>4.1 and up</td>
</tr>
</tbody>
</table>

#### VPN Tunnels

<table>
<thead>
<tr>
<th>Supported Actions</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>view</td>
<td>4.1 and up</td>
</tr>
<tr>
<td>create</td>
<td>4.1 and up</td>
</tr>
<tr>
<td>delete</td>
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</tr>
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<table>
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<th>Functionality</th>
<th>Supported Actions</th>
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</thead>
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<td></td>
<td>create</td>
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<tr>
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<td>edit</td>
<td>4.3 and up</td>
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<td>delete</td>
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</tr>
<tr>
<td>Resource Pool Data Stores</td>
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<tr>
<td></td>
<td>create</td>
<td>4.3 and up</td>
</tr>
<tr>
<td></td>
<td>edit</td>
<td>4.3 and up</td>
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<td></td>
<td>delete</td>
<td>4.3 and up</td>
</tr>
<tr>
<td>Resource Pool Billing Statistics</td>
<td>view</td>
<td>4.2 and up</td>
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<tr>
<td>VMware Cloud Director Buckets</td>
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<td>Payments</td>
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<td></td>
<td>edit</td>
<td>4.2 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
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</tr>
<tr>
<td>Application servers functionality</td>
<td></td>
<td>5.4 and up</td>
</tr>
<tr>
<td>CDN edge servers functionality</td>
<td></td>
<td>5.4 and up</td>
</tr>
</tbody>
</table>

1.5 OnApp Dashboard

The OnApp dashboard is displayed after logging into the system. You can view resource usage statistics, activity log and summary of the entire cloud.
1.5.1 vCloud Director Statistics

You can choose the time period (24 hours, 7 or 30 days), for which the vCloud statistics will be shown. Resource statistics are represented in the form of bars and charts, which show the following:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Used</th>
<th>Total</th>
<th>Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCloud CPU*</td>
<td>Points on the graph show daily peaks of used provider vDC CPU (in GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vCloud Storage*</td>
<td>Points on the graph show daily peaks of used vCloud storage (in GB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*VMware Cloud Director charts are not shown on the dashboard if VMware Cloud Director has never been connected to the Control Panel.

To view additional VMware Cloud Director cloud statistics, click the vCloud icon by the silver dial. Be aware, that you should be logged in as vCloud administrator to view the statistics. You can view the following statistics:

- Memory - the amount of used/total memory (in GB)
- CPU - the amount of used/total CPU (in GHz)
- vDisks - the amount of vDisks and disk size (in GB), used by these vDisks
- IOPS - the amount of input and output requests

For more information on the OnApp dashboard, refer to the Dashboard guide.

Additionally, you can view the last time VCD statistics was gathered from VMware Cloud Director at Control Panel > Sysadmin.

There are two levels of VMware Cloud Director statistics gathering:
1. Level 1 - statuses of vApps and VSS. This statistic is gathered every 60 seconds.
2. Level 2 - CPU statistics gathered every 180 seconds.

1.6 Configuration Settings

For more information on general OnApp system settings, refer to Administration Guide.

Configuration settings include system settings related to RabbitMQ, VMware Cloud Director timeouts, and vDC maximum limits. To edit VCD-related configuration settings, refer to the following sections.
1.6.1 RabbitMQ Settings

On this page:

- RabbitMQ Settings
- VMware Cloud Director Timeouts
- vCloud vDC limits

See also:

- Create and Manage vApps
- Create and Manage vApp Templates
- Virtual Server Power Options
- Virtual Server Snapshots
- Manage Edge Gateways
- Resource Pools

To modify RabbitMQ settings for VMware Cloud Director:

1. Go to your Control Panel > Admin > Settings menu and click the Configuration icon.

2. Click the Infrastructure tab to change the following settings:

   If you change and save any settings, the Control Panel server will restart OnApp services.

   - **RabbitMQ Host** - RabbitMQ server IP address
   - **RabbitMQ Port** - RabbitMQ port
   - **RabbitMQ Virtual Host** - the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.
   - **RabbitMQ Login** - RabbitMQ login
   - **RabbitMQ Password** - RabbitMQ password

If you want to use a separate RabbitMQ instance for VMware Cloud Director, specify the following VMware Cloud Director RabbitMQ parameters in the /onapp/configuration/rabbit_mq/vcloud/credentials.yml file:

- **:host**: - RabbitMQ server IP address
- **:port**: - RabbitMQ port
- **:vhost**: - the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred
1.6.2 VMware Cloud Director Timeouts

You can set custom timeouts for executing VCD-related operations. If the operation is not performed during the period of time you specify in timeouts, this operation will fail with the timeout error.

To set custom timeouts for VCD-related operations:

1. Go to your Control Panel > Admin > Settings menu and click the Configuration icon.

2. Click the vCloud tab and enter the timeout intervals in seconds for the following operations:
   - Default timeout - the default timeout for running VCD-related operations that are not listed below
   - Delete vApp template timeout - the amount of time for deleting a vApp template
   - Delete vApp timeout - the amount of time for deleting vApp
   - Delete media timeout - the amount of time for deleting media files
   - Instantiate vApp template timeout - the amount of time for provisioning a vApp
   - Power-on timeout - the amount of time for starting up a powered-off virtual server
   - Power-off timeout - the amount of time for shutting down a powered-on virtual server
   - Suspend timeout - the amount of time for suspending a virtual server
   - Discard suspend timeout - the amount of time for unsuspending a virtual server
   - Reboot timeout - the amount of time for rebooting a virtual server
   - Undeploy timeout - the amount of time for undeploying a vApp
   - Process descriptor vApp template timeout - the amount of time for uploading a vApp template
   - HTTP request timeout - the amount of time for executing HTTP (API) requests
   - Recompose vApp timeout - the amount of time for recomposing a vApp
   - Create edge gateway timeout - the amount of time for creating an edge gateway
   - Compose vApp template timeout - the amount of time for composing a vApp template
   - Create snapshot timeout - the amount of time for creating a VS snapshot

The undeployment is taking place for a vApp that includes no virtual servers but has assigned networks.
3. Click the **Save Configuration** button to apply settings.

### 1.6.3 vCloud vDC limits

To set the maximum number of resources available in virtual data center:

1. Go to your Control Panel > **Admin > Settings** menu and click the **Configuration** icon.

2. Click the **vCloud** tab to set the following settings:
   - **Max CPU quota** - set the custom max CPU quota limit available. The default value is 1000GHz.
   - **Max memory quota** - set the custom max memory limit available. The default value is 1000GB.

3. Click the **Save Configuration** button to apply settings.
2 Administration Guide

The Administration Guide is updated based on features, improvements, and fixes implemented for VCD within the latest OnApp version that is **OnApp 6.5 Edge 4**. For earlier versions of the documentation, refer to **Previous Versions**.

Here is the sorted list of documentation currently available for vCloud and OnApp integration functionality for administrator users.

- **VMware Cloud Director Virtual Servers**
- **VMware Cloud Director Application Servers**
- **VMware Cloud Director Edge Servers**
- **VMware Cloud Director vApps**
- **Organizations and Users**
- **Buckets and Limits**
- **VMware Cloud Director Permissions**
- **VMware Cloud Director Resources**
- **Networking**
- **NSX-V Integration**
- **NSX-T Integration**

### 2.1 VMware Cloud Director Virtual Servers

Virtual servers, built on a guest operating system, can be used to install and run software compatible with that operating system. Below you can view the list of the current functions you can perform with VMware Cloud Director virtual servers by means of the OnApp Control Panel:

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<tr>
<th>Virtual Server Options</th>
<th>Power Options</th>
<th>Administrative Options</th>
<th>vCloud Director Options</th>
<th>Networking</th>
<th>Disk Stats</th>
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<tbody>
<tr>
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<td>Go to vApp</td>
<td>Configure network interfaces</td>
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<tr>
<td>Delete</td>
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<td>Go to VCD UI</td>
<td>Edit disks</td>
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<tr>
<td>Snapshots</td>
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<td>Delet disk</td>
<td>Network interface statistics</td>
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<td></td>
</tr>
</tbody>
</table>
2.1.1 Manage VMware Cloud Director VSs

VMware Cloud Director virtual servers, built on a guest operating system, can be used to install and run software compatible with that operating system. Below you can view the list of the current functions you can perform with VMware Cloud Director virtual servers by means of OnApp Control Panel:

This document provides the information on how you can manage the virtual servers imported from your VMware Cloud Director.

2.1.1.1 View Virtual Servers

To view all virtual servers deployed in the cloud:

1. Go to your Control Panel > Cloud > Virtual Servers menu to see an overview of all virtual servers in the cloud.

2. The page that loads will show the list of VSs together with their:
   - operating system - the OS on which the virtual server is based
   - label - the name of the virtual server. Click the label to see the VS details.
   - IP addresses - IP addresses assigned to the virtual server
   - disk size - disk size assigned to the virtual server in GB
   - RAM - RAM assigned to the virtual server in GB
   - backups - the number of snapshots and the space these snapshots occupy
   - CPU(s) - the number of CPU(s) included
   - power status - whether the VS is powered ON or OFF. Click the on/off buttons to change the status.
   - actions - click the Actions button next to the VS for the quick access to the list of VS actions:
     - reboot - click this action to reboot the virtual server
     - shutdown - click this action to shut down the virtual server

On this page:

- View Virtual Servers
- Edit Virtual Server
- Insert/Eject Media
- Virtual Server Power Options
- Virtual Server Console
- Set SSH Keys
- Delete Virtual Servers
You can access the details page of a vApp to which the virtual server is assigned from the VS’s Overview page. To view the details of the vApp with which the VS is associated, click the Tools button on the VS Overview screen at Dashboard > Cloud > Virtual Servers > VS label > Tools > Go to vApp.

To be redirected to the VCD user interface from VS Tools menu: go to Dashboard > Cloud > Virtual Servers > VS label > Tools > Go to vCD UI.

You can install VMware tools for your VSs to customize the guest operation system. To install VMware tools go to Dashboard > Virtual Servers > VS label > Tools > Install VMware Tools. After that you can find VMware tools version at VS's Overview page. A VS must be powered on to install VMware Tools.

Ensure that Install VMware Tools permission is on before managing VMware tools. For more information about permissions refer to the Permissions section.

2.1.1.1 Notes
The Notes section lists brief comments or reminders for a VS. You can add either Admin's or User's notes. The Admin's note will be available to cloud administrators with the Any action with admin note permission enabled. Click the Actions button in the Notes section of the page to add admin's or user's note.

2.1.1.2 Service Add-ons
If you have the service add-on functionality enabled and service add-on is assigned to the VS, you can view it at the VS overview page together with the following details:

- **Label** - the service add-on name (by clicking on it you can edit the service add-on)
- **Price** - the service add-on price, set for this service add-on in the Service Add-on Store
- **Type** - user or system
- **Status** - whether the service add-on is active or not
• Delete icon - you can unassign the Service Add-on from this Virtual Server by clicking the **Delete** icon.

To assign more service add-ons to the VS, click the "+" button at the upper right corner of the section. You will be redirected to the VS Overview > VMware Cloud Director VS Service Add-ons section of the VS options.

### 2.1.1.2 Edit Virtual Server

You can edit the label, CPU, and RAM resources for all VCD virtual servers. You can allocate more CPU and RAM without rebooting a virtual server. When you *hot* add more RAM to virtual servers with Linux 64-bit or Windows 7 32-bit guest operating systems, the following conditions are applied:

- If the powered-on VS has less than 3 GB of RAM, you cannot hot add more than 3 GB of RAM.
- If the VS has 1 GB of RAM, you can add 2 GB.
- If the VS has 2 GB of RAM, you can add 1 GB.
- If the VS has 3444 MB of RAM, you can add 128 MB.
- If the powered-on VS has 3 GB of RAM, you cannot hot add any more RAM.

To edit a VCD virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click a label of the server that you want to edit.
3. Click the **Tools** button and then click **Edit Virtual Server**.
4. You can edit the following virtual server settings:
   - **Label** - edit the label of the virtual server
   - **Virtual CPU hot add** - select this checkbox to add CPU resources without rebooting the VS
   - **Memory hot add** - select this checkbox to add RAM resources without rebooting the VS
   - **RAM** - change the amount of RAM allocated to the VS
   - **CPU Cores** - change the number of CPU cores allocated to the VS
   - **Cores per Socket** - select the number of CPU cores per socket

   If the **Virtual CPU hot add** and **Memory hot add** checkboxes are selected, you can add RAM and CPU without rebooting a VS. If only one checkbox is selected but you change both RAM and CPU, the VS needs to be rebooted.

5. Click the **Save** button.
6. If rebooting is required to apply the settings, click the **Continue** button.

### 2.1.1.3 Insert/Eject Media

This option allows you to attach an ISO file from the media library to the VS allowing you to utilize the contents of the ISO.

To attach ISO to VS:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the appropriate virtual server.
3. Click the Tools button and select the Insert Media link.
4. Choose the ISO file from the drop-down list.
5. Click Insert.

To remove ISO from VS:
1. Go to your Control Panel’s Virtual Servers menu.
2. Click the label of the appropriate virtual server.
3. Click the Tools button and select the Eject Media link.
4. Confirm by clicking the Eject button.

- Maximum one ISO can be inserted per VS at a time.
- Ensure that the Media permissions are on before enabling this option. For more information refer to the Permissions section.
- Use only unique media file names. When you copy a media file from public catalogs, rename it (use a unique name) to avoid issues with media ejection.
- You cannot insert floppy disk image files since they are no longer supported by VMware Cloud Director.

### 2.1.1.4 Virtual Server Power Options

The power options available for VS depend on the current state of the virtual server. For example, a powered-on VS will have the Reboot, Suspend and Shut down options, while for a powered-off VS there will be the single option to Startup Virtual Server.

To manage your virtual server’s power options:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of a required virtual server.
3. Click the Tools button and select the required power option:
   - Startup Virtual Server - power on a powered-off virtual server
   - Reboot Virtual Server - reboot the virtual server
   - Shut down Virtual Server - power off the virtual server. A pop-up window will appear where you can select whether the VS should be powered off gracefully (Gracefully shutdown) or forcefully (Power Off). If you select the former option and the system fails to shut down the VS gracefully in the time period indicated in the Timeout Before Shutting Down VSs (30-600 sec) parameter at Settings > Configuration > System, the VS will be shut down forcefully.
   - Suspend - suspend the virtual server
Unsuspend - unsuspend the virtual server

You can set custom timeouts that will be applied for executing the VS power actions and other VCD-related operations. For more information, refer to the Configuration Settings guide.

2.1.1.5 Virtual Server Console

You can use the MKS virtual server console to manage your virtual servers in the command line mode. To use the virtual server console:

1. Go to the Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a virtual server.
3. Click the Console button.

VMware Tools support shared folders and cut and paste operations between the guest operating system and the server from which you launch the VMware Cloud Director Web Console. VMware Cloud Director depends on VMware Tools to customize the guest OS. Using VMware Tools, you can move the pointer in and out of the virtual server console window. A virtual server must be powered on to install VMware Tools.

To add VMware tools:

1. Go to Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of appropriate Virtual Server.
3. Click the Tools button > Add VMware Tools. You will be redirected to the VCD user interface, where you can install or upgrade VMware Tools.

2.1.1.6 Set SSH Keys

- This functionality is applicable to Linux-based VSs only.
- The virtual server will be rebooted after setting SSH keys.
- If a VS owner does not have any SSH keys, the system will only assign admin keys.
- When you have more than one SSH key, you will have access to a list of available SSH keys containing SSH keys of a VS owner and SSH keys of a user who proceeds with such changes.

To set SSH keys for a virtual server:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the necessary virtual server.
3. Click the Tools button and select the Set SSH keys option to assign SSH keys of the admin and a VS owner to the VS.
4. If available, select the SSH keys from the list of VS owner keys and user keys from the dropbox.
5. Click the **Set SSH keys** button to confirm the action.

### 2.1.1.7 Delete Virtual Servers
Shut down the virtual server before destroying it. To remove the virtual server from the cloud:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. On the screen that appears, you'll see the list of all virtual servers in the cloud. Click the label of the virtual server you want to delete.
3. On the virtual server's screen, click the **Tools** button, then select **Delete Virtual Server**.

### 2.1.2 Migrate VSs from VMware Cloud Director to KVM
OnApp enables you to migrate your VMware Cloud Director virtual servers from VMware to KVM virtualization. You can initiate the migration from your OnApp Control Panel, using the procedure described in this document. The migration workflow includes several actions that are required to get your virtual servers up and running on KVM.

This workflow describes the basic steps that are run to migrate a virtual server from VMware Cloud Director to KVM. You can enable some additional automation settings while initiating the migration in the wizard.

**The Migration Workflow**

1. You initiate the migration of a virtual server from your VMware Cloud Director to a KVM compute resource.
2. The source virtual server is stopped and then exported from VMware Cloud Director as a self-contained OVA package.
3. The OVA package is imported to the **OVA List** page in OnApp Control Panel.
4. The OVA package is converted to the KVM virtualization.
5. The virtual server is built from the OVA package.

Before you proceed to migrating your virtual server from VMware Cloud Director to KVM, please take a look at the following section.

**On this page:**

- [Before You Begin](#)
- [Migrate Virtual Server to KVM](#)
- [Troubleshooting](#)

**See also:**

- [Migration from vCenter to KVM](#)
- [VMware Cloud Director Buckets](#)
- [Permissions](#)
2.1.2.1 Before You Begin

Before you proceed further, please note that:

- The migration from vCloud to KVM is available on clouds that run OnApp 5.10.
- You can migrate only virtual servers from your VMware Cloud Director instance to KVM.
- vCloud virtual servers with XFS or LVM partitions/file systems cannot be migrated to KVM.
- The Migrate any/own virtual server permission should be enabled for a user who wants to migrate a virtual server.
- The destination KVM compute, data store, backup server, and network zones should be available in a bucket of a user who runs the migration.
- You can migrate a virtual server to the KVM compute, data store, backup server, and network zones that have enough resources to handle the virtual server.
- If there are not enough resources available in these zones, you cannot complete the wizard and initiate the migration.

If you experience any issues while migrating your virtual servers from VMware Cloud Director to KVM, see Troubleshooting.

2.1.2.2 Migrate Virtual Server to KVM

To migrate a virtual server from a VMware Cloud Director instance to a KVM compute resource, follow the next procedure:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a virtual server that you want to migrate.
3. Click Tools and then click Migration to KVM.
4. Go through the following steps in the wizard to migrate the virtual server:

2.1.2.2.1 Step 1: Compute Resource

The first step enables you to select a KVM-based compute zone and resource to migrate your virtual server to.

- Compute Zone - select a KVM compute zone where you want to migrate the VS
- Compute Resource - select a destination KVM compute resources from the compute zone
- Label - edit a label of the VS if you want to keep the source VS after the migration
- Hostname - edit a hostname of the VS if you want to keep the source VS after the migration

Click Next to proceed to the following step.

2.1.2.2.2 Step 2: Disks

The second step allows you to configure the logic of the disks migration to data stores associated with the KVM compute zone. You can migrate all disks to one data store or select a separate data store for each disk.

- Allow Disk to One Data Store - switch the option on/off to enable or disable the migration of disks to one data store. Depending the selected option, one of the following boxes becomes available:
  - All Disks to One Data Store - select one data store to migrate all the the disks to
  - Select Data Store for Disk - select a separate data store to migrate each disk to
Click **Next** to proceed to the following step.

2.1.2.2.3  **Step 3: Networks**

The third step enables you to apply the network configuration based on the networks available in the KVM compute zone. You assign each interface to a separate network from a destination network zone.

- **Network** - select a network for the interface or leave **Any**. If you select a specific network, you can also set the following network configurations.
- **IP net** - select an IP net that contains the IP address ranges of the network or leave **Any**
- **IP range** - select an IP range from an IP net that you selected in the previous step or leave **Any**
- **IP address** - select an IP address from an IP range that you selected in the previous step or leave **Any**

Click **Next** to proceed to the following step.

2.1.2.2.4  **Step 4: Windows Licensing**

If you migrate a Windows virtual server, the fourth step of the wizard enables you to edit the licensing settings. You can select one of the following licensing options:

- **None** - select the checkbox to migrate a virtual server without license changes
- **MAK** - select the checkbox to migrate a virtual server with the MAK license and edit the following settings:
  - **Distribution** - select the Windows OS distribution of the virtual server
  - **R2** - select the checkbox to use an updated release of the Windows OS distribution
  - **Architecture** - select the architecture of the OS (x86 or x64)
  - **Edition** - select the edition of the Windows OS
- **Your own license** - select the checkbox and paste your own licensing key

Click **Next** to proceed to the following step.

2.1.2.2.5  **Step 5: Confirmation**

The final step allows you to configure the automation settings and initiate the migration.

- **Start VS after migration** - enable the option to start the VS after the migration is finished. If you disable this option, you can start the VS via the **Power Options** after it is migrated.
- **Remove source VS after successful migration** - enable the option to delete the source VS after the migration is finished. If you disable this option, make sure that you edited **Label** and **Hostname** of the VS in the first step of the wizard.

Click **Submit** to initiate the migration.

After you submit the changes, several transactions are run to import your virtual server from VMware Cloud Director to KVM. When the virtual server is built, you can see a log of the transactions in the **Activity Log** section of the destination VS. The migration process could take up to 15 minutes, depending on the virtual server configuration and the migration settings. If you cannot complete the wizard, see **Troubleshooting**.

2.1.2.3  **Troubleshooting**

You may face the following issues while initiating the migration of your virtual server from VMware Cloud Director to KVM:
Not enough resources are available in a destination compute zone.
If there are not enough resources, such as RAM and CPU, select another compute zone or allocate more resources to the destination compute zone.

Not enough disk space is available in a destination data store zone.
If there is not enough disk space, select another data store zone or allocate more space to the destination data store zone.

Not enough IP addresses are available in a destination network zone.
If there are not enough IP addresses, select another network zone or allocate more IP addresses to the destination network zone.

2.1.3 Manage VMware Cloud Director VS Disks
Virtual server storage is provided by disks. A disk is a partition of a data store that is allocated to a specific virtual server. This section provides the information on all the actions supported for disks imported from your VMware Cloud Director.

2.1.3.1 View Disk Details

To view disk details:
1. Go to Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of an appropriate virtual server.
3. Go to the Storage tab and click Disks.
4. Click the Label of an appropriate disk. On the screen that appears, you will see the disk identifier, size in GB and bus sub type.

On this page:
- View Disk Details
- Create Disk
- Edit Disk
- View Disk IOPS
- Delete Disk

See also:
- Manage VMware Cloud Director VSs
- VMware Cloud Director VS Network Interfaces
- Virtual Server Statistics

2.1.3.2 Create Disk

Adding a disk to a virtual server will require that VS to be rebooted. If a VS is running when you try to add a new disk to it, you'll be asked to confirm the reboot. To add a disk to a virtual server:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of an appropriate virtual server.
3. Click the Storage tab > Disks.
4. Click the Create Disk button.
5. Fill in the details:
   - Data Store - select the data store to which the disk will be assigned
   - Size - enter the disk size
   - Bus Sub Type - select the sub type of ‘scsi controller’ to create the disk on. For more information, refer to VMware documentation.
6. Click the Add Disk button to finish.

When you add a new disk to a virtual server, it will automatically become available to that server.

2.1.3.3 Edit Disk

You can resize the disk or live migrate it to another data store by following the next steps:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of an appropriate virtual server.
3. Click the Storage tab > Disks.
4. Click the Actions icon next to the disk that you want to modify and click the Edit button.
5. In the pop-up window change the required parameters:
   - Size - move the slider to select a new size for the disk in GB
   - Data Store - select a new data store for the disk
   - Hot migrate disk - turn the switcher to the right to run hot (live) migration of the disk to the destination data store

If you migrate the disk without the Hot migrate disk option enabled, the virtual server will be rebooted. You will be asked for confirmation to reboot the virtual server.

6. Click the Save Disk button.

- If fast provisioning is enabled for the disk resource pool, the disk cannot be resized.
- You cannot decrease the size of disk(s).
- If you resize the disk of a VS that is powered on, the virtual server will be rebooted. You will be asked for confirmation to reboot the virtual server.
- You can only migrate disks to data stores in data store zones assigned to your bucket.
• You cannot migrate a disk to a data store with less capacity than the disk size.
• If required, you can change a block size which is used during the disk migration at Control Panel > Settings > Configuration > System by editing the Block Size (MB) parameter.

2.1.3.4 View Disk IOPS

To view IOPS for a disk:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of an appropriate virtual server.
3. Click the Storage tab > Disks.
4. Click the Actions icon next to the required disk and click the IOPS button.
5. There are four charts on the screen that appears:
   - Instant IOPS - IOPS for the last hour
   - Hourly IOPS - IOPS for the last 24 hours
   - Instant data written/read - data written/read for the last 24 hours
   - Hourly data written/read - data written/read for the last hour

   To zoom into a time period, click and drag in a chart. Click the Reset Zoom button to zoom out again.

2.1.3.5 Delete Disk

To delete a disk:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Make sure your virtual server is powered off, then click its label to open its details screen.
3. Click the Storage > Disks tab.
4. Click the Actions icon next to the disk you want to delete and click the Delete button. You will be asked for confirmation.

The 'destroy disk' transaction is scheduled after you complete the preceding steps.

2.1.4 View VMware Cloud Director VS Statistics

This section provides the info on how you can manage statistics of virtual servers imported from your VMware Cloud Director.
You can set the `vcloud_stats_batch_size` parameter in the `onapp.yml` file. This parameter defines the number of VSs in a batch during statistics collection.

To have all VMware Cloud Director statistics delivered to OnApp, you need to set the vCenter password(s):

1. Go to your Control Panel > Admin > Settings menu and click the **Compute Resources** icon.
2. Click the label of the Compute resource you want to set vCenter password(s) for.
3. On the screen that appears, click the **Tools > vCenter passwords**.
4. On the page that loads, fill in the vCenter password and **Save**. If valid vCenter password is entered and connection is successful, you will see green dot in Connection status under vCenter password field. If connection fails, the dot is red.

**On this page:**

- [Virtual Server CPU Usage Statistics](#)
- [Virtual Server Disk IOPS Statistics](#)
- [Virtual Server Network Interface Statistics](#)

**See also:**

- [Manage VMware Cloud Director VSs](#)
- [VMware Cloud Director VS Network Interfaces](#)
- [VMware Cloud Director VS Snapshots](#)
- [Manage VMware Cloud Director VS Disks](#)
- [VMware Cloud Director VS Guest Customization](#)

### 2.1.4.1 Virtual Server CPU Usage Statistics

OnApp tracks CPU usage for virtual servers and generates charts that help analyze VS performance. The charts show the total CPU usage for all the cores of this particular VS for a specified time period.
The vertical axis shows the CPU usage percentage (CPU percentage is the core-independent quantity). The horizontal axis defines a time period.

To see CPU usage statistics:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Overview tab > CPU Usage.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there less data available, the chart will show utilization for the time available.
5. Tick the Show in My Timezone box to show bandwidth statistics according to your profile's timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the Show All button to zoom out again.

To see what percentage of compute resource's CPU resource a VS takes, go to your Control Panel's Virtual Servers menu and click the label of the VS you're interested in. On the screen that appears, the CPU(s)/Shares parameter displays the amount of CPU resource given to this VS.

2.1.4.2 Virtual Server Disk IOPS Statistics

The system tracks IOPS (Input/Output Operations per Second) for virtual servers and generates charts that help analyze VS disk performance. The data presented in the chart are for the periods during which the statistics was gathered, typically 3 minutes. To see IOPS for a virtual server:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Storage > Disks tab.
4. Click the Actions button next to the required disk, and then choose IOPS.
5. Click the Statistics (chart) icon next to the disk you're interested in. There are four charts on the screen that appears:
   o IOPS for the last hour
   o IOPS for the last 24 hours
   o Data written/read for the last 24 hours
   o Data written/read for the last hour
6. To zoom into a time period, click and drag in a chart. Click the Show All button to zoom out again.

The OnApp API allows you to limit the Hourly IOPS and Hourly data by setting the limit=N parameter, where the N variable is the number of hours for which the charts will display the info.

2.1.4.3 Virtual Server Network Interface Statistics

OnApp tracks network usage for virtual servers and generates charts that help analyze network performance. To see network utilization statistics for a virtual server:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Networking > Network Interfaces tab.
4. Click the Statistics (chart) icon next to the network you're interested in.
5. On the screen that appears, the top chart shows bandwidth usage for the last 24 hours. The bottom chart shows usage for the last three months.
6. To zoom into a time period, click and drag in a chart. Click the Show all button to zoom out again.

2.1.5 VMware Cloud Director VS Network Interfaces

The Networking > Network Interfaces menu shows the virtual network interfaces allocated to this VS. Network interfaces join the physical network to the VS.

When you create a VS a network interface is added automatically. This network interface will be assigned to the existing physical network using a spare IP (IPv4) and will be set primary by default.

OnApp supports IPv4 and IPv6. Since not every application supports IPv6, at least one IPv4 address must be allocated to a VS's primary network interface.

- To run the VS, at least one network interface with an assigned IP address (or addresses) is required!
- To allocate another physical network, add a new network interface.
- The maximum number of networks that can be added to a virtual server is 10.

On this page:

- View Virtual Server Network Interfaces
- Create Virtual Server Network Interface
- Edit Virtual Server Network Interface
- Delete Virtual Server Network Interface

See also:

- Manage VMware Cloud Director VSs
- Virtual Server Statistics
- VMware Cloud Director VS Snapshots
- Manage VMware Cloud Director VS Disks
- VMware Cloud Director VS Guest Customization
2.1.5.1 View Virtual Server Network Interfaces

To see the list of all network interfaces allocated to the VS:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. On the page that follows you will see the following fields:
   - **Interface** - the optional label of the network interface
   - **Network join** - the name of the network and a compute resource or compute zone this network is joined to
   - **Port Speed** - the speed set for the interface
   - **Adapter Type** - the network adapter type appropriate for this VS
   - **Primary Interface** – indication whether the interface is primary or not.

Here you can also view Interface Usage, edit and delete network interface (using icon controls) and add a new network interface using the button at the bottom of the screen.

2.1.5.2 Create Virtual Server Network Interface

To add a network interface:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. Click the Add New Network Interface button at the bottom of the screen.
5. On the screen that appears, specify the following details:
   - **Connected** - select this checkbox to indicate that the network interface is connected to VS
   - **Physical Network** - select a physical network from the drop-down menu that lists network joins assigned to vApp
   - **Adapter Type** - select one of the following network adapter types for this VS:
     - Viance
     - E1000
     - E1000E
     - VMXNET
     - VMXNET 2 (Enhanced)
     - VMXNET 3
     - FLEXIBLE

   The VMXNET 3 adapter is selected by default as it is the most recent virtual network device from VMware that was
designed for high performance. For more information on selecting network adapters, refer to VMware Documentation.

6. Click the Submit button.  
The maximum number of networks that can be added to a virtual server is 10.

2.1.5.3  Edit Virtual Server Network Interface

To edit a network interface:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. Click the Edit icon next to the interface you want to edit.
5. On the page that appears, you can change the following network interface details:
   o  Primary interface? - select this checkbox to indicate that this interface is primary
   o  Connected - select this checkbox to indicate that the network interface is connected to VS
   o  Physical network - select a network join from the drop-down menu that lists network joins assigned to vApp
6. Click the Submit button.

2.1.5.4  Delete Virtual Server Network Interface

To delete a network interface:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. Click the Delete interface button next to the interface you want to delete.
5. In the pop-up box, click OK to confirm the deletion.

2.1.6  VMware Cloud Director VS Snapshots

Snapshots lock the file system disk and create a new disk with the changes made alongside. There can be only one snapshot per VS; when a new snapshot is created for the VS, the previous one is deleted. You can view, create and delete virtual server snapshots. This section provides information on how to view, create, build and restore VS snapshots.

On this page:

- View VS Snapshots
- Create VS Snapshots
- Restore VS Snapshot
- Build VS Snapshot
- Delete VS Snapshot

2.1.6.1  View VS Snapshots
To view the list of VS Snapshots:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you want to back up.
3. Click the **Tools** button > **Snapshots**.
4. On the screen that appears, you'll see the list of all VS snapshots together with their details:
   - **Snapshot** - the number of snapshot
   - **Name** - timestamp, which shows when snapshot was taken
   - **Built** - whether snapshot is built or not
   - **Note** - text, added to the snapshot
   - **Actions** icon - the actions you can perform with snapshot (restore, delete, add note).

### 2.1.6.2 Create VS Snapshots

To create a snapshot for VMware VS:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you want to back up.
3. Click the **Tools** button > **Snapshots**.
4. Click the **New Snapshot** button.
5. Specify the following details:
   - Tick the **Memory** checkbox if you want to include a dump of the internal state of the virtual server in the snapshot. Memory snapshots take longer to create, but allow reversion to a running virtual server state as it was when the snapshot was taken.
   - Tick the **Quiesce** checkbox if you want to quieten the file system in the virtual server. Quiescing a file system is a process of bringing the on-disk data of a physical or virtual computer into a state suitable for backups. This process might include such operations as flushing dirty buffers from the operating system’s in-memory cache to disk, or other higher-level application-specific tasks.
6. Click **Create Snapshot** button.

### 2.1.6.3 Restore VS Snapshot
You can restore the system to the state it was in when the snapshot was built. To restore the VS from a snapshot:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you want to back up.
3. Click the Tools button > Snapshots.
4. Click the Actions button next to the snapshot you want to use and select Restore.

2.1.6.4 Build VS Snapshot

If the VS snapshot failed to build due to some reason, you can attempt to create it again. To build a snapshot:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you want to back up.
3. Click the Tools button > Snapshots.
4. Click the Actions button next to the snapshot you want to use and select Build.

2.1.6.5 Delete VS Snapshot

To delete a snapshot:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you want to back up.
3. Click the Tools button > Snapshots.
4. Click the Actions button next to the snapshot you want to use and select Delete.

2.1.7 VMware Cloud Director VS Guest Customization

VS guest customization is a tool, which helps you to configure the operating system of a VS. You can customize the network settings of the guest operating system of a virtual server created from a vApp template. Guest customization can be managed at OnApp Control Panel.

This section provides information on how you can view and edit VS guest customization details.
2.1.7.1 View Guest Customization

On this page:

- View Guest Customization
- Edit Guest Customization

See also:

- Manage VMware Cloud Director VSs
- VMware Cloud Director VS Network Interfaces
- Virtual Server Statistics

To view VS guest customization details:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you are interested in.
3. Click the Overview tab > Guest Customization.
4. The page that loads will show the following guest customization details:
   - **Enabled** - whether guest customization is enabled in VMware Cloud Director or not. The computer name and network settings configured for this VS are applied to its Guest OS when the VS is powered on. The following settings are only applied the first time the VS is powered on.
   - **Change SID** - this parameter is applicable for Windows VSs only and will run Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join.
   - **Host Name** - VS's computer name
   - **Allow Local Admin Password** - whether the local admin password is allowed or not
   - **Auto Generate Password** - whether the admin password is generated automatically or not
   - **Admin Password** - the password of administrator
   - **Automatically log on as Administrator** - if this option is disabled you will not be automatically logged into the server's OS. This option applies only to Windows VSs.
   - **Number of times to log on automatically** - after the indicated time is exceeded and you were not able to log in, the VS will remain running and you will need to enter your credentials. This option applies only if the Automatically log on as Administrator option is enabled.
   - **Require administrator to change password on first login** - if this option is disabled the administrator will be able to log into the virtual server's OS without changing their password
   - **Join Domain** - whether this VS is enabled to join a domain or not
   - **User Org Settings** - whether user org settings are enabled or not
   - **Customization Script** - a script for guest customization
2.1.7.2 Edit Guest Customization

You can edit guest customization if you have VMware tools installed on a destination virtual server. To edit VS guest customization details:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you are interested in.
3. Click the Overview tab > Guest Customization.
4. The page that loads will show the guest customization details. Click the Edit icon in the upper right corner and make the changes.
5. Click Update to save changes.

2.1.8 VMware Cloud Director VS Recipes

The recipe is the plugin mechanism used for adding new functionalities to the cloud. Each recipe is a set of instructions that triggers events at certain stages during the execution of certain services/event in the cloud. Essentially, recipes allow inputting code into virtual servers. This enables administrators to use recipes for configuring the server or report on it, thus providing advanced customization options in a standard environment.

Recipes allow admins to perform the following operations:

- Perform post script installation
- Use post provision installation scripts for third party applications, agents, etc.
- Disk reclaiming
- Update/modify virtual servers and compute zones with script injection
- Allow host to spin up custom virtual servers without requiring custom templates
- Download, run and report audit tools

The following requirements should be implemented before running recipes on vCloud virtual servers:

- VMware Tools must be installed. Also VMware compute resources, used by vCloud installation, need to be accessible over HTTPS from OnApp CP's network.
- Guest customization must be enabled. Admin password must be set in the guest customization.

On this page:

- View Virtual Server Recipes
- Assign Recipe
- Remove Recipe

See also:

- Manage VMware Cloud Director VSs
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- VMware Cloud Director VS Network Interfaces
- Virtual Server Statistics
- VMware Cloud Director VS Snapshots
- Virtual Server Disks
- VMware Cloud Director VS Guest Customization
- VMware Cloud Director VS Recipe Custom Variables

Currently, OnApp CP works only with Unix-compatible recipes for VMware Cloud Director VSs.

2.1.8.1 View Virtual Server Recipes

To view virtual server recipes:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you're interested in.
3. Click the Overview tab, then choose Recipes.
4. The screen that follows shows details of all the recipes in the cloud:
   - The left pane shows the list of available recipes organized into recipe groups.
   - The right pane displays the list of events to which the recipes can be assigned to. Click the arrow button next to event to expand the list of recipes assigned to it.

2.1.8.2 Assign Recipe

To assign a recipe:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you're interested in.
3. Click the Overview tab, then choose Recipes.
4. The screen that follows shows details of all the recipes in the cloud.
5. Click the arrow button in front of the required event to unfold it.
6. Select the required recipe in the left pane and hold it down with the left mouse button.
7. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

You can assign virtual server recipes to the following events:
- VS provisioning - run the recipe during the virtual server provisioning
- VS disk added - run the recipe while adding a disk to the virtual server
- IP address allocated for VS - run the recipe when adding an IP address to the VS network interface
- **IP address revoked from VS** - run the recipe when removing an IP address from the VS network interface
- **VS network interface added** - run the recipe while adding a network interface to the virtual server
- **VS network interface removed** - run the recipe while deleting a network interface from the virtual server
- **VS disk resized** - run the recipe while resizing a virtual server disk
- **VS resize** - run the recipe while resizing the virtual server
- **VS start** - run the recipe while starting the virtual server
- **VS reboot** - run the recipe while rebooting the virtual server

### 2.1.8.3 Remove Recipe

To remove recipe:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Overview** tab, then choose **Recipes**.
4. The screen that follows shows details of all the recipes in the cloud.
5. Click the arrow button in front of the required event to view the list of recipes assigned to it.
6. Click the **Delete** button next to the recipe you want to remove.

### 2.1.9 VMware Cloud Director VS Recipe Custom Variables

You can define custom variables for particular virtual servers. Each custom variable is a name-value set that can be used during the virtual server recipe implementation. Custom variables are set on a per server basis. You can create custom variables via the virtual server **Overview** menu.

#### 2.1.9.1 View Virtual Server Recipe Custom Variables

To view custom variables:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. You'll see a list of all virtual servers in your cloud. Click the name of a virtual server for which you want to view variables.
3. On the virtual server details screen, click the **Overview** tab, then choose **Recipes Variables**. The page that loads shows the list of recipe custom variables for this virtual server.

On this page:

- [View Virtual Server Recipe Custom Variables](#)
- [Create Virtual Server Recipe Custom Variables](#)
- [Edit Virtual Server Recipe Custom Variables](#)
- [Delete Virtual Server Recipe Custom Variables](#)
See also:

- Manage VMware Cloud Director VSs
- VMware Cloud Director VS Network Interfaces
- Virtual Server Statistics
- VMware Cloud Director VS Snapshots
- Virtual Server Disks
- VMware Cloud Director VS Guest Customization
- VMware Cloud Director VS Recipes

2.1.9.2 Create Virtual Server Recipe Custom Variables

To create a new custom variable:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. You'll see a list of all virtual servers in your cloud. Click the name of a virtual server for which you want to create a variable.
3. On the virtual server details screen, click the Overview tab, then choose Recipes Variables. The page that loads shows the list of recipe custom variables for this virtual server.
4. On the screen that appears, click the "+" button.
5. Specify the recipe name and its value.
6. Move the Enabled slider to the right to allow use of this recipe.
7. Click Save.

2.1.9.3 Edit Virtual Server Recipe Custom Variables

To edit a custom variable:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. You'll see a list of all virtual servers in your cloud. Click the name of a virtual server for which you want to edit a variable.
3. On the virtual server details screen, click the Overview tab, then choose Recipes Variables. The page that loads shows the list of recipe custom variables for this virtual server.
4. Click the Edit icon next to the required variable.
5. Edit the recipe name and its value.
6. Click Save.

2.1.9.4 Delete Virtual Server Recipe Custom Variables

To delete a custom variable:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.

2. You'll see a list of all virtual servers in your cloud. Click the name of a virtual server for which you want to delete a variable.

3. On the virtual server details screen, click the **Overview** tab, then choose **Recipes Variables**. The page that loads shows the list of recipe custom variables for this virtual server.

4. Click the **Delete** icon next to the required variable. You will be asked for confirmation before the variable is deleted.

**2.1.10 VMware Cloud Director VS Service Add-ons**

Service Add-ons functionality allows you to offer to your customers additional services on top of your current IaaS Virtual Server offering.

Before managing service add-ons, ensure that:

1. VMware Cloud Director is added to OnApp UI.
2. RabbitMQ settings are set in `config/rabbit_mq/vcloud/credentials.yml`.
3. Login and password are set for vCenter (Control Panel should have access to vCenter directly) in **Admin > Settings > Compute resources > Compute resource's label > Tools > vCenter passwords**.
4. **Guest customization** is enabled on a VMware Cloud Director VS and Admin Password is set.

When you have the service add-on functionality enabled in your license and everything is properly configured, you can assign service add-on to your VMware Cloud Director VS.

You can monitor the total cost for all service add-ons inside the company. For this, go to your Control Panel’s > **Admin** > **Groups** > your User group’s label > **Groups** link.

- **To manage user service add-ons for a VS**, ensure that **Manage Service Add-ons for all virtual servers** and/or **Manage Service Add-ons for own virtual servers** permissions are enabled.

- **To manage system service add-ons for a VS**, ensure that **Manage System Service Add-ons** and/or **Manage own System Service Add-ons** permissions in the Virtual Servers section are enabled. For more information about permissions refer to the **Permissions** section.

On this page:

- **View VS service add-ons**
- **Assign service add-on to the VS**
- **Unassign service add-on from the VS**
- **Generate statistics for system service add-ons**

See also:

- **Manage service add-ons**
- **Service add-on store**
• **Service add-ons**

### 2.1.10.1 View VS service add-ons

To view virtual server service add-ons:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Overview** tab, then choose **Service Add-ons**.
4. The screen that follows shows details of all the service add-ons assigned to the VS, if there are any:
   - **Label** - the service add-on name (by clicking on it you can [edit the service add-on])
   - **Price** - the service add-on price, set for this service add-on in the [Service Add-on Store](#)
   - **Status** - whether the service add-on is active or not
   - **Actions icon** - you can unassign the Service Add-on from this Virtual Server by clicking the **Delete** icon.

Also, if any service add-on is already assigned to the VS, you can view it at the [VS's details](#) page.

### 2.1.10.2 Assign service add-on to the VS

To assign service add-on to the VS:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Overview** tab, then choose **Service Add-ons**.
4. Click the "+" button at the upper right corner. You will get the list of service add-on groups (availability is configured in the bucket). The transaction to execute the On add event(s) will be scheduled for running.
5. Choose the necessary service add-on and click **Assign**.

Alternatively, if any service add-on is already assigned to the VS, you can assign another one at the [VS's details](#) page.

### 2.1.10.3 Unassign service add-on from the VS

To unassign service add-on from the VS:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Overview** tab, then choose **Service Add-ons**.
4. Click the "Delete" icon next to the service add-on you want to unassign. Confirm the deletion. The transaction to execute the On remove event(s) will be scheduled

Alternatively, you can unassign the service add-on at the [VS's details](#) page.
2.1.10.4 Generate statistics for system service add-ons

You may generate the statistics for the system service add-ons usage for a specified period. To generate the statistics:

1. Go to your Control Panel > Admin > Users.
2. Click the Full Name of the cloud admin to get to the User Profile.
3. In the Billing Details section, click the System Service Add-ons Report button.
4. Select the time period from the drop-down menu and click the Apply button to generate the report.
5. On the page that appears you will see the report with the following details:
   - From - the beginning of the specified time period for the statistics generation
   - Till - the end of the specified time period for the statistics generation
   - Virtual server - the VS the system service add-on in question is assigned to
   - Cores (peak usage) - the number of CPU cores used
   - Memory (peak usage) - RAM usage, GB
   - Disk size (peak usage) - disk usage, GB

You can save your billing statistics to a file in a CSV format. To download a CSV file with billing statistics for a selected period of time, click the Save as CSV button. The download will start automatically after you click the button.

The CSV file includes the following information:
- from - the beginning of the specified time period for the statistics generation
- till - the end of the specified time period for the statistics generation
- user_id - the ID of the user
- virtual_machine_id - the ID of the VS the system service add-on in question is assigned to
- service_addon_id - the ID of the system service add-on
- cpus - the number of CPU cores used
- memory - RAM usage, GB
- disk_size - disk usage, GB

The generated reports will be stored at the System Service Add-ons Report page. However, if you have statistics archiving enabled for your cloud, the reports will be stored according to the period, specified for the archiving.

For Windows-based VSs, you may also generate an SPLA report on the system service add-ons usage. For more information, refer to the SPLA Report section of this guide.
2.2 VMware Cloud Director Application Servers

VMware Cloud Director application servers are managed similarly to the regular application server instances. For information on how to manage application servers, refer to the Application Servers page.

The application server creation process is similar to virtual server creation. The difference is that a specific default template is used automatically during application server creation. For more information, refer to the Application Server Billing section.

- Before creating an Application server make sure that you specified at least two resolvers for the network on which this server will run. This can be done at Admin > Settings > Resolvers.
- Before creating an Application server you need to configure notifications for your cloud. This can be done at Control Panel > Admin > Notifications > Configuration. For information on how to set up notifications for your VMware Cloud Director cloud refer to Notifications Setup.
- Before creating an Application server you need to fill in the system_email parameter in the on_app.yml file.
- Starting with OnApp 5.4 version, application servers functionality is applicable for users with VMware Cloud Director integration. Ensure that Create a new virtual server and Compute zones permissions are on before creating application server for vCloud.

To create a VMware Cloud Director Application Server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. On the screen that appears, press "+" button or click the Create Application Server button underneath the list of servers on the screen.
3. Complete the application server creation form through the following steps.

On this page:

- Step 1 of 4. Cloud Locations
- Step 2 of 4. Properties
- Step 3 of 4. Resources
- Step 4. Confirmation

See also:

- Application Server Billing
- Application Server Disks
2.2.1 Step 1 of 4. Cloud Locations

The Cloud Locations step applies to those users who have compute zones assigned to location groups in their bucket.

If the user's bucket has several compute zones, some of which are assigned to location groups, whereas others are not - the cloud locations screen will not be available in the wizard. Also, if there is only one location, this step will be skipped. In this case the wizard will start with the Properties step.

Indicate your application server's cloud location:

- **Country** - choose the country, where the cloud is located, from the drop-down menu.
- **City** - specify the city, where the cloud is located, from the drop-down menu.

Click **Next** to proceed to the following steps of the wizard to specify the application server properties.

2.2.2 Step 2 of 4. Properties

Specify the following application server properties:

- **Label** - the label of the application server. The required parameter.
- **Hostname** - the hostname of the application server. The required parameter. The hostname should consist of letters [A-Z a-z], digits [0-9] and dash [-].
- **Domain** - specify the domain for this VS. The default value is `localdomain`. This parameter is not applicable to Windows virtual servers.

For example:
`test.onapp.com` - specify 'test' as hostname, 'onapp.com' - as domain.
If you leave the domain field blank, the default value 'localdomain' will be used and you will get the following - `test.onapp.com.localdomain`.

Click **Next** to proceed to the following step of the wizard to specify the application server resources.

Particular characters are not allowed in hostnames for Windows-based application servers:
percent sign [%]
double quotation marks ["]
brackets [<,>]
vertical bar [\]
caret [^]
ampersand [&]
parentheses [(),]
2.2.3 Step 3 of 4. Resources

At this step, you can set your application server’s resources, such as disk size, network configuration and other.

Compute Resources
- *Compute Zone* - the compute zone to build the application server on.
- *User group* - select the organization from the drop-down menu
- *Vdc* - select vCloud resource pool from the drop-down menu

Resources
- *RAM* - set the amount of application server’s RAM. The recommended RAM amount is at least 512 MB.
- *CPU Cores* - set the amount of application server’s CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.

Primary Disk
- *Data Store* - choose a data store for application server’s primary disk.

Network Configuration
- *Network* - choose a network from the drop-down box.

Click **Next** to proceed to the following step of the wizard that completes the application server creation process.

2.2.4 Step 4. Confirmation

At this step, configure the automation settings. This is the final step of the application server creation wizard.

- Move the **Build Virtual Server** slider to the right if you want the system to automatically build the application server. If you leave this box blank, you will have to build your server manually after it is created.

At the Confirmation step you can find the configuration summary of the application server, which will be created. You can view template’s name, RAM size, number of networks, primary disk and swap disk size, number of cores.

After you set up all parameters, click the **Create Application Server** button to start the creation process.

2.3 VMware Cloud Director Edge Servers

Starting with OnApp 5.4 version, the edge servers functionality is applicable for users with VMware Cloud Director integration.

On this page:

- [Prerequisites](#)
2.3.1 Prerequisites

vCloud edge server cannot be created if OnApp has not been configured properly. Please make sure you have completed the following steps:

- Add vCloud resources such as Compute, Datastore and Network zones to a CDN-enabled location group
- Have at least one backup server running in the cloud
- Download OnApp CDN Appliance template with "vCloud" virtualization type under OnApp system administrator
- The CP's "data" folder should be mounted via NFS as "/data" at the Backup server
- An Edge Server should be provisioned under a user from vCloud organization
- In order to do that, following permissions must be assigned to the corresponding user role:
  - Show Compute Zones on VirtualServer creation
  - Build/rebuild user's own edge servers
  - Create a new edge server
- A public IPv4 address should be assigned to the CDN Edge Server

2.3.2 Create VMware Cloud Director Edge Server

To create a new vCloud edge server:

1. Go to your Control Panel > CDN > Edge Servers menu.
2. On the screen that appears, click the Create Edge Server button or press the "+" button.

3. Fill in the edge server creation form step by step:

2.3.2.1 Step 1 of 4. Locations

The Cloud Locations step applies to those users who have compute zones assigned to location groups in their bucket.

If the user's bucket has several compute zones, some of which are assigned to location groups, whereas others are not - the cloud locations screen will not be available in the wizard. Also if there is only one location this step will be skipped. In this case the wizard will start with the Properties step.

Indicate your edge server's cloud location:

- **Country** - choose the country, where the cloud is located, from the drop-down menu.
- **City** - specify the city, where the cloud is located, from the drop-down menu.

Click Next to proceed to the following step of the wizard to specify the edge server properties.

2.3.2.2 Step 2 of 4. Properties

- Give your edge server a label. The label can consist of:
  - Lower- & upper-case letters [A-Za-z]
  - Digits [0-9]
Select an edge server type: HTTP or streaming

A third party application - Wowza will be installed automatically when installing a streaming edge server and additional charges will apply. Please, contact your account manager for details.

Move the Add to Marketplace slider to the right to submit this server to the OnApp CDN marketplace. If so, the minimum required disk size is 1 TB.

Click Next.

Any servers you submit will be assessed before they are accepted into the marketplace. Criteria include geographic location, bandwidth and server specs.

If your cloud has sufficient resources, but the Next button is dimmed during server creation, the reason might be a browser issue. For more information, refer to our Knowledge base article.

2.3.2.3  Step 3 of 4. Resources

Compute Resources
- Compute Zone - the compute zone to build the edge server on.
- User group - select the organization from the drop-down menu
- Vdc - select vCloud resource pool from the drop-down menu

Resources
- RAM - set the amount of edge server's RAM. The recommended RAM amount is at least 512 MB.
- CPU Cores - set the amount of edge server's CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.

Primary Disk
- Data Store - choose a data store for edge server's primary disk.

Network Configuration
- Network - choose a network from the drop-down box.
Click **Next** to proceed to the following step of the wizard that completes the edge server creation process.

2.3.2.4 Step 4. Confirmation

1. Move the **Build Edge Server Automatically** slider to the right if you want the system to automatically build the edge server. Otherwise, you will have to build your server manually after it is created.

4. Click **Create Edge Server**.

### 2.4 VMware Cloud Director vApps

A VMware Cloud Director vApp consists of one or more virtual servers that communicate over a network and use resources and services in a deployed environment.

In this chapter, you can find information on the following management options:

- **Create and Manage vApps**
- **Templates**
- **Networks**
- **Catalogs**

#### 2.4.1 Create and Manage vApps

VMware Cloud Director vApp consists of one or more virtual servers that communicate over a network and use resources and services in a deployed environment. A vApp can contain multiple virtual servers. To view the list of the current vApp functions you can perform in OnApp Control Panel refer to the **Supported Functionality** section of this guide.

This document provides the information on how you can manage the vApps imported from your VMware Cloud Director.

**2.4.1.1 View vApps**

To view all vApps in the cloud:

1. Go to your Control Panel > **Cloud** > **vApps** menu to see an overview of all vApps in the cloud.

2. The page that loads will show the list of vApps together with their details:
   - **Name** - the name of the vApp
   - **User** - the owner of the vApp. Click the user name to see the owner details. The owner of the vApp can be changed in VMware Cloud Director. These changes are synchronized with OnApp and can be seen in Control Panel > **Cloud** > **vApps** menu.
   - **Resource pool** - the label of the resource pool of this vApp
   - **Number of virtual servers** - the number of virtual servers within the vApp
   - **Number of networks** - the amount of vApp networks associated with this vApp
   - **Status** - the vApp status:
     - **Failed creation** - the vApp could not be created
     - **Unresolved** - the vApp is damaged and cannot be controlled by vCloud
- **Resolved** - the vApp has been created but it does not contain VSs
- **Suspended** - the vApp has been suspended; all virtual servers in the vApp are suspended
- **Powered on** - all the VSs in the vApp are on
- **Waiting for input** - the vApp is waiting for user input
- **Unknown** - the vApp is in a state that is identified but is not known to the system
- **Unrecognized** - the vApp is in a state that cannot be identified by the system
- **Powered off** - all the VSs in the vApp are off
- **Inconsistent state** - the vApp is in an inconsistent state. This status appears when the vApp was edited from the vSphere associated with the VCD in which the vApp resides, therefore, the vSphere and VCD databases are not yet fully synchronized.
- **Mixed (number/number)** - the amount of virtual servers in the vApp that have different power statuses: the first *number* before the slash indicates the amount of powered-on VSs, the second *number* - total amount of VSs in the vApp.
- **Building** - after the vApp is created or imported, its status will be **Building**, until the creation/import process is finished. On the overview screen of a specific vApp, its status will be shown as **Pending**. The user cannot perform any actions to the pending vApp except for deleting it.

  o **Power** - the power status of the vApp. To change the status, click the on/off buttons and confirm.
  o **Actions** - click the **Actions** button to perform one of the following processes on the vApp:

    - Edit
    - Recompose
    - Add to Catalog
    - Stop/Start
    - Change owner
    - Delete
    - Spin up Network

---

**On this page:**

- View vApps
- Creating vApps
- Recompose vApp
- Add vApp to Catalog
- Change vApp Owner
- Edit vApp
- Start/Stop vApps
- Start/Stop vApp Virtual Servers
• Suspend/Unsuspend vApp
• Reboot vApp
• Delete vApps

See also:

• Manage VMware Cloud Director VSs
• Create and Manage Catalogs
• Supported Functionality

2.4.1.1.1 vApp Details
Click the name of the vApp to view its details:

• Name - the name of the vApp
• Description - the description of the vApp
• Status - the status of the vApp. The vApp can have the following statuses:
  o Failed creation - the vApp could not be created
  o Unresolved - the vApp is damaged and cannot be controlled by vCloud
  o Resolved - the vApp has been created but it does not contain VSs
  o Suspended - the vApp has been suspended; all virtual servers in the vApp are suspended
  o Powered on - all the VSs in the vApp are on
  o Waiting for input - the vApp is waiting for user input
  o Unknown - the vApp is in a state that is identified but is not known to the system
  o Unrecognized - the vApp is in a state that cannot be identified by the system
  o Powered off - all the VSs in the vApp are off
  o Inconsistent state - the vApp is in an inconsistent state. This status appears when the vApp was edited from the vSphere associated with the VCD in which the vApp resides, therefore, the vSphere and VCD databases are not yet fully synchronized.
  o Mixed (number/number) - the amount of virtual servers in the vApp that have different power statuses: the first number before the slash indicates the amount of powered-on VSs, the second number - total amount of VSs in the vApp.
  o Pending - after the vApp is created or imported, its status will be Pending, until the creation/import process is finished. The user cannot perform any actions to the pending vApp except for deleting it.

• Virtual servers - the number of virtual servers within the vApp
• Number of CPUs - the number of CPUs used by the vApp
• Virtual Servers - the list of VSs associated with this vApp and their details. By pressing the “+” button you can recompose this vApp.
• vApp Networks - the list of vApp networks associated with this vApp and their details: label, status, network address. Click the Actions button to delete a vApp network. Removing the network will restart the vApp.
• Activity log - the list of log items associated with this vApp. Click the Ref number of a log item to view its details (data, action, status, initiator of transaction etc.)

Alternatively, you can access the details page of a particular vApp from the Overview page of a VS assigned to this vApp. To view the details of the vApp with which the VS is associated, click
the **Tools** button on the VS Overview screen at **Dashboard > Cloud > Virtual Servers** > label of the VS you are interested in > **Tools > Go to vApp**.

### 2.4.1.2 Creating vApps

You can create a new vApp based on a vApp template stored in a catalog to which you have access. Alternatively, you can compose a new vApp using virtual servers from vApp templates, new virtual servers, or a combination of both.

You cannot add vApps when being logged in as a non VMware Cloud Director user.

#### 2.4.1.2.1 Deploy New vApp

To configure guest customization and recipes during vApp creation you need to have the **Assign recipes to VS** and **Customize VS guest OS** permissions.

To create a new vApp:

1. Go to your Control Panel > **Cloud > vApps** menu to see an overview of all vApps in the cloud.
2. Click the **Deploy New vApp** button. If a new vApp template is created and added to catalog in VMware Cloud Director, it will be synchronized with OnApp. This vApp template will be added to the list of all vApp templates.
3. On the screen that appears, fill in the vApps creation form:
   - **Step 1. vApp**
     - *Name* - specify the vApp label
     - *Description* - enter the description for the vApp
     - *Resource Pool* - select the resource pool for the new vApp
     - *vApp Template* - select the vApp template
     - Click **Next**.

   - **Step 2. VS Resources**
     - *Label* - specify the name of VS
     - *CPU Cores* - use the slider to set the number of CPU cores
     - *Cores per socket* - set the number of cores per socket for the VS
Step 3. Guest Customization

Click the template to configure guest customization for the VS that will be created from this template:

General

- **Host Name** - VS's computer name
- **Enabled** - whether guest customization is enabled for the VS or not. The computer name and network settings configured for this VS are applied to its Guest OS when the VS is booted. Guest customization should be enabled if you want to configure recipes for this VS.

  If you do not tick the **Enabled** checkbox, the `PerformGuestCustomizationOnVirtualMachines` transaction will still run after you confirm vApp deployment: it will not perform guest customization on the VS, but only save the attributes selected at the Guest Customization step.

- **Change SID** - this parameter is applicable for Windows VSs only and will run Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join.
- **Automatically Reboot** - enable this option if you want the VS to be automatically rebooted after guest customization settings are updated.

Password Reset

- **Allow Local Admin Password** - select whether the local admin password is allowed or not. This option should be enabled if you want to configure recipes for this VS.
- **Auto Generate Password** - select whether the admin password is generated automatically or not
- **Admin password** - enter the administrator password
- **Automatically log on as Administrator** - if this option is disabled, you will not be automatically logged in to the server's OS. This option applies only to Windows VSs.
- **Number of Times to log on automatically** - after the indicated time is exceeded and you were not able to log in, the VS will remain running and you will need to enter
your credentials. This option applies only if the *Automatically log on as Administrator* option is enabled.

- *Require Administrator to Change Password on First Login* - if this option is disabled, the administrator will be able to log in to the virtual server’s OS without changing their password

**Customization Script**

- *Script* - a script for guest customization
- Click **Next** to proceed.

### Step 4. Recipes or Service Add-ons

If you want to configure recipes for the VS, you need to enable the *Enable* and *Allow Local Admin Password* options at the Guest Customization step. Click the template to configure recipes for the VS that will be created from this template:

**Recipes**

Use the drag and drop feature to assign recipes to the provisioning event.

a. Select the required recipe in the left pane and hold it down with the left mouse button.

b. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

c. If required, you can remove the assigned recipe by clicking the delete icon next to it.

**Custom Recipe Variables**

a. Specify the custom variable name and its value.

b. Move the *Enabled* slider to the right to allow use of this custom variable.

c. If required, you can remove a custom variable by clicking the delete icon next to it.

If mentioned below prerequisites are met, the Recipes step will be replaced with the Service Add-ons step.

**Service Add-ons**

<table>
<thead>
<tr>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that the following requirements are met to be able to assign service add-on to vApp during its creation:</td>
</tr>
<tr>
<td>- <em>Replace recipes</em> permission is enabled</td>
</tr>
<tr>
<td>- Service add-on groups are available in your bucket</td>
</tr>
<tr>
<td>- The service add-on group within the bucket has the On Provisioning option enabled for some of those service add-ons. In case there are no available service add-ons, then this step of the wizard will be skipped.</td>
</tr>
</tbody>
</table>
At this step you need to indicate the service add-ons you want to assign to your vApp. This step is optional. You can add service add-ons later if required.

a. Click the service add-on group icon on the left to expand the list of service add-ons on the right. Every service add-on contains the following info:
   - Label
   - VS’s types, with which this service add-on is compatible
   - description of the service add-on
   - Price per hour
b. Select the service add-on.
c. Click Next to proceed to the next step of the wizard that completes the vApp creation process.

If you are deploying more than one template, take the above mentioned steps for every template.

Step 5. Confirm
Click the template to review the details of the VS that will be created from this template.

  - Disable guest customization after run - move the slider to the right to schedule disabling of guest customization after the VS provisioning is finished.
  - Boot VS - move the slider to the right to boot the VS after deploying vApp.

If Boot VS is disabled and guest customization is enabled at the third step of the wizard, guest customization will be saved but not performed after the confirmation.
If Boot VS is disabled, guest customization is enabled at the third step of the wizard, and Disable guest customization after run is enabled, guest customization will be saved, disabled, and not performed.

4. Click Deploy vApp to finish the process.

2.4.1.2.2 Compose vApp

To compose a new vApp:
1. Go to your Control Panel > Cloud > vApps menu to see an overview of all vApps in the cloud.
2. Click the Compose vApp button.
3. On the screen that appears, fill in the form:

   Step 1. vApps and vApp Templates
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- **Blank vApp** - move the slider to the right if you want to create a blank vApp. Such a vApp will not contain any virtual servers. You need to fill in only the Name, Description, and Resource Pool for a blank vApp.

- **Name** - specify the vApp label

- **Description** - enter the description for the vApp

- **Resource Pool** - select the virtual data center

- **vApp Templates** - select one or several vApp templates from the drop-down list. All VSs built on those templates will be copied to your new vApp.

- **vApps** - select one or several vApps from the drop-down list. All VSs within selected vApps will be copied to your new vApp.

Click **Next**.

### Step 2. VS Resources

Depending on the vApp Templates and vApps that you selected during the previous step, you can apply the following hardware customization to virtual servers:

- **Label** - edit the label of the virtual server

- **CPU Cores** - edit the number of CPU cores allocated to the virtual server

- **Cores per Socket** - edit the number of cores per socket allocated to the virtual server

- **RAM** - edit the amount of RAM allocated to the virtual server

- **Default Data Store** - select the default data store from the drop-down list. If Fast Provisioning is not enabled for the previously selected resource pool, you can select a different data store for the VS's disks.

- **Data Store for Hard disk 1** - select a data store for the first hard disk from the drop-down list. This option appears only if the selected resource pool has Fast Provisioning disabled. If you do not select a data store, the disk is built on the default data store.

- **Hard Disk 1 Size** - set the size for the first hard disk

- **NIC 0 Connection** - the network to which the NIC will be connected

- **Adapter Type for NIC 0** - the type of the network adapter for NIC 0

Click **Next**.

### Step 3. Guest Customization

Click the template to configure guest customization for the VS that will be created from this template:

**General**

- **Host Name** - VS's computer name

- **Enabled** - whether guest customization is enabled for the VS or not. The computer name and network settings configured for this VS are applied to its Guest OS when the VS is powered on. Guest customization should be enabled if you want to configure recipes for this VS.
If you do not tick the **Enabled** checkbox, the `PerformGuestCustomizationOnVirtualMachines` transaction will still run after you confirm vApp compose: it will not perform Guest Customization on the VS, but only save the attributes selected at the Guest Customization step.

- **Change SID** - this parameter is applicable for Windows VSs only and will run Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join.
- **Automatically Reboot** - enable this option if you want the VS to be automatically rebooted after guest customization settings are updated.

**Password Reset**

- **Allow Local Admin Password** - select whether the local admin password is allowed or not. This option should be enabled if you want to configure recipes for this VS.
- **Auto Generate Password** - select whether the admin password is generated automatically or not
- **Admin password** - enter the administrator password
- **Automatically log on as Administrator** - if this option is disabled you will not be automatically logged into the server's OS. This option applies only to Windows VSs.
- **Number of Times to log on automatically** - after the indicated time is exceeded and you were not able to log in, the VS will remain running and you will need to enter your credentials. This option applies only if the **Automatically log on as Administrator** option is enabled.
- **Require Administrator to Change Password on First Login** - if this option is disabled the administrator will be able to log into the virtual server's OS without changing their password

**Customization Script**

- **Script** - a script for guest customization
- **Click Next** to proceed.

**Step 4. Confirm**

During the final step, you can overview the summary of virtual servers that the vApp will include and edit Automation Settings.

- **Disable guest customization after run** - move the slider to the right to schedule disabling of guest customization after the VS provisioning is finished.

  The checkbox is available if you enabled guest customization at the third step of the wizard.

- **Boot VS** - move the slider to the right to boot the VS after deploying vApp. Enabled by default.
If *Boot VS* is disabled and guest customization is enabled at the third step of the wizard, guest customization will be saved but not performed after the confirmation.
If *Boot VS* is disabled, guest customization is enabled at the third step of the wizard, and *Disable guest customization after run* is enabled, guest customization will be saved, disabled, and not performed.

- Click the **Compose vApp** button.

**Recompose vApp**

To configure guest customization and recipes during vApp creation you need to have the **Assign recipes to VS** and **Customize VS guest OS** permissions.

Unlike a **Compose vApp** option, which helps you to create a new vApp, the **Recompose vApp** option allows you to modify an existing vApp. After you recompose a vApp, new virtual servers will be added to it.

To recompose a vApp:

1. Go to **Control Panel > Cloud > vApps** menu.
2. Click the **Actions** button next to the vApp you want to change, then click **Recompose**.
3. Complete the two-step vApp recompose process:

   **Step 1. vApp Template**
   
   - **vApp Template** - select the vApp template
   - Click **Next**.

   **Step 2. VS Resources**
   
   Click the template to set the resources for the VS that will be created from this template:
   
   - **Label** - the name of VS
   - **CPU Cores** - use the slider to set the number of CPU cores
   - **Cores per socket** - set the number of cores per socket for the VS
   - **RAM** - use the slider to set the RAM for the VS
Step 3. Guest Customization

Click the template to configure guest customization for the VS that will be created from this template:

**General**
- **Host Name** - VS’s computer name
- **Enabled** - whether guest customization is enabled for the VS or not. The computer name and network settings configured for this VS are applied to its Guest OS when the VS is powered on. Guest customization should be enabled if you want to configure recipes for this VS.

If you do not tick the *Enabled* checkbox, the *PerformGuestCustomizationOnVirtualMachines* transaction will still run after you confirm vApp recompose: it will not perform Guest Customization on the VS, but only save the attributes selected at the Guest Customization step.

- **Change SID** - this parameter is applicable for Windows VSs only and will run Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join.
- **Automatically Reboot** - enable this option if you want the VS to be automatically rebooted after guest customization settings are updated.

**Password Reset**
- **Allow Local Admin Password** - select whether the local admin password is allowed or not. This option should be enabled if you want to configure recipes for this VS.
- **Auto Generate Password** - select whether the admin password is generated automatically or not
- **Admin password** - enter the administrator password
- **Automatically log on as Administrator** - if this option is disabled you will not be automatically logged into the server's OS. This option applies only to Windows VSs.
- **Number of Times to log on automatically** - after the indicated time is exceeded and you were not able to log in, the VS will remain running and you will need to enter your credentials. This option applies only if the **Automatically log on as Administrator** option is enabled.
- **Require Administrator to Change Password on First Login** - if this option is disabled the administrator will be able to log into the virtual server's OS without changing their password

**Customization Script**
- **Script** - a script for guest customization
- Click **Next** to proceed.

**Step 4. Recipes**
If you want to configure recipes for the VS, you need to enable the **Enable and Allow Local Admin Password** options at the Guest Customization step. Click the template to configure recipes for the VS that will be created from this template:

**Recipes**
Use the drag and drop feature to assign recipes to the provisioning event.

a. Select the required recipe in the left pane and hold it down with the left mouse button.

b. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

c. If required, you can remove the assigned recipe by clicking the delete icon next to it.

**Custom Recipe Variables**

a. Specify the custom variable name and its value.

b. Move the **Enabled** slider to the right to allow use of this custom variable.
c. If required, you can remove a custom variable by clicking the delete icon next to it.

If mentioned below prerequisites are met, the Recipes step will be replaced with the Service Add-ons step.

**Service Add-ons**

<table>
<thead>
<tr>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that the following requirements are met to be able to assign service add-on to vApp during its creation:</td>
</tr>
<tr>
<td>- <em>Replace recipes</em> permission is enabled</td>
</tr>
<tr>
<td>- Service add-on groups are available in your bucket</td>
</tr>
<tr>
<td>- The service add-on group within the bucket has the On Provisioning option enabled for some of those service add-ons. In case there are no available service add-ons, then this step of the wizard will be skipped.</td>
</tr>
</tbody>
</table>

At this step you need to indicate the service add-ons you want to assign to your vApp. This step is optional. You can add service add-ons later if required.

a. Click the service add-on group icon on the left to expand the list of service add-ons on the right. Every service add-on contains the following info:
   - Label
   - VS's types, with which this service add-on is compatible
   - description of the service add-on
   - Price per hour

b. Select the service add-on.

c. Click **Next** to proceed to the next step of the wizard that completes the vApp creation process.

**Step 5. Confirm**

  - *Disable guest customization after run* - move the slider to the right to schedule disabling of guest customization after the VS provisioning is finished.
The checkbox is available if you enabled guest customization at the third step of the wizard.

- **Boot VS** - move the slider to the right to boot the VS after deploying vApp.

If **Boot VS** is disabled and guest customization is enabled at the third step of the wizard, guest customization will be saved but not performed after the confirmation. If **Boot VS** is disabled, guest customization is enabled at the third step of the wizard, and **Disable guest customization after run** is enabled, guest customization will be saved, disabled, and not performed.

Click the template to review the details of the VS that will be created from this template.

4. Click **Recompose vApp** to finish the process.

You can also access the vApp recompose wizard at **Control Panel > Cloud > vApps > Label** > icon in the **Virtual Servers** section.

### Add vApp to Catalog

1. To add a vApp to catalog: Go to **Control Panel > Cloud > vApps** menu.
2. Click the **Actions** button next to the vApp you want to add to catalog, then click **Add to Catalog**.
3. Fill in the following fields:
   - **Catalog** - choose the catalog from the drop-down menu
   - **Overwrite Catalog Item** - move the slider to the right to save this vApp as template instead of another vApp template. In the **Target vApp Template** field choose the appropriate vApp template, which will be replaced, from the drop-down menu.

You can add vApp to a public catalog, which belongs to the same organization as vApp does.

If you assign a system service add-on to a VS associated with a vApp, and then convert this vApp to a vApp
template, the aforementioned system service add-on will also be assigned to the newly created vApp template.

- **Label** - specify the name of the vApp. This option is missing if the Overwrite catalog item slider is enabled.
- **Description** - add the appropriate vApp description

4. Click **Add vApp to Catalog**.

After you add a vApp to catalog, you will be able to create a new vApp with the same configuration as the original one.

### Prerequisites

Ensure that Convert vApp permission is on before adding vApp to catalog. For more information about permissions refer to the [VMware Cloud Director Permissions](#) section of this guide.

---

### Change vApp Owner

- You need to have the Change vApp Owner permission enabled to assign a vApp to the new owner.
- When you share your vApp with the organization or specific users and groups on the VCD side, the changes are automatically synchronized to Control Panel. Depending on the access level that you set via VCD, the corresponding users can access shared vApps on CP.

1. To change the owner of a vApp: Go to **Control Panel > Cloud > vApps > Label**.
2. Click the **Tools** button and select **Change Owner**.
3. In the pop-up window select the new owner of the vApp from the drop-down list.
4. Click **Change owner**.
Edit vApp

1. To edit a vApp: Go to **Control Panel > Cloud > vApps** menu.
2. Click the **Actions** button next to the vApp you are interested in, then click **Edit**.
3. On the screen that appears, you can edit the name and description of the vApp.
4. Click **Save**.

Start/Stop vApps

1. To start a vApp in the cloud: Go to your **Control Panel > Cloud > vApps > Label**.
2. Click the **Tools** button and then click **Start**.

1. To shut down the vApp forcefully: Go to your **Control Panel > Cloud > vApps > Label**.
2. Click the **Tools** button and then click **Stop**.

1. To shut down the vApp gracefully: Go to your **Control Panel > Cloud > vApps > Label**.
2. Click the **Tools** button and then click **Shutdown**.

Start/Stop vApp Virtual Servers

You can schedule actions for starting and stopping virtual servers when the vApp is being started and stopped.

1. To preconfigure the start/stop actions for virtual servers that the vApp contains: Go to your **Control Panel > Cloud > vApps > Label**.
2. Click the **Tools** button and then click **Starting and stopping VSs**.
3. At the page that appears, you can set start/stop actions using the instructions from the table below.
4. Click the **Submit** button to apply settings.

<table>
<thead>
<tr>
<th>Virtual Server Label</th>
<th>Order</th>
<th>Start Action</th>
<th>Start Delay (seconds)</th>
<th>Stop Action</th>
<th>Stop Delay (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The list of vApp virtual servers to start and stop when the vApp is being started and stopped.</td>
<td>For vApps with multiple virtual servers, specify the order in which to start and stop VSs by typing numbers in the box. Virtual servers with lower numbers are started first and stopped last. You cannot specify negative numbers. Virtual servers with the same numbers are started and stopped at the same time.</td>
<td>Select an action to apply to virtual servers when you start the vApp: - <strong>Power On</strong> - select this option to power on virtual servers - <strong>None</strong> - select this option to run no start action on virtual servers</td>
<td>The delay in seconds after starting one virtual server and before starting the next virtual server.</td>
<td>Select an action to apply to virtual servers when you stop the vApp: - <strong>Power Off</strong> - select this option to power off virtual servers forcefully - <strong>Shutdown</strong> - select this option to shut down virtual servers gracefully</td>
<td>The delay in seconds to wait after stopping one virtual server and before stopping the next virtual server.</td>
</tr>
</tbody>
</table>

**Suspend/Unsuspend vApp**

1. To suspend a vApp: Go to your Control Panel > **Cloud** > **vApps** menu to view all vApps and click the label of the required vApp.

2. Click the **Tools** button and select **Suspend**. The transaction to suspend all the VSs in the vApp will be scheduled.

There are two methods of unsuspend a vApp:

1. To shutdown all the vApp’s VSs and unsuspend the vApp: Go to your Control Panel > **Cloud** > **vApps** menu to view all vApps and click the label of the required vApp.
2. Click the **Tools** button and select **Unsuspend**. All the VSs in the vApp will shut down.

1. To start up all the vApp’s VSs and unsuspend the vApp: Go to your Control Panel > **Cloud** > **vApps** menu to view all vApps and click the label of the required vApp.
2. Click the **Tools** button and select **Start**. All the VSs in the vApp will scheduled to start.

---

**Reboot vApp**

1. To reboot a vApp and all the VSs in it: Go to your Control Panel > **Cloud** > **vApps** menu to view all vApps and click the label of the required vApp.
2. Click the **Tools** button and select **Reboot**. All the VSs in the vApp will scheduled to reboot.

---

**Delete vApps**

1. To delete a vApp in the cloud: Go to your Control Panel > **Cloud** > **vApps** menu to view all vApps.
2. Click the **Actions** button next to the required vApp.
3. If the vApp is running, then choose the **Stop** action.
4. When the vApp is stopped, click **Delete**.

---

### 2.4.2 Create and Manage vApp Templates

A VMware Cloud Director vApp template is a virtual server image that is loaded with an operating system, applications, and data. These templates ensure that virtual servers are consistently configured across an entire organization.

vApp templates are added to **vApp catalogs**.

You can add a vApp template to a vApp catalog via the OnApp Control Panel. It will be synchronized with VMware Cloud Director and a new vApp template will be added to the corresponding vApp catalog in VMware Cloud Director.

#### 2.4.2.1 View vApp Template
On this page:

- View vApp Template
- Create vApp Template
- View vApp Templates Library
- Manage vApp Template System Service Add-ons
- Delete vApp Template

See also:

- Create and Manage Catalogs
- Create and Manage vApp Networks
- Create and Manage vApps

To view a vApp template:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click a label of a vApp catalog.
3. Click a label of a vApp template.
4. On the screen that appears, you will see the following details about the vApp template:
   - **Label** - the label of the vApp template
   - **Description** - the description of the vApp template
   - **Virtual Servers** - the list of virtual servers that are built from the template
   - **Activity Log** - the activity log of the virtual servers

2.4.2.2 Create vApp Template

To create vApp template:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click a label of a vApp catalog.
3. On the screen that appears, click the "+" button or the Upload vApp Template button.
4. Specify the vApp template's label and click Next.
5. Specify the following parameters:
   - **File** - click the Choose File button to upload a template. Make sure to select all the files in the archive for the template.
   - or
   - **File URL** - indicate the route, from where the template will be uploaded
   
   You can upload the following vApp template formats: OVF and OVA. Be aware that files inside OVA should not be archived, otherwise, the OVA upload will fail. Each template that you upload to CP should have a unique name.

6. Click Submit.
2.4.2.3 View vApp Templates Library

To view the vApp templates library:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files which this catalog contains).
3. Click the vApp Templates tab.
4. You will see the list of available vApp templates together with their details:
5. o Label - the name of vApp template  
   o Virtual Servers - number of VSs that run on the vApp template  
   o Actions - you can assign system service add-ons to the template and manage them and delete the template

2.4.2.4 Manage vApp Template System Service Add-ons

To manage system service add-ons of a vApp template:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files which this catalog contains).
3. Click the vApp Templates tab.
4. Next to the required template, click the Actions button and select the Manage System Service Add-ons option.
5. The screen that follows shows details of all the system service add-ons in the cloud:
   o The left pane shows the list of available system service add-ons organized into groups. Click the arrow button next to a group to expand the list of add-ons assigned to it.
   o The right pane displays the list of virtual servers assigned to this vApp, which the system service add-ons can be assigned to.

Assign system service add-on to vApp template

Use drag and drop feature to assign system service add-on to a vApp template:
1. Click the arrow button in front of the required system service add-on group to unfold it.
2. Select the required system service add-on in the left pane and hold it down with the left mouse button.
3. Drag the system service add-on up to the right pane and release the mouse button to drop and add the add-on to the required virtual server assigned to this vApp.

**Unassign system service add-on from vApp template**

To unassign a system service add-on:

1. Click the arrow button in front of the required virtual server to view the list of system service add-on assigned to it.
2. Click the Delete button next to the system service add-on you want to unassign.

---

**2.4.2.5 Delete vApp Template**

To delete vApp template:

1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click a label of a vApp catalog.
3. On the screen that appears, you will see the list of vApp templates added to this vApp catalog.
4. Click the Actions button next to the template you want to delete and click Delete.
5. Confirm the deletion.

---

**2.4.3 Create and Manage vApp Networks**

The following network types are imported into OnApp:

- **organization vDC networks** (this network allows virtual servers in the organization vDC to communicate with each other and to access other networks)
- **external networks** (this network provides the interface to the Internet for virtual servers connected to external organization vDC networks)
- **vApp networks** (this network controls how the virtual servers in a vApp connect to each other and to organization vDC networks)

You can view the list of imported vApp networks at OnApp Cloud Control Panel. Also you can add a vApp network in VMware Cloud Director using OnApp Control Panel.

**On this page:**

- View vApp Networks
- Create vApp Network
• **Delete vApp Network**

  **See also:**
  • Create and Manage vApps
  • VMware Cloud Director Supported Functionality
  • Manage VMware Cloud Director VSs

2.4.3.1 View vApp Networks

To view the list of your imported networks:

1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Networks** button and select the **vApp** tab.
3. The screen that appears shows the list of your imported vApp networks and their details.
   - **Label** - the label of the network
   - **Identifier** - the identifier of the network
   - **VLAN** - VLAN number
   - **Actions** - click the Actions button to edit or delete the vApp network.

   You can also click a network's label to see the list of IPs assigned to that network.

2.4.3.2 Create vApp Network

**Ensure that vApp Networks permissions are on before creating a vApp network. For more information about permissions refer to the VMware Cloud Director Permissions section of this guide.**

To add a vApp network:

1. Go to **Control Panel** > **Cloud** > **vApps** menu.
2. Click the label of the required vApp.
3. On the vApp overview page click the + button above the vApp networks list.
4. On the screen that appears, select the organizational network with which the vApp network will be associated.
5. Click **Create vApp Network** to finish the process. Adding a new vApp network will restart the vApp.

2.4.3.3 Delete vApp Network

To delete a vApp network:

1. Go to **Control Panel** > **Cloud** > **vApps** menu.
2. Click the label of the required vApp.
3. Click the **Actions** button next to the required network in the vApp networks list and select **Delete**. Deleting a network will restart the vApp.
2.4.4 Create and Manage Catalogs

A VMware Cloud Director catalog is a container for vApp templates and media files. Users can access vApp templates and media files that they own or that are shared with them.

In VMware Cloud Director there is a possibility to make a catalog public. When catalog is public all organizations will see the catalog to deploy vApps from. Administrators can access a published catalog and copy its vApp templates to a catalog in their organization. They can then share the organization catalog with other members of their organization so that they can use the vApp templates and media files.

OnApp provides an ability to import vApp catalogs from VMware Cloud Director and use them for vApp creation.

You can create, edit or delete a vApp catalog via the OnApp Control Panel. The action will be synchronized with VMware Cloud Director and a new catalog will be created or deleted in VMware Cloud Director. Also you can save a vApp to a catalog as a vApp template.

On this page:

- View Catalogs
- Create Catalog
- Edit Catalog
- Delete Catalog
- View Media Library
- Add File to Media Library
- View vApp Templates Library

See also:
- Create and Manage vApps
- Create and Manage Orchestration Models
- Manage VMware Cloud Director VSs

2.4.4.1 View Catalogs

To view your list of vApp catalogs:

1. Go to your Control Panel > Cloud > Catalogs menu.
2. On the screen that appears, you will see the catalogs imported from the VMware Cloud Director and their details:
   - **Label** - the name of the catalog
   - **User Group** - the user group to which the catalog is assigned
   - **Resource Pool** - the resource pool that is used by the catalog
   - **Organization** - the organization to which the catalog is assigned
   - **vApp Templates** - the number of vApp templates that the catalog includes
   - **Media** - the number of media files that the catalog includes

   - **Published** - whether this catalog is published or not. The ✔️ icon appears next to catalogs that are published, i.e. shared between all organizations. An ✗ icon appears next to catalogs that are shared only between certain organizations or users.

   - **Actions** - click the button if you want to Edit or Delete the catalog
Click the catalog label to view the list of assigned templates and medial files.

### 2.4.4.2 Create Catalog
To create a new vApp catalog:

1. Go to your Control Panel > **Cloud** > **Catalogs** menu.
2. Click the **New Catalog** button.
3. Set the following parameters:
   - **Label** - specify the label of a new catalog
   - **Description** - add description of the catalog
   - **Organization** - select the organization this catalog will be added to
   - **Resource Pool** - choose the resource pool this catalog will be assigned to
   - **Data Store** - choose the data store this catalog will be assigned to
4. Click the **Submit** button.

### 2.4.4.3 Edit Catalog
To edit a vApp catalog:

1. Go to your Control Panel > **Cloud** > **Catalogs** menu.
2. Click the **Actions** button next to the catalog you want to edit and click **Edit**.
3. Edit the following parameters:
   - **Label** - the label of a catalog
   - **Description** - add description of the catalog
4. Click the **Submit** button.

### 2.4.4.4 Delete Catalog
To delete a vApp catalog:

1. Go to your Control Panel > **Cloud** > **Catalogs** menu.
2. Click the **Actions** button next to the catalog you want to delete and click **Delete**.
3. Confirm the deletion.

### 2.4.4.5 View Media Library
Media library is a part of a catalog, which contains different file types for their further usage.

- Currently only **ISO files** can be uploaded to Media library.
- Ensure that the **Media** permissions are on before enabling this option. For more information refer to the **Permissions** section.

To view the Media library:

1. Go to your Control Panel > **Cloud** > **Catalogs** menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files which this catalog contains).
3. Click the **Media** tab.

4. You will see the list of available media files together with their details:
   - **Label** - the name of media file
   - **Status** - the status of media file
   - **Image Type** - the type of media file (ISO)
   - **Resource Pool** - the label of resource pool where media file is stored
   - **Size** - the size of media file
   - **Created on** - the date of media file creation
   - **Actions** - you can either edit media file (change label) or delete file

You can attach an ISO file from the media library to the VS. For details refer to the Manage VMware Cloud Director VSs section of this guide.

### 2.4.4.6 Add File to Media Library

To add file to Media library:

1. Go to your Control Panel > **Cloud > Catalogs** menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files which this catalog contains).
3. Click the **Media** tab. You will see the list of available media files together with their details.
4. Click the "+" button in the upper right corner of the section or the **Upload Media** button.
5. Enter a name for the file you wish to upload and click **Next**.
6. Click the **Choose File** button and indicate the path from where the file will be uploaded. You can add only one file at a time.
7. Click the **Upload** button to add the file or click **Cancel** to select another file.
8. Click **Submit** to finish the process.

### 2.4.4.7 View vApp Templates Library

To view the vApp templates library:

1. Go to your Control Panel > **Cloud > Catalogs** menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files which this catalog contains).
3. Click the **vApp Templates** tab.
4. You will see the list of available vApp templates together with their details:
5. 
   - **Label** - the name of vApp template
   - **Virtual Servers** - number of VSs that run on the vApp template
   - **Actions** - you can manage system service add-ons of the template, or delete the template
2.5 Organizations and Users

In this chapter, you can find information on how to manage VMware Cloud Director Organizations and Users:

- Set up New Customers
- Create and Manage Users
- Create and Manage Organizations
- Organization Networks
- VMware Cloud Director Credentials

2.5.1 Set up New Customers

This page provides an overview of how to onboard a new customer for VMware VMware Cloud Director, using OnApp. The procedure consists of the following steps:

2.5.1.1 1. Create an Organization
The first step is to create a new organization in OnApp. During the creation process you need to add the organization to an existing user group or choose to create new user group for it. You also need to select the bucket and the VMware Cloud Director compute resource for the new organization.

2.5.1.2 2. Create a User
Next you need to create a new end user account. During the creation process select the organization you've added (Step 1). You also need to select a VMware Cloud Director role for the user from the drop-down list.

2.5.1.3 3. Deploy Resources
Once the organization and user have been created, the end user will be able to log in to OnApp. The final step is to provide resources for the new user. There are several ways of doing that:

- Use a pre-defined Orchestration Model. Orchestration Models are a quick way to get started, as they deploy a resource pool, organization network(s) and storage policies in one wizard.

- Allow the customer to log in with no pre-defined resources. They can deploy a resource pool and organization networks from the VCD sidebar in the OnApp Control Panel.

- Deploy resources on behalf of your customer via VMware Cloud Director. They will automatically synchronize with OnApp via RabbitMQ.

On this page:

- 1. Create an Organization
- 2. Create a User
- 3. Deploy Resources
See also:

- VMware Cloud Director Virtual Servers
- VMware Cloud Director Buckets
- Create and Manage vApp Networks

2.5.2 Create and Manage Users

You can create VMware Cloud Director users in OnApp. This process will add a user both to vCloud and OnApp. The user creation form is standard for OnApp, the fields that will synchronize user data with vCloud are: Login, Password, User Role, User Group, First and Last Name, and Email.

After you add a user, the change will be synchronized to VMware Cloud Director. When you assign the VMware Cloud Director user that you add in OnApp to an Organisation (user group), you define the resources the new user will have access to.

If in VCD you delete a user from a user group with which several organizations from different VCDs are associated, the user will be removed but will be recreated after the synchronization. The reason is that the user exists in all organizations within one user group. If you delete such users in OnApp, they are removed from all organizations in the user group.

On this page:

- Create User
- Edit User
- Delete User

See also:

- Manage User Restrictions and Resources
- Create and Manage User Groups (Organizations)
- Manage vCloud Credentials

2.5.2.1 Create User

To add a new user:

1. Go to your Control Panel > Cloud > Users menu. You'll see a list of all user accounts in your cloud.
2. Click the Create User button at the bottom of the list.
3. Fill in the user creation form step by step:

   Step 1 of 4
   - Move the Use Gravatar slider to the right to use the gravatar image.
Login - provide user login name. It can consist of 2-40 characters, letters [A-Za-z], digits [0-9], dash [-], lower dash [ _ ], [@]. You can use both lower- and uppercase letters. This will be the user's VMware Cloud Director e-mail.

First name - specify user first name. It can consist of any 1-20 characters.

Last name - specify user last name. It can consist of any 1-20 characters.

Email - specify user email. This will be the user's email in the VMware Cloud Director database.

Time zone - select the required time zone from the drop-down box.

Locale - specify user locale settings by selecting the appropriate locale from the drop-down box (see Locales section for details).

Password - specify user password and confirm it. The password can consist of 6-40 characters and must meet the password complexity requirements. This will be the user's VMware Cloud Director password.

Repeat password - repeat user password

Additional info - fill in a custom field, created using additional fields functionality, with corresponding information

Display infoboxes - move the slider to the right to display guidance infoboxes for the user.

Click Next.

The VMware Cloud Director Phone and IM fields will be left blank when the user is created via OnApp.

The value 'unlimited' will be set automatically for the VMware Cloud Director All VMs quota and Running VMs quota fields.

Step 2 of 4

User group - assign user to the user group by selecting the required user group from the drop-down box. Assign a user to VMware Cloud Director Organization(s). If you select several user groups the user will belong to several organizations at the same time and have access to the resources of these organizations.

User role - select one of the VMware Cloud Director roles for this user.

OnApp supports both default and custom VCD roles. Default vCloud roles are mapped using the label, therefore, please do not change the labels of the default user roles in VMware Cloud Director. The custom role will not appear in the user creation wizard if the role does not exist in all organizations under a certain user group. Custom roles are not synchronized between the organizations in a user group, therefore, you will be required to add the same custom role in VCD for all organizations in a user group.
• Click **Next**.

**Step 3 of 4**

• Assign user to the bucket by selecting the required bucket from the drop-down box.
• Click **Next**.

**Step 4**

1. Specify Auto-suspending options if any. You can configure the system to suspend a user at a definite time or in several hours after creation.

   If you set Suspend settings for a user, the suspend action at OnApp will disable the user in VMware Cloud Director.

2. Click the **Save** button to finish.

### 2.5.2.2 Edit User

To edit a user account:

1. Go to your Control Panel > **Cloud** > **Users** menu. You'll see a list of all user accounts in your cloud.
2. Click the **Edit** icon next to the user you want to edit.
3. Change their details as required on the screen that appears:
   o Move the **Use Gravatar** slider to the right to use the gravatar image.
   o **Login** - provide user login name. It can consist of 2-40 characters, letters [A-Za-z], digits [0-9], dash [-], lower dash [ _ ], [@]. You can use both lower- and uppercase letters. This will be the user's VMware Cloud Director user name.
   o **First name** - specify user first name. It can consist of any 1-20 characters.
   o **Last name** - specify user last name. It can consist of any 1-20 characters. The **First name** and **Last name** comprise the user's full name in VMware Cloud Director.
   o **Email** - specify user email. This will be the user's email in the VMware Cloud Director database.
   o **Time zone** - select the required time zone from the drop-down box.
   o **Locale** - specify user locale settings by selecting the appropriate locale from the drop-down box (see **Locales** section for details).
   o **System theme** - specify the desirable theme for the user CP look and feel. By default, the global cloud settings are applied.
   o **Password** - specify user password and confirm it. The password can consist of 6-40 characters and must meet the password complexity requirements. This will be the user’s VMware Cloud Director password.
   o **Repeat password** - repeat user password
   o **Display infoboxes** - move the slider to the right to display guidance infoboxes for the user.
   o **Bucket** - select the required bucket from the drop-down box.
User roles - select one of the VMware Cloud Director roles for this user.

User group - assign user to the user group by selecting the required user group from the drop-down box. Assign a user to VMware Cloud Director Organization(s). If you select several user groups the user will belong to several organizations at the same time and have access to the resources of these organizations.

Auto suspending - edit the auto-suspending options.

4. Click the Save button to finish.

Pay attention to the following points regarding the VMware Cloud Director users:

- When you change the First or Last Name, the VMware Cloud Director Full Name value is edited.
- When you change the Password, the password in VMware Cloud Director is also changed.
- When you change the user role, the user's role in VMware Cloud Director is also updated.
- You cannot change the user's user group (organization).
- If you set Suspend settings for a user, the suspend action at OnApp will disable the user in VMware Cloud Director.
- User without the Administrator Control permission has no ability to edit own first name, last name and email fields.

2.5.2.3 Delete User

Completely deleting a user from the system is a two-step process.

- When you delete VMware Cloud Director users in OnApp, they are completely erased in the VMware Cloud Director.
- You can delete a user but transfer the resources associated with the user to you.
- If in VCD you delete a user from a user group with which several organizations from different VCDs are associated, the user will be removed but will be recreated after the synchronization. The reason is that the user exists in all organizations within one user group. If you delete such users in OnApp, they are removed from all organizations in the user group.

2.5.2.3.1 Step 1. Deleting Users

To delete a user:

1. Go to your Control Panel > Cloud > Users menu. You'll see the list of all user accounts in your cloud.
2. Click the Actions icon next to the user you want to remove and click Delete.
3. In the confirmation window, you can select the *Transfer user's objects to me* checkbox. If you don't select the checkbox, all resources associated with the user are deleted.

4. Click the **Confirm** button.

5. Enter your admin password and click **Confirm**.

To enable confirmation of the user deletion by means of a password, go to **Admin > Settings > Configuration > Defaults** tab and move the **Enable password protection on user deleting** slider to the right. Otherwise, the password protection will be disabled by default.

After the deletion, the resources associated with the user are transferred to you if you selected the *Transfer user's objects to me* checkbox. If you don't select the checkbox, all the user resources are deleted except for recipes. Recipes that run on other user's resources are not deleted after their owners are removed. These recipes can be accessed via **Recipes > Unowned Recipes** menu. The user with global permissions can become an owner of any of the unowned recipes by choosing **Actions > Become an owner**.

### 2.5.3 Create and Manage Organizations

In vCloud, an organization is a unit of administration for a collection of users, groups, and computing resources. Users authenticate at the organization level, supplying credentials established by an organization administrator when the user was created or imported. System administrators create and provision organizations, while organization administrators manage organization users, groups, and catalogs.

vCloud organizations when imported into OnApp are associated with user groups. User groups define the bucket under which the users in the organization are billed. You can view/create/delete organizations at the OnApp Control Panel.

When an organization is created or deleted at the OnApp Control Panel, it is synchronized with VMware Cloud Director and a new organization is created or deleted in VCD.

**On this page:**

- View Organizations
- Create Organizations
- Import Organizations
- Delete Organizations
- User Groups

**See also:**

- Restriction Sets
- Resource Pools
- VMware Cloud Director Permissions
- VMware Cloud Director Credentials
2.5.3.1 View Organizations

To view VMware Cloud Director organizations:
1. Go to your Control Panel > Cloud > Organizations menu.
2. Click an organization's label to see the compute resource and the user group the organization is associated with.
3. Click the number of users to see the list of users assigned to this user group.

2.5.3.2 Create Organizations

To create a new organization:
1. Go to Control Panel > Cloud > Organizations and click Add New Organization.
2. On the page that loads, fill in the following parameters:
   - Label - the name of the organization
   - Compute Resource - the VCD compute resource with which the new organization is to be associated
   - Automatically create User Group? - whether you wish to create a new user group with which this organization will be associated. If you enable this slider, a new user group with the label of this organization will be created and will contain this organization. If you do not enable this option, you can associate this organization with an already existing user group.
   - Note that your existing user group should have at least one bucket assigned. Otherwise, the organization creation will fail.
   - User Group - the user group with which this organization is to be associated. This parameter applies only if you disable the Automatically create User Group? slider.
   - Company Billing Plan - the bucket for the user group that is to be created once to create this organization. This parameter applies only if you enable the Automatically create User Group? slider.
3. Click Submit to save create the new organization.

2.5.3.3 Import Organizations

When importing VCD resources you can choose whether you wish your users to be associated with one or several VMware Cloud Director instances. If you wish your users to have access to multiple VMware Cloud Director instances, you can set up several organizations in OnApp to be associated with a single user groups and have access to resources across multiple VCD instances. For such configuration, VCD compute resources should be imported in multiple vCloud Director mode at Control Panel > Admin > Settings > Compute Resources > Add New Compute Resource. In this mode you select which organization is imported and is associated with a certain user group. After the initial import, changes to the organization will be synchronized between VCD and OnApp.
To import an organization:
1. Go to Control Panel > Admin > Settings > Compute Resources > Label.
2. The page that loads shows the details of your VCD compute resource. Click Tools and select Import Organization from vCloud.
3. Move the Import slider to the right next to the organization(s) you wish to import.
4. Select a user group to which you wish to assign the organization in the Assign to User Group field. If you do not select a user group but enable the Import slider, a new user group will be created for this organization. If you select a user group that is already associated with one or several organizations, the users from the new organization will be created in the already present organizations and the users from the already present organizations will be created in the new user group.
5. Click Submit to import the organizations.

2.5.3.4  Delete Organizations

To delete an organization:
1. Go to Control Panel > Cloud > Organizations
2. Click the Actions icon next to the organization you wish to remove
3. Select Delete. Once the organization is removed in OnApp it will also be removed in VCD.

2.5.3.5  User Groups

Organizations are associated with OnApp user groups. If there are several organizations associated with one user group, the users from one organization will be created in other organizations in the user group. In this case, users will have access to multiple VCD instances. User groups define the bucket under which the users in the organization are billed.

To give users access to multiple VCD instances, you need to select the multiple vCloud Director mode for the VCD compute resource during import configuration.

2.5.3.5.1  View User Groups

For VMware Cloud Director Organizations the following parameters are displayed on the user group details page at Control Panel > Admin > Groups:

- Roles - the list of roles, assigned to users of the user group
- Organizations - vCloud user groups
- Bucket - the bucket assigned to this user group
- User Buckets - bucket available for the users of this group
- Monthly fee - the money amount which has to be paid on a monthly basis according to the bucket
- Price per hour - the price per hour including the total for all resources that are billed on an hourly basis for the last hour
- *Price per month* - the price per month including the total for all resources that are billed on a monthly basis
- *Price per hour (including discount)* - the price per hour including the total for all resources that are billed on an hourly basis for the last hour with the discount included (if any)
- *Price per month (including discount)* - the price per month including the total for all resources that are billed on a monthly basis with the discount included (if any)
- *Paid Amount* - the already paid money amount
- *Total Amount* - the total money amount according to the bucket
- *Discount due to free* - the amount that will be deducted from the invoice because there are free resources in the bucket
- *Total Amount with Discount* - the sum total for the resource usage after discount due to free deduction
- *Outstanding Amount* - the money amount which has to be paid (total amount minus paid amount)
- *Payments* - click this link to see the list of payments. To manage payments, go to the Billing > Payments menu. For more info refer to the *Payments* section of this guide.
- *Monthly bills* - click this link to see the list of monthly bills
- *Service Addons Stats* - click this link to see the service add-on billing statistics and total amount. That will show the amount due for the service add-on usage for all the users in the group that have assigned the service add-ons to their VSs.
- *User Group Billing Report* - click this link to see the billing statistics for all the resources used by users within this user group. For more information, refer to the section below.
- *Resource Pools* - the list of the resource pools associated with the organization.

### 2.5.3.5.2 View User Group Billing Report

The **User Group Report** page displays billing statistics for the specified period of time for all resources used by users within the user group.

To view the billing report for a particular user group:

1. Go to you Control Panel > Admin > Groups menu.
2. Click a label of a destination user group.
3. Click the **User Group Billing Report** link.
4. Filter statistics for a particular period of time and click the **Apply** button.

On the page that follows, you can see the following details:

- *From* - the start date for generating statistics
- *Till* - the end date for generating statistics
- *Virtual Server* - the label of the virtual server that you can click to view the VS details
- *User* - the username of the VS owner that you can click to view the user profile
- *Resource Pool* - the price for the usage of resource pool for the selected period of time
- *Storage* - the price for the usage of storage resources for the selected period of time
- *Network* - the price for the usage of network resources for the selected period of time
- *Service Add-ons* - the price for the usage of service add-ons for the selected period of time
• **Total Cost** - the price for all used resources (Resource Pool, Storage, Network, and Service Add-ons) for the selected period of time

To download a CSV file with statistics for a selected period of time, click the **Save as CSV** button. The download will start automatically after you click the button.

### 2.5.3.5.3 Create User Group

To create a new user group with default bucket and all roles:
1. Go to your Control Panel > **Admin** > **Groups** menu.
2. Click the "+" button or the **Create Group** button.
3. On the screen that appears, fill in the organization creation form:
   - **Label** - choose a name for the organization
   - **Buckets** - choose the bucket from the drop-down list
   - **Assign vCloud roles** - move this slider to the right to assign VCD roles to the user group
   - **Roles** - the roles for the users in the group
   - **User Buckets** - the buckets for the user group
4. Click **Save**.

After you create a user group, you can assign organizations to it during the import.

### 2.5.3.5.4 Edit User Group

To edit a user group:
1. Go to your Control Panel > **Admin** > **Groups** menu.
2. Click the label of the required organization.
3. Click the **Edit** icon in the upper right corner.
4. On the page that loads, make the necessary changes:
   - **Label** - choose a name for the organization
   - **Buckets** - choose the bucket from the drop-down list
   - **Assign vCloud Roles** - move this slider to the right to assign VCD roles to the user group
   - **Roles** - the roles for the users in the group
   - **User Buckets** - the buckets for the user group
5. Click **Save**.

### 2.5.3.5.5 Delete User Group

To delete an organization:
1. Go to your Control Panel > **Admin** > **Groups** menu.
2. Click **Delete** in the **Actions** list next to a user group to delete a specific group.
2.5.4 VMware Cloud Director Credentials

VMware Cloud Director system administrators are not automatically imported into OnApp from VMware Cloud Director (as, in this case they will automatically get access to all the OnApp functions). Alternatively, OnApp administrators can set their own VMware Cloud Director credentials to be able to log into VMware Cloud Director and manage VMware Cloud Director resources with OnApp.

Also OnApp administrators can create system administrators in their OnApp cloud and assign administrator roles to them at their own risk. After that system administrators can log in to OnApp and then set their VCD credentials by themselves. Administrators can also set the VMware Cloud Director password for their users.

The following VMware Cloud Director credentials are displayed on the user profile page:

- **Login** - the user's VMware Cloud Director login
- **Password** - click the Change Password link to edit the user’s VMware Cloud Director credentials

**On this page:**

- Set System Administrator Credentials
- Set VMware Cloud Director User Password

**See also:**

- Create and Manage User Groups (Organizations)
- Manage User Restrictions and Resources

### 2.5.4.1 Set System Administrator Credentials

To set system administrator credentials:

1. Click the Create Credentials button.
2. On the screen that appears, set the VMware Cloud Director login and password to be able to manage vCloud resources Director with OnApp.
3. Click Save.

### 2.5.4.2 Set VMware Cloud Director User Password

To set user's VMware Cloud Director password:

1. Click the Change Password button.
2. On the screen that appears, set the VMware Cloud Director password.
3. Click Save.

If you (or your system administrator) change your vCloud password on vCloud side, it is required to update the password on the OnApp side to sync. Once the credentials become out-of-sync, you will see a notification to update your vCloud credentials at the bottom of the screen. Click Manage vCloud Credentials to update the password.
API info

- **API key** - click the **Generate key** button to generate a new API key.

2.5.5 VMware Cloud Director Roles

OnApp supports both custom and default VCD roles. Default roles are mapped using the label, therefore, please do not change the labels of the default user roles in VMware Cloud Director. The custom role will not appear in the user creation wizard if the role does not exist in all organizations under a certain user group. Custom roles are not synchronized between the organizations in a user group, therefore, you will be required to add the same custom role in VCD for all organizations in a user group.

To enable all VMware Cloud Director roles on the User Group level, select the **Assign vCloud Roles** checkbox while creating or editing a user group to which the organization will belong.

On this page:

- [List of Roles](#)
- [Rights Included in VMware Cloud Director Roles](#)

See also:

- [VMware Cloud Director Permissions](#)
- [VMware Cloud Director Virtual Servers](#)
- [Organizations and Users](#)

2.5.5.1 List of Roles

**vCloud Organization Administrator**

A user with the predefined Organization Administrator role can manage users and groups in their organization and assign them roles, including the predefined Organization Administrator role. Roles created or modified by an Organization Administrator are not visible to other organizations.

**vCloud Catalog Author**

The rights associated with the predefined Catalog Author role allow a user to create and publish catalogs.

**vCloud vApp Author**

The rights associated with the predefined vApp Author role allow a user to use catalogs and create vApps.

**vCloud vApp User**

The rights associated with the predefined vApp User role allow a user to use existing vApps.

**vCloud Console Access Only**
The rights associated with the predefined Console Access Only role allow a user to view virtual machine state and properties and to use the guest OS.

**vCloud Defer to Identity Provider**

Rights associated with the predefined Defer to Identity Provider role are determined based on information received from the user's OAuth or SAML Identity Provider. To qualify for inclusion when a user or group is assigned the Defer to Identity Provider role, a role or group name supplied by the Identity Provider must be an exact, case-sensitive match for a role or group name defined in your organization.

- If the user is defined by an OAuth Identity Provider, the user is assigned the roles named in the roles array of the user's OAuth token.
- If the user is defined by a SAML Identity Provider, the user is assigned the roles named in the SAML attribute whose name appears in the RoleAttributeName element, which is in the SamlAttributeMapping element in the organization's OrgFederationSettings.

You must manually assign a role to such users.

OnApp supports both default and custom VCD roles. Default vCloud roles are mapped using the label, therefore, please do not change the labels of the default user roles in VMware Cloud Director. The custom role will not appear in the user creation wizard if the role does not exist in all organizations under a certain user group. Custom roles are not synchronized between the organizations in a user group, therefore, you will be required to add the same custom role in VCD for all organizations in a user group.

### 2.5.5.2 Rights Included in VMware Cloud Director Roles

Except the Defer to Identity Provider role, each predefined role includes the following set of default rights:

<table>
<thead>
<tr>
<th>Right Group Name</th>
<th>Organization Administrator</th>
<th>Catalog Author</th>
<th>vApp Author</th>
<th>vApp User</th>
<th>Console Access Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backups</td>
<td>Any action</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Recovery points</td>
<td>Any action</td>
<td>-</td>
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<tr>
<td>Backup resource zones</td>
<td>Any action</td>
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<tr>
<td>Backup resources</td>
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<td>Buckets</td>
<td>See details of any bucket</td>
<td>See own bucket</td>
<td>See own bucket</td>
<td>See own bucket</td>
<td>See own bucket</td>
</tr>
<tr>
<td>Right Group Name</td>
<td>Organization Administrator</td>
<td>Catalog Author</td>
<td>vApp Author</td>
<td>vApp User</td>
<td>Console Access Only</td>
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<tr>
<td>Resource Pools statistics</td>
<td>See own</td>
<td>-</td>
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<tr>
<td>Cross VDC Networks</td>
<td>Any action</td>
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<td>Dashboard</td>
<td>Show cloud dashboard</td>
<td>Show cloud dashboard</td>
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<td>Data stores</td>
<td>Any action on data stores</td>
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<td>Disks</td>
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<td>Create a new disk</td>
<td>See own disks</td>
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<td>Destroy any disk</td>
<td>Destroy own disk</td>
<td>Destroy own disk</td>
<td>See own disks</td>
<td>See own disks</td>
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<td>See all disks</td>
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<td>Update any disk</td>
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<td>Edge Gateways</td>
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<td>Firewall rules</td>
<td>Any action</td>
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<td>Virtual Server's IP Addresses</td>
<td>Add IP address to any virtual server</td>
<td>Add IP address to own virtual server</td>
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<td>Log items</td>
<td>Delete any log item</td>
<td>Delete own log item</td>
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<td>Right Group Name</td>
<td>Organization Administrator</td>
<td>Catalog Author</td>
<td>vApp Author</td>
<td>vApp User</td>
<td>Console Access Only</td>
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<tr>
<td>Monthly User Billing Statistics</td>
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2.6 Buckets and Limits

In this chapter, you can find information on how to manage buckets and limits:

- **Buckets**
- **Create and Manage Payments**
- **Restrictions Sets**
- **VMware Cloud Director Permissions**

### 2.6.1 VMware Cloud Director Buckets

OnApp provides a possibility to limit which resources should be allocated to customers, and charge users for what they actually consume. For this, it is required to create a bucket, set prices and resource limits, and then assign users to that bucket. Buckets can be assigned to individual users and to organizations imported into OnApp.

Buckets enable you to set up resources allocation and pricing separately. They are subdivided into two subsections:

- **Access Control** - in this section you configure the resources allocation for the users under this bucket. If you assign a bucket to a user, that user will have access only to those resources which you have added to the bucket. If no resources are added to a section of

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**Virtual Machine Statistics**

- See Virtual Machine Statistics
- See all Virtual Machines Statistics
- See own Virtual Machines Statistics
- See own Virtual Machines Statistics
- See own Virtual Machines Statistics
- See own Virtual Machines Statistics
the Access Control, e.g. compute zones, the user under the bucket will not have access to any of the compute zones in the cloud.

- **Rate Card** - in this section you set up prices for the resources and the amount of resources users can request for free. Users under the bucket will be billed according to the prices you configure in the Rate Card. In the Rate Card, you can set the pricing type: hourly or monthly.

For convenience, you can duplicate resources from the Access Control to the Rate Card and vice versa. When adding a resource to the Access Control tick the **Duplicate to rate card** checkbox and the resource will be added to the Rate Card with no prices and free limits by default. Similarly, when adding a resource to the Rate Card tick the **Duplicate to access control** checkbox box and the resource will be added to the access control with no limits by default.

These tabs are further subdivided into sections that depend on the server types of resources you have in the cloud. The VMware Cloud Director resources have the VPC server type. For information on buckets related to other resource types, refer to [Buckets](#).

Buckets functionality is applicable to three models of resources allocation of **VMware Cloud Director resource pools** - Pay-As-You-Go, reservation pool and allocation pool. If you are allocating resources to your customers based on these VMware Cloud Director resource pools, you can charge customers for the block of resources (CPU, RAM, storage, & network etc.) assigned to their user group.

You can set two types of billing for each resource:

- **Hourly** - the number of used resources is calculated hourly and users are charged per hour for the usage of resources.
- **Monthly (on peak usage)** - the number of used resources is calculated monthly and users are charged once per month (on the first day of a month for the preceding month) for a peak value of a resource usage. The peak value is the highest value that occurred throughout a month (e.g. from 01.04.2019 00:00 to 30.04.2019 23:59).

2.6.1.1 **Before you Begin**

- Be careful when deleting or editing resources in buckets assigned to users or user groups and which have been used to build servers, as any changes will affect these servers. For example, if you have a server running on a template and the template’s store is removed from the bucket, the server will remain running but it will not be possible to edit it. Therefore, we advise to clone the required bucket and make the necessary changes in the cloned version.

- Ensure that **Buckets and Resource Pool Statistics** permissions are on before creating a bucket. For more information about permissions, refer to the [VMware Cloud Director Permissions](#) section of this guide.

- Be aware that the maximum value that you can set is $10^{13}$.

Below you can find instructions on how to create and manage buckets and billing statistics.

---

**On this page:**

- [Create Bucket](#)
- [Configure Resource Allocation and Prices](#)
  - [Configure Access Control](#)
  - [Configure Rate Card](#)
- [Assign Users to Bucket](#)
- [Assign Organizations to Bucket](#)
- [View List of Users Assigned to Bucket](#)
2.6.1.2 Create Bucket

To create a bucket:
1. Go to your Control Panel > Admin > Buckets menu.
2. On the screen that appears, click the + button or click New Bucket at the bottom of the screen.
3. Complete the form on the screen that appears:
   - Label – enter a name for the bucket
   - Monthly price – set a monthly price for the bucket. This price will be applied regardless of the actual prices for used resources.
   - Be aware that the maximum value that you can set is $10^{13}$.
   - Currency - set a currency to charge in.
4. Specify Windows licensing support settings:
   - Tick the Allows mak box to enable MAK licensing for a user signed up for this bucket
   - Tick the Allows kms box to allow using KMS service
   - Choose Allows own to permit inserting custom licenses
5. Click Save to finish.

2.6.1.3 Configure Resource Allocation and Prices

- A resource pool is allocated to an organization, and the organization is associated with a compute resource of a specific compute zone. Thus, when you set limits and pricing for a specific compute zone, it means that these prices are set for all resource pools associated with this compute zone.
The amount of free resources is given to an organization as a total amount for all VMware Cloud Director resources in the compute zone. The minimum/maximum amounts and prices are set for each VMware Cloud Director resource pool in the compute zone.

2.6.1.3.1 Configure Access Control
Access control is used to manage availability of resources to users. For the newly created bucket, the Access Control is empty, and that means that no resources are available to a user to whom this bucket is assigned. To make compute, disk space, or networking resources available, add the corresponding zones to a bucket.

- If you do not add resources to a section of Access Control, e.g. compute zone, the user under this bucket will not have access to any of the compute zones in the cloud.
- If you remove a template store or compute/data store/network/backup server zone from the Access Control, it will not be possible to edit the resources of the servers running in this zone(s).

To manage resources allocation:
1. Go to your Control Panel > Admin > Buckets menu.
2. Click a label of a bucket. You will be redirected to the Access Control tab of the bucket.
3. Click an icon to select the required server type (VPC) and add resources as follows:
   - Click the + in the appropriate box.
   - When the new windows pops up, set limits for resources (see the table below for reference).
   - Select the Duplicate to rate card checkbox if you want to set free limits and prices for the resources.

<table>
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<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| Miscellaneous     | Virtual Servers  | Max    | Set the total amount of VSs the users can create in the cloud. This parameter affects the number of virtual servers, VSSs in Federation and load balancers users can create.
|                   |                  |        | Leave the '-' value to let the user create an unlimited amount of VSs in the cloud.                                                        |
|                   | Application Servers | Max    | Set the total amount of application servers that the users can create in the cloud.
<p>|                   |                  |        | Leave the '-' value to let the user create an unlimited amount of application servers in the cloud.                                         |</p>
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| Limits for compute zones          | Allocation Pool    | Min Max| • The minimum amount of CPU (in GHz) users can request for each VMware Cloud Director resource pool in the compute zone.  
• The maximum amount of CPU (in GHz) users can request for each VMware Cloud Director resource pool in the compute zone.  
Leave the '-' value to provide an unlimited amount of CPU within the compute zone to a user under this bucket. |
| CPU Allocation                    | Min Max            |        | • The minimum amount of CPU Resources (in %) users can request for each VMware Cloud Director resource pool in the compute zone.  
• The maximum amount of CPU Resources (in %) users can request for each VMware Cloud Director resource pool in the compute zone.  
Leave the '-' value to provide an unlimited amount of guaranteed CPU resources within the compute zone to a user under this bucket. |
| vCPUs                             | Min Max            |        | • The minimum amount of vCPUs (in cores) users can request for each VMware Cloud Director resource pool in the compute zone.  
• The maximum amount of vCPUs (in cores) users can request for each VMware Cloud Director resource pool in the compute zone.  
Leave the '-' value to provide an unlimited amount of vCPUs within the compute zone to a user under this bucket. |
| Memory Allocation                 | Min Max            |        | • The minimum amount of Memory (in GB) users can request for each VMware Cloud Director resource pool in the compute zone.  
• The maximum amount of Memory (in GB) users can request for each VMware Cloud Director resource pool in the compute zone.  
Leave the '-' value to provide an unlimited amount of RAM within the compute zone to a user under this bucket. |
| Memory Guaranteed                 | Min Max            |        | • The minimum amount of Memory Resources (in %) users can request for each VMware Cloud Director resource pool in the compute zone.  
• The maximum amount of Memory Resources (in %) users can request for each VMware Cloud Director resource pool in the compute zone.  
Leave the '-' value to provide an unlimited amount of guaranteed RAM resources within the compute zone to a user under this bucket. |
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU Speed</td>
<td></td>
<td>Min Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The minimum amount of vCPU speed (in MHz) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The maximum amount of vCPU speed (in MHz) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>Leave the '-' value to provide unlimited vCPU speed within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for compute zones</td>
<td>CPU Allocation</td>
<td>Min Max</td>
<td></td>
</tr>
<tr>
<td>Reservation Pool</td>
<td></td>
<td>-</td>
<td>The minimum amount of CPU (in GHz) users can allocate for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The maximum amount of CPU (in GHz) users can allocate for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>Leave the '-' value to provide an unlimited amount of CPU within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>vCPUs</td>
<td></td>
<td>Min Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The minimum amount of vCPUs (in cores) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The maximum amount of vCPUs (in cores) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>Leave the '-' value to provide an unlimited amount of vCPUs within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>Memory Allocation</td>
<td></td>
<td>Min Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The minimum amount of Memory (in GB) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The maximum amount of Memory (in GB) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>Leave the '-' value to provide an unlimited amount of RAM within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for compute zones</td>
<td>CPU Quota</td>
<td>Min Max</td>
<td></td>
</tr>
<tr>
<td>Pay-As-You-Go</td>
<td></td>
<td>-</td>
<td>The minimum amount of CPU (in GHz) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>The maximum amount of CPU quota (in GHz) users can request for each VMware Cloud Director resource pool in the compute zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>Leave the '-' value to provide an unlimited amount of CPU Quota within the compute zone to a user under this bucket.</td>
</tr>
</tbody>
</table>

CPU quota is a CPU limit in terms of resource pool creation. Min/max amounts of CPU quotas affect the range within which you can set CPU limits during.
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>resource pool creation/edit. If min/max amounts of CPU quota is set to unlimited, that allows you to set unlimited CPU and memory during resource pool creation/edit. Otherwise, the unlimited option will not be available during resource pool creation/edit.</td>
</tr>
</tbody>
</table>
| vCPUs         | Min Max       | • The minimum amount of vCPUs (in cores) users can request for each VMware Cloud Director resource pool in the compute zone.  
• The maximum amount of vCPUs (in cores) users can request for each VMware Cloud Director resource pool in the compute zone.  
Leave the '-' value to provide an unlimited amount of vCPUs within the compute zone to a user under this bucket. |
| Memory Quota  | Min Max       | • The minimum amount of Memory quota (in GB) users can request under this bucket  
• The maximum amount of Memory quota (in GB) users can request under this bucket.  
Leave the '-' value to provide an unlimited amount of RAM Quota within the compute zone to a user under this bucket. |

Memory quota is the name of the resource which controls the memory limit at resource pool creation. Min/max amounts of memory quotas affect the range within which you can set memory limits during resource pool creation/edit. If min/max amounts of CPU and memory quotas are set to unlimited, that allows you to set unlimited CPU and memory during resource pool creation/edit. Otherwise, the unlimited option will not be available during resource pool creation/edit.

- CPU quota is a CPU limit in terms of resource pool creation (memory quota is the memory limit respectively).
- Min/max amounts of CPU and memory quotas affect the range within which you can set CPU and memory limits during resource pool creation/edit.
- If min/max amounts of CPU and memory quotas are set to unlimited, that allows you to set unlimited CPU and memory during resource pool creation/edit. Otherwise, the unlimited option will not be available during resource pool creation/edit.

| Limits for compute zones | VS CPU Cores | Max | The maximum amount of CPU cores that users can request for all VSSs totally created in the compute zone.  
Leave the '-' value to let the user request an unlimited amount of CPU cores for their servers within the compute zone. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Type</td>
<td>Resource name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Limits for compute zones</td>
<td>VS RAM</td>
<td>Max</td>
<td>The maximum amount of RAM that users can request for all VSs totally within the compute zone. Leave the '-' value to let the user request an unlimited amount of CPU cores for their VSs within the compute zone.</td>
</tr>
<tr>
<td>NSX-T Edge Gateways</td>
<td>Number of NSX-T edge gateways</td>
<td>Max</td>
<td>The maximum number of NSX-T edge gateways can be created in the compute zone.</td>
</tr>
<tr>
<td>Limits for data store zones</td>
<td>Disk Size</td>
<td>Min</td>
<td>The minimum amount of disk size (in GB) users can request for each storage policy (data store) in a provider storage policy (data store zone). Leave the '-' value to set an unlimited amount of minimum disk size a user can request for each storage policy in a provider storage policy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max</td>
<td>The maximum amount of disk size (in GB) users can request for each storage policy (data store) in a provider storage policy (data store zone). Leave the '-' value to provide an unlimited amount of disk space in the selected data store zone to a user under this bucket.</td>
</tr>
<tr>
<td></td>
<td>VS Disk Size</td>
<td>Max</td>
<td>The maximum amount of disk size that users can request for all VSs totally within the whole data store zone. Leave the '-' value to provide an unlimited amount of VS disk space in the selected data store zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for network zones</td>
<td>IP Address</td>
<td>Max</td>
<td>The maximum number of IP Addresses users can request to deploy Edge Gateways for the whole network zone. Leave the '-' value to provide an unlimited amount of IP addresses in the selected network zone to a user under this bucket.</td>
</tr>
<tr>
<td></td>
<td>VS IP Addresses</td>
<td>Max</td>
<td>The maximum amount of IP addresses that users can allocate to deploy/recompose a vApp within the whole network zone. Leave the '-' value to provide an unlimited amount of VS IP addresses in the selected network zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for NSX-V edges</td>
<td>Firewall NAT</td>
<td>Yes</td>
<td>Move the slider to the right to provide access to NSX-V service.</td>
</tr>
<tr>
<td></td>
<td>Load balancer</td>
<td>No</td>
<td>Move the slider to the left not to deny access to NSX-V service.</td>
</tr>
<tr>
<td></td>
<td>IPSec VPN</td>
<td></td>
<td>After the bucket Access Control is enabled for selected NSX-V services, they will be billed according to the prices set in the Rate Cards section.</td>
</tr>
<tr>
<td></td>
<td>L2 VPN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Limits for orchestration models
Add the orchestration model(s) which will be available for a user or user group at the Orchestration Models menu.

The orchestration models section will appear only if you added the compute zone(s) associated with the model(s) to the Access Control.

### Limits for backup resource zones
Select which backup resource zones will be available to users under this bucket.

### Limits for edge groups
Select which edge groups will be available to users under this bucket.

### Limits for template store
Select which template stores from which templates will be available for users to select during a virtual server creation.

### Limits for recipe groups
Select which groups of recipes will be available to users under this bucket.

### Limits for service add-on groups
Select which service add-on groups will be available for users to assign to virtual servers.

#### Other Resources

**Configure Rate Card**
Rate Card is used to manage the prices and the amount of free limits for resources. For the newly created bucket, the Rate Card is empty, and that means that a user, to whom this bucket is assigned, is not billed for any of the resources in the system. To configure pricing for compute, disk space, or networking resources, add the corresponding zones to the bucket's Rate Card.

- If you add a resource to the Rate Card but do not add it to the Access Control, the user under this bucket will not have access to that resource.
- In case you remove from Access Control a resource on which users under the bucket have running servers, the users’ existing servers will remain as they are, but users will not be able to access these resources to create new servers. If you leave such a resource in the Rate Card, the users’ existing servers will continue to be billed according to the prices you have configured.
- If you remove a template store or compute/data store/network/backup server zone from the Rate Card, the prices for the removed resource will be set to zero for the servers using this zone(s).
- If you want to disable prices completely you can do so by enabling the *Disable billing* slider at the *Edit System Configuration* page. When the billing is disabled, the Rate Cards are removed from existing buckets. Note that if billing is enabled again, the prices won't be recalculated again. Instead, the price calculation will start with the next hour.
To manage pricing for the resources:

1. Go to your Control Panel > Admin > Buckets menu.
2. Click a label of a bucket. You will be redirected to the Access Control tab of the bucket.
3. Click the Rate Card tab.
4. Click an icon to select the required server type and add resources as follows:
   - Click the + in the appropriate section.
   - When the new window pops up, set the value for the free limit and the price (see the table below for reference).
   - Select the Duplicate to access control checkbox if you want to add the resource not only to Rate Card but also to Access Control.

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>Virtual Servers</td>
<td>Max</td>
<td>Set the total amount of VSs the users can create in the cloud. This parameter affects the number of virtual servers, VSs in Federation and load balancers users can create. Leave the ‘-’ value to let the user create an unlimited amount of VSs in the cloud.</td>
</tr>
</tbody>
</table>
| Application Server                | Free Price    |        | • The amount of application servers users can create for free under this bucket  
• The price per application server per hour for the application servers the users have created under this bucket |
| Pricing for compute zones         | CPU Allocation | Price  | • The price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket  
• The amount of CPU (in GHz) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| RAM Allocation                    | Price         | Free   | • The price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket  
• The amount of memory (in GB) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
<p>| CPU Used                          | Price         | Free   | • The price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket |</p>
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| vCPUs         | Price Free   | • The amount of used CPU (in GHz) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket.  
These parameters apply only if you are configuring a bucket that will be assigned to organizations.  
| RAM Used      | Price Free   | • The price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket.  
• The amount of free used memory (GB) users get for free under this bucket per hour or per month depending on the selected pricing type.  
These parameters apply only if you are configuring a bucket that will be assigned to organizations.  
| CPU Resources Guaranteed | Price Free | • The price per % per hour or per month (depending on selected pricing type) for CPU resources in this compute zone under this bucket.  
• The amount of CPU Resources (in %) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket.  
These parameters apply only if you are configuring a bucket that will be assigned to organizations.  
| RAM Resources Guaranteed | Price Free | • The price per % per hour or per month (depending on selected pricing type) for memory resources in this compute zone under this bucket.  
• The memory resources (in %) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket.  
These parameters apply only if you are configuring a bucket that will be assigned to organizations.  
| vCPU Speed    | Price Free   | • The price per MHz per hour or per month (depending on selected pricing type) for vCPU speed in this compute zone under this bucket.  

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| Pricing for compute zones | CPU Allocation | Price | • The price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket  
• The amount of CPU (in GHz) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| **Reservation Pool** | vCPUs | Price | • The price per core per hour or per month (depending on selected pricing type) for used vCPUs in this compute zone under this bucket  
• The amount of used vCPUs (in cores) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| **Pricing for compute zones** | RAM Allocation | Price | • The price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket  
• The amount of memory (in GB) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| **Pay-As-You-Go** | CPU Quota | **Regular Price** | • The regular price is per GHz per hour or per monthly peak (depending on selected pricing type) for CPU quota  
• The unlimited price is set for the unlimited amount of CPU quota per hour  
• The amount of CPU quota (in GHz) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| RAM Quota    | Regular Price Unlimited Price Free | • The regular price is per GB per hour or per monthly peak (depending on selected pricing type) for Memory quota.  
• The unlimited price is set per unlimited amount of memory quota per hour  
• The amount of memory quota (in GB) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| CPU Used     | Price Free | • The price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket  
• The amount of used CPU (in GHz) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| vCPUs        | Price Free | • The price per core per hour or per month (depending on selected pricing type) for used vCPUs in this compute zone under this bucket  
• The amount of used vCPUs (in cores) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| RAM Used     | Price Free | • The price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket  
• The amount of used memory (in GB) that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket  
These parameters apply only if you are configuring a bucket that will be assigned to organizations. |
| Pricing for compute zones | VS CPU | Price on | Price off Free | • The price per GHz per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket  
• The price per GHz per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket |
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS RAM</td>
<td>Price on</td>
<td>Free</td>
<td>The price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td>Price off</td>
<td>Free</td>
<td>The price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td>Price Free</td>
<td>Free</td>
<td>The amount of RAM (GB) users can request for free per hour or per month (depending on selected pricing type) for the total number of their VSs built in this compute zone under this bucket.</td>
</tr>
<tr>
<td>Pricing for compute zones NSX-T Edge Gateways</td>
<td>Number of Edge Gateways</td>
<td>Price Free</td>
<td>The number of NSX-T edge gateways that users get for free per hour or per month, depending on the selected pricing type, for their virtual servers created in this compute zone.</td>
</tr>
<tr>
<td>Pricing for data store zones</td>
<td>Disk Size</td>
<td>Price Free</td>
<td>The price is per GB per hour or per month (depending on selected pricing type) for the disk size users can request in this data store zone.</td>
</tr>
<tr>
<td></td>
<td>Used</td>
<td>Price Free</td>
<td>The amount of disk size (in GB) that users get for free per hour or per month, depending on the selected pricing type, in this data store zone.</td>
</tr>
<tr>
<td>Disk Size</td>
<td>Used</td>
<td>Price Free</td>
<td>The price per GB per hour or per month (depending on selected pricing type) for used disk size in this data store zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The amount of used disk size (in GB) that users get for free per hour or per month, depending on the selected pricing type, in this data store zone.</td>
</tr>
</tbody>
</table>

These parameters apply only if you are configuring a bucket that will be assigned to individual users.
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Description</td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to organizations.</td>
</tr>
<tr>
<td></td>
<td>VS Disk Size</td>
<td>Price on</td>
<td>• Price per GB per hour or per month (depending on selected pricing type) for disk size of an individual VS created in this data store zone that is powered on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
<td>• Price is per GB per hour or per month (depending on selected pricing type) for disk size of an individual VS created in this data store zone that is powered off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>• The amount of disk size (in GB) that users get for free per hour or per month, depending on the selected pricing type, for their virtual servers created in this data store zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to organizations.</td>
</tr>
<tr>
<td></td>
<td>Unlimited Disk</td>
<td>Price</td>
<td>If disk capacity for the data store zone is set to unlimited, you can set price per unlimited disk size per hour or per month, depending on the selected pricing type</td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td></td>
<td>This parameter applies only if you are configuring a bucket that will be assigned to organizations.</td>
</tr>
<tr>
<td></td>
<td>Pricing for</td>
<td></td>
<td>• The price per IP address per hour or per month (depending on the selected pricing type) which users can request in this network zone</td>
</tr>
<tr>
<td></td>
<td>network zones</td>
<td>Price</td>
<td>• The number of IP addresses that users get for free in this network zone per hour or per month (depending on the selected pricing type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to organizations.</td>
</tr>
<tr>
<td></td>
<td>VS IP Address</td>
<td>Price on</td>
<td>• The price per IP address per hour or per month (depending on the selected pricing type) for users' VSs created in this network zone that are powered on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
<td>• The price per IP address per hour or per month (depending on the selected pricing type) for user's VSs created in this network zone that are powered off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>• The number of IP addresses that users get for free per hour or per month (depending on the selected pricing type) for their VSs created in this network zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to individual users.</td>
</tr>
<tr>
<td></td>
<td>Data Sent</td>
<td>Price</td>
<td>• The price over free units per GB per hour or per month (depending on selected pricing type) for sent data in this network zone</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Data Received</td>
<td></td>
<td>Price</td>
<td>The price over free units per GB per hour or per month (depending on selected pricing type) for received data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>The amount of received data (in GB) that users get for free per hour or per month (depending on selected pricing type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to organizations.</td>
</tr>
<tr>
<td>VS Data Sent</td>
<td></td>
<td>Price</td>
<td>The price over free units per GB per hour or per month (depending on selected pricing type) for data sent by for the user VSs built in this network zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>The amount of sent data (in GB) that users get for free per hour or per month (depending on selected pricing type) for data sent for user VSs built in this network zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to organizations.</td>
</tr>
<tr>
<td>VS Data Received</td>
<td></td>
<td>Price</td>
<td>The price over free units per GB per hour or per month (depending on selected pricing type) for data received for user VSs built in this network zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>The amount of sent data (in GB) that users get for free per hour or per month (depending on selected pricing type) for data received for user VSs built in this network zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>These parameters apply only if you are configuring a bucket that will be assigned to individual users.</td>
</tr>
<tr>
<td>Pricing for NSX-V edges</td>
<td></td>
<td>Price on</td>
<td>The price per service per hour or per month (depending on selected pricing type) which users can request under this bucket.</td>
</tr>
<tr>
<td>Firewall NAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load balancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPSec VPN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L2 VPN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pricing for backup</td>
<td></td>
<td>Recovery Point</td>
<td>Price</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.6.1.3.4 Other Resources
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>resource zones</td>
<td>• the number of recovery points (recovery point/hour) that users can store in the backup resource zone for free under this bucket. The <strong>recovery point</strong> is a term that is used to refer to a backup created by means of a <strong>backup plugin</strong>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery Point Size</td>
<td>Price</td>
<td>Free</td>
<td>• the price for a recovery point size in Gb per hour charged for recovery points stored in the backup resource zone under this bucket. • the size (Gb/hour) that users can consume to store their recovery points in the backup resource zone for free under this bucket.</td>
</tr>
<tr>
<td>Space Used</td>
<td>Price</td>
<td>Free</td>
<td>• set the price for a total disk size (Gb/hour) charged for all backups of a particular virtual server in the backup resource zone under this bucket. • set the free size (Gb/hour) that users can consume to store all backups of a particular virtual server in the backup resource zone under this bucket.</td>
</tr>
<tr>
<td>Pricing for edge groups</td>
<td>Edge Group Resource</td>
<td>Price</td>
<td>Set the price per GB of CDN bandwidth that will be available to users under this bucket in the selected CDN edge group.</td>
</tr>
<tr>
<td>Pricing for template store</td>
<td>Template Store</td>
<td>Price</td>
<td>Select the template store for the templates in which you wish to set a price and enter the cost for each individual template. As a single template can be included in multiple template stores, the same template will have the same price in all the template stores added to the rate card of a single bucket. If you add/edit the price of a template in one template store, the price of the same template will change to the new value in all the template stores in the rate card. Once you add a template to the Rate Card, all the template stores that contain that template will be added to that Rate Card with a price set only for that template. Tick the <strong>Apply to all buckets</strong> checkbox to set the price you have configured for the templates in the store to all buckets that contain this template store.</td>
</tr>
<tr>
<td>Pricing for service add-on groups</td>
<td>Service Add-on Store</td>
<td>Price</td>
<td>The price that will be charged for adding the service add-ons from this service add-on store to virtual servers. • the additional price for CPU (CPU core/hr) that applies to VSs to which a service add-on is added. • the amount of CPU (CPU core/hr) users can request for free for the total number of VSs to which a service add-on is added.</td>
</tr>
<tr>
<td>Memory</td>
<td>Price</td>
<td>Free</td>
<td>• the additional price for RAM (GB/hr) that applies to VSs to which a service add-on is added.</td>
</tr>
</tbody>
</table>
2.6.1.4 Assign Users to Bucket

You can assign a bucket to an individual user while creating or editing a user profile.

To assign a bucket to a new user:

1. Go to the Control Panel > Admin > Users menu. The page that loads shows all the users in your cloud.
2. Click the + icon or the Create User button. You will be forwarded to the first step of the user creation wizard.
3. Fill in the login, first and last name, email and password for the new user and click Next.
4. At the second step of the user creation process select the required VMware Cloud Director user group and one or several vCloud roles for the user from the drop-down lists. Click Next to proceed.
5. Select the bucket under which the user will be billed. Click Next to proceed to the final step of the user creation process.
6. Set the auto suspending options if required and click Save to create the user. The new user will be able to log into OnApp with the credentials you have specified during creation and will be billed according to the bucket you have selected.

To assign a bucket to an existing user:

1. Go to the Control Panel > Admin > Users menu. The page that loads shows all the users in your cloud.
2. Click the Actions icon next to the user to which you want to assign a bucket.
3. To assign a certain bucket to a user, select the required bucket from the drop-down list in the Buckets field. On this page, you can also change other details of the user account, e.g., login, email, password, etc.
4. Click Save to change the details of the user profile. After this process the user will be billed according to the bucket you have selected.

2.6.1.5 Assign Organizations to Bucket

You can assign a user group to a bucket while creating a new organization.

The total number of vCloud Virtual Servers created by all users in the group cannot exceed the Virtual Servers limit set in the bucket for that user group. The exact number of VSs that can be allocated to each user in the
group is not predefined in the group's bucket. Therefore, when one group member uses, for example, half of the group's bucket VS limit, the remaining amount of VSs is left for the rest of users in the group even if they have not reached the VS limit set in their individual bucket. If the VS bucket limit is reached, users will not be able to create new virtual servers. Currently, such behavior is implemented only for the Virtual Servers functionality.

To assign a bucket to the user group:
1. Go to your Control Panel > Cloud > Organizations menu.
2. Click the + icon or the Add new Organization button.
3. On the screen that appears, fill in the organization details:
   - **Label** - type a name for the organization
   - **Compute Resource** - the VCD compute resource with which the new organization is to be associated
   - **Automatically create User Group?** - whether you wish to create a new user group with which this organization will be associated. If you enable this slider, a new user group with the label of this organization will be created and will contain this organization. If you do not enable this option, you can associate this organization with an already existing user group.
   - **User Group** - the user group with which this organization is to be associated. This parameter applies only if you disable the **Automatically create User Group?** slider.
   - **Company Billing Plan** - the bucket for the user group that is to be created for this organization. This parameter applies only if you enable the **Automatically create User Group?**
4. Click **Submit** to create a new organization.

The newly created organization will have the following roles:

- If you select to automatically create a new user group for this organization, all VMware Cloud Director roles are assigned to this organization by default and cannot be further changed.
- If you select an existing user group, the organization inherits roles from this user group settings.

To enable all VMware Cloud Director roles on the User Group level, select the Assign vCloud Roles checkbox while creating or editing a user group to which the organization will belong.

2.6.1.6 View List of Users Assigned to Bucket

You can view the list of users assigned to a bucket from the buckets list page.

To view the list of users assigned to a bucket:
1. Go to Control Panel > Admin > Buckets. The page that loads lists all the buckets in your cloud.
2. In the Associated with users column click the number next to the bucket you are interested in. This number indicates how many active users are associated with this bucket. You will be forwarded to the list of users to whom the bucket is assigned. The users which have been deleted or deactivated are not shown at this list.

3. Click the user’s Full Name to view the account details or click the Actions icon next to the user to edit, delete or perform other action related to this user.

2.6.1.7 Edit Bucket

To edit a bucket:
1. Go to your Control Panel > Admin > Buckets menu.
2. Click the Actions button next to the required bucket and then click Edit.
3. Change the required settings and click the Save button.

- Editing a bucket that is associated with more than one user will affect all users attached to it. If you want to affect only a particular user, copy the bucket, assign it to this user and then edit the bucket.
- When a bucket is edited, the new monthly price will apply starting with the following month. For the current month, the monthly price from the previous month is taken.

2.6.1.8 Copy Bucket

To copy a bucket:
1. Go to your Control Panel > Admin > Buckets menu. The screen that appears will show all the buckets currently set up on the cloud.
2. Click the Actions icon next to a required bucket, then click Copy.
3. You will be forwarded to the Access Control section of the copied version of the original bucket. The copy will be displayed in the bucket's list at Control Panel > Buckets with a label consisting of ‘Bucket clone of’ and the name of the original bucket, e.g. ‘Bucket Clone of Test.Bucket’.

2.6.1.9 Delete Bucket

To delete a bucket:
1. Go to your Control Panel > Admin > Buckets menu. The screen that appears will show all the buckets currently set up in the cloud.
2. Click the Delete icon next to a bucket to remove it from the system. You’ll be asked for confirmation before the bucket is removed.
Deleting a bucket that is associated with more than one user will affect all users attached to it. If you want to delete or change the bucket for a particular user, go to the **Users** menu and edit the bucket in the user profile.

### 2.6.1.10 Billing Statistics

The billing statistics on used VMware Cloud Director resources and prices for them is collected from **VMware Cloud Director resource pools**. Buckets for VMware Cloud Director resource pool types includes charging for the block of resources (CPU, RAM, storage, network, etc.) assigned to your organization.

**Statistics are not collected on a resource pool if the compute zone is not added to the bucket.**

To view VMware Cloud Director resource pool billing statistics:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the label of a specific resource pool.
3. Click the **Billing Statistics** tab.
4. The page that loads will show the following details of the billing statistics:
   - **Date** - particular date and hour for the generated statistics
   - **User Group** - the label of user group (VMware Cloud Director organization), to which the bucket is assigned. Click the user group name to see its details.
   - **Resource Pool** - the resource pool name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
   - **Network Usage** - the network name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
   - **Storage Policy Usage** - the storage policy name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
   - **Costs** - the total due for the Resource Pools, Network Usage and Storage Policy Usage at the point of time specified in the Date column.

To generate statistics for a particular time period:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the label of a specific resource pool.
3. Click the **Billing Statistics** tab.
4. At the top of the table set Start and End time for which you want to generate the billing statistics.
5. Tick the **Show in my timezone** checkbox if you want to show billing statistics according to your profile's timezone settings.
6. Click Apply.

2.6.2 Payments

OnApp provides a possibility to add information about payments to OnApp Control Panel. Payments are already paid invoices for used resources according to buckets. There are two types of payments in OnApp: user payments and company payments. User payments are those which you charge for the resources created on KVM compute resources. Company payments are those for the VMware Cloud Director integration resources.

- Ensure that Payments permissions are on before managing payments.
- Ensure that See own company payments and Monthly user group billing statistics permissions are on before managing a company payment and monthly bills.

For more information refer to the VMware Cloud Director Permissions section of this guide.

Below you can find instructions on how to view, create and manage company payments.

**On this page:**

- View Company Payments
- Create Company Payment
- Edit Company Payment
- Delete Company Payment

2.6.2.1 View Company Payments

To view company payments:

1. Go to your Control Panel > Admin > Payments menu.
2. Click the Company Payments tab.
3. On the screen that appears, you will see the list of all payments together with their details:
   - **Payment Date** – the date when the payment was done
   - **Company** – the name of a user group, whose user conducted the payment
   - **Invoice Number** – the serial number of a paid invoice
   - **Amount** – the money amount which was paid
   - **Actions** – click the Actions button to perform one of the following processes on the payment: edit or delete.

You can filter the list of payments by user group - select the user group from the drop-down menu and click the Apply button.

To view monthly bills:

1. Go to your Control Panel > Admin > Groups menu.
2. Click the label of a specific user group.
3. On the screen that appears, you will see the details of this user group. Click the Monthly Bills link.

4. On the page that appears you will get the list of bills which shows the total due per each month of the year selected from the drop-down menu. To view billing statistics, select a year from the drop-down menu and click the Apply button.

2.6.2.2 Create Company Payment

To create a company payment:
1. Go to your Control Panel > Admin > Payments menu.
2. Select the Company Payments tab.
3. On the screen that appears, you will see the list of all payments. Click the New Payment button or the + or the New Payment button.
4. Complete the form on the screen that follows:
   o Company – the name of a user group, whose user conducted the payment
   o Invoice Number – the serial number of a paid invoice
   o Amount – the money amount which was paid
5. Click Save.

2.6.2.3 Edit Company Payment

To edit a company payment:
1. Go to your Control Panel > Admin > Payments menu.
2. Select the Company Payments tab.
3. On the screen that appears, you will see the list of all payments. Click the Actions button next to the payment you want to edit, then click Edit.
4. Make changes on the screen that follows:
   o Company – write the name of a user group, whose user conducted the payment
   o Invoice Number – put the serial number of a paid invoice
   o Amount – change the money amount which was paid
5. Click Save.

2.6.2.4 Delete Company Payment

To delete a company payment:
1. Go to your Control Panel > Admin > Payments menu.
2. Select the Company Payments tab.
3. On the screen that appears, you will see the list of all payments. Click the Actions button next to the payment you want to delete, then click Delete.
4. Confirm the deletion.
2.6.3 Restrictions Sets

For more information on the restrictions resources, refer to the Restrictions Sets section.

Restrictions sets can limit the following VMware Cloud Director resources:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Restriction Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Org Networks</td>
<td>by bucket</td>
<td>The vCloud user can manage org networks, which reside in the network zone associated with VCD bucket.</td>
</tr>
<tr>
<td>vApps</td>
<td>by user group</td>
<td>The vCloud user can manage only vApps which run in the vCloud organization (user group).</td>
</tr>
<tr>
<td>vApp Templates</td>
<td>by user group</td>
<td>The vCloud user can manage only vApp templates in the vCloud organization (user group).</td>
</tr>
<tr>
<td>Catalogs</td>
<td>by user group</td>
<td>The vCloud user can manage only vApp template catalogs in the vCloud organization (user group).</td>
</tr>
<tr>
<td>vDCs</td>
<td>by user group</td>
<td>The vCloud user can manage virtual DataCenters which exist in the vCloud Organization (user group).</td>
</tr>
<tr>
<td>vDC Storage Profiles</td>
<td>by user group</td>
<td>The vCloud user can manage Storage profiles associated with virtualDataCenters in the vCloud Organization (user group).</td>
</tr>
<tr>
<td>vCloud Credentials</td>
<td>by user group</td>
<td>The vCloud users can manage vCloud credentials only of those users, who are assigned to their vCloud organization (user group).</td>
</tr>
</tbody>
</table>

2.7 VMware Cloud Director Permissions

The list below includes the permissions related to VMware Cloud Director resources.

- Users with the Administrator role in OnApp have VMware Cloud Director related permissions enabled by default. They can create and manage VMware Cloud Director resources if there is a VMware Cloud Director compute resource in the cloud.
- The VMware Cloud Director permissions list is not updated in OnApp for custom roles imported from VCD.

2.7.1 The list of permissions:

- Catalogs
- Buckets
- Dashboard
- NSX-V Edge Gateways
OnApp administrators can control users’ ability to manage VMware Cloud Director catalogs through the Control Panel's Roles menu. You can set the following catalogs permissions for user roles:

- Any action on Catalogs - the user can take any action on catalogs
- Create a new Catalog - the user can create new catalogs
- Delete any Catalog - the user can delete any catalog
• **Delete own Catalogs** - the user can only delete own catalogs
• **Read any Catalog** - the user can see the the list of all catalogs
• **Read own Catalogs** - the user can only see own catalogs
• **Read public Catalogs** - the user can view shared catalogs form other user groups
• **Update any Catalog** - the user can edit any catalog

For details, refer to the *Catalogs* section.

2.7.1.2 Buckets

OnApp administrators can control users’ ability to manage the buckets. This is handled through the Control Panel's Roles menu. You can set the following bucket permissions for user roles:

• **Any action on buckets** - the user can take any action on any bucket
• **Create a new bucket** - the user can create a new bucket
• **Delete any bucket** - the user can delete any bucket
• **See list of all buckets** - the user can see list of all buckets
• **See details of any bucket** - the user can see details of any bucket
• **See own bucket** - the user can only see own bucket
• **Update any bucket** - the user can edit any bucket

For details, refer to the [VMware Cloud Director Buckets](#) section.

2.7.1.3 Dashboard

OnApp administrators can control users’ access to the dashboard through the Control Panel's Roles menu. You can set the following VMware Cloud Director dashboard permissions for user roles:

• **Show vCloud dashboard** - the user can see VMware Cloud Director details on the dashboard

2.7.1.4 NSX-V Edge Gateways

OnApp administrators can control users’ ability to manage NSX-V edge gateways through the Control Panel's Roles menu. You can set the following edge gateway permissions for user roles:

• **Any action on NSX-V Edge Gateways** - the user can take any action on NSX-V edge gateways
• **Manage Advanced NSX-V Edge Gateway Services** - the user can manage advanced NSX-V edge gateway services
• **Create new NSX-V Edge Gateways** - the user can create new NSX-V edge gateways
• **Delete any NSX-V Edge Gateways** - the user can delete any NSX-V edge gateways
• **Delete own NSX-V Edge Gateways** - the user can delete only own NSX-V edge gateways
• **Manage Services in vCD UI** - the user has access to the edge gateways services in VCD UI
• **Read any NSX-V Edge Gateways** - the user can see the list of all NSX-V edge gateways under the NSX-V tab at Control Panel > Edge Gateways
• **Read own NSX-V Edge Gateways** - the user can only see their own NSX-V edge gateways under the NSX-V tab at Control Panel > Edge Gateways
• **Update any NSX-V Edge Gateways** - the user can update any NSX-V edge gateways
• **Update own NSX-V Edge Gateways** - the user can update only their own NSX-V edge gateways

For details, refer to the [NSX-V Edge Gateways](#) section.
2.7.1.5 NSX-T Edge Gateways
OnApp administrators can control users’ ability to manage their own NSX-T edge gateways through the Control Panel's Roles menu. You can set the following edge gateway permissions for user roles:

- **Any action on NSX-T Edge Gateways** - the user can take any action on NSX-T edge gateways
- **Create NSX-T Edge Gateways** - the user can create NSX-T edge gateway
- **Delete NSX-T Edge Gateways** - the user can delete NSX-T edge gateway
- **See NSX-T Edge Gateways** - the user has access to the NSX-T tab at Control Panel > Edge Gateways
- **Update NSX-T Edge Gateways** - the user can update NSX-T edge gateways

For details, refer to the [Create and Manage NSX-T Edge Gateways](#) section.

2.7.1.6 Nat Rules
OnApp administrators can control users’ ability to manage VMware Cloud Director nat rules. This is handled through the Control Panel's Roles menu. You can set the following VMware Cloud Director nat rules permissions for user roles:

- **Any action on nat rules** - the user can take any action on nat rules
- **Create nat rules** - the user can create a nat rule in any edge gateway
- **Delete any nat rule** - the user can delete any nat rule
- **Delete own nat rules** - the user can delete only own nat rules
- **See any nat rule** - the user can see all nat rules
- **See own nat rules** - the user can see only own nat rules
- **Edit any nat rule** - the user can edit all nat rules
- **Edit own nat rules** - the user can edit only own nat rules

For details, refer to the [Nat Rules](#) section.

2.7.1.7 NSX-V Firewall Rules
OnApp administrators can control users' ability to manage NSX-V firewall rules through the Control Panel's Roles menu. You can set the following firewall rules permissions for user roles:

- **Any action on firewall rule** - the user can take any action on NSX-V firewall rules
- **Create any firewall rule** - the user can create a new NSX-V firewall rule
- **Delete any firewall rule** - the user can delete any NSX-V firewall rule
- **See any firewall rules** - the user can see any NSX-V firewall rules
- **Update any firewall rule** - the user can edit any NSX-V firewall rule

2.7.1.8 NSX-V Firewall Services
OnApp administrators can control users' ability to manage NSX-V firewall services through the Control Panel's Roles menu. You can set the following firewall services permissions for user roles:

- **Any action on firewall service** - the user can take any action on NSX-V firewall services
- **See any firewall service** - the user can see any NSX-V firewall service
- **Update any firewall service** - the user can edit any NSX-V firewall service
2.7.1.9 NSX-T Firewall Rules
OnApp administrators can control users’ ability to manage firewall rules assigned to NSX-T edge gateway through the Control Panel's Roles menu. You can set the following firewall rules permissions for user roles:

- See any NSX-T Firewall - the user can see any NSX-T firewall rule
- Manage Firewalls - the user can create/edit/delete NSX-T firewall rules

2.7.1.10 NSX-V IPSec Services
OnApp administrators can control users’ ability to manage NSX-V IPSec services through the Control Panel's Roles menu. You can set the following IPSec services permissions for user roles:

- Any action on IPSec service - the user can take any action on NSX-V IPSec services
- See any IPSec service - the user can see any NSX-V IPSec service
- Update any IPSec service - the user can edit any NSX-V IPSec service

2.7.1.11 NSX-V IPSec Sites
OnApp administrators can control users’ ability to manage NSX-V IPSec sites through the Control Panel's Roles menu. You can set the following IPSec sites permissions for user roles:

- Any action on IPSec site - the user can take any action on NSX-V IPSec sites
- Create IPSec sites - the user can create an NSX-V IPSec site
- Delete any IPSec site - the user can delete any NSX-V L2 VPN IPSec site
- See any IPSec site - the user can see any NSX-V IPSec sites
- Update any IPSec site - the user can edit any NSX-V IPSec site

2.7.1.12 NSX-V L2 VPN Peer Sites
OnApp administrators can control users’ ability to manage NSX-V L2 VPN peer sites through the Control Panel's Roles menu. You can set the following L2 VPN peer sites permissions for user roles:

- Any action on L2 VPN peer site - the user can take any action on NSX-V L2 VPN peer sites
- Create L2 VPN peer sites - the user can create an NSX-V L2 VPN peer site
- Delete any L2 VPN peer site - the user can delete any NSX-V L2 VPN peer site
- See any L2 VPN peer site - the user can see any NSX-V L2 VPN sites
- Update any L2 VPN peer site - the user can edit any NSX-V L2 VPN sites

2.7.1.13 NSX-V L2 VPN Services
OnApp administrators can control users’ ability to manage NSX-V L2 VPN services through the Control Panel's Roles menu. You can set the following L2 VPN services permissions for user roles:

- Any action on L2 VPN service - the user can take any action on NSC L2 VPN services
- See any L2 VPN service - the user can see any NSX-V L2 VPN service
- Update any L2 VPN service - the user can edit any NSX-V load balancer L2 VPN services

2.7.1.14 NSX-V Load Balancer Application Profiles
OnApp administrators can control users’ ability to manage NSX-V load balancer application profiles through the Control Panel's Roles menu. You can set the following load balancer application profiles permissions for user roles:

- Any action on application profile - the user can take any action on NSX-V load balancer application profiles
• Create any application profile - the user can create a new NSX-V load balancer application profile
• Delete any application profile - the user can delete any NSX-V load balancer application profile
• See any application profile - the user can see any NSX-V load balancer application profile
• Update any application profile - the user can edit any NSX-V load balancer application profile

2.7.1.15 NSX-V Load Balancer Application Rules
OnApp administrators can control users' ability to manage NSX-V load balancer application rules through the Control Panel's Roles menu. You can set the following load balancer application rules permissions for user roles:
• Any action on application rules - the user can take any action on NSX load balancer application rules
• Create any application rule - the user can create a new NSX-V load balancer application rule
• Delete any application rule - the user can delete any NSX-V load balancer application rule
• See any application rule - the user can see any NSX-V load balancer application rules
• Update any application rule - the user can edit any NSX-V load balancer application rules

2.7.1.16 NSX-V Load Balancer Monitors
OnApp administrators can control users' ability to manage NSX-V load balancer monitors through the Control Panel's Roles menu. You can set the following load balancer monitors permissions for user roles:
• Any action on monitors - the user can take any action on NSX-V load balancer monitors
• Create any monitor - the user can create a new NSX-V load balancer monitor
• Delete any monitor - the user can delete any NSX-V load balancer monitor
• See any monitor - the user can see any NSX-V load balancer monitors
• Update any monitor - the user can edit any NSX-V load balancer monitors

2.7.1.17 NSX-V Load Balancer Pools
OnApp administrators can control users' ability to manage NSX-V load balancer pools through the Control Panel's Roles menu. You can set the following load balancer pools permissions for user roles:
• Any action on pool - the user can take any action on NSX-V load balancer pools
• Create any pool - the user can create a new NSX-V load balancer pool
• Delete any pool - the user can delete any NSX-V load balancer pool
• See any pool - the user can see any NSX-V load balancer pools
• Update any pool - the user can edit any NSX-V load balancer pools

2.7.1.18 NSX-V Load Balancer Services
OnApp administrators can control users' ability to manage NSX-V load balancer services through the Control Panel's Roles menu. You can set the following load balancer services permissions for user roles:
• Any action on load balancer service - the user can take any action on NSX-V load balancer services
• See any load balancer service - the user can see any NSX-V load balancer service
• Update any load balancer service - the user can edit any NSX-V load balancer service
2.7.1.19 NSX-V Load Balancer Virtual Servers

OnApp administrators can control users’ ability to manage NSX-V Edge internal or uplink interfaces as virtual servers through the Control Panel's Roles menu. You can set the following permissions for user roles:

- Any action on virtual server - the user can take any action on NSX-V load balancer virtual servers
- Create any virtual server - the user can create a new NSX-V load balancer virtual server
- Delete any virtual server - the user can delete any NSX-V load balancer virtual servers
- See any virtual server - the user can see any NSX-V load balancer virtual servers
- Update any virtual server - the user can edit any NSX-V load balancer virtual servers

2.7.1.20 NSX-V Managers

OnApp administrators can control users' ability to manage NSX-V managers through the Control Panel's Roles menu. You can set the following NSX-V managers permissions for user roles:

- Any action on NSX manager - the user can take any action on NSX-V manager
- See any NSX manager - the user can see any NSX-V manager
- Update any NSX manager - the user can edit any NSX-V manager

2.7.1.21 NSX-V NAT Rules

OnApp administrators can control users’ ability to manage NSX-V NAT rules through the Control Panel's Roles menu. You can set the following NAT rules permissions for user roles:

- Any action on nat rule - the user can take any action on NSX-V NAT rules
- Create any nat rule - the user can create a new NSX-V NAT rule
- Delete any nat rule - the user can delete any NSX-V NAT rule
- See any nat rule - the user can see any NSX-V NAT rules
- Update any nat rule - the user can edit any NSX-V NAT rules

2.7.1.22 NSX-V NAT Services

OnApp administrators can control users’ ability to manage NSX-V NAT services through the Control Panel's Roles menu. You can set the following NAT services permissions for user roles:

- Any action on nat service - the user can take any action on NSX-V NAT services
- See any nat service - the user can see any NSX-V NAT services
- Update any nat service - the user can edit any NSX-V NAT services

2.7.1.23 Orchestration Models

OnApp administrators can control users’ ability to manage orchestration models through the Control Panel's Roles menu. You can set the following orchestration models permissions for user roles:

- Create new Orchestration Model - the user can create a new orchestration model
- Delete any Orchestration Model - the user can delete any orchestration model
- Deploy any Orchestration Model - the user can deploy any orchestration model
- Read any Media - the user can see any orchestration model

For details, refer to the Orchestration Models section.

2.7.1.24 Org Networks

OnApp administrators control how users can manage org networks. This is handled through the Control Panel's Roles menu. You can set the following org network permissions for user roles:
• **Any action on org networks** - the user can take any action on org networks
• **Create a new org network** - the user can create a new org network of any type
• **Create a new bridged org network** - the user can create a new direct org network
• **Create a new isolated org network** - the user can create a new isolated org network
• **Create a new routed org network** - the user can create a new routed org network
• **Destroy any org network** - the user can delete any org network
• **See all org networks** - the user can see all org networks
• **Update any org network** - the user can edit any org network

For details, refer to the [Organization Networks](#) section.

2.7.1.25 Payments
OnApp administrators control how users can manage company payments. This is handled through the Control Panel's Roles menu. You can set the following company payments permissions for user roles:

• **See own company/group payments** - the user can only see their own company payments

For details, refer to the [Payments](#) section.

**Provider Resource Pools**

OnApp administrators control whether users can view VMware Cloud Director provider resource pools. This is handled through the Control Panel's Roles menu. You can set the following provider resource pool permissions for user roles:

• **Any action on Provider Resource Pools** - the user can take any action on provider resource pools
• **Read any Provider Resource Pool** - the user can view any provider resource pool

For details, refer to the [Provider Resource Pools](#) section.

2.7.1.26 Resource Pool
OnApp administrators control how users can manage VMware Cloud Director resource pools. This is handled through the Control Panel's Roles menu. You can set the following resource pool permissions for user roles:

• **Any action on Resource Pools** - the user can take any action on resource pools
• **Create a new Resource Pool** - the user can create a new Resource Pool
• **Delete any Resource Pools** - the user can delete any resource pool
• **Read any Resource Pool** - the user can see the list of all resource pools
• **Update any Resource Pool** - the user can edit any Resource Pool

For details, refer to the [Resource Pool](#) section.

2.7.1.27 Resource Pool Statistics
OnApp administrators control how users can manage VMware Cloud Director resource pool statistics. This is handled through the Control Panel's Roles menu. You can set the following resource pool statistics permissions for user roles:

• **Any action on resource pool statistics** - the user can take any action on any resource pool statistics
• **See all resource pools statistics** - the user can see statistics for all resource pools
• **See own resource pools statistics** - the user can see statistics for own resource pools only

For details, refer to the [Resource Pool Statistics](#) section.
2.7.1.28 Tunnels
OnApp administrators control how users can manage VPN tunnels. This is handled through the Control Panel's Roles menu. You can set the following tunnels permissions for user roles:

- **Any action on tunnels** - the user can take any action on tunnels
- **Create tunnels for anyone** - the user can create tunnels for anyone
- **Create own tunnels** - the user can only create own tunnels
- **Destroy any tunnels** - the user can delete any tunnels
- **Destroy own tunnels** - the user can only delete own tunnels
- **Read all tunnels** - the user can see all tunnels
- **Read own tunnels** - the user can only see own tunnels
- **Update all tunnels** - the user can edit all tunnels
- **Update own tunnels** - the user can only edit own tunnels

2.7.1.29 vApps
OnApp administrators control users' ability to manage vApps. This is handled through the Control Panel's Roles menu. You can set the following vApps permissions for user roles:

- **Any action on vApps** – the user can take any action on vApps
- **Assign recipes to VS** – the user can assign provisioning recipes to Virtual Server on vApp deployment
- **Change vApp owner** - the user can change the owner of a vApp
- **Compose vApp** - the user can compose a vApp from vApp Templates
- **Convert vApp** – the user can convert vApp into vApp Template
- **Create a new vApp** – the user can create a new vApp
- **Customize VS guest OS** - the user can customize Virtual Server guest OS on vApp deployment
- **Delete any vApp** – the user can destroy any vApp
- **Delete own vApps** – the user can only destroy their own vApps
- **Any power action on vApps** – the user can take any power actions on vApps
- **Any power action on own vApps** – the user can only take power actions on their own vApps
- **Read any vApps** – the user can view any vApps
- **Read own vApps** – the user can only view their own vApps
- **Edit any vApp** – the user can edit any vApp
- **Edit own vApps** – the user can only edit their own vApps

For details, refer to the vApps section.

2.7.1.30 vApp Networks
OnApp administrators control how users can manage vApp networks. This is handled through the Control Panel's Roles menu. You can set the following vApp network permissions for user roles:

- **Any action on vApp networks** - the user can take any action on vApp networks
- **Create a new vApp network** - the user can create a new vApp network
- **Destroy any vApp network** - the user can delete any vApp network
- **See all vApp networks** - the user can see all vApp networks
- Update any vApp network - the user can edit any vApp network

For details, refer to the vApps Networks section.

2.7.1.31 vApp Templates
OnApp administrators can control users' ability to manage vApp templates. This is handled through the Control Panel's Roles menu. You can set the following vApp template permissions for user roles:

- Any action on vApp templates – the user can take any action on vApp templates
- Create any vApp templates – the user can create any vApp template
- Delete any vApp templates – the user can destroy any vApp template
- See any vApp templates - the user can see any vApp templates
- See own vApp templates - the user see only own vApp templates
- See vApp templates from shared catalogs - the user can see vApp templates from shared catalogs
- Manage System Service Add-on - the user can manage system service add-ons of the vApp templates

For details, refer to the vApps Templates section.

2.7.1.32 vCloud Permissions
OnApp administrators can control users' ability to manage vCloud permissions. This is handled through the Control Panel's Roles menu. You can set the following VMware Cloud Director permissions for user roles:

- Administrator Control - the user can manage general administrative stuff (for example, edit all fields in own user profile). Without this permission the user has no ability to edit own first name, last name and email fields in user profile.

For details, refer to the vCloud Permissions section.

2.7.1.33 Virtual Servers
OnApp administrators can control users' ability to manage vCloud virtual servers. This is handled through the Control Panel's Roles menu. You can set the following vCloud virtual servers permissions for user roles:

- Install VMWare tools - the user can install VMWare tools (applicable for VMware Cloud Director VSs)
- Access To VCD UI - the user can access VMware Cloud Director UI
- Allow insert/eject media for all virtual server - the user can insert/eject media for all virtual servers
- Allow insert/eject media for own virtual server - the user can insert/eject media for their own virtual servers

For details, refer to the vCloud Virtual Servers section.

2.7.1.34 Virtual Server Snapshots
OnApp administrators can control user's access to VMware virtual server snapshots. You can set the following snapshot permissions:

- Any action on Virtual Server Snapshots - the user can take any action on snapshots
- Create or Restore own Virtual Server Snapshot - the user can create/restore own snapshots
- Destroy own Virtual Server Snapshot - the user can delete own snapshots
- See own Virtual Server Snapshots - the user can see the list of own snapshots
For details, refer to VMware Cloud Director VS Snapshots section.

2.8 VMware Cloud Director Resources

In this chapter, you can find information on how to manage the following resources for VMware Cloud Director:

- Compute Resources
- Orchestration Models
- Resource Pools
- Provider Resource Pools
- Storage Policies

2.8.1 Compute Resources

The VMware Cloud Director Instance is imported into OnApp as a compute resource (vcloud type). First you need to create a VMware Cloud Director compute zone and than a vCloud compute resource which should be attached it to the zone. After you add a VMware Cloud Director compute resource, your VCD resources are imported into OnApp.

- After you create a VMware Cloud Director compute zone you need to attach compute resources, networks and backup servers to it. Keep in mind that you can attach only those resources related to the VMware Cloud Director compute zone.
- You cannot remove a VMware Cloud Director compute resource from a compute zone.

On this page:

- Create VMware Director Compute Zones
- Create VMware Cloud Director Compute Resources
- VMware Cloud Director Compute Resource Characteristics

See also:

- Compute Resource Settings
- Create and Manage Compute Resources

2.8.1.1 Create VMware Director Compute Zones

To create a new VMware Cloud Director compute zone, follow the next steps:

1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Press "+" or click the Create Compute Zone button.
3. On the screen that follows the parameters, you need to fill in the next properties:
2.8.1.2 Create VMware Cloud Director Compute Resources

When importing VCD resources you can choose whether you wish your users to be associated with one or several VMware Cloud Director instances. If you wish your users to have access to multiple VMware Cloud Director instances, you can set up several organizations in OnApp to be associated with a single user group and have access to resources across multiple VCD instances.

- **single vCloud Director mode** - all resources are imported from the VCD instance. Each organization is imported as a separate user group which can be associated with one VCD instance.

- **multiple vCloud director mode** - only system level entities are imported (provider VDCs, external networks, etc.). Organizations are imported but are empty, i.e. do not contain resources and users. After the initial import you can select which organization you wish to import and associate with a certain user group. Users imported in this mode can be configured to have access to multiple VCD instances.

To create a VCD compute resource:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Press the + button or click the Add New Compute Resource button underneath the list of compute resources on the screen.
4. On the screen that appears:
   - **Label** - enter a compute resource label.
   - **Compute resource type** - choose a Compute resource type, in this case vcloud.
   - **Compute zone** - select the compute zone of VPC type
   - **Operation mode** - select whether you wish to import the zone in the single or multiple VMware Cloud Director mode. If you select the multiple VMware Cloud Director, you need to later import the resources of an organization and its users.

You can later switch from single VMware Cloud Director mode to the multiple VMware Cloud Director mode if required. In this case, the new organizations will no longer be synchronized from VCD to OnApp. It will be required to import each new organization.
You cannot switch from multiple to single VMware Cloud Director mode.

- **API URL** - set the VMware Cloud Director API URL - e.g. [https://example.com](https://example.com)
- **Login** - specify the VMware Cloud Director system admin login
- **Password** - specify the VMware Cloud Director system admin password
- **AMQP Exchange Name** - specify your VMware Cloud Director AMQP exchange name (this can be taken in your VMware Cloud Director instance Extensibility > Settings > Exchange)

5. Click the **Save** button. The Compute resource will be added to the system. You can view it under the **Compute resources** menu. Click the **Back** button to return to the **Compute resource Settings** page.

If you have selected the multiple VMware Cloud Director mode for the compute resource, you need to **import organizations**.

### 2.8.1.3 VMware Cloud Director Compute Resource Characteristics

<table>
<thead>
<tr>
<th>Feature / Virtualization Software</th>
<th>VMware Cloud Director</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provisioning</strong></td>
<td></td>
</tr>
<tr>
<td>Self Service via UI</td>
<td>Y</td>
</tr>
<tr>
<td>CloudBoot</td>
<td>N</td>
</tr>
<tr>
<td>Recipes</td>
<td>N</td>
</tr>
<tr>
<td>Host CDN Edge</td>
<td>N</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td></td>
</tr>
<tr>
<td>OnApp Integrated Storage</td>
<td>N</td>
</tr>
<tr>
<td>Local Storage</td>
<td>Y</td>
</tr>
<tr>
<td>SAN</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td></td>
</tr>
<tr>
<td>Automatic Failover</td>
<td>Y</td>
</tr>
<tr>
<td>Integrated Backup</td>
<td>N</td>
</tr>
<tr>
<td>Incremental Backup</td>
<td>N</td>
</tr>
<tr>
<td>Snapshot Capability</td>
<td>see VMware Cloud Director VS Snapshots</td>
</tr>
<tr>
<td><strong>Networking</strong></td>
<td></td>
</tr>
<tr>
<td>Load balancing clusters</td>
<td>N</td>
</tr>
<tr>
<td>Firewall rules</td>
<td>Y</td>
</tr>
<tr>
<td>Manage Network Interfaces</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Virtual server management</strong></td>
<td></td>
</tr>
<tr>
<td>Autoscaling</td>
<td>N</td>
</tr>
<tr>
<td>Hot RAM resize without reboot**</td>
<td>N</td>
</tr>
<tr>
<td>Feature</td>
<td>Supported</td>
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<tr>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>Hot CPU cores resize without reboot</td>
<td>N</td>
</tr>
<tr>
<td>Hot migration**</td>
<td>N</td>
</tr>
<tr>
<td>Cold migration</td>
<td>N</td>
</tr>
<tr>
<td>Disk hotattachment / detachment</td>
<td>N</td>
</tr>
<tr>
<td>Disk resize (increase/decrease)</td>
<td>Y - cold</td>
</tr>
<tr>
<td>IPv6 support ***</td>
<td>N</td>
</tr>
<tr>
<td>Reboot in recovery</td>
<td>N</td>
</tr>
<tr>
<td>Segregate</td>
<td>N</td>
</tr>
<tr>
<td>VIP status</td>
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</tr>
<tr>
<td>Change owner</td>
<td>N</td>
</tr>
<tr>
<td>CPU Topology</td>
<td>N</td>
</tr>
<tr>
<td>Power on/off/reboot vApp</td>
<td>Y</td>
</tr>
<tr>
<td>Power on/off/reboot VS</td>
<td>Y</td>
</tr>
<tr>
<td>Build vApp from template</td>
<td>Y</td>
</tr>
<tr>
<td>Build VS from template</td>
<td>N</td>
</tr>
<tr>
<td>Integrated VS into vApp</td>
<td>Y</td>
</tr>
<tr>
<td>Delete vApp</td>
<td>Y</td>
</tr>
<tr>
<td>Delete VS</td>
<td>N</td>
</tr>
<tr>
<td>Reset root password</td>
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</tr>
<tr>
<td>Set SSH Keys</td>
<td>N</td>
</tr>
<tr>
<td>Edit VS Resources</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Statistics</strong></td>
<td></td>
</tr>
<tr>
<td>CPU Stats</td>
<td>Y</td>
</tr>
<tr>
<td>Disk IOPS Stats</td>
<td>Y</td>
</tr>
<tr>
<td>Network Interface Stats</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Console</strong></td>
<td></td>
</tr>
<tr>
<td>HTML 5 Console</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Smart Servers</strong></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Edge servers</td>
<td>N</td>
</tr>
<tr>
<td>Baremetal servers</td>
<td>N</td>
</tr>
<tr>
<td>Application servers</td>
<td>N</td>
</tr>
<tr>
<td>Container servers</td>
<td>N</td>
</tr>
<tr>
<td>Load Balancers</td>
<td>N</td>
</tr>
<tr>
<td>Ballooning release resource type for Compute zones</td>
<td>N</td>
</tr>
<tr>
<td>CPU Units</td>
<td>N</td>
</tr>
</tbody>
</table>
2.8.2 Orchestration Models

VMware Cloud Director orchestration models let you provide your customers with a ready environment which they can use to deploy virtual servers. The administrator creates and deploys orchestration models. In their turn, customers receive a VMware Cloud Director environment with configured resource pool(s), network(s) and data store(s). This page describes how you can add orchestration models using OnApp.

Using OnApp you can view, create, edit, deploy, clone, and delete orchestration models. When you deploy an orchestration model you create a new VDC on the VMware Cloud Director side. CPU, memory, network, and data store resources associated with the new VDC are configured according to the parameters you set during the orchestration model creation and deployment.

Ensure that Orchestration Models permissions are on before managing orchestration models. For more information about permissions, refer to the VMware Cloud Director Permissions section of this guide.

On this page:

- View Orchestration Models
- Create Orchestration Model
- Edit Orchestration Model
- Clone Orchestration Model
- Deploy Orchestration Model
- Delete Orchestration Model

See also:

- Manage VMware Cloud Director VSS
- Create and Manage vApps
- Storage Policies

2.8.2.1 View Orchestration Models

To view orchestration models, go to the Control Panel > Cloud > Orchestration Models in the VMware Cloud Director section. The page that loads shows the list of orchestration models with their labels and the particular VMware Cloud Director to which each template is associated.

Click the VMware Cloud Director label next to the template you are interested in to view the details of the VMware Cloud Director compute resource associated with it.

Click the label of a orchestration model to view its details:

Properties

- Label - the name of the orchestration model
- Compute Resource - the compute resource associated with the orchestration model
• **Provider Resource Pool** - select from the drop-down list the provider VDC that will be used when an organization VDC will be deployed from the orchestration model.

**Compute Options**

• **VDC Model Type** - the resource pool type: Allocation Pool, Reservation Pool or Pay-As-You-Go

There are three types of resource pools:

- **Allocation Pool** - a percentage of the resources you allocate from the provider virtual datacenter are committed to the organization virtual datacenter. You can specify the percentage for both CPU and memory.
- **Pay-As-You-Go** - resources are committed only when users create vApps in the organization virtual datacenter.
- **Reservation Pool** - all of the resources you allocate are immediately committed to the organization virtual datacenter.

• The array of resources with the minimum, maximum, and default values the end client can order and information on whether the end client can change and see the values. The parameters apply to a certain VDC model type selected previously. For details see the [Orchestration Models API](#).

**Network Options**

• **Default Network** - the network pool for the selected compute resource

• **Deploy edge gateway** - whether an edge gateway will be deployed or not.

• **Edge gateway name** - the label for the new edge gateway. The default name is MyEdgeGateway. This field appears only when the **Deploy edge gateway** option is enabled.

• **Create networks** - the networks that will be created during orchestration model deployment with their details:
  - **Network Name** - the label for the network
  - **Type** - the type of the network: direct, routed or isolated.
  - **Network Address** - the network address in "x.x.x.x/x" format.
  - **DNS** - DNS for the network.

**Storage**

• **Enable thin provisioning** - whether thin provisioning is enabled

• **Enable fast provisioning** - whether fast provisioning is enabled

• **Data store option choices** - the settings for data stores:
  - **Label** - the name of the data store zone(s) in which data stores will be created during orchestration model deployment.
  - **Minimum** - the minimum data store size (GB) that can be requested during orchestration model deployment
  - **Maximum** - the maximum data store size (GB) that can be requested during orchestration model deployment
2.8.2.2 Create Orchestration Model

To create an orchestration model, go to Control Panel > Cloud > Orchestration Models in the VMware Cloud Director section and click New Orchestration Model. On the page that loads fill in the form:

Properties
- **Label** - the name of the orchestration model
- **Compute Resource** - select the compute resource associated with the orchestration model from the drop-down list
- **Provider Resource Pool** - select from the drop-down list the provider VDC that will be used when an organization VDC will be deployed from the orchestration model.

Compute Options
- **VDC model type** - select the resource pool type: Allocation Pool, Reservation Pool or Pay-As-You-Go.

There are three types of resource pools:
- **Allocation Pool** - a percentage of the resources you allocate from the provider virtual datacenter are committed to the organization virtual datacenter. You can specify the percentage for both CPU and memory.
- **Pay-As-You-Go** - resources are committed only when users create vApps in the organization virtual datacenter.
- **Reservation Pool** - all of the resources you allocate are immediately committed to the organization virtual datacenter.

- **VDC Properties** - for the array of resources specify the minimum, maximum and default values the end client can order and whether the end client can change and see the values. The parameters shown depend on the VDC model type selected previously:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Allocation Pool</th>
<th>Reservation Pool</th>
<th>Pay-As-You-Go</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Allocation (GHz)</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>CPU Resource Guaranteed (%)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>CPU Quota (GHz)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>vCPU Speed (MHz)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Resource</td>
<td>Allocation Pool</td>
<td>Reservation Pool</td>
<td>Pay-As-You-Go</td>
</tr>
<tr>
<td>--------------------------</td>
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</tr>
<tr>
<td>Memory Allocation (GB)</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Memory resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>guaranteed (%)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Memory Quota (GB)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Number of VMs</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Network Quota</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Network Options**

- **Default network pool** - choose a network pool for the selected compute resource from the drop-down list
- **Deploy edge gateway** - move the slider to deploy an edge gateway. If an edge gateway is not deployed, you will not be able to configure routed networks within the orchestration model.
- **Edge gateway name** - fill in the label for the new edge gateway. The default name is MyEdgeGateway. This field appears only when the **Deploy edge gateway** option is enabled.
- **Create networks** - move the slider to create networks when the template is deployed. If you select to create networks, click the + button to add a new network(s). For each of the networks double-click the fields to provide the following details, some fields apply only to certain network types:
  - **Default Name** - the label for the network
  - **Type** - the type of the network: routed, isolated or direct networks. You can add routed networks only when the **Deploy edge gateway** option is enabled in the orchestration model.
  - **Network Address** - fill in the network address in "x.x.x.x/x" format.
  - **DNS** - DNS for the network.

**Data Store Options**

- **Enable thin provisioning** - move the slider to enable thin provisioning
- **Enable fast provisioning** - move the slider to enable fast provisioning

- **Data stores to create** - fill in the settings for data stores. Click the + button to add a data store zone from the drop-down list. The list will contain data store zones associated with the compute resource you have selected. For each of the data store zones provide the following details (double-click the values to change):
  - **Minimum** - the minimum data store size (GB) that can be requested during orchestration model deployment
  - **Maximum** - the maximum data store size (GB) that can be requested during orchestration model deployment
  - **Default** - the default data store size (GB) that will be set during orchestration model deployment. If the data store options are not set as customizable and/or visible, the default data store size will be applied during orchestration model deployment.
  - **Customizable** - move the slider to select whether the data store size can be altered during orchestration model deployment
Visible - whether the data store zone will be listed during orchestration model deployment. If the data store zone is not visible, a data store will still be created in it.

Use - move the slider to select whether a data store will be created in this data store zone during orchestration model deployment.

If the orchestration model properties do not suit the resources' min/max criteria in VMware Cloud Director Buckets, then you will not be able to create this orchestration model.

2.8.2.3 Edit Orchestration Model

To edit an orchestration model:

1. Go to Control Panel > Cloud > Orchestration Models in the VMware Cloud Director section.
2. Click the Actions button next to an orchestration model that you want to edit.
3. Click the Edit button and modify the following properties:

Properties

- Label - the name of the orchestration model
- Compute Resource - select the compute resource associated with the orchestration model from the drop-down list
- Provider Resource Pool - select from the drop-down list the provider VDC that will be used when an organization VDC will be deployed from the orchestration model.

Compute Options

- VDC Model Type - select the resource pool type: Allocation Pool, Reservation Pool or Pay-As-You-Go.

There are three types of resource pools:

- Allocation Pool - a percentage of the resources you allocate from the provider virtual datacenter are committed to the organization virtual datacenter. You can specify the percentage for both CPU and memory.
- Pay-As-You-Go - resources are committed only when users create vApps in the organization virtual datacenter.
- Reservation Pool - all of the resources you allocate are immediately committed to the organization virtual datacenter.

- VDC Properties - for the array of resources specify the minimum, maximum and default values the end client can order and whether the end client can change and
see the values. The parameters shown depend on the VDC model type selected previously:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Allocation Pool</th>
<th>Reservation Pool</th>
<th>Pay-As-You-Go</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Allocation (GHz)</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>CPU Resource Guaranteed (%)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>CPU Quota (GHz)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>vCPU Speed (MHz)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Memory Allocation (GB)</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Memory resources guaranteed (%)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Memory Quota (GB)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Number of VMs</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Network Quota</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Network Options**

- Default network pool - choose a network pool for the selected compute resource from the drop-down list
- Deploy edge gateway - move the slider to deploy an edge gateway. If an edge gateway is not deployed, you will not be able to configure routed networks within the orchestration model.
- Edge gateway name - fill in the label for the new edge gateway. The default name is MyEdgeGateway. This field appears only when the Deploy edge gateway option is enabled.
- Create networks - move the slider to create networks when the template is deployed. If you select to create networks, click the + button to add a new network(s). For each of the networks double-click the fields to provide the following details, some fields apply only to certain network types:
  - Default Name - the label for the network
  - Type - the type of the network: routed, isolated or direct networks. You can add routed networks only when the Deploy edge gateway option is enabled in the orchestration model.
  - Network Address - fill in the network address in "x.x.x.x/x" format.
  - DNS - DNS for the network.

**Data Store Options**

- Enable thin provisioning - move the slider to enable thin provisioning
- Enable fast provisioning - move the slider to enable fast provisioning
- Data stores to create - fill in the settings for data stores. Click the + button to add a data store zone from the drop-down list. The list will contain data store zones
associated with the compute resource you have selected. For each of the data store zones provide the following details (double-click the values to change):

- **Minimum** - the minimum data store size (GB) that can be requested during orchestration model deployment
- **Maximum** - the maximum data store size (GB) that can be requested during orchestration model deployment
- **Default** - the default data store size (GB) that will be set during orchestration model deployment. If the data store options are not set as customizable and/or visible, the default data store size will be applied during orchestration model deployment.
- **Customizable** - move the slider to select whether the data store size can be altered during orchestration model deployment
- **Visible** - whether the data store zone will be listed during orchestration model deployment. If the data store zone is not visible, a data store will still be created in it.
- **Use** - move the slider to select whether a data store will be created in this data store zone during orchestration model deployment

If the orchestration model properties do not suit the resources' min/max criteria in VMware Cloud Director Buckets, then you will not be able to edit this orchestration model.

4. Click the **Submit** button to apply the settings.

**2.8.2.4 Clone Orchestration Model**

To clone an orchestration model:

1. Go to Control Panel > Cloud > Orchestration Models in the VMware Cloud Director section.
2. Click the **Actions** button next to an orchestration model that you want to clone.
3. Click **Copy** and click **OK** to confirm the action.

**2.8.2.5 Deploy Orchestration Model**

To deploy an orchestration model:

1. Go to the Control Panel > Cloud > Orchestration Models in the VMware Cloud Director section.
2. Click the **Actions** button next the template you want to deploy and select **Deploy**.
3. On the page that loads, configure the resources assigned to the VMware Cloud Director created from this VDC template:

   **General**
   - **Organization** - select the organization with which the orchestration model will be associated
• **Resource Pool Label** - enter a label for a resource pool that will be created after the template is deployed

**CPU Resources**
• **CPU Allocation** - amount of CPU resources (GHZ) that will be allocated after the template is deployed
• **CPU Guaranteed** - amount of guaranteed CPU allocation (%)
• **vCPU Speed** - the vCPU speed that can be consumed after the template is deployed (MHz)

**Memory Resources**
• **Memory** - the amount of memory(MB) that will be allocated after the template is deployed
• **Memory Guaranteed** - amount of guaranteed memory allocation (%)
• **VS Number** - the number VSs that can be created after the template is deployed

**Storage**
• **Default Storage Policy** - select the default storage policy
• Set the disk size for the data stores that will be allocated after the template is deployed

**Network**
• 
  o **Edge gateway name** - the name of the edge gateway
  o **Edge gateway uplink networks** - select one or several external networks
  o **Default gateway** - select the default gateway
  o **Use default gateway for DNS relay** - move this slider to the right to use default gateway for DNS relay

The networks that will be assigned to the newly created VDC with their details:
•   
  o **Network Name** - the label for the network
  o **Type** - the type of the network: routed, isolated or direct
  o **Network Address** - the network address in "x.x.x.x/x" format
  o **DNS** - DNS for the network

Click **Next** to proceed.

**Confirmation**
Review the details of the VMware Cloud Director you are going to deploy.
If you are satisfied with the configurations, click the **Submit** button to deploy the orchestration model.
If you want to change any of the resources, click the **Previous** button and make the necessary changes.

2.8.2.6 **Delete Orchestration Model**

To delete an orchestration model:
1. Go to the **Control Panel > Cloud > Orchestration Models** in the VMware Cloud Director section.

2. Click the **Actions** button next the template that you want to remove and select **Delete**. You will be asked for confirmation before the template is removed.

### 2.8.3 Resource Pools

A VMware Cloud Director resource pool is an allocation model which determines how and when the provider virtual data center compute and memory resources are committed to the organization virtual data center.

There are three types of resource pools:

- **Allocation Pool** - a percentage of the resources you allocate from the provider virtual data center are committed to the organization virtual data center. You can specify the percentage for both CPU and memory.

- **Pay-As-You-Go** - resources are committed only when users create vApps in the organization virtual data center.

- **Reservation Pool** - all of the resources you allocate are immediately committed to the organization virtual data center.

You can view, create, edit and delete resource pools using OnApp Control Panel.

#### 2.8.3.1 View Resource Pool

To view VMware Cloud Director resource pools:

1. Go to your **Control Panel > Cloud > Resource Pools** menu to see an overview of all resource pools in the cloud.

2. The page that loads will show the list of resource pools with their details:

   - **Label** - the name of the resource pool
   - **Status** - whether the resource pool is enabled or not. When a resource pool is disabled, the memory and compute resources of the resource pool are no longer available.
   - **Type** - the type of the resource pool: Allocation Pool, Pay-As-You-Go or Reservation Pool.
   - **Organization** - the organization associated with the resource pool
   - **User Group** - the user group associated with the resource pool
   - **CPU (GHz)** - the used and total CPU reservations for the resource pool, in GHz
   - **Memory (GB)** - the used and total memory reservations for the resource pool, in GB
   - **Actions** - click the **Actions** button to edit or delete the resource pool

The search box at the top right corner of the page allows you to search a Resource Pool by its label.

**On this page:**

- **View Resource Pool**
- **Create Resource Pool**
- **Edit Resource Pool**
- **Delete VMware Cloud Director Resource Pool**
To view VMware Cloud Director resource pool details:

1. Go to your Control Panel > **Cloud > Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the label of a specific resource pool.
3. The page that loads will show the following details of the resource pool:
   - **Label** - the name of the resource pool
   - **User Group** - the user group associated with the resource pool
   - **Organization** - the organization associated with the resource pool
   - **Allocation Model** - the type of the resource pool
   - **VS Quota** - the quota of VSs
   - **Network Quota** - the quota of org networks that you can create in the resource pool
   - **Enabled** - whether this resource pool is enabled or not
   - **Fast Provisioning** - whether the fast provisioning is enabled for this resource pool or not
   - **Thin Provisioning** - whether the thin provisioning is enabled for this resource pool or not
   - **CPU** - the amount of Allocated CPU, Reserved CPU, Used CPU and percentage of guaranteed CPU
   - **vCPU Speed** - the speed of vCPU (in MHz)
   - **Memory** - the amount of Allocated Memory, Reserved Memory, Used Memory and percentage of guaranteed Memory
   - **Data Stores** - the list of data stores within the resource pool. The following parameters are displayed for each of the data stores: label, disk usage, disk capacity, whether the data store is enabled or not. Click the **Actions** button to edit/delete a data store.

Information on the *Used* resource pool resources (CPU and Memory) is updated every 3 minutes by default.
Also, you can customize resource pool statistics period using the following configuration in `on_app.yml` file:

```yaml
vcloud_stats_level2_period: <period in second>
```

It is recommended to set the value between 1 and 5 minutes for effective stats gathering.

### 2.8.3.1.1 Manage Firewalls

Make sure **Manage Firewalls** permission is on before managing firewalls. For more information about permissions, refer to the [VMware Cloud Director Permissions](#) section of this guide.

Firewalls are used to route VS networking traffic in and out of OnApp. Because all customer VSs are running inside the network, firewalls are required as the VS gateway.

To manage firewall rules:

1. Go to Control Panel > **Cloud** > **Resource Pools** menu.
2. Click a label of a resource pool.
3. Click the **Manage Firewall** tab.

You will be redirected to the vCloud to manage firewall for the VCD page.

- To learn how to manage firewalls refer to [Add an Edge Gateway Firewall Rule Using the Tenant Portal](#) guide
- To learn more about grouping objects refer to [Custom Grouping Objects](#) guide
- To get more information about security tags refer to [Working with Security Tags](#) guide

### 2.8.3.2 Create Resource Pool

To create a VMware Cloud Director resource pool:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the + button.
3. On the screen that appears, fill in the resource pool creation form:
   - **Label** - specify a name for the resource pool
   - **Organization** - select the organization that will be associated with the resource pool
- **Provider vdc** - choose the provider resource pool from the drop-down list. Ensure that **Provider resource pools** permissions are on. For more information about permissions, refer to the **Permissions** section.

- **Allocation Model** - choose the type of the resource pool. Depending on the selected type, the compute resource options will differ:

  **Compute Resources**

  **Pay-As-You-Go**

  - **CPU limit** - specify the maximum amount of CPU (in GHz) that can be requested (or tick the check box below to set **CPU limit** to unlimited)

  - **Guaranteed CPU** - specify the amount of guaranteed CPU allocation (%)

  - **vCPU Speed** - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)

  - **Memory limit** - specify the maximum amount of memory (in GB) which can be used (or tick the check box below to set **Memory limit** to unlimited)

  - **Guaranteed memory** - specify the amount of guaranteed memory allocation (%)

  - **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set **VS quota** to unlimited)

  - **Network Quota** - enter the number of org networks that can be created after the resource pool is deployed

  - CPU limit is equal to CPU quota in a bucket (memory limit - to memory quota respectively).

  - Min/max amounts of CPU and memory quotas in the bucket influence boundaries, within which you can set CPU and memory limits.

  - If min/max amounts of CPU and memory quotas are set to unlimited in the bucket, you can set unlimited CPU and memory limits by ticking the checkbox, otherwise, unlimited option will not be available.

  **AllocationPool**

  - **CPU allocated** - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created

  - **Guaranteed CPU** - specify the amount of guaranteed CPU allocation (%)

  - **vCPU Speed** - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)

  - **Memory allocated** - specify the amount of memory (in GB) allocated to this resource pool

  - **Guaranteed memory** - specify the amount of guaranteed memory allocation (%)
- **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
- **Network Quota** - enter the number of org networks that can be created after the resource pool is deployed

**ReservationPool**
- **CPU allocated** - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
- **Memory allocated** - specify the amount of memory (in GB) allocated to this resource pool
- **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
- **Network Quota** - enter the number of org networks that can be created after the resource pool is deployed

**Network Options**
- **Default Network Pool** - choose the default network pool from the drop-down list. This network pool is used when adding isolated and routed networks to the resource pool. If there is no network pool associated with a resource pool, you will not be able to add isolated and routed networks to the resource pool.

**Datatstore Options**
- **Thin Provisioning** - move the slider to the right to enable thin provisioning for this resource pool
- **Fast Provisioning** - move the slider to the right to enable fast provisioning for this resource pool
- **Data Store Zone** - choose the data store zone which is a provider's storage policy in VMware Cloud Director from the drop-down list. The selection will be limited by the company plan's resources.
- **Disk Capacity** - the size of the data store that will be created. The capacity range depends on the company plan's limits. For the Pay-As-You-Go resource pools, you can select the Unlimited (∞) checkbox. After you create a resource pool, a new data store (storage policy) will be automatically created with the capacity set during resource pool creation in the selected data store zone.

4. Click the **Submit** button.

---

**2.8.3.3 Edit Resource Pool**

To edit a VMware Cloud Director resource pool:

1. Go to your Control Panel > **Cloud > Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the **Actions** button next to the resource pool you want to edit, then click **Edit**.
3. On the screen that appears, edit the necessary parameters, depending on the resource pool type:
   o **Label** - specify a name for the resource pool

   **Compute resources**

   **Pay-As-You-Go**
   - *CPU limit* - specify the maximum amount of CPU (in GHz) that can be requested (or tick the check box below to set *CPU limit* to unlimited)
   - *Guaranteed CPU* - specify the amount of guaranteed CPU allocation (%)
   - *vCPU Speed* - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)
   - *Memory limit* - specify the maximum amount of memory (in GB) which can be used (or tick the check box below to set *Memory limit* to unlimited)
   - *Guaranteed memory* - specify the amount of guaranteed memory allocation (%)
   - *VS Quota* - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set *VS quota* to unlimited)
   - *Network Quota* - enter the number of org networks that can be created in the resource pool

   **AllocationPool**
   - *CPU allocated* - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
   - *Guaranteed CPU* - specify the amount of guaranteed CPU allocation (%)
   - *vCPU Speed* - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)
   - *Memory allocated* - specify the amount of memory (in GB) allocated to this resource pool
   - *Guaranteed memory* - specify the amount of guaranteed memory allocation (%)
   - *VS Quota* - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set *VS quota* to unlimited)
   - *Network Quota* - enter the number of org networks that can be created in the resource pool

   **ReservationPool**
   - *CPU allocated* - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
   - *Memory allocated* - specify the amount of memory (in GB) allocated to this resource pool
   - *VS Quota* - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set *VS quota* to unlimited)
   - *Network Quota* - enter the number of org networks that can be created in the resource pool
Network Options

- **Default Network Pool** - choose the network pool from the drop-down list. This network pool is used when adding isolated and routed networks to the resource pool. If there is no network pool associated with a resource pool, you will not be able to add isolated and routed networks to the resource pool.

Datastore Options

- **Thin Provisioning** - move the slider to the right to enable thin provisioning for this resource pool
- **Fast Provisioning** - move the slider to the right to enable fast provisioning for this resource pool

4. Click the **Submit** button.

2.8.3.4 Delete VMware Cloud Director Resource Pool

You can delete a resource pool that contains no vApps, Org Networks, or catalogs with templates. To delete a VMware Cloud Director resource pool:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.
2. Click the **Actions** button next to the resource pool you want to delete and click **Delete**.
3. Click **OK** to confirm the deletion.

2.8.3.5 Resource Pool Data Stores

You can add new data stores and edit or delete existing data stores from the resource pool overview page at Control Panel > Cloud > Resource Pools > Label. For more information, refer to Storage Policies.

2.8.3.5.1 Add Resource Pool Data Stores

To add a data store to a resource pool:

1. Go to your Control Panel > Cloud > Resource Pools menu to overview all resource pools in the cloud.
2. Click a label of a resource pool to which you want to add a new data store.
3. On the resource pool overview page, click the + button in the Data Stores section.
4. Fill in the form that appears:
   - **Data Store Zone** - select the data store zone in which the data store will be created
   - **Enabled** - select the option to enable the data store. By default, all the newly created data stores are enabled.
   - **Make default** - select the option to make the data store a default one. You cannot delete or disable a default data store.
   - **Disk Capacity** - move the slider to specify the size of the data store. For the Pay-As-You-Go resource pools, you can select the **Unlimited (∞)** checkbox.
5. Click the **Submit** button to add the data store.
2.8.3.5.2 Edit Resource Pool Data Stores

To edit a resource pool data store:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.

2. Click a label of the required resource pool.

3. In the Data Stores section, click the Actions button next to the data store you want to update and select Edit.

4. Update the required fields in the form that appears:
   - Enabled - move the slider to select whether the data store should be enabled or not
   - Make default - select the option to make the data store a default one. You cannot delete or disable a default data store.
   - Disk Capacity - move the slider to specify the size of the data store. For the Pay-As-You-Go resource pools, you can select the Unlimited (∞) checkbox.

5. Click the Submit button to save the changes.

2.8.3.5.3 Delete Resource Pool Data Stores

To delete a resource pool data store:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.

2. Click the label of the required resource pool.

3. In the data stores section, click the Actions button next to the data store you want to remove and select Delete.

2.8.3.6 Resource Pool Billing Statistics

VMware Cloud Director Buckets statistics about used VMware Cloud Director resources is gathered from VMware Cloud Director resource pools. Three types of VMware Cloud Director resource pools are used for billing statistics - reservation and allocation pools and pay-as-you-go. The bucket for these VMware Cloud Director resource pool types will include charging for the block of resources (CPU, RAM, storage, & network etc.) assigned to your user group.

- Statistics are not collected on a resource pool if the compute zone is not added to the bucket.
- Statistics for VMware Cloud Director external networks is generated only for networks based on vSphere Distributed Switch (VDS) port groups but not on vSphere Standard Switch (VSS) ones.

2.8.3.6.1 View and Generate Statistics

To view VMware Cloud Director resource pool billing statistics:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.

2. Click the label of a specific resource pool.
3. Click the **Billing Statistics** tab.

4. The page that loads will show the following details of the billing statistics:
   - **Date** - particular date and time for the generated statistics
   - **User Group** - the label of user group, to which the bucket is assigned. Click the user group name to see its details.
   - **Resource Pool** - the resource pool name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
   - **Network Usage** - the network name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
   - **Storage Policy Usage** - the storage policy name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
   - **Costs** - the total due for the **Resource Pools** and **Storage Policy Usage** at the point of time specified in the Date column.
   - **Total Amount** - the total due for all **Resource Pools** and **Storage Policy Usage** for a given period of time.

To generate statistics for a particular time period:

| The statistics for the selected period might be missing if the resource pool didn't exist, or statistics archiving was turned on. For information on statistics archiving, refer to the **Archive Statistics** section below. |

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the label of a specific resource pool.
3. Click the **Billing Statistics** tab.
4. At the top of the table set Start and End time for which you want to generate the billing statistics.
5. Tick the **Show in my timezone** checkbox if you want to show billing statistics according to your profile's timezone settings.
6. Click **Apply**.

Also, you can customize resource pool statistics period using the following configuration in `on_app.yml` file:

```yaml
vdc_stats_delay: <period in second>
```

### 2.8.4 Provider Resource Pools

A VMware Cloud Director resource pool is an allocation model which determines how and when the provider virtual data center compute and memory resources are committed to the organization virtual data center. You can view the provider resource pools with details on available resources from the Control Panel.

#### 2.8.4.1 View Provider Resource Pools
You can access the **Cloud > Provider Resource Pools** page from your Control Panel. The page provides the following information about the available resource pools:

- **Label** - the name of the provider resource pool
- **Enabled** - the status that indicates whether the resource pool is enabled or not
- **Hypervisor** - the VMware Cloud Director compute resource
- **CPU (GHz)** - the number of used / total CPU and the percentage of used CPU in GHz
- **Memory (GB)** - the number of used / total memory and the percentage of used memory in GB

To view details on a particular provider resource pool, see the following section.

**On this page:**

- [View Provider Resource Pools](#)
- [View Provider Resource Pool Details](#)

**See also:**

- [Resource Pools](#)
- [Storage Policies](#)
- [VMware Cloud Director Buckets](#)
- [Create and Manage vApps](#)
- [Manage VMware Cloud Director VSs](#)
- [Manage Catalogs](#)

### 2.8.4.2 View Provider Resource Pool Details

To view details of a provider resource pool, go to Control Panel > **Cloud > Provider Resource Pools** and click a label of a destination pool. You can see the following information on the provider resource pool:

**Properties**

- **Label** - the name of the provider resource pool
- **Enabled** - the status that indicates whether the resource pool is enabled or not
- **Hypervisor** - the VMware Cloud Director compute resource
- **CPU** - the number of **Allocated**, **Used**, and **Total** CPU in GHz
- **Memory** - the number of **Allocated**, **Used**, and **Total** memory in GB

**Data Store Groups**

The list of data stores available within the provider resource pool. To see more details on a specific data store, click its label.
• **Network Groups**
  The list of networks available within the provider resource pool. To see more details on a specific network, click its label.

• **External Networks**
  The list of external (public) networks available within the provider resource pool. To see more details on a specific network, click its label.

### 2.8.5 Storage Policies

VMware Cloud Director provider storage policies are imported into OnApp and appear in the OnApp UI as data store zones. Whereas storage policies are imported as data stores. These data stores are assigned to the data store zones of the VPC type that are the provider storage policies with which the storage policies are associated. Storage policies are not only imported but can also be created in OnApp.

The storage policies are created in OnApp in the following cases:

- During the orchestration model deployment. The newly created storage policies will be associated with the provider storage policies set in data store options.
- During the resource pool creation and modification. The newly created storage policy will be associated with the provider storage policy set on the resource pool page or creation form.

You can select storage policies during the vApp creation. You can create, edit, and delete storage policies when managing resource pools. For more information, refer to [Resource Pools](#).

**On this page:**

- View Storage Policies
- Manage Data Store Zone

**See also:**

- Resource Pools
- Create and Manage vApps
- Manage Organization Networks

#### 2.8.5.1 View Storage Policies

To view storage policies:

1. Go to your **Control Panel** > **Admin** > **Settings** > **Data Stores** menu.
2. On the screen that appears, you will see the list of all data stores within a cloud and their details:
   - **Label** - the name of the storage policy
   - **IP address** - the IP address of the storage policy
   - **Shared?** - whether the storage policy is shared between several compute resources or not
   - **Identifier** - the identifier of the data store
2.8.5.2 Manage Data Store Zone

To manage data store zone:
1. Go to your Control Panel > Admin > Settings > Data Store Zones menu.
2. On the screen that appears, you will see the list of the VMware Cloud Director data store zones. The label of the data store zone consists of the following parts: "Storage Policy Name (pVDC Name) - Compute Resource Name". Click the label of the data store zone to view the storage policies assigned to this data store zone.
3. If you want to edit a data store zone label, click the Actions button and then click Edit.
4. If you want to delete a data store zone, click the Actions button and then click Delete. Confirm the deletion.

2.9 Networking

In this chapter, you can find information on how to manage the following networking settings for VMware Cloud Director:

- NAT Rules
- Firewall Rules
- External Networks
- VPN Services

2.9.1 Organization Networks

VMware Cloud Director organization networks enable communication between vApps within a VMware Cloud Director organization. You can view, create, edit, and delete VMware Cloud Director Organization networks using OnApp. Any changes that you make via OnApp regarding Organization networks are synchronized with VMware Cloud Director and vice versa.

2.9.1.1 View Organization Networks

To view the list of Organization networks, go to Control Panel left navigation pane Cloud > vCloud > Org Networks menu. The page that loads shows the list of VMware Cloud Director Organization networks and their details:

On this page:
• View Organization Networks
• Create Organization Network
• Edit Organization Network
• Delete Organization Network

See also:
• Create and Manage vApp Networks
• Edge Gateways
• Network Interfaces (API)

• Label - the name of the network
• Edge Gateway - the edge gateway associated with the network. Click this label to view the details of the edge gateway.
• Gateway Address - the IP address of the gateway
• Network Mask - mask of the network
• Resource Pool Owner - the resource pool associated with the network. Click this label to view the details of the resource pool.
• User Group - the organization associated with the organization network

Click the "+" button at the top of the screen, and you will be redirected to the VCD UI, where you can add the organization network.

Click the Organization network label to view its details:

• Label - the name of the network
• Status - the status of the network, whether it is switched on or not.
• Type - the type of the network. It can be routed, isolated or direct.
• Edge Gateway - the edge gateway associated with the network. Click this label to view the details of the edge gateway.
• Gateway Address - the IP address of the gateway
• Network Mask - IP of the network mask
• Use gateway DNS - whether gateway DNS is applied to the network or not
• Primary DNS - IP address of the primary domain name system (DNS) server
• Secondary DNS - IP address of the secondary domain name system (DNS) server
• Shared - whether this organization network is shared or not
• Resource Pool Owner - the resource pool associated with the network. Click this label to view the details of the resource pool.

2.9.1.2 Create Organization Network
Ensure that *Org Networks* permissions are on before creating an org network. Depending on the assigned permissions, you can create all types of org networks, or only certain org network type(s) - direct, routed or isolated. For more information about permissions refer to the [VMware Cloud Director Permissions](#) section of this guide.

To create an organization network:

1. Go to **Control Panel** left navigation pane **Cloud > vCloud > Org Networks** menu.
2. Click the + button.
3. On the screen that appears, fill in the organization network creation form:
   - *Label* - specify a name for the organization network
   - *Organization* - an organization to which the network will be connected (appears by default and can not be changed)
   - *Resource Pool* - choose a resource pool to which the network will be connected
   - *Network Type* - choose a type of the organization network. Depending on the type selected, the options will differ:
     - **Direct**
       - *External Network* - choose an external network from the drop-down list
       - *Shared* - move the slider to the right to make this network shared
     - **Routed**
       - *Shared* - move the slider to the right to make this network shared
       - *Edge Gateway* - choose an edge gateway to which the network will be connected
       - *Network Address* - specify a network address (CIDR address format with gateway address)
       - *User Gateway DNS* - move the slider to the right if the selected edge gateway has configured DNS. Otherwise fill in *Primary DNS*, *Secondary DNS*, and *DNS Suffix* fields.
       - *Primary DNS* - specify IP address of the primary domain name system (DNS) server
       - *Secondary DNS* - specify IP address of the primary domain name system (DNS) server
       - *DNS Suffix* - specify DNS suffix
       - *Static IP Pools* - specify start/end IP addresses. To add more than one line, click the + button
     - **Isolated**
       - *Shared* - move the slider to the right to make this network shared
2.9.1.3 Edit Organization Network

To edit an organization network:
1. Go to Control Panel left navigation pane Cloud > vCloud > Org Networks menu.
2. Click the Actions button next to the organization network you want to edit, then click Edit.
3. On the screen that appears, edit the necessary parameters:
   - Label - specify a name for the organization network
   - Shared - move the slider to the right to make this network shared
   - Primary DNS - specify IP address of the primary domain name system (DNS) server
   - Secondary DNS - specify IP address of the primary domain name system (DNS) server
   - DNS Suffix - specify DNS suffix
   - Static IP Pools (applicable for isolated and routed org networks)
     - Start IP - specify start IP address
     - End IP - specify end IP address
     Click the “+” button to add several IP pools.
4. Click the Submit button.

2.9.1.4 Delete Organization Network

To delete an Organization network:
1. Go to Control Panel left navigation pane Cloud > vCloud > Org Networks menu.
2. The page that loads shows the list of VMware Cloud Director Organization networks.
3. Click the Actions button next to the network you want to delete and click Delete. You will be asked for confirmation before the network is deleted.

2.9.2 NAT Rules

Information on this page applies only to non-advanced edge gateways. For information on how to manage NAT rules for advanced edge gateways, refer to NAT Rules for NSX Integration.

VMware Cloud Director NAT (Network Address Translation) service translates source or destination IP addresses and port numbers. In the most common case, you associate a NAT
service with an uplink interface on an Edge Gateway so that addresses on organization VDC networks are not exposed on the external network.

You can view/create/edit/delete NAT rules using OnApp Control Panel.

2.9.2.1 View NAT Rules

On this page:

- **View NAT Rules**
- **Create NAT Rules**
- **Edit NAT Rule**
- **Delete NAT Rules**

To view NAT service of a specific edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > Edge gateway's label > **Nat Service** tab.
2. On the page that appears, you will see the list of NAT rules together with their details:
   - **Rule type** - the type of the NAT rule (DNAT, SNAT)
   - **Network** - the name of VMware Cloud Director network
   - **Original IP** - the original IP address to apply this rule on
   - **Original port** - the port of original IP address
   - **Translated IP** - the IP address to translate the addresses of outgoing packets to
   - **Translated port** - the port of translated IP address
   - **Enabled** - whether this rule is enabled or not
   - **Protocol** - the type of protocol
   - **Actions** - processes which you can perform with the NAT rule

2.9.2.2 Create NAT Rules

To create a NAT rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > edge gateway's label > **Nat Service** tab.
2. Click the **Add New Rule** button or "+" button.
3. On the page that appears specify the following parameters:
   - **Enabled** - tick the checkbox to enable this NAT rule
   - **Rule type** - choose the type of the NAT rule from the drop-down menu:
     - **SNAT** - source network address translation. This kind of rule translates the packet's source address and, optionally, source IP port to the values you specify.
     - **DNAT** - destination network address translation. This kind of rule translates the packet's destination address and, optionally, destination IP port to the values you specify.
   - **Network** - choose the VMware Cloud Director network from the drop-down menu
     - **Original IP** - specify the original IP address to apply this rule on
4. Click **Create**.

### 2.9.2.3 Edit NAT Rule

To edit a NAT rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > edge gateway's label > **Nat Service** tab.
2. Click the **Actions** icon > **Edit** next to the NAT rule, which you want to edit.
3. On the page that appears change the following parameters:
   - **Enabled** - move the slider to the right to enable this NAT rule
   - **Network** - choose the VMware Cloud Director network from the drop-down menu
   - **Original IP** - specify the original IP address to apply this rule on
   - **Original port** - specify the port of original IP address (applies only for DNAT rule type)
   - **Translated IP** - specify the IP address to translate the addresses of outgoing packets
   - **Translated port** - specify the port of translated IP address (applies only for DNAT rule type)
   - **Protocol** - choose the type of protocol from the drop-down menu (applies only for DNAT rule type)

4. Click **Submit**.

### 2.9.2.4 Delete NAT Rules

To delete a NAT rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > specific edge gateway's label > **Nat Service** tab.
2. Click the **Delete** icon next to the NAT rule you want to delete.
3. Confirm the deletion.

### 2.9.3 Firewall Rules

Information on this page applies only to non-advanced edge gateways. For information on how to manage firewall for advanced edge gateways, refer to **NSX Firewalls**.
2.9.3.1 Create Firewall Rules

To add a firewall rule:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Click specific Edge Gateway's label.
3. Click the Firewall Service tab > Firewall Rules.
4. Click the Add New Rule button.
5. Set the following:
   - **Enabled** - whether the firewall rule is enabled or not.
   - **Description** - the description of the firewall rule.
   - **Command** - there are two commands:
     - **ACCEPT** – defines the packets that will be accepted by the firewall.
     - **DROP** – defines the packets that will be rejected by the firewall.
   - **Source** - the source IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
   - **Source port** - the source port for which this firewall rule is effective.
   - **Destination** - the destination IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
   - **Destination port** - the destination port for which this firewall rule is effective.
   - **Protocol** - there are several types of protocol - TCP, UDP, ICMP, TCP+UDP or any.
   - **Enable logging** - tick this check box to enable logging.
6. Click the Create button.

2.9.3.2 Edit Firewall Rules

To edit a firewall rule:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Click specific Edge Gateway's label.
3. Click the Firewall Service tab > Firewall Rules.
4. On the page that appears you will see the list of firewall rules. Click the Edit icon next to the firewall rule you want to edit.
5. Change the following settings:
   - **Enabled** - whether the firewall rule is enabled or not.
   - **Description** - the description of the firewall rule.
   - **Command** - there are two commands:
     - **ACCEPT** – defines the packets that will be accepted by the firewall.
     - **DROP** – defines the packets that will be rejected by the firewall.
   - **Source** - the source IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
6. Click the **Save** button.

### 2.9.3.3 Delete Firewall Rules

To delete a firewall rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu.
2. Click specific Edge Gateway's label.
3. Click the **Firewall Service** tab > **Firewall Rules**.
4. On the page that appears you can see the list of firewall rules. Click the **Delete** icon next to the firewall rule you want to delete. Confirm the deletion.

### 2.9.4 Cross VDC Networks

Cross virtual data center networking is introduced in **vCloud Director 9.5**. Cross-virtual data center networks enable organizations to group up to four virtual data centers and configure stretched layer 2 networks in each group. Cross-virtual data center networks are imported from VCD to OnApp CP both as a network zone and as an Org network within this zone. Importing cross-virtual data center networks as network zones enables administrators to [configure billing](https://www.onapp.com) for their usage.

On your Control Panel, you can create and manage cross VDC networks and use them to [deploy a vApp](https://www.onapp.com). In this document, you can find information on how to manage cross VDC networks and network zones.

**On this page:**

- [View Cross VDC Networks Imported as Network Zones](#)
- [View Cross VDC Networks Imported as Networks](#)
- [Create Cross VDC Network](#)
- [Edit Cross VDC Network](#)
- [Delete Cross VDC Network](#)

**See also:**

- [Create and Manage vApps](#)
- [Buckets](#)
- [Org Networks](#)
2.9.4.1 View Cross VDC Networks Imported as Network Zones

To view cross VDC networks imported as network zones, follow the next steps:

1. Go to your Control Panel > Admin > Settings.
2. Click the **Network Zones** icon. The screen that appears will show all network zones with the following details:
   - **Label** - the name of the network zone
   - **Zone type** - cross VDC networks belong to the **VPC Server Zone**
   - **Location group** - the location group with which the network zone is associated

To view the list of networks assigned to the zone, click the zone label.

2.9.4.2 View Cross VDC Networks Imported as Networks

To view cross VDC networks imported as networks, follow the next steps:

1. Go to your Control Panel > Admin > Settings.
2. Click the **Networks** button and switch to the **Org** tab.
3. The screen that appears shows the list of all organization networks, including cross VDC networks with the following details:
   - **Label** - the name of the network
   - **Edge Gateway** - the edge gateway associated with the network
   - **Gateway Address** - the IP address of the gateway
   - **Network Mask** - the mask of the network
   - **Resource Pool Owner** - the resource pool associated with the network
   - **User Group** - the organization associated with the org network

When you click a cross VDC network label, you can see the following information:

1. **Label** - the name of the network
2. **Status** - the status of the network
3. **Type** - the type of the network that is **Cross VDC**
4. **Edge Gateway** - the edge gateway associated with the network
5. **Gateway Address** - the IP address of the gateway
6. **Network Mask** - the IP address of the network mask
7. **Use gateway DNS** - whether gateway DNS is applied to the network or not
8. **Primary DNS** - the IP address of the primary domain name system (DNS) server
9. **Secondary DNS** - the IP address of the secondary domain name system (DNS) server
10. **Shared** - whether this organization network is shared or not
11. **Resource Pool Owner** - the resource pool associated with the network
12. **IP Nets** - the list of available IP nets with the following details
    - **IP Address** - the list of IP addresses included into the IP Net
- **Assigned** - the status that indicated whether IP addresses are assigned to VS
- **VS** - the virtual servers to which IP addresses are assigned

### 2.9.4.3 Create Cross VDC Network

To create a cross VDC network, follow the next steps:
1. Go to your Control Panel > Cloud > Cross VDC Networks.
2. Click **New Cross VDC Network** and provide the following details:
   - **Label** - the name of the network
   - **VDC Group** - the group associated with the network
   - **Gateway CIDR** - the network Classless Inter-Domain Routing (CIDR) setting in the format `network_gateway_IP_address/subnet_prefix_length`
3. Click **Create** to apply the settings.

After you create the cross VDC network, a corresponding Org network is created that you can use to provision a vApp.

### 2.9.4.4 Edit Cross VDC Network

To edit a cross VDC network, follow the next steps:
1. Go to your Control Panel > Cloud > Cross VDC Networks.
2. Click the **Actions** icon and click **Edit**.
3. You can edit a **Label** of the network.
4. Click **Save** to apply the settings.

### 2.9.4.5 Delete Cross VDC Network

To delete a cross VDC network, follow the next steps:
1. Go to your Control Panel > Cloud > Cross VDC Networks.
2. Click the **Actions** icon and click **Delete**.
3. Click **OK** to confirm the deletion.

When you delete a cross VDC network, the corresponding Org network is also deleted.

### 2.9.5 External Networks

External networks provide the interface to the Internet for virtual servers connected to external organization vDC networks. External networks are imported both as a network zone and as a network within that zone. Importing external networks as network zones enables administrators to configure billing for external network usage. Currently, you can only view external networks in OnApp.

#### 2.9.5.1 View External Networks Imported as Network Zones

To view external networks imported as network zones into OnApp:
1. Go to your Control Panel > Admin > Settings menu.

2. Click the **Network Zones** icon. The screen that appears will show all network zones with the following details:
   - *Label* - the name of the zone
   - *Location group* - the location group with which the zone is associated

   Click a zone's label (name) to see the list of networks assigned to it.

   **At Control Panel > Settings > Network Zones** there is an **Actions** button next to the imported external networks which enables you to edit or delete networks. However, these changes are not synchronized with VMware Cloud Director. Therefore, it is not recommended to edit or delete imported external networks in OnApp.

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**On this page:**

- View External Networks Imported as Network Zones
- View External Networks Imported as Networks

**See also:**

- Create and Manage vApp Networks
- Manage Organization Networks
- Virtual Server Network Interfaces

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2.9.5.2 View External Networks Imported as Networks

To view the external networks imported as networks into OnApp:

1. Go to your Control Panel > Admin > Settings menu.

2. Click the **Networks** button and select the **External** tab.

3. The screen that appears shows the list of imported external networks:
   - *Label* - the name of the network
   - *Identifier* - the identifier of the network
   - *VLAN* - the VLAN number

   When you click a network label, you can see the following information:

   **Details**
   - *Label* - the name of the network
   - *Identifier* - the identifier of the network
   - *VLAN* - the VLAN number
• **Network Zone** - the network zone to which the network belongs

**IP Nets**

• **IP Address** - the list of IP addresses included into the IP Net

• **Assigned** - the status that indicated whether IP addresses are assigned to VS

• **VS** - the virtual servers to which IP addresses are assigned

### 2.9.6 VPN Services

Information on this page applies only to non-advanced edge gateways. For information on how to manage VPN for advanced edge gateways, refer to [NSX IPSec VPN] and [L2 VPN].

A VMware Cloud Director edge gateway configuration can define an IPsec virtual private networking (VPN) service to provide secure virtual private networking within an organization, between organization VDC networks, or between an organization VDC network and an external IP address.

VPN Service allows you to create VPN tunnels for current Edge Gateway using OnApp Control Panel.

Ensure that **Tunnels** permissions are on before managing VPN tunnels. For more information about permissions refer to the [List of all OnApp Permissions] section.

#### 2.9.6.1 View VPN Tunnels

**On this page:**

• [View VPN Tunnels]

• [Create VPN Tunnel]

• [Delete VPN Tunnel]

**See also:**

• [Edge Gateways]

• [NAT Rules]

• [Firewall Rules]

• [Create and Manage vApp Networks]

• [VMware Cloud Director VS Network Interfaces]

To view VPN service of a specific edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > *edge gateway's label* > **VPN Service** tab.

2. On the page that appears, you will see the list of VPN tunnels together with their details:
• **Name** - the label of the VPN tunnel
• **Enabled** - whether VPN tunnel is enabled or not
• **Description** - the description of the VPN tunnel
• **Peer** - the ID for the peer end point
• **Local** - the ID for local end point
• **Local network** - the name of the local network in the VPN tunnel
• **Peer network** - the name of the peer network in the VPN tunnel
• **Operational** - whether this VPN tunnel is operational or not
• **Actions** - processes which you can perform with the VPN tunnel

### 2.9.6.2 Create VPN Tunnel

To create VPN tunnel of a specific edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > specific edge gateway's label > **VPN Service** tab.

2. Click the "+" button.

3. On the page that appears, specify the following parameters:
   - **Name** - specify the label of the VPN tunnel
   - **Enabled** - move the slider to the right to enable this VPN tunnel
   - **Description** - provide the description of the VPN tunnel that can include no more than 255 characters
   - **Tunnel type** - select the type of the VPN tunnel
   - **Local Native Address** - specify the IP address of the local network
   - **Local Networks** - select one or several local networks from the drop-down list. Local networks are organization networks that are connected to the destination edge gateway.
   - **Peer ID** - specify the IP address of the peer endpoint. The Peer IP cannot be the same for multiple IPSec VPNs. Peer ID is used to uniquely identify the peer. If the peer address is on this or another organization VDC network, this should be peer's native IP address. If peer is NAT'd, this should be the private peer IP address.
   - **Peer Behind NAT** - move the slider to the right to enable specifying peer native address
   - **Peer Native Address** - if **Peer Behind NAT** slider is enabled, enter IP address to reach the peer. If the Peer is NAT'd, this should be the public side address of NAT.
   - **PeerNetworks** - specify the peer network address. Peer Network cannot be the same as the local network. Network address should be written in CIDR format.
   - **Shared Secret Encrypted** - move the slider to the right to encrypt the shared secret
   - **Encryption Protocol** - specify the type of encryption protocol (default protocol is AES-236)
   - **Prehashed Key** - the key used for authentication. Shared secret key should be from 32 to 128 characters in length and have at least one uppercase letter, one lowercase letter and one number. Special characters are not allowed.
   - **MTU** - specify the size of maximum transmission unit (default value is 1500)

4. Click **Create**.
2.9.6.3 Delete VPN Tunnel

To delete VPN tunnel of a specific edge gateway:

1. Go to your Control Panel > Cloud > Edge Gateways > edge gateway's label > VPN Service tab.
2. Click the Delete icon next to the VPN tunnel you want to delete.
3. Confirm the deletion.

2.10 NSX-V Integration

OnApp integration with VMware NSX-V Data Center delivers a complete L2-L7 networking and security virtualization platform providing you with agility and automation. This feature allows you to configure Advanced Edge services within the OnApp UI. Also, you receive access to full end-to-end provisioning instead of a limited one.

Requirements to use NSX-V with Cloud Director are the following:

- NSX-V integration must be enabled on your license. Please contact your Account Manager
- The version of Cloud Director should be 9.7 or higher
- It is a requirement to convert your Edge Gateway’s to Advanced Edge Gateways after importing your environment to OnApp

In this chapter, you can find the following information on how to manage NSX-V integration with VMware Cloud Director:

- NSX-V Manager in OnApp
- NSX-V Firewalls
- NAT Rules for NSX-V Integration
- NSX-V Load Balancers
- NSX-V IPSec VPN
- NSX-V L2 VPN

2.10.1 NSX Managers in OnApp

The NSX manager is used to deploy a universal controller cluster that provides the control plane for the NSX-V environment. At OnApp, you can import NSX manager with limited functionality available and set vCloud credentials to gain access to full functionality. Once imported, it allows you to view and edit imported vCloud edge gateways in OnApp interface.

- This functionality is available for users with the vCloud Organization Administrator role.
- For vCloud, NSX-V Manager is enabled by default but you have to import and sync it with NSX-V edge first.
• Ensure that *Any action on NSX manager* permission is on before starting using NSX-V integration. For more information about permissions refer to the Permissions page.

On this page:

- View NSX Manager Details
- Import NSX Manager to OnApp

See also:
- NSX-V Firewalls
- NAT Rules for NSX-V Integration
- NSX-V Load Balancers

2.10.1.1 View NSX Manager Details

To view the details of a particular NSX manager:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the SDN Managers icon, then click the vCenter/vCloud tab.
3. Click the label of an NSX manager to view its details:
   - *Label* - the name of the NSX manager
   - *Resource* - the hostname of the controller
   - *Type* - the type of manager, which is NSX (NSX-V)
   - *Version* - build and version number of NSX manager
   - *IP Address* - the IP address of the controller
   - *Uptime* - the time the NSX manager has been working and available
   - *Status* - powered on/off status of NSX manager

2.10.1.2 Import NSX Manager to OnApp

Although NSX-V is enabled by default in OnApp, two steps are required to activate and start using this functionality. First, you need to set NSX-V credentials in order to communicate with NSX-V. Second, you need to import vCloud edge gateways to OnApp.

To import NSX manager to OnApp:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the **SDN Managers** icon, then click the **vCenter/vCloud** tab.
3. Click the **Actions** button next to the NSX manager to view its options.
4. First, click **Set credentials**.
5. In the dialogue box that pops up, enter login and password.
6. Next, click the **Import** option.

    After the transaction is completed, all the NSX-V items will be imported to OnApp Control Panel. For instance, vCloud edge gateways will be available at **Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways** tab.

7. Click the **Save** button.

After NSX manager is successfully imported to OnApp interface, you can proceed to configuration of NSX-V firewalls and networks and start using edge gateways created at the vCloud side in OnApp interface.

### 2.10.2 Create and Manage NSX-V Edge Gateways

A VMware Cloud Director edge gateway is a virtual router for organization vDC (virtual Data Center) networks. NSX-V edge gateway provides a routed connection between an organization vDC network and an external network. Edge gateway can support up to ten interfaces. These interfaces are categorized as uplinks when they connect to an external network and internal interfaces when they connect to an organization vDC network.

You can create edge gateway in either a compact or a full configuration. The full configuration provides increased capacity and performance. The compact configuration requires less memory and fewer compute resources. All services are supported in either configuration.

On this page:

- View NSX-V Edge Gateways
- Create NSX-V Edge Gateway
- View NSX-V Edge Gateway Details
- Edit NSX-V Edge Gateways
- Delete NSX-V Edge Gateways
- Advanced Edge Gateway Services
- Convert Edge Gateways to Advanced Edge Gateways

### 2.10.2.1 View NSX-V Edge Gateways

To view edge gateways:
1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > **NSX-V**.

2. The page that loads will show the list of VSs together with their:
   - **Label** - the name of the edge gateway
   - **External address** - external firewall IP
   - **User group** - the user group with which the edge gateway is associated
   - **Organization** - the organization with which the edge gateway is associated
   - **Resource pool** - the resource pool with which the edge gateway is associated
   - **Status** - power status, active or inactive

2.10.2.2 Create NSX-V Edge Gateway

To create an edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > **NSX-V** tab and click the "+" button. This will start an edge gateway creation wizard.
2. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.
3. Click the **New Edge Gateway** button to start the creation process. You will be taken to the **edge gateway details screen**.

**Step 1 of 6. General**

1. Depending of the type of edge gateway, indicate some of the following details:
   - **Label** - indicate the label of the edge gateway
   - **Description** - write additional info about the edge gateway
   - **Organization** - select the organization with which the edge gateway will be associated
   - **Resource Pool** - choose the appropriate resource pool from the drop-down list
   - **Edge Gateway Configuration** - choose configuration type of the edge gateway from the drop-down list:
     - **Compact** - requires less memory and fewer compute resources
Large - provides increased capacity and performance compared to the Compact option

- Quad large - recommended for high throughput and requires a high connection rate

- Enable High Availability - move the slider to the right to enable high availability option for this edge gateway

- Create as Advanced Gateway - move this slider to the right to enable advanced edge gateway services. Note that after you enable this slider, the Enable Distributed Routing slider becomes available to you.

- Enable Distributed Routing - move this slider to the right to enable distributed routing

- Configure IP settings - move this slider to the right to manually configure IP settings

- Configure Rate Limits - move this slider to the right to manually configure the inbound and outbound rate limits

2. Click Next to proceed to the following step of the wizard where you can specify the external networks.

Step 2 of 6. External Networks

At this step, choose external networks to which your edge gateway will be connected:

- External Networks - select the external network from the drop-down list

Click Next to proceed to the following step of the wizard where you can specify the IP settings configuration.

Step 3 of 6. Configure IP Settings

This step is optional. It becomes available after you move the Configure IP settings slider to the right at the first step of the creation wizard.

1. Click the label of the external network.

2. Indicate the following details:

- Assign - move this slider to the right to assign an IP address for each of the subnets. You may choose not to assign IP addresses to a given subnet at all.

- Auto - move this slider to the left to indicate the IP address manually.

- IP range - select the IP range from the drop-down list

- IP address - select the IP address from the drop-down list

3. Click Next to proceed to the following step of the wizard where you can specify the default gateway.

Step 4 of 6. Default Gateway

At this step, select a network to be the default gateway:
• **Configure default gateway** - move this slider to the right to enable automatic configuration of the default gateway

• **Default gateway** - select the default gateway from the drop-down list

• **Use default gateway for DNS relay** - move this slider to the right to use default gateway for DNS relay

Click **Next** to proceed to the following step of the wizard where you can configure rate limits.

### Step 5 of 6. Configure Rate Limits

This step is optional. It becomes available after you move the **Configure rate limits** slider to the right at the first step of the creation wizard.

1. Click the label of the external network.

2. Indicate the following details:
   - **Enable rate limits** - move this slider to the right to enable the inbound and outbound rate limits
   - **Incoming rate limit** - indicate the inbound rate limit in megabits per second. The default value is 100. The minimal value is 0.001 Mbps.
   - **Outgoing rate limit** - indicate the outbound rate limit in megabits per second. The default value is 100. The minimal value is 0.001 Mbps.

3. Click **Next** to proceed to the next step of the wizard that completes the edge gateway creation process.

### Step 6 of 6. Summary

At this step, you can find the configuration summary of the edge gateway, which will be created. You can view the external networks with their IP nets, IP addresses, incoming and outgoing rate limits.

The page that loads will provide you with the following information:

- **Label** - the label of the edge gateway
- **Description** - additional info about the edge gateway

  - **Organization** - the organization with which the edge gateway will be associated with
    - **Resource Pool** - the resource pool with which the edge gateway is associated
    - **Edge Gateway Configuration** - the configuration type of the edge gateway
    - **Enable High Availability** - whether high availability is enabled for this edge gateway
    - **Create as Advanced Gateway** - whether advanced edge gateway services are enabled
      - **Enable Distributed Routing** - whether distributed routing is enabled
      - **Default gateway** - the default gateway
    - **Use default gateway for DNS relay** - whether default gateway for DNS relay is used

  After you check all parameters, click **Submit** to start the creation process.

2.10.2.3 View NSX-V Edge Gateway Details

To view details of a specific NSX-V edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > NSX-V tab.
2. Choose the specific label. Click the **Overview** tab to see the following information:

   - **Label** - the name of the edge gateway
   - **Description** - additional info about the edge gateway
   - **Resource Pool** - the resource pool with which the edge gateway is associated
   - **Organization** - the organization with which the edge gateway is associated
   - **User Group** - the user group with which the edge gateway is associated
   - **Edge Gateway Configuration** - configuration type of the edge gateway
   - **High Availability** - whether high availability option is enabled for this edge gateway or not
   - **Use default route for dns relay** - whether default route for DNS relay is used or not
   - **IP Settings section below includes the following columns:**
     - **External network**
     - **IP net**
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- **IP address**
- **Sub-allocated IP pool** - if you have any sub-allocated IP pools on the vCloud side, these will be displayed in this field

3. Also at this page you will see the following information about external network interfaces, to which this edge gateway is connected:
   - **Label** - the label of the network
   - **Gateway address** - the IP address of the gateway

4. Click the **Firewall, NAT, Load Balancer, IPSec VPN, L2 VPN** tabs for the respective actions.

5. By clicking the **Services** tab you will be redirected to the VMware Cloud Director where you can manage appropriate edge gateway services if needed.

2.10.2.4 Edit NSX-V Edge Gateways

Whether you want to change an edge gateway or its components, be sure to select the corresponding action. If you want to edit an edge gateway choose the Edit action. For other components, select among such actions as Edit External Networks, Edit Default Gateway, Edit IP Settings or Edit Rate Limits.

To edit edge gateway:

1. Go to your Control Panel's **Edge Gateways** menu.

2. Click the **Actions** icon next to the edge gateway you want to edit, then choose the action from the list.

3. Edit the necessary parameters:

**Edit Edge Gateway**

1.  
   - **Label** - change the label of edge gateway
   - **Description** - specify additional info about edge gateway
   - **Edge Gateway Configuration** - this field cannot be edited, it is set during edge gateway creation
   - **High Availability** - tick the checkbox to enable high availability option for this edge gateway

**Edit External Networks**

Select the external network from the drop-down list

**Edit Default Gateway**

1.  
   - **Configure default gateway** - move this slider to the left to enable automatic configuration of the default gateway
   - **Default gateway** - select the default gateway from the drop-down list
   - **Use default gateway for DNS relay** - move this slider to the right to use default gateway for DNS relay

**Edit IP Settings**

1.  
   - **Participate** - move this slider to the right to assign IP address for each of the subnets. You may choose not to participate in a given subnet.
   - **Auto IP assignment** - move this slider to the left to indicate the IP address manually.
Edit Rate Limits

1. **Enable rate limits** - move this slider to the right to enable the inbound and outbound rate limits.

2. **Incoming rate limit** - indicate the inbound rate limit in megabits per second. The default value is 100. The minimal value is 0.001 Mb/s.

3. **Outgoing rate limit** - indicate the outbound rate limit in megabits per second. The default value is 100. The minimal value is 0.001 Mb/s.

4. Click **Submit**.

2.10.2.5 Delete NSX-V Edge Gateways

To delete edge gateway:

1. Go to your Control Panel > Cloud > Edge Gateways menu > NSX-V tab.
2. Click the **Actions** icon next to the edge gateway you want to remove, then choose **Delete**.
3. Confirm the deletion.

2.10.2.6 Advanced Edge Gateway Services

Starting with OnApp 5.4, you can manage advanced edge gateway services. You can check whether an edge gateway is advanced using Edge Gateways API requests (advanced edge gateway has the `advanced_enabled` parameter set to 'true'). If your edge gateway is not advanced you can convert it to one as described in the section below.

Ensure that the **Manage Advanced Edge Gateway Services** permission is on before managing advanced edge gateway services. For more information refer to the [List of all OnApp Permissions] section of the Administration guide.

To manage advanced edge gateway services:

1. Go to your Control Panel > Cloud > Edge Gateways menu > NSX-V tab.
2. Choose the specific Edge Gateways's label. Click the Services tab. You will be redirected to the VMware Cloud Director where you can manage appropriate advanced edge gateway services. For more information, refer to the [VMware Cloud Director documentation].

2.10.2.7 Convert Edge Gateways to Advanced Edge Gateways

To convert the nonadvanced edge gateway into advance:

1. Go to your Control Panel > Cloud > Edge Gateways menu > NSX-V tab.
2. Click the **Actions** icon next to the edge gateway you want to convert and then select **Convert to Advanced Edge Gateway**.
2.10.3 NSX-V Firewalls

NSX-V Firewall monitors the North-South traffic to provide perimeter security functionality including firewall, Network Address Translation (NAT), and site-to-site IPSec VPN functionality.

OnApp provides you with the possibility to manage NSX-V firewall service separately for each vCloud edge gateway in your cloud. It is possible to enable and disable firewall for the entire edge gateway or enable some of the rules on the list. You can configure the details of sources and destinations for each rule.

There are two major types of firewall rules in OnApp: internal (created on vCloud side and imported to OnApp) and user-defined (created on OnApp side).

NSX-V firewalls may be configured for an existing vCloud edge gateway or vCenter edge. For more information on creation and import of the aforementioned instances, see vCloud Edge Gateways and Edges sections of this guide.

On this page:

- Create NSX-V Firewall Rule
- Edit NSX-V Firewall Rule
- Delete NSX-V Firewall Rule

See also:

- NSX-V integration
- Adding NSX-V Manager to OnApp
- NSX-V Load Balancers

2.10.3.1 Create NSX-V Firewall Rule

To add a new NSX-V firewall rule:

1. Go to your Control Panel > Cloud > NSX-V Edge Gateways menu.
2. In the NSX-V Edge Gateways tab click the label of the necessary Edge Gateway.
3. Click the Firewall tab to see the list of the firewall rules.
4. Click the button above the table. A new line will appear on the list.
5. In the line that appeared, specify the following parameters:

   - click to enable the rule.
   - Rule name - click to add the name of the rule.
   - Sources - as you hover over the Sources column space in the required line, the and buttons will appear:
     - Click the button to add a source IP address this firewall rule will be active for. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive. Click the Apply IP button to save the changes.
     - Click the button to add the following types of destinations for this rule:
       - Network interfaces - select the necessary network interfaces from the list
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- **Virtual machines** - select the necessary virtual servers from the list
- **Networks** - select the necessary networks from the list
- **IP sets** - select the necessary options from the list of IP sets imported from vCloud side
- **Security groups** - select the necessary options from the list of security groups imported from vCloud side

Click the **Apply rules** button to save the changes.

- The **Toggle exclusion** button appears only if there are any sources already added to the list. Click this button to exclude all the specified sources, so that the rule will accept as a source all possible options, except the ones you included. Once this option is enabled, the **Any but** tag appears before the list of sources.

1. 

- **Destinations** - as you hover over the Destinations column space in the required line, the **IP** and **+** buttons will appear:
  - Click the **IP** button to add a destination IP addresses this firewall rule will be active for. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive. Click the **Apply IP** button to save the changes.
  - Click the **+** button to configure the following types of destinations for this rule:
    - **Network interfaces** - select the necessary network interfaces from the list.
    - **Virtual machines** - select the necessary virtual servers from the list.
    - **Networks** - select the necessary networks from the list.
    - **IP sets** - select the necessary options from the list of IP sets imported from vCloud side.
    - **Security groups** - select the necessary options from the list of security groups imported from vCloud side.
  
  Click the **Apply rules** button to save the changes.

- The **Toggle exclusion** button appears only if there are any destinations already added to the list. Click this button to exclude all the specified destinations, so that the rule will accept as a destination all possible options, except the ones you included. Once this option is enabled, the **Any but** tag appears before the list of destinations.

- **Services** - click the **+** button to open up a pop up window. Once it appears, specify the following values:
  - **Protocol** - select TCP, UDP, ICMP, or Any.
  - **Source port** - insert the source port (from 1 to 65535).
  - **Destination port** - insert the destination port (from 1 to 65535).

If you don't specify any source, destination, or service value, it will be displayed as "any" by default.
- **ACCEPT** – click to specify that the traffic from or to the specified source(s), destination(s), and service(s) that will be accepted by the firewall.
- **DENY** – click to specify that the traffic from or to the specified source(s), destination(s), and service(s) that will be denied by the firewall.
- **Logging** - move the slider to the right to enable logging for this rule.

6. Click the **Save** button above the table to apply the changes.

- You may filter the rules in the list by name, source, destination, and service.
- To select all firewall rules on the list, hover over the top left corner of the table, and tick the checkbox that appears.
- To revert the last changes applied, click **Discard changes** below the table.
- To see the rules of the user-defined type only, click the user-defined icon above the table.
2.10.3.2 Edit NSX-V Firewall Rule

To edit a firewall rule:

1. Go to your Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways tab.
2. Click specific NSX-V Edge Gateway’s label.
3. Click the Firewall tab.
4. On the page that appears, you will see the list of firewall rules for this edge gateway. Find the necessary rule and make the necessary changes in the corresponding line.

Click to view the description of parameters available for editing.

- X - click to enable the rule. If the rule is enabled, click the button to disable it.
- Rule name - click to change the name of the rule.
- Sources - as you hover over the Sources column space in the required line, the - and + buttons will appear:
  - Click the button to add a source IP address this firewall rule will be active for. This can be an IP address, CIDR, IP range, “any”, “internal” or “external”. This field is not case sensitive. Click the Apply IP button to save the changes.
  - Click the + button to configure the following types of destinations for this rule:
    - Network interfaces - select the necessary network interfaces from the list.
    - Virtual machines - select the necessary virtual servers from the list.
    - Networks - select the necessary networks from the list.
• **IP sets** - select the necessary options from the list of IP sets imported from vCloud side.

• **Security groups** - select the necessary options from the list of security groups imported from vCloud side.

  Click the **Apply rules** button to save the changes.

  ▪ the **Toggle exclusion** button appears only if there are any sources already added to the list. Click this button to exclude all the sources except the ones added to the list. Once this option is enabled, the **Any but** tag appears before the list of sources.

    a.

  ▪ **Destinations** - as you hover over the **Destinations** column space in the required line, the **+**, **-**, and **etc.** buttons will appear:

    • Click the **+** button to add a destination IP addresses this firewall rule will be active for. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive. Click the **Apply IP** button to save the changes.

    • Click the **+** button to configure the following types of destinations for this rule:

      o **Network interfaces** - select the necessary network interfaces from the list.

      o **Virtual machines** - select the necessary virtual servers from the list.

      o **Networks** - select the necessary networks from the list.

      o **IP sets** - select the necessary options from the list of IP sets imported from vCloud side.

      o **Security groups** - select the necessary options from the list of security groups imported from vCloud side.

        Click the **Apply rules** button to save the changes.

    • The **Toggle exclusion** button appears only if there are any destinations already added to the list. Click this button to exclude all the destinations except the ones added to the list. Once this option is enabled, the **Any but** tag appears before the list of destinations.

  ▪ **Services** - click the **+** button to open up a pop up window. Once it appears, specify the following values:

    • **Protocol** - select TCP, UDP, ICMP, or Any.

    • **Source port** - insert the source port (from 1 to 65535).

    • **Destination port** - insert the destination port (from 1 to 65535).

If you don’t specify any source, destination, or service value, it will be displayed as "any" by default.
▪ **ACCEPT** – click to specify that the traffic from or to the specified source(s), destination(s), and service(s) that will be accepted by the firewall.

▪ **DENY** – click to specify that the traffic from or to the specified source(s), destination(s), and service(s) that will be denied by the firewall.

▪ **Logging** - move the slider to the right to enable logging for this rule.

5. Click the **Save** button above the table to apply the changes.

2.10.3.3 Delete NSX-V Firewall Rule

To delete a firewall rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > **NSX-V Edge Gateways**.

2. Click specific NSX-V Edge Gateway's label.

3. Click the **Firewall** tab.

4. On the page that appears, you will see the list of firewall rules. Select a rule from the list, and then click the **"-"** button above the table.

5. Click the **Save** button above the table to apply the changes.

2.10.4 NAT Rules for NSX-V Integration

VMware Cloud Director NAT (Network Address Translation) service translates source or destination IP addresses and port numbers. In the most common case, you associate a NAT service with an uplink interface on an Edge Gateway so that addresses on organization VDC networks are not exposed on the external network.

You can view/create/edit/delete NAT rules using OnApp Control Panel.

This functionality is available for users with the vCloud Organization Administrator role.

On this page:

- Create NAT Rules
- Edit NAT Rule
- Delete NAT Rules

See also:

- Create Edge Gateways
- Manage Edge Gateways
- NSX-V Firewalls

2.10.4.1 Create NAT Rules

To add a new NAT rule for NSX-V integration:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > **NSX-V** > NSX-V edge gateway's label > **Nat Service** tab.

2. Click the "+" button.
3. On the page that appears specify the following parameters:
   For DNAT rules:
   - **Applied on** - select the VMware Cloud Director external network where the rule will be applied
   - **Protocol** - select the type of protocol (TCP, UDP, ICMP or Any)
   - **Original IP** - specify the original IP address to apply this rule on
   - **Original port** - specify the port of original IP address
   - **Translated IP** - specify the IP address to translate the addresses of outgoing packets to
   - **Translated port** - specify the port of translated IP address
   - **Description** - add description if any
   For SNAT rules:
   1. **Applied on** - select the VMware Cloud Director external network where the rule will be applied
   - **Original IP** - specify original IP address to apply this rule on and click the "?" icon to configure IP nets and IP ranges
   - **IP Net** - select an IP net from which the original IP address should be assigned
   - **IP Range** - select an IP range from which the original IP address should be assigned
   - **Translated IP** - specify the IP address to translate the addresses of outgoing packets to and click the “?” icon to configure IP nets and IP ranges
   - **IP Net** - select an IP range from which the translated IP address should be assigned
   - **IP Range** - select an IP range from which the translated IP address should be assigned
   - **Description** - add description if any
   4. Click the **Apply Rules** button to save the changes.
2.10.4.2 Edit NAT Rule

To edit a NAT rule:

1. Go to your Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways > NSX-V edge gateway’s label > Nat Service tab.

2. Click the icon next to the NAT rule, which you want to edit.

3. On the page that appears change the following parameters:

   For DNAT rules:
   - **Applied on**: select the VMware Cloud Director external network where the rule will be applied
   - **Protocol**: select the type of protocol (TCP, UDP, ICMP or Any)
   - **Original IP**: specify the original IP address to apply this rule on
   - **Original port**: specify the port of original IP address
   - **Translated IP**: specify the IP address to translate the addresses of outgoing packets to
   - **Translated port**: the port of translated IP address
   - **Description**: add description if any

   For SNAT rules:
   - **Applied on**: select the VMware Cloud Director external network where the rule will be applied
   - **Original IP**: specify original IP address to apply this rule on and click the “?” icon to configure IP nets and IP ranges
   - **IP Net**: select an IP net from which the original IP address should be assigned
   - **IP Range**: select an IP range from which the original IP address should be assigned
   - **Translated IP**: specify the IP address to translate the addresses of outgoing packets to and click the “?” icon to configure IP nets and IP ranges
   - **IP Net**: select an IP net from which the translated IP address should be assigned
   - **IP Range**: select an IP range from which the translated IP address should be assigned
   - **Description**: add description if any

4. Click the Apply Rules button to save the changes.
2.10.4.3 Delete NAT Rules

To delete a NAT rule:

1. Go to your Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways > edge gateway's label.
2. Click the Nat Service tab.
3. On the page that appears you will see the list of all NAT rules.
4. Select a rule from the list, and then click the button above the table.
5. Click the Save button to apply the changes.

2.10.5 NSX-V Load Balancers

The NSX-V Edge load balancer enables high-availability service and distributes the network traffic load among multiple servers. It distributes incoming service requests evenly among multiple servers in such a way that the load distribution is transparent to users. Load balancing thus helps in achieving optimal resource utilization, maximizing throughput, minimizing response time, and avoiding overload. NSX-V Edge provides load balancing up to Layer 7.

You map an external, or public, IP address to a set of internal servers for load balancing. The load balancer accepts TCP, UDP, HTTP, or HTTPS requests on the external IP address and decides which internal server to use. Port 80 is the default port for HTTP and port 443 is the default port for HTTPS.

2.10.5.1 Before you begin

- You must have a working NSX-V Edge instance before you can configure load balancing. For information on setting up NSX-V Edge, see NSX-V Edge Configuration or VMware Cloud Director edge gateways.
- For information on configuring an NSX-V Edge certificate, see Certificate Authentication.
- Select the layer of load balancing (L7 or L4) by clicking on the Type selection icon in the top right corner of the screen.
- Select the level of logging from the Log level drop-box in the top right corner of the screen. Note that Emergency is the least detailed level of logging, and Debug is the most detailed level of logging.

On this page:

- Before you begin
- Add Application Profiles
- Edit Application Profiles
- Add Service Monitors
- Edit Service Monitors
- Add Server Pools
- Edit Server Pools
- Add Application Rules
- Edit Application Rules
- Add Virtual Servers
- Edit Virtual Servers
2.10.5.2 Add Application Profiles

To add an application profile:

1. Go to Control Panel > vCloud > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.
2. Select Application Profiles tab.
3. Click the "+" button on the top of the page.
4. On the page that appears, specify the following parameters:
   - **Name** - enter the name of the application profile
   - **Type** - select the type of traffic (TCP, HTTP, HTTPS or UDP). Depending on the type of traffic, specify the following parameters:

**Click to view the list of parameters**

For TCP or UDP
- **Persistence** - select the persistence type (Source IP, MSRDP or none)
- **Expires** - enter the persistence expiration time in seconds. The default value is 60 seconds.

For HTTP
- **Persistence** - select the persistence type (Source IP, Cookie or none)
- **HTTP Redirect URL** - enter the URL to which you want to redirect the HTTP traffic
- **Mode** - if you selected the Cookie persistence type, select the mode of inserting the cookie (insert, prefix or App session)
- **Cookie name** - if you selected the Cookie persistence type, enter the cookie name
- **Expires** - enter the persistence expiration time in seconds. The default value is 60 seconds.
- **Insert X-Forwarded-For HTTP header** - move the slider to the right to identify the originating IP address of a client connecting to a Web server through the load balancer

For HTTPS
- **Enable SSL Passthrough** - move the slider to the right to enable SSL passthrough
- **HTTP Redirect URL** - enter the URL to which you want to redirect the HTTP traffic
- **Persistence** - select the persistence type (Source IP, Cookie or none)
- **Mode** - if you selected the Cookie persistence type, select the mode of inserting the cookie (insert, prefix or App session)
- **Cookie name** - if you selected the Cookie persistence type, enter the cookie name
- **Expires** - enter the persistence expiration time in seconds. The default value is 60 seconds.
- **Enable pool side SSL** - move the slider to the right to enable the HTTPS communication between the load balancer and the back-end servers
- Insert X-Forwarded-For HTTP header - move the slider to the right to identify the originating IP address of a client connecting to a Web server through the load balancer
- Cipher - enter a cipher algorithm
- Client Auth - select whether to ignore or accept client authentication
- Virtual server certificates - select server certificates, CA certificates and CRLs certificates to authenticate the load balancer from the server side

5. Click the Save button.

2.10.5.3 Edit Application Profiles

To edit application profile:

1. Go to Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.
2. Select Application Profiles tab.
3. Click the icon next to the application profile you want to edit.
4. On the page that loads, edit the following parameters:
   - Name - enter the name of the application profile
   - Type - select the type of traffic (TCP, HTTP, HTTPS or UDP). Depending on the type of traffic, specify the following parameters:

Click to view the list of parameters

For TCP or UDP
- Persistence - select the persistence type (Source IP, MSRD or none)
- Expires - enter the persistence expiration time in seconds. The default value is 60 seconds.

For HTTP
- Persistence - select the persistence type (Source IP, Cookie or none)
- HTTP Redirect URL - enter the URL to which you want to redirect the HTTP traffic
- Mode - if you selected the Cookie persistence type, select the mode of inserting the cookie (insert, prefix or App session)
- Cookie name - if you selected the Cookie persistence type, enter the cookie name
- Expires - enter the persistence expiration time in seconds. The default value is 60 seconds.
- **Insert X-Forwarded-For HTTP header** - move the slider to the right to identify the originating IP address of a client connecting to a Web server through the load balancer.

For HTTPS:
- **Enable SSL Passthrough** - move the slider to the right to enable SSL passthrough.
- **HTTP Redirect URL** - enter the URL to which you want to redirect the HTTP traffic.
- **Persistence** - select the persistence type (Source IP, Cookie or none).
- **Mode** - if you selected the Cookie persistence type, select the mode of inserting the cookie (insert, prefix or App session).
- **Cookie name** - if you selected the Cookie persistence type, enter the cookie name.
- **Expires** - enter the persistence expiration time in seconds. The default value is 60 seconds.
- **Enable pool side SSL** - move the slider to the right to enable the HTTPS communication between the load balancer and the back-end servers.
- **Insert X-Forwarded-For HTTP header** - move the slider to the right to identify the originating IP address of a client connecting to a Web server through the load balancer.
- **Cipher** - enter a cipher algorithm.
- **Client Auth** - select whether to ignore or accept client authentication.
- **Virtual server certificates** - select server certificates, CA certificates and CRLs certificates to authenticate the load balancer from the server side.

5. Click the **Save** button.

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2.10.5.4 Add Service Monitors

To add service monitors:

1. Go to **Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers** tab.
2. Select Service Monitoring tab.
3. Click the "+" button on the top of the page.
4. On the page that appears specify the following parameters:
   - **Name** - enter a name for the service monitor
   - **Interval** - enter the interval in seconds in which a server is to be tested
   - **Timeout** - the maximum time in seconds within which a response from the server must be received
   - **Max retries** - enter the number of times the server is tested before it is declared DOWN
   - **Method** - select the method to detect server status from the drop-down menu: GET, OPTIONS, or POST (GET, OPTIONS or POST)
   - **URL** - Enter the URL to GET or POST ("/" by default).
Expected - Enter the string that the monitor expects to match in the status line of HTTP response in the Expected section. This is a comma-separated list. For example, 200,301,302,401.

Send - enter the string sent to the back-end server after a connection is established. The maximum permitted string length is 256 characters.

Receive - enter the string to be matched. This string can be a header or in the body of the response. When the received string matches this definition, the server is considered UP.

Extension - enter advanced monitor parameters as key=value pairs in the Extension section

5. Click the Save button.

2.10.5.5 Edit Service Monitors
To edit service monitors:

1. Go to Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.

2. Select Service Monitoring tab.

3. Click the pencil icon next to the service monitor you want to edit.

4. On the page that loads, edit the following parameters:
   o Name - enter a name for the service monitor
   o Interval - enter the interval in seconds in which a server is to be tested
   o Timeout - the maximum time in seconds within which a response from the server must be received
   o Max retries - enter the number of times the server is tested before it is declared DOWN
   o Method - select the method to detect server status from the drop-down menu: GET, OPTIONS, or POST. (GET, OPTIONS or POST)
   o URL - enter the string that the monitor expects to match in the status line of HTTP response in the Expected section. This is a comma-separated list.
   o For example, 200,301,302,401.
2.10.5.6 Add Server Pools

To add server pools to manage load balancer distribution:

1. Go to Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway’s label > Load Balancers tab.

2. Select Pools tab.

3. Click the "+" button on the top of the page.

4. On the page that appears specify the following parameters:

   o **Name** - enter a name of the server pool
   o **Description** - additional description if any
   o **Monitor** - select an existing default or custom monitor from the Monitors drop-down menu
   o **Transparent** - move the slider to the right to make client IP addresses visible to the back-end servers
   o **Members** - enter the name and IP address of the server member
     - **Weight** - enter the proportion of traffic this member can handle
     - **Monitor port** - enter the monitor port where the member is to receive health monitor pings
     - **Port** - enter the port where the member is to receive traffic
     - **Min Conn.** - enter the minimum number of concurrent connections that a member must always accept
     - **Max Conn.** - enter the maximum number of concurrent connections that the member can handle. If the incoming requests go higher than the maximum, they are queued and wait for a connection to be released.

5. Click the **Save** button.
2.10.5.7  Edit Server Pools

To edit load balancer pools:

1. Go to **Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.**

2. Select Pools tab.

3. Click the ✎ icon next to the service monitor you want to edit.

4. On the page that loads, edit the following parameters:
   - **Name** - enter a name of the server pool
   - **Description** - additional description if any
   - **Monitor** - select an existing default or custom monitor from the Monitors drop-down menu
   - **Transparent** - move the slider to the right to make client IP addresses visible to the back-end servers
   - **Members** - enter the name and IP address of the server member
     - **Weight** - enter the proportion of traffic this member can handle
     - **Monitor port** - enter the monitor port where the member is to receive health monitor pings
     - **Port** - enter the port where the member is to receive traffic
     - **Min Conn.** - enter the minimum number of concurrent connections that a member must always accept
     - **Max Conn.** - enter the maximum number of concurrent connections that the member can handle. If the incoming requests go higher than the maximum, they are queued and wait for a connection to be released.

5. Click the **Save** button.

2.10.5.8  Add Application Rules

To add application rules:

1. Go to **Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.**

2. Select Application Rules tab.

3. Click the "+" button on the top of the page.

4. On the page that appears specify the following parameters:
   - **Name** - enter a name for an application rule
5. Click the **Save** button.

### 2.10.5.9 Edit Application Rules
**To edit application rules:**

1. Go to **Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.**

2. **Select Application Rules tab.**

3. Click the **edit** icon next to the service monitor you want to edit.

4. On the page that loads, edit the following parameters:
   - **Name** - enter a name for an application rule
   - **Script** - type the name and script for the rule. For information about the application rule syntax, see [http://cbonte.github.io/haproxy-dconv/](http://cbonte.github.io/haproxy-dconv/).

5. Click the **Save** button.

### 2.10.5.10 Add Virtual Servers
**To add an NSX-V Edge internal or uplink interface as a virtual server:**

1. Go to **Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.**

2. **Select Virtual Servers tab.**

3. **On the page that appears you will see the list of virtual servers together with their details:**
   - **Name** - enter a name of a virtual server
   - **Application profile** - select application profile associated with this VS from the drop-down menu
   - **Enable virtual server** - move the slider to the right to make this virtual server available for use
   - **Enable acceleration** - move the slider to the right to enable acceleration for the load balancer to use the faster L4 load balancer engine rather than L7 load balancer engine
   - **Description** - add description if any
   - **IP Address** - enter an IP address that the load balancer is listening on
   - **Protocol** - select the protocol that the virtual server handles
   - **Port** - enter the port number that the load balancer listens on
   - **Default pool** - select the default VSs pool
   - **Conn limit** - enter the maximum concurrent connections that the virtual server can process
   - **Conn rate limit** - enter the maximum incoming new connection requests per second section
   - **Selected rules** - add the application rule to associate it with the virtual server

4. Click the **Save** button.
2.10.5.11 Edit Virtual Servers

To edit virtual servers:

1. Go to Control Panel > vCloud > Edge Gateways > NSX-V Edge Gateways > Edge gateway's label > Load Balancers tab.

2. Select Virtual Servers tab.

3. On the page that appears, edit the following parameters:
   - Name - enter a name of a virtual server
   - Application profile - select application profile associated with this VS from the drop-down menu
   - Enable virtual server - move the slider to the right to make this virtual server available for use
   - Enable acceleration - move the slider to the right to enable acceleration for the load balancer to use the faster L4 load balancer engine rather than L7 load balancer engine
   - Description - add description if any
   - IP Address - enter an IP address that the load balancer is listening on
   - Protocol - select the protocol that the virtual server handles
   - Port - enter the port number that the load balancer listens on
   - Default pool - select the default VSs pool
   - Conn limit - enter the maximum concurrent connections that the virtual server can process
   - Conn rate limit - enter the maximum incoming new connection requests per second section
   - Selected rules - add the application rule to associate it with the virtual server

4. Click the Save button.
2.10.6 NSX-V IPSec VPN

Internet Protocol Security (IPSec) VPN ensures secure and private communications over Internet Protocol (IP) networks. It authenticates and encrypts IP packets between two endpoints. A site-to-site VPN allows offices in multiple fixed locations to establish secure connections with each other over a public network such as the internet. Site-to-site VPN extends the company's network, making computer resources from one location available to employees at other locations. The goal is to securely connect two or more LAN networks and allow full communication between them, without any restrictions.

On this page:

- Manage IPSec VPN Service
- Add IPSec VPN Site
- Edit IPSec VPN Site
- Certificate Authentication
- Delete IPSec VPN Site

See also:

- NSX-V L2 VPN
- NSX-V Managers in OnApp
- NSX-V Firewalls

2.10.6.1 Manage IPSec VPN Service

To manage IPSec VPN service for a specific edge gateway:

1. Go to your Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways tab.
2. Click the label of the necessary NSX-V edge gateway from the list of all NSX-V gateways in your cloud.
3. Go to the IPSec VPN tab.
4. You can manage the following options for the entire service for a specific edge:
   - Service status - move the slider to the right to enable IPSec VPN service for this edge gateway
   - Global shared key - the global pre-shared key (PSK) that is shared by all the sites whose peer endpoint is set to Any

   If a global PSK is already set, changing the PSK to an empty value and saving it has no effect on the existing setting.

   - - click to edit the global shared key
   - - click to preview the global shared key
   - Log level - select one of the following options, where Emergency is the least detailed level of logging, and Debug is the most detailed level of logging)
2.10.6.2 Add IPSec VPN Site

OnApp IPSec VPN has two different session types: policy-based and route-based. With the policy-based IPSec VPN session type, you can connect multiple local subnets behind the NSX-V Edge with the peer subnets on the remote VPN site by using IPSec tunnels. Alternatively, if you select the route-based IPSec VPN session type, virtual tunnel interfaces (VTI) are created on the ESG appliance. Each VTI is associated with an IPSec tunnel. The encrypted traffic is routed from one site to another site through the VTI interfaces. IPSec processing happens only at the VTI interfaces.

To add an IPSec VPN site:

1. Go to your Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways tab.
2. Select the necessary NSX-V edge gateway from the list of all NSX-V gateways in your cloud.
3. Go to the IPSec VPN tab > click the IPSec VPN sites tab below.
4. Click the button above the table.
5. In the window that appears, specify the following parameters:
   - **Name** - specify the name of the IPSec VPN site
   - **Enabled** - move the slider to the right to enable this IPSec VPN site
   - **Enabled PFS** - move the slider to the right to enable Perfect Forward Secrecy for this site
   - **Local ID** - enter the local ID to identify the local NSX-V edge instance. This local ID is the peer ID on the remote site. Preferably, use the public IP address of the VPN or a fully qualified domain name (FQDN) for the VPN service as the local ID.
   - **Local Endpoint** - enter an IP address or an FQDN of the local endpoint. If you are adding an IP-to-IP tunnel using a pre-shared key, the local ID and local endpoint IP can be the same.
   - **Local subnets** - enter the subnets to share between the IPSec VPN sites in the CIDR format. Use a comma separator to enter multiple subnets.

   The local subnets behind an NSX-V edge must have address ranges that do not overlap with the IP addresses on the peer VPN site. If the local and remote peer across an IPsec VPN tunnel have overlapping IP addresses, traffic forwarding across the tunnel might not be consistent.

   - **Peer ID** - enter the Peer ID to identify the peer site:
     - For peers using certificate authentication, this ID must be the distinguished name (DN) in the peer’s certificate. Enter the DN of the certificate as a range of comma-separated values in the following order without spaces: C=xxx,ST=xxx,L=xxx,O=xxx,OU=xxx,CN=xxx,E=xxx.
     - For PSK peers, the peer ID can be any text value. Preferably, use the public IP address of the VPN or an FQDN for the VPN service as the peer ID.
o **Peer endpoint** - enter an IP address or an FQDN of the peer endpoint. The default value is any. If you retain the default value, you must configure the Global PSK.

o **Peer subnet** - enter the internal IP address of the peer subnet in the CIDR format. Use a comma separator to type multiple subnets.

o **Encryption algorithm** - select one of the following supported encryption algorithms from the dropbox:
  - AES (AES128-CBC)
  - AES256 (AES256-CBC)
  - Triple DES (3DES192-CBC)
  - AES-GCM (AES128-GCM)

o **Authentication** - select one of the following options:
  - **PSK (Pre Shared Key)** - indicates that the secret key shared between NSX-V edge and the peer site is to be used for authentication. The secret key can be a string with a maximum length of 128 bytes. PSK authentication is disabled in FIPS mode.
  - **Certificate** - indicates that the certificate defined at the global level is to be used for authentication.

o **Shared key** - the global pre-shared key (PSK) is shared by all the sites whose peer endpoint is set to ‘any’. If a global PSK is already set, changing the PSK to an empty value and saving it has no effect on the existing setting.

o **Diffie-Hellman Group** - select one of the following cryptography schemes that allows the peer site and the NSX-V edge to establish a shared secret over an insecure communications channel:
  - **DH-2** (not available when the FIPS mode is enabled)
  - **DH-5** (not available when the FIPS mode is enabled)
  - **DH-14** (a default selection for both FIPS and non-FIPS mode)
  - **DH-15**
  - **DH-16**

o **Extension** - type one of the following:
  - `securelocaltrafficbyip=IPAddress` to redirect Edge local traffic over the IPSec VPN tunnel. IP address is the default value.
  - `passthroughSubnets=PeerSubnetIPAddress` to support overlapping subnets.

o **Digest Algorithm** - select one of the following secure hashing algorithms:
  - **SHA1**
  - **SHA_256**

o **IKE Option** - select one of the following Internet Key Exchange (IKE) protocols to set up a security association (SA) in the IPSec protocol suite:
  - **IKEv1** - when you select this option, IPSec VPN initiates and responds to IKEv1 protocol only
  - **IKEv2** - when you select this option, IPSec VPN initiates and responds to IKEv2 protocol only
  - **IKE-Flex** - when you select this option, and if the tunnel establishment fails with IKEv2 protocol, the source site does not fall back and initiate a connection with the IKEv1 protocol. Instead, if the remote site initiates a connection with the IKEv1 protocol, then the connection is accepted
If you configure multiple sites with the same local and remote endpoints, make sure that you select the same IKE version and PSK across all these IPSec VPN sites.

- **IKE Responder Only** - move the slider to the right to operate IPSec VPN in a responder-only mode. In this mode, IPSec VPN never initiates a connection.
- **Session Type** - select one of the possible options:
  - **policy based** - select to use the policy-based IPSec VPN
  - **route-based** - select to use the route-based IPSec VPN. If you select this session type, fill in the following additional fields that will appear:
    - **Tunnel Interface IP CIDR**
    - **Tunnel Interface MTU** - default value is 1476. Valid values are in the range from 92 to 8976

4. Click the **Save** button above the table to apply the changes.

### 2.10.6.3 Edit IPSec VPN Site

To edit the details of an IPSec VPN site:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > **NSX-V Edge Gateways**.
2. Select the necessary NSX-V edge gateway from the list of all NSX-V gateways in your cloud.
3. Go to the **IPSec VPN** tab > click the **IPSec VPN sites** tab below.
4. Click the **edit** icon next to the required IPSec VPN site.
5. Make the necessary changes in the window that appears.
Click here to view the description of parameters available for editing.

- **Name** - specify the name of the IPSec VPN site
- **Enabled** - move the slider to the right to enable this IPSec VPN site
- **Enabled PFS** - move the slider to the right to enable Perfect Forward Secrecy for this site
- **Local ID** - enter the local ID to identify the local NSX-V edge instance. This local ID is the peer ID on the remote site. Preferably, use the public IP address of the VPN or a fully qualified domain name (FQDN) for the VPN service as the local ID.
- **Local Endpoint** - enter an IP address or an FQDN of the local endpoint. If you are adding an IP-to-IP tunnel using a pre-shared key, the local ID and local endpoint IP can be the same.
- **Local subnets** - enter the subnets to share between the IPSec VPN sites in the CIDR format. Use a comma separator to enter multiple subnets.
- **Peer ID** - enter the Peer ID to identify the peer site:
  - For peers using certificate authentication, this ID must be the distinguished name (DN) in the peer's certificate. Enter the DN of the certificate as a range of comma-separated values in the following order without spaces:
    
    C=xxx,ST=xxx,L=xxx,O=xxx,OU=xxx,CN=xxx,E=xxx.
  - For PSK peers, the peer ID can be any text value. Preferably, use the public IP address of the VPN or an FQDN for the VPN service as the peer ID.
- **Peer endpoint** - enter an IP address or an FQDN of the peer endpoint. The default value is **any**. If you retain the default value, you must configure the Global PSK.
- **Peer subnet** - enter the internal IP address of the peer subnet in the CIDR format. Use a comma separator to type multiple subnets.
- **Encryption algorithm** - select one of the following supported encryption algorithms from the dropdown:
  - AES (AES128-CBC)
  - AES256 (AES256-CBC)
  - Triple DES (3DES192-CBC)
  - AES-GCM (AES128-GCM)
- **Authentication** - select one of the following options:
  - **PSK (Pre Shared Key)** - indicates that the secret key shared between NSX-V Edge and the peer site is to be used for authentication. The secret key can be a string with a maximum length of 128 bytes.
    
    PSK authentication is disabled in FIPS mode.
  - **Certificate** - indicates that the certificate defined at the global level is to be used for authentication.
- **Shared key** - the global pre-shared key (PSK) is shared by all the sites whose peer endpoint is set to 'any'. If a global PSK is already set, changing the PSK to an empty value and saving it has no effect on the existing setting.
- **Diffie-Hellman Group** - select one of the following cryptography schemes that allows the peer site and the NSX-V Edge to establish a shared secret over an insecure communications channel:
  - **DH-2** (not available when the FIPS mode is enabled)
  - **DH-5** (not available when the FIPS mode is enabled)
  - **DH-14** (a default selection for both FIPS and non-FIPS mode)
  - **DH-15**
  - **DH-16**
• **Extension** - type one of the following:
  - `securelocaltrafficbyip=IPAddress` to redirect Edge local traffic over the IPSec VPN tunnel. IP address is the default value.
  - `passthroughSubnets=PeerSubnetIPAddress` to support overlapping subnets.

• **Digest Algorithm** - select one of the following secure hashing algorithms:
  - SHA1
  - SHA_256

• **IKE Option** - select one of the following Internet Key Exchange (IKE) protocols to set up a security association (SA) in the IPSec protocol suite
  - `IKEv1` - when you select this option, IPSec VPN initiates and responds to IKEv1 protocol only.
  - `IKEv2` - when you select this option, IPSec VPN initiates and responds to IKEv2 protocol only.
  - `IKE-Flex` - when you select this option, and if the tunnel establishment fails with IKEv2 protocol, the source site does not fall back and initiate a connection with the IKEv1 protocol. Instead, if the remote site initiates a connection with the IKEv1 protocol, then the connection is accepted.

If you configure multiple sites with the same local and remote endpoints, make sure that you select the same IKE version and PSK across all these IPSec VPN sites.

• **IKE Responder Only** - move the slider to the right to operate IPSec VPN in a responder-only mode. In this mode, IPSec VPN never initiates a connection.

• **Session Type** - select one of the possible options:
  - `policy based` - select to use the policy-based IPSec VPN
  - `route-based` - select to use the route-based IPSec VPN. If you select this session type, the following additional fields will appear:
    - `Tunnel Interface IP CIDR`
    - `Tunnel Interface MTU` - default value is 1476. Valid values are in the range from 92 to 8976

6. Click the **Save** button above the table to apply the changes.

### 2.10.6.4 Certificate Authentication

If you select Certificate as an Authentication option for an IPSec VPN site, it is required to enable **Certificate Authentication**. It is not possible to upload a certificate on OnApp side; the certificates are imported to OnApp from vCloud as you import the edge gateway (if there were any certificates assigned on the vCloud side).

Self-signed certificates cannot be used for IPSec VPN.

To configure certificate authentication for IPSec VPN:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > **NSX-V Edge Gateways**.
2. Select the necessary NSX-V edge gateway from the list of all NSX-V gateways in your cloud.

3. Go to the IPSec VPN tab.

4. Move the Enable Certificate Authentication slider to the right to enable service authentication.

5. On the page that appears, select the necessary service certificates, CA certificates and CRLs certificates.

2.10.6.5 Delete IPSec VPN Site

To delete an IPSec VPN site:

1. Go to your Control Panel > Cloud > Edge Gateways > NSX-V Edge Gateways.

2. Click the label of the NSX-V edge gateway the necessary IPSec VPN was added to.

3. Click the IPSec VPN tab.

4. Click the IPSec VPN sites tab below. On the page that appears, you will see the list of IPSec VPN sites added to this NSX-V edge gateway.

5. Click the line with the required IPSec VPN site to select it.

6. Once selected, click the button that appeared above the table to delete the IPSec VPN site.

7. Click the Save button above the table to apply the changes.

2.10.7 NSX-V L2 VPN

With L2 VPN, you can stretch multiple logical networks (both VLAN and VXLAN) between different physical sites. In addition, you can configure multiple sites on an L2 VPN server. L2 VPN allows you to extend your datacenter by allowing virtual machines to retain network connectivity across geographical boundaries. Virtual servers remain on the same subnet when they are moved between sites and their IP addresses do not change.

NSX-V L2 VPN configuration consists of three steps:

1. Configuration of your destination edge - L2 VPN server

2. Adding peer sites to the L2 VPN server

3. Configuration of your source edge - L2 VPN client

Before you proceed further, please note that:

- The Any action on L2 VPN service and Any action on L2 VPN peer site permissions should be enabled for a user who wants to use NSX-V L2 VPN.

- You must enable the L2 VPN service on both the server and the client. For that, use the L2 VPN slider located at the top left corner of the screen.

On this page:
• **Edit L2 VPN Server**
• **Add Peer Sites to L2 VPN Server**
• **Edit Peer Sites**
• **Edit L2 VPN Client**
• **Edit Advanced Client Settings**

See also:
• **NSX-V Firewalls**
• **NSX-V IPSec VPN**
• **NSX-V Load Balancers**

2.10.7.1 Edit L2 VPN Server
Configure L2 VPN Server which is the destination NSX-V edge to which the client is to be connected.

To configure L2 VPN server:

1. Go to *Dashboard > Cloud > Edge Gateways > NSX-V Edge Gateways* tab.
2. Click the label of the NSX-V edge gateway for which you want to configure the server.
3. Click the L2 VPN tab, then click *Server > Server Global* tab.
4. On the page that follows edit the following fields:
   - **Listener IP** - enter the primary or secondary IP address of an external interface of the NSX-V edge
   - **Listener Port** - edit the port number for the L2 VPN service
   - **Encryption algorithm** - select one or more encryption algorithms to encrypt the communication between the server and the client
   - **Validate server certificate** - move the slider to the right to enable the certificate to be bound to SSL VPN server, then select the certificate from the list that appears
5. Click the **Save** button at the top of the page.

Next, you can add and configure multiple sites on an L2 VPN server.

2.10.7.2 Add Peer Sites to L2 VPN Server
To add new peer sites:

1. Go to *Dashboard > Cloud > Edge Gateways > NSX-V Edge Gateways* tab.
2. Click the label of the NSX-V edge gateway for which you want to configure the server.
3. Click the L2 VPN tab, then click *Server > Server Sites* tab.
4. On the page that follows, edit the following details:
   - **Name** - enter a unique name for the peer site
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- **Enabled** - move the slider to the left to disable the newly added peer site
- **Description** - add a description of your peer site
- **User ID** - enter a user name with which the peer site is to be authenticated
- **User password** - enter a password with which the peer site is to be authenticated
- **Confirm password** - confirm the password
- **Select sub-interfaces** - select the sub interfaces to be stretched with the client
- **Egress optimization gateway address** - enter the gateway IP addresses for which the traffic is to be locally routed or for which the traffic is to be blocked over the tunnel

Can be used if the default gateway for virtual servers is the same across the two sites. Provide the list of IP addresses separated by comma, e.g. 191.1.1.1, 192.1.1.1

5. Click the **Save** button.

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2.10.7.3 Edit Peer Sites

To edit peer sites:

1. Go to **Dashboard > Cloud > Edge Gateways > NSX-V Edge Gateways** tab.
2. Click the label of the NSX-V edge gateway for which you want to configure the server.
3. Click the **L2 VPN** tab, then click **Server > Server Sites** tab.
4. Click the icon next to the label of the peer site you want to edit.
5. On the page that loads, edit the following details:
   - **Name** - enter a unique name for the peer site
   - **Enabled** - move the slider to the left to disable the newly added peer site
   - **Description** - add a description of your peer site
   - **User ID** - enter a user name with which the peer site is to be authenticated
   - **User password** - enter a password with which the peer site is to be authenticated
   - **Confirm password** - confirm the password
   - **Select sub-interfaces** - select the sub interfaces to be stretched with the client

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2.10.7.4 Edit L2 VPN Client

To edit L2 VPN client:

1. Go to Dashboard > Cloud > Edge Gateways > NSX-V Edge Gateways tab.
2. Click the label of the NSX-V edge gateway for which you want to configure the server.
3. Click the L2 VPN tab, then click Client > Client Global tab.
4. On the page that loads, edit the following details:
   - Server address - enter the address of the L2 VPN server to which this client is to be connected
   - Server port - edit the default port to which the L2 VPN client must connect to, if necessary
   - Encryption algorithm - select the encryption algorithm for communicating with the server
   - Select sub-interfaces - to select the sub interfaces to be stretched to the server
   - Egress optimization gateway address - enter the gateway IP address of the sub interfaces or the IP addresses to which traffic should not flow over the tunnel
   - User ID - enter a user name with which the server is to be authenticated
   - User password - enter a password with which the peer site is to be authenticated
   - Confirm password - confirm the password
5. Click the Save button at the top of the page.

2.10.7.5 Edit Advanced Client Settings

When a client edge does not have direct access to the Internet and must reach the source (server) NSX-V edge through a proxy server, you must specify proxy server settings as follows:

1. Go to Dashboard > Cloud > Edge Gateways > NSX-V Edge Gateways menu.
2. Click the label of the NSX-V edge gateway for which you want to configure the server.
3. Click the L2 VPN tab, then click Client > Client Advanced tab.
4. On the page that loads, edit the following details:
   - Enable secure proxy - move the slider to the right to enable only secure proxy connections
     - Proxy address - enter the proxy server address
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- **Proxy port** - enter the proxy server port
- **Proxy user name** - enter a user name with which the proxy server is to be authenticated
- **Proxy user password** - enter a user password with which the proxy server is to be authenticated
  - **Use system generated certificate** - move the slider to the right to use system generated certificate

5. Click the **Save** button at the top of the page.

### 2.11 NSX-T Integration

There are two types of NSX software-defined networking platforms — NSX-V and NSX-T.

NSX-T was created for different virtualization platforms and multi-hypervisor environments. NSX-V (for vSphere) supports SDN for only VMware vSphere, NSX-T supports network virtualization stack for KVM, Docker, Kubernetes, and OpenStack as well as AWS native workloads. NSX-T can be deployed without a vCenter Server and is adopted for heterogeneous compute systems.

In this chapter, you can find the following information on how to manage NSX-T integration with VMware Cloud Director:

- Create and Manage NSX-T Edge Gateways
- NSX-T Firewall Rules

#### 2.11.1 Create and Manage NSX-T Edge Gateways

NSX-T edge gateways provide routing services and connectivity to networks that are external to the NSX-T deployment. On this page, you will find information on how to create and manage NSX-T edge gateways.

On this page:

- View NSX-T Edge Gateways
- Create NSX-T Edge Gateway
  - Step 1 of 4. General
  - Step 2 of 4. External Networks
  - Step 3 of 4. Allocated IPs
  - Step 4 of 4. Summary
- Edit NSX-T Edge Gateway
2.11.1.1 View NSX-T Edge Gateways

To view edge gateways:
1. Go to your Control Panel > Cloud > Edge Gateways > NSX-T tab.
2. The page that loads will show the list of NSX-T edge gateways together with their:
   - **Label** - the name of the edge gateway
   - **User group** - the user group with which the edge gateway is associated
   - **Organization** - the organization with which the edge gateway is associated
   - **Resource pool** - the resource pool with which the edge gateway is associated

2.11.1.2 Create NSX-T Edge Gateway

To create NSX-T edge gateway:
1. Go to your Control Panel > Cloud > Edge Gateways > NSX-T and click the "+" button above the table or New NSX-T Edge Gateway below. This will start an edge gateway creation wizard.
2. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.
3. Click the New Edge Gateway button to start the creation process. You will be taken to the edge gateway details screen.

2.11.1.2.1 Step 1 of 4. General
1. Fill in the following details:
   - **Label** - indicate the label of the edge gateway
   - **Description** - write additional info about the edge gateway
   - **Enable distributed routing** - select the check box to enable distributed routing
   - **Organization** - select the organization with which the edge gateway will be associated from the drop-down list
   - **Resource Pool** - select the appropriate resource pool from the drop-down list
2. Click Next to proceed to the following step of the wizard where you can specify the external networks.

2.11.1.2.2 Step 2 of 4. External Networks

At this step, choose external networks to which your edge gateway will be connected:
2.11.1.2.3 Step 3 of 4. Allocated IPs
1. Fill in the following details:
   - **Primary IP** - public IP address of edge gateway
   - **Allocate IP range** - allocated IP addresses of an external network to an edge gateway, where:
     - **Start address** - the start of the IP addresses range
     - **End address** - the end of the IP addresses range
   2. Click Next to proceed to the following step of the wizard where you can specify the external networks.

2.11.1.2.4 Step 4 of 4. Summary
At this step, you can find the configuration summary of the edge gateway, which will be created. You can view the external networks with their IP nets, IP addresses, incoming and outgoing rate limits.

The page that loads will provide you with the following information:
- **Label** - the label of the edge gateway
- **Description** - additional info about the edge gateway
- **Enable distributed routing** - true if distributed routing is enabled, otherwise false
- **Organization** - the organization with which the edge gateway will be associated with
- **Resource Pool** - the resource pool with which the edge gateway is associated
- **External Network** - the external networks to which your edge gateway is connected
- **Allocated IP** - allocated IP addresses of an external network to an edge gateway

After you check all parameters, click the Submit to start the creation process.

2.11.1.3 Edit NSX-T Edge Gateway
To edit the details of an edge gateway, click the Actions icon next to the one you want to edit. On the page the load, you can change the following:
- **Label** - the label of the edge gateway
- **Description** - additional info about the edge gateway

Click Submit to save the changes.

2.11.1.4 Delete NSX-T Edge Gateways
To delete edge gateway:
1. Go to your Control Panel > Cloud > Edge Gateways > NSX-T.
2. Click the Actions icon next to the edge gateway you want to remove, then choose Delete.
3. Confirm the deletion.

2.11.2 NSX-T Firewall Rules
NSX-T firewall is a set of customizable rules, which protect the system against network threats. NSX-T firewall rules are completely synchronized with the vCloud, so regardless of the
side from where you are updating the firewalls, all updates are visible on your OnApp Control Panel.

In OnApp, you can manage the firewall rule separately for each NSX-T edge gateway in your cloud. You can also configure the details of sources and destinations for each rule. Please note that at this point we support only firewall rules with IPv4 type.

On this page:

- Create NSX-T Firewall Rule
- Edit NSX-T Firewall Rule
- Delete NSX-T Firewall Rule

See also:
- NSX-T Integration
- Create and Manage NSX-T Edge Gateways

2.11.2.1 Create NSX-T Firewall Rule

To add a new firewall rule:

1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Select the NSX-T tab.
3. Click the label of the necessary NSX-T edge gateway.
4. Click the Firewall Rules tab to see the list of the firewall rules.
5. Click the row above the table. A new row will appear in the table of firewall rules with the default data. You can add the desired amount of rows by clicking .
6. Hover over the row that appeared and specify the following parameters:
   - **Label** - name of the rule.
   - **Sources** - click to add IP sets and security groups imported from the vCloud side. Select the necessary options from the list and then click **Save** to save the changes.
   - **Destinations** - click to add IP sets and security groups imported from the vCloud side. Select the necessary options from the list and then click **Save** to save the changes.
   - **Applications** - click , select the needed application port profiles, then click **Save**.

   If you don't specify any source, application, or destination value, it will be displayed as "Any" by default.

1. **Directions** – the options are In, Out, and In/Out. The default is In/Out. This field refers to the direction of traffic from the point of view of the destination object. In means that only traffic to the object is checked, Out means that only traffic from the object is checked, and In/Out means traffic in both directions is checked. Click to specify that the traffic from or to the specified source(s), destination(s), and service(s) will be accepted by the firewall.
- **Actions** – the action applied by the rule can be **Accept** or **Deny**. The default is **Accept**. Click to specify that the traffic from or to the specified source(s), destination(s), and service(s) will be allowed by the firewall.

- **Logging** - move the slider to the right to enable logging for this rule.

6. Click **Save** below the table to apply the changes.

- To select all firewall rules on the list, hover over the top left corner of the table, and tick the checkbox that appears.
- To revert the last changes applied, click **Discard Changes** below the table.
- To see only the enabled rules, move the **Only Enabled** slider above the table to the right.

---

2.11.2.2 Edit NSX-T Firewall Rule

To edit a firewall rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > **NSX-T** tab.
2. Click the label of the necessary NSX-T edge gateway.
3. Click the **Firewall Rules** tab to see the list of the firewall rules. Find the necessary rule and make the necessary changes in the corresponding row.

Click to view the description of parameters available for editing.

- **Status** - move the slider on the **Status** column to the right to enable the rule. If the rule is enabled, move the slider to the left to disable it.
- **Label** - click to change the name of the rule.
- **Sources** - as you hover over the required row, the **+** button will appear:
  - Click **+** to add IP sets and security groups imported from the vCloud side. Select the necessary options from the list and then click **Save** to save the changes.
  - Click **-** near a source if you want to remove it.
- **Destinations** - as you hover over the required row, the **+** button will appear:
▪ Click ▶ to configure the IP sets and security groups imported from vCloud side for this rule. Select the necessary options from the list and then click Save to save the changes.

▪ Click ⇧ near a destination if you want to remove it

  o Applications - as you hover over the required row, the ➕ button will appear:
    ▪ Click ➕ to configure the application port profiles for this rule. Select the necessary options from the list and then click Save to save the changes.
    ▪ Click ▼ near an application port profile if you want to remove it.

If you don't specify any source, destination, or service value, it will be displayed as "Any" by default.

a. ▪ Directions - click to specify that the traffic from or to the specified source(s), destination(s), and service(s) will be accepted by the firewall.
  ▪ Actions - click to specify that the traffic from or to the specified source(s), destination(s), and service(s) will be allowed by the firewall.
  ▪ Logging - move the slider to the right to enable logging for this rule.

4. Click Save below the table to apply the changes.

2.11.2.3 Delete NSX-T Firewall Rule
To delete a firewall rule:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Select the NSX-T tab.
3. Click specific Edge Gateway’s label.
4. Click the Firewall Rules tab.
5. On the page that appears, you will see the list of firewall rules. Select a rule you want to delete from the list, and then click the ➖ button above the table.
6. Click the Save button below the table to apply the changes.
3 User Guide

The User Guide is updated based on features, improvements, and fixes implemented for VCD within the latest OnApp version that is OnApp 6.3. For earlier versions of the documentation, refer to Previous Versions.

The VMware Cloud Director User Guide provides information on how you can manage VMware Cloud Director functionality imported into OnApp:

- Catalogs
- Orchestration Models
- vApps
- vApp Templates
- Edge Gateways
- NAT Rules
- Organization Networks
- VPN Service
- Resource Pools
- Firewall Rules

For other VMware Cloud Director components in OnApp, refer to one of the following sections:

- VCD Virtual Servers
- Users
- User Groups (Organizations)
- vApp Networks
- Company Payments
- Buckets

3.1 VCD Virtual Servers

Virtual servers, built on a guest operating system, can be used to install and run software compatible with that operating system. Below you can view the list of the current functions you can perform with VMware Cloud Director virtual servers by means of OnApp Control Panel:

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3.1.1 Manage VCD VSs

VMware Cloud Director virtual servers, built on a guest operating system, can be used to install and run software compatible with that operation system. Below you can view the list of the current functions you can perform with VMware Cloud Director virtual servers by means of OnApp Control Panel:

This document provides the information on how you can manage the virtual servers imported from your VMware Cloud Director.

This functionality is available for users with the following roles:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator

3.1.1.1 View Virtual Servers

On this page:

- View Virtual Servers
- Edit Virtual Server
- Insert/Eject Media
- Virtual Server Power Options
- Virtual Server Console
- Delete Virtual Servers

See also:

- Virtual Server Disks
- VCD VS Network Interfaces
- Virtual Server Statistics
- VCD VS Snapshots

To view all virtual servers deployed in the cloud:
1. Go to your Control Panel > Cloud > Virtual Servers menu to see an overview of all virtual servers in the cloud.

2. The page that loads will show the list of VSs together with their:
   - **operating system** - the OS on which the virtual server is based
   - **label** - the name of the virtual server. Click the label to see the VS details.
   - **IP addresses** - IP addresses assigned to the virtual server
   - **disk size** - disk size assigned to the virtual server in GB
   - **RAM** - RAM assigned to the virtual server in GB
   - **backups** - the number of snapshots and the space these snapshots occupy (available only for users with vCloud Organization Administrator role)
   - **CPU(s)** - the number of CPU(s) included
   - **power status** - whether the VS is powered ON or OFF. Click the on/off buttons to change the status.
   - **actions** - click the Actions button next to the VS for the quick access to the list of VS actions:
     - **reboot** - click this action to reboot the virtual server
     - **shutdown** - click this action to shutdown the virtual server

You can access the details page of a vApp to which the virtual server is assigned from the VS's Overview page. To view the details of the vApp with which the VS is associated, click the Tools button on the VS Overview screen at Dashboard > Cloud > Virtual Servers > VS label > Tools > Go to vApp.

To be redirected to the VCD user interface from VS Tools menu: go to Dashboard > Cloud > Virtual Servers > VS label > Tools > Go to vCD UI.

You can install VMWare tools for your VSs to customize the guest operation system. To install VMWare tools go to Dashboard > Cloud > Virtual Servers > VS label > Tools > Install VMWare Tools. After that you can find VMWare tools version at VS's Overview page. A VS must be powered on to install VMWare Tools.

Ensure that **Install VMWare Tools** permission is on before managing VMWare tools.

### 3.1.1.2 Edit Virtual Server

You can edit the label, CPU, and RAM resources for all VCD virtual servers. You can allocate more CPU and RAM without rebooting a virtual server. When you hot add more RAM to virtual servers with Linux 64-bit or Windows 7 32-bit guest operating systems, the following conditions are applied:

- If the powered-on VS has less than 3 GB of RAM, you cannot hot add more than 3 GB of RAM.
- If the VS has 1 GB of RAM, you can add 2 GB.
- If the VS has 2 GB of RAM, you can add 1 GB.
- If the VS has 3444 MB of RAM, you can add 128 MB.
• If the powered-on VS has 3 GB of RAM, you cannot hot add any more RAM.

To edit the a VCD virtual server:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of the server that you want to edit.
3. Click the Tools button and then click Edit Virtual Server.
4. You can edit the following virtual server settings:
   - **Label** - edit the label of the virtual server
   - **Virtual CPU hot add** - select this checkbox to add CPU resources without rebooting the VS
   - **Memory hot add** - select this checkbox to add RAM resources without rebooting the VS
   - **RAM** - change the amount of RAM allocated to the VS
   - **CPU Cores** - change the number of CPU cores allocated to the VS
   - **Cores per Socket** - select the number of CPU cores per socket

If the **Virtual CPU hot add** and **Memory hot add** checkboxes are selected, you can add RAM and CPU without rebooting a VS. If only one checkbox is selected but you change both RAM and CPU, the VS will be rebooted.

5. Click the Save button.
6. If rebooting is required to apply the settings, click the Continue button.

### 3.1.1.3 Insert/Eject Media

This option allows you to attach an ISO file from the Create and Manage Catalogs to the VS allowing you to utilize the contents of the ISO.

To attach ISO to VS:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the appropriate virtual server.
3. Click the Tools button and select the **Insert Media** link.
4. Choose the ISO file from the drop-down list.
5. Click **Insert**.

To remove ISO from VS:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the appropriate virtual server.
3. Click the Tools button and select the **Eject Media** link.
4. Confirm by clicking the **Eject** button.
- Maximum one ISO can be inserted per VS at a time.
- Ensure that the Media permissions are on before enabling this option.
- Use only unique media file names. When you copy a media file from public catalogs, rename it (use a unique name) to avoid issues with media ejection.
- You cannot insert floppy disk image files since they are no longer supported by VMware Cloud Director.

3.1.1.4 Virtual Server Power Options

To start, stop or reboot a virtual server:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of a required virtual server.
3. Click the appropriate icon at the Properties page to change virtual server's power status.

3.1.1.5 Virtual Server Console

This functionality is available for users with the vCloud Console Access Only role.

You can use the MKS virtual server console to manage your virtual servers in the command line mode. To use the virtual server console:
1. Go to Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a virtual server.
3. Click the Console button.

VMware Tools support shared folders and cut and paste operations between the guest operating system and the server from which you launch the VMware Cloud Director Web console. VMware Cloud Director depends on VMware Tools to customize the guest OS. Using VMware Tools, you can move the pointer in and out of the virtual server console window. A virtual server must be powered on to install VMware Tools.

To add VMware tools:
1. Go to Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of appropriate Virtual Server.
3. Click the Tools button > Add VMware Tools. You will be redirected to the VCD user interface, where you can install or upgrade VMware Tools.

3.1.1.6 Delete Virtual Servers
Shut down the virtual server before destroying it. To remove the virtual server from the cloud:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. On the screen that appears, you’ll see the list of all virtual servers in the cloud. Click the label of the virtual server you want to delete.
3. On the virtual server’s screen, click the **Tools** button, then select **Delete Virtual Server**.

### 3.1.2 Manage VCD VS Disks

Virtual server storage is provided by disks. A disk is a partition of a data store that is allocated to a specific virtual server. This section provides the information on all the actions supported for disks imported from your VMware Cloud Director.

This functionality is available for users with the following roles:
- vCloud Catalog Author
- vCloud vApp Author
- vCloud Organization Administrator

**On this page:**

- [Create Disk](#)
- [Edit Disk](#)
- [Delete Disk](#)

**See also:**
- [Manage VCD VSs](#)
- [VCD VS Network Interfaces](#)
- [Virtual Server Statistics](#)

#### 3.1.2.1 Create Disk

Adding a disk to a virtual server will require that VS to be rebooted. If a VS is running when you try to add a new disk to it, you’ll be asked to confirm the reboot. To add a disk to a virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the **Label** of an appropriate virtual server.
3. Click the **Storage** tab > **Disks**.
4. Click the **Create Disk** button.
5. Fill in the details:
   - **Data Store** - select the data store to which the disk will be assigned
   - **Size** - enter the disk size
   - **Bus Sub Type** - select the sub type of ‘scsi controller’ to create the disk on. For more information, refer to [VMware documentation](#).
6. Click the **Add Disk** button to finish.
When you add a new disk to a virtual server, it will automatically become available to that server.

### 3.1.2.2 Edit Disk

You can resize the disk or live migrate it to another data store by following the next steps:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the **Label** of an appropriate virtual server.
3. Click the **Storage** tab > **Disks**.
4. Click the **Actions** icon next to the disk that you want to modify and click the **Edit** button.
5. In the pop-up window change the required parameters:
   - **Label** - enter a new label for the disk
   - **Size** - move the slider to select a new size for the disk in GB
   - **Data Store** - select a new data store for the disk
   - **Hot migrate disk** - turn the switcher to the right to run hot (live) migration of the disk to the destination data store

   If you migrate the disk without the **Hot migrate disk** option enabled, the virtual server will be rebooted. You will be asked for confirmation to reboot the virtual server.

6. Click the **Save Disk** button.

   - If fast provisioning is enabled for the disk **resource pool**, the disk cannot be resized.
   - You cannot decrease the size of disk(s).
   - If you resize the disk of a VS that is powered on, the virtual server will be rebooted. You will be asked for confirmation to reboot the virtual server.
   - You can only migrate disks to data stores in data store zones assigned to your **bucket**.
   - You cannot migrate a disk to a data store with less capacity than the disk size.

### 3.1.2.3 Delete Disk

To delete a disk:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Make sure your virtual server is powered off, then click its label to open its details screen.
3. Click the **Storage** > **Disks** tab.
4. Click the **Actions** icon next to the disk you want to delete and click the **Delete** button. You will be asked for confirmation.

The ‘destroy disk’ transaction is scheduled after you complete the preceding steps.

### 3.1.3 View VCD VS Statistics

This section provides the info on how you can manage statistics of virtual servers imported from your VMware Cloud Director.

You can set the `vcloud_stats_batch_size` parameter in the `onapp.yml` file. This parameter defines the number of VSs in a batch during statistics collection.

To have all VMware Cloud Director statistics delivered to OnApp, you need to set the vCenter password(s):

1. Go to your Control Panel > **Admin** > **Settings** menu and click the **Compute Resources** icon.
2. Click the label of the Compute resource you want to set vCenter password(s) for.
3. On the screen that appears, click the **Tools** > **vCenter passwords**.
4. On the page that loads, fill in the vCenter password and **Save**. If valid vCenter password is entered and connection is successful, you will see green dot in Connection status under vCenter password field. If connection fails, the dot is red.

This functionality is available for users with the following roles:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only

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**On this page:**

- [Virtual Server CPU Usage Statistics](#)
- [Virtual Server Disk IOPS Statistics](#)
- [Virtual Server Network Interface Statistics](#)

**See also:**

- [Manage VCD VSs](#)
3.1.3.1 Virtual Server CPU Usage Statistics

OnApp tracks CPU usage for virtual servers and generates charts that help analyze VS performance. The charts show the total CPU usage for all the cores of this particular VS for a specified time period.

The vertical axis shows the CPU usage percentage (CPU percentage is the core-independent quantity). The horizontal axis defines a time period.

To see CPU usage statistics:
1. Go to your Control Panel > Admin > Virtual Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Overview > CPU Usage.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there less data available, the chart will show utilization for the time available.
5. Tick the Show in My Timezone box to show bandwidth statistics according to your profile's timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the Show All button to zoom out again.

To see what percentage of compute resource's CPU resource a VS takes, go to your Control Panel's Virtual Servers menu and click the label of the VS you're interested in. On the screen that appears, the CPU(s)/Shares parameter displays the amount of CPU resource given to this VS.

3.1.3.2 Virtual Server Disk IOPS Statistics

The system tracks IOPS (Input/Output Operations per Second) for virtual servers and generates charts that help analyze VS disk performance. The data presented in the chart are for the periods during which the statistics was gathered, typically 3 minutes. To see IOPS for a virtual server:
1. Go to your Control Panel > Admin > Virtual Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Storage > Disks tab.
4. Click the Actions button next to the required disk, and then choose IOPS.
5. Click the Statistics (chart) icon next to the disk you're interested in. There are four charts on the screen that appears:
   - IOPS for the last hour
   - IOPS for the last 24 hours
   - Data written/read for the last 24 hours
6. To zoom into a time period, click and drag in a chart. Click the Show All button to zoom out again.

The OnApp API allows you to limit the Hourly IOPS and Hourly data by setting the limit=N parameter, where the N variable is the number of hours for which the charts will display the info.

### 3.1.3.3 Virtual Server Network Interface Statistics

OnApp tracks network usage for virtual servers and generates charts that help analyze network performance. To see network utilization statistics for a virtual server:

1. Go to your Control Panel > Admin > Virtual Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Networking > Network Interfaces tab.
4. Click the Statistics (chart) icon next to the network you're interested in.
5. On the screen that appears, the top chart shows bandwidth usage for the last 24 hours. The bottom chart shows usage for the last three months.
6. To zoom into a time period, click and drag in a chart. Click the Show all button to zoom out again.

### 3.1.4 VCD VS Network Interfaces

The Networking > Network Interfaces menu shows the virtual network interfaces allocated to this VS. Network interfaces join the physical network to the Manage VCD VSs.

When you create a VS a network interface is added automatically. This network interface will be assigned to the existing physical network using a spare IP (IPv4) and will be set primary by default.

OnApp supports IPv4 and IPv6. Since not every application supports IPv6, at least one IPv4 address must be allocated to a VS's primary network interface.

- To run the VS, at least one network interface with an assigned IP address (or addresses) is required!
- To allocate another physical network, add a new network interface.
- The maximum number of networks that can be added to a virtual server is 10.

---

**On this page:**

- View Virtual Server Network Interfaces
- Create Virtual Server Network Interface
- Edit Virtual Server Network Interface
- Delete Virtual Server Network Interface
See also:

- Manage VMware Cloud Director VSs
- Virtual Server Statistics
- VMware Cloud Director VS Snapshots
- Virtual Server Disks

### 3.1.4.1 View Virtual Server Network Interfaces

This functionality is available for users with the following roles:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only

To see the list of all network interfaces allocated to the VS:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. On the page that follows you will see the following fields:
   - **Interface** - the optional label of the network interface
   - **Network join** - the name of the network and a compute resource or compute zone this network is joined to
   - **Port Speed** - the speed set for the interface
   - **Adapter Type** - the network adapter type appropriate for this VS
   - **Primary Interface** – indication whether the interface is primary or not.

Here you can also view View VCD VS Statistics, edit and delete network interface (using icon controls) and add a new network interface using the button at the bottom of the screen.

### 3.1.4.2 Create Virtual Server Network Interface

This functionality is available for users with the vCloud Organization Administrator role.
To add a network interface:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. Click the Add New Network Interface button at the bottom of the screen.
5. On the screen that appears, specify the following details:
   - Connected - select this checkbox to indicate that the network interface is connected to VS
   - Physical Network - select a physical network from the drop-down menu that lists network joins assigned to vApp
   - Adapter Type - select one of the following network adapter types for this VS:
     ▪ Vlance
     ▪ E1000
     ▪ E1000E
     ▪ VMXNET
     ▪ VMXNET 2 (Enhanced)
     ▪ VMXNET 3
     ▪ FLEXIBLE

The VMXNET 3 adapter is selected by default as it is the most recent virtual network device from VMware that was designed for high performance. For more information on selecting network adapters, refer to VMware Documentation.

6. Click the Submit button.

The maximum number of networks that can be added to a virtual server is 10.

3.1.4.3 Edit Virtual Server Network Interface

This functionality is available for users with the vCloud Organization Administrator role.

To edit a network interface:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you are interested in.
3. Click the Networking tab and then click Network Interfaces.
4. Click the **Edit** icon next to the interface you want to edit.

5. On the page that appears, you can change the following network interface details:
   - **Primary interface?** - select this checkbox to indicate that this interface is primary
   - **Connected** - select this checkbox to indicate that the network interface is connected to VS
   - **Physical network** - select a network join from the drop-down menu that lists network joins assigned to vApp

6. Click the **Submit** button.

### 3.1.4.4 Delete Virtual Server Network Interface

This functionality is available for users with the vCloud Organization Administrator role.

To delete a network interface:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you are interested in.
3. Click the **Networking** tab and then click **Network Interfaces**.
4. Click the **Delete interface** button next to the interface you want to delete.
5. In the pop-up box, click **OK** to confirm the deletion.

### 3.1.5 VCD VS Snapshots

Snapshots lock the file system disk and create a new disk with the changes made alongside. There can be only one snapshot per VS: when a new snapshot is created for the VS, the previous one is deleted. You can view, create and delete virtual server snapshots. This section provides information on how to view, create, build and restore VS snapshots.

This functionality is available for users with the following roles:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator

**On this page:**

- [View VS Snapshots](#)
- [Delete VS Snapshot](#)
3.1.5.1 View VS Snapshots

To view the list of VS Snapshots:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you want to back up.
3. Click the Tools > Snapshots.
4. On the screen that appears, you'll see the list of all VS snapshots together with their details:
   - **Snapshot** - the number of snapshot
   - **Name** - timestamp, which shows when snapshot was taken
   - **Built** - whether snapshot is built or not
   - **Note** - text, added to the snapshot
   - **Actions** icon - the actions you can perform with snapshot (restore, delete, add note).

3.1.5.2 Delete VS Snapshot

To delete a snapshot:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you want to back up.
3. Click the Tools > Snapshots.
4. Click the Actions button next to the snapshot you want to use and select Delete.

3.2 VCD vApps

A VMware Cloud Director vApp consists of one or more virtual servers that communicate over a network and use resources and services in a deployed environment.

In this chapter, you can find information on the following management options:

- Create and Manage vApps
- Create and Manage Templates
- Create and Manage Networks
- Create and Manage Catalogs

3.2.1 Create and Manage VCD vApps

A VMware Cloud Director vApp consists of one or more virtual servers that communicate over a network and use resources and services in a deployed environment. A vApp can contain multiple virtual servers.
This document provides the information on how you can manage the vApps imported from your VMware Cloud Director.

This functionality is available for users with the following roles:
- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator

You can also access vApps shared with you by the administrator on the VMware Cloud Director side, depending on the access level granted to you.

On this page:

- View vApps
- Creating vApps
- Recompose vApp
- Add vApp to Catalog
- Edit vApp
- Start/Stop vApps
- Start/Stop vApp Virtual Servers
- Delete vApps

See also:
- vApps (API)
- Manage VMware Cloud Director VSS
- Create and Manage Catalogs

3.2.1.1 View vApps

To view all vApps in the cloud:

1. Go to your Control Panel > Cloud > vApps menu to see an overview of all vApps in the cloud.
2. The page that loads will show the list of vApps together with their details:
   - **Name** - the name of the vApp
   - **User** - the owner of the vApp. Click the user name to see the owner details. The owner of the vApp can be changed in VMware Cloud Director. These changes are
synchronized with OnApp and can be seen in Control Panel > Cloud > vApps menu.

- **Resource pool** - the label of the resource pool of this vApp
- **Number of virtual servers** - the number of virtual servers within the vApp
- **Number of networks** - the amount of vApp networks associated with this vApp
- **Status** - the vApp status:
  - **Failed creation** - the vApp could not be created
  - **Unresolved** - the vApp is damaged and cannot be controlled by vCloud
  - **Resolved** - the vApp has been created but it does not contain VSs
  - **Suspended** - the vApp has been suspended; all virtual servers in the vApp are suspended
  - **Powered on** - all the VSs in the vApp are on
  - **Waiting for input** - the vApp is waiting for user input
  - **Unknown** - the vApp is in a state that is identified but is not known to the system
  - **Unrecognized** - the vApp is in a state that cannot be identified by the system
  - **Powered off** - all the VSs in the vApp are off
  - **Inconsistent state** - the vApp is in an inconsistent state. This status appears when the vApp was edited from the vSphere associated with the VCD in which the vApp resides, therefore, the vSphere and VCD databases are not yet fully synchronized.
  - **Mixed (number/number)** - the amount of virtual servers in the vApp that have different power statuses: the first number before the slash indicates the amount of powered-on VSs, the second number - total amount of VSs in the vApp.
  - **Building** - after the vApp is created or imported, its status will be Building, until the creation/import process is finished. On the overview screen of a specific vApp, its status will be shown as Pending. The user cannot perform any actions to the pending vApp except for deleting it.

- **Power** - the power status of the vApp. To change the status, click the on/off buttons and confirm.
- **Actions** - click the Actions button to perform one of the following processes on the vApp:
  - Edit
  - Recompose
  - Add to Catalog
  - Stop/Start
  - Delete
  - Spin up Network

### 3.2.1.1.1 vApp Details
Click the name of the vApp to view its details:

- **Name** - the name of the vApp
- **Description** - the description of the vApp
- **Status** - the status of the vApp. A vApp can have the following statuses:
Failed creation - the vApp could not be created

Unresolved - the vApp is damaged and cannot be controlled by vCloud

Resolved - the vApp has been created but it does not contain VSs

Suspended - the vApp has been suspended; all virtual servers in the vApp are suspended

Powered on - all the VSs in the vApp are on

Waiting for input - the vApp is waiting for user input

Unknown - the vApp is in a state that is identified but is not known to the system

Unrecognized - the vApp is in a state that cannot be identified by the system

Powered off - all the VSs in the vApp are off

Inconsistent state - the vApp is in an inconsistent state. This status appears when the vApp was edited from the vSphere associated with the VCD in which the vApp resides, therefore, the vSphere and VCD databases are not yet fully synchronized.

Mixed (number/number) - the amount of virtual servers in the vApp that have different power statuses: the first number before the slash indicates the amount of powered-on VSs, the second number - total amount of VSs in the vApp.

Pending - after the vApp is created or imported, its status will be Pending, until the creation/import process is finished. The user cannot perform any actions to the pending vApp except for deleting it.

- Virtual servers - the number of virtual servers within the vApp
- Number of CPUs - the number of CPUs used by the vApp
- Virtual Servers - the list of VSs associated with this vApp and their details. By pressing the "+" button you can recompose this vApp.
- vApp Networks - the list of vApp networks associated with this vApp and their details: label, status, network address. Click the Actions button to delete a vApp network. Removing the network will restart the vApp.
- Activity log - the list of log items associated with this vApp. Click the Ref number of a log item to view its details (data, action, status, initiator of transaction etc.)

Alternatively, you can access the details page of a particular vApp from the Overview page of a VS assigned to this vApp. To view the details of the vApp with which the VS is associated, click the Tools button on the VS Overview screen at Dashboard > Cloud > Virtual Servers > label of the VS you are interested in > Tools > Go to vApp.

3.2.1.2 Creating vApps

You can create a new vApp based on a vApp template stored in a catalog to which you have access. Alternatively, you can compose a new vApp using virtual servers from vApp templates, new virtual servers, or a combination of both.

You cannot add vApps when being logged in as a non VMware Cloud Director user.
3.2.1.2.1 Deploy New vApp

To create a new vApp:

1. Go to your Control Panel > Cloud > vApps menu to see an overview of all vApps in the cloud.

2. Click the **Deploy New vApp** button. If a new vApp template is created and added to catalog in VMware Cloud Director, it will be synchronized with OnApp. This vApp template will be added to the list of all vApp templates.

3. On the screen that appears, fill in the vApps creation form:

   **Step 1. vApp**
   - **Name** - specify the vApp label
   - **Description** - enter the description for the vApp
   - **Resource Pool** - select the resource pool for the new vApp
   - **vApp Template** - select the vApp template
   - Click **Next**.

   **Step 2. VS Resources**
   Click the template to set the resources for the VS that will be created from this template:
   - **Label** - specify the name of VS
   - **CPU Cores** - use the slider to set the number of CPU cores
   - **Cores per socket** - set the number of cores per socket for the VS
   - **RAM** - use the slider to set the RAM for the VS
   - **Data Store** - choose data store from the drop-down list
   - **Hard disk 1 Size** - set the size in GB
   - **NIC 0 Connection** - select the network to which the NIC will be connected
   - Click **Next** to proceed.

   **Step 3. Guest Customization**
   Click the template to configure guest customization for the VS that will be created from this template:
   **General**
   - **Host Name** - VS's computer name
   - **Enabled** - whether guest customization is enabled for the VS or not. The computer name and network settings configured for this VS are applied to its Guest OS when the VS is powered on. Guest customization should be enabled if you want to configure recipes for this VS.
   - **Change SID** - this parameter is applicable for Windows VSs only and will run Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join.
   - **Automatically Reboot** - enable this option if you want the VS to be automatically rebooted after guest customization settings are updated.

   **Password Reset**
Customization Script
- **Script** - a script for guest customization
- **Click Next** to proceed.

**Step 4. Recipes**
If you want to configure recipes for the VS, you need to enable the **Enable** and **Allow Local Admin Password** options at the Guest Customization step. Click the template to configure recipes for the VS that will be created from this template:

**Recipes**
Use the drag and drop feature to assign recipes to the provisioning event.
- a. Select the required recipe in the left pane and hold it down with the left mouse button.
- b. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.
- c. If required, you can remove the assigned recipe by clicking the delete icon next to it.

**Custom Recipe Variables**
- a. Specify the custom variable name and its value.
- b. Move the **Enabled** slider to the right to allow use of this custom variable.
- c. If required, you can remove a custom variable by clicking the delete icon next to it.

**Step 5. Confirm**
Click the template to review the details of the VS that will be created from this template.

4. **Click Deploy vApp** to finish the process.
1. Go to your Control Panel > **Cloud** > **vApps** menu to see an overview of all vApps in the cloud.
2. Click the **Compose vApp** button.
3. On the screen that appears, fill in the form:

   **Step 1. vApps and vApp Templates**
   - **Blank vApp** - move the slider to the right if you want to create a blank vApp. Such a vApp will not contain any virtual servers. You need to fill in only the Name, Description, and Resource Pool for a blank vApp.
   - **Name** - specify the vApp label
   - **Description** - enter the description for the vApp
   - **Resource Pool** - select the virtual data center
   - **vApp Templates** - select one or several vApp templates from the drop-down list. All VSs built on those templates will be copied to your new vApp.
   - **vApps** - select one or several vApps from the drop-down list. All VSs within selected vApps will be copied to your new vApp.

   Click **Next** to proceed to the following step.

   **Step 2. VS Resources**
   Depending on the vApp Templates and vApps that you selected during the previous step, you can apply the following hardware customization to virtual servers:
   - **Label** - edit the label of the virtual server
   - **CPU Cores** - edit the number of CPU cores allocated to the virtual server
   - **Cores per Socket** - edit the number of cores per socket allocated to the virtual server
   - **RAM** - edit the amount of RAM allocated to the virtual server
   - **Default Data Store** - select the default data store from the drop-down list. If Fast Provisioning is not enabled for the previously selected resource pool, you can select a different data store for the VS's disks.
   - **Data Store for Hard disk 1** - select a data store for the first hard disk from the drop-down list. This option appears only if the selected resource pool has Fast Provisioning disabled. If you do not select a data store, the disk is built on the default data store.
   - **Hard Disk 1 Size** - set the size for the first hard disk
   - **NIC 0 Connection** - the network to which the NIC will be connected
   - **Adapter Type for NIC 0** - the type of the network adapter for NIC 0

   Click **Next** to proceed to the final step.

   **Step 3. Confirm**
   During the final step, you can overview the summary of virtual servers that the vApp will include and edit Automation Settings. In Automation Settings, the **Boot VS** option is enabled by default.
4. Click the **Compose vApp** button.

### 3.2.1.3 Recompose vApp

Unlike a **Compose vApp** option, which helps you to create a new vApp, the **Recompose vApp** option allows you to modify an existing vApp. After you recompose a vApp, new virtual servers will be added to it.

To recompose a vApp:
1. Go to **Control Panel > Cloud > vApps** menu.
2. Click the **Actions** button next to the vApp you want to change, then click **Recompose**.
3. Complete the two-step vApp recompose process:
   
   **Recompose vApp**
   
   - **vApp Template** - select a template for your vApp
   - **Click Next**.

#### Customize Virtual Servers

Click the template to set the resources for the VS that will be created from this template:
- **Label** - the name of VS
- **CPU Cores** - use the slider to set the number of CPU cores
- **Cores per socket** - set the number of cores per socket for the VS
- **RAM** - use the slider to set the RAM for the VS
- **Data Store** - choose data store from the drop-down list
- **Hard disk 1 Size** - set the size in GB
- **NIC 0 Connection** - the network to which the NIC will be connected

4. Click **Recompose** to finish the process.

You can also access the vApp recompose wizard at **Control Panel > Cloud > vApps > Label** > ![icon](image)

icon in the **Virtual Servers** section.

### 3.2.1.4 Add vApp to Catalog

To add a vApp to catalog:
1. Go to **Control Panel > Cloud > vApps** menu.
2. Click the **Actions** button next to the vApp you want to add to catalog, then click **Add to Catalog**.
3. Fill in the following fields:
   - **Catalog** - choose the catalog from the drop-down menu
You can add vApp to a public catalog, which belongs to the same organization as vApp does.

- **Overwrite Catalog Item** - move the slider to the right to save this vApp as template instead of another vApp template. In the **Target vApp Template** field, choose the appropriate vApp template, which will be replaced, from the drop-down menu.
- **Label** - specify the name of the vApp. This option is missing if the Overwrite catalog item slider is enabled.
- **Description** - add the appropriate vApp description

4. Click **Add vApp to Catalog**.
After you add a vApp to catalog, you will be able to create a new vApp with the same configuration as the original one.

### Prerequisites
Ensure that **Convert vApp** permission is on before adding vApp to catalog.

---

### 3.2.1.5 Edit vApp

To edit a vApp:
1. Go to **Control Panel > Cloud > vApps** menu.
2. Click the **Actions** button next to the vApp you are interested in, then click **Edit**.
3. On the screen that appears, you can edit the name and description of the vApp.
4. Click **Save**.

---

### 3.2.1.6 Start/Stop vApps

To start or stop a vApp in the cloud:
1. Go to your **Control Panel > Cloud > vApps** menu to view all vApps.
2. Click the **Actions** button next to the required vApp, then choose **Start** or **Stop** action.

---

### 3.2.1.7 Start/Stop vApp Virtual Servers

You can schedule actions for starting and stopping virtual servers when the vApp is being started and stopped.

To preconfigure the start/stop actions for virtual servers that the vApp contains:
1. Go to your **Control Panel > Cloud > vApps > Label**.
2. Click the **Tools** button and then click **Starting and stopping VSS**.
3. At the page that appears, you can set start/stop actions using the instructions from the table below.
4. Click the **Submit** button to apply settings.

<table>
<thead>
<tr>
<th>Virtual Server Label</th>
<th>Order</th>
<th>Start Action</th>
<th>Start Delay (seconds)</th>
<th>Stop Action</th>
<th>Stop Delay (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The list of vApp virtual servers to start and stop when the vApp is being started and stopped.</td>
<td>For vApps with multiple virtual servers, specify the order in which to start and stop VSs by typing numbers in the box. Virtual servers with lower numbers are started first and stopped last. You cannot specify negative numbers. Virtual servers with the same numbers are started and stopped at the same time.</td>
<td>Select an action to apply to virtual servers when you start the vApp:</td>
<td>The delay in seconds after starting one virtual server and before starting the next virtual server.</td>
<td>Select an action to apply to virtual servers when you stop the vApp:</td>
<td>The delay in seconds after stopping one virtual server and before stopping the next virtual server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>Power On</strong> - select this option to power on virtual servers</td>
<td></td>
<td>- <strong>Power Off</strong> - select this option to power off virtual servers forcefully</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>None</strong> - select this option to run no start action on virtual servers</td>
<td></td>
<td>- <strong>Shutdown</strong> - select this option to shut down virtual servers gracefully</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.1.8 Delete vApps

To delete a vApp in the cloud:

1. Go to your Control Panel > **Cloud** > **vApps** menu to view all vApps.
2. Click the **Actions** button next to the required vApp.
3. If the vApp is running, then choose the **Stop** action.
4. When the vApp is stopped, click **Delete**.

### 3.2.2 Create & Manage vApp Templates

VMware Cloud Director vApp template is a virtual server image that is loaded with an operating system, applications, and data. These templates ensure that virtual servers are consistently configured across an entire organization.

vApp templates are added to **vApp catalogs**.

You can add a vApp template to a vApp catalog via the OnApp Control Panel. It will be synchronized with VMware Cloud Director and a new vApp template will be added to a corresponding vApp catalog in VMware Cloud Director.

**On this page:**
3.2.2.1 View vApp Template

This functionality is available for users with the following roles:
- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only

To view a vApp template:
1. Go to your Control Panel > Catalogs menu.
2. Click a label of a vApp catalog.
3. Click a label of a vApp template.
4. On the screen that appears, you will see the following details about the vApp template:
   - Label - the label of the vApp template
   - Description - the description of the vApp template
   - Virtual Servers - the list of virtual servers that are built from the template
   - Activity Log - the activity log of the virtual servers

3.2.2.2 Create vApp Template

This functionality is available for users with the following roles:
- vCloud Catalog Author
- vCloud Organization Administrator

To create a vApp template:
1. Go to your Control Panel Catalogs menu.
2. Click the label of vApp catalog.
3. On the screen that appears, click the "+" button or the **Upload vApp Template** button.

4. Specify vApp template's label and click **Next**.

5. Specify the following parameters:
   - **File** - click the **Choose File** button to upload a template. Make sure to select all the files in the archive for the template.
   - **File URL** - indicate the route, from where the template will be uploaded

   You can upload the following vApp template formats: OVF and OVA. Be aware that files inside OVA should not be archived, otherwise, the OVA upload will fail. Each template that you upload to CP should have a unique name.

6. Click **Submit**.

### 3.2.2.3 Delete vApp Template

This functionality is available for users with the vCloud Organization Administrator role.

To delete vApp template:

1. Go to your Control Panel **Catalogs** menu.
2. Click the label of vApp catalog.
3. On the screen that appears, you will see the list of vApp templates added to this vApp catalog.
4. Click the **Actions** button next to the template you want to delete and click **Delete**.
5. Confirm the deletion.

### 3.2.3 Create & Manage vApp Networks

The following network types are imported into OnApp:

- **organization vDC networks** (this network allows virtual servers in the organization vDC to communicate with each other and to access other networks)
- **external networks** (this network provides the interface to the Internet for virtual servers connected to external organization vDC networks)
- **vApp networks** (this network controls how the virtual servers in a vApp connect to each other and to organization vDC networks)

You can view the list of imported vApp networks at OnApp Cloud Control Panel. Also you can add a vApp network in VMware Cloud Director using OnApp Control Panel.

This functionality is available for users with the following roles:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
On this page:

- **View vApp Networks**
- **Create vApp Network**
- **Delete vApp Network**

See also:

- **Create and Manage vApps**
- **vApps (API)**
- **Manage VMware Cloud Director VSs**

### 3.2.3.1 View vApp Networks

To view the list of your imported networks:

1. Go to your Control Panel's **Settings** menu.
2. Click the **vApp Networks** icon.
3. The screen that appears shows the list of your imported vApp networks and their details.
   - **Label** - the label of the network
   - **Identifier** - the identifier of the network
   - **VLAN** - VLAN number
   - **Network Zone** - the network zone with which this network is associated
   - **Location group** - the location group with which this network is associated
   - **Actions** - click the Actions button to delete the vApp network.

You can also click a network's label to see the list of IPs assigned to that network.

### 3.2.3.2 Create vApp Network

Ensure that **vApp Networks** permissions are on before creating a vApp network.

To add a vApp network:

1. Go to **Control Panel > vApps** menu.
2. Click the label of the required vApp.
3. On the vApp overview page click the + button above the vApp networks list.
4. On the screen that appears, select the organizational network with which the vApp network will be associated.
5. Click **Create vApp Network** to finish the process. Adding a new vApp network will restart the vApp.

### 3.2.3.3 Delete vApp Network

To delete a vApp network:

1. Go to **Control Panel > vApps** menu.
2. Click the label of the required vApp.
3. Click the **Actions** button next to the required network in the vApp networks list and select **Delete**. Deleting a network will restart the vApp.

### 3.2.4 Create & Manage Catalogs

A VMware Cloud Director catalog is a container for vApp templates and media files. Users can access vApp templates and media files that they own or that are shared with them.

In VMware Cloud Director, there is a possibility to make a catalog public. When catalog is public, all organizations will see the catalog to deploy vApps from. Administrators can access a published catalog and copy its vApp templates to a catalog in their organization. They can then share the organization catalog with other members of their organization so that they can use the vApp templates and media files.

OnApp provides an ability to import vApp catalogs from VMware Cloud Director and use them for vApp creation.

You can create, edit or delete a vApp catalog via the OnApp Control Panel. The action will be synchronized with VMware Cloud Director and a new catalog will be created or deleted in VMware Cloud Director. Also you can **save a vApp to a catalog** as a vApp template.

The catalogs functionality is available for users with the following roles:

- vCloud Catalog Author
- vCloud Organization Administrator

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**On this page:**

- View Catalogs
- Create Catalog
- Edit Catalog
- Delete Catalog
- View Media Library
- Add File to Media Library

**See also:**

- Create and Manage vApps
- vApps (API)
- Manage VMware Cloud Director VSS
3.2.4.1 View Catalogs

To view your list of vApp catalogs:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. On the screen that appears, you will see the catalogs imported from the VMware Cloud Director and their details:
   - **Label** - the name of the catalog
   - **User Group** - the user group to which the catalog is assigned
   - **Resource Pool** - the resource pool that is used by the catalog
   - **Organization** - the organization to which the catalog is assigned
   - **vApp Templates** - the number of vApp templates that the catalog includes
   - **Media** - the number of media files that the catalog includes
   - **Published** - whether this catalog is published or not. The ✔ icon appears next to catalogs that are published, i.e. shared between all organizations. The ✗ icon appears next to catalogs that are shared only between certain organizations or users.
   - **Actions** - click the button if you want to Edit or Delete the catalog

Click the catalog label to view the list of assigned templates and media files.

3.2.4.2 Create Catalog

To create a new vApp catalog:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the **New Catalog** button.
3. Set the following parameters:
   - **Label** - specify the label of a new catalog
   - **Description** - add description of the catalog
   - **Organization** - choose the organization, this catalog will be added to
   - **Resource Pool** - choose the resource pool, this catalog will be assigned to
   - **Data Store** - choose the data store, this catalog will be assigned to
4. Click the **Submit** button.

3.2.4.3 Edit Catalog

To edit a vApp catalog:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the **Actions** button next to the catalog you want to edit and click **Edit**.
3. Edit the following parameters:
   - **Label** - the label of a catalog
   - **Description** - add description of the catalog
4. Click the **Submit** button.
3.2.4.4  Delete Catalog

To delete a vApp catalog:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the Actions button next to the catalog you want to delete and click Delete.
3. Confirm the deletion.

3.2.4.5  View Media Library

This functionality is available for users with the following roles:
- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only

Media Library is a part of catalog, which contains different file types for their further usage.

Currently only ISO files can be uploaded to Media library.

To view the Media library:
1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files that this catalog contains).
3. Click the Media tab.
4. You will see the list of available media files together with their details:
   - Label - the name of media file
   - Status - the status of media file
   - Image type - the type of media file (ISO)
   - Resource Pool - the label of resource pool where media file is stored
   - Size - the size of media file
   - Created on - the date of media file creation
   - Actions - you can either edit media file (change label) or delete file

You can attach an ISO file from the media library to the VS. For details refer to the Manage VMware Cloud Director VSs section of this guide.
3.2.4.6 Add File to Media Library

To add file to Media library:

1. Go to your Control Panel > Cloud > Catalogs menu.
2. Click the label of a catalog you are interested in. You will see the catalog details (label, user group, amount of vApp templates and media files which this catalog contains).
3. Click the Media tab. You will see the list of available media files together with their details.
4. Click the "+" button in the upper right corner of the section and fill in the following:
   - Label - specify a name for a media file
   - File - click the Choose File button and indicate the route, from where the file will be uploaded
5. Click Upload Media.

3.3 VCD Organizations and Users

In this chapter, you can find information on how to manage VMware Cloud Director Organizations and Users:

- Organizations
- Users

3.3.1 VCD Organizations

In VMware Cloud Director, an organization is a unit of administration for a collection of users, groups, and computing resources. Users authenticate at the organization level, supplying the credentials established by an organization administrator when the user was created or imported. VMware Cloud Director organizations are imported into OnApp as organizations (Control Panel > Cloud > Organizations) associated with user groups (Control Panel > Admin > Groups).

You can view the list and details of user groups if you are a user with one of the following roles:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only

3.3.2 VCD Users

OnApp provides very fine control over cloud users and what they're allowed to do. You can set up as many different types of users as you need, and customize their access to cloud resources and Control Panel functions as required.

Users with the following roles can view users of their user group:

- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only
Users with the vCloud Organization Administrator role can also manage users within their user group. The following user related actions are available for users with the vCloud Organization Administrator role:

- view users
- create users
- edit users
- delete users

The creation process will add a user both to VMware Cloud Director and OnApp. The user creation form is standard for OnApp, the fields that will synchronize user data with VMware Cloud Director are: Login, Password, User Role, User Group, First and Last Name, and Email. After you add a user, the change will be synchronized to VMware Cloud Director. When you assign the VMware Cloud Director user that you add in OnApp to an Organisation (user group), you define the resources the new user will have access to.

If you (or your system administrator) change your vCloud password on vCloud side, it is required to update the password on the OnApp side to sync. Once the credentials become out-of-sync, you will see a notification to update your vCloud credentials at the bottom of the screen. Click Manage vCloud Credentials to update the password.

### 3.4 VCD Buckets

In this chapter, you can find information on how to manage buckets and limits:

- Buckets
- Create and Manage Payments

#### 3.4.1 Buckets

This functionality is available for users with the vCloud Organization Administrator role.

A bucket is a set of limits and prices for the resources used by VMware Cloud Director organizations imported as user groups into OnApp. Buckets functionality is applicable for three models of resource allocation of VMware Cloud Director resource pools - Pay-As-You-Go, reservation pool and allocation pool.

As a user with the vCloud Organization User role, you can only view your own buckets.

#### 3.4.2 Create & Manage Payments

OnApp provides a possibility to add information about payments to OnApp Control Panel. Payments are already paid invoices for used resources according to buckets. There are two types of payments in OnApp: user payments and company payments. User payments are those which you charge for the resources created on XEN/KVM compute resources. Company payments are those for the VMware Cloud Director integration resources. If you do not have the VMware Cloud Director integration, the Company Payments tab will be missing.
On this page:

- View user payments
- View company payments

Ensure that Payments permissions are on before managing payments.
Ensure that See own company payments and Monthly user group billing statistics permissions are on before managing a company payment and monthly bills.

Below you can find instructions on how to create and manage payments.

This functionality is available for users with the following roles:
- vCloud Catalog Author
- vCloud vApp Author
- vCloud vApp User
- vCloud Organization Administrator
- vCloud Console Access Only

3.4.2.1 View user payments

To view payments:
1. Go to your Control Panel > Admin > Payments menu.
2. On the screen that appears, you will see the list of all payments together with their details:
   - User – the name of a user, who made the payment
   - Payment Date – the date when the payment was done
   - Amount – the money amount which was paid
   - Invoice Number – the serial number of a paid invoice
   - Actions – click the Actions button to edit or delete a payment

You can filter the list of payments by user - select the user from the drop-down menu and click the Apply button.

3.4.2.2 View company payments

To view payments:
1. Go to your Control Panel > Admin > Payments menu.
2. Click the Company Payments tab.
3. On the screen that appears, you will see the list of all payments together with their details:
You can filter the list of payments by user group - select the user group from the drop-down menu and click the **Apply** button.

To view monthly bills:
1. Go to your Control Panel > **Admin > Groups** menu.
2. Click the label of a specific user group.
3. On the screen that appears, you will see the details of this user group. Click the **Monthly Bills** link.
4. On the page that appears you will get the list of bills which shows the total due per each month of the year selected from the drop-down menu. To view billing statistics, select a year from the drop-down menu and click the **Apply** button.

### 3.5 VCD Resources

In this chapter, you can find information on how to manage the following resources for VMware Cloud Director:
- **Compute Resources**
- **Orchestration Models**
- **Resource Pools**
- **Provider Resource Pools**

#### 3.5.1 VCD Compute Resources

A vCloud compute resource is used to integrate OnApp and VMware Cloud Director so that to enable existing VMware Cloud Director installations to use the OnApp CP as their front-end UI.

For details on how to create a vCloud compute resource, refer to the [Create vCloud Compute resource](#) section of the OnApp and VMware Cloud Director Configuration Guide.

#### 3.5.1.1 vCloud Director Compute Resource Characteristics

<table>
<thead>
<tr>
<th>Virtualization Software</th>
<th>vCloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature</td>
<td></td>
</tr>
<tr>
<td>Integrated Storage</td>
<td>N</td>
</tr>
<tr>
<td>Cloud Boot</td>
<td>N</td>
</tr>
<tr>
<td>Smart Servers</td>
<td>N</td>
</tr>
<tr>
<td>Incremental backups</td>
<td>N</td>
</tr>
<tr>
<td>Load balancing clusters</td>
<td>N</td>
</tr>
<tr>
<td>Autoscaling</td>
<td>N</td>
</tr>
</tbody>
</table>
### 3.5.2 VCD Orchestration Models

VMware Cloud Director orchestration models let you provide your customers with a ready environment which they can use to deploy virtual servers. The administrator creates and deploys orchestration models. In their turn, customers receive a VMware Cloud Director environment with configured resource pool(s), network(s) and data store(s). This page describes how you can add orchestration models using OnApp.

Using OnApp you can view create, deploy and delete orchestration models. When you deploy an orchestration model you create a new VDC on the VMware Cloud Director side. CPU, memory, network and data store resources associated with the new VDC will be configured according to the parameters you set during orchestration model creation and deployment.

- Ensure that *Orchestration Models* permissions are on before managing orchestration models.
- This functionality is available for users with the vCloud Organization Administrator role.

<table>
<thead>
<tr>
<th>Virtual server options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipes</td>
<td>Y</td>
</tr>
<tr>
<td>Edge servers</td>
<td>Y</td>
</tr>
<tr>
<td>Ballooning release resource type for Compute zones</td>
<td>N</td>
</tr>
<tr>
<td>CPU Units</td>
<td>N</td>
</tr>
<tr>
<td>Hot RAM resize without reboot**</td>
<td>N</td>
</tr>
<tr>
<td>Hot CPU cores resize without reboot</td>
<td>N</td>
</tr>
<tr>
<td>Hot migration**</td>
<td>N</td>
</tr>
<tr>
<td>Cold migration</td>
<td>N</td>
</tr>
<tr>
<td>Disk hotattachment / detachment</td>
<td>N</td>
</tr>
<tr>
<td>Disk resize (increase/decrease)</td>
<td>Y - cold</td>
</tr>
<tr>
<td>IPv6 support ***</td>
<td>N</td>
</tr>
<tr>
<td>Reboot in recovery</td>
<td>N</td>
</tr>
<tr>
<td>Segregate</td>
<td>N</td>
</tr>
<tr>
<td>VIP status</td>
<td>N</td>
</tr>
<tr>
<td>Firewall</td>
<td>Y</td>
</tr>
<tr>
<td>Backups</td>
<td>see <a href="#">Virtual Server Snapshots</a></td>
</tr>
<tr>
<td>Change owner</td>
<td>N</td>
</tr>
<tr>
<td>CPU Topology</td>
<td>N</td>
</tr>
</tbody>
</table>
On this page:

- View Orchestration Models
- Deploy Orchestration Model

See also:

- Manage VMware Cloud Director VSs
- Create and Manage vApps
- Manage User Restrictions and Resources

3.5.2.1 View Orchestration Models

To view orchestration models, go to the Control Panel > Cloud > Orchestration Models in the VMware Cloud Director section. The page that loads shows the list of orchestration models with their labels and the particular VMware Cloud Director to which each template is associated.

Click the VMware Cloud Director label next to the template you are interested in to view the details of the VMware Cloud Director compute resource associated with it.

Click the label of a orchestration model to view its details:

Properties

- *Label* - the name of the orchestration model
- *Compute Resource* - the compute resource associated with the orchestration model
- *Provider Resource Pool* - select from the drop-down list the provider VDC that will be used when an organization VDC will be deployed from the orchestration model.

Compute Options

- *VDC model type* - the resource pool type: Allocation Pool, Reservation Pool or Pay-As-You-Go

There are three types of resource pools:

- *Allocation Pool* - a percentage of the resources you allocate from the provider virtual datacenter are committed to the organization virtual datacenter. You can specify the percentage for both CPU and memory.
- *Pay-As-You-Go* - resources are committed only when users create vApps in the organization virtual datacenter.
- *Reservation Pool* - all of the resources you allocate are immediately committed to the organization virtual datacenter.

- The array of resources with the minimum, maximum, and default values the end client can order and information on whether the end client can change and see the values. The parameters apply to a certain VDC model type selected previously. For details see the Orchestration Models API.

Network Options
• **Default Network** - the network pool for the selected compute resource
• **Deploy edge gateway** - whether an edge gateway will be deployed or not.
• **Edge gateway name** - the label for the new edge gateway. The default name is MyEdgeGateway. This field appears only when the **Deploy edge gateway** option is enabled.
• **Networks to create** - the networks that will be created during orchestration model deployment with their details:
  o **Network Name** - the label for the network
  o **Type** - the type of the network: direct, routed or isolated.
  o **Network Address** - the network address in "x.x.x.x/x" format.
  o **DNS** - DNS for the network.

**Storage**
• **Enable thin provisioning** - whether thin provisioning is enabled
• **Enable fast provisioning** - whether fast provisioning is enabled
• **Data store option choices** - the settings for data stores:
  o **Label** - the name of the data store zone(s) in which data stores will be created during orchestration model deployment.
  o **Minimum** - the minimum data store size (GB) that can be requested during orchestration model deployment
  o **Maximum** - the maximum data store size (GB) that can be requested during orchestration model deployment
  o **Default** - the default data store size (GB) that will be set during orchestration model deployment. If the data store options are not set as customizable and/or visible, the default data store size will be applied during orchestration model deployment.
  o **Customizable** - whether the data store size can be altered during orchestration model deployment
  o **Visible** - whether the data store zone will be listed during orchestration model deployment. If the data store zone is not visible, a data store will still be created in it.

3.5.2.2  Deploy Orchestration Model

To deploy an orchestration model:

1. Go to the **Control Panel > Cloud > Orchestration Models** in the VMware Cloud Director section.
2. Click the **Actions** button next the template you want to deploy and select **Deploy**.
3. On the page that loads, configure the resources assigned to the VMware Cloud Director created from this VDC template:

**General**
• **Organization** - select the organization with which the orchestration model will be associated
• **Resource Pool Label** - enter a label for a resource pool that will be created after the template is deployed

**CPU Resources**
- **CPU Allocation** - amount of CPU resources (GHZ) that will be allocated after the template is deployed
- **CPU Guaranteed** - amount of guaranteed CPU allocation (%)
- **vCPU Speed** - the vCPU speed that can be consumed after the template is deployed

**Memory Resources**
- **Memory** - the amount of memory(MB) that will be allocated after the template is deployed
- **Memory Guaranteed** - amount of guaranteed memory allocation (%)
- **VS Number** - the number VSs that can be created after the template is deployed

**Storage**
- **Default Storage Policy** - select the default storage policy
- Set the disk size for the data stores that will be allocated after the template is deployed

**Network**
- **Edge gateway name** - the name of the edge gateway
- **Edge gateway uplink networks** - select one or several external networks
- **Default gateway** - select the default gateway
- **Use default gateway for DNS relay** - move this slider to the right to use default gateway for DNS relay

The networks that will be assigned to the newly created VDC with their details:
- **Network Name** - the label for the network
- **Type** - the type of the network: routed, isolated or direct
- **Network Address** - the network address in "x.x.x.x/x" format
- **DNS** - DNS for the network

Click **Next** to proceed.

**Confirmation**
Review the details of the VMware Cloud Director you are going to deploy.

If you are satisfied with the configurations, click the **Submit** button to deploy the orchestration model.

If you want to change any of the resources, click the **Previous** button and make the necessary changes.

### 3.5.3 VCD Resource Pools

A VMware Cloud Director resource pool is an allocation model which determines how and when the provider virtual data center compute and memory resources are committed to the organization virtual data center.

There are three types of resource pools:
- **Allocation Pool** - a percentage of the resources you allocate from the provider virtual data center are committed to the organization virtual data center. You can specify the percentage for both CPU and memory.
• Pay-As-You-Go - resources are committed only when users create vApps in the organization virtual data center.

• Reservation Pool - all of the resources you allocate are immediately committed to the organization virtual data center.

You can view, create, edit and delete resource pools using OnApp Control Panel.

This functionality is available for users with the vCloud Organization Administrator role.

On this page:

• View Resource Pool
• Create Resource Pool
• Edit Resource Pool
• Delete VMware Cloud Director Resource Pool
• Resource Pool Data Stores
• Resource Pool Billing Statistics

See also:

• Create and Manage vApps
• Manage VMware Cloud Director VSs
• Manage Catalogs

3.5.3.1 View Resource Pool

To view VMware Cloud Director resource pools:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.

2. The page that loads will show the list of resource pools with their details:
   o Label - the name of the resource pool
   o Status - whether the resource pool is enabled or not. When a resource pool is disabled, the memory and compute resources of the resource pool are no longer available.
   o Type - the type of the resource pool: Allocation Pool, Pay-As-You-Go or Reservation Pool.
   o CPU (GHz) - the used and total CPU reservations for the resource pool, in GHz.
   o Memory (GB) - the used and total memory reservations for the resource pool, in GB.
   o Actions - click the Actions button to delete the resource pool

The search box at the top right corner of the page allows you to search a Resource Pool by its label.
To view VMware Cloud Director resource pool details:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.
2. Click the label of a specific resource pool.
3. The page that loads will show the following details of the resource pool:
   - **Label** - the name of the resource pool.
   - **Owner** - the user group to which this resource pool is assigned. Click the name to view the user group details.
   - **Allocation Model** - the type of resource pool
   - **VS Quota** - the quota of VSs
   - **Network Quota** - the quota of org networks that you can create in the resource pool
   - **Enabled** - whether this resource pool is enabled or not
   - **Fast Provisioning** - whether the fast provisioning is enabled for this resource pool or not
   - **Thin Provisioning** - whether the thin provisioning is enabled for this resource pool or not
   - **CPU** - the amount of Allocated CPU, Reserved CPU, Used CPU and percentage of guaranteed CPU
   - **vCPU Speed** - the speed of vCPU (in MHz)
   - **Memory** - the amount of Allocated Memory, Reserved Memory, Used Memory and percentage of guaranteed Memory
   - **Data Stores** - the list data stores within the resource pool. The following parameters are displayed for each of the data stores: label, disk usage, disk capacity, whether the data store is enabled or not. You can edit/delete the existing data stores.

Information on the Used resource pool resources (CPU and Memory) is updated every 3 minutes by default.

Also, you can customize resource pool statistics period using the following configuration in on_app.yml file:

```
vcloud_stats_level2_period: <period in second>
```

It is recommended to set the value between 1 and 5 minutes for effective stats gathering.

3.5.3.2 Create Resource Pool

To create a VMware Cloud Director resource pool:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.
2. Click the + button.
3. On the screen that appears, fill in the resource pool creation form:
   - **Label** - specify a name for the resource pool
- User group - choose the user group to which this resource pool will be assigned
- Provider vdc - choose the provider resource pool from the drop-down list

Ensure that Provider resource pools permissions are on.

- Allocation Model - choose the type of resource pool. Depending on the type selected, the compute resource options will differ:

**Compute resources**

**Pay-As-You-Go**

- **Guaranteed CPU** - specify the amount of guaranteed CPU allocation (%)
- **Guaranteed memory** - specify the amount of guaranteed memory allocation (%)
- **CPU limit** - specify the maximum amount of CPU (in GHz) that can be requested (or tick the check box below to set CPU limit to unlimited)
- **vCPU Speed** - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)
- **Memory limit** - specify the maximum amount of memory (in GB) which can be used (or tick the check box below to set Memory limit to unlimited)
- **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
- **Network Quota** - enter the number of org networks that can be created after the resource pool is deployed

- CPU limit is equal to CPU quota in a bucket (memory limit - to memory quota respectively).
- Min/max amounts of CPU and memory quotas in the bucket influence boundaries, within which you can set CPU and memory limits.
- If min/max amounts of CPU and memory quotas are set to unlimited in the bucket, you can set unlimited CPU and memory limits by ticking the check box. Otherwise unlimited option will not be available.

**AllocationPool**

- **CPU allocated** - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
- **Guaranteed CPU** - specify the amount of guaranteed CPU allocation (%)
- **Memory allocated** - specify the amount of memory (in GB) allocated to this resource pool
- **Guaranteed memory** - specify the amount of guaranteed memory allocation (%)
- **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
Network Quota - enter the number of org networks that can be created after the resource pool is deployed

ReservationPool
• CPU allocated - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
• Memory allocated - specify the amount of memory (in GB) allocated to this resource pool
• VS Quota - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
• Network Quota - enter the number of org networks that can be created after the resource pool is deployed

Network Options

• Default network pool - choose the default network pool from the drop-down list. This network pool is used when adding isolated and routed networks to the resource pool. If there is no network pool associated with a resource pool, you will not be able to add isolated and routed networks to the resource pool.

Datastore Options

• Thin Provisioning - move the slider to the right to enable thin provisioning for this resource pool
• Fast Provisioning - move the slider to the right to enable fast provisioning for this resource pool
• Data Store Zone - choose the data store zone which is a provider’s storage policy in VMware Cloud Director from the drop-down list. The selection will be limited by the company plan's resources.
• Capacity - the size of the data store that will be created. The capacity range depends on the company plan's limits. For the Pay-As-You-Go resource pools, you can select the Unlimited (∞) checkbox. After you create a resource pool, a new data store (storage policy) will be automatically created with the capacity set during resource pool creation in the selected data store zone.

4. Click the Submit button.

3.5.3.3 Edit Resource Pool

To edit a VMware Cloud Director resource pool:

1. Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.
2. Click the Actions button next to the resource pool you want to edit, then click Edit.
3. On the screen that appears, edit the necessary parameters depending on the resource pool type:
- **Label** - specify a name for the resource pool

**Compute resources**

- **AllocationVApp** (Pay-As-You-Go)
  - **Guaranteed CPU** - specify the amount of guaranteed CPU allocation (%)
  - **Guaranteed memory** - specify the amount of guaranteed memory allocation (%)
  - **CPU limit** - specify the maximum amount of CPU (in GHz) that can be requested (or tick the check box below to set CPU limit to unlimited)
  - **vCPU Speed** - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)
  - **Memory limit** - specify the maximum amount of memory (in GB) which can be used (or tick the check box below to set Memory limit to unlimited)
  - **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
  - **Network Quota** - enter the number of org networks that can be created in the resource pool

- **AllocationPool**
  - **CPU allocated** - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
  - **Guaranteed CPU** - specify the amount of guaranteed CPU allocation (%)
  - **Memory allocated** - specify the amount of memory (in GB) allocated to this resource pool
  - **Guaranteed memory** - specify the amount of guaranteed memory allocation (%)
  - **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
  - **Network Quota** - enter the number of org networks that can be created in the resource pool

- **ReservationPool**
  - **CPU allocated** - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
  - **Memory allocated** - specify the amount of memory (in GB) allocated to this resource pool
  - **VS Quota** - specify the number of VSs that can be created after the resource pool is deployed (or tick the check box below to set VS quota to unlimited)
  - **Network Quota** - enter the number of org networks that can be created in the resource pool

**Network Options**

- **Default network pool** - choose the network pool from the drop-down list. This network pool is used when adding isolated and routed networks to the resource pool. If there is no network pool associated with a resource pool,
you will not be able to add isolated and routed networks to the resource pool.

**Datastore Options**
- **Thin Provisioning** - move the slider to the right to enable thin provisioning for this resource pool
- **Fast Provisioning** - move the slider to the right to enable fast provisioning for this resource pool

4. Click the **Submit** button.

### 3.5.3.4 Delete VMware Cloud Director Resource Pool

You can delete a resource pool that contains no vApps, Org Networks, or catalogs with templates. To delete a VMware Cloud Director resource pool:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the **Actions** button next to the resource pool you want to delete and click **Delete**.
3. Click **OK** to confirm the deletion.

### 3.5.3.5 Resource Pool Data Stores

You can add new data stores and edit or delete existing data stores from the resource pool overview page at Control Panel > **Cloud** > **Resource Pools** > **Label**. For more information refer to **Storage Policies**.

#### 3.5.3.5.1 Add Resource Pool Data Stores

To add a data store to a resource pool:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to overview all resource pools in the cloud.
2. Click a label of a resource pool to which you want to add a new data store.
3. On the resource pool overview page, click the **+** button in the **Data Stores** section.
4. Fill in the form that appears:
   - **Data Store Zone** - select the data store zone in which the data store will be created
   - **Enabled** - select the option to enable the data store. By default, all the newly created data stores are enabled.
   - **Make default** - select the option to make the data store a default one. You cannot delete or disable a default data store.
   - **Disk Capacity** - move the slider to specify the size of the data store. For the Pay-As-You-Go resource pools, you can select the **Unlimited (∞)** checkbox.
5. Click the **Submit** button to add the data store.

#### 3.5.3.5.2 Edit Resource Pool Data Stores

To edit a resource pool data store:
1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.

2. Click a label of the required resource pool.

3. In the **Data Stores** section, click the **Actions** button next to the data store you want to update and select **Edit**.

4. Update the required fields in the form that appears:
   - **Enabled** - move the slider to select whether the data store should be enabled or not
   - **Make default** - select the option to make the data store a default one. You cannot delete or disable a default data store.
   - **Disk Capacity** - move the slider to specify the size of the data store. For the Pay-As-You-Go resource pools, you can select the **Unlimited (∞)** checkbox.

5. Click the **Submit** button to save the changes.

### 3.5.3.5.3 Delete Resource Pool Data Stores

#### To delete a resource pool data store:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.

2. Click the label of the required resource pool.

3. In the data stores section, click the **Actions** button next to the data store you want to remove and select **Delete**.

### 3.5.3.6 Resource Pool Billing Statistics

Bucket statistics about used VMware Cloud Director resources is gathered from VMware Cloud Director resource pools. Two types of VMware Cloud Director resource pools are used for billing statistics - reservation and allocation pools. The bucket for these VMware Cloud Director resource pool types will include charging for the block of resources (CPU, RAM, storage, & network etc.) assigned to your user group.

Statistics are not collected on a resource pool if the compute zone is not added to the bucket.

### 3.5.3.6.1 View and generate statistics

#### To view VMware Cloud Director resource pool billing statistics:

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.

2. Click the label of a specific resource pool.

3. Click the **Billing Statistics** tab.

4. The page that loads will show the following details of the billing statistics:
   - **Date** - particular date and time for the generated statistics
   - **User Group** - the label of user group, to which the bucket is assigned. Click the user group name to see its details.
   - **Resource Pool** - the resource pool name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.
o **Network Usage** - the network name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.

o **Storage Policy Usage** - the storage policy name with the total due for VMware Cloud Director resources for the point of time specified in the Date column.

o **Costs** - the total due for the Resource Pools and Storage Policy Usage at the point of time specified in the Date column.

o **Total Amount** - the total due for all Resource Pools and Storage Policy Usage for a given period of time.

To generate statistics for a particular time period:

The statistics for the selected period might be missing if the resource pool didn't exist, or statistics archiving was turned on. For information on statistics archiving, refer to the **Archive Statistics** section below.

1. Go to your Control Panel > **Cloud** > **Resource Pools** menu to see an overview of all resource pools in the cloud.
2. Click the label of a specific resource pool.
3. Click the **Billing Statistics** tab.
4. At the top of the table set Start and End time for which you want to generate the billing statistics.
5. Tick the **Show in my timezone** checkbox if you want to show billing statistics according to your profile's timezone settings.
6. Click **Apply**.

Also you can customize resource pool statistics period using the following configuration in on_app.yml file:

```
vdc_stats_delay: <period in second>
```

3.5.3.6.2 **Archive statistics**

If required, you can turn on resource pool statistics archiving. If this feature is enabled, hourly statistics will be converted into monthly and then stored as an archive.

To configure statistics archiving:

1. Go to your Control Panel > **Admin** > **Settings** menu, and click the **Configuration** icon.
2. Click the **System** tab.
3. Configure the following settings in the **Statistics Management** section:

   o **Enable hourly statistics archiving** - move the slider to the right to switch on archiving for hourly statistics. If enabled, hourly statistics will be converted into monthly and stored as archive for all the period that exceeds the time specified in the **Time of hourly statistics storage (months)** parameter below.

   o **Time of hourly statistics storage (months)** - this parameter configures how long you want the detailed hourly statistics to be stored in database before being converted into monthly statistics. For example, if you set this parameter to 10, the hourly statistics will be stored for the last 10 months. And everything older than 10 months will be sent to archive (that is converted into monthly statistics). If this parameter is set as 1, then you can view the detailed hourly statistics for the current month only.
Set this parameter at least as 2 to keep the statistics for the previous month available.

4. Click the Save Configuration button to finish. Saving the configuration will restart OnApp services.

3.5.3.6.3 Manage Firewalls

Firewalls are used to route VS networking traffic in and out of OnApp. Because all customer VSs are running inside the network, firewalls are required as the VS gateway.

To manage firewall rules:
1. Go to Control Panel > Cloud > Resource Pools menu.
2. Click the label of the resource pool.
3. Click the Manage Firewall tab.

You will be redirected to the vCloud to manage firewall for the VCD page.

- To learn how to manage firewalls refer to Add an Edge Gateway Firewall Rule Using the Tenant Portal guide
- To learn more about grouping objects refer to Custom Grouping Objects guide
- To get more information about security tags refer to Working with Security Tags guide

3.5.4 VCD Provider Resource Pools

A VMware Cloud Director resource pool is an allocation model which determines how and when the provider virtual data center compute and memory resources are committed to the organization virtual data center. You can view the provider resource pools with details on available resources from the Control Panel.

This functionality is available for users with the vCloud Organization Administrator role.

3.5.4.1 View Provider Resource Pools

You can access the Provider Resource Pools page from your Control Panel. The page provides the following information about the available resource pools:

- **Label** - the name of the provider resource pool
- **Enabled** - the status that indicates whether the resource pool is enabled or not
- **Hypervisor** - the VMware Cloud Director compute resource
- **CPU (GHz)** - the number of used / total CPU and the percentage of used CPU in GHz
- **Memory (GB)** - the number of used / total memory and the percentage of used memory in GB

To view details on a particular provider resource pool, see the following section.
On this page:

- View Provider Resource Pools
- View Provider Resource Pool Details

See also:

- VCD Resource Pools
- Storage Policies
- VMware Cloud Director Buckets
- Create and Manage vApps
- Manage VMware Cloud Director VSs
- Manage Catalogs

3.5.4.2 View Provider Resource Pool Details

To view details of a provider resource pool, go to Control Panel > Cloud > Provider Resource Pools and click a label of a destination pool. You can see the following information on the provider resource pool:

- Properties
  - *Label* - the name of the provider resource pool
  - *Enabled* - the status that indicates whether the resource pool is enabled or not
  - *Hypervisor* - the VMware Cloud Director compute resource
  - *CPU* - the number of *Allocated*, *Used*, and *Total* CPU in GHz
  - *Memory* - the number of *Allocated*, *Used*, and *Total* memory in GB

- Data Store Groups
  The list of data stores available within the provider resource pool. To see more details on a specific data store, click its label.

- Network Groups
  The list of networks available within the provider resource pool. To see more details on a specific network, click its label.

- External Networks
  The list of external (public) networks available within the provider resource pool. To see more details on a specific network, click its label.

3.6 VCD Edge Gateways

In this chapter, you can find information on how to manage VMware Cloud Director edge gateways:
• **Create Edge Gateways**
• **Manage Edge Gateways**

### 3.6.1 Create VCD Edge Gateway

A VMware Cloud Director edge gateway is a virtual router for organization VDC (Virtual Data Center) networks. An Edge Gateway provides a routed connection between an organization VDC network and an external network.

You can create an Edge Gateway in either a compact or a full configuration. The full configuration provides increased capacity and performance. The compact configuration requires less memory and fewer compute resources. All services are supported in either configuration.

To create an edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu and click the "+" button. This will start an edge gateway creation wizard.

2. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.

3. Click the **New Edge Gateway** button to start the creation process. You will be taken to the edge gateway details screen.

**On this page:**

- **Step 1 of 6. General**
- **Step 2 of 6. External Networks**
- **Step 3 of 6. Configure IP Settings**
- **Step 4 of 6. Default Gateway**
- **Step 5 of 6. Configure Rate Limits**
- **Step 6 of 6. Summary**

#### 3.6.1.1 Step 1 of 6. General

1. Indicate the following details:

   - **Label** - indicate the label of the edge gateway
   - **Description** - write additional info about the edge gateway

   - **Organization** - select the organization with which the edge gateway will be associated
   - **Resource Pool** - choose the appropriate resource pool from the drop-down list
   - **Edge Gateway Configuration** - choose the configuration type of the edge gateway from the drop-down list:
     - **Compact** - requires less memory and fewer compute resources
     - **Large** - provides increased capacity and performance compared to the Compact option
     - **Quad large** - recommended for high throughput and requires a high connection rate

   - **Enable High Availability** - move the slider to the right to enable high availability option for this edge gateway

   - **Create as Advanced Gateway** - move this slider to the right to enable advanced edge gateway services. Note that after you enable this slider, the **Enable Distributed Routing** slider becomes available to you.

   - **Enable Distributed Routing** - move this slider to the right to enable distributed routing
• **Configure IP settings** - move this slider to the right to manually configure IP settings
• **Configure rate limits** - move this slider to the right to manually configure the inbound and outbound rate limits

2. Click **Next** to proceed to the following step of the wizard where you can specify the external networks.

### 3.6.1.2 Step 2 of 6. External Networks
At this step, choose external networks to which your edge gateway will be connected:

- **External Networks** - select the external network from the drop-down list

Click **Next** to proceed to the following step of the wizard where you can specify the IP settings configuration.

### 3.6.1.3 Step 3 of 6. Configure IP Settings
This step is optional. It becomes available after you move the **Configure IP settings** slider to the right at the first step of the creation wizard.

1. Click the label of the external network.
2. Indicate the following details:
   - **Assign** - move this slider to the right to assign an IP address for each of the subnets. You may choose not to assign IP addresses to a given subnet at all.
   - **Auto** - move this slider to the left to indicate the IP address manually
   - **IP range** - select the IP range from the drop-down list
   - **IP address** - select the IP address from the drop-down list
3. Click **Next** to proceed to the following step of the wizard where you can specify the default gateway.
3.6.1.4  Step 4 of 6. Default Gateway
At this step, select a network to be the default gateway:

- *Configure default gateway* - move this slider to the right to enable automatic configuration of the default gateway
- *Default gateway* - select the default gateway from the drop-down list
- *Use default gateway for DNS relay* - move this slider to the right to use default gateway for DNS relay

Click **Next** to proceed to the following step of the wizard where you can configure rate limits.

3.6.1.5  Step 5 of 6. Configure Rate Limits
This step is optional. It becomes available after you move the *Configure rate limits* slider to the right at the first step of the creation wizard.

1. Click the label of the external network.
2. Indicate the following details:
   - *Enable rate limits* - move this slider to the right to enable the inbound and outbound rate limits
   - *Incoming rate limit* - indicate the inbound rate limit in megabits per second. The default value is 100. The minimal value is 0.001 Mb/s.
   - *Outgoing rate limit* - indicate the outbound rate limit in megabits per second. The default value is 100. The minimal value is 0.001 Mb/s.
3. Click **Next** to proceed to the next step of the wizard that completes the edge gateway creation process.
3.6.1.6  Step 6 of 6. Summary
At this step, you can find the configuration summary of the edge gateway, which will be created. You can view the external networks with their IP nets, IP addresses, incoming and outgoing rate limits.

The page that loads will provide you with the following information:

- **Label** - the label of the edge gateway
- **Description** - additional info about the edge gateway
- **Organization** - the organization with which the edge gateway will be associated with
- **Resource Pool** - the resource pool with which the edge gateway is associated
- **Edge Gateway Configuration** - the configuration type of the edge gateway
- **Enable High Availability** - whether high availability is enabled for this edge gateway
- **Create as Advanced Gateway** - whether advanced edge gateway services are enabled
- **Enable Distributed Routing** - whether distributed routing is enabled
- **Default gateway** - the default gateway
- **Use default gateway for DNS relay** - whether default gateway for DNS relay is used

After you check all parameters, click the **Submit** button to start the creation process.
3.6.2 Manage VCD Edge Gateways

A VMware Cloud Director edge gateway is a virtual router for organization VDC (Virtual Data Center) networks. An Edge Gateway provides a routed connection between an organization VDC network and an external network.

An Edge Gateway can support up to ten interfaces. These interfaces are categorized as uplinks when they connect to an external network and internal interfaces when they connect to an organization VDC network.

This functionality is available for users with the vCloud Organization Administrator role.

3.6.2.1 View Edge Gateways

To view edge gateways:
1. Go to your Control Panel's **Edge Gateways** menu.
2. The page that loads will show the list of VSs together with their:
   - **Label** - the name of the edge gateway
   - **External address** - external firewall IP
   - **User group** - the user group with which the edge gateway is associated
   - **Organization** - the organization with which the edge gateway is associated
   - **Resource pool** - the resource pool with which the edge gateway is associated
   - **Status** - power status, active or inactive

On this page:

- **View Edge Gateways**
• View Edge Gateway Details
• Edit Edge Gateways
• Delete Edge Gateways
• Advanced Edge Gateway Services

See also:

• Edge Gateways (API)

• VMware Cloud Director Firewall Rules
• VMware Cloud Director vApp Networks

3.6.2.2 View Edge Gateway Details

To view details of a specific edge gateway:

1. Go to your Control Panel's Edge Gateways menu.

2. Choose the specific Edge Gateways's label. Click the Overview tab to see the following information:
   o Label - the name of the edge gateway
   o Description - additional info about the edge gateway
   o Resource Pool - the resource pool with which the edge gateway is associated
   o Organization - the organization with which the edge gateway is associated
   o User Group - the user group with which the edge gateway is associated
   o Edge Gateway Configuration - configuration type of the edge gateway
   o High Availability - whether high availability option is enabled for this edge gateway or not
   o Use default route for dns relay - whether default route for dns relay is used or not

3. Also at this page you will see the following information about external network interfaces, to which this edge gateway is connected:
   o Label - the label of the network
   o Gateway address - the IP address of the gateway

4. Click the Firewall Service, Nat Service, VPN Service tabs for the respective actions.

5. By clicking the Manage Services button you will be redirected to the VMware Cloud Director where you can manage appropriate edge gateway services if needed.
3.6.2.3 Edit Edge Gateways

Whether you want to change an edge gateway or its components, be sure to select the corresponding action. If you want to edit an edge gateway choose the Edit action. For other components, select among such actions as Edit External Networks, Edit Default Gateway, Edit IP Settings or Edit Rate Limits.

To edit edge gateway:
1. Go to your Control Panel's **Edge Gateways** menu.
2. Click the **Actions** icon next to the edge gateway you want to edit, then choose the action from the list.
3. Edit the necessary parameters:

**Edit Edge Gateway**

1. 
   - **Label** - change the label of edge gateway
   - **Description** - specify additional info about edge gateway
   - **Edge Gateway Configuration** - this field cannot be edited, it is set during edge gateway creation
   - **High Availability** - tick the checkbox to enable high availability option for this edge gateway

**Edit External Networks**

Select the external network from the drop-down list

**Edit Default Gateway**

1. 
   - **Configure default gateway** - move this slider to the left to enable automatic configuration of the default gateway
   - **Default gateway** - select the default gateway from the drop-down list
   - **Use default gateway for DNS relay** - move this slider to the right to use default gateway for DNS relay

**Edit IP Settings**

1. 
   - **Participate** - move this slider to the right to assign IP address for each of the subnets. You may choose not to participate in a given subnet.
   - **Auto IP assignment** - move this slider to the left to indicate the IP address manually.
   - **IP address** - indicate the IP address

**Edit Rate Limits**

1. 
3.6.2.4 Delete Edge Gateways

To delete edge gateway:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Click the Actions icon next to the edge gateway you want to remove, then choose Delete.
3. Confirm the deletion.

3.6.2.5 Advanced Edge Gateway Services

Starting with OnApp 5.4, you can manage advanced edge gateway services. You can check whether an edge gateway is advanced using Edge Gateways API requests (advanced edge gateway has the `advanced_enabled` parameter set to 'true').

Ensure that the Manage Advanced Edge Gateway Services permission is on before managing advanced edge gateway services. For more information refer to the List of all OnApp Permissions section of the Administration guide.

To manage advanced edge gateway services:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Choose the specific Edge Gateways's label. Click the Services tab. You will be redirected to the VMware Cloud Director where you can manage appropriate advanced edge gateway services. For more information refer to the VMware Cloud Director documentation.
3.7 VCD Networking

In this chapter, you can find information on how to manage the following networking settings for VMware Cloud Director:

- NAT Rules
- Firewall Rules
- VPN Services

3.7.1 VCD Organization Networks

VMware Cloud Director organization networks enable communication between vApps within a VMware Cloud Director organization. You can view, create, edit, and delete VMware Cloud Director Organization networks using OnApp. Any changes that you make via OnApp regarding Organization networks are synchronized with VMware Cloud Director and vice versa.

This functionality is available for users with the vCloud Organization Administrator role.

3.7.1.1 View Organization Networks

To view the list of Organization networks, go to Control Panel left navigation pane Cloud > Org Networks menu. The page that loads shows the list of VMware Cloud Director Organization networks and their details:

- **Label** - the name of the network
- **Edge Gateway** - the edge gateway associated with the network. Click this label to view the details of the edge gateway.
- **Gateway Address** - the IP address of the gateway
- **Network Mask** - mask of the network
- **Resource Pool Owner** - the resource pool associated with the network. Click this label to view the details of the resource pool.
- **User Group** - the organization associated with the organization network

Click the "+" button at the top of the screen, and you will be redirected to the VCD UI, where you can add the organization network.

Click the Organization network label to view its details:

- **Label** - the name of the network
- **Status** - the status of the network, whether it is switched on or not.
- **Type** - the type of the network. It can be routed, isolated or direct.
- **Edge Gateway** - the edge gateway associated with the network. Click this label to view the details of the edge gateway.
- **Gateway Address** - the IP address of the gateway
- **Network Mask** - IP of the network mask
- **Use gateway DNS** - whether gateway DNS is applied to the network or not
- **Primary DNS** - IP address of the primary domain name system (DNS) server
• **Secondary DNS** - IP address of the secondary domain name system (DNS) server

• **Shared** - whether this organization network is shared or not

• **Resource Pool Owner** - the resource pool associated with the network. Click this label to view the details of the resource pool.

**On this page:**

- View Organization Networks
- Create Organization Network
- Edit Organization Network
- Delete Organization Network

**See also:**

- VMware Cloud Director vApp Networks
- Edge Gateways
- VMware Cloud Director Firewall Rules
- Network Interfaces (API)

### 3.7.1.2  Create Organization Network

Ensure that **Org Networks** permissions are on before creating an org network. Depending on the assigned permissions, you can create all types of org networks, or only certain org network type(s) - direct, routed or isolated.

To create an organization network:

1. Go to **Control Panel** left navigation pane **Cloud > Org Networks** menu.
2. Click the + button.
3. On the screen that appears, fill in the organization network creation form:
   a. **Label** - specify a name for the organization network
   b. **Organization** - an organization to which the network will be connected (appears by default and can not be changed)
   c. **Resource Pool** - choose a resource pool to which the network will be connected
   d. **Network Type** - choose a type of the organization network. Depending on the type selected, the options will differ:
Direct

- **External Network** - choose an external network from the drop-down list
- **Shared** - move the slider to the right to make this network shared

Routed

- **Shared** - move the slider to the right to make this network shared
- **Edge Gateway** - choose an edge gateway to which the network will be connected
- **Network Address** - specify a network address (CIDR address format with gateway address)
- **Use Gateway DNS** - move the slider to the right if the selected edge gateway has configured DNS. Otherwise fill in **Primary DNS**, **Secondary DNS**, and **DNS Suffix** fields.
- **Primary DNS** - specify IP address of the primary domain name system (DNS) server
- **Secondary DNS** - specify IP address of the secondary domain name system (DNS) server
- **DNS Suffix** - specify DNS suffix
- **Static IP Pools** - specify start/end IP addresses. To add more than one line, click the + button

Isolated

- **Shared** - move the slider to the right to make this network shared
- **Primary DNS** - specify IP address of the primary domain name system (DNS) server
- **Secondary DNS** - specify IP address of the secondary domain name system (DNS) server
- **DNS Suffix** - specify DNS suffix
- **Static IP Pools** - specify start/end IP addresses. To add more than one line, click the + button

4. Click the **Submit** button.

3.7.1.3 Edit Organization Network

To edit an organization network:
1. Go to **Control Panel** left navigation pane **Cloud > Org Networks** menu.
2. Click the **Actions** button next to the organization network you want to edit, then click **Edit**.
3. On the screen that appears, edit the necessary parameters:
   - **Label** - specify a name for the organization network
   - **Shared** - move the slider to the right to make this network shared
   - **Primary DNS** - specify IP address of the primary domain name system (DNS) server
   - **Secondary DNS** - specify IP address of the secondary domain name system (DNS) server
   - **DNS Suffix** - specify DNS suffix
   - **Static IP Pools** (applicable for isolated and routed org networks)
     - **Start IP** - specify start IP address
     - **End IP** - specify end IP address
     Click the “+” button to add several IP pools.
4. Click the **Submit** button.

---

### 3.7.1.4 Delete Organization Network

To delete an Organization network:

1. Go to **Control Panel** left navigation pane **Cloud > Org Networks** menu.
2. The page that loads shows the list of VMware Cloud Director Organization networks.
3. Click the **Actions** button next to the network you want to delete and click **Delete**. You will be asked for confirmation before the network is deleted.

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### 3.7.2 VCD NAT Rules

VMware Cloud Director NAT (Network Address Translation) service translates source or destination IP addresses and port numbers. In the most common case, you associate a NAT service with an uplink interface on an Edge Gateway so that the addresses on organization VDC networks are not exposed on the external network.

You can view/create/edit/delete NAT rules using OnApp Control Panel.

This functionality is available for users with the vCloud Organization Administrator role.

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### 3.7.2.1 View NAT Rules

To view NAT service of a specific edge gateway:
1. Go to your Control Panel > **Cloud** > **Edge Gateways** > Edge gateway's label > **Nat Service** tab.

2. On the page that appears you will see the list of NAT rules together with their details:
   - **Rule type** - the type of the NAT rule (DNAT, SNAT)
   - **Network** - the name of VMware Cloud Director network
   - **Original IP** - the original IP address to apply this rule on
   - **Original port** - the port of original IP address
   - **Translated IP** - the IP address to translate the addresses of outgoing packets to
   - **Translated port** - the port of translated IP address
   - **Enabled** - whether this rule is enabled or not
   - **Protocol** - the type of protocol
   - **Actions** - processes which you can perform with the NAT rule

On this page:

- [View NAT Rules](#)
- [Create NAT Rules](#)
- [Edit NAT Rule](#)
- [Delete NAT Rules](#)

See also:

- [Edge Gateways](#)
- [Edge Gateways (API)](#)
- [VMware Cloud Director Firewall Rules](#)
- [VMware Cloud Director vApp Networks](#)
- [VMware Cloud Director VS Network Interfaces](#)

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### 3.7.2.2 Create NAT Rules

To create a NAT rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > edge gateway's label > **Nat Service** tab.

2. Click the **Add New Rule** button or "+" button.

3. On the page that appears specify the following parameters:
   - **Enabled** - tick the checkbox to enable this NAT rule
4. Click **Create**.

### 3.7.2.3 Edit NAT Rule

To edit a NAT rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > edge gateway's label > **Nat Service** tab.
2. Click the **Actions** icon > **Edit** next to the NAT rule, which you want to edit.
3. On the page that appears change the following parameters:
   - **Enabled** - move the slider to the right to enable this NAT rule
   - **Network** - choose the VMware Cloud Director network from the drop-down menu
   - **Original IP** - specify the original IP address to apply this rule on
   - **Original port** - specify the port of original IP address (applies only for DNAT rule type)
   - **Translated IP** - specify the IP address to translate the addresses of outgoing packets
   - **Translated port** - specify the port of translated IP address (applies only for DNAT rule type)
   - **Protocol** - choose the type of protocol from the drop-down menu (applies only for DNAT rule type)
4. Click **Submit**.

### 3.7.2.4 Delete NAT Rules

To delete a NAT rule:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** menu > specific edge gateway's label > **Nat Service** tab.
2. Click the Delete icon next to the NAT rule you want to delete.
3. Confirm the deletion.
3.7.3 VCD Firewall Rules

This section provides the information on how you can manage the firewall rules for the virtual servers imported from your VMware Cloud Director.

This functionality is available for users with the vCloud Organization Administrator role.

3.7.3.1 Create Firewall Rules

On this page:

- Create Firewall Rules
- Edit Firewall Rules
- Delete Firewall Rules

See also:

- Firewall Rules (API)
- Edge Gateways
- VMware Cloud Director vApp Networks

To add a firewall rule:

1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Click specific Edge Gateway's label.
3. Click the Firewall Service tab > Firewall Rules.
4. Click the Add New Rule button.
5. Set the following:
   - Enabled - whether the firewall rule is enabled or not.
   - Description - the description of the firewall rule.
   - Command - there are two commands:
     - ACCEPT – defines the packets that will be accepted by the firewall.
     - DROP – defines the packets that will be rejected by the firewall.
   - Source - the source IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
   - Source port - the source port for which this firewall rule is effective.
   - Destination - the destination IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
   - Destination port - the destination port for which this firewall rule is effective.
   - Protocol - there are several types of protocol - TCP, UDP, ICMP, TCP+UDP or any.
3.7.3.2 Edit Firewall Rules

To edit a firewall rule:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Click specific Edge Gateway’s label.
3. Click the Firewall Service tab > Firewall Rules.
4. On the page that appears you will see the list of firewall rules. Click the Edit icon next to the firewall rule you want to edit.
5. Change the following settings:
   - **Enabled** - whether the firewall rule is enabled or not.
   - **Description** - the description of the firewall rule.
   - **Command** - there are two commands:
     - ACCEPT – defines the packets that will be accepted by the firewall.
     - DROP – defines the packets that will be rejected by the firewall.
   - **Source** - the source IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
   - **Source port** - the source port for which this firewall rule is effective.
   - **Destination** - the destination IP address for which this firewall rule is active. The destination IP address for which this firewall rule is active. This can be an IP address, CIDR, IP range, "any", "internal" or "external". This field is not case sensitive.
   - **Destination port** - the destination port for which this firewall rule is effective.
   - **Protocol** - there are several types of protocol - TCP, UDP, ICMP, TCP+UDP or any.
   - **Enable logging** - tick this check box to enable logging.
6. Click the Save button.

3.7.3.3 Delete Firewall Rules

To delete a firewall rule:
1. Go to your Control Panel > Cloud > Edge Gateways menu.
2. Click specific Edge Gateway’s label.
3. Click the Firewall Service tab > Firewall Rules.
4. On the page that appears you can see the list of firewall rules. Click the Delete icon next to the firewall rule you want to delete. Confirm the deletion.

3.7.4 VCD VPN Services

The VMware Cloud Director edge gateway configuration can define an IPsec virtual private networking (VPN) service to provide secure virtual private networking within an organization,
between organization VDC networks, or between an organization VDC network and an external IP address.

VPN Service allows you to create VPN tunnels for current Edge Gateway using OnApp Control Panel.

- Ensure that *Tunnels* permissions are on before managing VPN tunnels.
- This functionality is available for users with the vCloud Organization Administrator role.

### 3.7.4.1 View VPN Tunnels

To view VPN service of a specific edge gateway:

1. Go to your Control Panel > **Cloud** > **Edge Gateways** > edge gateway’s label > **VPN Service** tab.
2. On the page that appears, you will see the list of VPN tunnels together with their details:
   - *Name* - the label of the VPN tunnel
   - *Enabled* - whether VPN tunnel is enabled or not
   - *Description* - the description of the VPN tunnel
   - *Peer* - the ID for the peer end point
   - *Local* - the ID for local end point
   - *Local network* - the name of the local network in the VPN tunnel
   - *Peer network* - the name of the peer network in the VPN tunnel
   - *Operational* - whether this VPN tunnel is operational or not
   - *Actions* - processes which you can perform with the VPN tunnel

On this page:

- View VPN Tunnels
- Create VPN Tunnel
- Delete VPN Tunnel

See also:

- Edge Gateways
- Edge Gateways (API)
- Manage NAT Rules
- VMware Cloud Director Firewall Rules
- VMware Cloud Director vApp Networks
- VMware Cloud Director VS Network Interfaces
3.7.4.2  Create VPN Tunnel

To create a VPN tunnel of a specific edge gateway:
1. Go to your Control Panel > Cloud > Edge Gateways menu > specific edge gateway's
   label > VPN Service tab.
2. Click the "+" button.
3. On the page that appears specify the following parameters:
   o Name - specify the label of VPN tunnel
   o Enabled - move the slider to the right to enable this VPN tunnel
   o Description - provide the description of the VPN tunnel that can include no more
     than 255 characters
   o Local Native Address - specify the IP address of the local network
   o Local Networks - choose one or several local networks from the drop-down list
   o Peer ID - specify the IP address of the peer endpoint. The Peer IP cannot be the
     same for multiple IPSec VPNs. Peer ID is used to uniquely identify the peer. If the
     peer address is on this or another organization VDC network, this should be peer's
     native IP address. If peer is NAT'd, this should be the private peer IP address.
   o Peer Behind NAT - move the slider to the right to enable specifying peer native
     Address
   o Peer Native Address - if Peer Behind NAT slider is enabled, enter IP address to
     reach the peer. If the Peer is NAT'd, this should be the public side address of NAT.
   o Peer Networks - specify the peer network. Peer Network cannot be the same as
     the local network. Network address should be written in CIDR format.
   o Shared secret encrypted - move the slider to the right to encrypt the shared secret
   o Encryption protocol - specify the type of encryption protocol (default protocol
     is AES-236)
   o Prehashed Key - the key used for authentication. Shared secret key should be from
     32 to 128 characters in length and have at least one uppercase letter, one
     lowercase letter and one number. Special characters are not allowed.
   o MTU - specify the size of maximum transmission unit (default value is 1500)
4. Click Create.

3.7.4.3  Delete VPN Tunnel

To delete a VPN tunnel of a specific edge gateway:
1. Go to your Control Panel > Cloud > Edge Gateways > edge gateway's label > VPN
   Service tab.
2. Click the Delete icon next to the VPN tunnel you want to delete.
3. Confirm the deletion.
4 API Guide

The API Guide is updated based on features, improvements, and fixes implemented for VCD within the latest OnApp version that is OnApp 6.5 Edge 4. For earlier versions of the documentation, refer to Previous Versions.

The VMware Cloud Director API Guide includes API requests you can use to manage VCD-related entities:

- Buckets API
- Catalogs API
- Company Billing Plans API
- Company Payments API
- Edge Gateways API
- External Networks API
- Firewall Rules API
- Network Interfaces API
- Cross VDC Networks API
- Orchestration Models API
- Organizations API
- Organization Networks API
- Resource Pools API
- User Groups API
- Users API
- vApps API
- vApp Networks API
- vCloud Virtual Servers API
- vCloud VS Snapshots API
- System Configuration API
- NSX-V Integration API
- NSX-T Integration API

For information on managing VCD entities in OnApp UI, refer to the Administration Guide or User Guide.

4.1 Buckets API

Buckets define the resource allocation and prices for resources in the cloud. They are made up of two parts:

- Access Control which defines the resources the user under the bucket has access to
- Rate Card which includes the prices for resource usage
This section contains the API requests you can use to manage buckets.

### 4.1.1 Get List of Buckets

To get the list of buckets, use the following request:

GET /billing/buckets.xml
GET /billing/buckets.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**

```
<buckets type="array">
  <bucket>
    <id type="integer">3</id>
    <label>ut</label>
    <created_at type="dateTime">2017-06-26T08:48:05+00:00</created_at>
    <updated_at type="dateTime">2017-06-26T08:48:05+00:00</updated_at>
    <currency_code>USD</currency_code>
    <show_price nil="true"/>
    <monthly_price type="decimal">1.0</monthly_price>
    <allows_mak type="boolean">true</allows_mak>
    <allows_kms type="boolean">true</allows_kms>
    <allows_own type="boolean">true</allows_own>
    <associated_with_users type="integer">1</associated_with_users>
  </bucket>
</buckets>
```

Where:

- **id** - the bucket ID
- **label** - the bucket name
- **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the bucket was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
- **currency_code** - the currency in which the users are charged
- **show_price** - true, if users can see the prices set up for them, otherwise false
- **monthly_price** - the monthly fee for bucket usage
- **allows_mak** - true, if the MAK licensing is allowed, otherwise false
- **allows_kms** - true, if the KMS licensing is allowed for this bucket, otherwise false
- **allows_own** - true, if adding own licenses is allowed for this bucket, otherwise false
**associated_with_users** - the number of users with which this bucket is associated

### 4.1.2 Get Bucket Details

To get bucket details, use the following request:

GET /billing/buckets/id.xml
GET /billing/buckets/id.json

**XML Request Example**


**JSON Request Example**


**XML Output Example**

```xml
<buckets type="array">
  <bucket>
    <id type="integer">21</id>
    <label>minima</label>
    <created_at type="dateTime">2017-06-26T08:48:09+00:00</created_at>
    <updated_at type="dateTime">2017-06-26T08:48:09+00:00</updated_at>
    <currency_code>USD</currency_code>
    <show_price nil="true"/>
    <monthly_price type="decimal">1.0</monthly_price>
    <allows_mak type="boolean">true</allows_mak>
    <allows_kms type="boolean">true</allows_kms>
    <allows_own type="boolean">true</allows_own>
    <type>Billing::Buckets::Plan</type>
    <associated_with_users type="integer">1</associated_with_users>
  </bucket>
</buckets>
```

**Where:**

- **id** - the bucket ID
- **label** - the bucket name
- **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the bucket was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
- **currency_code** - the currency in which the users are charged
- **show_price** - true, if users can see the prices set up for them, otherwise false
- **monthly_price** - the monthly fee for bucket usage
- **allows_mak** - true, if the MAK licensing is allowed, otherwise false
- **allows_kms** - true, if the KMS licensing is allowed for this bucket, otherwise false
- **allows_own** - true, if adding own licenses is allowed for this bucket, otherwise false
**type** - the type of bucket

**associated_with_users** - the number of users with which this bucket is associated

### 4.1.3 Add Bucket

To create a new bucket, use the following request:

POST /billing/buckets.xml
POST /billing/buckets.json

**XML Request Example**

```
curl -i -X POST http://onapp.test/billing/buckets.xml -H 'Accept: application/xml' -H 'Content-Type: application/xml' -u user:userpass -d '<bucket><label>Label</label><currency_code>USD</currency_code><monthly_price type="integer">10</monthly_price><allows_kms type="boolean">false</allows_kms><allows_mak type="boolean">true</allows_mak><allows_own type="boolean">false</allows_own></bucket>'
```

**JSON Request Example**

```
```

**Where:**

*label* - the bucket name

*currency_code* - the currency that users will be charged in within this bucket (USD by default)

*monthly_price* - set the monthly fee for bucket usage

*allows_kms* - true, if the KMS licensing is allowed for this bucket, otherwise, false

*allows_mak* - true, if the MAK licensing is allowed, otherwise, false

*allows_own* - true, if adding own licenses is allowed for this bucket, otherwise, false

### 4.1.4 Edit Bucket

To edit a bucket, use the following request:

PUT /billing/buckets/14.xml
PUT /billing/buckets/13.json

**XML Request Example**

```
```

**JSON Request Example**

Where:

* label - the bucket name
* monthly_price - set the monthly fee for bucket usage

### 4.1.5 Clone Bucket

To clone a bucket with its prices and added resources, use the following request:

```sh
POST /billing/buckets/:bucket_id/clone.xml
POST /billing/buckets/:bucket_id/clone.json
```

**XML Request Example**

```sh
```

**JSON Request Example**

```sh
```

Where you indicate in the URL the ID of the cloned bucket.

### 4.1.6 Delete Bucket

Use the following API request to delete a bucket:

```sh
DELETE /billing/buckets/id.xml
DELETE /billing/buckets/id.json
```

**XML Request Example**

```sh
```

**JSON Request Example**

```sh
```

Returns HTTP 204 response on successful processing, and HTTP 404 when there is no bucket with a requested ID or URL is incorrect.
4.1.7 Access Control

The Access Control is the part of the bucket which defines the resources to which a user under the bucket has access. In the Access Control, you define the maximum/minimum/default limits for resource usage. If a resource is not added to the Access Control a user under the bucket will not have access to that resource. This section contains the API requests you can use to manage Access Controls.

4.1.7.1 Get List of Access Controls for VPC Server Type

To get the list of access controls, use the following request:

GET /billing/buckets/:bucket_id/access_controllers.xml
GET /billing/buckets/:bucket_id/access_controllers.json

XML Request Example

```bash
```

JSON Request Example

```bash
```

XML Output Example
<access_controls type="array">
  <access_control>
    <bucket_id type="integer">24</bucket_id>
    <server_type>vpc</server_type>
    <target_id type="integer">2</target_id>
    <type>data_store_zone_resource</type>
    <target_name>Default DataStore Zone</target_name>
    <limits>
      <limit_min_allocation_cpu_allocation type="decimal">1.0</limit_min_allocation_cpu_allocation>
      <limit_min_allocation_memory_allocation type="decimal">1.0</limit_min_allocation_memory_allocation>
      <limit_min_allocation_cpu_resources_guaranteed type="decimal">0.0</limit_min_allocation_cpu_resources_guaranteed>
      <limit_min_allocation_vcpu type="decimal">1.0</limit_min_allocation_vcpu>
      <limit_min_allocation_memory_resources_guaranteed type="decimal">1.0</limit_min_allocation_memory_resources_guaranteed>
      <limit_min_allocation_vcpu_speed type="decimal">1.0</limit_min_allocation_vcpu_speed>
      <limit_allocation_cpu_allocation type="decimal">1.0</limit_allocation_cpu_allocation>
      <limit_allocation_memory_allocation type="decimal">1.0</limit_allocation_memory_allocation>
      <limit_allocation_cpu_resources_guaranteed type="decimal">1.0</limit_allocation_cpu_resources_guaranteed>
      <limit_allocation_vcpu type="decimal">2.0</limit_allocation_vcpu>
      <limit_allocation_memory_resources_guaranteed type="decimal">1.0</limit_allocation_memory_resources_guaranteed>
      <limit_allocation_vcpu_speed type="decimal">1.0</limit_allocation_vcpu_speed>
      <limit_min_reservation_cpu_allocation type="decimal">1.0</limit_min_reservation_cpu_allocation>
      <limit_min_reservation_vcpu type="decimal">1.0</limit_min_reservation_vcpu>
      <limit_reservation_vcpu type="decimal">2.0</limit_reservation_vcpu>
      <limit_min_reservation_memory_allocation nil="true"/>
      <limit_reservation_cpu_allocation type="decimal">1.0</limit_reservation_cpu_allocation>
      <limit_reservation_memory_allocation nil="true"/>
      <limit_min_pay_as_you_go_cpu_limit type="decimal">1.0</limit_min_pay_as_you_go_cpu_limit>
      <limit_min_pay_as_you_go_vcpu type="decimal">1.0</limit_min_pay_as_you_go_vcpu>
      <limit_min_pay_as_you_go_memory_limit type="decimal">1.0</limit_min_pay_as_you_go_memory_limit>
      <limit_pay_as_you_go_cpu_limit type="decimal">1.0</limit_pay_as_you_go_cpu_limit>
      <limit_pay_as_you_go_vcpu type="decimal">1.0</limit_pay_as_you_go_vcpu>
      <limit_pay_as_you_go_memory_limit nil="true"/>
      <limit_pay_as_you_go_memory_limit nil="true"/>
      <limit_vs_cpu type="decimal">1.0</limit_vs_cpu>
      <limit_vs_memory nil="true"/>
    </limits>
  </access_control>
  ...<access_control>
</access_controls>

Where:

(bucket_id) - the ID of the bucket with which this access control is associated
(server_type) - the server type this access control is applicable to. For VPS resources, it is vpc.
**target_id** - the ID of the resource for which access control is configured

**type** - the type of the resource for which configuration is set, it can be one of the following values:
- `virtual_servers_resource`
- `application_servers_resource`
- `compute_zone_resource`
- `data_store_zone_resource`
- `network_zone_resource`

**timing_strategy** - the type of billing for each resource: hourly or monthly (on peak usage)

**target_name** - the name of the resource that is added to access control. For example, it can be a label of a template group or a compute zone, etc.

**limits** - the array of limits for the resource. Depending on the type of the resource, you can have the following limits:

### VPC Server Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>virtual_servers_resource</code></td>
<td><code>limit</code></td>
<td>the total amount of VSs the users can create in the cloud (VS/hour)</td>
</tr>
<tr>
<td><code>application_servers_resource</code></td>
<td><code>limit</code></td>
<td>the total amount of application servers that the users can create in the cloud (application VS/hour)</td>
</tr>
<tr>
<td><code>compute_zone_resource</code></td>
<td><code>limit_min_allocation_cpu_allocation</code></td>
<td>the minimum amount of CPU users can request for each VMware Cloud Director resource pool in the compute zone (GHz/limit_type)</td>
</tr>
<tr>
<td></td>
<td><code>limit_min_allocation_memory_allocation</code></td>
<td>the minimum amount of Memory users can request for each VMware Cloud Director resource pool in the compute zone</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>VPC Server Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>zone</strong> (GB/limit_type)</td>
<td>the minimum amount of CPU Resources users can request for each VMware Cloud Director resource pool in the compute zone</td>
</tr>
<tr>
<td><strong>limit_min_allocation_cpu_resources_guaranteed</strong></td>
<td>the minimum amount of CPU Resources users can request for each VMware Cloud Director resource pool in the compute zone (%/limit_type)</td>
</tr>
<tr>
<td><strong>limit_min_allocation_vcpu</strong></td>
<td>the minimum amount of vCPU Resources users can request for each VMware Cloud Director resource pool in the compute zone (cores/limit_type)</td>
</tr>
<tr>
<td><strong>limit_min_allocation_memory_resources_guaranteed</strong></td>
<td>the minimum amount of Memory Resources users can request for each VMware Cloud Director resource pool in the compute zone (%/limit_type)</td>
</tr>
<tr>
<td><strong>limit_min_allocation_vcpu_speed</strong></td>
<td>the minimum amount of vCPU speed users can request for each VMware Cloud Director resource pool in the compute zone (MHz/limit_type)</td>
</tr>
<tr>
<td><strong>limit_allocation_cpu_allocation</strong></td>
<td>the maximum amount of CPU users can request for</td>
</tr>
</tbody>
</table>
### VPC Server Type

<table>
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<th>Description</th>
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<tbody>
<tr>
<td>limit_allocation_memory_allocation</td>
<td>the maximum amount of Memory users can request for each VMware Cloud Director resource pool in the compute zone (GB/limit_type)</td>
</tr>
<tr>
<td>limit_allocation_cpu_resources_guaranteed</td>
<td>the maximum amount of CPU Resources users can request for each VMware Cloud Director resource pool in the compute zone (%/limit_type)</td>
</tr>
<tr>
<td>limit_allocation_vcpu</td>
<td>the minimum amount of vCPU Resources users can request for each VMware Cloud Director resource pool in the compute zone (cores/limit_type)</td>
</tr>
<tr>
<td>limit_allocation_memory_resources_guaranteed</td>
<td>the maximum amount of Memory Resources users can request for each VMware Cloud Director resource pool in the compute zone (%/limit_type)</td>
</tr>
</tbody>
</table>
### VPC Server Type

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<tbody>
<tr>
<td><code>limit_allocation_vcpu_speed</code></td>
<td>the maximum amount of vCPU speed users can request for each VMware Cloud Director resource pool in the compute zone (MHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_min_reservation_cpu_allocation</code></td>
<td>the minimum amount of CPU users can allocate for each VMware Cloud Director resource pool in the compute zone (GHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_min_reservation_vcpu</code></td>
<td>the minimum amount of vCPU users can allocate for each VMware Cloud Director resource pool in the compute zone (cores/limit_type)</td>
</tr>
<tr>
<td><code>limit_min_reservation_memory_allocation</code></td>
<td>the minimum amount of Memory users can request for each VMware Cloud Director resource pool in the compute zone (GB/limit_type)</td>
</tr>
<tr>
<td><code>limit_reservation_cpu_allocation</code></td>
<td>the maximum amount of CPU users can allocate for each VMware Cloud Director resource pool in the compute zone</td>
</tr>
<tr>
<td>VPC Server Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>limit_reservation_vcpu</td>
<td>the maximum amount of vCPU users can allocate for each VMware Cloud Director resource pool in the compute zone (cores/limit_type)</td>
</tr>
<tr>
<td>limit_reservation_memory_allocation</td>
<td>the maximum amount of Memory users can request for each VMware Cloud Director resource pool in the compute zone (GB/limit_type)</td>
</tr>
<tr>
<td>limit_min_pay_as_you_go_cpu_limit</td>
<td>the minimum amount of CPU users can request for each VMware Cloud Director resource pool in the compute zone (GHz/limit_type)</td>
</tr>
<tr>
<td>limit_min_pay_as_you_go_vcpu</td>
<td>the minimum amount of vCPU users can request for each VMware Cloud Director resource pool in the compute zone (cores/limit_type)</td>
</tr>
<tr>
<td>limit_min_pay_as_you_go_memory_limit</td>
<td>the minimum amount of Memory quota users can request under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>VPC Server Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><code>limit_pay_as_you_go_cpu_limit</code></td>
<td>the maximum amount of CPU quota users can request for each VMware Cloud Director resource pool in the compute zone (GHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_pay_as_you_go_vcpu</code></td>
<td>the maximum amount of vCPU quota users can request for each VMware Cloud Director resource pool in the compute zone (cores/limit_type)</td>
</tr>
<tr>
<td><code>limit_pay_as_you_go_memory_limit</code></td>
<td>the maximum amount of Memory quota users can request under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>data_store_zone_resource limit</code></td>
<td>the maximum amount of disk size users can request for each storage policy (data store) in a provider storage policy (data store zone) (GB/hour)</td>
</tr>
<tr>
<td><code>network_zone_resource limit_ip</code></td>
<td>the maximum number of IP Addresses users can request to deploy Edge Gateways for the whole network zone (IP/hour)</td>
</tr>
</tbody>
</table>
v.6.3 Edge 1

- added the following parameters:
  - `limit_min_allocation_vcpu`
  - `limit_allocation_vcpu`
  - `limit_min_reservation_vcpu`
  - `limit_min_pay_as_you_go_vcpu`
  - `limit_pay_as_you_go_vcpu`
  - `limit_reservation_vcpu`

4.1.7.2 Add Access Control for VPC Server Type

To create a new access control, use the following requests:

POST /billing/buckets/:bucket_id/access_controls.xml

POST /billing/buckets/:bucket_id/access_controls.json

**XML Request Example**

```
curl -i -X POST http://onapp.test/billing/buckets/1/access_controls.xml -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d '<access-control><target-id type="integer">30</target-id><type>compute_zone_resource</type><bucket-id type="integer">1</bucket-id><server-type>vpc</server-type><apply_to_all_resources_in_the_bucket>true</apply_to_all_resources_in_the_bucket><limits><limit_cpu_share>1</limit_cpu_share><limit_cpu_units>1</limit_cpu_units><limit_memory>1</limit_memory><limit_default_cpu>1</limit_default_cpu><limit_min_cpu>1</limit_min_cpu><limit_min_memory>1</limit_min_memory><limit_min_cpu_priority>1</limit_min_cpu_priority><limit_default_cpu_share>1</limit_default_cpu_share><limit_min_cpu_priority>1</limit_min_cpu_priority><limit_nsxt_edge_gateways type="integer">13</limit_nsxt_edge_gateways></limits></access-control>'
```

**JSON Request Example**

```
```

Where:

- **target_id** - the ID of the resource for which access control is configured
- **type** - the type of the resource, it can be one of the following values:
  - `virtual_servers_resource`
  - `application_servers_resource`
  - `compute_zone_resource`
  - `data_store_zone_resource`
- `network_zone_resource`

  `bucket_id` * - the ID of the bucket with which this access control is associated

  `server_type` * - the server type this access control is applicable to. For VPS resources, it is `vpc`.

  `target_name` - the name of the resource that is added to the access control. For example, it can be a label of a network or compute zone, etc.

  `limits` - the array of limits for a resource. Depending on the type of the resource, you can have limits described in the table below.

  `apply_to_all_resources_in_the_bucket` - set to `true` to apply limits that you pass for a zone resource to all resources of the same type in the bucket. The parameter is applicable to the following recourse types:

  - `compute_zone_resource`
  - `data_store_zone_resource`
  - `network_zone_resource`

<table>
<thead>
<tr>
<th>VPC Server Type</th>
<th>Type</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>virtual_servers_resource</code></td>
<td><code>limit</code></td>
<td>the total amount of VSs the users can create in the cloud (VS/hour)</td>
</tr>
<tr>
<td></td>
<td><code>application_servers_resource</code></td>
<td><code>limit</code></td>
<td>the total amount of application servers that the users can create in the cloud (application VS/hour)</td>
</tr>
<tr>
<td></td>
<td><code>compute_zone_resource</code></td>
<td><code>limit_min_allocation_cpu_allocation</code></td>
<td>the minimum amount of CPU users can request for each VMware Director resource pool in the compute zone (GHz/limit_type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>limit_min_allocation_memory_allocation</code></td>
<td>the minimum amount of Memory users can request for each VMware Director resource pool in the compute zone (GB/limit_type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>limit_min_allocation_cpu_resources_guaranteed</code></td>
<td>the minimum amount of CPU Resources users can request for</td>
</tr>
<tr>
<td>VPC Server Type</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_allocation_vcpu</td>
<td>the minimum amount of vCPU Resources users can request for each VMware Director resource pool in the compute zone (cores/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_allocation_memory_resources_guaranteed</td>
<td>the minimum amount of Memory Resources users can request for each VMware Director resource pool in the compute zone (%/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_allocation_vcpu_speed</td>
<td>the minimum amount of vCPU speed users can request for each VMware Director resource pool in the compute zone (MHz/limit_type)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>VPC Server Type</td>
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<td></td>
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<tr>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>zone</code></td>
<td>(GB/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>limit_allocation_cpu_resources_guaranteed</code></td>
<td>the maximum amount of CPU Resources users can request for each VMware Director resource pool in the compute zone (%/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>limit_allocation_vcpu</code></td>
<td>the minimum amount of vCPU Resources users can request for each VMware Director resource pool in the compute zone (cores/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>limit_allocation_memory_resources_guaranteed</code></td>
<td>the maximum amount of Memory Resources users can request for each VMware Director resource pool in the compute zone (%/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>limit_allocation_vcpu_speed</code></td>
<td>the maximum amount of vCPU speed users can request for each VMware Director resource pool in the compute zone (MHz/limit_type)</td>
<td></td>
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</tr>
<tr>
<td><code>limit_min_reservation_cpu Allocation</code></td>
<td>the minimum amount of CPU users can allocate for each VMware Director resource pool in the compute zone (GHz/limit_type)</td>
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</tr>
<tr>
<td>VPC Server Type</td>
<td>Description</td>
<td></td>
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<tr>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_reservation_vcpu</td>
<td>the minimum amount of vCPU users can allocate for each VMware Director resource pool in the compute zone (cores/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_reservation_vcpu</td>
<td>the maximum amount of vCPU users can allocate for each VMware Director resource pool in the compute zone (cores/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_reservation_memory_allocation</td>
<td>the minimum amount of Memory users can request for each VMware Director resource pool in the compute zone (GB/limit_type)</td>
<td></td>
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<tr>
<td>limit_reservation_cpu_allocation</td>
<td>the maximum amount of CPU users can allocate for each VMware Director resource pool in the compute zone (GHz/limit_type)</td>
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<tr>
<td>limit_reservation_memory_allocation</td>
<td>the maximum amount of Memory users can request for each VMware Director resource pool in the compute zone (GB/limit_type)</td>
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<td></td>
</tr>
<tr>
<td>limit_min_pay_as_you_go_cpu_limit</td>
<td>the minimum amount of CPU users can request for each VMware Director</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPC Server Type</td>
<td>Description</td>
<td></td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_pay_as_you_go_vcpu</td>
<td>the minimum amount of vCPU users can request for each VMware Director resource pool in the compute zone (cores/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_pay_as_you_go_memory_limit</td>
<td>the minimum amount of Memory quota users can request under this bucket (GB/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_pay_as_you_go_cpu_limit</td>
<td>the maximum amount of CPU quota users can request for each VMware Director resource pool in the compute zone (GHz/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_pay_as_you_go_vcpu</td>
<td>the maximum amount of vCPU quota users can request for each VMware Director resource pool in the compute zone (cores/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_pay_as_you_go_memory_limit</td>
<td>the maximum amount of Memory quota users can request under this bucket (GB/limit_type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_pay_as_you_go_vcpu_speed</td>
<td>the maximum amount of vCPU speed users can request under this bucket (MHz/limit_type)</td>
<td></td>
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</tr>
<tr>
<td>VPC Server Type</td>
<td>Description</td>
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<tr>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_vs_cpu</td>
<td>the maximum amount of CPU cores that users can request for all VSs totally created in the compute zone (CPU core/hour)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_vs_memory</td>
<td>the maximum amount of RAM that users can request for all VSs totally within the compute zone (Mb/hour)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit nsxt_edge_gateways</td>
<td>the maximum number of NSX-T edge gateways that can be created in a compute zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>data_store_zone_resource</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_min_disk_size</td>
<td>the minimum amount of disk size (users can request for each storage policy (data store) in a provider storage policy (data store zone) (GB/hour)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_disk_size</td>
<td>the maximum amount of disk size users can request for each storage policy (data store) in a provider storage policy (data store zone) (GB/hour)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_vs_disk_size</td>
<td>the maximum amount of disk size that users can request for all VSs totally within the whole data store zone (GB/hour)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>network_zone_resource</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit_ip</td>
<td>the maximum number of IP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VPC Server Type

<table>
<thead>
<tr>
<th>limit_vs_ip</th>
<th>the maximum amount of IP addresses that users can allocate to deploy/recompose a vApp within the whole network zone (IP/hour)</th>
</tr>
</thead>
</table>

Page History

v.6.5 Edge 4
- added limit_vs_ip parameter

v.6.3 Edge 1
- added the following parameters:
  - limit_min_allocation_vcpu
  - limit_allocation_vcpu
  - limit_min_reservation_vcpu
  - limit_min_pay_as_you_go_vcpu
  - limit_pay_as_you_go_vcpu
  - limit_reservation_vcpu

4.1.7.3 Edit Access Control for VPC Server Type
To edit access control, use the following request:

PUT /billing/buckets/:bucket_id/access_controls.xml
PUT /billing/buckets/:bucket_id/access_controls.json

XML Request Example

```
curl -i -X PUT http://onapp.test/billing/buckets/1/access_controls.xml -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d '<access-control><target_id type="integer">30</target_id><type>compute_zone_resource</type><bucket_id type="integer">1</bucket_id><server_type>vpc</server_type><apply_to_all_resources_in_the_bucket>true</apply_to_all_resources_in_the_bucket><limits><limit_cpu_share>1</limit_cpu_share><limit_cpu_units>1</limit_cpu_units><limit_memory>1</limit_memory><limit_default_cpu>1</limit_default_cpu><limit_min_cpu>1</limit_min_cpu><limit_min_memory>1</limit_min_memory><limit_default_memory>1</limit_default_memory><limit_min_cpu_priority>1</limit_min_cpu_priority><limit_default_cpu_priority>1</limit_default_cpu_priority><use_cpu_units>1</use_cpu_units><limit_nsxt_edge_gateways type="integer">15</limit_nsxt_edge_gateways></limits></access-control>'
```
JSON Request Example

```
curl -i -X PUT http://onapp.test/billing/buckets/1/access_controls.json -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' -d '{"target_id":30,"type":"compute_zone_resource","bucket_id":1,"server_type ":"vpc","apply_to_all_resources_in_the_bucket":"true","limits":{"limit_cpu_share":1.0,"limit_cpu_units":1.0,"limit_memory":1.0,"limit_default_cpu":1 .0,"limit_min_cpu":1.0,"limit_min_memory":1.0,"limit_default_cpu_share":1.0, "limit_min_cpu_priority":1.0,"use_cpu_units":1.0,"limit_nsxt_edge_gateways": 8}}'
```

Where:

- `target_id` - the ID of the resource for which access control is configured
- `type` - the type of the resource, it can be one of the following values:
  - `virtual_servers_resource`
  - `application_servers_resource`
  - `compute_zone_resource`
  - `data_store_zone_resource`
  - `network_zone_resource`
- `bucket_id` - the ID of the bucket with which this access control is associated
- `server_type` - the server type this access control is applicable to. For VPS resources, it is VPC.
- `apply_to_all_resources_in_the_bucket` - set to true to apply limits that you pass for a zone resource to all resources of the same type in the bucket. The parameter is applicable to the following recourse types:
  - `compute_zone_resource`
  - `data_store_zone_resource`
  - `network_zone_resource`
- `limits` - the array of limits for a resource. Depending on the type of resource, you can have limits described in the table below.

### VPC Server Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>virtual_servers_resource</code></td>
<td>limit</td>
<td>the total amount of VSs the users can create in the cloud (VS/hour)</td>
</tr>
<tr>
<td><code>application_servers_resource</code></td>
<td>limit</td>
<td>the total amount of application servers that the users can create in the cloud (application VS/hour)</td>
</tr>
<tr>
<td><code>compute_zone_resource</code></td>
<td><code>limit_cpu_share</code></td>
<td>the maximum amount of CPU shares users can request for all their servers in this compute zone under this bucket (CPU share %/hour)</td>
</tr>
<tr>
<td></td>
<td><code>limit_cpu_units</code></td>
<td>the maximum amount of CPU units that users can request for all their VSs within this compute zone under the bucket (CPU unit/hour)</td>
</tr>
</tbody>
</table>
### VPC Server Type

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>limit_memory</td>
<td>the maximum amount of RAM that users can request for all their VSs within this compute zone under the bucket (Mb/hour)</td>
</tr>
<tr>
<td>limit_default_cpu</td>
<td>the default amount of CPU cores that will be set in the VS creation wizard when the user adds a VS in this compute zone under this bucket (CPU core/hour)</td>
</tr>
<tr>
<td>limit_min_cpu</td>
<td>the minimum amount of CPU cores that can be set in the VS creation wizard when the user adds a VS under this bucket in the compute zone (CPU core/hour)</td>
</tr>
<tr>
<td>limit_min_memory</td>
<td>the minimum amount of RAM that can be set in the VS creation wizard when the user adds a VS under this bucket in the compute zone (Mb/hour)</td>
</tr>
<tr>
<td>limit_default_cpu_share</td>
<td>the default amount of CPU shares that will be set in the VS creation wizard when the user adds a VS in this compute zone under this bucket (CPU share %/hour)</td>
</tr>
<tr>
<td>limit_min_cpu_priority</td>
<td>the minimum amount of CPU priority which can be set in the VS creation wizard when the user adds a VS under this bucket in the compute zone (CPU share %/hour)</td>
</tr>
<tr>
<td>use_cpu_units</td>
<td>set to &quot;1&quot; to use CPU shares instead of CPU priority (CPU unit/hour). Otherwise, set to &quot;0&quot;. Set the number of CPU units available to users under this bucket using the limit_cpu_units parameter.</td>
</tr>
<tr>
<td>limit_nsxt_edge_gateways</td>
<td>the maximum number of NSX-T edge gateways that can be created in a compute zone</td>
</tr>
<tr>
<td>data_store_zone_resource</td>
<td></td>
</tr>
<tr>
<td>limit_min_disk_size</td>
<td>the minimum amount of disk size (users can request for each storage policy (data store) in a provider storage policy (data store zone) (GB/hour))</td>
</tr>
<tr>
<td>limit_disk_size</td>
<td>the maximum amount of disk size users can request for each storage policy (data store) in a provider storage policy (data store zone) (GB/hour)</td>
</tr>
<tr>
<td>limit_vs_disk_size</td>
<td>the maximum amount of disk size that users can request for all VSs</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>VPC Server Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>network_zone_resource</td>
<td>totally within the whole data store zone (GB/hour)</td>
</tr>
<tr>
<td>limit_ip</td>
<td>the maximum number of IP Addresses users can request to deploy Edge Gateways for the whole network zone (IP/hour)</td>
</tr>
<tr>
<td>limit_vs_ip</td>
<td>the maximum amount of IP addresses that users can allocate to deploy/recompose a vApp within the whole network zone (IP/hour)</td>
</tr>
</tbody>
</table>

**Page History**

v.6.5 Edge 4

- **added** limit_nsxt_edge_gateways parameter

**4.1.7.4 Delete Resource from Access Control for VPC Server Type**

If you remove a compute/data store/network zone from the Access Control, it will not be possible to edit the resources of the servers running in this zone(s).

To delete resources from access controls, use the following request:

DELETE /billing/buckets/:bucket_id/access_controls.xml

DELETE /billing/buckets/:bucket_id/access_controls.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**Where:**
type - the type of the resource for which configuration is set, it can be one of the following values:

- `virtual_servers_resource`
- `application_servers_resource`
- `compute_zone_resource`
- `data_store_zone_resource`
- `network_zone_resource`

`bucket_id` - the ID of the bucket with which this access control is associated

`server_type` - the server type this access control is applicable to. For VPS resources, it is `vpc`.

`target_id` - the ID of the resource for which configuration is set

### 4.1.7.5  Get List of Access Controls for Other Server Type

To get the list of access controls, use the following request:

GET /billing/buckets/:bucket_id/access_controls.xml

GET /billing/buckets/:bucket_id/access_controls.json

**XML Request Example**

curl -i -X GET http://onapp.test/billing/buckets/5263/access_controls.xml

-u user:userpass
-H 'Accept: application/xml'
-H 'Content-type: application/xml'

**JSON Request Example**

curl -i -X GET http://onapp.test/billing/buckets/5263/access_controls.json

-u user:userpass
-H 'Accept: application/json'
-H 'Content-type: application/json'

**XML Output Example**

```xml
<access_controls type="array">
  <access_control>
    <bucket_id type="integer">5263</bucket_id>
    <server_type>other</server_type>
    <target_id type="integer">14</target_id>
    <type>template_groups_resource</type>
    <timing_strategy>hourly</timing_strategy>
    <target_name>RHEL</target_name>
    <limits></limits>
  </access_control>
</access_controls>
```

**Where:**

- `bucket_id` - the ID of the bucket with which this access control is associated
- `server_type` - the server type this access control is applicable to, in this case, `other`
- `target_id` - the ID of the resource for which configuration is set
type - the type of the resource for which configuration is set, it can be one of the following values:

- edge_groups_resource
- template_groups_resource
- recipe_groups_resource
- service_addon_groups_resource

timing_strategy - the type of billing for each resource: hourly or monthly (on peak usage)

target_name - the label of the resource added to the access control

limits - the array of limits for the resource. The access control for Other resources does not contain limits.

4.1.7.6 Add Access Control for Other Server Type

To create a new access control, use the following request:

POST /billing/buckets/:bucket_id/access_controls.xml
POST /billing/buckets/:bucket_id/access_controls.json

XML Request Example

curl -i -X POST http://onapp.test/billing/buckets/331/access_controls.xml
-u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml' -d
'<access_control><bucket_id>331</bucket_id><server_type>other</server_type>
<target_id>2</target_id><create_rate_card>false</create_rate_card><type>recipe_groups_resource</type><target_name>RecipeGroup1</target_name></access_control>'

JSON Request Example

curl -i -X POST http://onapp.test/billing/buckets/331/access_controls.json
-u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json' -d
"{"access_control": {"bucket_id": 331, "server_type": "other", "target_id": 2, "create_rate_card": false, "type": "recipe_groups_resource", "target_name": "RecipeGroup1"}}"

Where:

bucket_id * - the ID of the bucket with which this access control is associated

server_type * - the server type this access control is applicable to, in this case, other

target_id - the ID of the resource added to the access control

create_rate_card - set true if you want to add this resource not only to the access control, but to the rate card as well, otherwise, set false

type - the type of the resource for which configuration is set, it can be one of the following values:

- template_groups_resource
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- `edge_groups_resource`
- `recipe_groups_resource`
- `service_addon_groups_resource`

**target_name** - the name of the resource that is added to the access control. For example, it can be a label of a recipe group.

4.1.7.7 Edit Access Control for Other Server Type

To edit access control, use the following request:

PUT /billing/buckets/:bucket_id/access_controls.xml
PUT /billing/buckets/:bucket_id/access_controls.json

**XML Request Example**

<access_control><bucket_id>331</bucket_id><server_type>other</server_type><target_id>2</target_id><create_rate_card>false</create_rate_card><type>recipe_groups_resource</type><target_name>RecipeGroup1</target_name></access_control>

**JSON Request Example**

curl -i -X PUT http://onapp.test/billing/buckets/331/access_controls.json -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' -d '{"access_control": {"bucket_id": 331, "server_type": "other", "target_id": 2, "type": "recipe_groups_resource", "target_name": "RecipeGroup1"}}'

Where:

- `bucket_id` - the ID of the bucket with which this access control is associated
- `server_type` - the server type this access control is applicable to, in this case, other
- `target_id` - the ID of the resource added to the access control
- `type` - the type of the resource for which configuration is set. For CDN resources, it can be one of the following values:
  - `template_groups_resource`
  - `edge_groups_resource`
  - `recipe_groups_resource`
  - `service_addon_groups_resource`

**target_name** - the name of the resource that is added to the access control. For example, it can be a label of a recipe group.

4.1.7.8 Delete Resource from Access Control for Other Server Type

To delete a resource from access controls, use the following request:
DELETE /billing/buckets/:bucket_id/access_controls.xml
DELETE /billing/buckets/:bucket_id/access_controls.json

**XML Request Example**

curl -I -X DELETE
http://onapp.test/billing/buckets/331/access_controls/delete.xml -u
user:userpass -H 'Accept: application/xml' -H 'Content-type:
application/xml' -d
'<?xml version="1.0" encoding="UTF-8"?>
<access_control><type>recipe_groups_resource</type><bucket_id>331</bucket_id><server_type>other</server_type><target_id>2</target_id></access_control>'

**JSON Request Example**

curl -I -X DELETE
http://onapp.test/billing/buckets/331/access_controls/delete.json -u
user:userpass -H 'Accept: application/json' -H 'Content-type:
application/json' -d "{"access_control": {"type": "recipe_groups_resource", "bucket_id": 331, "server_type": "other", "target_id": 2}}"

Where:

- **type** - the type of the resource to be deleted from access control, it can be one of the following values:
  - template_groups_resource
  - edge_groups_resource
  - recipe_groups_resource
  - service_addon_groups_resource

- **bucket_id** - the ID of the bucket with which this access control is associated

- **server_type** - the server type this access control is applicable to, in this case, other

- **target_id** - the ID of the resource to be deleted

**4.1.8 Rate Card**

Rate Cards are the part of buckets that contain the free limits for resources and prices for resource usage. This section contains the API requests which you can use to manage Rate Cards.

**4.1.8.1 Get the List of Rate Cards for VPC Server Type**

To get the list of rate cards, use the following request:

GET /billing/buckets/:bucket_id/rate_cards.xml
GET /billing/buckets/:bucket_id/rate_cards.json

**XML Request Example**

**JSON Request Example**


**XML Output Example**

```xml
<rate_cards type="array">
  <rate_card>
    <bucket_id type="integer">24</bucket_id>
    <legacy_resource_id nil="true"/>
    <server_type>vpc</server_type>
    <type>compute_resource_storing_resource</type>
    <timing_strategy>hourly</timing_strategy>
    <prices>
      <price type="decimal">11.0</price>
    </prices>
  </rate_card>
  <rate_card>...
</rate_cards>
```

Where:

- **bucket_id** - the ID of the bucket with which this rate card is associated
- **legacy_resource_id** - the resource ID from the bucket present before OnApp 5.6
- **server_type** - the server type this rate card is applicable to. Can be virtual, smart, baremetal or vpc.
- **timing_strategy** - the type of billing for each resource: hourly or monthly (on peak usage).
- **target_id** - the ID of the resource for which the prices are set.
- **target_name** - the name of the resource that is added to the bucket. For example, this can be the label of a template group or a compute zone, etc.
- **target_type** - the type of the resource for which configuration is set. The value can be one of the following:
  - `compute_zone`
  - `data_store_zone`
  - `network_zone`
  - `backup_server_zone`
  - `instance_package`
  - `template_group`
  - `edge_group`
  - `recipe_group`
- service_addon_group
- service_addon_target
- service_addon
- template

type - the type of resource. Depending on the type of resource, you will have the following price parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>compute_zone_resource</td>
<td>limit_free_allocation_cpu_allocation</td>
<td>the amount of CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_memory_allocation</td>
<td></td>
<td>the amount of memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_cpu_used</td>
<td></td>
<td>the amount of used CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_memory_used</td>
<td></td>
<td>the amount of free used memory that users get for free under this bucket per hour or per month depending on the selected pricing type (GB/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_cpu_resources_guaranteed</td>
<td></td>
<td>the amount of CPU Resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (%/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_memory_resources_guaranteed</td>
<td></td>
<td>the memory resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (%/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_vcpu_speed</td>
<td></td>
<td>the amount of vCPU speed that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_reservation_cpu_allocation</code></td>
<td>the amount of CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_reservation_memory_allocation</code></td>
<td>the amount of memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_pay_as_you_go_cpu_limit</code></td>
<td>the amount of CPU quota that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_pay_as_you_go_memory_limit</code></td>
<td>the amount of memory quota that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_pay_as_you_go_cpu_used</code></td>
<td>the amount of used CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_pay_as_you_go_memory_used</code></td>
<td>the amount of used memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_allocation_vcpu</code></td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_reservation_vcpu</code></td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
<td></td>
</tr>
</tbody>
</table>
### VPC Server

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>limit_free_pay_as_you_go_vcpu</td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
</tr>
<tr>
<td>limit_free_vs_cpu</td>
<td>the amount of GHz per hour users can request for free per hour or per month (depending on selected pricing type) for their VSs built in this compute zone under this bucket (GHz/hour)</td>
</tr>
<tr>
<td>limit_free_vs_memory</td>
<td>the amount of RAM users can request for free per hour or per month (depending on selected pricing type) for the total number of their VSs built in this compute zone under this bucket (GB/hour)</td>
</tr>
<tr>
<td>price_allocation_cpu_allocation</td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_allocation_memory_allocation</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>price_allocation_cpu_resources_guaranteed</td>
<td>the price per % per hour or per month (depending on selected pricing type) for CPU resources in this compute zone under this bucket (%/limit_type)</td>
</tr>
<tr>
<td>price_allocation_memory_resources_guaranteed</td>
<td>the price per % per hour or per month (depending on selected pricing type) for memory resources in this compute zone under this bucket (%/limit_type)</td>
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### VPC Server

<table>
<thead>
<tr>
<th>Pricing Item</th>
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</thead>
<tbody>
<tr>
<td><code>price_allocation_cpu_used</code></td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>price_allocation_memory_used</code></td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>price_allocation_vcpu_speed</code></td>
<td>the price per MHz per hour or per month (depending on selected pricing type) for vCPU speed in this compute zone under this bucket (MHz/limit_type)</td>
</tr>
<tr>
<td><code>price_allocation_vcpu</code></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><code>price_reservation_vcpu</code></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_vcpu</code></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><code>price_reservation_cpu Allocation</code></td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>price_reservation_memory_allocation</code></td>
<td>the price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_cpu_limit</code></td>
<td>the regular price is per GHz per hour or per monthly peak (depending</td>
</tr>
<tr>
<td>VPC Server</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>price_pay_as_you_go_memory_limit</td>
<td>the regular price is per GB per hour or per monthly peak (depending on selected pricing type) for Memory quota (Ghz/hour)</td>
</tr>
<tr>
<td>price_pay_as_you_go_cpu_limit_unlimited</td>
<td>the unlimited price is set for the unlimited amount of CPU quota per hour (GHz/hour)</td>
</tr>
<tr>
<td>price_pay_as_you_go_memory_limit_unlimited</td>
<td>the unlimited price is set for the unlimited amount of Memory quota per hour (GB/hour)</td>
</tr>
<tr>
<td>price_pay_as_you_go_cpu_used</td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_pay_as_you_go_memory_used</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>price_on_vs_cpu</td>
<td>the price per GHz per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_off_vs_cpu</td>
<td>the price per GHz per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket (GHz/limit_type)</td>
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<tr>
<td>price_on_vs_memory</td>
<td>the price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket (GB/limit_type)</td>
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<tr>
<td>VPC Server</td>
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<td>------------------------------------------------</td>
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</tr>
<tr>
<td><strong>price_off_vs_memory</strong></td>
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<tr>
<td>the price for RAM GB per hour or per month</td>
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<tr>
<td>(depending on the selected pricing type),</td>
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<tr>
<td>charged for powered off VSSs which are</td>
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<tr>
<td>built in this compute zone under this bucket</td>
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<tr>
<td>(GB/limit_type)</td>
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<tr>
<td><strong>data_store_zone_resource</strong></td>
<td></td>
</tr>
<tr>
<td><strong>limit_free_disk_size</strong></td>
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</tr>
<tr>
<td>the amount of disk size that users get for</td>
<td></td>
</tr>
<tr>
<td>free per hour or per month, depending on the</td>
<td></td>
</tr>
<tr>
<td>selected pricing type, in this data store</td>
<td></td>
</tr>
<tr>
<td>(GB/limit_type)</td>
<td></td>
</tr>
<tr>
<td><strong>limit_free_disk_size_used</strong></td>
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</tr>
<tr>
<td>the amount of used disk size that users get</td>
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<tr>
<td>for free per hour or per month, depending on</td>
<td></td>
</tr>
<tr>
<td>the selected pricing type, in this data store</td>
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<tr>
<td>zone (GB/limit_type)</td>
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<tr>
<td><strong>limit_free_vs_disk_size</strong></td>
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<tr>
<td>free per hour or per month, depending on the</td>
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<tr>
<td>selected pricing type, for their virtual</td>
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<tr>
<td>servers created in this data store zone</td>
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<tr>
<td>(GB/limit_type)</td>
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<tr>
<td><strong>price_disk_size</strong></td>
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<tr>
<td>the price is per GB per hour or per month</td>
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<tr>
<td>(depending on selected pricing type) for the</td>
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<tr>
<td>disk size users can request in this data store</td>
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<tr>
<td>zone (GB/limit_type)</td>
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<tr>
<td><strong>price_disk_size_used</strong></td>
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</tr>
<tr>
<td>the price per GB per hour or per month</td>
<td></td>
</tr>
<tr>
<td>(depending on selected pricing type) for used</td>
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<tr>
<td>disk size in this data store zone (GB/limit_type)</td>
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<tr>
<td><strong>price_disk_size_unlimited</strong></td>
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<tr>
<td>the price per unlimited disk size per hour or</td>
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<tr>
<td>per month, depending on the selected pricing</td>
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<tr>
<td>type (GB/limit_type)</td>
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<tr>
<td><strong>price_vs_disk_size_on</strong></td>
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</tr>
<tr>
<td>the price per GB per hour or per month</td>
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<tr>
<td>(depending on selected pricing type) for disk</td>
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</tr>
<tr>
<td>size of an individual VS created in this data</td>
<td></td>
</tr>
<tr>
<td>store zone that is powered on (GB/limit_type)</td>
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</tr>
<tr>
<td><strong>price_vs_disk_size_off</strong></td>
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<tr>
<td>the price is per GB per hour or per month</td>
<td></td>
</tr>
<tr>
<td>(depending on selected pricing type) for</td>
<td></td>
</tr>
<tr>
<td>powered off VSSs which are built in this</td>
<td></td>
</tr>
<tr>
<td>compute zone under this bucket (GB/limit_type)</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>VPC Server</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>disk size of an individual VS created in this data store zone that is</td>
<td>powered off (Gb/limit_type)</td>
</tr>
<tr>
<td>powered off (Gb/limit_type)</td>
<td></td>
</tr>
<tr>
<td>network_zone_resource</td>
<td>limit_free_ip</td>
</tr>
<tr>
<td>the number of IP addresses that users get for free in this network zone</td>
<td>set per hour or per month (depending on the selected pricing type)</td>
</tr>
<tr>
<td>per hour or per month (depending on the selected pricing type) in this</td>
<td>(IP/limit_type)</td>
</tr>
<tr>
<td>network zone (GB/limit_type)</td>
<td></td>
</tr>
<tr>
<td>limit_free_data_sent</td>
<td></td>
</tr>
<tr>
<td>the amount of sent data that users get for free per hour or per month</td>
<td>set per hour or per month (depending on the selected pricing type)</td>
</tr>
<tr>
<td>the amount of received data that users get for free per hour or per</td>
<td>for their VSs created in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>month (depending on selected pricing type) in this network zone</td>
<td></td>
</tr>
<tr>
<td>limit_free_data_received</td>
<td></td>
</tr>
<tr>
<td>the number of IP addresses that users get for free per hour or per</td>
<td>set per hour or per month (depending on the selected pricing type)</td>
</tr>
<tr>
<td>month (depending on selected pricing type) for their VSs created in this</td>
<td>for data received for user VSs built in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>network zone (IP/limit_type)</td>
<td></td>
</tr>
<tr>
<td>limit_free_vs_ip</td>
<td></td>
</tr>
<tr>
<td>the number of IP addresses that users get for free per hour or per</td>
<td></td>
</tr>
<tr>
<td>month (depending on the selected pricing type) for data received for</td>
<td></td>
</tr>
<tr>
<td>limit_free_vs_data_received</td>
<td></td>
</tr>
<tr>
<td>the amount of sent data that users get for free per hour or per month</td>
<td></td>
</tr>
<tr>
<td>the amount of sent data that users get for free per hour or per month</td>
<td></td>
</tr>
<tr>
<td>(GB/limit_type)</td>
<td></td>
</tr>
<tr>
<td>price_ip</td>
<td></td>
</tr>
<tr>
<td>the price per IP address per hour or per month (depending on the selected</td>
<td></td>
</tr>
<tr>
<td>pricing type) which users can request in this network zone (IP/limit_type)</td>
<td></td>
</tr>
</tbody>
</table>
### VPC Server

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>price_data_sent</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for sent data in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_data_received</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for received data in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_vs_ip_on</td>
<td>the price per IP address per hour or per month (depending on the selected pricing type) for users' VSs created in this network zone that are powered on (IP/limit_type)</td>
</tr>
<tr>
<td>price_vs_ip_off</td>
<td>the price per IP address per hour or per month (depending on the selected pricing type) for user's VSs created in this network zone that are powered off (IP/limit_type)</td>
</tr>
<tr>
<td>price_vs_data_sent</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for data sent by the user VSs built in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_vs_data_received</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for data received for user VSs built in this network zone (GB/limit_type)</td>
</tr>
</tbody>
</table>

**Page History**

v.6.3 Edge 1

- added the following parameters:
  - limit_free_allocation_vcpu
  - limit_free_reservation_vcpu
  - limit_free_pay_as_you_go_vcpu
  - price_allocation_vcpu
  - price_reservation_vcpu
4.1.8.2 Add Rate Cards for VPC Server Type
To add rate cards, use the following requests:

POST /billing/buckets/:bucket_id/rate_cards.xml
POST /billing/buckets/:bucket_id/rate_cards.json

XML Request Example

curl -i -X POST http://onapp.test/billing/buckets/1/rate_cards.xml -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d '<rate_card><target_id type="integer">30</target_id><prices><limit_free_allocation_cpu_allocation>0.0</limit_free_allocation_cpu_allocation><limit_free_allocation_cpu_resources_guaranteed>0.0</limit_free_allocation_cpu_resources_guaranteed><limit_free_allocation_cpu_used>0.0</limit_free_allocation_cpu_used><limit_free_allocation_memory_allocation>0.0</limit_free_allocation_memory_allocation><limit_free_allocation_memory_resources_guaranteed>0.0</limit_free_allocation_memory_resources_guaranteed><limit_free_allocation_memory_used>0.0</limit_free_allocation_memory_used><limit_free_allocation_vcpu>0</limit_free_allocation_vcpu><limit_free_allocation_vcpu_speed>0</limit_free_allocation_vcpu_speed><limit_free_nsxt_edge_gateways>1</limit_free_nsxt_edge_gateways><limit_free_pay_as_you_go_cpu_limit>0.0</limit_free_pay_as_you_go_cpu_limit><limit_free_pay_as_you_go_cpu_used>0.0</limit_free_pay_as_you_go_cpu_used><limit_free_pay_as_you_go_memory_limit>0.0</limit_free_pay_as_you_go_memory_limit><limit_free_pay_as_you_go_memory_used>0.0</limit_free_pay_as_you_go_memory_used><limit_free_reservation_cpu_allocation>0.0</limit_free_reservation_cpu_allocation><limit_free_reservation_memory_allocation>0.0</limit_free_reservation_memory_allocation><limit_free_reservation_cpu_limit>0.0</limit_free_reservation_cpu_limit><limit_free_reservation_cpu_used>0.0</limit_free_reservation_cpu_used><limit_free_reservation_memory_limit>0.0</limit_free_reservation_memory_limit><limit_free_reservation_memory_used>0.0</limit_free_reservation_memory_used><price_allocation_cpu_allocation>0.00</price_allocation_cpu_allocation><price_allocation_cpu_resources_guaranteed>0.00</price_allocation_cpu_resources_guaranteed><price_allocation_cpu_used>0.00</price_allocation_cpu_used><price_allocation_memory_allocation>0.00</price_allocation_memory_allocation><price_allocation_memory_resources_guaranteed>0.00</price_allocation_memory_resources_guaranteed><price_allocation_memory_used>0.00</price_allocation_memory_used><price_allocation_vcpu>0.00</price_allocation_vcpu><price_allocation_vcpu_speed>0.00</price_allocation_vcpu_speed><price_nsxt_edge_gateways>13.00</price_nsxt_edge_gateways><price_off_vs_cpu>0.00</price_off_vs_cpu><price_off_vs_memory>0.00</price_off_vs_memory><price_on_vs_cpu>0.00</price_on_vs_cpu><price_on_vs_memory>0.00</price_on_vs_memory><price_pay_as_you_go_cpu_limit>0.00</price_pay_as_you_go_cpu_limit><price_pay_as_you_go_cpu_limit_unlimited>0.00</price_pay_as_you_go_cpu_limit_unlimited><price_pay_as_you_go_cpu_used>0.00</price_pay_as_you_go_cpu_used><price_pay_as_you_go_memory_limit>0.00</price_pay_as_you_go_memory_limit><price_pay_as_you_go_memory_memory_used>0.00</price_pay_as_you_go_memory_memory_used><price_pay_as_you_go_memory_memory_used>0.00</price_pay_as_you_go_memory_memory_used><price_pay_as_you_go_vcpu>0.00</price_pay_as_you_go_vcpu><price_pay_as_you_go_vcpu_speed>0.00</price_pay_as_you_go_vcpu_speed><price_reservation_cpu_allocation>0.00</price_reservation_cpu_allocation><price_reservation_memory_allocation>0.00</price_reservation_memory_allocation><price_reservation_vcpu>0.00</price_reservation_vcpu><prices><server_type>vpc</server_type><timing_strategy>monthly</timing_strategy><type>compute_zone_resource</type></rates_card>'

JSON Request Example
{"rate_card":
{"server_type": "vpc",
"type": "compute_zone_resource",
"timing_strategy": "monthly",
"target_ids": ["30"],
"prices":
{"price_allocation_cpu_allocation": "0.00",
"price_allocation_memory_allocation": "0.00",
"price_allocation_cpu_used": "0.00",
"price_allocation_vcpu": "0.00",
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"price_allocation_cpu_resources_guaranteed": "0.00",
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"limit_free_next_edge_gateways": "1",
"price_next_edge_gateways": "10.00"}}}

Where:

bucket_id * - the ID of the bucket with which this rate card is associated

server_type * - the server type this rate card is applicable to. Can be virtual, smart, baremetal, or vpc.

target_id - the ID of the resource for which the prices are set

type * - the type of resource that can be one of the following values:
- compute_zone_resource
- data_store_zone_resource
- network_zone_resource

timing_strategy - the type of billing for each resource: hourly or monthly (on peak usage)

target_name - the name of the resource that is added to the access control. For example, it can be a label of a network or compute zone, etc.

prices - the array of resource prices and free limits
<table>
<thead>
<tr>
<th>VPC Server</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>compute_zone_resource</code></td>
<td><code>limit_free_allocation_cpu_allocation</code></td>
<td>the amount of CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>limit_free_allocation_memory_allocation</code></td>
<td>the amount of memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>limit_free_allocation_cpu_used</code></td>
<td>the amount of used CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>limit_free_allocation_memory_used</code></td>
<td>the amount of free used memory users get for free under this bucket per hour or per month depending on the selected pricing type (GB/limit_type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>limit_free_allocation_cpu_resources_guaranteed</code></td>
<td>the number of CPU Resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (%/limit_type)</td>
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<tr>
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<td></td>
<td><code>limit_free_allocation_memory_resources_guaranteed</code></td>
<td>the memory resources that users get for free per hour or per month</td>
</tr>
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<td>VPC Server</td>
<td>Description</td>
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<tr>
<td><strong>limit_free_allocation_vcpu_speed</strong></td>
<td>the amount of vCPU speed that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (MHz/limit_type)</td>
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<td><strong>limit_free_reservation_cpu_allocation</strong></td>
<td>the amount of CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
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<td><strong>limit_free_reservation_memory_allocation</strong></td>
<td>the amount of memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
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<tr>
<td><strong>limit_free_pay_as_you_go_cpu_limit</strong></td>
<td>the amount of CPU quota that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
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<tr>
<td><strong>limit_free_pay_as_you_go_memory_limit</strong></td>
<td>the amount of memory quota that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
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<tr>
<td>limit_free_pay_as_you_go_cpu_used</td>
<td>the amount of used CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
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<td>limit_free_pay_as_you_go_memory_used</td>
<td>the amount of used memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (in GB/limit_type)</td>
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<tr>
<td>limit_free_pay_as_you_go_vcpu_speed</td>
<td>the speed of vCPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (in MHz/limit_type)</td>
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</tr>
<tr>
<td>limit_free_allocation_vcpu</td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type) for the reservation allocation model</td>
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<td>limit_freeReservation_vcpu</td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type) for the reservation pool model</td>
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<tr>
<td>limit_free_pay_as_you_go_vcpu</td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (in MHz/limit_type)</td>
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<table>
<thead>
<tr>
<th>VPC Server</th>
<th>Description</th>
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<tbody>
<tr>
<td>get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type) for the pay as you go allocation model</td>
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<tr>
<td>limit_free_vs_cpu</td>
<td>the amount of GHz per hour users can request for free per hour or per month (depending on selected pricing type) for their VSs built in this compute zone under this bucket (GHz/hour)</td>
</tr>
<tr>
<td>limit_free_vs_memory</td>
<td>the amount of RAM users can request for free per hour or per month (depending on selected pricing type) for the total number of their VSs built in this compute zone under this bucket (GB/hour)</td>
</tr>
<tr>
<td>limit_free_nsxt_edge_gateways</td>
<td>the number of NSX-T edge gateways users can request for free per hour or per month (depending on selected pricing type) under this bucket</td>
</tr>
<tr>
<td>price_allocation_cpu_allocation</td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_allocation_memory_allocation</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under</td>
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### VPC Server Costs

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>this bucket</td>
<td>(GB/limit_type)</td>
</tr>
<tr>
<td><strong>price_allocation_cpu_resources_guaranteed</strong></td>
<td>the price per % per hour or per month (depending on selected pricing type) for CPU resources in this compute zone under this bucket (%/limit_type)</td>
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<tr>
<td><strong>price_allocation_memory_resources_guaranteed</strong></td>
<td>the price per % per hour or per month (depending on selected pricing type) for memory resources in this compute zone under this bucket (%/limit_type)</td>
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<tr>
<td><strong>price_allocation_cpu_used</strong></td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket (GHz/limit_type)</td>
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<td>the price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket (GB/limit_type)</td>
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<td><strong>price_allocation_vcpu_speed</strong></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
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<td><strong>price_reservation_vcpu</strong></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this bucket (core/limit_type)</td>
</tr>
<tr>
<td>VPC Server</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>compute zone under this bucket (core/limit_type)</td>
<td></td>
</tr>
<tr>
<td>price_pay_as_you_go_vcpu</td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
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<tr>
<td>price_allocation_vcpu_speed</td>
<td>the price per MHz per hour or per month (depending on selected pricing type) for vCPU speed in this compute zone under this bucket (MHz/limit_type)</td>
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<td>price_reservation_cpu_allocation</td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (GHz/limit_type)</td>
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<td>price_reservation_memory_allocation</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>price_pay_as_you_go_cpu_limit</td>
<td>the regular price is per GHz per hour or per monthly peak (depending on selected pricing type) for CPU quota (Ghz/hour)</td>
</tr>
<tr>
<td>price_pay_as_you_go_memory_limit</td>
<td>the regular price is per GB per hour or per monthly peak (depending on selected pricing type) for Memory quota (Ghz/hour)</td>
</tr>
<tr>
<td>VPC Server</td>
<td>Description</td>
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</tr>
<tr>
<td>price_pay_as_you_go_cpu_limit_unlimited</td>
<td>the unlimited price is set for the unlimited amount of CPU quota per hour (GHz/hour)</td>
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<tr>
<td>price_pay_as_you_go_memory_limit_unlimited</td>
<td>the unlimited price is set for the unlimited amount of Memory quota per hour (GB/hour)</td>
</tr>
<tr>
<td>price_pay_as_you_go_cpu_used</td>
<td>the regular price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_pay_as_you_go_memory_used</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>price_pay_as_you_go_vcpu_speed</td>
<td>the price per core per hour or per month (depending on selected pricing type) for used vCPUs in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td>price_allocation_vcpu</td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td>price_reservation_vcpu</td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td>VPC Server</td>
<td>Description</td>
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</tr>
<tr>
<td><code>price_pay_as_you_go_vcpu</code></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><code>price_on_vs_cpu</code></td>
<td>the price per GHz per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>price_off_vs_cpu</code></td>
<td>the price per GHz per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>price_on_vs_memory</code></td>
<td>the price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>price_off_vs_memory</code></td>
<td>the price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket (GB_limit_type)</td>
</tr>
<tr>
<td><code>price_nsxt_edge_gateways</code></td>
<td>the price for NSX-T edge gateways per hour or per month (depending on the selected pricing type)</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
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</tr>
<tr>
<td><code>data_store_zone_resource</code></td>
<td></td>
</tr>
<tr>
<td><code>limit_free_disk_size</code></td>
<td>the amount of disk size that users get for free per hour or per month, depending on the selected pricing type, in this data store (GB/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_disk_size_used</code></td>
<td>the amount of used disk size that users get for free per hour or per month, depending on the selected pricing type, in this data store zone (GB/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_vs_disk_size</code></td>
<td>the amount of disk size that users get for free per hour or per month, depending on the selected pricing type, for their virtual servers created in this data store zone (GB/limit_type)</td>
</tr>
<tr>
<td><code>price_disk_size</code></td>
<td>the price is per GB per hour or per month (depending on selected pricing type) for the disk size users can request in this data store zone (GB/limit_type)</td>
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<tr>
<td><code>price_disk_size_used</code></td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used disk size in this data store zone (GB/limit_type)</td>
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<tr>
<td><code>price_disk_size_unlimited</code></td>
<td>the price per unlimited disk size per hour or per month, depending on the selected pricing type (GB/limit_type)</td>
</tr>
<tr>
<td><code>price_vs_disk_size_on</code></td>
<td>the price per GB per hour or per month (depending on selected pricing type) for disk size of an individual VS created</td>
</tr>
<tr>
<td>VPC Server</td>
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<tr>
<td></td>
<td>in this data store zone that is powered on (GB/limit_type)</td>
</tr>
<tr>
<td>price_vs_disk_size_off</td>
<td>the price is per GB per hour or per month (depending on selected pricing type) for disk size of an individual VS created in this data store zone that is powered off (Gb_limit_type)</td>
</tr>
<tr>
<td>network_zone_resource limit_free_ip</td>
<td>the number of IP addresses that users get for free in this network zone per hour or per month (depending on the selected pricing type) (IP/limit_type)</td>
</tr>
<tr>
<td>limit_free_data_sent</td>
<td>the amount of sent data that users get for free per hour or per month (depending on selected pricing type) in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>limit_free_data_received</td>
<td>the amount of received data (that users get for free per hour or per month (depending on selected pricing type) in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_ip</td>
<td>the price per IP address per hour or per month (depending on the selected pricing type) which users can request in this network zone (IP/limit_type)</td>
</tr>
<tr>
<td>price_data_sent</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for sent data in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>VPC Server</td>
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<tr>
<td>price_data_received</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for received data in this network zone (GB/limit_type)</td>
</tr>
</tbody>
</table>

Page History

**v.6.5 Edge 4**
- added the following parameters:
  - price_nsxt_edge_gateways
  - limit_free_nsxt_edge_gateways

**v.6.3 Edge 1**
- added the following parameters:
  - limit_free_allocation_vcpu
  - limit_free_reservation_vcpu
  - limit_free_pay_as_you_go_vcpu
  - price_allocation_vcpu
  - price_reservation_vcpu
  - price_pay_as_you_go_vcpu

4.1.8.3 Edit Rate Cards for VPC Server Type

To edit rate cards, use the following request:

POST /billing/buckets/:bucket_id/rate_cards.xml
POST /billing/buckets/:bucket_id/rate_cards.json

**XML Request Example**

curl -i -X PUT http://onapp.test/billing/buckets/1/rate_cards.xml -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d '<rate_card><target-id type="integer">30</target-id><prices><limit_free_allocation_cpu_allocation>0.0</limit_free_allocation_cpu_allocation><limit_free_allocation_cpu_resources_guaranteed>0.0</limit_free_allocation_cpu_resources_guaranteed><limit_free_allocation_cpu_used>0.0</limit_free_allocation_cpu_used><limit_free_allocation_memory_allocation>0.0</limit_free_allocation_memory_allocation><limit_free_allocation_memory_resources_guaranteed>0.0</limit_free_allocation_memory_resources_guaranteed><limit_free_allocation_memory_used>0.0</limit_free_allocation_memory_used><limit_free_allocation_vcpu>0</limit_free_allocation_vcpu><limit_free_allocation_vcpu_speed>0</limit_free_allocation_vcpu_speed><limit_free_nsxt_edge_gateways>1</limit_free_nsxt_edge_gateways><limit_free_pay_as_you_go_cpu_limit>0.0</limit_free_pay_as_you_go_cpu_limit><limit_free_pay_as_you_go_cpu_used>0.0</limit_free_pay_as_you_go_cpu_used><limit_free_pay_as_you_go_memory_limit>0.0</limit_free_pay_as_you_go_memory_limit><limit_free_pay_as_you_go_memory_used>0.0</limit_free_pay_as_you_go_memory_used><limit_free_reservation_cpu_allocation>0.0</limit_free_reservation_cpu_allocation>...
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JSON Request Example

```json
...
```
curl -i -X PUT http://onapp.test/billing/buckets/1/rate_cards.json -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' -d '{"rate_card": {"server_type": "vpc", "type": "compute_zone_resource", "target_id": "30", "timing_strategy": "monthly", "prices": {"price_allocation_cpu_allocation": "0.00", "price_allocation_memory_allocation": "0.00", "price_allocation_cpu_used": "0.00", "price_allocation_vcpu": "0.00", "price_allocation_memory_used": "0.00", "price_allocation_cpu_resources Guaranteed": "0.00", "price_allocation_memory_resources Guaranteed": "0.00", "limit_free_allocation_cpu_allocation": "0.0", "limit_free_allocation_memory_allocation": "0.0", "limit_free_allocation_cpu_used": "0.0", "limit_free_allocation_vcpu": "0", "limit_free_allocation_memory_used": "0.0", "limit_free_allocation_cpu_resources Guaranteed": "0.0", "limit_free_allocation_memory_resources Guaranteed": "0.0", "price_reservation_cpu_allocation": "0.0", "price_reservation_vcpu": "0.0", "price_reservation_memory_allocation": "0.0", "limit_free_reservation_cpu_allocation": "0.0", "limit_free_reservation_vcpu": "0", "limit_free_reservation_memory_allocation": "0.0", "price_pay_as_you_go_cpu_limit": "0.0", "price_pay_as_you_go_vcpu": "0.0", "price_pay_as_you_go_memory_limit": "0.0", "price_pay_as_you_go_cpu_limit_unlimited": "0.0", "price_pay_as_you_go_memory_limit_unlimited": "0.0", "price_pay_as_you_go_cpu_used": "0.0", "price_pay_as_you_go_vcpu": "0", "price_pay_as_you_go_memory_used": "0.0", "limit_free_pay_as_you_go_cpu_limit": "0.0", "limit_free_pay_as_you_go_cpu_allocation": "0.0", "limit_free_pay_as_you_go_vcpu": "0", "limit_free_pay_as_you_go_memory_limit": "0.0", "limit_free_pay_as_you_go_memory_allocation": "0.0", "price_on_vs_cpu": "0.0", "price_off_vs_cpu": "0.0", "price_on_vs_memory": "0.0", "price_off_vs_memory": "0.0", "limit_free_vs_cpu": "0", "limit_free_vs_memory": "0", "price_pay_as_you_go_vcpu_speed": "0.0", "limit_free_next_edge_gateways": "13.00"}}, "bucket_id": "1"}'}

Where:

target_id - the ID of the resource for which the prices are set
prices - the array of resource prices and free limits

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>compute_zone_resource</strong> limit_free_allocation_cpu_allocation</td>
<td>the amount of CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket(GHz/limit_type)</td>
</tr>
<tr>
<td>limit_free_allocation_cpu_resources Guaranteed</td>
<td>the number of CPU resources that users get for free per hour or per month (depending on</td>
</tr>
<tr>
<td>VPC Server</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><code>selected pricing type</code> in this compute zone under this bucket (%/limit_type)</td>
<td></td>
</tr>
<tr>
<td><code>limit_free_allocation_cpu_used</code></td>
<td>the amount of used CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_allocation_memory_allocation</code></td>
<td>the amount of memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_allocation_memory_used</code></td>
<td>the amount of free used memory users get for free under this bucket per hour or per month depending on the selected pricing type (GB/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_allocation_vcpu</code></td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_allocation_vcpu_speed</code></td>
<td>the amount of vCPU speed that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (MHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_nsxt_edge_gateways</code></td>
<td>the number of NSX-T edge gateways that</td>
</tr>
<tr>
<td>VPC Server</td>
<td>users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>limit_free_pay_as_you_go_cpu_limit</strong></td>
<td>the amount of CPU quota that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><strong>limit_free_allocation_memory_resources_guaranteed</strong></td>
<td>the memory resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (%/limit_type)</td>
</tr>
<tr>
<td><strong>limit_free_pay_as_you_go_cpu_used</strong></td>
<td>the amount of used CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><strong>limit_free_pay_as_you_go_memory_limit</strong></td>
<td>the amount of memory quota that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><strong>limit_free_pay_as_you_go_memory_used</strong></td>
<td>the amount of used memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this</td>
</tr>
</tbody>
</table>
### VPC Server

<table>
<thead>
<tr>
<th>Bucket</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>limit_free_pay_as_you_go_vcpu</code></td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_pay_as_you_go_vcpu_speed</code></td>
<td>the amount of vCPU speed that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (MHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_reservation_cpu_allocation</code></td>
<td>the amount of CPU that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_reservation_memory_allocation</code></td>
<td>the amount of memory that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_reservation_vcpu</code></td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
</tr>
<tr>
<td><code>limit_free_vs_cpu</code></td>
<td>the amount of GHz per hour users can request for free per</td>
</tr>
</tbody>
</table>
### VPC Server

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>limit_free_vs_memory</td>
<td>the amount of RAM users can request for free per hour or per month (depending on selected pricing type) for the total number of their VSs built in this compute zone under this bucket (GB/hour)</td>
</tr>
<tr>
<td>price_allocation_cpu_allocation</td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_allocation_cpu_resources_guaranteed</td>
<td>the price per % per hour or per month (depending on selected pricing type) for CPU resources in this compute zone under this bucket (%/limit_type)</td>
</tr>
<tr>
<td>price_allocation_cpu_used</td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_allocation_memory_allocation</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>VPC Server</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td><strong>price_allocation_memory_resources_guaranteed</strong></td>
<td>the price per % per hour or per month (depending on selected pricing type) for memory resources in this compute zone under this bucket (%/limit_type)</td>
</tr>
<tr>
<td><strong>limit_free_allocation_vcpu</strong></td>
<td>the amount of vCPU resources that users get for free per hour or per month (depending on selected pricing type) in this compute zone under this bucket (cores/limit_type)</td>
</tr>
<tr>
<td><strong>price_allocation_memory_used</strong></td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><strong>price_allocation_vcpu</strong></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><strong>price_allocation_vcpu_speed</strong></td>
<td>the price per MHz per hour or per month (depending on selected pricing type) for vCPU speed in this compute zone under this bucket (MHz/limit_type)</td>
</tr>
<tr>
<td><strong>price_nsxt_edge_gateways</strong></td>
<td>the price per NSX-T edge gateway per hour or per month (depending on selected pricing type) in this compute zone under this bucket</td>
</tr>
</tbody>
</table>
## VPC Server

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>price_off_vs_cpu</td>
<td>the price per GHz per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_off_vs_memory</td>
<td>the price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered off VSs which are built in this compute zone under this bucket (GB_limit_type)</td>
</tr>
<tr>
<td>price_on_vs_cpu</td>
<td>the price per GHz per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td>price_on_vs_memory</td>
<td>the price for RAM GB per hour or per month (depending on the selected pricing type), charged for powered on VSs which are built in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>price_pay_as_you_go_cpu_limit</td>
<td>the regular price is per GHz per hour or per monthly peak (depending on selected pricing type) for CPU quota (Ghz/hour)</td>
</tr>
<tr>
<td>price_pay_as_you_go_cpu_limit_unlimited</td>
<td>the unlimited price is set for the unlimited amount of CPU quota per hour (GHz/hour)</td>
</tr>
<tr>
<td>VPC Server</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_cpu_used</code></td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for used CPU in this compute zone under this bucket (GHz/limit_type)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_memory_limit</code></td>
<td>the regular price is per GB per hour or per monthly peak (depending on selected pricing type) for Memory quota (Ghz/hour)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_memory_limit_unlimited</code></td>
<td>the unlimited price is set for the unlimited amount of Memory quota per hour (GB/hour)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_memory_used</code></td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_vcpu</code></td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><code>price_pay_as_you_go_vcpu_speed</code></td>
<td>the price per core per hour or per month (depending on selected pricing type) for used vCPUs in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td><code>price_reservation_cpu_allocation</code></td>
<td>the price per GHz per hour or per month (depending on selected pricing type) for CPU in this compute zone under</td>
</tr>
</tbody>
</table>
### VPC Server

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>this bucket (GHz/limit_type)</td>
<td></td>
</tr>
<tr>
<td>price_reservation_memory_allocation</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for memory in this compute zone under this bucket (GB/limit_type)</td>
</tr>
<tr>
<td>price_reservation_vcpu</td>
<td>the price per core per hour or per month (depending on selected pricing type) for CPU in this compute zone under this bucket (core/limit_type)</td>
</tr>
<tr>
<td>data_store_zone_resouce</td>
<td></td>
</tr>
<tr>
<td>limit_free_disk_size</td>
<td>the amount of disk size that users get for free per hour or per month, depending on the selected pricing type, in this data store (GB/limit_type)</td>
</tr>
<tr>
<td>limit_free_disk_size_used</td>
<td>the amount of used disk size that users get for free per hour or per month, depending on the selected pricing type, in this data store zone (GB/limit_type)</td>
</tr>
<tr>
<td>limit_free_vs_disk_size</td>
<td>the amount of disk size that users get for free per hour or per month, depending on the selected pricing type, for their virtual servers created in this data store zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_disk_size</td>
<td>the price is per GB per hour or per month (depending on selected pricing type) for the disk size users can request in</td>
</tr>
<tr>
<td>VPC Server</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>this data store zone (GB/limit_type)</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for used disk size in this data store zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_disk_size_used</td>
<td>the price per unlimited disk size per hour or per month, depending on the selected pricing type (GB/limit_type)</td>
</tr>
<tr>
<td>price_disk_size_unlimited</td>
<td>the price per unlimited disk size per hour or per month, depending on the selected pricing type (GB/limit_type)</td>
</tr>
<tr>
<td>price_vs_disk_size_on</td>
<td>the price per GB per hour or per month (depending on selected pricing type) for disk size of an individual VS created in this data store zone that is powered on (GB/limit_type)</td>
</tr>
<tr>
<td>price_vs_disk_size_off</td>
<td>the price is per GB per hour or per month (depending on selected pricing type) for disk size of an individual VS created in this data store zone that is powered off (Gb_limit_type)</td>
</tr>
<tr>
<td>network_zone_resource limit_free_ip</td>
<td>the number of IP addresses that users get for free in this network zone per hour or per month (depending on the selected pricing type) (IP/limit_type)</td>
</tr>
<tr>
<td>limit_free_data_sent</td>
<td>the amount of sent data that users get for free per hour or per month (depending on selected pricing type) in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>limit_free_data_received</td>
<td>the amount of received data (that users get for free per hour or per month)</td>
</tr>
</tbody>
</table>
### VPC Server

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>price_ip</td>
<td>the price per IP address per hour or per month (depending on the selected pricing type) for which users can request in this network zone (IP/limit_type)</td>
</tr>
<tr>
<td>price_data_sent</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for sent data in this network zone (GB/limit_type)</td>
</tr>
<tr>
<td>price_data_received</td>
<td>the price over free units per GB per hour or per month (depending on selected pricing type) for received data in this network zone (GB/limit_type)</td>
</tr>
</tbody>
</table>

**Page History**

v.6.5 Edge 4
- added the following parameters:
  - price_nsxt_edge_gateways
  - limit_free_nsxt_edge_gateways

v.6.3 Edge 1
- added the following parameters:
  - limit_free_allocation_vcpu
  - limit_free_reservation_vcpu
  - limit_free_pay_as_you_go_vcpu
  - price_allocation_vcpu
  - price_reservation_vcpu
  - price_pay_as_you_go_vcpu
4.1.8.4 Delete Resources from Rate Cards for VPC Server Type

If you remove a compute/data store/network/backup server zone from the Rate Card, the prices for the removed resource will be set to zero for the servers using this zone(s).

XML Request Example

```bash
curl -i -X DELETE -u user:userpass --url
'<rate_card><type>compute_zone_resource</type><bucket_id>359</bucket_id><server_type>vpc</server_type><target_id>116</target_id></rate_card>'
```

JSON Request Example

```bash
curl -i -X DELETE -u user:userpass --url
```

Where:

- **type** - the type of the resource for which configuration is set, it can be one of the following values:
  - compute_zone
  - data_store_zone
  - network_zone
  - backup_server_zone
  - instance_package
  - template_group
  - edge_group
  - recipe_group
  - service_addon_group
  - service_addon_target
  - orchestration_model
  - service_addon
  - template

- **bucket_id** - the ID of the bucket with which this rate card is associated

- **server_type** - the server type this rate card is applicable to. In this case vpc.

- **target_id** - the ID of the resource which is deleted

4.1.8.5 Get List of Rate Cards for Other Server Type

To get the list of rate cards, use the following request:
GET /billing/buckets/:bucket_id/rate_cards.xml
GET /billing/buckets/:bucket_id/rate_cards.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**

```
<rate_cards type="array">
  <rate_card>
    <bucket_id type="integer">5263</bucket_id>
    <server_type>other</server_type>
    <target_id type="integer">2</target_id>
    <type>edge_groups_resource</type>
    <timing_strategy>hourly</timing_strategy>
    <target_name>qaOHegF</target_name>
    <prices>
      <price type="decimal">0.0</price>
    </prices>
  </rate_card>
  ...
</rate_cards>
```

**Where:**

- **bucket_id** - the ID of the bucket with which this rate card is associated.
- **server_type** - the server type this rate card is applicable to. In this case other.
- **target_id** - the ID of the resource for which the prices are set.
- **type** - the type of the resource for which configuration is set. The value can be one of the following:
  - `backup_resource_zone_resource`
  - `edge_groups_resource`
  - `template_resource`
  - `service_addon_resource`
- **timing_strategy** - the type of billing for each resource: hourly or monthly.
**target_name** - the name of the resource that was added to the bucket. For example, this can be the label of a template.

**prices** - the array of prices and free limits for the resource that can be the following.

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>backup_resource_zone_resource</strong></td>
<td>price</td>
<td>• The price for a recovery point (backup) per hour.</td>
</tr>
<tr>
<td></td>
<td>price_recovery_point_size</td>
<td>• The price for a recovery point (backup) size in Gb per hour.</td>
</tr>
<tr>
<td></td>
<td>limit_free</td>
<td>• The number of recovery points (backup/hour) users can store in a backup resource zone for free.</td>
</tr>
<tr>
<td></td>
<td>limit_recovery_point_size_free</td>
<td>• The size of recovery points (Gb/hour) users can consume in a backup resource zone for free.</td>
</tr>
<tr>
<td><strong>edge_groups_resource</strong></td>
<td>price</td>
<td>The price per GB of bandwidth.</td>
</tr>
<tr>
<td><strong>service_addon_resource</strong></td>
<td>price</td>
<td>The price per service add-on per hour.</td>
</tr>
<tr>
<td></td>
<td>price_cpu</td>
<td>The price for the CPU usage per hour per CPU core.</td>
</tr>
<tr>
<td></td>
<td>price_memory</td>
<td>The additional price for RAM per GB per hour.</td>
</tr>
<tr>
<td></td>
<td>price_disk_size</td>
<td>The additional price for disk size per GB per hour.</td>
</tr>
<tr>
<td><strong>template_resource</strong></td>
<td>price</td>
<td>The price per template in a template store.</td>
</tr>
</tbody>
</table>

**Page History**

v. 6.0

- added the following parameters for a **backup_resource_zone_resource** type:
  - **price_recovery_point_size**
  - **limit_recovery_point_size_free**

v. 5.8

- added the **backup_resource_zone_resource** type

4.1.8.6 Add Rate Cards for Other Server Type

To add rate cards, use the following request:

POST /billing/buckets/:bucket_id/rate_cards.xml

POST /billing/buckets/:bucket_id/rate_cards.json

**XML Request Example**
curl -i -X POST -u user:userpass --url

JSON Request Example

```bash
curl -i -X POST -u user:userpass --url
http://onapp.test/billing/buckets/321/rate_cards.json -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"rate_card": {"target_id": 8, "type": "service_addon_groups_resource", "bucket_id": 321, "server_type": "other", "prices": {"price": 12, "price_cpu": 23, "price_memory": 34, "price_disk_size": 45}}}'}
```

Where:

- **bucket_id** - the ID of the bucket with which this rate card is associated.
- **server_type** - the server type this rate card is applicable to. In this case other.
- **target_id** - the ID of the resource for which the prices are set.
- **type** - the type of the resource that is added to the rate card, it can be one of the following values:
  - `backup_resource_zone_resource`
  - `edge_groups_resource`
  - `template_resource`
  - `service_addon_resource`
- **prices** - the array of prices and free limits for the resource that can be the following.

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>backup_resource_zone_resource</code></td>
<td><code>price</code></td>
<td>- The price for a recovery point (backup) per hour.</td>
</tr>
<tr>
<td></td>
<td><code>price_recovery_point_size</code></td>
<td>- The price for a recovery point (backup) size in Gb per hour.</td>
</tr>
<tr>
<td></td>
<td><code>limit_free</code></td>
<td>- The number of recovery points (backup/hour) users can store in a backup resource zone for free.</td>
</tr>
<tr>
<td></td>
<td><code>limit_recovery_point_size_free</code></td>
<td>- The size of recovery points (Gb/hour) users can consume in a backup resource zone for free.</td>
</tr>
<tr>
<td>Type</td>
<td>Parameters</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>edge_groups_resource</td>
<td>price</td>
<td>The price per GB of bandwidth.</td>
</tr>
<tr>
<td>service_addon_resource</td>
<td>price</td>
<td>The price per service add-on per hour.</td>
</tr>
<tr>
<td></td>
<td>price_cpu</td>
<td>The price for the CPU usage per hour per CPU core.</td>
</tr>
<tr>
<td></td>
<td>price_memory</td>
<td>The additional price for RAM per GB per hour.</td>
</tr>
<tr>
<td></td>
<td>price_disk_size</td>
<td>The additional price for disk size per GB per hour.</td>
</tr>
<tr>
<td>template_resource</td>
<td>price</td>
<td>The price per template in a template store.</td>
</tr>
</tbody>
</table>

**Page History**

v. 6.0
- added the following parameters for a `backup_resource_zone_resource` type:
  - `price_recovery_point_size`
  - `limit_recovery_point_size_free`

v. 5.8
- added the `backup_resource_zone_resource` type

**4.1.8.7 Edit Rate Cards for Other Server Type**

To edit rate cards, use the following request:

PUT /billing/buckets/:bucket_id/rate_cards.xml

PUT /billing/buckets/:bucket_id/rate_cards.json

**XML Request Example**

```bash
curl -i -X PUT -u user:userpass -d "<rate_card><target_id>7</target_id><type>edge_groups_resource</type><bucket_id>367</bucket_id><server_type>other</server_type><prices><price>0</price><limit_free>-2.22</limit_free></prices></rate_card>"
```

**JSON Request Example**

```bash
curl -i -X PUT -u user:userpass -d '{"rate_card": {"target_id": 7, "type": "edge_groups_resource", "bucket_id": 367, "server_type": "other", "prices": {"price": 0, "limit_free": -2.22}}}'}
```

Where:
- `bucket_id` - the ID of the bucket with which this rate card is associated
- `server_type` - the server type this rate card is applicable to, in this case `other`
**target_id** - the ID of the resource that is added to the rate card

**type** - the type of the resource that is added to the rate card, it can be one of the following values:

- `backup_resource_zone_resource`
- `edge_groups_resource`
- `template_resource`
- `service_addon_groups_resource`

**prices** - the array of prices and free limits for the resource that can be the following.

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>backup_resource_zone_resource</code></td>
<td>price</td>
<td>• The price for a recovery point (backup) per hour.</td>
</tr>
<tr>
<td></td>
<td><code>price_recovery_point_size</code></td>
<td>• The price for a recovery point (backup) size in Gb per hour.</td>
</tr>
<tr>
<td></td>
<td><code>limit_free</code></td>
<td>• The number of recovery points (backup/hour) users can store in a backup resource zone for free.</td>
</tr>
<tr>
<td></td>
<td><code>limit_recovery_point_size_free</code></td>
<td>• The size of recovery points (Gb/hour) users can consume in a backup resource zone for free.</td>
</tr>
<tr>
<td><code>edge_groups_resource</code></td>
<td>price</td>
<td>The price per GB of bandwidth.</td>
</tr>
<tr>
<td><code>service_addon_resource</code></td>
<td>price</td>
<td>The price per service add-on per hour.</td>
</tr>
<tr>
<td></td>
<td><code>price_cpu</code></td>
<td>The price for the CPU usage per hour per CPU core.</td>
</tr>
<tr>
<td></td>
<td><code>price_memory</code></td>
<td>The additional price for RAM per GB per hour.</td>
</tr>
<tr>
<td></td>
<td><code>price_disk_size</code></td>
<td>The additional price for disk size per GB per hour.</td>
</tr>
<tr>
<td><code>template_resource</code></td>
<td>price</td>
<td>The price per template in a template store.</td>
</tr>
</tbody>
</table>

**Page History**

v. 6.0
- added the following parameters for a `backup_resource_zone_resource` type:
  - `price_recovery_point_size`
  - `limit_recovery_point_size_free`

v. 5.8
4.1.8.8  Delete Resource from Rate Card for Other Server Type

To delete resources from rate card, use the following request:

DELETE /billing/buckets/:bucket_id/rate_cards.xml
DELETE /billing/buckets/:bucket_id/rate_cards.json

**XML Request Example**

```
curl -i -X DELETE -u user:userpass --url
http://onapp.test/billing/buckets/308/rate_cards/delete.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml' -d
'<rate_card><type>template_groups_resource</type><bucket_id>308</bucket_id>
<server_type>other</server_type><target_id>1</target_id></rate_card>
```

**JSON Request Example**

```
curl -i -X DELETE -u user:userpass --url
http://onapp.test/billing/buckets/308/rate_cards/delete.json
-H 'Accept: application/json' -H 'Content-type: application/json' -d
{"rate_card": {"type": "template_groups_resource", "bucket_id": 308, "server_type":
"other", "target_id": 1}}
```

Where:

- **type** - the type of the resource for which configuration is set, it can be one of the following values:
  - `backup_resource_zone_resource`
  - `edge_groups_resource`
  - `template_groups_resource`
  - `service_addon_groups_resource`

- **bucket_id** - the ID of the bucket with which this access control is associated
- **server_type** - the server type this access control is applicable to. In this case `other`.
- **target_id** - the ID of the resource which is deleted

---

### 4.2 Catalogs API

This section provides the API calls you can use to manage catalogs imported from VMware Cloud Director.

#### 4.2.1 Get List of Catalogs

To view the list of catalogs, use the following request:

GET /catalogs.xml
GET /catalogs.json

**XML Request Example**
4.2.2 Get Catalog Details
To view the details of catalog, use the following request:
GET /catalogs/:id.xml
GET /catalogs/:id.json

XML Request Example
```xml
<vcloud_catalogs type="array">
    <vcloud_catalog>
        <user_id>null</user_id>
        <hypervisor_id>4</hypervisor_id>
        <created_at>2016-02-01T11:43:52+00:00</created_at>
        <updated_at>2016-02-01T11:43:52+00:00</updated_at>
        <label>vn-onapp-public8</label>
        <published>true</published>
        <organization_id>11</organization_id>
        <identifier>a6d6d29a-e8eb-4869-a9af-53a5ec9b792c</identifier>
        <id>8</id>
        <description>This is a description of a catalog</description>
        <data_store_id>18</data_store_id>
    </vcloud_catalog>
    ...</vcloud_catalogs>
```
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**JSON Request Example**


**XML Output Example**

```xml
<vcloud_catalogs type="array">
  <vcloud_catalog>
    <user_id>null</user_id>
    <hypervisor_id>4</hypervisor_id>
    <created_at>2016-02-01T11:43:52+00:00</created_at>
    <updated_at>2016-02-01T11:43:52+00:00</updated_at>
    <label>Vn-onapp-public8</label>
    <published>true</published>
    <organization_id>11</organization_id>
    <identifier>a6d629a-e8eb-4869-a9af-53a5ec9b792c</identifier>
    <id>8</id>
    <description>This is a description of a catalog</description>
  </vcloud_catalog>
</vcloud_catalogs>
```

**Where:**

- **user_id** - the owner ID
- **hypervisor_id** - the ID of the compute resource
- **created_at** - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **updated_at** - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **label** - the name of the catalog
- **published** - true if catalog is published, otherwise, false
- **organization_id** - the ID of the organisation, to which the catalog is assigned
- **identifier** - the identifier of the catalog
- **id** - the ID of the catalog
- **description** - the description of the catalog
- **data_store_id** - the ID of a data store used by the catalog

**4.2.3 Create Catalog**

To create a catalog, use the following request:

POST /catalogs.xml
POST /catalogs.json

**XML Request Example**
JSON Request Example


Where:

organization_id - the ID of the organisation, to which the catalog will be assigned
data_store_id - the ID of the data store, to which the catalog will be assigned
vdc_id - the ID of the resource pool, to which the catalog will be assigned
label - the name of the catalog
description - the description of the catalog

4.2.4 Edit Catalog

To edit a catalog, use the following request:

PUT /catalogs/:id.xml
PUT /catalogs/:id.json

XML Request Example


JSON Request Example

4.2.5 Add vApp to Catalog

Ensure that FullControl or Change access rights for a user or group are applied to the Catalog at the vCloud side before adding vApp to catalog. For more information, refer to Access Rights to VMware Cloud Director Objects.

To add a vApp to catalog, use the following request:

POST /vapps/:vapp_id/conversion.xml
POST /vapps/:vapp_id/conversion.json

XML Request Example

```
```

JSON Request Example

```
curl -i -X POST -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' http://onapp.test/vapps/12/conversion.json -d '{"vcloud_vapp_template":{"catalog":"1","overwrite_catalog_item":"1","label":"vApp_system_111","description":"test","target_vapp_template":"1"}}'
```

Where:

catalog - choose the catalog to which the vApp will be added.

overwrite-catalog-item - set "1" to save this vApp as a template instead of another vApp template, otherwise set "0".

label - specify the name of the vApp. This parameter is applicable only when the overwrite-catalog-item parameter is set to "0".

description - add the appropriate vApp description.

target-vapp-template - choose the appropriate vApp template, which will be replaced. This parameter is applicable only when the overwrite-catalog-item parameter is set to "1".

4.2.6 Delete Catalog

To delete a catalog, use the following request:

DELETE /catalogs/:id.xml
DELETE /catalogs/:id.json

XML Request Example

```
```
4.2.7 Get List of vApp Templates

To view the list of vApp templates, use the following request:

GET/catalogs/:id/vapp_templates.xml
GET/catalogs/:id/vapp_templates.json

XML Request Example

```
curl -i -X GET -u user:userpass --url
http://onapp.test/catalogs/12/vapp_templates.xml -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

XML Output Example

```
```
<vcloud_vapp_templates type="array">
<vcloud_vapp_template>
  <id type="integer">16</id>
  <identifier>vappTemplate-1a1fd44-3e72-4add-8810-89d90e2c8bc6</identifier>
  <label>VApp_1_nk</label>
  <created_at type="dateTime">2018-08-08T15:52:21+03:00</created_at>
  <updated_at type="dateTime">2018-09-05T20:45:50+03:00</updated_at>
  <virtual_machines type="array">
    <virtual_machine>
      <identifier>vm-4bde71-b44a-46ca-a6ba-9f04e48b4333</identifier>
      <name>debian9_nadita</name>
      <disks type="array">
        <disk>
          <instance_id>2000</instance_id>
          <label>Hard disk 1</label>
          <capacity>3072</capacity>
          <bus_type>6</bus_type>
          <bus_sub_type>VirtualSCSI</bus_sub_type>
        </disk>
      </disks>
      <nics type="array">
        <nic>
          <adapter_type>VMXNET3</adapter_type>
        </nic>
      </nics>
      <cpus>
        <cpus>1</cpus>
      </cpus>
      <memory>1024</memory>
      <operating_system>debian8_64Guest</operating_system>
      <vmware_tools>10277</vmware_tools>
      <guest_customization>
        <enabled type="boolean">false</enabled>
        <change_sid type="boolean">false</change_sid>
        <join_domain_enabled type="boolean">false</join_domain_enabled>
        <use_org_settings type="boolean">false</use_org_settings>
        <admin_password_enabled type="boolean">true</admin_password_enabled>
        <admin_password_auto type="boolean">true</admin_password_auto>
        <admin_password nil="true"/>
        <admin_auto_logon_enabled type="boolean">false</admin_auto_logon_enabled>
        <admin_auto_logon_count type="integer">0</admin_auto_logon_count>
        <reset_password_required type="boolean">false</reset_password_required>
        <computer_name>debian9-001</computer_name>
        <script nil="true"/>
      </guest_customization>
    </virtual_machine>
  </virtual_machines>
  <catalog_item_id type="integer">18</catalog_item_id>
  <description>Description</description>
</vcloud_vapp_template>
</vcloud_vapp_templates>

Where:

id - ID of the vApp template

identifier - the identifier of the vApp template

label - the name of the vApp template

created_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
virtual_machines - the array of virtual servers that are built from the template

virtual_machine - the array of the virtual server parameters

identifier - the identifier of the virtual server
name - the name of the virtual server

disks - the array of the virtual server disks

disk - the array of the disk parameters
instance_id - the ID of the disk
label - the label of the disk
capacity - the capacity of the disk in GB
bus_type - the bus type of the disk
bus_sub_type - the bus sub type of the disk

nics - the array of the virtual server NICs
nic - the array of the NIC parameters
adapter_type - the network adapter type provided for the VS

cpus - the number of allocated CPU cores
cores_per_socket - the number of cores per socket
memory - the number of RAM allocated to the VS
operating_system - the operating system used by the VS
vmware_tools - the ID of the VMware tools

guest_customization - the array of the guest customization parameters applied to the VS.
The guest customization is available only for virtual servers with the VMware tools.

enabled - true, if the guest customization is enabled, otherwise, false

change_sid - true, if Change SID is enabled, otherwise, false. This parameter is applicable only for Windows VSs and runs Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join.

join_domain_enabled - true, if the VS is enabled to join a domain, otherwise, false

use_org_settings - true, if the user org settings are enabled, otherwise, false

admin_password_enabled - true, if the local administrator password is enabled, otherwise, false

admin_password_auto - true, if the administrator password is generated automatically, otherwise, false

admin_password - the password of the administrator

admin_auto_logon_enabled - true, if the administrator can be automatically logged in to the VS. This parameter applies only to Windows VSs.

admin_auto_logon_count - the number of automatic logins available for the administrator. After the indicated time is exceeded and you are not able to log in, the VS remains running and you need to enter your credentials. This option applies only if the admin_auto_logon_enabled is true.

reset_password_required - true, if the administrator is required to change the password on a first login to the VS, otherwise, false

computer_name - the VS computer name

script - the script for the guest customization
catalog_item_id - the ID of the catalog

description - the description of the vApp template

Page History
v. 6.0
• added the following parameters:
  o virtual_machines array
  o description

4.2.8 Get List of Media Files
To view the list of Media files, use the following request:
GET/catalogs/:id/media.xml
GET/catalogs/:id/media.json

XML Request Example
```
```

JSON Request Example
```
curl -i -X GET -u user:userpass --url http://onapp.test/catalogs/12/media.json -H 'Accept: application/json' -H 'Content-type: application/json'
```

XML Output Example
```
<vcloud_media type="array">
  <vcloud_media>
    <status>1</status>
    <user_id>null</user_id>
    <description>test</description>
    <data_store_id>2</data_store_id>
    <image_type>iso</image_type>
    <created_at>2016-02-04T14:19:26+02:00</created_at>
    <updated_at>2016-02-04T14:19:26+02:00</updated_at>
    <label>Kostya000</label>
    <catalog_item_id>3</catalog_item_id>
    <identifier>6677d99d-a3af-40d0-a44a-907b41ab2559</identifier>
    <vdc_id>1</vdc_id>
    <id>1</id>
    <size>414187520</size>
  </vcloud_media>
</vcloud_media>
```

Where:
status - the status of media file
user_id - owner ID
description - the media file description

data_store_id - the ID of the data store to which the media file is assigned

image_type - the type of the media file

created_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

label - the name of the media file

catalog_item_id - ID of the catalog

identifier - the identifier of the media file

vdc_id - the ID of the resource pool

id - the ID of the media file

size - the size of media file

4.2.9 Add File to Media Library

To add a file to media library, take the following steps:

1. Upload file to the Control Panel

2. Add file to the media library of a specific catalog

4.2.9.1 File uploading to the Control Panel

To upload file to the Control Panel, use the following request:

POST /catalogs/upload_files

Request Example


Where:

vcloud_media[folder] - path, where the media file is stored

4.2.9.2 Adding a file to the media library

To add a file to the media library, use the following request:

POST /catalogs/:id/media.xml

POST /catalogs/:id/media.json

XML Request Example


JSON Request Example
curl -i -X POST -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' http://onapp.test/catalogs/12/media.json -d '{"vcloud_media":{"label":"Media","folder":"path"}}'

Where:

- **label** - the name of the media file
- **folder** - path, where the media file is situated (the same folder, as indicated during file uploading to the Control Panel)

### 4.2.10 Create vApp Template (Add to Catalog)

To create a vApp template, use the following request:

```
POST /catalogs/:id/vapp_templates.xml
POST /catalogs/:id/vapp_templates.json
```

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
curl -i -X POST -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' http://onapp.test/catalogs/12/vapp_templates.json -d '{"vcloud_vapp_template":{"label":"Template","ovf_url":"url"}}'
```

Where:

- **label** - the name of the vApp template
- **ovf_url** - the link to the vApp template
- **folder** - path, where the vApp template is situated

### 4.2.11 Delete vApp Template

To delete a vApp template, use the following request:

```
DELETE /catalogs/:id/vapp_templates/:id.xml
DELETE /catalogs/:id/vapp_templates/:id.xml
```

**XML Request Example**

```bash
```

**JSON Request Example**
curl -i -X DELETE -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' http://onapp.test/catalogs/1/vapp_templates/12.json

4.3 Company Billing Plans API

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.1 Get List of Company Billing Plans

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.2 Get Company Billing Plan Details

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.3 Get Company Billing Plan Resources

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.4 Get Company Billing Plan Resource Details

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.
4.3.5 Create Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.6 Add Limits for Compute Zone

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.7 Add Limits for Data Store Zones

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.8 Add Limits for Network Zone

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.9 Edit Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.10 Edit Limits & Pricing for Data Store Zones in Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.
4.3.11 Edit Limits & Pricing for Network Zones in Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.12 Edit Limits & Pricing for Compute Zones in Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.13 Delete Resource From Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.3.14 Delete Company Billing Plan

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.4 Company Payments API

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.4.1 Get List of Company Payments

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.
4.4.2 Get List of Company Monthly Bills

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.4.3 Create Company Payment

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.4.4 Edit Company Payment

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.4.5 Delete Company Payment

The API requests in this section are deprecated in this version. For the new API requests refer to the Buckets API section of this guide.

4.5 Edge Gateways API

This section provides the API calls you can use to manage edge gateways imported from VMware Cloud Director.

4.5.1 Get List of Edge Gateways

To view the list of edge gateways, use the following request:

GET /edge_gateways.xml
GET /edge_gateways.json

XML Request Example

curl -i -X GET http://onapp.test/edge_gateways.xml -u user:userpass

JSON Request Example
curl -i -X GET http://onapp.test/edge_gateways.json -u user:userpass

XML Output Example

```xml
<edge_gateways type="array">
  <edge_gateway>
    <advanced_enabled type="boolean">true</advanced_enabled>
    <created_at type="dateTime">2020-11-16T10:55:09Z</created_at>
    <description></description>
    <gateway_backing_config>compact</gateway_backing_config>
    <ha_enabled type="boolean">false</ha_enabled>
    <id type="integer">3</id>
    <identifier>02048021-8945-4942-944b-17e1a9b5158</identifier>
    <label>RD_edge_second</label>
    <status>READY</status>
    <updated_at type="dateTime">2020-11-16T10:55:09Z</updated_at>
    <use_default_route_for_dns_relay type="boolean">false</use_default_route_for_dns_relay>
    <vdc_id type="integer">4</vdc_id>
    <firewall_service nil="true"/>
    <gateway_ipsec_vpn_service nil="true"/>
    <nat_service nil="true"/>
    <nsx_edge>
      <id type="integer">6</id>
      <label>vse-RD_edge_second</label>
      <identifier>edge-4</identifier>
      <manager_id type="integer">2</manager_id>
      <state>deployed</state>
      <status>GREEN</status>
      <created_at type="dateTime">2020-11-16T11:02:39Z</created_at>
      <updated_at type="dateTime">2020-11-16T11:02:39Z</updated_at>
    </nsx_edge>
  </edge_gateway>

  <edge_gateway>
    <advanced_enabled type="boolean">true</advanced_enabled>
    <created_at type="dateTime">2020-11-16T10:55:09Z</created_at>
    <description></description>
    <gateway_backing_config>compact</gateway_backing_config>
    <ha_enabled type="boolean">false</ha_enabled>
    <id type="integer">4</id>
    <identifier>984b2bd1-0b03-4327-b9fb-80abb4e9aela</identifier>
    <label>RD_edge_first</label>
    <status>READY</status>
    <updated_at type="dateTime">2020-11-16T10:55:09Z</updated_at>
    <use_default_route_for_dns_relay type="boolean">false</use_default_route_for_dns_relay>
    <vdc_id type="integer">4</vdc_id>
    <firewall_service nil="true"/>
    <gateway_ipsec_vpn_service nil="true"/>
    <nat_service nil="true"/>
    <nsx_edge>
      <id type="integer">5</id>
      <label>vse-RD_edge_first</label>
      <identifier>edge-3</identifier>
      <manager_id type="integer">2</manager_id>
      <state>deployed</state>
      <status>GREEN</status>
      <created_at type="dateTime">2020-11-16T11:02:37Z</created_at>
      <updated_at type="dateTime">2020-11-16T11:02:37Z</updated_at>
    </nsx_edge>
  </edge_gateway>
</edge_gateways>
```
Where:

- `advanced_enabled` - true, if the edge gateway is advanced, otherwise false
- `created_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- `description` - the description of the edge gateway by the admin
- `gateway_backing_config` - the configuration of the edge gateway, can be: `compact, full, full-4`
- `ha_enabled` - whether high availability option is enabled for this edge gateway or not
- `id` - ID of the edge gateway
- `identifier` - the identifier of the edge gateway
- `label` - the name of the edge gateway
- `status` - edge gateway status
- `updated_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- `use_default_route_for_dns_relay` - whether default route for dns relay is used or not
- `vdc_id` - ID of the vDC the edge gateway is associated with
- `firewall_service` - equal to nil if firewall service is imported into CP
- `gateway_ipsec_vpn_service` - an array of parameters related to the VPN service of the edge gateway
- `nat_service` - equal to nil if is the NAT service of the edge gateway is imported into CP
- `nsx_edge` - an array of parameters related to the NSX edge:
  - `id` - ID of the NSX edge
  - `label` - the name of the NSX edge
  - `identifier` - the identifier of the NSX edge
  - `manager_id` - ID of NSX manager
  - `state` - indicates if the NSX edge is deployed
  - `status` - indicates the status of the NSX edge
  - `created_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
  - `updated_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- `edge_gateway` - an array of parameters related to the edge gateway:
  - `advanced_enabled` - true, if the edge gateway is advanced, otherwise false
  - `created_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
  - `description` - the description of the edge gateway by the admin
  - `gateway_backing_config` - the configuration of the edge gateway, can be: `compact, full, full-4`
  - `ha_enabled` - whether high availability option is enabled for this edge gateway or not
  - `id` - ID of the edge gateway
  - `identifier` - the identifier of the edge gateway
  - `label` - the name of the edge gateway
  - `status` - edge gateway status
  - `updated_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
  - `use_default_route_for_dns_relay` - whether default route for dns relay is used or not
  - `vdc_id` - ID of the VDC the edge gateway is associated with
  - `firewall_service` - equal to nil if firewall service is imported into CP
gateway_ipsec_vpn_service - equal to nil if the VPN service of the edge gateway is enabled

nat_service - equal to nil if the NAT service of the edge gateway is imported into CP

Page History

v. 6.4

- added nsx_edge parameter together with the subsequent parameters
  (id, label, identifier, manager_id, state, status, created_at, updated_at)
- added edge_gateway parameter together with the subsequent parameters
  (advanced_enabled, created_at, description, gatewayBackingConfig, ha_enabled, id, identifier, label, status, updated_at, useDefaultRouteForDnsRelay, vdc_id, firewall_service, gateway_ipsec_vpn_service, nat_service)

v. 5.4

- added advanced_enabled parameter

4.5.2 Get List of Edge Gateway Interfaces

To view the list of edge gateway interfaces, use the following request:

GET /edge_gateways/:id/gateway_interfaces.xml
GET /edge_gateways/:id/gateway_interfaces.json

XML Request Example

```bash
curl -i -X GET -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml'
http://onapp.test/edge_gateways/5/gateway_interfaces.xml
```

JSON Request Example

```bash
curl -i -X GET -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json'
http://onapp.test/edge_gateways/5/gateway_interfaces.json
```

XML Output Example
<gateway_interfaces type="array">
  <gateway_interface>
    <created_at type="datetime">2016-05-25T02:36:24+03:00</created_at>
    <default_firewall_rule>ACCEPT</default_firewall_rule>
    <id type="integer">1628</id>
    <identifier>axd19u2wrhjl1v</identifier>
    <label>Fake Ext Net DC1</label>
    <network_join_id type="integer">624</network_join_id>
    <updated_at type="datetime">2016-05-25T02:36:24+03:00</updated_at>
  </gateway_interface>
  <gateway_interface>
    <created_at type="datetime">2016-05-25T02:36:24+03:00</created_at>
    <default_firewall_rule>ACCEPT</default_firewall_rule>
    <id type="integer">1629</id>
    <identifier>i88bsaopdhsogz</identifier>
    <label>onapp routed net 2</label>
    <network_join_id type="integer">634</network_join_id>
    <updated_at type="datetime">2016-05-25T02:36:24+03:00</updated_at>
  </gateway_interface>
</gateway_interfaces>

Where:

created_at - the date when the edge gateway interface was created in the [YYYY][MM][DD][hh][mm][ss]Z format

default_firewall_rule - set default firewall rule for the edge gateway interface – either DROP or ACCEPT

id - ID of the edge gateway interface

identifier - the identifier of the edge gateway interface

label - the name of the edge gateway interface

network_join_id - the ID of the network join to which this edge gateway interface belongs

updated_at - the date when the edge gateway interface was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

4.5.3 Get Edge Gateway Details

To view the details of an edge gateway, use the following request:

GET /edge_gateways/:id.xml

GET /edge_gateways/:id.json

XML Request example

curl -i -X GET http://onapp.test/edge_gateways/22.xml -u user:userpass

JSON Request Example

curl -i -X GET http://onapp.test/edge_gateways/22.json -u user:userpass

XML Output Example
<edge_gateways type="array">
  <edge_gateway>
    <advanced_enabled type="boolean">true</advanced_enabled>
    <created_at type="dateTime">2020-11-16T10:55:09Z</created_at>
    <description></description>
    <gateway_backing_config>compact</gateway_backing_config>
    <ha_enabled type="boolean">false</ha_enabled>
    <id type="integer">3</id>
    <identifier>02048021-8945-4942-944b-17ec1a9b5158</identifier>
    <label>RD_edge_second</label>
    <status>READY</status>
    <updated_at type="dateTime">2020-11-16T10:55:09Z</updated_at>
    <use_default_route_for_dns_relay type="boolean">false</use_default_route_for_dns_relay>
    <vdc_id type="integer">4</vdc_id>
    <firewall_service nil="true"/>
    <gateway_ipsec_vpn_service nil="true"/>
    <nat_service nil="true"/>
    <nsx_edge>
      <id type="integer">6</id>
      <label>vse-RD_edge_second</label>
      <identifier>edge-4</identifier>
      <manager_id type="integer">2</manager_id>
      <state>deployed</state>
      <status>GREEN</status>
      <created_at type="dateTime">2020-11-16T11:02:39Z</created_at>
      <updated_at type="dateTime">2020-11-16T11:02:39Z</updated_at>
    </nsx_edge>
  </edge_gateway>
  <edge_gateway>
    <advanced_enabled type="boolean">true</advanced_enabled>
    <created_at type="dateTime">2020-11-16T10:55:09Z</created_at>
    <description></description>
    <gateway_backing_config>compact</gateway_backing_config>
    <ha_enabled type="boolean">false</ha_enabled>
    <id type="integer">4</id>
    <identifier>984b2bd1-0b03-4327-b9fb-80abb4e9a61</identifier>
    <label>RD_edge_first</label>
    <status>READY</status>
    <updated_at type="dateTime">2020-11-16T10:55:09Z</updated_at>
    <use_default_route_for_dns_relay type="boolean">false</use_default_route_for_dns_relay>
    <vdc_id type="integer">4</vdc_id>
    <firewall_service nil="true"/>
    <gateway_ipsec_vpn_service nil="true"/>
    <nat_service nil="true"/>
    <nsx_edge>
      <id type="integer">5</id>
      <label>vse-RD_edge_first</label>
      <identifier>edge-3</identifier>
      <manager_id type="integer">2</manager_id>
      <state>deployed</state>
      <status>GREEN</status>
      <created_at type="dateTime">2020-11-16T11:02:37Z</created_at>
      <updated_at type="dateTime">2020-11-16T11:02:37Z</updated_at>
    </nsx_edge>
  </edge_gateway>
</edge_gateways>

Where:

**advanced_enabled**: true, if the edge gateway is advanced, otherwise false

**created_at**: the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

**description**: the description of the edge gateway by the admin
gateway_backing_config - the configuration of the edge gateway, can be: compact, full, full-4
ha_enabled - whether high availability option is enabled for this edge gateway or not
advanced_enabled - true, if the edge gateway is advanced, otherwise false
id - ID of the edge gateway
identifier - the identifier of the edge gateway
label - the name of the edge gateway
status - edge gateway status
updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
use_default_route_for_dns_relay - whether default route for dns relay is used or not
vdc_id - ID of the vDC the edge gateway is associated with
firewall_service - equal to nil if firewall service is imported into CP
gateway_ipsec_vpn_service - equal to nil if VPN service of the edge gateway is enabled
nat_service - equal to nil if the NAT service of the edge gateway is enabled
nsx_edge - an array of parameters related to the NSX edge:
  id - ID of the NSX edge
  label - the name of the NSX edge
  identifier - the identifier of the NSX edge
  manager_id - ID of NSX manager
  state - indicates if the NSX edge is deployed
  status - indicates the status of the NSX edge
  created_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
  updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
description - the description of the edge gateway by the admin
gateway_backing_config - the configuration of the edge gateway, can be: compact, full, full-4
ha_enabled - whether high availability option is enabled for this edge gateway or not
id - ID of the edge gateway
identifier - the identifier of the edge gateway
label - the name of the edge gateway
status - edge gateway status
updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
use_default_route_for_dns_relay - whether default route for dns relay is used or not
vdc_id - ID of the VDC the edge gateway is associated with
firewall_service - equal to nil if firewall service is imported into CP
gateway_ipsec_vpn_service - equal to nil if the VPN service of the edge gateway is enabled
nat_service - equal to nil if the NAT service of the edge gateway is enabled

Page History
v. 6.4

- added added *nsx_edge* parameter together with the subsequent parameters
  *(id, label, identifier, manager_id, state, status, created_at, updated_at)*

- added *edge_gateway* parameter together with the subsequent parameters
  *(advanced_enabled, created_at, description, gateway_backing_config, ha_enabled, id, identifier, label, status, updated_at, use_default_route_for_dns Relay, vdc_id, firewall_service, gateway_ipsec_vpn_service, nat_service)*

v. 5.4

- added *advanced_enabled* parameter

### 4.5.4 Create Edge Gateway

To create an edge gateway, use the following request:

**POST /edge_gateways.xml**

**POST /edge_gateways.json**

#### XML Request Example

```
curl -i -X POST -u user:userpass --url http://onapp.test/edge_gateways.xml
-H 'Accept: application/xml'
-H 'Content-type: application/xml'
-d '<edge_gateway><label>Edge Gateway</label>
<description></description>
<vdc_id>3</vdc_id>
<gateway_backing_config>compact</gateway_backing_config>
<ha_enabled>true</ha_enabled>
<advanced_enabled>true</advanced_enabled>
<distributed_routing_enabled>true</distributed_routing_enabled>
<external_network_configurations_attributes type="array">
<element><network_id>2</network_id>
<ip_net_configurations_attributes type="array">
<element><ip_net_id>1</ip_net_id>
<participate>true</participate>
<auto_ip_assignment>true</auto_ip_assignment></element>
<element><ip_net_id>2</ip_net_id>
<participate>true</participate>
<auto_ip_assignment>true</auto_ip_assignment></element>
<element><ip_net_id>3</ip_net_id>
<participate>true</participate>
<auto_ip_assignment>true</auto_ip_assignment></element>
</ip_net_configurations_attributes>
</element>
<element><ip_net_id>4</ip_net_id>
<participate>false</participate>
<auto_ip_assignment>true</auto_ip_assignment></element>
<element><ip_net_id>5</ip_net_id>
<participate>true</participate>
<auto_ip_assignment>false</auto_ip_assignment>
</element>
</ip_net_configurations_attributes>
<enable_rate_limits>1</enable_rate_limits>
</external_network_configurations_attributes>
<configure_gateway>true</configure_gateway>
<default_gateway>10.0.0.1</default_gateway>
<use_default_route_for_dns Relay>true</use_default_route_for_dns Relay>
</edge_gateway>'
```

#### JSON Request Example

```
curl -i -X POST -u user:userpass --url http://onapp.test/edge_gateways.json
-H 'Accept: application/json'
-H 'Content-type: application/json'
-d '{
  "edge_gateway": {
    "label": "Edge Gateway",
    "description": null,
    "vdc_id": 3,
    "gateway_backing_config": "compact",
    "ha_enabled": true,
    "advanced_enabled": true,
    "distributed_routing_enabled": true,
    "external_network_configurations": [
      {
        "network_id": 2,
        "ip_net_configurations": [
          {
            "ip_net_id": 1,
            "participate": true,
            "auto_ip_assignment": true
          },
          {
            "ip_net_id": 2,
            "participate": true,
            "auto_ip_assignment": true
          },
          {
            "ip_net_id": 3,
            "participate": true,
            "auto_ip_assignment": true
          },
          {
            "ip_net_id": 4,
            "participate": false,
            "auto_ip_assignment": true
          },
          {
            "ip_net_id": 5,
            "participate": true,
            "auto_ip_assignment": false
          }
        ]
      },
      {
        "network_id": 8,
        "ip_net_configurations": [
          {
            "ip_net_id": 1972,
            "ip_address": "10.0.0.3"
          }
        ]
      }
    ],
    "enable_rate_limits": 1,
    "configure_gateway": true,
    "default_gateway": "10.0.0.1",
    "use_default_route_for_dns": true
  }
}'
```
curl -i -X POST -u user:password -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"edge_gateway": {"label": "Edge Gateway", "description": "", "vdc_id": "3", "gateway_backing_config": "compact", "ha_enabled": "true", "advanced_enabled": "true", "distributed_routing_enabled": "true", "external_network_configurations_attributes": [{"network_id": "2", "ip_net_configurations_attributes": [{"ip_net_id": "1", "participate": "true", "auto_ip_assignment": "true"}, {"ip_net_id": "3", "participate": "true", "auto_ip_assignment": "true"}]}, {"network_id": "7", "ip_net_configurations_attributes": [{"ip_net_id": "1", "participate": "true", "auto_ip_assignment": "true"}]}], "enable_rate_limits": "1", "incoming_rate_limit": "101", "outgoing_rate_limit": "102"}, "configure_gateway": "true", "default_gateway": "10.0.0.1", "use_default_route_for_dns_relay": "true"}'}

Where:

- **label** - the name of the edge gateway
- **description** - the description of the edge gateway by the admin
- **vdc_id** - ID of the VDC the edge gateway is associated with
- **gateway_backing_config** - the configuration of the edge gateway, can be: compact, full, full-4
- **ha_enabled** - whether high availability option is enabled for this edge gateway or not
- **advanced_enabled** - true if advanced edge gateway services are enabled; otherwise, false
- **distributed_routing_enabled** - true if distributed routing is enabled; otherwise, false
- **external_network_configuration_attributes** - an array of external network configuration attributes with the details:
  - **network_id** - the ID of the external network which will be connected to the edge gateway
  - **ip_net_configurations_attributes** - the array of attributes of the IP net as follows:
    - **ip_net_id** - the ID of the IP net
    - **participate** - true if the IP address is assigned for each of the subnets; otherwise, false
    - **auto_ip_assignment** - true if you want to configure the IP address manually; otherwise, false
    - **ip_range_id** - the ID of the IP range with available IP addresses
    - **ip_address** - the IP address of the IP net
  - **enable_rate_limits** - set 1 to enable rate limits
  - **incoming_rate_limit** - the inbound rate limit in megabits per second. The default value is 100. The minimal value is 0,001 Mb/s.
  - **outgoing_rate_limit** - the outbound rate limit in megabits per second. The default value is 100. The minimal value is 0,001 Mb/s.
- **configure_gateway** - true if the automatic configuration of the default gateway is enabled; otherwise, false
- **default_gateway** - the default gateway
- **use_default_route_for_dns_relay** - true if the default route for DNS relay is used; otherwise, false
Page History

v.6.1 Edge 2
- added the *ip_range_id* parameter

v.6.0
- added the following parameters:
  - *advanced_enabled*
  - *distributed_routing_enabled*
  - *network_id*
  - *ip_net_id*
  - *participate*
  - *auto_ip_assignment*
  - *ip_address*
  - *enable_rate_limits*
  - *incoming_rate_limit*
  - *outgoing_rate_limit*
  - *configure_gateway*
  - *default_gateway*

- removed the *external_network_ids* parameter

4.5.5 Edit Edge Gateway

To edit an edge gateway, use the following request:

**XML Request Example**
OnApp and VMware Cloud 6.5 Edge 4 Director Configuration Guide

```
curl -i -X PUT http://onapp.test/edge_gateways/12.xml -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d '<edge_gateway><label>R1</label><description>abcde</description><ha_enabled>0</ha_enabled><configure_gateway>true</configure_gateway><default_gateway>10.0.0.2</default_gateway><use_default_route_for_dns Relay>true</use_default_route_for_dns_relay><external_network_configurations_attributes type="array"><element><id>1</id><enable_rate_limits>true</enable_rate_limits><incoming_rate_limit>101.0</incoming_rate_limit><outgoing_rate_limit>102.0</outgoing_rate_limit><ip_net_configurations_attributes type="array"><element><id>1</id><participate>false</participate><ip_address>199.51.100.4</ip_address></element><element><id>2</id><participate>true</participate><ip_address>10.0.0.10</ip_address></element><element><id>3</id><participate>true</participate><auto_ip_assignment>false</auto_ip_assignment><ip_address>199.51.100.4</ip_address></element><element><id>4</id><participate>true</participate><auto_ip_assignment>true</auto_ip_assignment><ip_address>10.0.0.10</ip_address></element></ip_net_configurations_attributes></element></external_network_configurations_attributes></edge_gateway>'
```

JSON Request Example

```
curl -i -X PUT http://onapp.test/edge_gateways/12.json -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"edge_gateway": {"label": "R1", "description": "abcde", "ha_enabled": "0", "configure_gateway": "true", "default_gateway": "10.0.0.2", "use_default_route_for_dns_relay": "true", "external_network_configurations_attributes": {"0": {"id": "1", "enable_rate_limits": "true", "incoming_rate_limit": "101.0", "outgoing_rate_limit": "102.0", "ip_net_configurations_attributes": {"0": {"id": "1", "participate": "false"}, "1": {"id": "2", "participate": "true", "auto_ip_assignment": "false", "ip_address": "199.51.100.4"}, "2": {"id": "3", "participate": "true", "auto_ip_assignment": "false", "ip_address": "10.0.0.10"}}}, "1": {"id": "2", "ip_net_configurations_attributes": {"0": {"id": "4", "participate": "true", "auto_ip_assignment": "true"}}}}}}'
```

Where:

To edit the edge gateway:
- `label` - the name of the edge gateway
- `description` - the description of the edge gateway by the admin
- `ha_enabled` - `true` if high availability option is enabled for this edge gateway; otherwise, `false`

To edit the default gateway:
- `configure_gateway` - `true` if the automatic configuration of the default gateway is enabled; otherwise, `false`
- `default_gateway` - the default gateway
- `use_default_route_for_dns_relay` - `true` if the default route for DNS relay is used; otherwise, `false`
• *id* - the ID of the external network which will be connected to the edge gateway

• *enable_rate_limits* - *true* if rate limits are enabled; otherwise, *false*

• *incoming_rate_limit* - the inbound rate limit in megabits per second. The default value is 100. The minimal value is 0,001 Mb/s.

• *outgoing_rate_limit* - the outbound rate limit in megabits per second. The default value is 100. The minimal value is 0,001 Mb/s.

*ip_net_configurations_attributes* - the attributes of the IP net as follows:

• *id* - the ID of the IP net

• *participate* - *true* if the IP address is assigned for each of the subnets; otherwise, *false*

• *auto_ip_assignment* - *true* if you want to configure the IP address manually; otherwise, *false*

• *ip_address* - the IP address of the IP net

id - the ID of the edge gateway

**Page History**

v.6.0

• added the following parameters:
  
  o *configure_gateway*
  
  o *default_gateway*

  o *enable_rate_limits*

  o *incoming_rate_limit*

  o *outgoing_rate_limit*

  o *participate*

  o *auto_ip_assignment*

  o *ip_address*

• removed the *external_network_ids* parameter

**4.5.6 Edit External Networks**

To add new or remove existing external networks, use the following request:

PUT /edge_gateways/:id.xml

PUT /edge_gateways/:id.json

**XML Request Example**


**JSON Request Example**
4.5.7 Delete Edge Gateway

To delete an edge gateway, use the following request:

DELETE /edge_gateways/:id.xml
DELETE /edge_gateways/:id.json

XML Request Example

curl -i -X DELETE http://onapp.test/edge_gateways/12.xml -u user:userpass

JSON Request Example

curl -i -X DELETE http://onapp.test/edge_gateways/12.json -u user:userpass

4.5.8 Convert Edge Gateways to Advanced Edge Gateways

This step is only necessary if you are using older versions of vCloud Director including but not limited to 9.1 or 9.5.

To convert an edge gateway to an advanced edge gateway that is required to use NSX for vCloud at OnApp, use the following request:

PUT /edge_gateways/:edge_gateway_id/convert_to_advanced.xml
PUT /edge_gateways/:edge_gateway_id/convert_to_advanced.json

XML Request Example


JSON Request Example

4.6 External Networks API

This section provides the API calls you can use to manage external networks imported from vCloud.

4.6.1 Get List of vCloud External Networks

To view the list of external networks, use the following request:

GET /settings/external_networks.xml
GET /settings/external_networks.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example

```
<external_networks type="array">
  <external_network>
    <created_at type="datetime">2016-02-13T10:31:06+02:00</created_at>
    <default_nat_rule_number type="integer">9999</default_nat_rule_number>
    <default_outside_ip_address_id nil="true"/>
    <dns_suffix nil="true"/>
    <dvportgroup>dvportgroup-33</dvportgroup>
    <enabled type="boolean">false</enabled>
    <fence_mode nil="true"/>
    <gateway>172.16.0.254</gateway>
    <id type="integer">1</id>
    <identifier>32eef56a-799b-4a2e-a3c3-b663c24c43c5</identifier>
    <ip_address_pool_id nil="true"/>
    <is_nated type="boolean">true</is_nated>
    <label>External Net</label>
    <netmask>255.255.255.0</netmask>
    <network_group_id type="integer">12</network_group_id>
    <prefix_size nil="true"/>
    <primary_dns nil="true"/>
    <secondary_dns nil="true"/>
    <shared type="boolean">false</shared>
    <updated_at type="datetime">2016-02-13T10:31:06+02:00</updated_at>
    <user_id nil="true"/>
    <vapp_id nil="true"/>
    <vdc_id nil="true"/>
    <vlan nil="true"/>
  </external_network>
  ...
</external_networks>
```

Where:
4.6.2 Get vCloud External Network Details

To view the details of an external network, use the following request:

GET /settings/external_networks/:id.xml
GET /settings/external_networks/:id.json

**XML Request example:**


**JSON Request example:**

XML Output example:

```xml
<external_network>
  <created_at type="datetime">2016-02-13T10:31:06+02:00</created_at>
  <default_nat_rule_number type="integer">9999</default_nat_rule_number>
  <default_outside_ip_address_id nil="true"/>
  <dns_suffix nil="true"/>
  <dvportgroup>dvportgroup-33</dvportgroup>
  <enabled type="boolean">false</enabled>
  <fence_mode nil="true"/>
  <gateway>172.16.0.254</gateway>
  <id type="integer">1</id>
  <identifier>32eef56a-799b-4a2e-a3c3-b663c24c43c5</identifier>
  <ip_address_pool_id nil="true"/>
  <is_nated type="boolean">true</is_nated>
  <label>External Net</label>
  <network_group_id type="integer">12</network_group_id>
  <prefix_size nil="true"/>
  <primary_dns nil="true"/>
  <secondary_dns nil="true"/>
  <shared type="boolean">false</shared>
  <updated_at type="datetime">2016-02-13T10:31:06+02:00</updated_at>
  <user_id nil="true"/>
  <vapp_id nil="true"/>
  <vdc_id nil="true"/>
  <vlan nil="true"/>
</external_network>
```

Where:
- `created_at` - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format
- `default_nat_rule_number` - default NAT rule
- `default_outside_ip_address_id` - ID of the outside IP address
- `dns_suffix` - the DNS suffix
- `dvportgroup` - the portgroup that backs this network
- `enabled` - whether the network is enabled or not
- `fence_mode` - isolation type of the network
- `gateway` - the gateway associated with the network
- `id` - the ID of the network
- `identifier` - the identifier of the network
- `ip_address_pool_id` - the ID of the IP Address Pool
- `is_nated` - set true to use NAT for translating the traffic. Set false if you are using your own firewall with external IP address
- `label` - the name of the network
- `netmask` - IP of the network mask
- `network_group_id` - network zone ID
- `prefix_size` - subnet prefix size
- `primary_dns` - IP address of the primary domain name system (DNS) server
- `secondary_dns` - IP address of the secondary domain name system (DNS) server
- `shared` - whether this external network is shared or not
- `updated_at` - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format
user_id - owner ID

vapp_id - the vApp associated with the network

vdc_id - the resource pool associated with the network

vlan - VLAN number

4.6.3 Get List of IP Addresses Assigned to vCloud External Network

To get the list of IP addresses assigned to the external network, use the following request:

GET /settings/external_networks/:id/ip_addresses.xml
GET /settings/external_networks/:id/ip_addresses.json

XML Request Example


JSON Request Example


XML Output Example

```
<ip_addresses type="array">
  <ip_address>
    <address>172.16.0.1</address>
    <broadcast nil="true"/>
    <created_at type="datetime">2016-02-13T10:31:06+02:00</created_at>
    <customer_network_id nil="true"/>
    <disallowed_primary type="boolean">false</disallowed_primary>
    <gateway>172.16.0.254</gateway>
    <hypervisor_id nil="true"/>
    <id type="integer">1</id>
    <ip_address_pool_id nil="true"/>
    <network_address nil="true"/>
    <network_id type="integer">1</network_id>
    <pxe type="boolean">false</pxe>
    <updated_at type="datetime">2016-02-13T10:31:06+02:00</updated_at>
    <user_id nil="true"/>
    <free type="boolean">false</free>
    <netmask>255.255.255.0</netmask>
  </ip_address>
  ...
</ip_addresses>
```

Where:

address - the IP address assigned to the external network

broadcast - the broadcast address

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

customer_network_id - the ID of the customer network
disallowed_primary - true if not allowed to be used as primary (for VS build), otherwise false

gateway - the gateway associated with the network

hypervisor_id - the ID of the compute resource the IP address is associated with

id - the ID of the network

ip_address_pool_id - ID of the IP Address Pool

network_address - the address of the network

network_id - the ID of the network

pxe - true, if this compute resource address can be used for cloud booting a compute resource

updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

user_id - owner ID

free - true if free, otherwise false

netmask - IP of the network mask

### 4.7 Firewall Rules API

This section provides the API calls you can use to manage firewall rules.

#### 4.7.1 Get List of vCloud Firewall Rules

To view the list of firewall rules, use the following request:

GET /firewall_services/:firewall_service_id/firewall_rules.xml

GET /firewall_services/:firewall_service_id/firewall_rules.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**
<vcloud_firewall_rules type="array">
  <vcloud_firewall_rule>
    <address>internal</address>
    <command>ACCEPT</command>
    <created_at type="datetime">2015-07-20T12:30:18+00:00</created_at>
    <description>VMs' internet 80</description>
    <destination_ip>external</destination_ip>
    <enable_logging type="boolean">false</enable_logging>
    <enabled type="boolean">true</enabled>
    <firewall_service_id type="integer">4</firewall_service_id>
    <id type="integer">16</id>
    <identifier>1</identifier>
    <network_interface_id nil="true"/>
    <port>80</port>
    <position type="integer">1</position>
    <protocol>TCP</protocol>
    <source_port>-1</source_port>
    <updated_at type="datetime">2015-07-20T12:30:18+00:00</updated_at>
  </vcloud_firewall_rule>
  ...<vcloud_firewall_rule>
</vcloud_firewall_rules>

Where:

address - the traffic source IP address for which this rule is active
command - the command to ACCEPT or DROP the indicated IPs
created_at - the date when the record in DB was created
description - the description of the firewall rule
destination_ip - the traffic destination IP address for which this rule is active
enable_logging - 'true' if the system will log when the rule drops or accepts traffic
enabled - whether the firewall rule is enabled or not
firewall_service_id - the ID of the firewall service with which the rule is associated
id - the ID of the firewall rule
identifier - identifier of the firewall rule
network_interface_id - the ID of a network interface for which this rule is active
port - the traffic destination port for which this rule is active
position - the rule priority
protocol - protocol type (TCP or UDP)
source_port - the traffic source port for which this rule is active
updated_at - the date when the record was updated in DB

4.7.2 Get Firewall Rule Details

To view the list of firewall rules, use the following request:

GET /firewall_services/:firewall_service_id/firewall_rules/:id.xml
GET /firewall_services/:firewall_service_id/firewall_rules/:id.json

XML Request Example

-u user:userpass

JSON Request Example
curl -i -X GET
user:userpass

XML Output Example

```xml
<vcloud_firewall_rule>
  <address>internal</address>
  <command>ACCEPT</command>
  <created_at type="datetime">2015-07-20T12:30:18+00:00</created_at>
  <description>VMS' internet 80</description>
  <destination_ip>external</destination_ip>
  <enable_logging type="boolean">false</enable_logging>
  <enabled type="boolean">true</enabled>
  <firewall_service_id type="integer">4</firewall_service_id>
  <id type="integer">16</id>
  <identifier>1</identifier>
  <network_interface_id nil="true"/>
  <port>80</port>
  <position type="integer">1</position>
  <protocol>TCP</protocol>
  <source_port>-1</source_port>
  <updated_at type="datetime">2015-07-20T12:30:18+00:00</updated_at>
</vcloud_firewall_rule>
```

Where:

- **address**: the traffic source IP address for which this rule is active
- **command**: the command to ACCEPT or DROP the indicated IPs
- **created_at**: the date when the record in DB was created
- **description**: the description of the firewall rule
- **destination_ip**: the traffic destination IP address for which this rule is active
- **enable_logging**: 'true' if the system will log when the rule drops or accepts traffic
- **enabled**: whether the firewall rule is enabled or not
- **firewall_service_id**: the ID of the firewall service with which the rule is associated
- **id**: the ID of the firewall rule
- **identifier**: identifier of the firewall rule
- **network_interface_id**: the ID of a network interface for which this rule is active
- **port**: the traffic destination port for which this rule is active
- **position**: the rule priority
- **protocol**: protocol type (TCP or UDP)
- **source_port**: the traffic source port for which this rule is active
- **updated_at**: the date when the record was updated in DB

4.7.3 Create vCloud Firewall Rule

To create a firewall rule, use the following request:

- POST /firewall_services/:firewall_service_id/firewall_rules.xml
- POST /firewall_services/:firewall_service_id/firewall_rules.json

XML Request Example
curl -i -X POST http://onapp.test/firewall_services/12/firewall_rules.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml' -u
user:userpass -d
'(<vcloud_firewall_rule><enabled>1</enabled><description>Description</description><command>ACCEPT</command><address>0.0.0.0</address><source_port>80</source_port><destination_ip>0.0.0.0</destination_ip><port>80</port><protocol>TCP</protocol><enable_logging>0</enable_logging></vcloud_firewall_rule>
',

JSON Request Example

curl -i -X POST http://onapp.test/firewall_services/12/firewall_rules.json
-H 'Accept: application/json' -H 'Content-type: application/json' -u
user:userpass -d
'{"vcloud_firewall_rule":{"enabled":"1","description":"Description","command":"ACCEPT","address":"0.0.0.0","source_port":"80","destination_ip":"0.0.0.0","port":"80","protocol":"TCP","enable_logging":"0"},"firewall_service_id":"2"}"

Where:

description - fill in the description of the firewall rule

enabled - set the "enabled" as 1 if you want the firewall rule to be enabled, or 0 if you want it to be disabled

command - sets the command to ACCEPT or DROP the indicated IPs

address - set the traffic source IP address for which this rule is active

• Enter 'any' to apply this rule to all IPs
• Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
• Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
• Enter 'internal' to apply the rule to IP address from the current network
• Enter 'external' to apply the rule to IP address outside the current network

source_port - set the traffic source port for which this rule is active

• Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
• Enter 'any' to apply the rule to all ports

destination_ip - set the traffic destination IP address for which this rule is active

• Enter 'any' to apply this rule to all IPs
• Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
• Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
• Enter 'internal' to apply the rule to IP address from the current network
• Enter 'external' to apply the rule to IP address outside the current network

port - set the traffic destination port for which this rule is active

• Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
• Enter 'any' to apply the rule to all ports

protocol - protocol type (TCP or UDP)
**enable_logging** - set to 'true' if you want the system to log when the rule drops or accepts traffic

### 4.7.4 Edit vCloud Firewall Rules

To edit a firewall rule, use the following request:

```plaintext
PUT /firewall_services/:firewall_service_id/firewall_rules/:id.xml
PUT /firewall_services/:firewall_service_id/firewall_rules/:id.json
```

**XML Request Example**

```plaintext
curl -i -X PUT http://onapp.test/firewall_services/12/firewall_rules/1.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d "<vcloud_firewall_rule><enabled>1</enabled><description>ICMP</description><command>ACCEPT</command><address>internal</address><source_port>1</source_port><destination_ip>external</destination_ip><port/><protocol>ICMP</protocol><enable_logging>0</enable_logging></vcloud_firewall_rule>"
```

**JSON Request Example**

```plaintext
curl -i -X PUT http://onapp.test/firewall_services/12/firewall_rules/1.json
-H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"vcloud_firewall_rule":{"enabled":"1","description":"ICMP","command":"ACCEPT","address":"internal","source_port":"1","destination_ip":"external","port":"","protocol":"ICMP","enable_logging":"0"},"firewall_service_id":"2","id":"4"}"
```

**Where:**

- **enabled** - set the "enabled" as 1 if you want the firewall rule to be enabled, or 0 if you want it to be disabled
- **description** - fill in the description of the firewall rule
- **command** - set the command to ACCEPT or DROP the indicated IPs
- **address** - set the traffic source IP address for which this rule is active
  - Enter 'any' to apply this rule to all IPs
  - Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
  - Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
  - Enter 'internal' to apply the rule to IP address from the current network
  - Enter 'external' to apply the rule to IP address outside the current network
- **source_port** - set the traffic source port for which this rule is active
  - Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
  - Enter 'any' to apply the rule to all ports
- **destination_ip** - set the traffic destination IP address for which this rule is active
  - Enter 'any' to apply this rule to all IPs
  - Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
  - Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
• Enter 'internal' to apply the rule to IP address from the current network
• Enter 'external' to apply the rule to IP address outside the current network
  
  **port** - set the traffic destination port for which this rule is active
• Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
• Enter 'any' to apply the rule to all ports
  
  **protocol** - protocol type (TCP or UDP)
  
  **enable_logging** - set to 'true' if you want the system to log when the rule drops or accepts traffic

### 4.7.5 Delete vCloud Firewall Rule

To delete a firewall rule, use the following request:

```
DELETE /firewall_services/:firewall_service_id/firewall_rules/:id.xml
DELETE /firewall_services/:firewall_service_id/firewall_rules/:id.json
```

**XML Request Example**

```
curl -i -X DELETE
   http://onapp.test/firewall_services/12/firewall_rules/1.xml -u
   user:userpass
```

**JSON Request Example**

```
curl -i -X DELETE
   http://onapp.test/firewall_services/12/firewall_rules/1.json -u
   user:userpass
```

### 4.8 Network Interfaces API

This section provides the API calls you can use to manage network interfaces imported from vCloud.

#### 4.8.1 Get List of vCloud Network Interfaces

To view the list of network interfaces, use the following request:

```
GET /virtual_machines/:virtual_server_id/network_interfaces.xml
GET /virtual_machines/:virtual_server_id/network_interfaces.json
```

**XML Request Example**

```
curl -i -X GET
   http://onapp.test/virtual_machines/157/network_interfaces.xml -u
   user:userpass
```

**JSON Request Example**
curl -i -X GET  
http://onapp.test/virtual_machines/157/network_interfaces.json -u user:userpass

**XML Output Example**

```xml
<network_interfaces type="array">
  <vcloud_network_interface>
    <connected type="boolean">true</connected>
    <created_at type="datetime">2015-07-20T13:54:31+00:00</created_at>
    <default_firewall_rule>ACCEPT</default_firewall_rule>
    <id type="integer">5</id>
    <identifier>moq2607eyhz8vo</identifier>
    <label>Network adapter 0</label>
    <mac_address>00:50:56:01:01:1c</mac_address>
    <network_join_id type="integer">13</network_join_id>
    <primary type="boolean">true</primary>
    <rate_limit type="integer">0</rate_limit>
    <updated_at type="datetime">2015-07-20T13:54:31+00:00</updated_at>
    <usage nil="true"/>
    <usage_last_reset_at nil="true"/>
    <usage_month_rolled_at nil="true"/>
    <virtual_machine_id type="integer">157</virtual_machine_id>
    <adapter_type>VMXNET3</adapter_type>
  </vcloud_network_interface>
  ...</vcloud_network_interface>
</network_interfaces>
```

**Where:**

- **connected** - whether the network interface is connected to the VS or not
- **created_at** - the timestamp in the database when this network interface was created
- **default_firewall_rule** - not relevant to network interfaces
- **id** - the ID of this network interface
- **identifier** - the identifier in the database of this network interface
- **label** - network interface name
- **mac_address** - network interface MAC address
- **network_join_id** - the ID of the network join to which this network interface belongs
- **primary** - true if this network interface is primary, otherwise false
- **rate_limit** - port speed in Mbps
- **updated_at** - the timestamp in the database when this network interface was updated
- **usage** - not relevant to network interfaces
- **usage_last_reset_at** - not relevant to network interfaces
- **usage_month_rolled_at** - not relevant to network interfaces
- **virtual_machine_id** - the ID of a virtual server to which this network interface is attached
- **adapter_type** - the network adapter type provided for the VS that can be one of the following values:
  - Vlance
  - E1000
4.8.2 Get vCloud Network Interface Details

To view the details of a network interface, use the following request:

GET /virtual_machines/:virtual_server_id/network_interfaces/:id.xml
GET /virtual_machines/:virtual_server_id/network_interfaces/:id.json

XML Request Example

```bash
curl -i -X GET http://onapp.test/virtual_machines/157/network_interfaces/5.xml -u user:userpass
```

JSON Request Example

```bash
curl -i -X GET http://onapp.test/virtual_machines/157/network_interfaces/5.json -u user:userpass
```

XML Output Example

```xml
<network_interfaces type="array">
  <vcloud_network_interface>
    <connected type="boolean">true</connected>
    <created_at type="datetime">2015-07-20T13:54:31+00:00</created_at>
    <default_firewall_rule>ACCEPT</default_firewall_rule>
    <id type="integer">5</id>
    <identifier>moq2607eyhz8vo</identifier>
    <label>Network adapter 0</label>
    <mac_address>00:50:56:01:01:1c</mac_address>
    <network_join_id type="integer">13</network_join_id>
    <primary type="boolean">true</primary>
    <rate_limit type="integer">0</rate_limit>
    <updated_at type="datetime">2015-07-20T13:54:31+00:00</updated_at>
    <usage nil="true"/>
  </vcloud_network_interface>
</network_interfaces>
```

Where:

- **connected** - whether the network interface is connected to the VS or not
- **created_at** - the timestamp in the database when this network interface was created
- **default_firewall_rule** - not relevant to network interfaces
id - the ID of this network interface
identifier - the identifier in the database of this network interface
label - network interface name
mac_address - network interface MAC address
network_join_id - the ID of the network join to which this network interface belongs
primary - true if this network interface is primary, otherwise false
rate_limit - port speed in Mbps
updated_at - the timestamp in the database when this network interface was updated
usage - not relevant to network interfaces
usage_last_reset_at - not relevant to network interfaces
usage_month_rolled_at - not relevant to network interfaces
virtual_machine_id - the ID of a virtual server to which this network interface is attached
adapter_type - the network adapter type provided for the VS that can be one of the following values:
• Vlance
• E1000
• E1000E
• VMXNET
• VMXNET2
• VMXNET3
• FLEXIBLE

4.8.3 Create vCloud Network Interface

To create a network interface, use the following request:
POST /virtual_machines/:virtual_server_id/network_interfaces.xml
POST /virtual_machines/:virtual_server_id/network_interfaces.json

XML Request Example

```
curl -i -X POST
```

JSON Request Example

```
curl -i -X POST
```

Where:
**connected** - indicate whether the network interface is connected to a VS

**network_join_id** - choose a network join

**adapter_type** - the network adapter type provided for the VS that can be one of the following values:

- **Viance**
- **E1000**
- **E1000E**
- **VMXNET**
- **VMXNET2**
- **VMXNET3**
- **FLEXIBLE**

### 4.8.4 Edit vCloud Network Interface

To edit a network interface, use the following request:

PUT `/virtual_machines/:virtual_server_id/network_interfaces/:id.xml`

PUT `/virtual_machines/:virtual_server_id/network_interfaces/:id.json`

**XML Request Example**

```
curl -i -X PUT
http://onapp.test/virtual_machines/12/network_interfaces/2.xml
-H 'Accept: application/xml'
-H 'Content-type: application/xml'
-u user:userpass -d
'&lt;network_interface&gt;&lt;primary&gt;1&lt;/primary&gt;&lt;connected&gt;1&lt;/connected&gt;&lt;network_join_id&gt;9&lt;/network_join_id&gt;&lt;/network_interface&gt;'`
```

**JSON Request Example**

```
curl -i -X PUT
http://onapp.test/virtual_machines/12/network_interfaces/2.json
-H 'Accept: application/json'
-H 'Content-type: application/json'
-u user:userpass -d
'{"network_interface":{"primary":"1","connected":"1","network_join_id":"9"}}'
```

Where:

**primary** - indicate whether this interface is primary

**connected** - indicate whether the network interface is connected to a VS

**network_join_id** - choose a network join

### 4.8.5 Delete vCloud Network Interface

To delete a network interface, use the following request:

DELETE `/virtual_machines/:virtual_server_id/network_interfaces/:id.xml`

DELETE `/virtual_machines/:virtual_server_id/network_interfaces/:id.json`

**XML Request Example**
4.9 Cross VDC Networks API

This section provides the API calls you can use to manage cross VDC networks.

4.9.1 Create Cross VDC Network

To create a cross VDC network, use the following request:

POST /cross_vdc_networks.xml
POST /cross_vdc_networks.json

XML Request Example


JSON Request Example


Where:

cross_vdc_network - an array of the parameters for the cross VDC network
label - a label of the cross VDC network
vdc_group_id - a group ID of the cross VDC network
gateway_cidr - a network Classless Inter-Domain Routing (CIDR) setting in the format network_gateway_IP_address/subnet_prefix_length

4.9.2 Edit Cross VDC Network

To edit a cross VDC network, use the following request:

PUT /cross_vdc_networks/:id.xml
PUT /cross_vdc_networks/:id.json

XML Request Example

curl -i -X DELETE
http://onapp.test/virtual_machines/12/network_interfaces/2.xml -u user:userpass

JSON Request Example

curl -i -X DELETE
http://onapp.test/virtual_machines/12/network_interfaces/2.json -u user:userpass
4.9.3 Delete Cross VDC Network
To delete a cross VDC network, use the following request:

DELETE /cross_vdc_networks/:id.xml
DELETE /cross_vdc_networks/:id.json

XML Request Example

```
```

JSON Request Example

```
```

Where:
cross_vdc_network - an array of the parameters for the cross VDC network
label - a label of the cross VDC network

4.10 Orchestration Models API
This section provides the API calls you can use to manage the orchestration models imported from your vCloud.

4.10.1 Get List of Orchestration Models
To get the list of orchestration models, use the following request:

GET /vcloud/templates.xml
GET /vcloud/templates.json

XML Request Example

```
curl -i -X GET http://onapp.test/vcloud/templates.xml -u user:userpass
```
JSON Request Example

```
curl -i -X GET http://onapp.test/vcloud/templates.json -u user:userpass
```

XML Output Example
<vcloud_templates type="array">
    <vcloud_template>
        <cpu_allocation_customizable type="boolean">true</cpu_allocation_customizable>
        <cpu_allocation_default type="integer">12</cpu_allocation_default>
        <cpu_allocation_min type="integer">1</cpu_allocation_min>
        <cpu_allocation_visible type="boolean">true</cpu_allocation_visible>
        <cpu_guaranteed_customizable type="boolean">true</cpu_guaranteed_customizable>
        <cpu_guaranteed_default type="integer">10</cpu_guaranteed_default>
        <cpu_guaranteed_min type="integer">1</cpu_guaranteed_min>
        <cpu_guaranteed_visible type="boolean">true</cpu_guaranteed_visible>
        <cpu_quota_customizable type="boolean">false</cpu_quota_customizable>
        <cpu_quota_default nil="true"/>
        <cpu_quota_max nil="true"/>
        <cpu_quota_min nil="true"/>
        <cpu_guaranteed_max type="integer">100</cpu_guaranteed_max>
        <cpu_guaranteed_min type="integer">20</cpu_guaranteed_min>
        <cpu_guaranteed_visible type="boolean">true</cpu_guaranteed_visible>
        <create_networks type="boolean">true</create_networks>
        <data_stores_to_create type="array">
            <active_support_hash_with_indifferent_access>
                <label>* for vCD 8</label>
                <id type="integer">83a2105b-47f1-4f21-a9de-43cfad2a82bd</id>
                <min type="integer">0</min>
                <max type="integer">999999</max>
                <default type="integer">100</default>
                <data_store_visible type="boolean">true</data_store_visible>
                <data_store_customizable type="boolean">true</data_store_customizable>
                <use_it type="boolean">true</use_it>
            </active_support_hash_with_indifferent_access>
        </data_stores_to_create>
        <default_network_pool>131cfd1d-97dd-4531-96cf-ce2dc2ac426f</default_network_pool>
        <deploy_edge_gateway type="boolean">true</deploy_edge_gateway>
        <edge_gateway_name>MyEdgeGateway</edge_gateway_name>
        <edge_gateway_network_id nil="true"/>
        <enable_fast_provisioning type="boolean">true</enable_fast_provisioning>
        <enable_thin_provisioning type="boolean">false</enable_thin_provisioning>
        <hypervisor_id type="integer">24</hypervisor_id>
        <memory_customizable type="boolean">true</memory_customizable>
        <memory_default type="integer">8</memory_default>
        <memory_guaranteed_customizable type="boolean">true</memory_guaranteed_customizable>
        <memory_guaranteed_default type="integer">20</memory_guaranteed_default>
        <memory_guaranteed_max type="integer">100</memory_guaranteed_max>
        <memory_guaranteed_min type="integer">20</memory_guaranteed_min>
        <memory_guaranteed_visible type="boolean">true</memory_guaranteed_visible>
        <memory_max type="integer">40</memory_max>
        <memory_min type="integer">4</memory_min>
        <memory_quota_customizable type="boolean">false</memory_quota_customizable>
        <memory_quota_default nil="true"/>
        <memory_quota_max nil="true"/>
        <memory_quota_min nil="true"/>
    </vcloud_template>
</vcloud_templates>
<memory_quota_visible type="boolean">false</memory_quota_visible>
<memory_visible type="boolean">true</memory_visible>
<networks_to_create type="array">
  <active_support_hash_with_indifferent_access>
    <name>DefaultName</name>
    <type>routed</type>
    <network_address>12.12.1.1/24</network_address>
    <dns>8.8.8.8</dns>
  </active_support_hash_with_indifferent_access>
</networks_to_create>
<provider_vdc_id type="integer">13</provider_vdc_id>
<updated_at type="datetime">2016-04-25T16:45:54+00:00</updated_at>
<vcpu_speed_customizable nil="true"/>
<vcpu_speed_default nil="true"/>
<vcpu_speed_max nil="true"/>
<vcpu_speed_min nil="true"/>
<vcpu_speed_visible nil="true"/>
<vdc_model_type>allocation</vdc_model_type>
<vm_number_customizable type="boolean">true</vm_number_customizable>
<vm_number_default type="integer">100</vm_number_default>
<vm_number_max type="integer">500</vm_number_max>
<vm_number_min type="integer">1</vm_number_min>
<vm_number_visible type="boolean">true</vm_number_visible>
</vcloud_template>
</vcloud_templates>

Where:

`cpu_allocation_customizable` - whether the CPU allocation related parameters are editable during orchestration model deployment

`cpu_allocation_default` - the default amount of allocated CPU resources, that will be set during orchestration model deployment

`cpu_allocation_max` - the maximum amount of allocated CPU resources, that can be set during orchestration model deployment

`cpu_allocation_min` - the minimum amount of allocated CPU resources, that can be set during orchestration model deployment

`cpu_allocation_visible` - whether the CPU allocation related parameters will be visible during orchestration model deployment

`cpu_guaranteed_customizable` - whether the CPU guaranteed related parameters will be editable during orchestration model deployment

`cpu_guaranteed_default` - the default amount of guaranteed CPU, that will be set during orchestration model deployment

`cpu_guaranteed_max` - the maximum amount of guaranteed CPU, that can be set during orchestration model deployment

`cpu_guaranteed_min` - the minimum amount of guaranteed CPU, that can be set during orchestration model deployment

`cpu_guaranteed_visible` - whether the CPU guaranteed related parameters will be visible during orchestration model deployment

`cpu_quota_customizable` - whether the CPU quota related parameters will be editable during orchestration model deployment

`cpu_quota_default` - the default CPU quota, that will be set during orchestration model deployment

`cpu_quota_max` - the maximum CPU quota, that can be set during orchestration model deployment
cpu_quota_min - the minimum CPU quota, that can be set during orchestration model deployment

cpu_quota_visible - whether the CPU quota related parameters will be visible during orchestration model deployment

create_to_networks - the array of parameters related to the networks that will be created when the orchestration model is deployed

  name - the label for the network

  type - the type of the network: routed, isolated or direct

  network_address - the network address

  dns - DNS for the network

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

data_stores_to_create - the array of parameters related to the data stores that will be created when the orchestration model is deployed

  label - the label of the data store zone in which a data store will be created during orchestration model deployment

  id - the ID of the data store zone in which a data store will be created during orchestration model deployment

  min - the minimum data store size that can be requested during orchestration model deployment

  max - the maximum data store size that can be requested during orchestration model deployment

  default - the default data store size that will be set during orchestration model deployment

  data_store_visible - whether the data store related parameters will be visible during orchestration model deployment

  data_store_customizable - whether the data store related parameters will be editable during orchestration model deployment

  use_it - whether the data store will be created during orchestration model deployment

data_store_visible - whether the data store related parameters will be visible during orchestration model deployment

data_store_customizable - whether the data store related parameters will be editable during orchestration model deployment

use_it - whether the data store will be created during orchestration model deployment

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

default_network_pool - the network pool

deploy_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.
memory_guaranteed_default - the default amount of guaranteed memory allocation, that will be set during orchestration model deployment

memory_guaranteed_max - the maximum amount of guaranteed memory allocation, that can be set during orchestration model deployment

memory_guaranteed_min - the minimum amount of guaranteed memory allocation, that can be set during orchestration model deployment

memory_guaranteed_visible - whether memory guaranteed related parameters are visible during orchestration model deployment

memory_max - the maximum amount of allocated memory, that can be set during orchestration model deployment

memory_min - the minimum amount of allocated memory, that can be set during orchestration model deployment

memory_quota_customizable - whether memory quota related parameters are editable during orchestration model deployment

memory_quota_default - the default amount of memory which can be used, that will be set during orchestration model deployment

memory_quota_max - the maximum amount of memory which can be used, that can be set during orchestration model deployment

memory_quota_min - the minimum amount of memory which can be used, that can be set during orchestration model deployment

memory_quota_visible - whether memory quota related parameters are visible during orchestration model deployment

memory_visible - whether memory related parameters are visible during orchestration model deployment

provider_vdc_id - the ID of the provider vDC that will be used when an organization vDC will be deployed from the orchestration model

updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

vcpu_speed_customizable - whether vCPU speed related parameters are editable during orchestration model deployment

vcpu_speed_default - the default vCPU speed in MHz, that will be set during orchestration model deployment

vcpu_speed_max - the maximum vCPU speed in MHz, that can be set during orchestration model deployment

vcpu_speed_min - the minimum vCPU speed in MHz, that can be set during orchestration model deployment

vcpu_speed_visible - whether vCPU speed related parameters are visible during orchestration model deployment

vdc_model_type - the resource pool type

vm_number_customizable - whether VS number related parameters are editable during orchestration model deployment

vm_number_default - the default number of VSs, that will be set during orchestration model deployment

vm_number_max - the maximum number of VSs, that can be set during orchestration model deployment

vm_number_min - the minimum number of VSs, that can be set during orchestration model deployment

vm_number_visible - whether VS number related parameters are visible during orchestration model deployment
4.10.2 Get Orchestration Model Details
To get the details of a particular orchestration model, use the following request:
GET /vcloud/templates/:template_id.xml
GET /vcloud/templates/:template_id.json

XML Request Example
```
curl -i -X GET http://onapp.test/vcloud/templates/12.xml -u user:userpass
```

JSON Request Example
```
curl -i -X GET http://onapp.test/vcloud/templates/12.json -u user:userpass
```

XML Output Example
<vcloud_template>
  <cpu_allocation_customizable type="boolean">true</cpu_allocation_customizable>
  <cpu_allocation_default type="integer">1</cpu_allocation_default>
  <cpu_allocation_max type="integer">12</cpu_allocation_max>
  <cpu_allocation_min type="integer">1</cpu_allocation_min>
  <cpu_allocation_visible type="boolean">true</cpu_allocation_visible>
  <cpu_guaranteed_customizable type="boolean">true</cpu_guaranteed_customizable>
  <cpu_guaranteed_default type="integer">10</cpu_guaranteed_default>
  <cpu_guaranteed_max type="integer">100</cpu_guaranteed_max>
  <cpu_guaranteed_min type="integer">1</cpu_guaranteed_min>
  <cpu_guaranteed_visible type="boolean">true</cpu_guaranteed_visible>
  <cpu_quota_customizable type="boolean">false</cpu_quota_customizable>
  <cpu_quota_default nil="true"/>
  <cpu_quota_max nil="true"/>
  <cpu_quota_min nil="true"/>
  <cpu_quota_visible type="boolean">false</cpu_quota_visible>
  <create_networks type="boolean">true</create_networks>
  <created_at type="datetime">2016-04-25T16:44:19+03:00</created_at>
  <data_stores_to_create type="array">
    <active_support_hash_with_indifferent_access>
      <label>* for vCD 8</label>
      <id>83a2105b-47f1-4f21-a9de-43cfd2a82bd</id>
      <min type="integer">0</min>
      <max type="integer">999999</max>
      <default type="integer">100</default>
      <data_store_visible type="boolean">true</data_store_visible>
      <data_store_customizable type="boolean">true</data_store_customizable>
      <use_it type="boolean">true</use_it>
    </active_support_hash_with_indifferent_access>
    <default_network_pool>131cfd1d-97dd-4531-96cf-ce2d2426f</default_network_pool>
    <deploy_edge_gateway type="boolean">true</deploy_edge_gateway>
    <edge_gateway_name>MyEdgeGateway</edge_gateway_name>
    <edge_gateway_network_id nil="true"/>
    <enable_fast_provisioning type="boolean">true</enable_fast_provisioning>
    <enable_thin_provisioning type="boolean">false</enable_thin_provisioning>
    <hypervisor_id type="integer">24</hypervisor_id>
    <id type="integer">8</id>
    <label>skdjhgfjshdf</label>
    <memory_customizable type="boolean">true</memory_customizable>
    <memory_default type="integer">8</memory_default>
    <memory_guaranteed_customizable type="boolean">true</memory_guaranteed_customizable>
    <memory_guaranteed_default type="integer">20</memory_guaranteed_default>
    <memory_guaranteed_max type="integer">100</memory_guaranteed_max>
    <memory_guaranteed_min type="integer">20</memory_guaranteed_min>
    <memory_guaranteed_visible type="boolean">true</memory_guaranteed_visible>
    <max type="integer">40</max>
    <min type="integer">4</min>
    <memory_quota_customizable type="boolean">false</memory_quota_customizable>
    <memory_quota_default nil="true"/>
    <memory_quota_max nil="true"/>
    <memory_quota_min nil="true"/>
    <memory_quota_visible type="boolean">false</memory_quota_visible>
    <networks_to_create type="array">
      <active_support_hash_with_indifferent_access>
        <label>* for vCD 8</label>
        <id>83a2105b-47f1-4f21-a9de-43cfd2a82bd</id>
        <min type="integer">0</min>
        <max type="integer">999999</max>
        <default type="integer">100</default>
        <data_store_visible type="boolean">true</data_store_visible>
        <data_store_customizable type="boolean">true</data_store_customizable>
        <use_it type="boolean">true</use_it>
      </active_support_hash_with_indifferent_access>
      <default_network_pool>131cfd1d-97dd-4531-96cf-ce2d2426f</default_network_pool>
      <deploy_edge_gateway type="boolean">true</deploy_edge_gateway>
      <edge_gateway_name>MyEdgeGateway</edge_gateway_name>
      <edge_gateway_network_id nil="true"/>
      <enable_fast_provisioning type="boolean">true</enable_fast_provisioning>
      <enable_thin_provisioning type="boolean">false</enable_thin_provisioning>
      <hypervisor_id type="integer">24</hypervisor_id>
      <id type="integer">8</id>
      <label>skdjhgfjshdf</label>
      <memory_customizable type="boolean">true</memory_customizable>
      <memory_default type="integer">8</memory_default>
      <memory_guaranteed_customizable type="boolean">true</memory_guaranteed_customizable>
      <memory_guaranteed_default type="integer">20</memory_guaranteed_default>
      <memory_guaranteed_max type="integer">100</memory_guaranteed_max>
      <memory_guaranteed_min type="integer">20</memory_guaranteed_min>
      <memory_guaranteed_visible type="boolean">true</memory_guaranteed_visible>
      <max type="integer">40</max>
      <min type="integer">4</min>
      <memory_quota_customizable type="boolean">false</memory_quota_customizable>
      <memory_quota_default nil="true"/>
<active_support_hash_with_indifferent_access>
  <name>DefaultName</name>
  <type>routed</type>
  <network_address>12.12.1.1/24</network_address>
  <dns>8.8.8.8</dns>
</active_support_hash_with_indifferent_access>

Where:

cpu_allocation_customizable - whether the CPU allocation related parameters are editable during orchestration model deployment

cpu_allocation_default - the default amount of allocated CPU resources, that will be set during orchestration model deployment

cpu_allocation_max - the maximum amount of allocated CPU resources, that can be set during orchestration model deployment

cpu_allocation_min - the minimum amount of allocated CPU resources, that can be set during orchestration model deployment

cpu_allocation_visible - whether the CPU allocation related parameters will be visible during orchestration model deployment

cpu_guaranteed_customizable - whether the CPU guaranteed related parameters will be editable during orchestration model deployment

cpu_guaranteed_default - the default amount of guaranteed CPU, that will be set during orchestration model deployment

cpu_guaranteed_max - the maximum amount of guaranteed CPU, that can be set during orchestration model deployment

cpu_guaranteed_min - the minimum amount of guaranteed CPU, that can be set during orchestration model deployment

cpu_guaranteed_visible - whether the CPU guaranteed related parameters will be visible during orchestration model deployment

cpu_quota_customizable - whether the CPU quota related parameters will be editable during orchestration model deployment

cpu_quota_default - the default CPU quota, that will be set during orchestration model deployment

cpu_quota_max - the maximum CPU quota, that can be set during orchestration model deployment

cpu_quota_min - the minimum CPU quota, that can be set during orchestration model deployment
cpu_quota_visible - whether the CPU quota related parameters will be visible during orchestration model deployment

create_to_networks - the array of parameters related to the networks that will be created when the orchestration model is deployed

- name - the label for the network
- type - the type of the network: routed, isolated or direct
- network_address - the network address
- dns - DNS for the network

created_at - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format

data_stores_to_create - the array of parameters related to the data stores that will be created when the orchestration model is deployed

- label - the label of the data store zone in which a data store will be created during orchestration model deployment
- id - the ID of the data store zone in which a data store will be created during orchestration model deployment
- min - the minimum data store size that can be requested during orchestration model deployment
- max - the maximum data store size that can be requested during orchestration model deployment
- default - the default data store size that will be set during orchestration model deployment
- data_store_visible - whether the data store related parameters will be visible during orchestration model deployment
- data_store_customizable - whether the data store related parameters will be editable during orchestration model deployment
- use_it - whether the data store will be created during orchestration model deployment

data_store_visible - whether the data store related parameters will be visible during orchestration model deployment

data_store_customizable - whether the data store related parameters will be editable during orchestration model deployment

use_it - whether the data store will be created during orchestration model deployment

delete_network - the network pool

default_edge_gateway - whether an edge gateway will be deployed during orchestration model deployment

each_edge_gateway_name - the label for the new edge gateway. The default name is MyEdgeGateway.

each_edge_gateway_network_id - the ID of the edge gateway network

enable_fast_provisioning - whether fast provisioning is enabled

enable_thin_provisioning - whether thin provisioning is enabled

disable - whether hypervisor will be disabled during orchestration model deployment

hypervisor_id - the ID of the compute resource associated with the orchestration model

id - the ID of the orchestration model

label - the name of the orchestration model

memory_customizable - whether memory related parameters are editable during orchestration model deployment

memory_default - the default amount of allocated memory, that will be set during orchestration model deployment

memory_guaranteed_customizable - whether memory guaranteed related parameters are editable during orchestration model deployment

memory_guaranteed_default - the default amount of guaranteed memory allocation, that will be set during orchestration model deployment
memory_guaranteed_max - the maximum amount of guaranteed memory allocation, that can be set during orchestration model deployment

memory_guaranteed_min - the minimum amount of guaranteed memory allocation, that can be set during orchestration model deployment

memory_guaranteed_visible - whether memory guaranteed related parameters are visible during orchestration model deployment

memory_max - the maximum amount of allocated memory, that can be set during orchestration model deployment

memory_min - the minimum amount of allocated memory, that can be set during orchestration model deployment

memory_quota_customizable - whether memory quota related parameters are editable during orchestration model deployment

memory_quota_default - the default amount of memory which can be used, that will be set during orchestration model deployment

memory_quota_max - the maximum amount of memory which can be used, that can be set during orchestration model deployment

memory_quota_min - the minimum amount of memory which can be used, that can be set during orchestration model deployment

memory_quota_visible - whether memory quota related parameters are visible during orchestration model deployment

memory_visible - whether memory related parameters are visible during orchestration model deployment

provider_vdc_id - the ID of the provider vDC that will be used when an organization vDC will be deployed from the orchestration model

updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

vcpu_speed_customizable - whether vCPU speed related parameters are editable during orchestration model deployment

vcpu_speed_default - the default vCPU speed in MHz, that will be set during orchestration model deployment

vcpu_speed_max - the maximum vCPU speed in MHz, that can be set during orchestration model deployment

vcpu_speed_min - the minimum vCPU speed in MHz, that can be set during orchestration model deployment

vcpu_speed_visible - whether vCPU speed related parameters are visible during orchestration model deployment

vdc_model_type - the resource pool type

vm_number_customizable - whether VS number related parameters are editable during orchestration model deployment

vm_number_default - the default number of VSs, that will be set during orchestration model deployment

vm_number_max - the maximum number of VSs, that can be set during orchestration model deployment

vm_number_min - the minimum number of VSs, that can be set during orchestration model deployment

vm_number_visible - whether VS number related parameters are visible during orchestration model deployment
4.10.3 Create Orchestration Model

To create an orchestration model, use the following request:

POST /vcloud/templates.xml

Example

curl -i -X POST http://onapp.test/vcloud/templates.xml -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d '<vcloud-template><label>MyOrchestrationModel</label><hypervisor-id>11</hypervisor-id><provider-vdc-id><vdc-model-type>allocatable</vdc-model-type><cpu-allocation-min>1</cpu-allocation-min><cpu-allocation-max>12</cpu-allocation-max><cpu-allocation-default>1</cpu-allocation-default><cpu-allocation-customizable>1</cpu-allocation-customizable><cpu-allocation-visible>1</cpu-allocation-visible><cpu-guaranteed-min>1</cpu-guaranteed-min><cpu-guaranteed-max>100</cpu-guaranteed-max><cpu-guaranteed-default>10</cpu-guaranteed-default><cpu-guaranteed-customizable>1</cpu-guaranteed-customizable><cpu-guaranteed-visible>1</cpu-guaranteed-visible><memory-min>4</memory-min><memory-max>40</memory-max><memory-default>8</memory-default><memory-customizable>1</memory-customizable><memory-visible>1</memory-visible><memory-guaranteed-min>20</memory-guaranteed-min><memory-guaranteed-max>100</memory-guaranteed-max><memory-guaranteed-default>20</memory-guaranteed-default><memory-guaranteed-customizable>1</memory-guaranteed-customizable><memory-guaranteed-visible>1</memory-guaranteed-visible><vm-number-min>1</vm-number-min><vm-number-max>500</vm-number-max><vm-number-default>100</vm-number-default><vm-number-customizable>1</vm-number-customizable><vm-number-visible>1</vm-number-visible><network-pool><edge-gateway-name>MyEdgeGateway</edge-gateway-name><networks_to_create><network_to_create><name>Network 1</name><type>array</type><network_address>11.11.1.1/24</network_address><nsd><vdc-id><provider><vdc><name>MyVDC</name><id>vcloud-6dcb406b</vdc></provider></vdc></vdc-id><nsd-id><id>114a114a</id></nsd-id><nsd-type><nsd-type>routed</nsd-type></nsd-type><nsd-name><name>Network 1</name></nsd-name><nsd_id></nsd_id></nsd></network_to_create><network_to_create><name>Network 2</name><type>array</type><network_address>11.11.1.1/24</network_address><nsd><vdc-id><provider><vdc><name>MyVDC</name><id>vcloud-6dcb406b</vdc></provider></vdc></vdc-id><nsd-id><id>114a114a</id></nsd-id><nsd-type><nsd-type>routed</nsd-type></nsd-type><nsd-name><name>Network 2</name></nsd-name><nsd_id></nsd_id></nsd></network_to_create><data_store_to_create><label>BronzeStore</label><id>b5e6e041-114a-45e0-909d-ee18971a9be9</id><min>0</min><max>999999</max><default>1000</default><data_store_customizable>true</data_store_customizable><data_store_visible>true</data_store_visible><use_it>true</use_it></data_store_to_create><data_store_to_create><label>GoldStore</label><id>b5e6e041-114a-45e0-909d-ee18971a9be9</id><min>0</min><max>999999</max><default>1000</default><data_store_customizable>true</data_store_customizable><data_store_visible>true</data_store_visible><use_it>true</use_it></data_store_to_create><data_store_to_create><label>SilverStore</label><id>b5e6e041-114a-45e0-909d-ee18971a9be9</id><min>0</min><max>999999</max><default>1000</default><data_store_customizable>true</data_store_customizable><data_store_visible>true</data_store_visible><use_it>true</use_it></data_store_to_create></vcloud-template>

JSON Request Example

- removed edge_gateway_uplink_network_id parameter
curl -i -X POST http://onapp.test/vcloud/templates.json -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"vcloud_template":{"label":"My Orchestration Model","hypervisor_id":"11","provider_vdc_id":"23","vdc_model_type":"allocation","cpu_allocation_min":"1","cpu_allocation_max":"12","cpu_allocation_default":"10","cpu_guaranteed_min":"1","cpu_guaranteed_max":"100","cpu_guaranteed_default":"10","cpu_guaranteed_customizable":"1","cpu_guaranteed_visible":"1","memory_min":"4","memory_max":"40","memory_default":"8","memory_customizable":"1","memory_visible":"1","memory_guaranteed_min":"20","memory_guaranteed_max":"100","memory_guaranteed_default":"20","memory_guaranteed_customizable":"1","memory_guaranteed_visible":"1","vm_number_min":"1","vm_number_max":"500","vm_number_default":"100","vm_number_customizable":"1","vm_number_visible":"1","default_network_pool":"131cfd1d-44dd-4531-96cf-ce22dc2ac426","edge_gateway_name":"MyEdgeGateway","networks_to_create": [{"name":"Network-1","type":"routed","network_address":"11.11.1.1/24","dns":"9.9.9.9"},{"name":"Network-2","type":"routed","network_address":"11.11.2.1/24","dns":"9.9.4.4"}],"enable_thin_provisioning":"1","enable_fast_provisioning":"1","data_stores_to_create": [{"label":"* for vCloud 8","id":"44a2105b-47f1-4f21-a9de-43cfa2a82bd","min":"0","max":"999999","default":"1000","data_store_customizable":"true","data_store_visible":"true","use_it":"true"},{"label":"Bronze Storage for vCloud 8","id":"b5e6e041-114a-45e0-909d-ee1871a9b9","min":"0","max":"999999","default":"1000","data_store_customizable":"true","data_store_visible":"true","use_it":"true"},{"label":"Gold Storage for vCloud 8","id":"55abf6c6-6dcb-429d-9be0-61d6d38f3e0","min":"0","max":"999999","default":"1000","data_store_customizable":"true","data_store_visible":"true","use_it":"true"}]}}'

Where:

- **label** - the name of the orchestration model
- **hypervisor_id** - the ID of the compute resource associated with the orchestration model
- **provider_vdc_id** - the ID of the provider vDC that will be used when an organization vDC will be deployed from the orchestration model
- **vdc_model_type** - the resource pool type: allocation, reservation or pay_as_you_go
- **cpu_allocation_min** - the minimum amount of allocated CPU resources, that can be set during orchestration model deployment
- **cpu_allocation_max** - the maximum amount of allocated CPU resources, that can be set during orchestration model deployment
- **cpu_allocation_default** - the default amount of allocated CPU resources, that will be set during orchestration model deployment
- **cpu_allocation_customizable** - set to "1", if you want the CPU allocation related parameters to be editable during orchestration model deployment, otherwise set to "0"
- **cpu_allocation_visible** - set to "1", if you want the CPU allocation related parameters to be visible during orchestration model deployment, otherwise set to "0"
- **cpu_guaranteed_min** - the minimum amount of guaranteed CPU, that can be set during orchestration model deployment
- **cpu_guaranteed_max** - the maximum amount of guaranteed CPU, that can be set during orchestration model deployment
- **cpu_guaranteed_default** - the default amount of guaranteed CPU, that will be set during orchestration model deployment
- **cpu_guaranteed_customizable** - set to "1", if you want the CPU guaranteed related parameters to be editable during orchestration model deployment, otherwise set to "0"
cpu_guaranteed_visible - set to "1", if you want the CPU guaranteed related parameters to be visible during orchestration model deployment, otherwise set to "0"

memory_min - the minimum amount of allocated memory, that can be set during orchestration model deployment

memory_max - the maximum amount of allocated memory, that can be set during orchestration model deployment

memory_default - the default amount of allocated memory, that will be set during orchestration model deployment

memory_customizable - set to "1", if you want the memory related parameters to be editable during orchestration model deployment, otherwise set to "0"

memory_visible - set to "1", if you want the memory related parameters to be visible during orchestration model deployment, otherwise set to "0"

memory_guaranteed_min - the minimum amount of guaranteed memory allocation, that can be set during orchestration model deployment

memory_guaranteed_max - the maximum amount of guaranteed memory allocation, that can be set during orchestration model deployment

memory_guaranteed_default - the default amount of guaranteed memory allocation, that will be set during orchestration model deployment

memory_guaranteed_customizable - set to "1", if you want the memory guaranteed related parameters to be editable during orchestration model deployment, otherwise set to "0"

memory_guaranteed_visible - set to "1", if you want the memory guaranteed related parameters to be visible during orchestration model deployment, otherwise set to "0"

vm_number_min - the minimum number of VSs, that will be set during orchestration model deployment

vm_number_max - the maximum number of VSs, that will be set during orchestration model deployment

vm_number_default - the default number of VSs, that will be set during orchestration model deployment

vm_number_customizable - set to "1", if you want the VS number related parameters to be editable during orchestration model deployment, otherwise set to "0"

vm_number_visible - set to "1", if you want the VS number related parameters to be visible during orchestration model deployment, otherwise set to "0"

default_network_pool - set a network pool

default_network_pool - set a network pool

default_network_pool - set a network pool

edge_gateway_name - fill in the label for the new edge gateway. The default name is MyEdgeGateway.

networks_to_create - the array of parameters related to the networks that will be created when the orchestration model is deployed

    name - the label for the network
    type - the type of the network: routed, isolated or direct
    network_address - fill in the network address

    dns - DNS for the network

enable_thin_provisioning - set to "1" to enable thin provisioning, otherwise set to "0"

enable_fast_provisioning - set to "1" to enable fast provisioning, otherwise set to "0"

data_stores_to_create - the array of parameters related to the data stores that will be created when the orchestration model is deployed

    label - the label of the data store zone in which a data store will be created during orchestration model deployment
id - the ID of the data store zone in which a data store will be created during orchestration model deployment

min - the minimum data store size that can be requested during orchestration model deployment

max - the maximum data store size that can be requested during orchestration model deployment

default - the default data store size that will be set during orchestration model deployment

data_store_customizable - set to "true" if you want that the data store size can be altered during orchestration model deployment, otherwise set to "false"

data_store_visible - set to "true" for the data store to be listed during orchestration model deployment, otherwise set to "false". If the data store zone is not visible, a data store will still be created in it.

use_it - set to "true" for the data store to be created during orchestration model deployment, otherwise set to "false"

Page History

v. 5.1

- removed edge_gateway_uplink_network_id parameter

4.10.4 Edit Orchestration Model

To edit an orchestration model, use the following request:

PATCH /vcloud/templates/:id.xml
PATCH /vcloud/templates/:id.json

XML Request Example

43cfad2a82bd</id><min>0</min><max>999999</max><default>1000</default><data_store_customizable>true</data_store_customizable><data_store_visible>true</data_store_visible><use_it>true</use_it></data_store_to_create><data_store_to_create><label>BronzeStorageforvCloud8</label><id>b5e6e041-114a-45e0-909d-ee18971a9be9</id><min>0</min><max>999999</max><default>1000</default><data_store_customizable>true</data_store_customizable><data_store_visible>true</data_store_visible><use_it>true</use_it></data_store_to_create><data_store_to_create><label>GoldStorageforvCloud8</label><id>b5e6e041-114a-45e0-909d-ee18971a9be9</id><min>0</min><max>999999</max><default>1000</default><data_store_customizable>true</data_store_customizable><data_store_visible>true</data_store_visible><use_it>true</use_it></data_store_to_create></vcloud-template>

**JSON Request Example**

```json
curl -i -X PATCH http://onapp.test/vcloud/templates/12.json -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"vcloud_template": {"label": "My Orchestration Model", "hypervisor_id": "11", "provider_vdc_id": "23", "vdc_model_type": "allocation", "cpu_allocation_min": "1", "cpu_allocation_max": "12", "cpu_allocation_default": "1", "cpu_allocation_visible": "1", "cpu_guaranteed_min": "1", "cpu_guaranteed_max": "100", "cpu_guaranteed_default": "1", "cpu_guaranteed_visible": "1", "memory_min": "4", "memory_max": "40", "memory_default": "8", "memory_customizable": "1", "memory_visible": "1", "memory_guaranteed_min": "20", "memory_guaranteed_max": "100", "memory_guaranteed_default": "20", "memory_guaranteed_visible": "1", "vm_number_min": "1", "vm_number_max": "500", "vm_number_default": "100", "vm_number_customizable": "1", "vm_number_visible": "1", "default_network_pool": "131cfdd4-4add-4531-96cf-ce2dc2ac426f", "edge_gateway_name": "MyEdgeGateway", "networks_to_create": [{"name": "Network-1", "type": "routed", "network_address": "11.11.1.1/24", "dns": "9.9.9.9"}, {"name": "Network-2", "type": "routed", "network_address": "11.11.2.1/24", "dns": "9.9.4.4"}], "enable_thin_provisioning": "1", "enable_fast_provisioning": "1", "data_stores_to_create": [{"label": "BronzeStorage for vCloud 8", "id": "44a2105b-47f1-4f21-9ade-43cfa2a82bd", "min": "0", "max": "999999", "default": "1000", "data_store_customizable": "true", "data_store_visible": "true", "use_it": "true"}, {"label": "Gold Storage for vCloud 8", "id": "55abf6c6-6dcb-429d-9be0-61d6d38cf3e0", "min": "0", "max": "999999", "default": "1000", "data_store_customizable": "true", "data_store_visible": "true", "use_it": "true"}]}]
```

**Where:**

- **label** - the name of the orchestration model
- **hypervisor_id** - the ID of the compute resource associated with the orchestration model
- **provider_vdc_id** - the ID of the provider VDC that will be used when an organization VDC will be deployed from the orchestration model
- **vdc_model_type** - the resource pool type: allocation, reservation or pay_as_you_go
- **cpu_allocation_min** - the minimum amount of allocated CPU resources, that can be set during orchestration model deployment
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- **cpu_allocation_max** - the maximum amount of allocated CPU resources, that can be set during orchestration model deployment
- **cpu_allocation_default** - the default amount of allocated CPU resources, that will be set during orchestration model deployment
- **cpu_allocation_customizable** - set to "1", if you want the CPU allocation related parameters to be editable during orchestration model deployment, otherwise set to "0"
- **cpu_allocation_visible** - set to "1", if you want the CPU allocation related parameters to be visible during orchestration model deployment, otherwise set to "0"
- **cpu_guaranteed_min** - the minimum amount of guaranteed CPU, that can be set during orchestration model deployment
- **cpu_guaranteed_max** - the maximum amount of guaranteed CPU, that can be set during orchestration model deployment
- **cpu_guaranteed_default** - the default amount of guaranteed CPU, that will be set during orchestration model deployment
- **cpu_guaranteed_customizable** - set to "1", if you want the CPU guaranteed related parameters to be editable during orchestration model deployment, otherwise set to "0"
- **cpu_guaranteed_visible** - set to "1", if you want the CPU guaranteed related parameters to be visible during orchestration model deployment, otherwise set to "0"
- **memory_min** - the minimum amount of allocated memory, that can be set during orchestration model deployment
- **memory_max** - the maximum amount of allocated memory, that can be set during orchestration model deployment
- **memory_default** - the default amount of allocated memory, that will be set during orchestration model deployment
- **memory_customizable** - set to "1", if you want the memory related parameters to be editable during orchestration model deployment, otherwise set to "0"
- **memory_visible** - set to "1", if you want the memory related parameters to be visible during orchestration model deployment, otherwise set to "0"
- **memory_guaranteed_min** - the minimum amount of guaranteed memory allocation, that can be set during orchestration model deployment
- **memory_guaranteed_max** - the maximum amount of guaranteed memory allocation, that can be set during orchestration model deployment
- **memory_guaranteed_default** - the default amount of guaranteed memory allocation, that will be set during orchestration model deployment
- **memory_guaranteed_customizable** - set to "1", if you want the memory guaranteed related parameters to be editable during orchestration model deployment, otherwise set to "0"
- **memory_guaranteed_visible** - set to "1", if you want the memory guaranteed related parameters to be visible during orchestration model deployment, otherwise set to "0"
- **vm_number_min** - the minimum number of VSs, that will be set during orchestration model deployment
- **vm_number_max** - the maximum number of VSs, that will be set during orchestration model deployment
- **vm_number_default** - the default number of VSs, that will be set during orchestration model deployment
- **vm_number_customizable** - set to "1", if you want the VS number related parameters to be editable during orchestration model deployment, otherwise set to "0"
- **vm_number_visible** - set to "1", if you want the VS number related parameters to be visible during orchestration model deployment, otherwise set to "0"
default_network_pool - set a network pool

default_network_pool - set a network pool

edge_gateway_name - fill in the label for the new edge gateway. The default name is MyEdgeGateway.

networks_to_create - the array of parameters related to the networks that will be created when the orchestration model is deployed

name - the label for the network
type - the type of the network: routed, isolated or direct
network_address - fill in the network address
dns - DNS for the network

enable_thin_provisioning - set to "1" to enable thin provisioning, otherwise set to "0"

enable_fast_provisioning - set to "1" to enable fast provisioning, otherwise set to "0"

data_stores_to_create - the array of parameters related to the data stores that will be created when the orchestration model is deployed

label - the label of the data store zone in which a data store will be created during orchestration model deployment

id - the ID of the data store zone in which a data store will be created during orchestration model deployment

min - the minimum data store size that can be requested during orchestration model deployment

max - the maximum data store size that can be requested during orchestration model deployment

default - the default data store size that will be set during orchestration model deployment

data_store_customizable - set to "true" if you want that the data store size can be altered during orchestration model deployment, otherwise set to "false"

data_store_visible - set to "true" for the data store to be listed during orchestration model deployment, otherwise set to "false". If the data store zone is not visible, a data store will still be created in it.

use_it - set to "true" for the data store to be created during orchestration model deployment, otherwise set to "false"

4.10.5 Deploy Orchestration Model

To deploy an orchestration model, use the following request:

POST /vcloud/templates/:template_id/deploy.xml

POST /vcloud/templates/:template_id/deploy.json

XML Request example:
curl -i -X POST http://onapp.test/vcloud/templates/:template_id/deploy.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d
"<vcloud_template><user_group_id>174</user_group_id><vdc_label>MyResourcePool1</vdc_label><cpu_allocation>1</cpu_allocation><cpu_guaranteed>10</cpu_guaranteed><vcpu_speed>0</vcpu_speed><cpu_quota>0</cpu_quota><memory>8</memory><memory_guaranteed>20</memory_guaranteed><memory_quota>0</memory_quota><vm_number>100</vm_number><storage_profile>47a2105b-47f1-4f21-a9de-43cfa2a82bd</storage_profile><networks_to_create type="array"><action_controller_parameters><name>DefaultName</name></action_controller_parameters></networks_to_create><data_stores_created type="array"><data_store_created><id>24a2105b-47f1-4f21-a9de-43cfa2a82bd</id><label>*forvCloud8</label><disk_space>1000</disk_space></data_store_created><data_store_created><id>b5e6e041-114a-45e0-909d-e18971a9be9</id><label>BronzeStorageforvCloud8</label><disk_space>1000</disk_space></data_store_created><data_store_created><id>55abf6c6-6dcb-429d-9be0-61d638c53e0</id><label>GoldStorageforvCloud8</label><disk_space>1000</disk_space></data_store_created><networks_created><network_created><name>Name1</name></network_created><network_created><name>Name2</name></network_created></networks_created><edge_gateway_name>EdgeGatewayName</edge_gateway_name><default_gateway_ip_net_id>1532</default_gateway_ip_net_id><network_default_route_for_dns_relay>1</network_default_route_for_dns_relay><networks_created><network_created><name>Name1</name></network_created><network_created><name>Name2</name></network_created></networks_created><vcloud_template>"
memory_quota - the memory quota
vm_number - the number of VSs that can be created after the template is deployed
storage_profile - the default storage policy
name - the name of the default network
datastores - array of IDs of external networks
datastore - ID of external network
data_stores_created - the array of parameters related to the data stores that will be
allocated after the template is deployed
  id - id of the data store zone in which a data store will be created during the orchestration
  model deployment
  label - the name of the data store zone in which a data store will be created during the
  orchestration model deployment
  disk_space - the disk size for the data store that will be allocated after the template is deployed
datastore_name - the name of the datastore
default_gateway - the default gateway to be added to the IP net automatically
use_default_route_for_dns_relay - true if the default route for DNS relay is used; otherwise, false
networks_created - the list of the networks created
name - the name of the network

Page History:
v.6.1 Edge 2
• Added the default_gateway_ip_net_id and use_default_route_for_dns_relay parameters
v.5.8
• added edge_gateway_name, networks_created and name parameters
v. 5.1:
• added edge_gateway_uplink_networks parameter
• added edge_gateway_uplink_network parameter

4.10.6 Clone Orchestration Model
To clone an orchestration model, use the following request:
PUT /vcloud/templates/:id/clone.xml
PUT /vcloud/templates/:id/clone.json

XML Request Example

```
```

JSON Request Example
4.10.7 Delete Orchestration Model

To delete an orchestration model, use the following request:

DELETE /vcloud/templates/:template_id.xml
DELETE /vcloud/templates/:template_id.json

**XML Request Example**

```
curl -i -X DELETE http://onapp.test/vcloud/templates/12.xml -u user:userpass
```

**JSON Request Example**

```
curl -i -X DELETE http://onapp.test/vcloud/templates/12.json -u user:userpass
```

4.11 Organizations API

This section contains the API requests you can use to manage VMware Cloud Director organizations in OnApp.

4.11.1 Get List of Organizations

To view the list of organizations, use the following request:

GET /organizations.xml
GET /organizations.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**
Where:

* id - the ID of the organization
* user_group_id - ID of the user group with which the organization is associated
* hypervisor_id - the ID of the VCD compute resource with which the new organization is to be associated
* label - the name of the organization
* identifier - the identifier of the organization
* created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
* updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

### 4.11.2 Get Organization Details

To view the details of an organization, use the following request:

GET /organizations/:id.xml
GET /organizations/:id.json

**XML Request Example**
```
```

**JSON Request Example**
```
```

**XML Output Example**
<vcloud_organization>
  <id type="integer">19</id>
  <user_group_id type="integer">705</user_group_id>
  <hypervisor_id type="integer">19</hypervisor_id>
  <label>MyNewOrg</label>
  <identifier>09822e9c-4a20-8892-6f465e79a9a0</identifier>
  <created_at type="dateTime">2017-10-03T17:16:23+03:00</created_at>
  <updated_at type="dateTime">2017-10-03T17:16:23+03:00</updated_at>
</vcloud_organization>

Where:

- **id** - the ID of the organization
- **user_group_id** - ID of the user group with which the organization is associated.
- **hypervisor_id** - the ID of the VCD compute resource with which the new organization is to be associated
- **label** - the name of the organization
- **identifier** - the identifier of the organization
- **created_at** - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **updated_at** - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

### 4.11.3 Create Organization

To create a new organization, use the following request:

**POST /organizations.xml**

**POST /organizations.json**

**XML Request Example**

```bash
curl -i -X POST http://onapp.test/organizations.xml -d '<?xml version="1.0" encoding="UTF-8"?><vcloud_organization><label>TEST_XML</label><user_group_id>1</user_group_id><hypervisor_id>1</hypervisor_id><create_user_group>false</create_user_group><user_bucket_id>1</user_bucket_id></vcloud_organization>
```

**JSON Request Example**

```bash
curl -i -X POST http://onapp.test/organizations.json -d '{"vcloud_organization":{"label":"TEST_JSON","user_group_id":1,"hypervisor_id":1,"create_user_group":0,"user_bucket_id":1}}' -u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

Where:

- **label** - the name of the organization. Can contain only alphanumeric characters or one of the following characters: `[ - _ . ( ) ]`.
- **user_group_id** - the user group with which this organization is to be associated. This parameter applies only if you disable the `create_user_group` parameter.
It is required to indicate either the `user_group_id` or the `create_user_group` parameter.

- `hypervisor_id*` - the VCD compute resource with which the new organization is to be associated.
- `create_user_group` - whether you wish to create a new user group with which this organization will be associated. If you enable this option, a new user group with the label of this organization will be created and will contain this organization. If you do not enable this option, you can associate this organization with an already existing user group. To enable set to '1', otherwise, set to '0'.
- `user_bucket_id` - the bucket for the user group that is to be created once to create this organization. If not set, the first available company billing plan is selected. This parameter applies only if you disable the `create_user_group` parameter.

### 4.11.4 Delete Organization

To delete an organization, use the following request:

```plaintext
DELETE /organizations/:id.xml
DELETE /organizations/:id.json
```

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

### 4.12 Organization Networks API

This section provides the API calls you can use to manage Organization networks imported from vCloud.

#### 4.12.1 Get List of vCloud Organization Networks

To view the list of organization networks, use the following request:

```plaintext
GET /org_networks.xml
GET /org_networks.json
```

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

XML Output Example

```xml
<org_networks type="array">
  <org_network>
    <vdc_id>6</vdc_id>
    <dns_suffix>null</dns_suffix>
    <updated_at>2016-02-01T11:47:41+00:00</updated_at>
    <is_nated>true</is_nated>
    <secondary_dns>null</secondary_dns>
    <id>25</id>
    <user_id>null</user_id>
    <vapp_id>null</vapp_id>
    <dvportgroup>null</dvportgroup>
    <label>statis.network</label>
    <gateway>10.0.10.1</gateway>
    <shared>false</shared>
    <default_outside_ip_address_id>null</default_outside_ip_address_id>
    <prefix_size>null</prefix_size>
    <ip_address_pool_id>null</ip_address_pool_id>
    <netmask>255.255.255.0</netmask>
    <vlan>null</vlan>
    <default_nat_rule_number>9999</default_nat_rule_number>
    <fence_mode>natRouted</fence_mode>
    <created_at>2016-02-01T11:47:41+00:00</created_at>
    <enabled>true</enabled>
    <primary_dns>null</primary_dns>
    <identifier>04114f87-bfb4-4f66-ac0a-2651c1ca54d1</identifier>
    <network_group_id>16</network_group_id>
  </org_network>
  <org_network>...
</org_networks>
```

Where:

- **created_at** - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format
- **default_nat_rule_number** - default NAT rule
- **default_outside_ip_address_id** - ID of the outside IP address
- **dns_suffix** - the DNS suffix
- **dvportgroup** - the portgroup that backs this network
- **enabled** - whether the network is enabled or not
- **fence_mode** - isolation type of the network
- **gateway** - the gateway associated with the network
- **id** - the ID of the network
- **identifier** - the identifier of the network
- **ip_address_pool_id** - ID of the IP Address Pool
- **is_nated** - set true to use NAT for translating the traffic. Set false if you are using your own firewall with external IP address
- **label** - the name of the network
- **netmask** - IP of the network mask
network_group_id - network zone ID
prefix_size - subnet prefix size
primary_dns - IP address of the primary domain name system (DNS) server
secondary_dns - IP address of the secondary domain name system (DNS) server
shared - whether this organization network is shared or not
updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
user_id - owner ID
vapp_id - the vApp associated with the network
vdc_id - the resource pool associated with the network
vlan - VLAN number

4.12.2 Get vCloud Organization Network Details
To view the details of organization network, use the following request:
GET /org_networks/:id.xml
GET /org_networks/:id.json

XML Request Example
```
curl -i -X GET -u user:userpass --url
-H 'Content-type: application/xml'
```

JSON Request Example
```
curl -i -X GET -u user:userpass --url
-H 'Content-type: application/json'
```

XML Output Example
<org_network>
  <vdc_id>6</vdc_id>
  <dns_suffix>null</dns_suffix>
  <updated_at>2016-02-01T11:47:41+00:00</updated_at>
  <is_nated>true</is_nated>
  <secondary_dns>null</secondary_dns>
  <id>25</id>
  <user_id>null</user_id>
  <vapp_id>null</vapp_id>
  <dvportgroup>null</dvportgroup>
  <label>statis.network</label>
  <gateway>10.0.10.1</gateway>
  <shared>false</shared>

  <default_outside_ip_address_id>null</default_outside_ip_address_id>
    <prefix_size>null</prefix_size>
    <ip_address_pool_id>null</ip_address_pool_id>
    <netmask>255.255.255.0</netmask>
    <vlan>null</vlan>
    <default_nat_rule_number>9999</default_nat_rule_number>
    <fence_mode>natRouted</fence_mode>
    <created_at>2016-02-01T11:47:41+00:00</created_at>
    <enabled>true</enabled>
    <primary_dns>null</primary_dns>
    <identifier>04114f87-bfb4-4f66-ac0a-2651c1ca54d1</identifier>
    <network_group_id>16</network_group_id>
  </default_outside_ip_address_id>
</org_network>

Where:

- **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **default_nat_rule_number** - default NAT rule
- **default_outside_ip_address_id** - ID of the outside IP address
- **dns_suffix** - the DNS suffix
- **dvportgroup** - the portgroup that backs this network
- **enabled** - whether the network is enabled or not
- **fence_mode** - isolation type of the network
- **gateway** - the gateway associated with the network
- **id** - the ID of the network
- **identifier** - the identifier of the network
- **ip_address_pool_id** - ID of the IP Address Pool
- **is_nated** - set true to use NAT for translating the traffic. Set false if you are using your own firewall with external IP address
- **label** - the name of the network
- **netmask** - IP of the network mask
- **network_group_id** - network zone ID
- **prefix_size** - subnet prefix size
- **primary_dns** - IP address of the primary domain name system (DNS) server
- **secondary_dns** - IP address of the secondary domain name system (DNS) server
- **shared** - whether this organization network is shared or not
- **updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
user_id - owner ID
vapp_id - the vApp associated with the network
dvd_id - the resource pool associated with the network
vlan - VLAN number

4.12.3 Create vCloud Organization Network
To create an organization network, use the following request:
POST /org_networks.xml
POST /org_networks.json
You can create the following types of organization networks:
- direct organization network
- routed organization network
- isolated organization network

Create Direct Network XML Request example:
```
'Accept: application/xml' -H 'Content-type: application/xml' -d
'<org_network><label>test</label><vdc_id>13</vdc_id><fence_mode>bridged</fence_mode><parent_network_id>4</parent_network_id></org_network>'
```

Create Direct Network JSON Request example:
```
'Accept: application/json' -H 'Content-type: application/json' -d
'{"org_network": {"label": "test", "vdc_id": "13", "fence_mode": "bridged", "parent_network_id": "4"}}'
```

Where:
- label - the name of the network
- vdc_id - ID of the resource pool to which the network will be connected
- fence_mode - the type of the organization network, in this case it is 'bridged'
- parent_network_id - the ID of the external network with which the direct organization network will be associated

Create Routed Network XML Request example:
Create Routed Network JSON Request example:

{"org_network": {"label": "test", "vdc_id": "13", "fence_mode": "natRouted", "parent_network_id": "991", "network_gateway_cidr": "11.0.0.2/22", "shared": "0", "use_gateway_dns": "0", "primary_dns": "191.170.0.2", "secondary_dns": "191.170.0.3", "dns_suffix": "24", "ip_ranges_attributes": [{"start_address": "11.0.0.2", "end_address": "11.0.0.6"}], "edge_gateway": "4"}}

Where:

- **label** - the name of the network
- **vdc_id** - ID of the resource pool to which the network will be connected
- **fence_mode** - the type of the organization network, in this case it is 'natRouted'
- **parent_network_id** - the ID of the external network with which the routed organization network will be associated
- **network_gateway_cidr** - specify a network address (CIDR address format with gateway address)
- **shared** - whether this organization network is shared or not
- **primary_dns** - the IP address of the primary domain name system (DNS) server
- **secondary_dns** - the IP address of the secondary domain name system (DNS) server
- **dns_suffix** - the DNS suffix
- **ip_ranges_attributes**: 
  - **start_address** - specify start IP address
  - **end_address** - specify end IP address
- **edge_gateway** - the edge gateway to which the network will be connected

Create Isolated Network XML Request example:

<org_network><label>test</label><vdc_id>13</vdc_id><fence_mode>natRouted</fence_mode><parent_network_id>991</parent_network_id><network_gateway_cidr>11.0.0.2/22</network_gateway_cidr><shared>0</shared><primary_dns>191.170.0.2</primary_dns><secondary_dns>191.170.0.3</secondary_dns><dns_suffix>24</dns_suffix><ip_ranges_attributes type="array"><ip_ranges_attribute><start_address>11.0.0.2</start_address><end_address>11.0.0.6</end_address></ip_ranges_attribute></ip_ranges_attributes><edge_gateway>4</edge_gateway></org_network>
Create Isolated Network JSON Request example:

```bash
curl -X POST -u user:userpass --url http://onapp.test/org_networks.json -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"org_network": {"label": "test", "vdc_id": "13", "fence_mode": "isolated", "parent_network_id": "993", "network_gateway_cidr": "10.0.0.1/22", "shared": "0", "primary_dns": "10.0.0.3", "secondary_dns": "10.0.0.2"}, "ip_ranges_attributes": [{"start_address": "10.0.0.4", "end_address": "10.0.0.8"}], "edge_gateway": 5, "organization": {"organization_id": "1640"}}'
```

Where:
- **label** - the name of the network
- **vdc_id** - ID of the resource pool to which the network will be connected
- **fence_mode** - the type of the organization network, in this case it is 'isolated'
- **parent_network_id** - the ID of the external network with which the isolated organization network will be associated
- **network_gateway_cidr** - specify a network address (CIDR address format with gateway address)
- **shared** - whether this organization network is shared or not
- **primary_dns** - the IP address of the primary domain name system (DNS) server
- **secondary_dns** - the IP address of the secondary domain name system (DNS) server
- **dns_suffix** - the DNS suffix
- **ip_ranges_attributes**:
  - **start_address** - specify start IP address
  - **end_address** - specify end IP address
- **edge_gateway** - the edge gateway to which the network will be connected
- **organization_id** - the ID of the organization

### 4.12.4 Edit vCloud Organization Network

To edit an organization network, use the following request:

```bash
PUT /org_networks/:id.xml
PUT /org_networks/:id.json
```

**XML Request Example**
### JSON Request Example

```bash
"label": "test",
"ip_ranges_attributes": [
{
"start_address": "192.168.0.1",
"end_address": "192.168.0.5"
},
{
"start_address": "192.168.0.7",
"end_address": "192.168.0.9"
}
]}'}
```

**Where:**

- **label** - the name of the network
- **ip_ranges_attributes** - an array of static IP pools (applicable for isolated and routed org networks)
  - **start_address** - specify start IP address
  - **end_address** - specify end IP address

### 4.12.5 Delete vCloud Organization Network

To delete an organization network, use the following request:

DELETE /org_networks/:id.xml

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

### 4.13 Resource Pools API

This section provides the API calls you can use to manage resource pools imported from VMware Cloud Director.
4.13.1 Get List of Resource Pools

To view the list of resource pools, use the following request:

GET /vdcs.xml
GET /vdcs.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**

```xml
<vdcs type="array">
  <vdc>
    <allocation_model>AllocationPool</allocation_model>
    <guaranteed_memory>0.2</guaranteed_memory>
    <cpu_allocated>6000</cpu_allocated>
    <updated_at>2016-02-02T23:00:35+00:00</updated_at>
    <cpu_limit>6000</cpu_limit>
    <cpu_used>2000</cpu_used>
    <guaranteed_cpu>0.11</guaranteed_cpu>
    <id>6</id>
    <vcpu_speed>1000</vcpu_speed>
    <label>onapp vDC 1 allocation pool</label>
    <thin_provisioning>true</thin_provisioning>
    <memory_used>1536</memory_used>
    <memory_limit>8192</memory_limit>
    <vm_quota>0</vm_quota>
    <memory_reserved>1638</memory_reserved>
    <fast_provisioning>true</fast_provisioning>
    <network_quota>1000</network_quota>
    <provider_vdc_id>51</provider_vdc_id>
    <created_at>2016-02-01T11:43:43+00:00</created_at>
    <enabled>true</enabled>
    <cpu_reserved>660</cpu_reserved>
    <memory_allocated>8192</memory_allocated>
    <user_group_id>11</user_group_id>
    <identifier>9d740561-7960-4fdc-b795-c33142a6d125</identifier>
  </vdc>
  <vdc>...</vdc>
</vdcs>
```

**Where:**

- `allocation_model` - the type resource pool
- `guaranteed_memory` - the amount of memory (%) guaranteed to this resource pool
- `cpu_allocated` - the amount of CPU (MHz) allocated to this resource pool
- `updated_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- `cpu_limit` - the maximum amount of CPU resources which can be used
cpu_used - the amount of used CPU resources

guaranteed_cpu - the amount of CPU resources (%) guaranteed to this resource pool

id - the ID of the resource pool

cpu_speed - the speed of vCPU (in MHz)

label - the name of the resource pool

thin_provisioning - true if the thin provisioning is enabled for this resource pool; otherwise false

memory_used - the amount of used memory (MB)

memory_limit - the maximum amount of memory which can be used

vm_quota - the number of virtual servers that can be created within this resource pool

memoryReserved - the amount of reserved memory (MB)

fast_provisioning - true if the fast provisioning is enabled for this resource pool; otherwise false

network_quota - the number of networks that can be created within this resource pool

provider_vdc_id - the provider resource pool ID

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

enabled - true if the resource pool is enabled; otherwise false

cpuReserved - the amount of reserved CPU resources

memory_allocated - the amount of memory (MB) allocated to this resource pool

user_group_id - the ID of the organization, to which the resource pool is assigned

identifier - the identifier of the resource pool

Page History

v. 5.6

• added the provider_vdc_id parameter

4.13.2 Get Resource Pool Details

To view the details of a resource pool, use the following request:

GET /vdcs/:id.xml

GET /vdcs/:id.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example


<vdc>
  <allocation_model>AllocationPool</allocation_model>
  <guaranteed_memory>0.2</guaranteed_memory>
  <cpu_allocated>6000</cpu_allocated>
  <updated_at>2016-02-02T23:00:35+00:00</updated_at>
  <cpu_limit>6000</cpu_limit>
  <cpu_used>2000</cpu_used>
  <guaranteed_cpu>0.11</guaranteed_cpu>
  <id>6</id>
  <vcpu_speed>1000</vcpu_speed>
  <label>onapp vDC 1 allocation pool</label>
  <thin_provisioning>true</thin_provisioning>
  <memory_used>1536</memory_used>
  <memory_limit>8192</memory_limit>
  <vm_quota>0</vm_quota>
  <memory_reserved>1638</memory_reserved>
  <fast_provisioning>true</fast_provisioning>
  <network_quota>1000</network_quota>
  <provider_vdc_id>51</provider_vdc_id>
  <created_at>2016-02-01T11:43:43+00:00</created_at>
  <enabled>true</enabled>
  <cpu_reserved>660</cpu_reserved>
  <memory_allocated>8192</memory_allocated>
  <user_group_id>11</user_group_id>
  <identifier>9d740561-7960-4fdc-b795-c33142a6d125</identifier>
</vdc>

Where:

allocation_model - the type resource pool

guaranteed_memory - the amount of memory (%) guaranteed to this resource pool

cpu_allocated - the amount of CPU (MHz) allocated to this resource pool

updated_at - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format

cpu_limit - the maximum amount of CPU resources which can be used

cpu_used - the amount of used CPU resources

guaranteed_cpu - the amount of CPU resources (%) guaranteed to this resource pool

id - the ID of the resource pool

vcpu_speed - the speed of vCPU (in MHz)

label - the name of the resource pool

thin_provisioning - true if the thin provisioning is enabled for this resource pool; otherwise false

memory_used - the amount of used memory (MB)

memory_limit - the maximum amount of memory which can be used

vm_quota - the number of virtual servers that can be created within this resource pool

memory_reserved - the amount of reserved memory (MB)

fast_provisioning - true if the fast provisioning is enabled for this resource pool; otherwise false

network_quota - the number of networks that can be created within this resource pool

provider_vdc_id - the provider resource pool ID

created_at - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format

enabled - true if the resource pool is enabled; otherwise false

cpu_reserved - the amount of reserved CPU resources
memory_allocated - the amount of memory (MB) allocated to this resource pool
user_group_id - the ID of the organization, to which the resource pool is assigned
identifier - the identifier of the resource pool

Page History
v. 5.6
• added the provider_vdc_id parameter

4.13.3 Get Billing Statistics for Resource Pool
Use the following API call to view the billing statistics for a resource pool:
GET /vdcs/:id/statistics.xml
GET /vdcs/:id/statistics.json

XML Request Example
```
curl -i -X GET http://onapp.test/vdcs/88779/statistics.xml -u user:userpass
```

JSON Request Example
```
curl -i -X GET http://onapp.test/vdcs/88779/statistics.json -u user:userpass
```

External network labels in vCloud and vCenter should be identical and unique, otherwise, network interface statistics will incorrect.

XML Output Example
<vdc_stat type="array">
  <vdc_stat>
    <id type="integer">88779</id>
    <company_id type="integer">89</company_id>
    <vdc_id type="integer">48</vdc_id>
    <cost type="float">0.0</cost>
    <currency_code>USD</currency_code>
    <stat_time type="datetime">2016-01-01T00:00:00Z</stat_time>
    <created_at type="datetime">2016-01-01T00:31:00Z</created_at>
    <updated_at type="datetime">2016-01-01T00:31:00Z</updated_at>
    <vdc_model_type>Allocation</vdc_model_type>
    <status type="symbol">enabled</status>
    <resource_elements>
      <cpu_allocation type="float">1.0</cpu_allocation>
      <cpu_resource_guaranteed type="float">10</cpu_resource_guaranteed>
      <cpu_used type="float">0.0</cpu_used>
      <deployed_edge_gateways type="float">1.0</deployed_edge_gateways>
      <deployed_org_networks type="float">0.0</deployed_org_networks>
      <fast_provisioning_set type="float">1.0</fast_provisioning_set>
      <memory_allocation type="float">8.0</memory_allocation>
      <memory_resource_guaranteed type="float">10</memory_resource_guaranteed>
      <memory_used type="float">0.0</memory_used>
      <thin_provisioning_set type="float">0.0</thin_provisioning_set>
      <vcpu_speed type="decimal">1000.0</vcpu_speed>
      <vs_count type="float">0.0</vs_count>
      <vs_limit type="float">100.0</vs_limit>
    </resource_elements>
    <data_stores type="array">
      <data_store>
        <data_store_id type="integer">64</data_store_id>
        <allocated_amount type="float">512.0</allocated_amount>
        <used_amount type="float">300.0</used_amount>
      </data_store>
    </data_stores>
    <network_interfaces type="array">
      <network_interface>
        <network_interface_id type="integer">117</network_interface_id>
        <data_sent type="float">0.0</data_sent>
        <data_received type="float">0.0</data_received>
        <ip_addresses type="float">1.0</ip_addresses>
      </network_interface>
    </network_interfaces>
  </vdc_stat>
</vdc_stat>...

Where:

id - the ID of this unit of statistics
company_id - ID of the company with which the resource pool is associated
vdc_id - ID of the resource pool to which these statistics refer
cost - the total due for the resource pool, network usage and storage policy usage for the hour for which these statistics have been generated
currency_code - the code of the currency you’re going to charge in
stat_time - the time when the statistics have been recorded
created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
vdc_model - the type of resource pool (allocation, reservation or Pay-As-You-Go)
status - whether the resource pool is enabled or not
resource_elements - an array of parameters that refer to resource pools:
  cost - the total due for the resource
  compute zone - ID of the compute zone
  cpu_limit (for Pay-As-You-Go resource pool only) - the maximum amount of CPU resources which can be used
  cpu_allocation - the amount of CPU (GHz) allocated to this resource pool
  cpu_resource_guaranteed - the amount of CPU resources (%) guaranteed to this resource pool
  cpu_used - the amount of CPU resources used during the hour for which these statistics has been generated
  deployed_edge_gateways - the total number of edge gateways deployed within this resource pool
  deployed_org_networks - the total number of org networks deployed within this resource pool
  fast_provisioning_set - 1.0 if fast provisioning is enabled for the resource pool, otherwise 0.0
  memory_limit (for Pay-As-You-Go resource pool only) - the maximum amount of memory which can be used
  memory_allocation - the amount of memory (GB) allocated to this resource pool
  memory_resource_guaranteed - the amount of memory (%) guaranteed to this resource pool
  memory_used - the amount of memory (GB) used during the hour for which these statistics have been generated
  thin_provisioning_set - 1.0 if thin provisioning is enabled for the resource pool, otherwise 0.0
  vcpu_speed - the vCPU speed that can be consumed after the resource pool is created
  vs_count - the number of VSs deployed within the resource pool
  vs_limit - the number of virtual servers that can be created within this resource pool (VS quota)
data_stores - an array of parameters that refer to data stores:
  data_store_zone_id - the ID of the data store zone associated with the resource pool
  data_store_id - the ID of the data store associated with the resource pool
  cost - the total due for the resource
  allocated_amount - the amount of disk size allocated to this resource pool. For Pay-as-you-go, if the allocated amount is unlimited, OnApp represents it as 99999 value.
  used_amount - the amount of disk size (GB) used during the hour for which these statistics have been generated
network_interfaces - an array of parameters that refer to network interfaces:
  network_zone_id - ID of the network zone associated with the resource pool
  network_interface_id - ID of the network interface associated with the resource pool
  cost - the total due for the resource
  data_sent - the amount of data sent during the hour for which these statistics have been generated
  data_received - the amount of data received during the hour for which these statistics have been generated
ip_addresses - the total number of IP addresses used at the point when these statistics were generated

Page History
v5.0
- added the following parameters:
  - cost
  - compute zone
  - deployed_org_networks
  - data_store_zone_id
  - network_zone_id
  - cpu_limit
  - memory_limit

4.13.4 Get List of Provider Resource Pools

Ensure that Provider resource pools permissions are on. For more information about permissions refer to the Permissions section of this guide.

To view the list of provider vDCs, use the following request:
GET /provider_vdcs.xml
GET /provider_vdcs.json

XML Request Example
```bash
curl -i -X GET http://onapp.test/provider_vdcs.xml -u user:userpass
```

JSON Request Example
```bash
curl -i -X GET http://onapp.test/provider_vdcs.json -u user:userpass
```

XML Output Example
<provider_vdcs type="array">
  <provider_vdc>
    <id type="integer">13</id>
    <label>pvDC 1 Cluster1</label>
    <cpu_allocated type="integer">0</cpu_allocated>
    <cpu_total type="integer">35880</cpu_total>
    <cpu_used type="integer">11692</cpu_used>
    <created_at type="datetime">2016-04-19T12:57:27+03:00</created_at>
    <enabled type="boolean">true</enabled>
    <hypervisor_id type="integer">24</hypervisor_id>
    <identifier>4b5330c2-449c-4b30-b156-fb4901c1235b</identifier>
    <memory_allocated type="integer">0</memory_allocated>
    <memory_total type="integer">50683</memory_total>
    <memory_used type="integer">18716</memory_used>
    <updated_at type="datetime">2016-05-06T01:00:34+03:00</updated_at>
    <external_networks type="array">
      <external_network>
        <created_at type="datetime">2016-04-19T12:58:12+03:00</created_at>
        <default_nat_rule_number type="integer">9999</default_nat_rule_number>
        <default_outside_ip_address_id nil="true"/>
        <dns_suffix nil="true"/>
        <dvportgroup nil="true"/>
        <enabled type="boolean">false</enabled>
        <fence_mode>isolated</fence_mode>
        <gateway>69.168.237.1</gateway>
        <id type="integer">466</id>
        <identifier>00cfb7da-f5e4-4d3e-bcf6-f912aad4faa3</identifier>
        <ip_address_pool_id nil="true"/>
        <is_nated type="boolean">true</is_nated>
        <label>Public DC1</label>
        <netmask>255.255.255.0</netmask>
        <network_group_id type="integer">323</network_group_id>
        <parent_network_id nil="true"/>
        <prefix_size nil="true"/>
        <primary_dns nil="true"/>
        <secondary_dns nil="true"/>
        <shared type="boolean">false</shared>
        <updated_at type="datetime">2016-04-22T16:51:40+03:00</updated_at>
        <user_id nil="true"/>
        <vapp_id nil="true"/>
        <vdc_id nil="true"/>
        <vlan nil="true"/>
      </external_network>
    </external_networks>
    <storage_policies type="array">
      <storage_policy>
        <closed type="boolean">false</closed>
        <created_at type="datetime">2016-04-19T12:57:28+03:00</created_at>
        <draas_id nil="true"/>
        <federation_enabled type="boolean">false</federation_enabled>
        <federation_id nil="true"/>
        <hypervisor_id type="integer">24</hypervisor_id>
        <id type="integer">304</id>
        <identifier>83a2105b-47f1-4f21-a9de-43cfad2a82bd</identifier>
        <label>* for vCD 8</label>
        <location_group_id nil="true"/>
        <preconfigured_only type="boolean">false</preconfigured_only>
        <provider_vdc_id type="integer">13</provider_vdc_id>
        <traded type="boolean">false</traded>
        <updated_at type="datetime">2016-04-19T12:57:28+03:00</updated_at>
        <default_max_iops type="integer">15000</default_max_iops>
        <default_burst_iops type="integer">15000</default_burst_iops>
        <min_disk_size type="integer">1</min_disk_size>
      </storage_policy>
    </storage_policies>
  </provider_vdc>
</provider_vdcs>
Where:

id - the ID of the provider resource pool

label - the name of the provider resource pool

cpu_allocated - the amount of CPU (MHz) allocated to this provider resource pool

cpu_total - the total amount of CPU on the provider provider resource pool

cpu_used - the amount of used CPU resources

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

enabled - true if the provider resource pool is enabled; otherwise false

hypervisor_id - the ID of the compute resource

identifier - the identifier of the provider resource pool

memory_allocated - the amount of memory (MB) allocated to this provider resource pool

memory_total - the total amount of memory on the provider resource pool

memory_used - the amount of used memory (MB)

updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

external_networks - the array of parameters related to the external network(s) associated with the provider resource pool

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

default_nat_rule_number - default NAT rule

default_outside_ip_address_id - ID of the outside IP address

dns_suffix - the DNS suffix

dvportgroup - the portgroup that backs this network

enabled - whether the network is enabled or not

fence_mode - isolation type of the network
**gateway** - the gateway associated with the network

**id** - the ID of the network

**identifier** - the identifier of the network

**ip_address_pool_id** - ID of the IP Address Pool

**is_nated** - "true" if the NAT is used for translating the traffic. "False" if you are using your own firewall with the external IP address

**label** - the name of the network

**netmask** - IP of the network mask

**network_group_id** - network zone ID

**parent_network_id** - not relevant to external networks

**prefix_size** - subnet prefix size

**primary_dns** - IP address of the primary domain name system (DNS) server

**secondary_dns** - IP address of the secondary domain name system (DNS) server

**shared** - whether this external network is shared or not

**updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

**user_id** - owner ID

**vapp_id** - the vApp associated with the network

**vdc_id** - the resource pool associated with the network

**vlan** - VLAN number

**storage_policies** - the array of parameters related to the storage policies associated with the vDC

**closed** - not relevant to storage policies

**created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

**draas_id** - not relevant to storage policies

**federation_enabled** - not relevant to storage policies

**federation_id** - not relevant to storage policies

**hypervisor_id** - the ID of the compute resource

**id** - the ID of the storage policy

**identifier** - the identifier of the storage policy

**label** - the name of the storage policy

**location_group_id** - ID of a location group the storage policy is assigned to

**preconfigured_only** - whether the storage policy can be used for creating Instance Package VSSs only. When this option is enabled, the storage policy cannot be used during custom virtual server (VSSs built by setting resources manually) creation.

**provider_vdc_id** - the provider resource pool ID

**traded** - not relevant to storage policies

**updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

**default_max_iops** - the default maximum IOPS value for the data store zone

**default_burst_iops** - the default peak IOPS value

**min_disk_size** - minimum disk size for the data store zone

**network_pools** - the array of parameters related to the network pool(s) associated with the vDC
closed - not relevant to network pools
created_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
draas_id - not relevant to network pools
directory_enabled - not relevant to network pools
federation_id - not relevant to network pools
hypervisor_id - the ID of the compute resource
id - the ID of the network pool
identifier - the identifier of the network pool
label - the name of the network pool
location_group_id - ID of a location group the network pool is assigned to
preconfigured_only - whether the network pool can be used for creating Instance Package
 VSs only. When this option is enabled, the pool cannot be used during custom virtual server
(VSs built by setting resources manually) creation.
provider_vdc_id - the provider resource pool ID
traded - not relevant to storage policies

4.13.5 Create Resource Pool
To create a resource pool, use the following request:

POST /vdcs.xml
POST /vdcs.json

XML Request Example

```
curl -i -X POST -u user:password --url http://onapp.test/vdcs.xml -H
'Accept: application/xml' -H 'Content-type: application/xml' -d '
'<vdc><label>foobar</label><user_group_id>8</user_group_id><provider_vdc_i
d>1</provider_vdc_id><network_pool_identifier>222and215-97dd-4531-96cf-
ce2dc2ac426f</network_pool_identifier><allocation_model>AllocationPool</al
clocation_model><cpu_allocated>1.1</cpu_allocated><memory_allocated>10</memory_allocated><guaranteed_cpu>30</guaranteed_cpu><guaranteed_memory>20</guaranteed_memory><vm_quota>100</vm_quota><network_quota>500</network_quota><thin_provisioning>true</thin_provisioning><fast_provisioning>true</fast_provisioning><data_store_attributes></data_store_attributes><data_store><data_store_group_id>4</data_store_group_id><data_store_size>55</data_store_size></data_store></vdc>
```

JSON Request Example

```
curl -i -X POST -u user:password --url http://onapp.test/vdcs.json -H
'Accept: application/json' -H 'Content-type: application/json' -d '{"vdc":
{"label": "foobar", "network_pool_identifier": "222and215-97dd-4531-96cf-
ce2dc2ac426f", "user_group_id": "8", "provider_vdc_id": "1",
"allocation_model": "AllocationPool", "cpu_allocated": "1.1", "memory_allocated": "10", "guaranteed_cpu": "30", "guaranteed_memory": "20", "vm_quota": "100", "network_quota": "500", "thin_provisioning": "true", "fast_provisioning": "true", "data_store_attributes": [{"data_store_group_id": "4", "data_store_size": "22", "data_store_type": "vcloud"}]}}
```

Where:
**label** - specify a name for the resource pool

**user_group_id** - specify the ID of a user group to which this resource pool will be assigned

**provider_vdc_id** - indicate the provider resource pool ID

**network_pool_identifier** - fill in the ID of the default network pool for the resource pool

**allocation_model** - choose the type of resource pool (AllocationVApp, AllocationPool, ReservationPool). Depending on the type selected, the compute resource parameters will differ:

**AllocationVApp (Pay-As-You-Go):**

- **guaranteed_cpu** - specify the amount of guaranteed CPU allocation (%)
- **guaranteed_memory** - specify the amount of guaranteed memory allocation (%)
- **vm_quota** - specify the number of VSs that can be created after the resource pool is deployed

**AllocationPool:**

- **memory_allocated** - specify the amount of memory (in GB) allocated to this resource pool
- **guaranteed_cpu** - specify the amount of guaranteed CPU allocation (%)
- **guaranteed_memory** - specify the amount of guaranteed memory allocation (%)

**ReservationPool:**

- **memory_allocated** - specify the amount of memory (in GB) allocated to this resource pool
- **vm_quota** - specify the number of VSs that can be created after the resource pool is deployed

- **network_quota** - specify the number of org networks that can be created after the resource pool is deployed

**Data Stores Attributes:**

- **thin_provisioning** - true if thin provisioning is enabled for this resource pool; otherwise false
- **fast_provisioning** - true if fast provisioning is enabled for this resource pool; otherwise false
- **data_store_group_id** - indicate the data store group ID

- **data_store_size** - specify the size of the data store. For Pay-As-You-Go resource pools, you can set 0 to create a data store with unlimited capacity.

- **data_store_type** - specify the type of the data store (vcloud)
• added the `network_quota` parameter.

v 5.0

• added the `network_pool_identifier` parameter.

### 4.13.6 Edit Resource Pool

To edit a resource pool, use the following request:

**PUT /vdcs/:id.xml**

**PUT /vdcs/:id.json**

**XML Request example:**

```bash
```

**JSON Request example:**

```bash
curl -I -X PUT -u user:userpass --url http://onapp.test/vdcs/:id.json -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"vdc": {"cpu_allocated": "2.2"}}'
```

**Where:**

Depending on the resource pool type, the following parameters can be edited:

- `network_pool_identifier` - fill in the ID of the default network pool for the resource pool
- `cpu_allocated` - specify the amount of CPU resources (GHz) that will be allocated after the resource pool is created
- `memory_allocated` - specify the amount of memory (in GB) allocated to this resource pool
- `guaranteed_cpu` - specify the amount of guaranteed CPU allocation (%)
- `guaranteed_memory` - specify the amount of guaranteed memory allocation (%)
- `vm_quota` - specify the number of VSs that can be created after the resource pool is deployed
- `network_quota` - specify the number of org networks that can be created after the resource pool is deployed
- `cpu_limit` - specify the maximum amount of CPU (in GHz) that can be requested
- `memory_limit` - specify the maximum amount of memory (in GB) which can be used
- `vcpu_speed` - specify the vCPU speed that can be consumed after the resource pool is created (in MHz)
- `thin_provisioning` - true if thin provisioning is enabled for this resource pool; otherwise false
- `fast_provisioning` - true if fast provisioning is enabled for this resource pool; otherwise false

**Page History:**

v 6.0

Added the `network_quota` parameter.

v 5.1

Added the `network_pool_identifier` parameter.
4.13.7 Delete Resource Pool

You can delete a resource pool that contains no vApps, Org Networks, or catalogs with templates. To delete a resource pool, use the following request:

DELETE /vdcs/:id.xml
DELETE /vdcs/:id.json

XML Request Example

```
curl -i -X DELETE http://onapp.test/vdcs/:id.xml -u user:userpass
```

JSON Request Example

```
curl -i -X DELETE http://onapp.test/vdcs/:id.json -u user:userpass
```

4.13.8 Create Resource Pool Data Store

To create a resource pool data store, use the following request:

POST /vdcs/:id/data_stores.xml
POST /vdcs/:id/data_stores.json

XML Request Example

```
curl -i -X POST -u user:userpass --url
"<data_store><data_store_group_id>29</data_store_group_id><data_store_size>100</data_store_size><data_store_type>vcloud</data_store_type><default>1</default></data_store>"
```

JSON Request Example

```
curl -i -X POST -u user:userpass --url
http://onapp.test/vdcs/12/data_stores.json -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"data_store": {"data_store_group_id": "29", "data_store_size": "100", "data_store_type": "vcloud", "default": "1"}}'}
```

Where:

- **data_store_group_id** - indicate the data store group ID
- **data_store_size** - specify the size of the data store. For Pay-As-You-Go resource pools, you can set 0 to create a data store with unlimited capacity.
- **data_store_type** - specify the type of the data store (vcloud)
  - default - set 1 to make the data store a default one, otherwise, set 0
• added the default parameter

4.13.9 Edit Resource Pool Data Store

To edit a resource pool data store, use the following request:

```
PUT /vdcs/:resource_pool_id/data_stores/:data_store_id.xml
PUT /vdcs/:resource_pool_id/data_stores/:data_store_id.json
```

**XML Request Example**

```
curl -i -X PUT -u user:userpass --url
http://onapp.test/vdcs/12/data_stores/1.xml
-H 'Accept: application/xml'
-d '<data_store><enabled>false</enabled><data_store_size>200</data_store_size>
<default>1</default></data_store>'
```

**JSON Request Example**

```
curl -i -X PUT -u user:userpass --url
http://onapp.test/vdcs/12/data_stores/1.json
-H 'Accept: application/json'
-d '{"data_store": {"enabled": "false", "data_store_size": "200", "default": "1"}}';
```

Where:

- **enabled** - true if data store is enabled in vCloud, otherwise, false
- **data_store_size** - specify the size of the data store. For Pay-As-You-Go resource pools, you can set 0 to create a data store with unlimited capacity.

- **default** - set 1 to make the data store a default one, otherwise, set 0

Page History

v. 6.0

• added the default parameter

4.13.10 Delete Resource Pool Data Store

To delete a resource pool data store, use the following request:

```
DELETE /vdcs/:resource_pool_id/data_stores/:data_store_id.xml
DELETE /vdcs/:resource_pool_id/data_stores/:data_store_id.json
```

**XML Request Example**

```
curl -i -X DELETE -u user:userpass --url
http://onapp.test/vdcs/12/data_stores/1.xml
```
4.14 User Groups API

VMware Cloud Director organizations are associated with user groups in OnApp. Several organizations can be associated with a single user group. In this case, the users within the user group will have access to the resources of all organizations in the user group. This section contains the API requests you can use to manage user groups in your cloud.

4.14.1 Get List of User Groups

To get the list of user groups:

GET /user_groups.xml
GET /user_groups.json

XML Request Example

```
curl -i -u user:userpass -X GET http://onapp.test/user_groups.xml -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example

```
curl -i -u user:userpass -X GET http://onapp.test/user_groups.json -H 'Accept: application/json' -H 'Content-type: application/json'
```

XML Output Example
<table>
<thead>
<tr>
<th>Closed</th>
<th>Not relevant to user groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Created at</td>
<td>The date when this record was created in database</td>
</tr>
<tr>
<td>Federation_enabled</td>
<td>Not relevant to user groups</td>
</tr>
<tr>
<td>Federation_id</td>
<td>Not relevant to user groups</td>
</tr>
<tr>
<td>Id</td>
<td>The group ID</td>
</tr>
<tr>
<td>Identifier</td>
<td>Identifier of the user group</td>
</tr>
<tr>
<td>Label</td>
<td>The group name</td>
</tr>
<tr>
<td>Traded</td>
<td>Not relevant to user groups</td>
</tr>
<tr>
<td>Updated at</td>
<td>The date when this record was updated in database</td>
</tr>
<tr>
<td>User_buckets</td>
<td>An array of buckets to which this account is assigned to, where</td>
</tr>
<tr>
<td>Id</td>
<td>The bucket type ID</td>
</tr>
<tr>
<td>Label</td>
<td>The bucket name</td>
</tr>
<tr>
<td>Created at</td>
<td>The date in the [YYYY][MM][DD][T][hh][mm][ss]Z format</td>
</tr>
</tbody>
</table>
updated_at - the date when the bucket was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

currency_code - the currency in which the users are charged

show_price - true, if users can see the prices set up for them, otherwise false

monthly_price - monthly fee for plan usage

allows_kms - true, if the KMS licensing is allowed for this bucket, otherwise false

allows_mak - true, if the MAK licensing is allowed, otherwise false

allows_own - true, if adding own licenses is allowed for this bucket, otherwise false

roles — an array of user roles to which this account is assigned to, where

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

id – role ID

label – role title

identifier – role identifier

created_at – the date in the [YYYY][MM][DD][hh][mm][ss]Z format

updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

users_count - the number of users assigned to the role

4.14.2 Get User Group Details

To get details for a particular user group:

GET /user_groups/:id.xml

GET /user_groups/:id.json

XML Request Example

curl -i -u user:userpass -X GET http://onapp.test/user_groups/56.xml -H 'Accept: application/xml' -H 'Content-type: application/xml'

JSON Request Example

curl -i -u user:userpass -X GET http://onapp.test/user_groups/56.json -H 'Accept: application/json' -H 'Content-type: application/json'

XML Output Example
<user_group>
  <closed type="boolean">false</closed>
  <created_at type="datetime">2015-04-15T16:02:20+03:00</created_at>
  <federation_enabled type="boolean">false</federation_enabled>
  <federation_id nil="true"/>
  <hypervisor_id nil="true"/>
  <identifier>abywglogotbqza</identifier>
  <label>test</label>
  <traded type="boolean">false</traded>
  <updated_at type="datetime">2015-04-15T16:02:20+03:00</updated_at>
  <buckets_id type="array">
    <bucket_id>
      <id type="integer">1</id>
      <label>default billing</label>
      <created_at type="datetime">2013-09-03T15:31:30+03:00</created_at>
      <currency_code>USD</currency_code>
      <show_price nil="true"/>
      <monthly_price type="decimal">0.0</monthly_price>
      <allows_mak type="boolean">true</allows_mak>
      <allows_kms type="boolean">false</allows_kms>
      <allows_own type="boolean">false</allows_own>
    </bucket_id>
  </buckets_id>
  <roles type="array">
    <role>
      <id type="integer">1</id>
      <label>Administrator</label>
      <identifier>admin</identifier>
      <created_at type="datetime">2013-09-03T15:31:13+03:00</created_at>
      <updated_at type="datetime">2015-04-15T15:26:46+03:00</updated_at>
    </role>
  </roles>
</user_group>

Where:

closed - not relevant to user groups

created_at – the date when this record was created in database

federation_enabled - whether Federation is enabled for the compute zone

federation_id - not relevant to user groups

id – the group ID

identifier — identifier of the user group

label – the group name

traded - not relevant to user groups

updated_at – the date when this record was updated in database

buckets_id — an array of buckets to which this account is assigned to, where

  id - the bucket type ID

  label - the bucket name

  created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

  updated_at - the date when the bucket was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

  currency_code - the currency in which the users are charged
show_price - true, if users can see the prices set up for them, otherwise false
monthly_price - monthly fee for plan usage
allows_kms - true, if the KMS licensing is allowed for this bucket, otherwise false
allows_mak - true, if the MAK licensing is allowed, otherwise false
allows_own - true, if adding own licenses is allowed for this bucket, otherwise false
roles — an array of user roles to which this account is assigned to, where
created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
id – role ID
label – role title
identifier – role identifier
created_at – the date in the [YYYY][MM][DD][hh][mm][ss]Z format
updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
users_count - the number of users assigned to the role

4.14.3 Get List of Users Assigned to User Group
To get details for a particular user group:
GET /user_groups/:id/users.xml
GET /user_groups/:id/users.json

XML Request Example

```
curl -i -u user:userpass -X GET http://onapp.test/user_groups/12/users.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example

```
curl -i -u user:userpass -X GET http://onapp.test/user_groups/12/users.json
-H 'Accept: application/json' -H 'Content-type: application/json'
```

XML Output Example
<users type="array">
  <user>
    <activated_at type="datetime">2012-04-03T14:30:34+00:00</activated_at>
    <avatar nil="true"/>
    <bucket_id type="integer">201</bucket_id>
    <cdn_account_status>ACTIVE</cdn_account_status>
    <cdn_status>ACTIVE</cdn_status>
    <created_at type="datetime">2012-04-03T14:30:34+00:00</created_at>
    <deleted_at nil="true"/>
    <email>admin@example.com</email>
    <firewall_id type="integer">4</firewall_id>
    <first_name>John</first_name>
    <group_id>12</group_id>
    <id type="integer">1</id>
    <image_template_group_id nil="true"/>
    <infoboxes>
      <hidden_infoboxes type="array">
        <hidden_infobox>4840313084eef1f8e1dada293eb1bae</hidden_infobox>
      </hidden_infoboxes>
    </infoboxes>
    <last_name>Smith</last_name>
    <locale>en</locale>
    <login>admin</login>
    <password_changed_at type="datetime">2014-08-21T16:00:15+03:00</password_changed_at>
    <registered_yubikey>true</registered_yubikey>
    <status>active</status>
    <supplied type="boolean">false</supplied>
    <suspend_at nil="true"/>
    <system_theme>dark</system_theme>
    <total_amount type="float">8378.4296875</total_amount>
    <updated_at type="datetime">2012-05-03T10:32+00:00</updated_at>
    <use_gravatar type="boolean">false</use_gravatar>
    <user_group_id nil="true"/>
    <outstanding_amount type="float">925.13000972271</outstanding_amount>
    <payment_amount type="decimal">0.0</payment_amount>
    <roles type="array">
      <role>
        <created_at type="datetime">2012-04-03T14:30:31+00:00</created_at>
        <id type="integer">1</id>
        <identifier>admin</identifier>
        <label>Administrator</label>
        <updated_at type="datetime">2012-04-03T10:28:32+00:00</updated_at>
        <permissions type="array">
          <permission>
            <created_at type="datetime">2012-04-03T14:30:31+00:00</created_at>
            <id type="integer">110</id>
            <identifier>autobackup_templates</identifier>
            <label>Any action on autobackup templates</label>
            <updated_at type="datetime">2012-04-03T14:30:31+00:00</updated_at>
          </permission>
        </permissions>
      </role>
    </roles>
    <used_cpus type="integer">0</used_cpus>
    <used_memory type="integer">0</used_memory>
    <used_cpu_shares type="integer"></used_cpu_shares>
    <used_disk_size type="integer">0</used_disk_size>
    <ip_addresses type="array">
      <ip_address>
        <address>109.123.105.147</address>
        <broadcast>109.123.105.159</broadcast>
        <created_at type="datetime">2012-07-29T21:49:41-10:00</created_at>
      </ip_address>
    </ip_addresses>
  </user>
</users>
Where:

activated_at – time when the user was activated

avatar - user's avatar

bucket_id – ID of the bucket assigned to this user

cdn_account_status – always returns ACTIVE status; but it is actually activated when CDN was enabled for particular user

cdn_status - whether CDN resources are enabled for this user or not

created_at – time when the user was created, in [YYYY][MM][DD]T[hh][mm][ss]Z

deleted_at – time when the user was deleted

email – user’s email

firewall_id - the ID of the firewall the user is associated with

first_name – user's first name

group_id - deprecated attribute; will be removed in upcoming release

id — the ID of a user in the database

image_template_group – the ID of associated template group, if any

infoboxes - an array of infoboxes with the following details:

    hidden_infoboxes - an array of hidden infoboxes

    hidden_infobox - hash of a hidden inobox

    display_infoboxes - true, if the infoboxes are displayed for this user, otherwise false

last_name – the user’s last name

locale – locale (language) associated with user

login – user’s login name
Login parameter is not returned when API key is used for authentication instead of a login/password combination.

**password_changed_at** - the date when the user's password was changed in the [YYYY][MM][DD][hh][mm][ss]Z format

**registered_yubikey** - true, if the user has enabled logging in using a YubiKey, otherwise false. To view the Yubikey(s) associated with a certain user, refer to Get List of User’s YubiKeys. For the API request that adds a YubiKey, refer to Add YubiKey to User.

**status** – status of the user's account (active, suspended or deleted)

**supplied** - whether the user was created for the supplier when he published a zone to the Federation. If true, no actions can be performed on this user

**suspend_at** – time when the system should suspend a user

**system_theme** - color scheme of the interface: light or dark

**time_zone** – the time zone of the user

**total_amount** - sum total of outstanding and payment amount

**updated_at** – time when user's profile data was updated

**use_gravatar** – true, if avatar is enabled for the user, otherwise false

**user_group_id** – ID of the user group assigned to this user

**outstanding_amount** – the amount of money the user is due to pay

**payment_amount** – amount of money the user has actually paid

**roles** – an array of user roles to which this account is assigned to, where

- **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **id** – role ID
- **identifier** – role identifier
- **label** – role title
- **updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **permissions**– an array with permissions assigned to this role
  - **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
  - **id** – permission ID
  - **identifier** – permission identifier
  - **label** – permission title
  - **updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

**used_cpus** – number of CPU cores allocated to all virtual servers and edge servers of the user

**used_memory** - the amount of RAM used by the user (MB)

**used_cpu_shares** - the amount of CPU shares used

**used_disk_size** – size of all user disks in GB

**used_ip_addresses** – an array of IP addresses associated with the user

**ip_address** - an array of IP address with the following parameters:

- **address** - IP address
- **broadcast** – broadcast address
- **created_at** — the date in the [YYYY][MM][DD][hh][mm][ss]Z format
customer_network_id - the ID of the customer VLAN the IP address belongs to

disallowed_primary – true if not allowed to be used as primary (for VS build), otherwise false

gateway – gateway address

hypervisor_id - the ID of a compute resource the IP address is associated with

id – the ID of the IP address

ip_address_pool_id – the address of the IP address pool

network_address – the address of the network

network_id – the ID of the network

pxe - true, if this compute resource address can be used for cloudbooting a compute resource

updated_at – the date when the network was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

user_id – ID of a user associated with this IP address

free – true if free, otherwise false

netmask – netmask for the IP address

memory_available – the amount of RAM available to this user (MB)

disk_space_available – disk space available for the user (GB)

additional field – user additional field, where:

value – the additional field value

name – the additional field title

### 4.14.4 Get User Group Billing Reports

To get billing reports for a user group, use the following requests:

GET /user_groups/:id/report.xml
GET /user_groups/:id/report.json

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

**XML Output Example**
<billing_user_group_reports type="array">
  <billing_user_group_report>
    <from type="dateTime">2018-06-01T00:00:00Z</from>
    <till type="dateTime">2018-06-08T23:59:59Z</till>
    <user_id type="integer">9501</user_id>
    <virtual_machine_id type="integer">19682</virtual_machine_id>
    <resource_pool_costs type="decimal">11275.0</resource_pool_costs>
    <network_costs type="decimal">0.0</network_costs>
    <storage_costs type="decimal">176.0</storage_costs>
    <service_addon_costs type="decimal">0.0</service_addon_costs>
    <total_cost type="decimal">11451.0</total_cost>
  </billing_user_group_report>
  <billing_user_group_report>...</billing_user_group_report>
</billing_user_group_reports>

Where:

from - the start date for generating statistics in the [YYYY][MM][DD][hh][mm][ss] format

till - the end date for generating statistics in the [YYYY][MM][DD][hh][mm][ss] format

user_id - the ID of the user who owns the virtual server

virtual_machine_id - the ID of the virtual server for which the report is generated

resource_pool_costs - the price for the usage of resource pool for the specified period of time

network_costs - the price for the usage of network resources for the specified period of time

storage_costs - the price for the usage of storage resources for the specified period of time

service_addon_costs - the price for the usage of service add-ons for the specified period of time

total_cost - the price for all used resources

(resource_pool_costs, network_costs, storage_costs, and service_addon_costs) for the specified period of time

4.14.5 Add User Group

To create a user group use this request:

POST /user_groups.xml
POST /user_groups.json

XML Request example

curl -i -X POST http://onapp.test/user_groups.xml -d '<?xml version="1.0" encoding="UTF-8"?><user_group><label>TEST_XML</label><bucket_id>1</bucket_id><user_bucket_ids type="array"><user_bucket_id>1</user_bucket_id></user_bucket_ids><assign_vcloud_roles>false</assign_vcloud_roles><role_ids type="array"><role_id>1</role_id></role_ids></user_group>' -u user:userpass -H "Accept: application/xml" -H "Content-type: application/xml"

JSON Request example
curl -i -X POST http://onapp.test/user_groups.json -d "{"user_group":{"label":"TEST_JSON","bucket_id":1,"user_bucket_ids":[1],"assign_vcloud_roles":0,"role_ids":[]}" -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'

Where:

- **label** - the name of the user group
- **user_bucket_id** - ID of a user bucket which will be assigned to this user group
- **bucket_ids** - IDs of buckets which will be available to users of this user group
- **assign_vcloud_roles** - set to 'true', for the default VMware Cloud Director roles to be automatically assigned to the user group, otherwise, set to 'false'
- **role_ids** - IDs of roles that will be assigned to the user group. This parameter is ignored when the `assign_vcloud_roles` parameter is set to 'true'.

4.14.6 Edit User Group

This API call allows you to edit a user group. It can also be used to assign a role and/or a bucket to the user group.

PUT /user_groups/:id.xml
PUT /user_groups/:id.json

XML Request Example

curl -i -X PUT http://onapp.test/user_groups/4.xml -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d '<user_group><label>new_label</label><role_ids type="array"><role_id>2</role_id></role_ids><bucket_ids type="array"><bucket_id>1</bucket_id></bucket_ids></user_group>'

JSON Request Example

curl -i -X PUT http://onapp.test/user_groups/4.json -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"user_group":{"label":"new_label","role_ids":[]}"}'

Where:

- **label** - choose user group name
- **role_ids** - ID of the role(s) you wish to assign to the user group
- **bucket_ids** - ID of the bucket(s) you wish to assign to the user group
4.14.7 Delete User Group

To delete a user group:

DELETE /user_groups/:user_group_id.xml
DELETE /user_groups/:user_group_id.json

**XML Request Example**

curl -i -X DELETE http://onapp.test/user_groups/12.xml -u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml'

**JSON Request Example**

curl -i -X DELETE http://onapp.test/user_groups/12.json -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'

Returns 204 response on successful deletion, or 404 response if no user group with such ID exists in the DB

4.15 Users API

This chapter includes sections related to VMware Cloud Director users management. For more information on Users API, refer to the linked guide.

4.15.1 Edit VMware Cloud Director Credentials

To edit a user's VMware Cloud Director credentials, use the following request:

PUT /users/:user_id/vcloud_credentials.xml
PUT /users/:user_id/vcloud_credentials.json

**XML Request Example**


**JSON Request Example**

curl -i -X PUT -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json' http://onapp.test/users/12/vcloud_credentials.json -d '{"vcloud_credentials":{"password": "newpassword"}}'

**Where:**

- **password** - type in your VMware Cloud Director password

4.15.2 Add VCD User

Use the POST method to create a new vCloud user account:
POST /users.xml

XML Request Example

curl -i -X POST -d
'"<user><login>111111losj</login><email>MailTestApi@testmatil.com</email><first_name>TestApiname</first_name><last_name>TestAPIName</last_name><password>password_test1</password><user_group_id>1</user_group_id><billing_plan_id>1</billing_plan_id><role_id_list>"role_id"1</role_id></role_id_list><additional_fields type="array">"additional_field"name"additional_field_name"value"custom_value"</additional_fields><time_zone>Kyiv</time_zone><locale>en</locale></user>' - u user:userpass

JSON Request Example

curl -i -X POST -d
'{"user":{"login":"111111losj","email":"111111losj@test.test","first_name":"1111","last_name":"1311","password":"password_test1","user_group_id":"1","billing_plan_id":"1","role_ids":["1","2"],"additional_fields":{""additional_field"":"name""additional_field_name","value":"custom_value"}}}' - u user:userpass http://onapp.test/users.json -H 'Accept: application/json' -H 'Content-type: application/json'

Returns HTTP 201 on successful creation, or HTTP 422 if a user with such a login/email already exists.

Where:

* email - user's email address
* login - login of the user. It can consist of 2-40 characters, letters [A-Za-z], digits [0-9], dash [-], lower dash [ _ ], [@]. You can use both lower- and uppercase letters. The dash [-] and [@] symbols are not allowed as the first characters of the login name.
* password - user’s password. (min – 6 characters)
* first_name - user’s first name
* last_name - user’s last name
* role - assigns a role to a user
* time_zone - time zone of the user. Set by default
* locale - local of the user. Set by default
* status - user’s status (active, suspended, etc)
* bucket_id - set by default, if not selected
* additional field - an array of custom fields assigned to the user, where:
  * name - the name of a particular additional field
  * value - the value which you want to assign to this additional field
* role_ids - an array of the role IDs, assigned to the user
* user_group_id - ID of the group, to which the user is attached
* suspend_after_hours - time in hours, after which the user will be suspended
* suspend_at - time in [YYYY][MM][DD] T[hh][mm][ss]Z format, when the user will be suspended
4.15.3 Edit VCD User

To edit a VCD user, use this request:

PUT /users/:id.xml
PUT /users/:id.json

**XML Request Example**

```bash
curl -i -X PUT -d
'<?xml version="1.0" encoding="UTF-8"?>
<user>
  <email>somemail@example.com</email>
  <first_name>NewName</first_name>
  <last_name>NewLastName</last_name>
  <password>qwe23</password>
</user>
-u user:userpass http://onapp.test/users/12.xml
-H 'Accept: application/xml'
-H 'Content-type: application/xml'
```

**JSON Request Example**

```bash
{"user":{"email":"1111111losj@test.test","first_name":"1111","last_name":"1311","password":"changeme","user_group_id":"1","billing_plan_id":"1","role_ids":["1","2"],
"additional_fields":[]}
```

**Where:**

- **email** - user’s email address
- **first_name** - user’s first name
- **last_name** - user’s last name
- **password** - user’s password. (min – 6 characters)
- **user_group_id** - ID of the group, to which the user is attached
- **bucket_id** - ID of the bucket assigned to this user
- **role_ids** - an array of the role IDs, assigned to the user
- **additional field** – an array of custom fields assigned to the user, where:
  - **name** - the name of a particular additional field
  - **value** - the value which you want to assign to this additional field
- **suspend_at** - time in [YYYY][MM][DD] T[hh][mm][ss]Z format, when the user will be suspended
- **registered_yubikey** - set to ‘true’ if you want to enable logging in using a Yubikey for this user, otherwise set to ‘false’. For the API request that adds a YubiKey, refer to [Add YubiKey to User](#).

- To disable user auto-suspending, leave the suspend_at field empty.
- Users with API key instead of password are not allowed to see their login and change their password.
4.15.4 Delete VCD User

To delete a VMware Cloud Director user account from the cloud, use the following request:

```
DELETE /users/:id.xml
DELETE /users/:id.json
```

**XML Request Example**

```
```

**JSON Request Example**

```
```

Where:

- `take_ownership`: `true`, if you want to transfer all resources associated with the user to your account, otherwise, `false`

Returns HTTP 204 response on the successful deletion or HTTP 404 when a user with the specified ID is not found.

4.16 vApps API

This section provides the API calls you can use to manage the vApps imported from the VMware Cloud Director.

4.16.1 Get List of vApps

To view the list of vApps, use the following request:

```
GET /vapps.xml
GET /vapps.json
```

**XML Request Example**

```
```

**JSON Request Example**

```
```
XML Output Example

```xml
<vapps type="array">
  <vapp>
    <created_at type="datetime">2015-03-31T14:15:00+00:00</created_at>
    <id type="integer">1</id>
    <identifier>vapp-0b38fd9a-0ba6-41d2-95d2-4d40f3d769d6</identifier>
    <name>AD</name>
    <status>booted</status>
    <updated_at type="datetime">2015-03-31T14:47:00+00:00</updated_at>
    <user_id type="integer">11</user_id>
    <vdc_id type="integer">4</vdc_id>
    <deployed type="boolean">false</deployed>
    <description>This is a description of the vApp</description>
  </vapp>
  <vapp>...</vapp>
</vapps>
```

Where:

- `created_at` - time when the vApp was created, in [YYYY][MM][DD][hh][mm][ss]Z
- `id` - ID of the vApp
- `identifier` - identifier of the vApp
- `name` - name of the vApp
- `status` - the status of the vApp. A vApp can have the following statuses:
  - `FAILED_CREATION` - the vApp could not be created
  - `UNRESOLVED` - the vApp is damaged and cannot be controlled by vCloud
  - `RESOLVED` - the vApp has been created but it does not contain VSs
  - `SUSPENDED` - the vApp has been suspended
  - `POWERED_ON` - all the VSs in the vApp are on
  - `WAITING_FOR_INPUT` - the vApp is waiting for user input
  - `UNKNOWN` - the vApp is in a state that is identified but is not known to the system
  - `UNRECOGNIZED` - the vApp is in a state that cannot be identified by the system
  - `POWERED_OFF` - all the VSs in the vApp are off
  - `INCONSISTENT_STATE` - the vApp is in an inconsistent state. This status appears when the vApp was edited from the vSphere associated with the VCD in which the vApp resides, therefore, the vSphere and VCD databases are not yet fully synchronized.
  - `MIXED` - the VSs in the vApp have different power statuses: some are on and some are off
- `updated_at` - time when the vApp was updated, in [YYYY][MM][DD][hh][mm][ss]Z
- `user_id` - ID of the user associated with the vApp
- `vapp_template_id` - ID of the template on which the vApp was built
- `vdc_id` - ID of the datacenter on which the vApp was created
- `deployed` - true, if the vApp was deployed and false if the vApp was composed
- `description` - the description of the vApp
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- added the `description` parameter

### 4.16.2 Get List of vApp VSs

To get the list of a vApp VSs, use the following request:

GET /vapps/:vapp_id/virtual_machines.xml
GET /vapps/:vapp_id/virtual_machines.json

**XML Request Example**

```
curl -i -X GET -u user:pass --url
    http://onapp.test/vapps/10/virtual_machines.xml
    -H 'Accept: application/xml'
    -H 'Content-Type: application/xml'
```

**JSON Request Example**

```
curl -i -X GET -u user:pass --url
    http://onapp.test/vapps/10/virtual_machines.json
    -H 'Accept: application/json'
    -H 'Content-Type: application/json'
```

**XML Output Example**
<virtual_machines type="array">
  <virtual_machine>
    <add_to_marketplace nil="true"/>
    <admin_note nil="true"/>
    <allowed_hot_migrate nil="true"/>
    <allowed_swap type="boolean">true</allowed_swap>
    <autoscale_service nil="true"/>
    <booted type="boolean">true</booted>
    <cdboot type="boolean">false</cdboot>
    <cores_per_socket type="integer">1</cores_per_socket>
    <cpu_shares type="integer">1</cpu_shares>
    <cpu_sockets nil="true"/>
    <cpu_threads nil="true"/>
    <cpu_units type="integer">10</cpu_units>
    <cpus type="integer">1</cpus>
    <created_at type="datetime">2016-02-01T11:46:48+00:00</created_at>
    <customer_network_id nil="true"/>
    <deleted_at nil="true"/>
    <draas_keys type="array"/>
    <draas_mode type="integer">0</draas_mode>
    <edge_server_type nil="true"/>
    <enable_autoscale nil="true"/>
    <firewall_notrack type="boolean">false</firewall_notrack>
    <hostname>Centos66-001</hostname>
    <hot_add_cpu type="boolean">false</hot_add_cpu>
    <hot_add_memory type="boolean">false</hot_add_memory>
    <hypervisor_id type="integer">4</hypervisor_id>
    <id type="integer">7</id>
    <identifier>vm-e6482ca1-b829-4d79-8f7a-8c4ed080857f</identifier>
    <initial_root_password></initial_root_password>
    <initial_root_password_encrypted type="boolean">false</initial_root_password_encrypted>
    <instance_type_id nil="true"/>
    <iso_id nil="true"/>
    <local_remote_access_ip_address nil="true"/>
    <local_remote_access_port nil="true"/>
    <locked type="boolean">false</locked>
    <memory type="integer">1024</memory>
    <min_disk_size nil="true"/>
    <note nil="true"/>
    <operating_system>linux</operating_system>
    <operating_system_distro>centos64Guest</operating_system_distro>
    <preferred_hvs type="array"/>
    <recovery_mode nil="true"/>
    <remote_access_password nil="true"/>
    <service_password nil="true"/>
    <state>delivered</state>
    <storage_server_type nil="true"/>
    <strict_virtual_machine_id nil="true"/>
    <suspended type="boolean">false</suspended>
    <template_id nil="true"/>
    <template_label nil="true"/>
    <time_zone nil="true"/>
    <updated_at type="datetime">2016-02-02T11:32:35+00:00</updated_at>
    <user_id type="integer">24</user_id>
    <vapp_id type="integer">10</vapp_id>
    <vip nil="true"/>
    <xen_id nil="true"/>
    <ip_addresses type="array">
      <ip_address>
        <address>10.1.1.2</address>
        <broadcast nil="true"/>
        <created_at type="datetime">2016-02-01T11:46:20+00:00</created_at>
        <customer_network_id nil="true"/>
      </ip_address>
      <ip_address>
        <address>10.1.1.2</address>
        <broadcast nil="true"/>
        <created_at type="datetime">2016-02-01T11:46:20+00:00</created_at>
        <customer_network_id nil="true"/>
      </ip_address>
    </ip_addresses>
  </virtual_machine>
</virtual_machines>
Where:

add_to_marketplace — empty for VSs; used for edge servers only

admin_note — an optional note of the administrator

allowed_hot_migrate — true if the template, on which the VS is based, supports hot migration; otherwise false

allowed_swap — true if swap disk is allowed (depends on the template the VS is based on); otherwise false

booted — true if the VS is running, otherwise false

built — true if the VS is built, otherwise false

cores_per_socket - the amount of cores per socket

cpu_shares — CPU priority in percent's

cpu_sockets - this output parameter does not currently apply to vCloud VSs
cpu_threads - the amount of CPU threads per core. This parameter can be set for KVM compute resources only by those users who have Enable CPU topology permission granted.
cpu_units - the amount of CPU units per core if the CPU priority is replaced with CPU units in user bucket.
cpus — the number of allocated CPU cores
created_at — the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
customer_network_id - ID of a customer network
deleted_at - time when the VS was deleted
edge_server_type - true if this is the edge server
enable_autoscale — true if autoscaling is allowed for this VS
enable_monitis - deprecated attribute; will be removed in upcoming release
firewall_notrack - true if the NOTRACK rule is set in iptables
hostname — the name of your host
hypervisor_id — the ID of the compute resource used by this VS
id — the VS ID
identifier — the VS identifier
initial_root_password — the VS root password
initial_root_password_encrypted - true, if the root password is encrypted, otherwise false.
iso_id - the ID of the ISO the VS is based on
label — the VS label
local_remote_access_ip_address - IP address used for remote access
local_remote_access_port — the port ID used for console access
locked — true if the VS is locked; otherwise false
memory — the RAM size allocated to this VS
min_disk_size — the minimum disk size required to build a VS from a specified template
note — an optional reminder for this VS made by a user account
operating_system — operating system used by the VS
operating_system_distro — the distribution of the OS from which this VS is built
preferred_hvs - the array of preferable compute resources based on compute zone that meet some VS configuration settings
recovery_mode — true if recovery mode allowed. Otherwise false
remote_access_password — the password for the remote access
service_password - service account password
state — parameter reserved for future use
storage_server_type - true if this is a storage server
strict_virtual_machine_id — the ID of a virtual server that will never reside on the same compute resource with this VS
suspended — true if VS is suspended, otherwise false
template_id — the ID of the template the VS is based on
template_label — the name of the template from which this VS is built
updated_at — the date when the VS was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format
user_id — the ID of a user assigned to this VS

vip — true if the VS has VIP status (gives migration priority)

xen_id — the VS ID set by the virtualization engine

ip_addresses - an array of IP addresses assigned to this VS and their details:
    address - IP address
    broadcast - broadcast address
    created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
    customer_network_id - the ID of the customer VLAN the IP address belongs to
    disallowed_primary - true if not allowed to be used as primary, otherwise false
    gateway - gateway address
    hypervisor_id - the ID of a compute resource the IP address is associated with
    id - the ID of the IP address
    ip_address_pool_id - ID of the IP address pool the IP address is associated with
    network_address - the address of the network
    network_id - the ID of the network
    pxe - true, if this address can be used for cloudbooting a compute resource
    updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
    user_id - the ID of the user this IP address is assigned to
    free - true if free, otherwise false
    netmask - netmask for the IP address

monthly_bandwidth_used - VS monthly bandwidth in KB

total_disk_size — the total disk size in GB of all disks assigned to VS

price_per_hour - server's price per hour

price_per_hour_powered_off - price per hour when server is powered off

support_incremental_backups - 1, if virtual server supports incremental backups, and 0 if it does not

cpu_priority - this is a new parameter reserved for further use; currently will have the same value as cpu_shares

4.16.3 Get vApp Details

To view the details of a vApp, use the following request:

GET /vapps/:id.xml
GET /vapps/:id.json

XML Request Example


JSON Request Example

XML Output Example

```
<vapp>
  <created_at type="datetime">2015-03-31T11:14:15+00:00</created_at>
  <id type="integer">1</id>
  <identifier>vapp-0b38fd9a-0ba6-41d2-95d2-4d40f3d769d6</identifier>
  <name>AD</name>
  <status>booted</status>
  <storage_lease_expiration nil="true"/>
  <updated_at type="datetime">2015-03-31T11:14:47+00:00</updated_at>
  <user_id type="integer">11</user_id>
  <vapp_template_id nil="true"/>
  <vdc_id type="integer">4</vdc_id>
  <deployed type="boolean">false</deployed>
  <description>This is a description of the vApp</description>
</vapp>
```

Where:

- **created_at** - time when the vApp was created, in [YYYY][MM][DD][hh][mm][ss]Z
- **id** - ID of the vApp
- **identifier** - identifier of the vApp
- **name** - name of the vApp
- **status** - the status of the vApp. A vApp can have the following statuses:
  - FAILED_CREATION - the vApp could not be created
  - UNRESOLVED - the vApp is damaged and cannot be controlled by vCloud
  - RESOLVED - the vApp has been created but it does not contain VSs
  - SUSPENDED - the vApp has been suspended
  - POWERED_ON - all the VSs in the vApp are on
  - WAITING_FOR_INPUT - the vApp is waiting for user input
  - UNKNOWN - the vApp is in a state that is identified but is not known to the system
  - UNRECOGNIZED - the vApp is in a state that cannot be identified by the system
  - POWERED_OFF - all the VSs in the vApp are off
  - INCONSISTENT_STATE - the vApp is in an inconsistent state. This status appears when the vApp was edited from the vSphere associated with the VCD in which the vApp resides, therefore, the vSphere and VCD databases are not yet fully synchronized.
  - MIXED - the VSs in the vApp have different power statuses: some are on and some are off
- **storage_lease_expiration** - vApp's storage lease expiration
- **updated_at** - time when the vApp was updated, in [YYYY][MM][DD][hh][mm][ss]Z
- **user_id** - ID of the user associated with the vApp
- **vapp_template_id** - ID of the template on which the vApp was built
- **vdc_id** - ID of the datacenter on which the vApp was created
- **deployed** - true, if the vApp was deployed and false if the vApp was composed
description - the description of the vApp

Page History
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• added the description parameter

4.16.4 Get List of vApp VSs Start/Stop Order
To get the list of VSs start/stop order during the vApp start/stop, use the following request:
GET /vapps/:vapp_id/startup_items.xml
GET /vapps/:vapp_id/startup_items.json

XML Request Example
```
```

JSON Request Example
```
```

XML Output Example
```
<vapps_startup_items type="array">
  <vapps_startup_item>
    <id type="integer">2</id>
    <vapp_id type="integer">5</vapp_id>
    <virtual_machine_id type="integer">9</virtual_machine_id>
    <vm_name>virtual_server_label</vm_name>
    <order type="integer">1</order>
    <start_action>powerOn</start_action>
    <start_delay type="integer">0</start_delay>
    <stop_action>powerOff</stop_action>
    <stop_delay type="integer">0</stop_delay>
    <created_at type="dateTime">2018-03-20T16:06:15+00:00</created_at>
    <updated_at type="dateTime">2018-03-20T16:06:15+00:00</updated_at>
  </vapps_startup_item>
  ...</vapps_startup_items>
```

Where:
- vapps_startup_items - the array of startup items
- vapps_startup_item - the array of startup item parameters
- id - the ID of the startup item
- vapp_id - the ID of the vApp
- virtual_machine_id - the ID of the virtual server
- vm_name - the label of the virtual server that belongs to the vApp
order - the number that indicates the order in which to start and stop the virtual server

Virtual servers with lower numbers are started first and stopped last. You cannot specify negative numbers. Virtual servers with the same numbers are started and stopped at the same time.

start_action - the powerOn action to apply to the virtual server when the vApp is started

start_delay - the delay in seconds after starting one virtual server and before starting the next virtual server

stop_action - the action to apply to the virtual server when the vApp is stopped. The available actions include:

- powerOff - to power off the VS forcefully
- guestShutdown - to shut down the VS gracefully

stop_delay - the delay in seconds to wait after stopping one virtual server and before stopping the next virtual server

created_at - the date when the startup item was created in the [YYYY][MM][DD][hh][mm][ss] format

updated_at - the date when the startup item was updated in the [YYYY][MM][DD][hh][mm][ss] format

4.16.5 Deploy vApp

To deploy a vApp, use the following request:

POST /vapps.xml

POST /vapps.json

**XML Request example:**

```bash
curl -i -X POST -u 'user:userpass' -H 'Accept: application/xml' -H 'Content-Type: application/xml' http://onapp.test/vapps.xml -d '<vapp><name>APIvApp</name><description>This is a description of the vApp</description><vdc_id>64</vdc_id><vapp_template_id>390</vapp_template_id><virtual_machines><virtual_machine_0><id>vm-7sa7228c-94f6-470c-8798- c20c0bdlc90c/id<name>CentOS7</name><cpus>1</cpus><cores_per_socket>1</cores_per_socket><memory>512</memory><storage_policy>387</storage_policy><hard_disks><hard_disk_1><instance_id>5</instance_id><disk_space>3</disk_space></hard_disk_1></hard_disks><nics><nic_0><id>0</id><network_id>12</network_id></nic_0></nics></virtual_machines></vapp>'
```

**JSON Request example:**

```bash
curl -i -X POST -u 'user:userpass' -H 'Accept: application/json' -H 'Content-Type: application/json' http://onapp.test/vapps.json -d '{"vapp":{"name":"APIvApp","description":"This is a description of the vApp","vdc_id":"64","vapp_template_id":"390","virtual_machines":{"virtual_machine_0":{"id":"vm-7sa7228c-94f6-470c-8798-c20c0bdlc90c/id","name":"CentOS7","cpus":"1","cores_per_socket":1,"memory":512,"storage_policy":387,"hard_disks":{"hard_disk_1":{"instance_id":5,"disk_space":3}},"nics":{"nic_0":{"id":0,"network_id":12}}}}}
```
Where:

- **name** - name of the vApp
- **description** - the description of the vApp
- **vdc_id** - ID of the datacenter on which the vApp will be created
- **vapp_template_id** - ID of the template on which the vApp will be built
- **virtual_machines** - array of parameters associated with the VS
  - **id** - ID of the VS
  - **name** - choose a name for the VS
  - **cpus** - set the number of cores
  - **core_per_socket** - set the number of cores per socket
  - **memory** - the amount of RAM allocated to this VS in Mb
  - **storage_policy** - the virtual server's storage policy
  - **hard_disks** - array of parameters associated with the VS disks
    - **instance_id** - the ID of the corresponding disk that is available via the [Get List of vApp Templates] request
    - **disk_space** - set the disk's size
    - **storage_policy** - the disk's storage policy
  - **nics** - array of parameters associated with the NICs
    - **nic** - the sequence number of NIC
    - **id** - the ID of NIC
    - **network_id** - the ID of the network to which the NIC will be connected

Page History

v. 6.0
Added the **description** and **instance_id** parameters.
Added the **nic** and **id** parameters to the array of parameters associated with the NICs.

4.16.6 Compose vApp

To compose a vApp, use the following request:

```xml
POST /vapps/compose.xml
POST /vapps/compose.json
```

XML Request Example
curl -i -X POST http://onapp.test/vapps/compose.xml -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d '<vapp><blank_vapp>0</blank_vapp><name>vapp_name</name><description>This is a description of the vApp</description><vdc_id>9</vdc_id><vapp_template_ids><vapp_template_id>1</vapp_template_id></vapp_template_ids><vapp_ids><vapp_id>3</vapp_id></vapp_ids><cores_per_socket>1</cores_per_socket><memory>512</memory><storage_policy>2</storage_policy><hard_disks><hard_disk_1><instance_id>5</instance_id><disk_space>3</disk_space><storage_policy>4</storage_policy></hard_disk_1></hard_disks><nics><nic_0><id>4</id><network_id>19</network_id><adapter_type>VMXNET3</adapter_type></nic_0></nics><boot_vm>1</boot_vm>'

JSON Request Example

```
curl -i -X POST http://onapp.test/vapps/compose.json -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"vapp":{"blank_vapp":"0", "name":"vApp_Name", "description":"This is a description of the vApp", "vdc_id":"421", "vapp_template_ids": ["374"], "vapp_ids": ["1256", "1989"], "virtual_machines": [{"virtual_machine_0": {"id": "vm-10d686fca", "name": "CentOS7_vm", "cpus": "1", "cores_per_socket": "1", "memory": "512", "storage_policy": "845", "disk_space": "3", "adapter_type": "VMXNET3"}}, "virtual_machine_1": {"id": "vm-314738fr", "name": "CentOS7_vs", "cpus": "1", "cores_per_socket": "1", "memory": "512", "storage_policy": "845", "disk_space": "3", "adapter_type": "VMXNET3"}}]}
```

Where:
- **vapp** - the array of parameters to compose a vApp
- **blank_vapp** - set 1 to create a blank vApp, otherwise, set 0
- **name** - the vApp label
- **description** - the description of the vApp
- **vdc_id** - the virtual data center ID
- **vapp_template_ids** - the array of vApp templates IDs. All VSs that are built on these templates will be copied to your new vApp.
- **vapp_template_id** - the vApp template ID
- **vapp_ids** - the array of vApps IDs. All VSs within the specified vApps will be copied to your new vApp.
- **vapp_id** - the vApp ID
- **virtual_machines** - the array of parameters associated with the VS
  - **id** - the ID of the VS
  - **name** - edit the name of the VS
  - **cpus** - set the number of cores
  - **cores_per_socket** - set the number of cores per socket
  - **memory** - the amount of RAM allocated to this VS in Mb
storage_policy - the virtual server's storage policy that is a default data store ID. If Fast Provisioning is not enabled for the previously selected VDC, you can select a different data store for the VS's disks.

hard_disks - the array of parameters associated with the VS disks

  instance_id - the ID of the corresponding disk that is available via the Get List of vApp Templates request

  disk_space - set the disk size in Gb

  bus_sub_type - the bus sub type of the disk

  storage_policy - the disk storage policy that is a data store ID. This option is available only if the selected VDC has Fast Provisioning disabled. If you do not select a data store, the disk is built on the default data store.

nics - the array of parameters associated with the NICs

  id - the ID of the NIC

  network_id - the ID of the network to which the NIC will be connected

  adapter_type - the network adapter type provided for the VS that can be one of the following values:

  • Vlance
  • E1000
  • E1000E
  • VMXNET
  • VMXNET2
  • VMXNET3
  • FLEXIBLE

  boot_vm - set 1 if the VS should be switched on after the vApp deployment, otherwise, set 0

Page History
v. 6.1
• added the following parameters:
  o virtual_machines array
  o boot_vm

v. 6.0
• added the description parameter

4.16.7 Recompose vApp
To recompose a vApp, use the following request:

PUT /vapps/:id/recompose.xml
PUT /vapps/:id/recompose.json

XML Request example:
JSON Request example:

curl -X PUT -u user:userpass http://onapp.test/vapps/12/recompose.json -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"vapp": {"vapp_template_id": "1"}, "virtual_machines": [{"id": "vm-a111111-8885-4276-479c724b9d6e", "name": "Example", "cpus": 1, "cores_per_socket": 1, "memory": 1024, "storage_policy": "2", "hard_disks": [{"id": "5", "disk_space": 3, "storage_policy": "6"}], "nics": [{"network_id": 1, "adapter_type": "E1000"}], "vcloud_guest_customization": {"enabled": 1, "admin_password_enabled": 1, "admin_password_auto": 0, "admin_password": "password", "computer_name": "Example"}], "recipe_ids": [4, 5], "custom_recipe_variables": {"variable_0": {"name": "xxx", "value": "xy", "enabled": true}}, "boot_vm": 1, "disable_guest_customization_after_run": 0}}}'

Where:

- **vapp_template_id** - the ID of the template on which the vApp will be built
- **virtual_machines** - the array of parameters associated with the VSs
  - **id** - the ID of the VS
  - **name** - edit the name for the VS
  - **cpus** - set the number of cores
  - **cores_per_socket** - set the number of cores per socket
  - **memory** - the amount of RAM allocated to this VS in Mb
  - **storage_policy** - the virtual server's storage policy that is a default data store ID. If Fast Provisioning is not enabled for the previously selected VDC, you can select a different data store for the VS's disks.
  - **hard_disks** - the array of parameters associated with the VS disks
    - **instance_id** - the ID of the corresponding disk that is available via the Get List of vApp Templates request
    - **disk_space** - set the disk size in Gb
    - **storage_policy** - the disk storage policy that is a data store ID. This option is available only if the selected VDC has Fast Provisioning disabled. If you do not select a data store, the disk is built on the default data store.
  - **nics** - the array of parameters associated with the NICs
network_id - the ID of the network to which the NIC will be connected

adapter_type - the network adapter type provided for the VS that can be one of the following values:
- Vlance
- E1000
- E1000E
- VMXNET
- VMXNET2
- VMXNET3
- FLEXIBLE

vcloud_guest_customization - array of parameters associated with guest customization
- computer_name - VS's computer name
- enabled - set 'true' if guest customization should be enabled for the VS, otherwise, set 'false'
- admin_password_enabled - set 'true' if the local admin password should be allowed, otherwise, set 'false'
- admin_password - enter the password of the administrator
- admin_password_auto - set 'true' if the admin password should be generated automatically, otherwise, set 'false'

recipe_ids - the IDs of the recipes that are to be applied to the VS

custom_recipe_variables - array of parameters associated with custom variables
- name - the name of the custom variable
- value - the value of the custom variable
- enabled - set to 'true' if the custom variable should be enabled, otherwise, set 'false'

disable_guest_customization_after_run - set 'true' if guest customization for this VS should be disabled after vApp deployment, otherwise, set 'false'

boot_vm - set 'true' if the VS should be switched on after vApp deployment, otherwise, set 'false'

Page History
v. 5.3
- added parameters related to guest customization and recipes
v. 5.2
- added the following parameters:
  o virtual_machines
  o id
  o name
  o cpus
  o cores_per_socket
  o memory
  o storage_policy
4.16.8 Edit vApp

To edit a vApp, use the following request:

PUT /vapps/:id/edit.xml
PUT /vapps/:id/edit.json

XML Request Example

curl -i -X PUT -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d "<vapp><name>test.vapp</name><description>This is a description of the vApp</description></vapp>" --url http://onapp.test/vapps/5.xml

JSON Request Example

curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"vapp":{"name":"test.vapp","description":"This is a description of the vApp"}}' --url http://onapp.test/vapps/5.json

Where:

- **name** - the name of the vApp
- **description** - the description of the vApp

Page History

v. 6.0
- added description parameter

4.16.9 Start vApp

To start a vApp, use the following request:

POST /vapps/:id/start.xml
POST /vapps/:id/start.json

XML Request Example

curl -i -X POST -u user:userpass --url http://onapp.test/vapps/12/start.xml

JSON Request Example

curl -i -X POST -u user:userpass --url http://onapp.test/vapps/12/start.json
4.16.10 Stop vApp

To stop a vApp forcefully, use the following request:

POST /vapps/:id/stop.xml
POST /vapps/:id/stop.json

XML Request Example

```bash
curl -i -X POST -u user:userpass --url
http://onapp.test/vapps/12/stop.xml
```

JSON Request Example

```bash
curl -i -X POST -u user:userpass --url
http://onapp.test/vapps/12/stop.json
```

4.16.11 Start/Stop vApp VSs

To schedule actions for starting/stopping virtual servers when the vApp is being started/stopped, use the following request:

PUT /vapps/:vapp_id/startup_items.xml
PUT /vapps/:vapp_id/startup_items.json

XML Request Example

```bash
"<vapp><startup_items_attributes><item_1><vm_name>virtual_server_name1</vm_name><order>1</order><start_action>powerOn</start_action><start_delay>5</start_delay><stop_action>powerOff</stop_action><stop_delay>5</stop_delay><id>267</id></item_1><item_2><vm_name>virtual_server_name2</vm_name><order>2</order><start_action>powerOn</start_action><start_delay>5</start_delay><stop_action>powerOff</stop_action><stop_delay>5</stop_delay><id>266</id></item_2></startup_items_attributes></vapp>"
```

JSON Request Example

```bash
curl -i -X PUT -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json' http://onapp.test/vapps/12/startup_items.json -d
"{"vapp": {"startup_items_attributes": {"item_1": {"vm_name": "virtual_server_name1", "order": "1", "start_action": "powerOn", "start_delay": "5", "stop_action": "powerOff", "stop_delay": "5", "id": "267"}, "item_2": {"vm_name": "virtual_server_name2", "order": "1", "start_action": "powerOn", "start_delay": "5", "stop_action": "powerOff", "stop_delay": "5", "id": "266"}}}}"
```

Where:

- `startup_items_attributes` - the array of items for starting/stopping a virtual server
- `item_x` - the array of attributes for starting/stopping a virtual server where x should be a unique number for each item within the request
- `vm_name` - the label of the virtual server that belongs to the vApp
order - the number that indicates the order in which to start and stop the virtual server

Virtual servers with lower numbers are started first and stopped last. You cannot specify negative numbers. Virtual servers with the same numbers are started and stopped at the same time.

start_action - the powerOn action to apply to the virtual server when the vApp is started. To apply no start action, skip this parameter.

start_delay - the delay in seconds after starting one virtual server and before starting the next virtual server.

stop_action - the action to apply to the virtual server when the vApp is stopped. The available actions include:

- powerOff - to power off the VS forcefully
- guestShutdown - to shut down the VS gracefully

stop_delay - the delay in seconds to wait after stopping one virtual server and before stopping the next virtual server.

id - the ID of the startup item that is available via the Get List of vApp VSs Start/Stop Order request

4.16.12 Delete vApp

To delete a vApp, use the following request:

DELETE /vapps/:id.xml
DELETE /vapps/:id.json

XML Request Example

curl -i -X DELETE -u user:userpass http://onapp.test/vapps/12.xml

JSON Request Example

curl -i -X DELETE -u user:userpass http://onapp.test/vapps/12.json

4.16.13 Create vApp with Guest Customization and Recipes

To create a vApp, use the following request:

POST /vapps.xml
POST /vapps.json

XML Request Example
<vapp>
  <name>ExampleVApp</name>
  <vdc_id>2</vdc_id>
  <vapp_template_id>5</vapp_template_id>
  <virtual_machines>
    <virtual_machine_0>
      <id>4632-03fba33f0c0</id>
      <name>VM1</name>
      <cpus>2</cpus>
      <cores_per_socket>1</cores_per_socket>
      <memory>512</memory>
      <hard_disks>
        <hard_disk_1>
          <disk_space>6</disk_space>
        </hard_disk_1>
        <hard_disk_2>
          <disk_space>3</disk_space>
        </hard_disk_2>
      </hard_disks>
      <nics/>
    </virtual_machine_0>
    <virtual_machine_1>
      <id>4bb5-b124-15700d40073b</id>
      <name>VM2</name>
      <cpus>4</cpus>
      <cores_per_socket>2</cores_per_socket>
      <memory>1024</memory>
      <hard_disks>
        <hard_disk_1>
          <disk_space>31</disk_space>
        </hard_disk_1>
      </hard_disks>
      <nics/>
    </virtual_machine_1>
  </virtual_machines>
</vapp>'
**id** - ID of the VS

**name** - choose a name for the VS

**cpus** - set the number of cores

**cores_per_socket** - set the number of cores per socket

**memory** - the amount of RAM allocated to this VS in Mb

**storage_policy** - the virtual server's storage policy

**hard_disks** - array of parameters associated with the VS disks

  **disk_space** - set the disk's size

  **storage_policy** - the disk's storage policy

**nics** - array of parameters associated with the NICs

  **network_id** - the ID of the network to which the NIC will be connected

**vcloud_guest_customization** - array of parameters associated with guest customization

  **computer_name** - VS's computer name

  **enabled** - set ‘true’ if guest customization should be enabled for the VS, otherwise, set ‘false’

  **admin_password_enabled** - set ‘true’ if the local admin password should be allowed, otherwise, set ‘false’

  **admin_password** - enter the password of the administrator

  **admin_password_auto** - set ‘true’ if the admin password should be generated automatically, otherwise, set ‘false’

**recipe_ids** - the IDs of the recipes that are to be applied to the VS

**custom_recipe_variables** - array of parameters associated with custom variables

  **name** - the name of the custom variable

  **value** - the value of the custom variable

  **enabled** - set to ‘true’ if the custom variable should be enabled, otherwise, set ‘false’

**disable_guest_customization_after_run** - set ‘true’ if guest customization for this VS should be disabled after vApp deployment, otherwise, set ‘false’

**boot_vm** - set ‘true’ if the VS should be switched on after vApp deployment, otherwise, set ‘false’

### 4.16.14 Change vApp Owner

To change the owner of a vApp, use the following request:

PUT `/vapps/:id/owner.xml`

PUT `/vapps/:id/owner.json`

**XML Request Example**

```bash
curl -i -X PUT http://onapp.test/vapps/12/owner.xml -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d '<owner_change><new_owner_id>42</new_owner_id></owner_change>'
```

**JSON Request Example**
where:
id - the ID of the new owner of the vApp

4.16.15 Shutdown vApp
To shut down a vApp gracefully, use the following request:

POST /vapps/:id/shutdown.xml
POST /vapps/:id/shutdown.json

XML Request Example

curl -i -X POST -u user:userpass --url
http://onapp.test/vapps/12/shutdown.xml

JSON Request Example

curl -i -X POST -u user:userpass --url
http://onapp.test/vapps/12/shutdown.json

4.16.16 Suspend vApp
To suspend a vApp, use the following request:

POST /vapps/:id/suspend.xml
POST /vapps/:id/suspend.json

XML Request Example

curl -i -X POST -u user:userpass --url
http://onapp.test/vapps/12/suspend.xml

JSON Request Example

curl -i -X POST -u user:userpass --url
http://onapp.test/vapps/12/suspend.json

4.16.17 Unsuspend vApp
To unsuspend a vApp, use the following request. All the VSs in the vApp will be powered off. If you want to unsuspend the vApp and start up the VSs in it use the Start vApp API request.

POST /vapps/:id/unsuspend.xml
POST /vapps/:id/unsuspend.json
XML Request Example

```
curl -i -X POST -u user:userpass --url http://onapp.test/vapps/12/unsuspend.xml
```

JSON Request Example

```
curl -i -X POST -u user:userpass --url http://onapp.test/vapps/12/unsuspend.json
```

4.16.18 Reboot vApp

To reboot a vApp, use the following request:

POST /vapps/:id/reboot.xml
POST /vapps/:id/reboot.json

XML Request Example

```
curl -i -X POST -u user:userpass --url http://onapp.test/vapps/12/reboot.xml
```

JSON Request Example

```
curl -i -X POST -u user:userpass --url http://onapp.test/vapps/12/reboot.json
```

4.17 vApp Networks API

This section provides the API calls you can use to manage vApp networks imported from vCloud.

4.17.1 Get List of vApp Networks

To view the list of vApp networks, use the following request:

GET /settings/vapp_networks.xml
GET /settings/vapp_networks.json

XML Request Example

```
```

JSON Request Example

XML Output Example

```xml
<vapp_networks type="array">
  <vapp_network>
    <created_at type="datetime">2016-02-13T10:35:21+02:00</created_at>
    <default_nat_rule_number type="integer">9999</default_nat_rule_number>
    <default_outside_ip_address_id nil="true"/>
    <dns_suffix nil="true"/>
    <dvportgroup nil="true"/>
    <enabled type="boolean">true</enabled>
    <fence_mode>bridged</fence_mode>
    <gateway>10.1.1.254</gateway>
    <id type="integer">13</id>
    <identifier>c2a5a42c-594f-47ba-b211-8e456f17b825</identifier>
    <ip_address_pool_id nil="true"/>
    <is_nated type="boolean">true</is_nated>
    <label>antonov routed net</label>
    <netmask>255.255.255.0</netmask>
    <network_group_id type="integer">7</network_group_id>
    <prefix_size nil="true"/>
    <primary_dns nil="true"/>
    <secondary_dns nil="true"/>
    <shared type="boolean">false</shared>
    <updated_at type="datetime">2016-02-13T10:35:21+02:00</updated_at>
    <user_id nil="true"/>
    <vapp_id type="integer">2</vapp_id>
    <vdc_id nil="true"/>
    <vlan nil="true"/>
  </vapp_network>
...
</vapp_networks>
```

**Where:**

- `created_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- `default_nat_rule_number` - default NAT rule
- `default_outside_ip_address_id` - ID of the outside IP address
- `dns_suffix` - the DNS suffix
- `dvportgroup` - the portgroup that backs this network
- `enabled` - whether the network is enabled or not
- `fence_mode` - isolation type of the network
- `gateway` - the gateway associated with the network
- `id` - the ID of the network
- `identifier` - the identifier of the network
- `ip_address_pool_id` - ID of the IP Address Pool
- `is_nated` - set true to use NAT for translating the traffic. Set false if you are using your own firewall with external IP address
- `label` - the name of the network
- `netmask` - IP of the network mask
network_group_id - network zone ID
prefix_size - subnet prefix size
primary_dns - IP address of the primary domain name system (DNS) server
secondary_dns - IP address of the secondary domain name system (DNS) server
shared - whether this vApp network is shared or not
updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format
user_id - owner ID
vapp_id - the vApp associated with the network
vdc_id - the resource pool associated with the network
vlan - VLAN number

4.17.2 Get vApp Network Details
To view the details of vApp network, use the following request:
GET /settings/vapp_networks/:id.xml
GET /settings/vapp_networks/:id.json

XML Request Example
```bash
```

JSON Request Example
```bash
```

XML Output Example
<vapp_network>
  <created_at type="datetime">2016-02-13T10:35:21+02:00</created_at>
  <default_nat_rule_number type="integer">9999</default_nat_rule_number>
  <default_outside_ip_address_id nil="true"/>
  <dns_suffix nil="true"/>
  <dvportgroup nil="true"/>
  <enabled type="boolean">true</enabled>
  <fence_mode>bridged</fence_mode>
  <gateway>10.1.1.254</gateway>
  <id type="integer">13</id>
  <identifier>c2a5a42c-594f-47ba-b211-8e456f17b825</identifier>
  <is_nated type="boolean">true</is_nated>
  <label>antonov routed net</label>
  <netmask>255.255.255.0</netmask>
  <network_group_id type="integer">7</network_group_id>
  <prefix_size nil="true"/>
  <primary_dns nil="true"/>
  <secondary_dns nil="true"/>
  <shared type="boolean">false</shared>
  <updated_at type="datetime">2016-02-13T10:35:21+02:00</updated_at>
  <user_id nil="true"/>
  <vapp_id type="integer">2</vapp_id>
  <vdc_id nil="true"/>
  <vlan nil="true"/>
</vapp_network>

Where:

- **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **default_nat_rule_number** - default NAT rule
- **default_outside_ip_address_id** - ID of the outside IP address
- **dns_suffix** - the DNS suffix
- **dvportgroup** - the portgroup that backs this network
- **enabled** - whether the network is enabled or not
- **fence_mode** - isolation type of the network
- **gateway** - the gateway associated with the network
- **id** - the ID of the network
- **identifier** - the identifier of the network
- **ip_address_pool_id** - ID of the IP Address Pool
- **is_nated** - set true to use NAT for translating the traffic. Set false if you are using your own firewall with external IP address
- **label** - the name of the network
- **netmask** - IP of the network mask
- **network_group_id** - network zone ID
- **prefix_size** - subnet prefix size
- **primary_dns** - IP address of the primary domain name system (DNS) server
- **secondary_dns** - IP address of the secondary domain name system (DNS) server
- **shared** - whether this vApp network is shared or not
- **updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **user_id** - owner ID
4.17.3 Get List of IP Addresses Assigned to vApp Network

To get the list of IP addresses assigned to the vApp network, use the following request:

GET /settings/vapp_networks/:id/ip_addresses.xml
GET /settings/vapp_networks/:id/ip_addresses.json

XML Request Example

```bash
```

JSON Request Example

```bash
```

XML Output Example

```xml
<ip_addresses type="array">
  <ip_address>
    <address>10.1.1.1</address>
    <broadcast nil="true"/>
    <created_at type="datetime">2016-02-13T10:35:21+02:00</created_at>
    <customer_network_id nil="true"/>
    <disallowed_primary type="boolean">false</disallowed_primary>
    <gateway>10.1.1.254</gateway>
    <hypervisor_id nil="true"/>
    <id type="integer">1901</id>
    <ip_address_pool_id nil="true"/>
    <network_address nil="true"/>
    <network_id type="integer">13</network_id>
    <pxe type="boolean">false</pxe>
    <updated_at type="datetime">2016-02-13T10:35:21+02:00</updated_at>
    <user_id nil="true"/>
    <free type="boolean">true</free>
    <netmask>255.255.255.0</netmask>
  </ip_address>
  ...
</ip_addresses>
```

Where:

address - the IP address assigned to the vApp network
broadcast - the broadcast address
created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
customer_network_id - the ID of the customer network
disallowed_primary - true if not allowed to be used as primary (for VS build), otherwise false
4.18 vCloud Virtual Servers API

Virtual servers in OnApp are based on templates and deployed on compute resources. VMware Cloud Director virtual servers have their own root accounts so that VS owners can fully control, configure, and manage their servers.

This chapter includes API requests specific to VMware Cloud Director virtual servers. For more information on Virtual Servers API, refer to the linked guide.

4.18.1 Add Media File to vCloud VS

To add media file to a virtual server, use the following request:

PUT /virtual_machines/:id/media_drive.xml
PUT /virtual_machines/:id/media_drive.json

XML Request Example


JSON Request Example


Where:

media - ID of the media file

4.18.2 Remove Media File from vCloud VS

To remove media file from a virtual server, use the following request:

POST /virtual_machines/:id/media_drive/eject.xml
POST /virtual_machines/:id/media_drive/eject.json

gateway - the gateway associated with the network

hypervisor_id - the ID of the compute resource the IP address is associated with

id - the ID of the network

ip_address_pool_id - ID of the IP Address Pool

network_address - the address of the network

network_id - the ID of the network

pxe - true, if this compute resource address can be used for cloudbooting a compute resource

updated_at - the date in the [YYYY][MM][DD][T][hh][mm][ss]Z format

user_id - owner ID

free - true if free, otherwise false

netmask - IP of the network mask
XML Request Example

```
curl -i -X POST
http://onapp.test/virtual_machines/12/media_drive/eject.xml -u
user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example

```
curl -i -X POST
http://onapp.test/virtual_machines/12/media_drive/eject.json -u
user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'
```

4.18.3 View vCloud VS Guest Customization

To view VS guest customization, use the following request:

GET /virtual_machines/:id/guest_customization.xml
GET /virtual_machines/:id/guest_customization.json

XML Request Example

```
curl -i -X GET -u user:userpass --url
```

JSON Request Example

```
curl -i -X GET -u user:userpass --url
http://onapp.test/virtual_machines/20/guest_customization.json -H
'Accept: application/json' -H 'Content-type: application/json'
```

XML Output Example
Where:

admin_auto_logon_count - the number of times administrator can log in automatically

admin_auto_logon_enabled - true if administrator can log in automatically; otherwise false

admin_password_auto - true if admin password is generated automatically; otherwise false

admin_password_enabled - true if admin password is required; otherwise false

change_sid - this parameter is applicable for Windows VSs only and will run Sysprep to change Windows SID. On Windows NT, VCD uses Sidgen. Running sysprep is a prerequisite for completing domain join

computer_name - VS's computer name

created_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

enabled - true if guest customization is enabled in VMware Cloud Director; otherwise false

id - ID of the VS guest customization

join_domain_enabled - true if the VS is enabled to join a domain; otherwise false

reset_password_required - true if a password reset is required; otherwise false

updated_at - the date in the [YYYY][MM][DD][hh][mm][ss]Z format

use_org_settings - true if user org settings are enabled; otherwise false

virtual_machine_id - ID of the VS, which guest customization is viewed

4.18.4 Edit Virtual Server Disks

To edit a VMware Cloud Director virtual server disk, use the following request:

PUT /settings/disks/:id.xml
PUT /settings/disks/:id.json

You also can edit a virtual server disk, using the following URL:
/virtual_machines/:virtual_machines_id/disks/:id
XML Request Example

```
curl -i -X PUT http://onapp.test/settings/disks/12.xml -d
  '<disk><label>BU</label><disk_size>1</disk_size><data_store_id>33</data_store_id><hot_migrate_disk>1</hot_migrate_disk></disk>'
  -u user:userpass
  -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example

```
curl -i -X PUT http://onapp.test/settings/disks/12.json -d
  '{"disk":{"label":"BU", "disk_size":"1", "data_store_id":"33", "hot_migrate_disk":"1"}}'
  -u user:userpass
  -H 'Accept: application/json' -H 'Content-type: application/json'
```

Where:

- **label** - the label of the disk
- **disk_size** - the disk space in GB
- **data_store_id** - the ID of a data store you want to migrate the disk to
- **hot_migrate_disk** - set to 1 to migrate the disk in the hot (live) mode, otherwise, set to 0

- You cannot decrease the size of the disk.
- If fast provisioning is enabled for the disk [resource pool](#), the disk cannot be resized.
- If you resize the disk of a VS that is powered on, the virtual server will be rebooted.
- If you migrate the disk without the hot_migrate_disk option enabled, the virtual server will be rebooted.
- You can only migrate disks to data stores in data store zones assigned to your [bucket](#).
- You cannot migrate a disk to a data store with less capacity than the disk size.

### 4.18.5 Set SSH Keys

To assign specific SSH keys from all available owner and user keys to a virtual server, use the following request:

PUT /virtual_machines/:virtual_machine_id/set_ssh_keys.json

JSON Request Example

```
curl -i -X PUT http://onapp.test/settings/disks/12.json -d
  '{"disk":{"label":"BU", "disk_size":"1", "data_store_id":"33", "hot_migrate_disk":"1"}}'
  -u user:userpass
  -H 'Accept: application/json' -H 'Content-type: application/json'
```
curl -X PUT

Where:
ssh_key - is public SSH key

4.19vCloud VS Snapshots API
Snapshots lock the filesystem disk and create a new disk with the changes made alongside. There can be only one snapshot per VS: when a new snapshot is created for the VS, the previous one is deleted. This section lists the API calls you can use to manage snapshots.

4.19.1 Get List of vCloud VS Snapshots
To view the list of snapshots, use the following request:
GET /virtual_machines/:id/snapshots.xml
GET /virtual_machines/:id/snapshots.json

XML Request Example
```bash
curl -i -X GET -u user:userpass --url http://onapp.test/virtual_machines/3/snapshots.xml
```

JSON Request Example
```bash
curl -i -X GET -u user:userpass --url http://onapp.test/virtual_machines/3/snapshots.xml
```

Where:
id - ID of the VS the snapshot is associated with

XML Output Example
```xml
<virtual_machine_snapshots type="array">
  <virtual_machine_snapshot>
    <created_at type="datetime">2015-03-31T15:17:46+00:00</created_at>
    <id type="integer">1</id>
    <is_built type="boolean">false</is_built>
    <name>New Snapshot</name>
    <updated_at type="datetime">2015-03-31T15:17:46+00:00</updated_at>
    <virtual_machine_id type="integer">3</virtual_machine_id>
  </virtual_machine_snapshot>
</virtual_machine_snapshots>
```

Where:
created_at - the date when the record in the database was created
id - the ID of this snapshot
is_built - whether the snapshot was created or not
name - the label of the snapshot
updated_at - the date when this record in database was updated
virtual_machine_id - ID of the VS for which the snapshot was made

4.19.2 Create vCloud VS Snapshot
To create a snapshot, use the following request:
POST /virtual_machines/:id/snapshots.xml
POST /virtual_machines/:id/snapshots.json

XML Request Example

```
```

JSON Request Example

```
```

Where:
memory - the amount of RAM allocated to this VS in Mb
quiesce - set 1 to quiesce the file system in the VS, otherwise set 0

4.19.3 Build vCloud VS Snapshot
If the VS snapshot failed to build due to some reason, you can attempt to build it again. To build
a VS snapshot, use the following request:
GET /virtual_machines/:vm_id/snapshots/:snapshot_id/build.xml
GET /virtual_machines/:vm_id/snapshots/:snapshot_id/build.json

XML Request Example

```
```

JSON Request Example

```
```
4.19.4 Restore vCloud VS Snapshot

To restore a VS snapshot, use the following request:

GET /virtual_machines/:virtual_machine_id/snapshots/:id/restore.xml
GET /virtual_machines/:virtual_machine_id/snapshots/:id/restore.json

XML Request Example

```
curl -i -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml'
http://onapp.test/virtual_machines/12/snapshots/2/restore.xml
```

JSON Request Example

```
curl -i -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json'
http://onapp.test/virtual_machines/12/snapshots/2/restore.json
```

4.19.5 Delete vCloud VS Snapshot

To delete a snapshot, use the following request:

DELETE /virtual_machines/:virtual_machine_id/snapshots/:id.xml
DELETE /virtual_machines/:virtual_machine_id/snapshots/:id.json

XML Request Example

```
curl -i -X DELETE -u user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml'
http://onapp.test/virtual_machines/12/snapshots/2.xml
```

JSON Request Example

```
curl -i -X DELETE -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json'
http://onapp.test/virtual_machines/12/snapshots/2.json
```

4.20 System Configuration API

API calls related to the configuration settings of your VMware Cloud Director installation.

4.20.1 View System Configuration

This document provides information on VCD-related system configuration settings. For information on general OnApp system settings, refer to the OnApp Cloud API Guide.
To view system configuration settings, use the following request:

GET /settings/configuration.xml
GET /settings/configuration.json

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

**XML Output Example**

```xml
<settings>
  <rabbitmq_host>127.0.0.1</rabbitmq_host>
  <rabbitmq_port type="integer">5672</rabbitmq_port>
  <rabbitmq_vhost/></rabbitmq_vhost>
  <rabbitmq_login>login</rabbitmq_login>
  <rabbitmq_password>password</rabbitmq_password>
  <default_timeout type="integer">120</default_timeout>
  <delete_vapp_template_timeout type="integer">120</delete_vapp_template_timeout>
  <delete_vapp_timeout type="integer">120</delete_vapp_timeout>
  <delete_media_timeout type="integer">120</delete_media_timeout>
  <instantiate_vapp_template_timeout type="integer">900</instantiate_vapp_template_timeout>
  <power_on_timeout type="integer">600</power_on_timeout>
  <power_off_timeout type="integer">600</power_off_timeout>
  <suspend_timeout type="integer">600</suspend_timeout>
  <discard_suspend_timeout type="integer">600</discard_suspend_timeout>
  <reboot_timeout type="integer">600</reboot_timeout>
  <undeploy_timeout type="integer">720</undeploy_timeout>
  <create_edge_gateway_timeout type="integer">600</create_edge_gateway_timeout>
  <create_vdc_timeout type="integer">300</create_vdc_timeout>
  <create_snapshot_timeout type="integer">3600</create_snapshot_timeout>
  <create_vdc_timeout type="integer">300</create_vdc_timeout>
  <max_cpu_quota type="integer">30</max_cpu_quota>
  <max_memory_quota type="integer">0</max_memory_quota>
</settings>
```

Where:

- `rabbitmq_host` - the RabbitMQ server IP address
- `rabbitmq_port` - the RabbitMQ port
- `rabbitmq_vhost` - the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.
rabbitmq_login - the login of a RabbitMQ instance
rabbitmq_password - the password of a RabbitMQ instance
default_timeout - the default timeout for running VCD-related operations that are not listed below
delete_vapp_template_timeout - the amount of time for deleting a vApp template
delete_vapp_timeout - the amount of time for deleting vApp
delete_media_timeout - the amount of time for deleting media files
instantiate_vapp_template_timeout - the amount of time for provisioning vApp
power_on_timeout - the amount of time for starting up a powered-off virtual server
power_off_timeout - the amount of time for shutting down a powered-on virtual server
suspend_timeout - the amount of time for suspending a virtual server
discard_suspend_timeout - the amount of time for unsuspending a virtual server
reboot_timeout - the amount of time for rebooting a virtual server
undeploy_timeout - the amount of time for undeploying a vApp. The undeployment is taking place for a vApp that includes no virtual servers but has assigned networks.
process_descriptor_vapp_template_timeout - the amount of time for uploading a vApp template
http_request_timeout - the amount of time for executing HTTP (API) requests
recompose_vapp_timeout - the amount of time for recomposing vApp
create_edge_gateway_timeout - the amount of time for creating an edge gateway
compose_vapp_template_timeout - the amount of time for composing a vApp template
create_snapshot_timeout - the amount of time for creating a VS snapshot
create_vdc_timeout - the amount of time for creating a resource pool
max_cpu_quota - the custom max CPU quota limit available
max_memory_quota - the custom max memory limit available

4.20.2 Edit System Configuration

This document provides information on VCD-related system configuration settings. For information on general OnApp system settings, refer to the OnApp Cloud API Guide.

To edit VCD-related configuration settings, use the following requests:

PUT /settings.xml
PUT /settings.json

XML Request Example
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```
  <configuration>
    <rabbitmq_host>127.0.0.1</rabbitmq_host>
    <rabbitmq_port type="integer">5672</rabbitmq_port>
    <rabbitmq_vhost/>
    <rabbitmq_login>login</rabbitmq_login>
    <rabbitmq_password>password</rabbitmq_password>
    <default_timeout type="integer">120</default_timeout>
    <delete_vapp_template_timeout type="integer">120</delete_vapp_template_timeout>
    <delete_vapp_timeout type="integer">120</delete_vapp_timeout>
    <delete_media_timeout type="integer">120</delete_media_timeout>
    <instantiate_vapp_template_timeout type="integer">900</instantiate_vapp_template_timeout>
    <power_on_timeout type="integer">600</power_on_timeout>
    <power_off_timeout type="integer">600</power_off_timeout>
    <suspend_timeout type="integer">600</suspend_timeout>
    <discard_suspend_timeout type="integer">600</discard_suspend_timeout>
    <reboot_timeout type="integer">600</reboot_timeout>
    <undeploy_timeout type="integer">720</undeploy_timeout>
    <process_descriptor_vapp_template_timeout type="integer">300</process_descriptor_vapp_template_timeout>
    <http_request_timeout type="integer">240</http_request_timeout>
    <recompose_vapp_timeout type="integer">200</recompose_vapp_timeout>
    <create_edge_gateway_timeout type="integer">600</create_edge_gateway_timeout>
    <compose_vapp_template_timeout type="integer">300</compose_vapp_template_timeout>
    <create_snapshot_timeout type="integer">3600</create_snapshot_timeout>
    <create_vdc_timeout type="integer">300</create_vdc_timeout>
    <max_cpu_quota type="integer">0</max_cpu_quota>
    <max_memory_quota type="integer">0</max_memory_quota>
  </configuration>
```

JSON Request Example
  "configuration": {
    "rabbitmq_host": "127.0.0.1",
    "rabbitmq_port": 5672,
    "rabbitmq_vhost": "/",
    "rabbitmq_login": "login",
    "rabbitmq_password": "password",
    "default_timeout": 120,
    "delete_vapp_template_timeout": 120,
    "delete_vapp_timeout": 120,
    "delete_media_timeout": 120,
    "instantiate_vapp_template_timeout": 900,
    "power_on_timeout": 600,
    "power_off_timeout": 600,
    "suspend_timeout": 600,
    "discard_suspend_timeout": 600,
    "reboot_timeout": 600,
    "undeploy_timeout": 720,
    "process_descriptor_vapp_template_timeout": 300,
    "http_request_timeout": 240,
    "recompose_vapp_timeout": 200,
    "create_edge_gateway_timeout": 600,
    "compose_vapp_template_timeout": 300,
    "create_snapshot_timeout": 3600,
    "create_vdc_timeout": 300,
    "max_cpu_quota_type": 0,
    "max_memory_quota": 0
  }
}'

Where:

*rabbitmq_host* - the RabbitMQ server IP address

*rabbitmq_port* - the RabbitMQ port

*rabbitmq_vhost* - the name of the "virtual host" (or vhost) that specifies the namespace for entities (exchanges and queues) referred to by the protocol. Note that this is not virtual hosting in the HTTP sense.

*rabbitmq_login* - the login of a RabbitMQ instance

*rabbitmq_password* - the password of a RabbitMQ instance

*default_timeout* - the default timeout for running VCD-related operations that are not listed below

*delete_vapp_template_timeout* - the amount of time for deleting a vApp template

*delete_vapp_timeout* - the amount of time for deleting a vApp

*delete_media_timeout* - the amount of time for deleting media files

*instantiate_vapp_template_timeout* - the amount of time for provisioning a vApp

*power_on_timeout* - the amount of time for starting up a powered-off virtual server

*power_off_timeout* - the amount of time for shutting down a powered-on virtual server

*suspend_timeout* - the amount of time for suspending a virtual server

*discard_suspend_timeout* - the amount of time for unsuspending a virtual server

*reboot_timeout* - the amount of time for rebooting a virtual server

*undeploy_timeout* - the amount of time for undeploying a vApp. The undeployment is taking place for a vApp that includes no virtual servers but has assigned networks.
process_descriptor_vapp_template_timeout - the amount of time for uploading a vApp template
http_request_timeout - the amount of time for executing HTTP (API) requests
recompose_vapp_timeout - the amount of time for recomposing vApp
create_edge_gateway_timeout - the amount of time for creating an edge gateway
compose_vapp_template_timeout - the amount of time for composing a vApp template
create_snapshot_timeout - the amount of time for creating a VS snapshot
create_vdc_timeout - the amount of time for creating a resource pool

max_cpu_quota - the custom max CPU quota limit available. The default value is 1000GHz.
max_memory_quota - the custom max memory limit available. The default value is 1000GB.

4.21 NSX-V Integration API

This section provides the API calls you can use to manage NSX-V items imported from vCloud.

4.21.1 NSX-V Certificates API

Service certificates are required in case you select Certificate authentication option while configuring an IPSec VPN site for your vCloud edge gateway. This section contains the API requests you can use to manage NSX-V certificates and CRL certificates.

4.21.1.1 Get List of NSX Certificates

To get the list of NSX-V certificates imported from vCloud, use the following request:

GET /nsx/edges/:edge_id/certificates.xml
GET /nsx/edges/:edge_id/certificates.json

XML Request Example


JSON Request Example


XML Output Example
Where:

- **id** - the ID number of the certificate
- **identifier** - the identifier of the certificate
- **label** - the label of the certificate
- **common_name** - the certificate's common name
- **issuer_common_name** - common name of the certificate's issuer
- **certificate_type** - certificate_ca, certificate_self_signed, or certificate_signed
- **edge_id** - the ID of the edge the certificate is assigned to
- **valid_from** - the date when the certificate started to be valid
- **not_after** - final end-date, until the certificate is valid
- **created_at** - the date when the certificate was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the certificate was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
- **signature_algorithm** - the certificate's signature algorithm
- **public_key_algorithm** - RSA or DSA
- **public_key_length** - the key size in bits. The minimum is 2048 bits
4.21.1.2 Get List of CRL Certificates
To get the list of CRL certificates, use the following request:

GET /nsx/edges/:edge_id/crls.xml
GET /nsx/edges/:edge_id/crls.json

XML Request Example


JSON Request Example


XML Output Example

<nsx_crls type="array">
  <nsx_crl>
    <id type="integer">3</id>
    <label>serviceexample.test</label>
    <identifier>crl-6</identifier>
    <issuer_common_name>serviceexample.test</issuer_common_name>
    <edge_id type="integer">3</edge_id>
    <next_update type="dateTime">2019-11-24T12:57:04Z</next_update>
    <created_at type="dateTime">2019-11-11T08:26:41Z</created_at>
    <updated_at type="dateTime">2019-11-11T08:26:41Z</updated_at>
  </nsx_crl>
  <nsx_crl>
    <id type="integer">4</id>
    <label>www.example.com</label>
    <identifier>crl-5</identifier>
    <issuer_common_name>www.example.com</issuer_common_name>
    <edge_id type="integer">3</edge_id>
    <next_update type="dateTime">2019-11-15T11:15:49Z</next_update>
    <created_at type="dateTime">2019-11-11T08:26:41Z</created_at>
    <updated_at type="dateTime">2019-11-11T08:26:41Z</updated_at>
  </nsx_crl>
  <nsx_crl>
    <id type="integer">5</id>
    <label>www.example.com</label>
    <identifier>crl-4</identifier>
    <issuer_common_name>www.example.com</issuer_common_name>
    <edge_id type="integer">3</edge_id>
    <next_update type="dateTime">2019-11-15T11:15:49Z</next_update>
    <created_at type="dateTime">2019-11-11T08:26:41Z</created_at>
    <updated_at type="dateTime">2019-11-11T08:26:41Z</updated_at>
  </nsx_crl>
</nsx_crls>

Where:

id - ID of the CRL certificate
label - label of the CRL certificate
identifier - identifier of the CRL certificate
**issuer_common_name** - common name of the issuer

**edge_id** - ID of the corresponding edge

**next_update** - date of the next update scheduled in the [YYYY][MM][DD][T][hh][mm][ss]Z format

**created_at** - the date when the CRL certificate was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format

**updated_at** - the date when the CRL certificate was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format

### 4.21.2 NSX-V Firewalls API

Edge Firewall monitors the North-South traffic to provide perimeter security functionality including firewall, Network Address Translation (NAT), and site-to-site IPSec and SSL VPN functionality. You may set up specifications of the accepted or denied data and its paths to ensure a secure connection between the internal and external networks. This section contains the API requests you can use to manage NSX-V firewalls:

- Get NSX-V Firewall Service Details
- Edit NSX-V Firewall Service
- Get List of NSX-V Firewall Rules
- Get NSX-V Firewall Rule Details
- Add NSX-V Firewall Rule
- Edit NSX-V Firewall Rule
- Delete NSX-V Firewall Rule

#### 4.21.2.1 Get NSX-V Firewall Service Details

To get NSX-V firewall service details, use the following request:

GET /nsx/edges/:edge_id/firewall/service.xml
GET /nsx/edges/:edge_id/firewall/service.json

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

**XML Output Example**

```xml
<firewall_service>
  <created_at>2023-10-20T01:01:01Z</created_at>
  <updated_at>2023-10-20T01:01:01Z</updated_at>
  <next_update>2023-10-20T01:01:01Z</next_update>
  <edge_id>3</edge_id>
</firewall_service>
```
4.21.2.2 Edit NSX-V Firewall Service

To edit an NSX-V firewall service, use the following request:

**XML Request Example**

```bash
curl -i -X PUT http://onapp.test/\nsx/edges/:edge_id/firewall/service.xml -H 'Accept: application/xml' -H 'Content-Type: application/xml' -u user:userpass -d '<nsx_firewall_service>
<id type="integer">3</id>
<enabled type="boolean">true</enabled>
<edge_id type="integer">3</edge_id>
<created_at type="dateTime">2019-11-06T10:16:49Z</created_at>
<updated_at type="dateTime">2019-11-06T10:35:59Z</updated_at>
<locked type="boolean">false</locked>
</nsx_firewall_service>
```

**Where:**

- **id** - ID of the firewall service
- **enabled** - true, if the service is enabled; otherwise, false
- **edge_id** - ID of the edge the firewall service is assigned to
- **created_at** - the date when the firewall service was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the firewall service was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
- **locked** - true, if the firewall service is locked; otherwise, false

**JSON Request Example**

```bash
```

**XML Request Example**

```bash
curl -i -X PUT http://onapp.test/\nsx/edges/:edge_id/firewall/service.xml -H 'Accept: application/xml' -H 'Content-Type: application/xml' -u user:userpass -d '<nsx_firewall_service><enabled type="boolean">true</enabled><firewall_rules type="array"><firewall_rule><enabled type="boolean">true</enabled><label>Rule 2</label><source_excluded type="boolean">false</source_excluded><destination_excluded type="boolean">true</destination_excluded><action>deny</action><logging type="boolean">false</logging><sources type="array"><source><target_type>Nsx::Firewall::Rules::IpAddress</target_type><value>192.168.0.1</value></source><source><target_type>Nsx::NetworkInterface</target_type><value>vnic-0</value></source></sources><destinations type="array"><destination><target_type>Nsx::Firewall::Rules::IpAddress</target_type><value>192.168.1.1</value></destination><destination><target_type>Nsx::NetworkInterface</target_type><value>vnic-0</value></destination></destinations><services type="array"><service><protocol>tcp</protocol><source_port>3333</source_port><destination_port>4444</destination_port></service><service><protocol>icmp</protocol></service></services></firewall_rule></firewall_rules></nsx_firewall_service>
```

**JSON Request Example**

```bash
curl -i -X PUT http://onapp.test/\nsx/edges/:edge_id/firewall/service.json -H 'Accept: application/json' -H 'Content-Type: application/json' -u user:userpass -d '{ "nsx_firewall_service": { "id": 3, "enabled": true, "edge_id": 3, "created_at": "2019-11-06T10:16:49Z", "updated_at": "2019-11-06T10:35:59Z", "locked": false, "firewall_rules": [ { "enabled": true, "label": "Rule 2", "source_excluded": false, "destination_excluded": true, "action": "deny", "logging": false, "sources": [ { "type": "IpAddress", "target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.0.1" }, { "type": "NetworkInterface", "target_type": "Nsx::NetworkInterface", "value": "vnic-0" } ], "destinations": [ { "type": "IpAddress", "target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.1.1" }, { "type": "NetworkInterface", "target_type": "Nsx::NetworkInterface", "value": "vnic-0" } ], "services": [ { "protocol": "tcp", "source_port": 3333, "destination_port": 4444 } ] } ] } }
```
curl -i -X PUT http://onapp.test/nsx/edges/4/firewall/service.json
-H 'Accept: application/json' -H 'Content-type: application/json'
-u user:userpass
-d '{"nsx_firewall_service": {
  "enabled": true,
  "firewall_rules": ["enabled": true, "label": "Rule 2", "rule_type": "user", "source_excluded": false, "destination_excluded": true, "action": "deny", "logging": false, "sources": [{"target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.0.1"},
    {"target_type": "Nsx::NetworkInterface", "value": "vnic-0"}],
  "destinations": [{"target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.1.1"},
    {"target_type": "Nsx::NetworkInterface", "value": "vnic-0"}],
  "services": [{"protocol": "tcp", "source_port": "3333", "destination_port": "4444"}, {"protocol": "icmp"}]}]}'

**Where:**

- **enabled** - true, if firewall service is enabled; otherwise, false
- **firewall_rules:**
  - **enabled** - true, if NSX-V firewall rule is enabled; otherwise, false
  - **label** - label of NSX-V firewall rule
  - **rule_type** - user
  - **source_excluded** - true, if toggle exclusion for this source is enabled; otherwise, false
  - **destination_excluded** - true, if toggle exclusion for this destination is enabled; otherwise, false
  - **action** - accept or deny
  - **logging** - true, if logging for this rule is enabled; otherwise, false
  - **sources:**
    - target_type: *Nsx::Network, Nsx::VirtualMachine, Nsx::IpSet, Nsx::SecurityGroup, Nsx::Firewall::Rules::IpAddress or Nsx::NetworkInterface*
    - value - moref of the selected target (depending on the chosen target type)
  - **destinations:**
    - target_type: *Nsx::Network, Nsx::VirtualMachine, Nsx::IpSet, Nsx::SecurityGroup, Nsx::Firewall::Rules::IpAddress or Nsx::NetworkInterface*
    - value - moref of the selected target (depending on the chosen target type)
  - **services:**
    - protocol - any, tcp, udp or icmp
    - source_port - the source port
    - destination_port - the destination port

4.21.2.3 Get List of NSX-V Firewall Rules

To get the list of NSX-V firewall rules assigned to a specific edge in your cloud, use the following request:

GET /nsx/edges/:edge_id/firewall/service/rules.xml
GET /nsx/edges/:edge_id/firewall/service/rules.json

**XML Request Example**
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JSON Request Example


XML Output Example

```xml
<nsx_firewall_rules type="array">
    <nsx_firewall_rule>
        <id type="integer">14</id>
        <identifier>131074</identifier>
        <enabled type="boolean">true</enabled>
        <label>firewall</label>
        <rule_type>internal_high</rule_type>
        <action>accept</action>
        <logging type="boolean">false</logging>
        <firewall_service_id type="integer">3</firewall_service_id>
        <created_at type="dateTime">2019-11-06T10:16:49Z</created_at>
        <updated_at type="dateTime">2019-11-06T10:16:49Z</updated_at>
        <source_excluded type="boolean">false</source_excluded>
        <destination_excluded type="boolean">false</destination_excluded>
    </nsx_firewall_rule>
    <nsx_firewall_rule>
        <id type="integer">15</id>
        <identifier>133138</identifier>
        <enabled type="boolean">true</enabled>
        <label>New Rule</label>
        <rule_type>user</rule_type>
        <action>accept</action>
        <logging type="boolean">false</logging>
        <firewall_service_id type="integer">3</firewall_service_id>
        <created_at type="dateTime">2019-11-06T10:16:49Z</created_at>
        <updated_at type="dateTime">2019-11-06T10:16:49Z</updated_at>
        <source_excluded type="boolean">false</source_excluded>
        <destination_excluded type="boolean">false</destination_excluded>
    </nsx_firewall_rule>
</nsx_firewall_rules>

Where:

- **id** - ID of the NSX-V firewall rule
- **identifier** - identifier of the firewall rule
- **enabled** - true, if the rule is enabled; otherwise, false
- **label** - label of the firewall rule
- **rule_type** - internal_high, user or default_policy
- **action** - accept or deny
- **logging** - true, if logging for this firewall rule is enabled; otherwise, false
- **firewall_service_id** - ID of the firewall service the rule is assigned to
4.21.2.4 Get NSX-V Firewall Rule Details
To get NSX-V firewall rule details, use the following request:

GET /nsx/edges/:edge_id/firewall/service/rules/:rule_id.xml
GET /nsx/edges/:edge_id/firewall/service/rules/:rule_id.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example

```
<nsx_firewall_rule>
  <id type="integer">15</id>
  <identifier>133138</identifier>
  <enabled type="boolean">true</enabled>
  <label>New Rule</label>
  <rule_type>user</rule_type>
  <action>accept</action>
  <logging type="boolean">false</logging>
  <firewall_service_id type="integer">3</firewall_service_id>
  <created_at type="dateTime">2019-11-06T16:49Z</created_at>
  <updated_at type="dateTime">2019-11-06T16:49Z</updated_at>
  <source_excluded type="boolean">false</source_excluded>
  <destination_excluded type="boolean">false</destination_excluded>
</nsx_firewall_rule>
```

Where:

- **id** - ID of the NSX-V firewall rule
- **identifier** - identifier of the NSX-V firewall rule
- **enabled** - true, if the rule is enabled; otherwise, false
- **label** - label of the NSX-V firewall rule
- **rule_type** - internal_high, user or default_policy
- **action** - accept or deny
- **logging** - true, if logging for this firewall rule is enabled; otherwise, false
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**firewall_service_id** - ID of the firewall service the rule is assigned to

**created_at** - the date when the firewall rule was created in the [YYYY][MM][DD][hh][mm][ss][Z] format

**updated_at** - the date when the firewall rule was updated in the [YYYY][MM][DD][hh][mm][ss][Z] format

**source_excluded** - true, if toggle exclusion for this source is enabled; otherwise, false

**destination_excluded** - true, if toggle exclusion for this destination is enabled; otherwise, false

**XML Request Example**

```
curl -i -X POST -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url http://onapp.test/nsx/edges/3/firewall/service/rules.xml -d '<nsx_firewall_rule><enabled type="boolean">true</enabled><label>Rule 2</label><source_excluded type="boolean">false</source_excluded><destination_excluded type="boolean">false</destination_excluded><action>Deny</action><logging type="boolean">false</logging><sources type="array"><source><target_type>Nsx::Firewall::Rules::IpAddress</target_type><value>192.168.0.1</value></source><source><target_type>Nsx::NetworkInterface</target_type><value>vnic-0</value></source></sources><destinations type="array"><destination><target_type>Nsx::Firewall::Rules::IpAddress</target_type><value>192.168.1.1</value></destination><destination><target_type>Nsx::NetworkInterface</target_type><value>vnic-0</value></destination></destinations><services type="array"><service><protocol>udp</protocol><source_port>1111</source_port><destination_port>2222</destination_port></service><service><protocol>icmp</protocol></service></services></nsx_firewall_rule>
```

**JSON Request Example**

```
curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url http://onapp.test/nsx/edges/3/firewall/service/rules.json -d '{"nsx_firewall_rule": {"enabled": true, "label": "Rule 2", "rule_type": "user", "source_excluded": false, "destination_excluded": true, "action": "deny", "logging": false, "sources": [{"target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.0.1"}, {"target_type": "Nsx::NetworkInterface", "value": "vnic-0"}], "destinations": [{"target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.1.1"}, {"target_type": "Nsx::NetworkInterface", "value": "vnic-0"}], "services": [{"protocol": "udp", "source_port": "1111", "destination_port": "2222"}, {"protocol": "icmp"}]}}
```

**4.21.2.5 Add NSX-V Firewall Rule**

To add an NSX-V firewall rule, use the following request:

POST /nsx/edges/:edge_id/firewall/service/rules.xml

POST /nsx/edges/:edge_id/firewall/service/rules.json

**Where:**

**enabled** - true, if IPSec VPN site is enabled; otherwise, false

**label** - the label of the NSX-V firewall rule

**rule_type** - user

**source_excluded** - true, if toggle exclusion for this source is enabled; otherwise, false
destination_excluded - true, if toggle exclusion for this destination is enabled; otherwise, false

action - accept or deny

logging - true, if logging for this rule is enabled; otherwise, false

sources:
- target_type - Nsx::Network, Nsx::VirtualMachine, Nsx::IpSet, Nsx::SecurityGroup, Nsx::Firewall::Rules::IpAddress or Nsx::NetworkInterface
- value - moref of the selected target (depending on the chosen target type)

destinations:
- target_type - Nsx::Network, Nsx::VirtualMachine, Nsx::IpSet, Nsx::SecurityGroup, Nsx::Firewall::Rules::IpAddress or Nsx::NetworkInterface
- value - moref of the selected target (depending on the chosen target type)

services:
- protocol - any, tcp, udp or icmp
- source_port - the source port
- destination_port - the destination port

4.21.2.6 Edit NSX-V Firewall Rule

To edit an NSX-V firewall rule, use the following request:

PUT /nsx/edges/:edge_id/firewall/service/rules/:rule_id.xml
PUT /nsx/edges/:edge_id/firewall/service/rules/:rule_id.json

**XML Request Example**

curl -i -X PUT
http://onapp.test/edges/45/firewall/service/rules/56.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d '<nsx_firewall_rule><enabled type="boolean">true</enabled><label>Rule 2</label><source_excluded type="boolean">false</source_excluded><destination_excluded type="boolean">true</destination_excluded><action>deny</action><logging type="boolean">false</logging><sources type="array"><source><target_type>Nsx::Firewall::Rules::IpAddress</target_type><value>192.168.0.1</value></source><source><target_type>Nsx::NetworkInterface</target_type><value>vnic-0</value></source></sources><destinations type="array"><destination><target_type>Nsx::Firewall::Rules::IpAddress</target_type><value>192.168.1.1</value></destination><destination><target_type>Nsx::NetworkInterface</target_type><value>vnic-0</value></destination></destinations><services type="array"><service><protocol>tcp</protocol><source_port>3333</source_port><destination_port>4444</destination_port></service><service><protocol>icmp</protocol></service></services></nsx_firewall_rule>'

**JSON Request Example**

curl -i -X PUT
http://onapp.test/edges/45/firewall/service/rules/56.json
-H 'Content-type: application/json' -u user:userpass -d '{ "nsx_firewall_rule": { "enabled": true, "label": "Rule 2", "source_excluded": false, "destination_excluded": true, "action": "deny", "logging": false, "sources": [ { "target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.0.1" }, { "target_type": "Nsx::NetworkInterface", "value": "vnic-0" } ], "destinations": [ { "target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.1.1" }, { "target_type": "Nsx::NetworkInterface", "value": "vnic-0" } ], "services": [ { "protocol": "tcp", "source_port": 3333, "destination_port": 4444 } ] }'
curl -i -X PUT
http://onapp.test/nsx/edges/45/firewall/service/rules/56.json -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"nsx_firewall_rule": {"enabled": true, "label": "Rule 2", "rule_type": "user", "source_excluded": false, "destination_excluded": true, "action": "deny", "logging": false, "sources": [{"target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.0.1"}, {"target_type": "Nsx::NetworkInterface", "value": "vnic-0"}], "destinations": [{"target_type": "Nsx::Firewall::Rules::IpAddress", "value": "192.168.1.1"}, {"target_type": "Nsx::NetworkInterface", "value": "vnic-0"}], "services": [{"protocol": "tcp", "source_port": "3333", "destination_port": "4444"}, {"protocol": "icmp"}]}}'

Where:

- **enabled** - true, if firewall rule is enabled; otherwise, false
- **label** - the label of the firewall rule
- **rule_type** - user
- **source_excluded** - true, if toggle exclusion for this source is enabled; otherwise, false
- **destination_excluded** - true, if toggle exclusion for this destination is enabled; otherwise, false
- **action** - accept or deny
- **logging** - true, if logging for this rule is enabled; otherwise, false

**sources:**
- **target_type** - Nsx::Network, Nsx::VirtualMachine, Nsx::IpSet, Nsx::SecurityGroup, Nsx::Firewall::Rules::IpAddress or Nsx::NetworkInterface
- **value** - moref of the selected target (depending on the chosen target type)

**destinations:**
- **target_type** - Nsx::Network, Nsx::VirtualMachine, Nsx::IpSet, Nsx::SecurityGroup, Nsx::Firewall::Rules::IpAddress or Nsx::NetworkInterface
- **value** - moref of the selected target (depending on the chosen target type)

**services:**
- **protocol** - any, tcp, udp, icmp
- **source_port** - the source port
- **destination_port** - the destination port

4.21.2.7 Delete NSX-V Firewall Rule

To delete an NSX firewall rule, use the following request:

```bash
DELETE /nsx/edges/:edge_id/firewall/service/rules/:rule_id.xml
DELETE /nsx/edges/:edge_id/firewall/service/rules/:rule_id.json
```

**XML Request example**

```bash
curl -i -X DELETE -u user:userpass
```

**JSON Request Example**

Returns HTTP 204 response on successful deletion, or HTTP 404 when a firewall with the ID specified is not found.

4.21.3 NSX-V IPSec VPN API

Internet Protocol Security (IPSec) VPN ensures secure and private communications over Internet Protocol (IP) networks. It authenticates and encrypts IP packets between two endpoints. This section contains the API requests you can use to manage NSX-V IPSec VPN service and IPSec VPN sites.

4.21.3.1 NSX-V IPSec VPN Service

Below you can find the list of operations applicable for NSX-V IPSec VPN services:

- Get IPSec VPN Service Details
- Edit IPSec VPN Service

4.21.3.1.1 Get IPSec VPN Service Details

To get IPSec VPN service details, use the following request:

GET /nsx/edges/:edge_id/vpn/ipsec/service.xml
GET /nsx/edges/:edge_id/vpn/ipsec/service.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example

```
<nsx_ipsec_service>
  <id type="integer">116</id>
  <enabled type="boolean">true</enabled>
  <logging type="boolean">true</logging>
  <edge_id type="integer">126</edge_id>
  <service_certificate_id type="integer">205</service_certificate_id>
  <psk>testkey</psk>
  <log_level>info</log_level>
  <created_at type="dateTime">2019-11-06T13:01:09Z</created_at>
  <updated_at type="dateTime">2019-11-06T13:01:09Z</updated_at>
  <locked type="boolean">false</locked>
</nsx_ipsec_service>
```

Where:
id - ID of the IPSec VPN service

enabled - true, if IPSec VPN service is enabled; otherwise, false

logging - true, if logging for this IPSec VPN service is enabled; otherwise, false

edge_id - ID of the edge this IPSec VPN service was created for

service_certificate_id - ID of the service certificate

psk - the value of the pre-shared key

log_level - emergency, alert, critical, error, warning, notice, info or debug

created_at - the date when the IPSec VPN service was created in the [YYYY][MM][DD][hh][mm][ss]Z format

updated_at - the date when the IPSec VPN service was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

locked - true, if IPSec VPN service is locked; otherwise, false

4.21.3.1.2 Edit IPSec VPN Service

To edit IPSec VPN service, use the following request:

PUT /nsx/edges/:edge_id/vpn/ipsec/service.xml
PUT /nsx/edges/:edge_id/vpn/ipsec/service.json

XML Request Example

```
curl -i -X PUT -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -u http://onapp.test/edges/3/vpn/ipsec/service.xml -d '<nsx_ipsec_service><certificate_auth_enabled>true</certificate_auth_enabled><enabled>true</enabled><ipsec_sites type="array"><ipsec_site><authentication_mode>psk</authentication_mode><compliance_suite>none</compliance_suite><dh_group>dh5</dh_group><digest_algorithm>sha1</digest_algorithm>enable_pfs>false</enable_pfs><encrypted>false</encrypted><encryption_algorithm>aes</encryption_algorithm><ike_option>ikev1</ike_option><ipsec_session_type>policybasedsession</ipsec_session_type><label>Alpha</label><local_id>10.0.0.133</local_id><local_ip>10.0.0.133</local_ip><local_subnets type="array"><local_subnet>0.0.0.0/0</local_subnet><local_subnet>123.23.3.3</local_subnet><peer_id>123.23.3.3</peer_id><peer_ip>123.23.3.3</peer_ip><peer_subnets type="array"><peer_subnet>0.0.0.0/0</peer_subnet><peer_subnets><psk>:testkey</psk><responder_only>false</responder_only></ipsec_site></ipsec_sites><log_level>info</log_level><logging>true</logging><psk>testkey</psk><service_certificate>certificate-45</service_certificate></nsx_ipsec_service>'
```

JSON Request Example

```
curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -u http://onapp.test/edges/3/vpn/ipsec/service.json -d '{"nsx_ipsec_service": {"enabled":true, "logging":true, "log_level":"info", "psk":"testkey", "service_certificate":"certificate-45", "certificate_auth_enabled":true, "ipsec_sites":{"enabled":false, "label":"Alpha", "local_id":"10.0.0.133", "local_ip":"10.0.0.133", "peer_id":"123.23.3.3", "peer_ip":"123.23.3.3", "ipsec_session_type":"policybasedsession", "encryption_algorithm":"aes", "enable_pfs":false, "dh_group":"dh5", "psk":"testkey", "authentication_mode":"psk", "digest_algorithm":"sha1", "responder_only":false, "compliance_suite":"none", "ike_option":"ikev1", "local_subnets":["0.0.0.0/0"], "peer_subnets":[]}}}'
```
Where:

- **enabled** - true, if IPSec VPN service is enabled; otherwise, false
- **logging** - true, if logging for IPSec VPN service is enabled; otherwise, false
- **log_level** - emergency, alert, critical, error, warning, notice, info or debug
- **psk** - the value of the pre-shared key
- **service_certificate** - identifier of the service certificate (optional; required if any IPSec site uses certificate authentication)
- **ca_certificates** - identifiers of the CA certificates
- **crl_certificates** - identifiers of the CRL certificates
- **certificate_auth_enabled** - true, if certificate authentication is enabled; otherwise, false

**ipsec_sites:**
- **enabled** - true, if IPSec VPN site is enabled; otherwise, false (local IP must be assigned to an Edge's Uplink vNIC)
- **label** - label of an IPSec VPN site
- **local_id** - ID of the local site
- **local_ip** - IP of the local site (local IP must be assigned to an Edge's Uplink vNIC)
- **peer_id** - ID of a peer site (for certificate authentication must be a valid Distinguished Name)
- **peer_ip** - IP or FQDN of a peer site
- **ipsec_session_type** - policybasedsession or routebasedsession. If routebasedsession is selected:
  - **tunnel_interface_ip** - tunnel interface IP in CIDR notation
  - **tunnel_interface_mtu** - MTU, allowed values 152 - 8916 (inclusively)
- **encryption_algorithm** - aes, aes256, aes-gsm, or 3des
- **enable_pfs** - true, if PFS is enabled; otherwise, false
- **dh_group** - dh2, dh5, dh14, dh15, or dh16
- **psk** - the value of the pre-shared key
- **authentication_mode** - psk or x.509 (for Certificate mode; available only if service_certificate for a service is set)
- **digest_algorithm** - sha1 or sha-256
- **responder_only** - true, if IKE Responder Only option is enabled; otherwise, false
- **compliance_suite** - none, cnsa, prime, suite-b-gcm-128, suite-b-gcm-256, suite-b-gmac-128, suite-b-gmac-256, or foundation
- **ike_option** - ikev1, ikev2, or ike-flex
- **local_subnets** - an array of local subnets in CIDR format (If routebasedsession is set for ipsec_session_type, local_subnets value should be ["0.0.0.0/0"])**
- **peer_subnets** - an array of peer subnets in CIDR format (If routebasedsession is set for ipsec_session_type, peer_subnets value should be ["0.0.0.0/0"])**

4.21.3.2 NSX-V IPSec VPN Sites

Below you can find the list of operations applicable for NSX-V IPSec VPN sites:

- **Get List of IPSec VPN Sites**
- **Get IPSec VPN Site Details**
4.21.3.2.1 Get List of IPSec VPN Sites
To get list of IPSec VPN sites, use the following request:
GET /nsx/edges/:edge_id/vpn/ipsec/service/sites.xml
GET /nsx/edges/:edge_id/vpn/ipsec/service/sites.json

XML Request Example

```
curl -i -X GET -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url
http://onapp.test/edges/13/vpn/ipsec/service/sites.xml
```

JSON Request Example

```
curl -i -X GET -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url
http://onapp.test/edges/13/vpn/ipsec/service/sites.json
```

XML Output Example
<nsx_ipsec_sites type="array">
  <nsx_ipsec_site>
    <id type="integer">735</id>
    <enabled type="boolean">false</enabled>
    <identifier>ipsecsite-170</identifier>
    <ipsecserviceid type="integer">116</ipsecserviceid>
    <localid>123123213123123123</localid>
    <localip>10.0.0.133</localip>
    <peerid>123123213123123123</peerid>
    <peerip>123.23.3.3</peerip>
    <ipsecsessiontype>policybasedsession</ipsecsessiontype>
    <encryptionalgorithm>aes</encryptionalgorithm>
    <enablepfs type="boolean">false</enablepfs>
    <dhgroup>dh5</dhgroup>
    <tunnelinterfaceipaddress nil="true"/>
    <tunnelinterfacemtu nil="true"/>
    <ipsecsessiontype>policybasedsession</ipsecsessiontype>
    <encryptionalgorithm>aes</encryptionalgorithm>
    <enablepfs type="boolean">false</enablepfs>
    <dhgroup>dh5</dhgroup>
    <tunnelinterfaceipaddress nil="true"/>
    <tunnelinterfacemtu nil="true"/>
    <ipsecsessiontype>policybasedsession</ipsecsessiontype>
    <encryptionalgorithm>aes</encryptionalgorithm>
    <enablepfs type="boolean">false</enablepfs>
    <dhgroup>dh5</dhgroup>
    <tunnelinterfaceipaddress nil="true"/>
    <tunnelinterfacemtu nil="true"/>
  </nsx_ipsec_site>
  <nsx_ipsec_site>
    <id type="integer">736</id>
    <enabled type="boolean">false</enabled>
    <identifier>ipsecsite-171</identifier>
    <ipsecserviceid type="integer">116</ipsecserviceid>
    <localid>10.0.0.133</localid>
    <localip>10.0.0.133</localip>
    <peerid>123.32.3.3</peerid>
    <peerip>123.32.3.3</peerip>
    <ipsecsessiontype>policybasedsession</ipsecsessiontype>
    <encryptionalgorithm>aes-gcm</encryptionalgorithm>
    <enablepfs type="boolean">false</enablepfs>
    <dhgroup>dh15</dhgroup>
    <tunnelinterfaceipaddress nil="true"/>
    <tunnelinterfacemtu nil="true"/>
    <ipsecsessiontype>policybasedsession</ipsecsessiontype>
    <encryptionalgorithm>aes-gcm</encryptionalgorithm>
    <enablepfs type="boolean">false</enablepfs>
    <dhgroup>dh15</dhgroup>
    <tunnelinterfaceipaddress nil="true"/>
    <tunnelinterfacemtu nil="true"/>
  </nsx_ipsec_site>
</nsx_ipsec_sites>
Where:

- **id** - ID of the IPSec VPN site
- **enabled** - true, if IPSec VPN site is enabled; otherwise, false
- **label** - the label of the IPSec VPN site
- **identifier** - identifier of the IPSec VPN site
- **ipsec_service_id** - ID of the IPSec VPN service
- **local_id** - ID of the local site
- **local_ip** - IP of the local site
- **peer_id** - ID of a peer site
- **peer_ip** - IP of a peer site
- **ipsec_session_type** - policybasedsession or routebasedsession. If **ipsec_session_type** is set to routebasedsession:
  - **tunnel_interface_ip** - tunnel interface IP in CIDR notation
  - **tunnel_interface_mtu** - MTU, allowed values 152 - 8916 (inclusively)
- **encryption_algorithm** - aes, aes256, aes-gsm, or 3des
- **enable_pfs** - true, if PFS is enabled; otherwise, false
- **dh_group** - dh2, dh5, dh14, dh15, or dh16
- **local_subnets** - an array of local subnets in CIDR format
- **peer_subnets** - an array of peer subnets in CIDR format
- **psk** - the value of the pre-shared key
- **authentication_mode** - psk or x.509 (for Certificate mode)
- **extension** - securelocaltrafficbyip=IPAddress or passthroughSubnets=PeerSubnetIPAddress
- **digest_algorithm** - sha1 or sha-256
- **responder_only** - true, if IKE Responder Only option is enabled; otherwise, false
- **compliance_suite** - none, cnsa, prime, suite-b-gcm-128, suite-b-gcm-256, suite-b-gmac-128, suite-b-gmac-256, or foundation
- **ike_option** - ikev1, ikev2, or ike-flex
- **certificate_id** - identifier of the certificate

### 4.21.3.2.2 Get IPSec VPN Site Details

To get the IPSec VPN site details, use the following request:

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
GET /nsx/edges/:edge_id/vpn/ipsec/service/sites/:site_id.xml
GET /nsx/edges/:edge_id/vpn/ipsec/service/sites/:site_id.json
```
<nsx_ipsec_site>
    <id type="integer">735</id>
    <enabled type="boolean">false</enabled>
    <label>Alpha</label>
    <identifier>ipsecsite-170</identifier>
    <ipsec_service_id type="integer">116</ipsec_service_id>
    <local_id>1231233213123123123</local_id>
    <local_ip>10.0.0.133</local_ip>
    <peer_id>123123123123123</peer_id>
    <peer_ip>123.23.3.3</peer_ip>
    <ipsec_session_type>policybasedsession</ipsec_session_type>
    <encryption_algorithm>aes</encryption_algorithm>
    <enable_pfs type="boolean">false</enable_pfs>
    <dh_group>dh5</dh_group>
    <tunnel_interface_ip_address nil="true"/>
    <tunnel_interface_mtu nil="true"/>
    <local_subnets type="array">
        <local_subnet>0.0.0.0/0</local_subnet>
    </local_subnets>
    <peer_subnets type="array">
        <peer_subnet>0.0.0.0/0</peer_subnet>
    </peer_subnets>
    <psk>:SLEFP8KLFEP{SEKFSEP{KFSEPSEF{SEPSEFS<f</psk>
    <authentication_mode>psk</authentication_mode>
    <digest_algorithm>sha1</digest_algorithm>
    <responder_only type="boolean">false</responder_only>
    <extension></extension>
    <ike_option>ikev1</ike_option>
    <certificate_id nil="true"/>
</nsx_ipsec_site>

Where:

id - ID of the IPSec VPN site
enabled - true, if IPSec VPN site is enabled; otherwise, false
label - label of the IPSec VPN site
identifier - identifier of the IPSec VPN site
ipsec_service_id - ID of the IPSec VPN service
local_id - ID of the local site
local_ip - IP of the local site
peer_id - ID of a peer site
peer_ip - IP of a peer site
ipsec_session_type - policybasedsession or routebasedsession. If ipsec_session_type is set to routebasedsession:
    • tunnel_interface_ip - tunnel interface IP in CIDR notation
    • tunnel_interface_mtu - MTU, allowed values 152 - 8916(inclusively)
encryption_algorithm - aes, aes256, aes-gsm, or 3des
enable_pfs - true, if PFS is enabled; otherwise, false
dh_group - dh2, dh5, dh14, dh15, or dh16
local_subnets - an array of local subnets in CIDR format
peer_subnets - an array of peer subnets in CIDR format
psk - the value of the pre-shared key
authentication_mode - psk or x.509 (for Certificate mode)
extension - securelocaltrafficbyip=IPAddress or passthroughSubnets=PeerSubnetIPAddress
digest_algorithm - sha1 or sha-256
responder_only - true, if IKE Responder Only option is enabled; otherwise, false
compliance_suite - none, cnsa, prime, suite-b-gcm-128, suite-b-gcm-256, suite-b-gmac-128, suite-b-gmac-256, or foundation
ike_option - ikev1, ikev2, or ike-flex
certificate_id - identifier of the certificate

4.21.3.2.3 Add IPSec VPN Site
To add an IPSec VPN site, use the following request:

POST /nsx/edges/:edge_id/vpn/ipsec/service/sites.xml
POST /nsx/edges/:edge_id/vpn/ipsec/service/sites.json

XML Request Example

```
curl -i -X POST -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url http://onapp.test/nsx/edges/113/vpn/ipsec/service/sites.xml -d '<nsx_ipsec_site><authentication_mode>x.509</authentication_mode><certificatetype>certificate-45</certificate><compliance_suite>none</compliance_suite><dh_group>dh5</dh_group><digest_algorithm>sha-256</digest_algorithm><enable_pfs>false</enable_pfs><enabled>false</enabled><encryption_algorithm>aes-gcm</encryption_algorithm><extension /><ike_option>ike-flex</ike_option><ipsec_session_type>routebasedsession</ipsec_session_type><label>Bravo</label><local_id>10.0.0.133</local_id><local_ip>10.0.0.133</local_ip><local_subnets type="array"><local_subnet>0.0.0.0/0</local_subnet></local_subnets><peer_id>C=Test, L=host</peer_id><peer_ip>123.32.4.32</peer_ip><peer_subnets type="array"><peer_subnet>0.0.0.0/0</peer_subnet></peer_subnets><responder_only>false</responder_only><tunnel_interface_ip_address>23.23.21.23/24</tunnel_interface_ip_address><tunnel_interface_mtu>1500</tunnel_interface_mtu></nsx_ipsec_site>'```

JSON Request Example

```
```
curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url http://onapp.test/nsx/edges/113/vpn/ipsec/service/sites.json -d '{"nsx_ipsec_site": {"enabled": false, "label": "Bravo", "local_id": "10.0.0.133", "local_ip": "10.0.0.133", "peer_id": "C=Test, L=host", "peer_ip": "123.32.4.32", "ipsec_session_type": "routebasedsession", "encryption_algorithm": "aes-gcm", "enable_pfs": false, "dh_group": "dh5", "tunnel_interface_ip_address": "23.23.21.23/24", "tunnel_interface_mtu": 1500, "local_subnets": ["0.0.0.0/0"], "peer_subnets": ["0.0.0.0/0"], "authentication_mode": "x.509", "extension": "", "digest_algorithm": "sha-256", "responder_only": false, "compliance_suite": "none", "ike_option": "ike-flex", "certificate": "certificate-45"}}

Where:

*enabled* - true, if IPSec VPN site is enabled; otherwise, false (local IP must be assigned to an Edge's Uplink vNIC)

*label* - label of an IPSec VPN site

*local_id* - ID of the local site

*local_ip* - IP of the local site (local IP must be assigned to an Edge's Uplink vNIC)

*peer_id* - ID of a peer site (for certificate authentication must be a valid Distinguished Name)

*peer_ip* - IP or FQDN of a peer site

*ipsec_session_type* - policybasedsession or routebasedsession. If routebasedsession is selected:

- *tunnel_interface_ip* - tunnel interface IP in CIDR notation
- *tunnel_interface_mtu* - MTU, allowed values 152 - 8916 (inclusively)
- *encryption_algorithm* - aes, aes256, aes-gsm, or 3des
- *enable_pfs* - true, if PFS is enabled; otherwise, false
- *dh_group* - dh2, dh5, dh14, dh15, or dh16
- *local_subnets* - an array of local subnets in CIDR format (If routebasedsession is set for *ipsec_session_type*, *local_subnets* value should be ["0.0.0.0/0"])
- *peer_subnets* - an array of peer subnets in CIDR format (If routebasedsession is set for *ipsec_session_type*, *peer_subnets* value should be ["0.0.0.0/0"])
- *authentication_mode* - psk or x.509 (for Certificate mode; available only if service_certificate for a service is set)
- *extension* - securelocaltrafficbyip=IPAddress or passthroughSubnets=PeerSubnetIPAddress
- *digest_algorithm* - sha1 or sha-256
- *responder_only* - true, if IKE Responder Only option is enabled; otherwise, false
- *compliance_suite* - none, cnsa, prime, suite-b-gcm-128, suite-b-gcm-256, suite-b-gmac-128, suite-b-gmac-256, or foundation
- *ike_option* - ikev1, ikev2, or ike-flex
- *certificate* - identifier of the certificate

4.21.3.2.4 Edit IPSec VPN Site

To edit an IPSec VPN site, use the following request:

PUT /nsx/edges/:edge_id/vpn/ipsec/service/sites/:site_id.xml
PUT /nsx/edges/:edge_id/vpn/ipsec/service/sites/:site_id.json
XML Request Example

```bash
curl -i -X PUT -H 'Accept: application/xml' -H 'Content-type: application/xml' --user user:userpass --url http://onapp.test/nax/edges/13/vpn/ipsec/service/sites/3.xml -d '<nsx_ipsec_site><authentication_mode>x.509</authentication_mode><certificate><cert45</certificate><compliance_suite>none</compliance_suite><dh_group>dh5</dh_group><digest_algorithm>sha-256</digest_algorithm><enable_pfs>false</enable_pfs><enabled>false<enable_d><encryption_algorithm>aes-gcm</encryption_algorithm><ike_option>ike-flex</ike_option><ipsec_session_type>routebasedsession</ipsec_session_type><label>Bravo</label><local_id>10.0.0.133</local_id><local_ip>10.0.0.133</local_ip><local_subnets><element>0.0.0.0/0</element></local_subnets><peer_id>C=Test,L=host</peer_id><peer_ip>123.32.4.32</peer_ip><peer_subnets><element>0.0.0.0/0</element></peer_subnets><responder_only>false</responder_only><tunnel_interface_ip_address>23.23.21.23/24</tunnel_interface_ip_address></nsx_ipsec_site>'
```

JSON Request Example

```bash
curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' --user user:userpass --url http://onapp.test/nax/edges/13/vpn/ipsec/service/sites/3.json -d '{"nsx_ipsec_site": {"enabled": false, "label": "Bravo", "local_id": "10.0.0.133", "local_ip": "10.0.0.133", "peer_id": "C=Test, L=host", "peer_ip": "123.32.4.32", "ipsec_session_type": "routebasedsession", "encryption_algorithm": "aes-gcm", "enable_pfs": false, "dh_group": "dh5", "tunnel_interface_ip_address": "23.23.21.23/24", "tunnel_interface_mtu": 1500, "local_subnets": ["0.0.0.0/0"], "peer_subnets": ["0.0.0.0/0"], "authentication_mode": "x.509", "extension": ", "digest_algorithm": "sha-256", "responder_only": false, "compliance_suite": "none", "ike_option": "ike-flex", "certificate": "certificate-45"}}
```

Where:

* `enabled` - true, if IPSec VPN site is enabled; otherwise, false
* `label` - label of the IPSec VPN site
* `ipsec_service_id` - ID of the IPSec VPN service
* `local_id` - ID of the local site
* `local_ip` - IP of the local site (local IP must be assigned to an Edge's Upplink vNIC)
* `peer_id` - ID of a peer site (for certificate authentication must be a valid Distinguished Name)
* `peer_ip` - IP or FQDN of a peer site
* `ipsec_session_type` - policybasedsession or routebasedsession. If routebasedsession is selected:
  * `tunnel_interface_ip` - tunnel interface IP in CIDR notation
  * `tunnel_interface_mtu` - MTU, allowed values 152 - 8916 (inclusively)
* `encryption_algorithm` - aes, aes256, aes-gsm, or 3des
* `enable_pfs` - true, if FFS is enabled; otherwise, false
dh_group* - dh2, dh5, dh14, dh15, or dh16

local_subnets* - an array of local subnets in CIDR format (If routebasedsession is set for ipsec_session_type, local_subnets value should be ["0.0.0.0/0"]) peer_subnets* - an array of peer subnets in CIDR format (If routebasedsession is set for ipsec_session_type, peer_subnets value should be ["0.0.0.0/0"]) authentication_mode* - psk or x.509 (for Certificate mode; available only if service_certificate for a service is set) psk - the value of the pre-shared key extension - securelocaltrafficbyip=IPAddress or passthroughSubnets=PeerSubnetIPAddress digest_algorithm* - sha1 or sha-256 responder_only - true, if IKE Responder Only option is enabled; otherwise, false compliance_suite - none, cnlsa, prime, suite-b-gcm-128, suite-b-gcm-256, suite-b-gmac-128, suite-b-gmac-256, or foundation ike_option* - ikev1, ikev2, or ike-flex certificate_id - identifier of the certificate

4.21.3.2.5 Delete IPSec VPN Site
To delete IPSec VPN site, use the following request:
DELETE /nsx/edges/:edge_id/vpn/ipsec/service/sites/:site_id.xml
DELETE /nsx/edges/:edge_id/vpn/ipsec/service/sites/:site_id.json

XML Request Example
```
curl -i -X DELETE -u user:userpass
http://onapp.test/nsx/edges/45/vpn/ipsec/service/sites/3.xml
-H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example
```
curl -i -X DELETE -u user:userpass
http://onapp.test/nsx/edges/45/vpn/ipsec/service/sites/3.json
-H 'Accept: application/json' -H 'Content-type: application/json'
```

Returns HTTP 204 response on successful deletion, or HTTP 404 when an IPSec VPN site with the ID specified is not found.

4.21.4 NSX-V L2 VPN API
This section provides the API calls you can use to manage NSX-V L2 VPN. With L2 VPN, you can stretch multiple logical networks (both VLAN and VXLAN) between different physical sites.

4.21.4.1 NSX-V L2 VPN Server
L2 VPN allows you to extend your datacenter by allowing virtual machines to retain network connectivity across geographical boundaries. Virtual servers remain on the same subnet when they are moved between sites and their IP addresses do not change. This section contains the API requests you can use to manage L2 VPN server:

- Edit NSX-V L2 VPN Server
- Get List of L2 VPN Peer Sites
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- Get NSX-V L2 VPN Peer Site Details
- Add NSX-V L2 VPN Peer Site
- Edit NSX-V L2 VPN Peer Site
- Delete NSX-V L2 VPN Peer Site

4.21.4.1.1 Edit NSX-V L2 VPN Server
To edit L2 VPN server, use the following request:

PUT /nsx/edges/:edge_id/vpn/l2_vpn/service.xml
PUT /nsx/edges/:edge_id/vpn/l2_vpn/service.json

XML Request Example

<nsv_l2_vpn_service><certificate_auth_enabled>true</certificate_auth_enabled><enabled>false</enabled><encryption_algorithm type="array"><encryption_algorithm>ECDHE-RSA-SHA256</encryption_algorithm>ECDHE-RSA-AES128-GCM-SHA256</encryption_algorithm><encryption_algorithm>ECDHE-RSA-AES256-GCM-SHA384</encryption_algorithm><encryption_algorithm><l2_vpn_peer_sites type="array"><l2_vpn_peer_site><description>1</description><egress_optimization type="array"><egress_optimization>123.43.21.3</egress_optimization></egress_optimization><enabled>true</enabled><identifier>12vpngpeersite-83</identifier><label>Alpha</label><routed_remote_subnets_enabled>false</routed_remote_subnets_enabled><sub_interfaces type="array"><sub_interface>10</sub_interface><sub_interface>11</sub_interface></sub_interfaces><user_id>newusername</user_id><user_password>%b5u`=8G[Gk#vHe`</user_password></l2_vpn_peer_site></l2_vpn_peer_sites><listener_ip>10.0.0.133</listener_ip><listener_port>443</listener_port><mode>server</mode><service_certificate>certificate-46</service_certificate></nsx_l2_vpn_service>

JSON Request Example

curl -i -X PUT -H 'Accept: application/json' -H 'Content-Type: application/json' -u user:userpass -u http://onapp.test/edges/126/vpn/l2_vpn/service.json -d '{"nsx_l2_vpn_service":{"enabled":false,"mode":"server","listener_ip":"10.0.0.133","listener_port":443,"encryption_algorithm":["ECDHE-RSA-AES128-GCM-SHA256","ECDHE-RSA-AES256-GCM-SHA384"],"service_certificate":"certificate-46","certificate_auth_enabled":true,"l2_vpn_peer_sites":[{"label":"Alpha","identifier":"12vpngpeersite-83","enabled":true,"description":"1","user_id":"newusername","user_password":"%b5u`=8G[Gk#vHe`","egress_optimization":["123.43.21.3"],"routed_remote_subnets_enabled":false,"sub_interfaces":["10","11"],"label":"Bravo","identifier":"12vpngpeersite-84","enabled":true,"description":"2","user_id":"user2","user_password":"Hv8u0026Q+4UJst^vgz9","egress_optimization":[]},"routed_remote_subnets_enabled":false,"sub_interfaces":["11"]]}}

Where:

- enabled* - true if L2 VPN service is enabled; otherwise, false
- mode* - server
- listener_ip* - the primary or secondary IP address of an external interface of the NSX-V edge
listener_port* - the port number for the L2 VPN service

encryption_algorithm* - ECDHE-RSA-AES128-GCM-SHA256, ECDHE-RSA-AES256-GCM-SHA384, NULL-SHA256, AES128-GCM-SHA256, or NULL-MD5

service_certificate - the identifier of the service certificate

certificate_auth_enabled* - true if the certificate to be bound to the SSL VPN server is enabled; otherwise, false

l2_vpn_peer_sites - an array of L2 VPN peer sites added to this server with their details:

- description - the description of the peer site
- egress_optimization - the gateway IP addresses for which the traffic is to be locally routed or for which the traffic is to be blocked over the tunnel; an array of IP addresses ("192.168.1.1", "192.168.1.2") or comma-separated string("192.168.1.1, 192.168.1.2")
- enabled* - true if the newly added peer site is enabled; otherwise, false
- identifier - the identifier of the peer site
- label - the name of the peer site
- routed_remote_subnets_enabled - true if the sub interfaces to be stretched with the client are enabled; otherwise, false
- sub_interfaces* - the indexes of the sub interfaces
- user_id* - a user name with which the peer site is to be authenticated
- user_password* - a password with which the peer site is to be authenticated

4.21.4.1.2 Get List of L2 VPN Peer Sites

To view the list of L2 VPN peer sites on your cloud, use the following request:

GET /nsx/edges/:edge_id/vpn/l2_vpn/service/peer_sites.xml
GET /nsx/edges/:edge_id/vpn/l2_vpn/service/peer_sites.json

XML Request Example

```
curl -i -X GET -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url
http://onapp.test/nsx/edges/113/vpn/l2_vpn/service/peer_sites.xml
```

JSON Request Example

```
curl -i -X GET -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url
http://onapp.test/nsx/edges/113/vpn/l2_vpn/service/peer_sites.json
```

XML Request Output
<nsx_l2_vpn_peer_sites type="array">
  <nsx_l2_vpn_peer_site>
    <id type="integer">732</id>
    <label>Alpha</label>
    <identifier>l2vpnpeersite-83</identifier>
    <description>1</description>
    <egress_optimization type="array">
      <egress_optimization>123.43.21.3</egress_optimization>
    </egress_optimization>
    <enabled type="boolean">true</enabled>
    <user_id>newusername</user_id>
    <user_password>%b5u`=8G[GK_fwHe`</user_password>
    <routed_remote_subnets_enabled type="boolean">false</routed_remote_subnets_enabled>
    <l2_vpn_service_id type="integer">100</l2_vpn_service_id>
    <ca_certificate_id nil="true"/>
    <created_at type="dateTime">2019-11-06T13:01:10Z</created_at>
    <updated_at type="dateTime">2019-11-06T13:01:10Z</updated_at>
  </nsx_l2_vpn_peer_site>
  ...
</nsx_l2vpn_peer_sites>

Where:

id - the ID of the peer site
label - the name of the peer site
identifier - identifier of the peer site
description - the description of a peer site
egress_optimization - the gateway IP addresses for which the traffic is to be locally routed or for which the traffic is to be blocked over the tunnel
enabled - true if the newly added peer site is enabled; otherwise, false
user_id - the ID of a user of a peer site
user_password - the password with which the peer site is to be authenticated
routed_remote_subnets_enabled - true if the sub interfaces to be stretched with the client are enabled; otherwise, false
l2_vpn_service_id - the ID of the VPN service attached
ca_certificate_id - the ID of the CA certificate attached
created_at - the date when the peer site was created in the [YYYY][MM][DD][hh][mm][ss]Z format
updated_at - the date when the peer site was edited in the [YYYY][MM][DD][hh][mm][ss]Z format

4.21.4.1.3 Get NSX-V L2 VPN Peer Site Details
To get the details of a particular L2 VPN peer site, use the following request:

GET /nsx/edges/:edge_id/vpn/l2_vpn/service/peer_sites/:peer_site_id.xml
GET /nsx/edges/:edge_id/vpn/l2_vpn/service/peer_sites/:peer_site_id.js

XML Request Example

### JSON Request Example

```
```

### XML Output Example

```
<nsx_l2_vpn.peer_site>
    <id type="integer">732</id>
    <label>Alpha</label>
    <identifier>l2vpnpeersite-83</identifier>
    <description></description>
    <egress_optimization type="array">
        <egress_optimization>123.43.21.3</egress_optimization>
    </egress_optimization>
    <enabled type="boolean">true</enabled>
    <user_id>newusername</user_id>
    <user_password>%b5u=`8G[G#vHe`</user_password>
    <routed_remote_subnets_enabled type="boolean">false</routed_remote_subnets_enabled>
    <l2_vpn_service_id type="integer">100</l2_vpn_service_id>
    <ca_certificate_id nil="true"/>
    <created_at type="dateTime">2019-11-06T13:01:10Z</created_at>
    <updated_at type="dateTime">2019-11-06T13:01:10Z</updated_at>
</nsx_l2_vpn.peer_site>
```

Where:
- **id** - the ID of the peer site
- **label** - the name of the peer site
- **identifier** - identifier of the peer site
- **description** - the description of a peer site
- **egress_optimization** - the gateway IP addresses for which the traffic is to be locally routed or for which the traffic is to be blocked over the tunnel
- **enabled** - true if the newly added peer site is enabled; otherwise, false
- **user_id** - the ID of a user of a peer site
- **user_password** - the password with which the peer site is to be authenticated
- **routed_remote_subnets_enabled** - true if the sub interfaces to be stretched with the client are enabled; otherwise, false
- **l2_vpn_service_id** - the ID of the VPN service attached
- **ca_certificate_id** - the ID of the CA certificate attached
- **created_at** - the date when the peer site was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the peer site was edited in the [YYYY][MM][DD][hh][mm][ss]Z format
4.21.4.1.4 Add NSX-V L2 VPN Peer Site

To create an L2 VPN peer site, use the following request:

POST /nsx/edges/:edge_id/vpn/12_vpn/service/peer_sites.xml
POST /nsx/edges/:edge_id/vpn/12_vpn/service/peer_sites.json

XML Request Example

```bash
curl -i -X POST http://onapp.test/nsx/edges/126/vpn/12_vpn/service/peer_sites.xml -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d '<nsx_l2_vpn_peer_site><description>1</description><egress_optimization type="array"><egress_optimization>123.43.21.3</egress_optimization></egress_optimization><enabled>true</enabled><l2_vpn_service_id>87</l2_vpn_service_id><sub_interfaces type="array"><sub_interface>10</sub_interface><sub_interface>11</sub_interface></sub_interfaces><user_id>newusername</user_id><user_password>%b5u`=8G[ GK#vHe`</user_password></nsx_l2_vpn_peer_site>'
```

JSON Request Example

```bash
curl -i -X POST http://onapp.test/nsx/edges/113/vpn/12_vpn/service/peer_sites.json -H 'Accept: application/json' -H 'Content-Type: application/json' -d '{"nsx_l2_vpn_peer_site": {"label": "New rule", "description": "desc", "egress_optimization": ["123.43.21.3"], "enabled": true, "user_id": "someuser", "user_password": "%b5u`=8G[ GK#vHe`", "routed_remote_subnets_enabled": false, "sub_interfaces": ["10", "11"]}}'
```

Where:

- **label** - the label of a new peer site
- **description** - description of the peer site
- **egress_optimization** - the gateway IP addresses for which the traffic is to be locally routed or for which the traffic is to be blocked over the tunnel; array of IP addresses ("192.168.1.1", "192.168.1.2") or comma-separated string("192.168.1.1, 192.168.1.2")
- **enabled** - true if the newly added peer site is enabled; otherwise, false
- **user_id** - the ID of a user with which the peer site is to be authenticated
- **user_password** - a password with which the peer site is to be authenticated
- **routed_remote_subnets_enabled** - true if the sub interfaces to be stretched with the client are enabled; otherwise, false
- **sub_interfaces** - the indexes of the sub interfaces

4.21.4.1.5 Edit NSX-V L2 VPN Peer Site

To edit L2 VPN peer service, use the following request:

PUT /nsx/edges/:edge_id/vpn/12_vpn/service/peer_sites/:peer_site_id.xml
PUT /nsx/edges/:edge_id/vpn/12_vpn/service/peer_sites/:peer_site_id.json

XML Request Example

'Accept: application/json' -H 'Content-Type: application/xml' -d
'\n<nsx_l2_vpn_peer_site><description>1</description><egress_optimization type="array"><egress_optimization>123.43.21.3</egress_optimization></egress_optimization><enabled>true</enabled><l2_vpn_service_id>87</l2_vpn_service_id><routed_remote_subnets_enabled>false</routed_remote_subnets_enabled><sub_interfaces type="array"><sub_interface>10</sub_interface><sub_interface>11</sub_interface></sub_interfaces><user_id>newusername</user_id><user_password>%b5u`=8G[K#vHe`</user_password></nsx_l2_vpn_peer_site>'

**JSON Request Example**

curl -i -X PUT http://onapp.test/nx/edges/113/vpn/l2_vpn/service/peer_sites/678.json

'Accept: application/json' -H 'Content-Type: application/json' -d
'\n{"nsx_l2_vpn_peer_site": {"label":"Alpha","description": "1","egress_optimization": ["123.43.21.3"],"enabled": true,"user_id":"newusername","user_password":"%b5u`=8G[K#vHe`","routed_remote_subnets_enabled": false,"l2_vpn_service_id": 87,"sub_interfaces": ["10","11"]}}'

**Where:**

- **label** - the label of a new peer site
- **description** - description of the peer site
- **egress_optimization** - the gateway IP addresses for which the traffic is to be locally routed or for which the traffic is to be blocked over the tunnel; array of IP addresses ("["192.168.1.1", "192.168.1.2"]") or comma-separated string ("192.168.1.1, 192.168.1.2")
- **enabled** - true if the newly added peer site is enabled; otherwise, false
- **user_id** - the ID of a user with which the peer site is to be authenticated
- **user_password** - a password with which the peer site is to be authenticated
- **routed_remote_subnets_enabled** - true if the sub interfaces to be stretched with the client are enabled; otherwise, false
- **l2_vpn_service_id** - the ID of the VPN service associated
- **sub_interfaces** - the indexes of the sub interfaces

**4.21.4.1.6 Delete NSX-V L2 VPN Peer Site**

To delete an L2 VPN peer site, use the following request:

DELETE /nsx/edges/:edge_id/vpn/l2_vpn/service/peer_sites/:peer_site_id.xml
DELETE /nsx/edges/:edge_id/vpn/l2_vpn/service/peer_sites/:peer_site_id.json

**XML Request Example**


**JSON Request Example**

Returns HTTP 204 response on successful deletion, or HTTP 404 when a peer site with the ID specified is not found.

4.21.4.2 NSX-V L2 VPN Client
In this section you can find the list of operations applicable for NSX managers:

- Get NSX-V L2 VPN Client Details
- Edit L2 VPN Client

4.21.4.2.1 Get NSX-V L2 VPN Client Details
To view the details of a particular L2 VPN client, use the following request:

GET /nsx/edges/:edge_id/vpn/l2_vpn/service.xml
GET /nsx/edges/:edge_id/vpn/l2_vpn/service.json

**XML Request Example**


**JSON Request Example**


**XML Request Output**
<nsx_l2_vpn_service>
    <id type="integer">102</id>
    <enabled type="boolean">false</enabled>
    <logging type="boolean">true</logging>
    <log_level>debug</log_level>
    <edge_id type="integer">128</edge_id>
    <routed_remote_subnets_enabled type="boolean">false</routed_remote_subnets_enabled>
    <mode>client</mode>
    <listener_ip nil="true"/>
    <listener_port nil="true"/>
    <server_address>123.3.23.3</server_address>
    <server_port type="integer">433</server_port>
    <service_certificate_id nil="true"/>
    <ca_certificate_id type="integer">217</ca_certificate_id>
    <encryption_algorithm type="array">
        <encryption_algorithm>AES128-GCM-SHA256</encryption_algorithm>
    </encryption_algorithm>
    <egress_optimization type="array">
        <egress_optimization>32.23.3.3</egress_optimization>
    </egress_optimization>
    <user_id>user</user_id>
    <user_password>@{5BChTJn`~3~("f</user_password>
    <proxy_type>https</proxy_type>
    <proxy_address>123.3.33.4</proxy_address>
    <proxy_port type="integer">433</proxy_port>
    <proxy_user_name>user</proxy_user_name>
    <proxy_user_password nil="true"/>
    <created_at type="dateTime">2019-11-06T13:01:22Z</created_at>
    <updated_at type="dateTime">2019-11-06T13:01:22Z</updated_at>
    <locked_type="boolean">false</locked_type>
</nsx_l2_vpn_service>

Where:

id - the ID of the L2 VPN client
enabled - true if the L2 VPN service is enabled; otherwise, false
logging - true, if logging for this L2 VPN client is enabled; otherwise, false
log_level - emergency, alert, critical, error, warning, notice, info or debug
edge_id - the ID of the edge the L2 VPN client is associated with
routed_remote_subnets_enabled - true if the routed remote subnets are enabled; otherwise, false
mode - the mode of L2 VPN (server or client)
listener_ip - the primary or secondary IP address of an external interface of the NSX Edge
listener_port - the port number for the L2 VPN client
server_address - the address of the L2 VPN server to which this client is to be connected
server_port - the default port to which the L2 VPN client must connect to
service_certificate_id - the ID of the service certificate
ca_certificate_id - the ID of the CA certificate
encryption_algorithm - the encryption algorithm for communicating with the server
egress_optimization - the gateway IP address of the sub interfaces or the IP addresses to which traffic should not flow over the tunnel
user_id - a user name with which the server is to be authenticated
user_password - a password with which the peer site is to be authenticated

proxy_type - the type of traffic (TCP, HTTP, HTTPS or UDP)

proxy_address - the proxy server address

proxy_port - the proxy server port

proxy_user_name - a user name with which the proxy server is to be authenticated

proxy_user_password - a user password with which the proxy server is to be authenticated

created_at - the date when the L2 VPN client was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format

updated_at - the date when the L2 VPN client was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format

locked - true if this L2 VPN client is locked; otherwise, false

4.21.4.2.2 Edit L2 VPN Client
To edit L2 VPN client, use the following request:

PUT /nsx/edges/:edge_id/vpn/l2_vpn/service.xml
PUT /nsx/edges/:edge_id/vpn/l2_vpn/service.json

XML Request Example

curl -i -X PUT http://onapp.test/nsx/edges/128/vpn/l2_vpn/service.xml -H 'Accept: application/xml' -H 'Content-Type: application/xml' -d <nsx_l2_vpn_service><ca_certificate>certificate-38</ca_certificate><certificate_auth_enabled>true</certificate_auth_enabled><egress_optimization type="array"><egress_optimization>32.23.3.3</egress_optimization></egress_optimization><enabled>true</enabled><encryption_algorithm type="array"><encryption_algorithm>AES128-GCM-SHA256</encryption_algorithm></encryption_algorithm><mode>client</mode><proxy_address>123.3.33.4</proxy_address><proxy_port>2722</proxy_port><proxy_user_name>user</proxy_user_name><proxy_user_password>%b5u`=8G[&GK#vHe`<secure_proxy_enabled>true</secure_proxy_enabled><server_address>123.3.23.3</server_address><server_port>433</server_port><sub_interfaces type="array"><sub_interface>10</sub_interface><sub_interface>11</sub_interface></sub_interfaces><user_id>user</user_id><user_password>%b5u`=8G[&GK#vHe`</user_password></nsx_l2_vpn_service>

JSON Request Example

curl -i -X PUT http://onapp.test/nsx/edges/115/vpn/l2_vpn/service.json -H 'Accept: application/json' -H 'Content-Type: application/json' -d '{"nsx_l2_vpn_service":{"enabled":true,"mode":"client","server_address":"123.3.23.3","server_port":"433","encryption_algorithm":{"AES128-GCM-SHA256","egress_optimization":["32.23.3.3"],"user_id":"user","user_password":"%b5u`=8G[&GK#vHe`","proxy_address":"123.3.33.4","proxy_port":"2722","proxy_user_name":"user","proxy_user_password":"%b5u`=8G[&GK#vHe`","ca_certificate":"certificate-38","sub_interfaces":["10","11"],"certificate_auth_enabled":true,"secure_proxy_enabled":true}}}'

Where:

enabled* - true if L2 VPN service is enabled; otherwise, false

mode* - client
server_address* - the address of the L2 VPN server to which this client is to be connected

server_port* - the default port to which the L2 VPN client must connect to

encryption_algorithm* - the encryption algorithm for communicating with the server

egress_optimization* - the gateway IP address of the sub interfaces or the IP addresses to which traffic should not flow over the tunnel

user_id* - a user name with which the server is to be authenticated

user_password* - a password with which the peer site is to be authenticated

proxy_address - the proxy server address; required if secure_proxy_enabled is true

proxy_port - the proxy server port; required if secure_proxy_enabled is true

proxy_user_name - a user name with which the proxy server is to be authenticated; required if secure_proxy_enabled is true

proxy_user_password - a user password with which the proxy server is to be authenticated; required if secure_proxy_enabled is true

ca_certificate - the identifier of the CA certificate for this client

sub_interfaces - the indexes of the sub interfaces

certificate_auth_enabled* - true if certificate client authentication is enabled; otherwise, false

secure_proxy_enabled* - true if only secure proxy connections are enabled; otherwise, false

4.21.5 NSX-V Load Balancers API

The NSX-V Edge load balancer distributes incoming service requests evenly among multiple servers in such a way that the load distribution is transparent to users. This section contains the following API requests you can use to manage NSX-V load balancers:

- Get NSX-V Load Balancer Service Details
- Edit NSX-V Load Balancer Service
- Application Profiles
- Pools
- Virtual Servers
- Service Monitors
- Application Rules

4.21.5.1 Get NSX-V Load Balancer Service Details

To get the details of the NSX-V load balancer service, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service.xml
GET /nsx/edges/:edge_id/load_balancer/service.json

**XML Request Example**

```
```

**JSON Request Example**

```

**XML Output Example**

```xml
<nsx_load_balancer_service>
  <id type="integer">3</id>
  <enabled type="boolean">false</enabled>
  <acceleration type="boolean">true</acceleration>
  <logging type="boolean">true</logging>
  <edge_id type="integer">3</edge_id>
  <created_at type="dateTime">2019-11-06T16:50:01Z</created_at>
  <updated_at type="dateTime">2019-11-06T16:50:01Z</updated_at>
  <locked type="boolean">false</locked>
</nsx_load_balancer_service>
```

**Where:**

- **id** - the ID of the NSX-V load balancer service
- **enabled** - true if NSX-V load balancer service is enabled, otherwise false
- **acceleration** - true if acceleration is enabled; otherwise, false
- **logging** - true if logging is enabled; otherwise, false
- **log_level** - emergency, alert, critical, error, warning, notice, info, or debug
- **edge_id** - the ID of the edge
- **created_at** - the date when the load balancer service was created in the [YYYY]MMDDThhmmssZ format
- **updated_at** - the date when the load balancer service was updated in the [YYYY]MMDDThhmmssZ format
- **locked** - true, if load balancer service is locked; otherwise, false

**4.21.5.2 Edit NSX-V Load Balancer Service**

To edit NSX-V load balancer service, use the following request:

PUT /nsx/edges/:edge_id/load_balancer/service.xml
PUT /nsx/edges/:edge_id/load_balancer/service.json

**XML Request Example**

```xml
curl -i -X PUT -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:password --url http://onapp.test/nsx/edges/3/load_balancer/service.xml -d '<nsx_load_balancer_service><enabled type="boolean">true</enabled><acceleration type="boolean">false</acceleration><logging type="boolean">false</logging><log_level type="info"/></nsx_load_balancer_service>
```
type="boolean">false</server_ssl><service_certificate>certificate-
52</service_certificate><ca_certificates
type="array"><ca_certificate>certificate-
54</ca_certificate><crl_certificates
type="array"><crl_certificate>crl-
6</crl_certificate></crl_certificates></application_profile></application
_profiles><monitors type="array"><monitor><identifier>monitor-
2</identifier><label>ads</label><url>ads</url><expected>ads</expected>
<send_data>ads</send_data><receive_data>ads</receive_data><extension>ads
</extension><type=http><method_data>GET</method_data><interval>1</interval>
<timeout>2</timeout><max_retries>3</max_retries></monitor></monitors>
pools type="array"><pool><identifier>pool-
4</identifier><label>ads</label><description>ads</description><algorithm>
ip-hash</algorithm><transparent>true</transparent><monitor-
2</monitor><members type="array"><member><identifier>member-
2</identifier><label>ads</label><ip_address>192.168.0.1</ip_address>
<monitor_port>1111</monitor_port><port>2222</port><enabled
type="boolean">true</enabled><weight>1</weight><max_conn>3</max_conn><min
_conn>4</min_conn></member></members></pool></pools><application_rules
type="array"><application_rule><identifier>applicationRule-
6</identifier><label>asd</label><script>asfd</script></application_rule><
/application_rules><virtual_servers type="array"><virtual_server><identifier>
virtualServer-1</identifier><label>ads</label><ip_address>
192.168.0.1</ip_address><port>1111</port><protocol>http</protocol>
<connection_limit>123</connection_limit><connection_rate_limit>1234
</connection_rate_limit><enabled type="boolean">true</enabled><acceleration
type="boolean">true</acceleration><application_profile>applicationProfile-
6</application_profile><default_pool>pool-
9</default_pool></virtual_server></virtual_servers>
/application_rule><application_rule><identifier>applicationRule-
1</identifier></application_rule><application_rule><identifier>applicationRule-
2</identifier></application_rule></virtual_server>
</nsx_load_balancer_service>"

Where:

- **enabled** - true, if this load balancer service is enabled; otherwise, false
- **acceleration** - true, if acceleration is enabled; otherwise, false
- **logging** - true, if logging for load balancer service is enabled; otherwise, false
- **log_level** - emergency, alert, critical, error, warning, notice, info or debug

**application_profiles:**

- **identifier** - identifier of the application profile
- **label** - label of the application profile
- **http_redirect_url** - HTTP redirect URL
- **cookie_name** - Cookie's label
- **cipher** - a cipher algorithm
- **client_auth** - required or ignored
- **mode** - insert, prefix or app
- **persistence** - sourceip, msrdp, cookie or ssl_sessionid
- **type** - the type of traffic (TCP, HTTP, HTTPS or UDP)
- **expires** - the persistence expiration time in seconds. The default value is 60 seconds.
- **insert_x_forwarded** - true or false
- **ssl_passthrough** - true if SSL passthrough is enabled; otherwise, false
- **server_ssl** - true if poolside SSL is enabled; otherwise, false
- **service_certificate** - service certificate's identifier
- **ca_certificates** - CA certificates' identifiers
- **crl_certificates** - CRL certificates' identifiers

**monitors:**
- **identifier** - identifier of the monitor
- **label** - label of the monitor
- **url** - the URL to GET or POST
- **expected** - the string that the monitor expects to match in the status line of HTTP response in the Expected section
- **send_data** - the string sent to the back-end server after a connection is established
- **receive_data** - the string to be matched
- **extension** - advanced monitor parameters as key=value pairs
- **type** - http, https, tcp, icmp or udp
- **method_data** - GET, OPTIONS or POST
- **interval** - the interval in seconds in which a server is to be tested
- **timeout** - the maximum time in seconds within which a response from the server must be received
- **max_retries** - the number of times the server is tested before it is declared DOWN

**pools:**
- **identifier** - identifier of the pool
- **label** - label of the pool
- **description** - description of the pool
- **algorithm** - round-robin, ip-hash, leastconn, uri, httpheader or url
- **transparent** - true if client IP addresses are visible to the back-end servers; otherwise, false
- **monitor** - the ID of the existing default or custom monitor
- **members** - an array of the server members with the following details:
  - **label** - the name of the server member
  - **ip_address** - the IP address of the server member
  - **monitor_port** - the monitor port where the member is to receive health monitor pings
  - **port** - the port where the member is to receive traffic
  - **enabled** - true if this member is enabled; otherwise, false
  - **weight** - the proportion of traffic this member can handle
  - **max_conn** - the maximum number of concurrent connections that the member can handle. If the incoming requests go higher than the maximum, they are queued and wait for a connection to be released.
  - **min_conn** - the minimum number of concurrent connections that a member must always accept

**application_rules:**
- **identifier** - identifier of the application rule
- **label** - label of the application rule
- **script** - application rule's script

**virtual_servers:**
- **identifier** - identifier of the virtual server
4.21.5.3 Application Profiles

You create an application profile to define the behavior of a particular type of network traffic. After configuring a profile, you associate the profile with a virtual server. The virtual server then processes traffic according to the values specified in the profile. This section contains the following API requests:

- Get List of Application Profiles
- Get Application Profile Details
- Add Application Profile
- Edit Application Profile
- Delete Application Profile

4.21.5.3.1 Get List of Application Profiles

To get a list of application profiles, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service/application_profiles.xml
GET /nsx/edges/:edge_id/load_balancer/service/application_profiles.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**
<nsx_load_balancer_application_profiles type="array">
    <nsx_load_balancer_application_profile>
        <cipher null="true" />
        <client_auth null="true" />
        <cookie_name null="true" />
        <created_at>2019-10-03T10:31:00.000Z</created_at>
        <expires>123</expires>
        <http_redirect_url null="true" />
        <id>4</id>
        <identifier>applicationProfile-3</identifier>
        <insert_x_forwarded>false</insert_x_forwarded>
        <label>1</label>
        <load_balancer_service_id>9</load_balancer_service_id>
        <mode null="true" />
        <persistence>sourceip</persistence>
        <server_ssl>false</server_ssl>
        <ssl_passthrough>false</ssl_passthrough>
        <type>TCP</type>
        <updated_at>2019-10-03T10:31:00.000Z</updated_at>
    </nsx_load_balancer_application_profile>
    ...
</nsx_load_balancer_application_profiles>

Where:
cipher - DEFAULT, ECDHE-RSA-AES128-GCM-SHA256, ECDHE-RSA-AES256-GCM-SHA384, ECDHE-RSA-AES256-SHA, ECDHE-ECDSA-AES256-SHA, ECDH-ECDSA-AES256-SHA, ECDH-RSA-AES256-SHA, AES256-SHA AES128-SHA, or DES-CBC3-SHA
client_auth - ignored or required
cookie_name - the Cookie's identifier
created_at - the date in the [YYYY][MM][DD]T[hh][mm][ss]Z format
expires - the persistence expiration time in seconds. The default value is 60 seconds.
http_redirect_url - the HTTP redirect URL
id - the ID of the application profile
identifier - the identifier of an application profile
insert_x_forwarded - true or false
label - the label of the application profile
load_balancer_service_id - the ID of the load balancer service
mode - insert, prefix or app
persistence - sourceip, msrdp, cookie or ssl_sessionid
server_ssl - true if poolside SSL is enabled; otherwise, false
ssl_passthrough - true if SSL passthrough is enabled; otherwise, false
type - the type of traffic (TCP, HTTP, HTTPS or UDP)
updated_at - the date when the application profile was updated in the [YYYY][MM][DD]T[hh][mm][ss]Z format

4.21.5.3.2 Get Application Profile Details
To get details of a particular application profile, use the following request:

GET /nxr/edges/:edge_id/load_balancer/service/application_profiles/:application_profile_id.xml
GET
XML Request Example

```
```

JSON Request Example

```
```

XML Output Example

```
<nsx_load_balancer_application_profile>
  <cipher>DEFAULT</cipher>
  <client_auth>required</client_auth>
  <cookie_name>true</cookie_name>
  <created_at>2019-10-04T08:17:34.000Z</created_at>
  <expires>123</expires>
  <http_redirect_url>true</http_redirect_url>
  <id>4</id>
  <identifier>applicationProfile-3</identifier>
  <insert_x_forwarded>true</insert_x_forwarded>
  <label>1111</label>
  <load_balancer_service_id>9</load_balancer_service_id>
  <mode>true</mode>
  <persistence>sourceip</persistence>
  <server_ssl>true</server_ssl>
  <ssl_passthrough>false</ssl_passthrough>
  <type>HTTPS</type>
  <updated_at>2019-10-04T08:17:34.000Z</updated_at>
</nsx_load_balancer_application_profile>
```

Where:

- **cipher** - DEFAULT, ECDHE-RSA-AES128-GCM-SHA256, ECDHE-RSA-AES256-GCM-SHA384, ECDHE-RSA-AES256-SHA, ECDH-ECDSA-AES256-SHA, ECDH-ECDSA-AES256-SHA, ECDH-RSA-AES256-SHA, AES256-SHA AES128-SHA, or DES-CBC3-SHA
- **client_auth** - whether client authentication is required or ignored
- **cookie_name** - true for the Cookie persistence type; otherwise, false
- **created_at** - the date when the application profile was created in the [YYYY][MM][DD][hh][mm][ss][Z] format
- **expires** - the persistence expiration time in seconds. The default value is 60 seconds.
- **http_redirect_url** - true for HTTP or HTTPs type of traffic; false for TCP or UDP
- **id** - the ID of an application profile
- **identifier** - the identifier of an application profile
- **insert_x_forwarded** - true or false
label - the label of an application profile
load_balancer_service_id - the ID of the load balancer service
mode - true for Cookie persistence type; otherwise, false
persistence - the persistence type (sourceip, cookie or none)
servers_ssl - true if poolside SSL is enabled; otherwise, false
sslパススルー - true if SSL passthrough is enabled; otherwise, false
type - the type of traffic (TCP, HTTP, HTTPS or UDP)
updated at - the date when the application profile was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

4.21.5.3.3 Add Application Profile
To create an application profile, use the following request:

POST /nsx/edges/:edge_id/load_balancer/service/application_profiles.xml
POST /nsx/edges/:edge_id/load_balancer/service/application_profiles.json

XML Request Example

curl -i -X POST -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url
http://onapp.test/nsx/edges/3/load_balancer/service/application_profiles.xml
-d '<nsx_application_profile><label>new</label><cipher>DEFAULT</cipher><client_auth>required</client_auth><persistence>sourceip</persistence><type>HTTPS</type><expires type="integer">123</expires><insert_x_forwarded type="boolean">true</insert_x_forwarded><server_ssl type="boolean">true</server_ssl><ca_certificates type="array"><ca_certificate>certificate-52</ca_certificate></ca_certificates><crl_certificates type="array"><crl_certificate>crl-4</crl_certificate><crl_certificate>crl-6</crl_certificate></crl_certificates><service_certificate>certificate-54</service_certificate></nsx_application_profile>''

JSON Request Example

curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url
http://onapp.test/nsx/edges/3/load_balancer/service/application_profiles.json
-d '{"nsx_application_profile": {"label": "new","cipher": "DEFAULT","client_auth": "required","persistence": "sourceip","type": "HTTPS","expires": 123,"insert_x_forwarded": true,"sslパススルー": false,"server_ssl": true,"ca_certificates": ["certificate-52"],"service_certificate": "certificate-54"}}'

Where:
label - the label of an application profile
cipher - DEFAULT, ECDHE-RSA-AES128-GCM-SHA256, ECDHE-RSA-AES256-GCM-SHA384, ECDHE-RSA-AES256-SHA, ECDHE-ECDSA-AES256-SHA, ECDH-ECDSA-AES256-SHA, ECDH-RSA-AES256-SHA, AES256-SHA AES128-SHA, or DES-CBC3-SHA
client_auth - select whether to ignore or accept client authentication (ignore or required)
persistence - the persistence type (sourceip, cookie or none)
**type** - the type of traffic (TCP, HTTP, HTTPS or UDP)

**expires** - the persistence expiration time in seconds. The default value is 60 seconds.

**insert_x_forwarded** - true or false

**ssl_passthrough** - true if SSL passthrough is enabled; otherwise, false

**server_ssl** - true if poolside SSL is enabled; otherwise, false

**ca_certificates** - CA certificates' identifiers

**crl_certificates** - CRL certificates' identifiers

**service_certificate** - server certificates to authenticate the load balancer from the server side

4.21.5.3.4 Edit Application Profile

To edit a particular application profile, use the following request:

PUT
/nsx/edges/:edge_id/load_balancer/service/application_profiles/:application_profile_id.xml

PUT
/nsx/edges/:edge_id/load_balancer/service/application_profiles/:application_profile_id.json

**XML Request Example**

```bash
'<?xml application_profile='label='new' cipher='DEFAULT' client_auth='required' persistence='sourceip' type='HTTP'S expires='123' insert_x_forwarded='true' ssl_passthrough='false' server_ssl='true' ca_certificates='certificate-26' service_certificate='certificate-16'></nsx_application_profile>'
```

**JSON Request Example**

```bash
```

**Where:**

**label** - label of the application profile

**cipher** - DEFAULT, ECDHE-RSA-AES128-GCM-SHA256, ECDHE-RSA-AES256-GCM-SHA384, ECDHE-RSA-AES256-SHA, ECDHE-ECDSA-AES256-SHA, ECDH-ECDSA-AES256-SHA, ECDH-RSA-AES256-SHA, AES256-SHA AES128-SHA, or DES-CBC3-SHA

**client_auth** - select whether to ignore or accept client authentication (ignore or required)
533

persistence - the persistence type (sourceip, cookie or none)

type - the type of traffic (TCP, HTTP, HTTPS or UDP)

expires - the persistence expiration time in seconds. The default value is 60 seconds.

insert_x_forwarded - true or false

ssl_passthrough - true if SSL passthrough is enabled; otherwise, false

server_ssl - true if poolside SSL is enabled; otherwise, false

certificate - CA certificates' identifiers

crl_certificates - CRL certificates' identifiers

service_certificate - server certificate's identifier to authenticate the load balancer from the server side

4.21.5.3.5 Delete Application Profile

To delete an application profile, use the following request:

DELETE
/nsx/edges/:edge_id/load_balancer/service/application_profiles/:service_application_id.xml

DELETE
/nsx/edges/:edge_id/load_balancer/service/application_profiles/:service_application_id.json

XML Request Example

curl -i -X DELETE -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --
url http://onapp.test/nsx/edges/3/load_balancer/service/application_profiles/6.xml

JSON Request Example

curl -i -X DELETE -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --
url http://onapp.test/nsx/edges/3/load_balancer/service/application_profiles/6.json

Returns HTTP 204 response on successful deletion, or HTTP 404 when an application profile with the ID specified is not found.

4.21.5.4 Pools

After you add a server pool to manage load balancer distribution, you can update the existing pool or delete it to save system resources. The following API requests are applicable for NSX-V load balancer virtual server pools:

- Get List of Pools
- Get Pool Details
- Add Pool
- Edit Pool
- Delete Pool
4.21.5.4.1 Get List of Pools
To view a list of the pools, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service/pools.xml
GET /nsx/edges/:edge_id/load_balancer/service/pools.json

XML Request Example

4.21.5.4.2 Get Pool Details
To view the details of a particular pool, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service/pools/:pool_id.xml
GET /nsx/edges/:edge_id/load_balancer/service/pools/:pool_id.json

XML Request Example


JSON Request Example


XML Output Example

```xml
<nsx_load_balancer_pool>
  <algorithm>ip-hash</algorithm>
  <algorithm_params null="true" />
  <created_at>2019-10-07T09:45:07.000Z</created_at>
  <description>2</description>
  <id>2</id>
  <identifier>pool-6</identifier>
  <label>p2</label>
  <load_balancer_service_id>9</load_balancer_service_id>
  <monitor_id>26</monitor_id>
  <transparent>false</transparent>
  <updated_at>2019-10-07T09:45:07.000Z</updated_at>
</nsx_load_balancer_pool>
```

Where:
- **algorithm** - round-robin, ip-hash, leastconn, uri, httpheader or url
- **algorithm_params** - algorithm parameters for httpheader, url
- **created_at** - the date when the VS pool was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **description** - the description of the VS pool
- **id** - the edge gateway ID
- **identifier** - the identifier of the VS pool
- **label** - the label of the VS pool
- **load_balancer_service_id** - the ID of the load balancer service
- **monitor_id** - the ID of the default or custom monitor
- **transparent** - true if client IP addresses are visible to the back-end servers; otherwise, false
- **updated_at** - the date when the VS pool was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format

4.21.5.4.3 Add Pool
To create a pool, use the following request:
POST /nsx/edges/:edge_id/load_balancer/service/pools.xml
POST /nsx/edges/:edge_id/load_balancer/service/pools.json

**XML Request Example**

```
```

**JSON Request Example**

```
curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"nsx_pool": {"label": "ads","description": "ads","algorithm": "ip-hash","transparency": "true","monitor": "monitor-2","members": [{"label": "ads","ip_address": "192.168.0.1","monitor_port": "1111","port": "2222","enabled": true,"weight": "1","max_conn": "3","min_conn": "4"}]]}'
```

Where:

- **label** - the label of the VS pool
- **description** - the description of the VS pool
- **algorithm** - round-robin, ip-hash, leastconn, uri, httpheader or url
- **transparency** - true if client IP addresses are visible to the back-end servers; otherwise, false
- **monitor** - the identifier of the existing default or custom monitor
- **members** - an array of the server members with the following details:
  - **label** - the name of the server member
  - **ip_address** - the IP address of the server member
  - **monitor_port** - the monitor port where the member is to receive health monitor pings
  - **port** - the port where the member is to receive traffic
  - **enabled** - true if this member is enabled; otherwise, false
  - **weight** - the proportion of traffic this member can handle
  - **max_conn** - the maximum number of concurrent connections that the member can handle. If the incoming requests go higher than the maximum, they are queued and wait for a connection to be released.
  - **min_conn** - the minimum number of concurrent connections that a member must always accept

4.21.5.4.4 Edit Pool
To edit a particular pool, use the following request:

PUT /nsx/edges/:edge_id/load_balancer/service/pools/:pool_id.xml
PUT /nsx/edges/:edge_id/load_balancer/service/pools/:pool_id.json

**XML Request Example**
OnApp and VMware Cloud 6.5 Edge 4 Director Configuration Guide

### JSON Request Example

```
```

**Where:**

- **label** - the label of the pool
- **description** - the description of the pool
- **algorithm** - round-robin, ip-hash, leastconn, uri, httpheader or url
- **algorithm_params** - algorithm parameters for httpheader, url
- **transparent** - set to 1 to make client IP addresses visible to the back-end servers
- **monitor** - the identifier of the service monitor

**Optional parameters:**

- **members** - an array of the server members with the following parameters:
  - **enabled** - set to 1 to enable load balancers service
  - **ip_address** - the IP address of the server member
  - **label** - a name of the server member
  - **max_conn** - enter the maximum number of concurrent connections that the member can handle. If the incoming requests go higher than the maximum, they are queued and wait for a connection to be released.
  - **min_conn** - enter the minimum number of concurrent connections that a member must always accept
  - **port** - enter the monitor port where the member is to receive health monitor pings
  - **weight** - enter the proportion of traffic this member can handle

### 4.21.5.4.5 Delete Pool

To delete a pool, use the following request:

```
DELETE /nsx/edges/:edge_id/load_balancer/service/pools/:pool_id.xml
DELETE /nsx/edges/:edge_id/load_balancer/service/pools/:pool_id.json
```

**XML Request Example**

```
```
OnApp and VMware Cloud 6.5 Edge 4 Director Configuration Guide

JSON Request Example

```bash
curl -i -X DELETE -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --
```

Returns HTTP 204 response on successful deletion, or HTTP 404 when a pool with the ID specified is not found.

4.21.5.5 Virtual Servers
After you add virtual servers, you can update the existing virtual server configuration or delete it. This section contains the following API requests:

- Get List of Virtual Servers
- Get Virtual Server Details
- Add Virtual Server
- Edit Virtual Server
- Delete Virtual Server

4.21.5.5.1 Get List of Virtual Servers
To view the list of virtual servers, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service/virtual_servers.xml
GET /nsx/edges/:edge_id/load_balancer/service/virtual_servers.json

XML Request Example

```bash
curl -i -X GET -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --
url http://onapp.test/nsx/edges/9/load_balancer/service/virtual_servers.xml
```

JSON Request Example

```bash
curl -i -X GET -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --
url http://onapp.test/nsx/edges/9/load_balancer/service/virtual_servers.json
```

XML Output Example
<nsx_load_balancer_virtual_servers type="array">
  <nsx_load_balancer_virtual_server>
    <id type="integer">6</id>
    <identifier>virtualServer-24</identifier>
    <label>vs1</label>
    <description nil="true"/>
    <ip_address>69.168.237.214</ip_address>
    <port>222</port>
    <protocol>tcp</protocol>
    <connection_limit type="integer">0</connection_limit>
    <connection_rate_limit type="integer">0</connection_rate_limit>
    <enabled type="boolean">false</enabled>
    <acceleration type="boolean">false</acceleration>
    <default_pool_id type="integer">2</default_pool_id>
    <load_balancer_service_id type="integer">3</load_balancer_service_id>
    <created_at type="dateTime">2019-11-07T11:44:20Z</created_at>
    <updated_at type="dateTime">2019-11-07T11:44:20Z</updated_at>
    <application_profile_id type="integer">6</application_profile_id>
  </nsx_load_balancer_virtual_server>
  ...
</nsx_load_balancer_virtual_servers>

Where:

- **id** - the ID of the virtual server
- **identifier** - the identifier of the VS
- **label** - the name of a virtual server
- **description** - the description of the VS
- **ip_address** - an IP address that the load balancer is listening on
- **port** - the port number that the load balancer listens on
- **protocol** - http, https, tcp or udp
- **connection_limit** - the maximum concurrent connections that the virtual server can process
- **connection_rate_limit** - the maximum incoming new connection requests per second section
- **enabled** - true if this virtual server is available for use; otherwise, false
- **acceleration** - true if acceleration is enabled for this VS; otherwise, false
- **default_pool_id** - the identifier of the default VSs pool
- **load_balancer_service_id** - the ID of the load balancer service
- **created_at** - the date when the VS was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **updated_at** - the date when the VS was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **application_profile_id** - the ID of the application profile associated with this VS

4.21.5.5.2 Get Virtual Server Details
To view the details of a particular virtual server, use the following request:

GET
/nsx/edges/:edge_id/load_balancer/service/virtual_servers/:virtual_server_id.xml
GET
/nsx/edges/:edge_id/load_balancer/service/virtual_servers/:virtual_server_id.json

XML Request Example

JSON Request Example


XML Output Example

```xml
<nsx_load_balancer_virtual_server>
  <id type="integer">6</id>
  <identifier>virtualServer-24</identifier>
  <label>vs1</label>
  <description nil="true"/>
  <ip_address>69.168.237.214</ip_address>
  <port>222</port>
  <protocol>tcp</protocol>
  <connection_limit type="integer">0</connection_limit>
  <connection_rate_limit type="integer">0</connection_rate_limit>
  <enabled type="boolean">false</enabled>
  <acceleration type="boolean">false</acceleration>
  <default_pool_id type="integer">2</default_pool_id>
  <load_balancer_service_id type="integer">3</load_balancer_service_id>
  <created_at type="dateTime">2019-11-07T11:44:20Z</created_at>
  <updated_at type="dateTime">2019-11-07T11:44:20Z</updated_at>
  <application_profile_id type="integer">6</application_profile_id>
</nsx_load_balancer_virtual_server>
```

Where:
- **id** - ID of the VS
- **identifier** - the identifier of the VS
- **label** - the name of a virtual server
- **description** - the description of the VS
- **ip_address** - an IP address that the load balancer is listening on
- **port** - the port number that the load balancer listens on
- **protocol** - http, https, tcp or udp
- **connection_limit** - the maximum concurrent connections that the virtual server can process
- **connection_rate_limit** - the maximum incoming new connection requests per second section
- **enabled** - true if this virtual server is available for use; otherwise, false
- **acceleration** - true if acceleration is enabled for this VS; otherwise, false
- **default_pool_id** - the ID of the default VSs pool
- **load_balancer_service_id** - the identifier of the load balancer service
- **created_at** - the date when the VS was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **updated_at** - the date when the VS was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **application_profile_id** - the ID of the application profile associated with this VS
4.21.5.5.3 Add Virtual Server
To create a virtual server, use the following request:

POST /nsx/edges/:edge_id/load_balancer/service/virtual_servers.xml
POST /nsx/edges/:edge_id/load_balancer/service/virtual_servers.json

**XML Request Example**

```
```

**JSON Request Example**

```
curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -url http://onapp.test/edge/9/load_balancer/service/virtual_servers.json -d '{"nsx_virtual_server": {"label": "New","description": "New","ip_address": "10.0.0.138","port": "4321","protocol": "tcp","connection_limit": "1","connection_rate_limit": "2","enabled": true,"acceleration": false,"application_profile": "applicationProfile-3","default_pool": "pool-7","application_rules": [{"applicationRule-1"},{"applicationRule-2"}]}'}
```

Where:
- **label** - the name of a virtual server
- **description** - the description of the VS
- **ip_address** - an IP address that the load balancer is listening on
- **port** - the port number that the load balancer listens on
- **protocol** - http, https, tcp or udp
- **connection_limit** - the maximum concurrent connections that the virtual server can process
- **connection_rate_limit** - the maximum incoming new connection requests per second section
- **enabled** - true if this virtual server is available for use; otherwise, false
- **acceleration** - true if acceleration is enabled for this VS; otherwise, false
- **application_profile** - the label of the application profile associated with this VS
- **default_pool** - identifier of the default pool
- **application_rules** - an array of application rules associated with the virtual server

4.21.5.5.4 Edit Virtual Server
To edit virtual servers, use the following request:

PUT /nsx/edges/:edge_id/load_balancer/service/virtual_servers/:virtual_server_id.xml
PUT
/nsx/edges/:edge_id/load_balancer/service/virtual_servers/:virtual_server_id.json

XML Request Example

```
  <nsx_virtual_server>
    <label>New</label>
    <description>New</description>
    <ip_address>10.0.0.138</ip_address>
    <port>4321</port>
    <protocol>tcp</protocol>
    <connection_limit>1</connection_limit>
    <connection_rate_limit>2</connection_rate_limit>
    <enabled type="boolean">true</enabled>
    <acceleration type="boolean">false</acceleration>
    <application_profile>applicationProfile-3</application_profile>
    <default_pool>pool-7</default_pool>
    <application_rules type="array"></application_rules>
  </nsx_virtual_server>
```

JSON Request Example

```
  "nsx_virtual_server": {
    "label": "NEWEST",
    "description": 
     "New",
    "ip_address": "10.0.0.138",
    "port": "4321",
    "protocol": "tcp",
    "connection_limit": "1",
    "connection_rate_limit": "2",
    "enabled": "true",
    "acceleration": "false",
    "application_profile": "applicationProfile-3",
    "default_pool": "pool-7",
    "application_rules": []
  }
}'
```

Where:

- **label** - the name of a virtual server
- **description** - the description of the VS
- **ip_address** - an IP address that the load balancer is listening on
- **port** - the port number that the load balancer listens on
- **protocol** - http, https, tcp or udp
- **connection_limit** - the maximum concurrent connections that the virtual server can process
- **connection_rate_limit** - the maximum incoming new connection requests per second section
- **enabled** - true, if this virtual server is available for use; otherwise, false
- **acceleration** - true, if acceleration is enabled for this VS; otherwise, false
- **application_profile** - the label of the application profile associated with this VS
- **default_pool** - the identifier of the default pool
- **application_rules** - an array of application rules associated with the virtual server

4.21.5.5 Delete Virtual Server

To delete a virtual server, use the following request:

DELETE
/nsx/edges/:edge_id/load_balancer/service/virtual_servers/:virtual_server_id.xml
DELETE
/nsx/edges/:edge_id/load_balancer/service/virtual_servers/:virtual_server_id.json
XML Request Example

```
curl -i -X DELETE -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -
```

JSON Request Example

```
curl -i -X DELETE -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -
```

Returns HTTP 204 response on successful deletion, or HTTP 404 when a VS with the ID specified is not found.

4.21.5.6 Service Monitors

A service monitor defines health check parameters for the load balancer. After you create a service monitor and associate it with a server pool, you can update the existing service monitor or delete it to save system resources. Below you can find the list of operations applicable for NSX-V service monitors:

- Get List of Service Monitors
- Get Service Monitor Details
- Add Service Monitor
- Edit Service Monitor
- Delete Service Monitor

4.21.5.6.1 Get List of Service Monitors

To get the list of service monitors, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service/monitors.xml
GET /nsx/edges/:edge_id/load_balancer/service/monitors.json

XML Request Example

```
curl -i -X GET -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url
http://onapp.test/nsx/edges/3/load_balancer/service/monitors.xml
```

JSON Request Example

```
curl -i -X GET -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url
http://onapp.test/nsx/edges/3/load_balancer/service/monitors.json
```

XML Output Example
<nsx_load_balancer_monitors type="array">
  <nsx_load_balancer_monitor>
    <id type="integer">2</id>
    <identifier>monitor-1</identifier>
    <label>default_tcp_monitor</label>
    <url nil="true"/>
    <expected nil="true"/>
    <send_data nil="true"/>
    <receive_data nil="true"/>
    <type>tcp</type>
    <method_data nil="true"/>
    <interval type="integer">5</interval>
    <timeout type="integer">15</timeout>
    <max_retries type="integer">3</max_retries>
    <load_balancer_service_id type="integer">3</load_balancer_service_id>
    <created_at type="dateTime">2019-11-06T10:16:50Z</created_at>
    <updated_at type="dateTime">2019-11-06T10:16:50Z</updated_at>
  </nsx_load_balancer_monitor>
  <nsx_load_balancer_monitor>
    <id type="integer">9</id>
    <identifier>monitor-5</identifier>
    <label>m1</label>
    <url>/</url>
    <expected nil="true"/>
    <send_data>qwe</send_data>
    <receive_data>qwe</receive_data>
    <extension nil="true"/>
    <type>http</type>
    <method_data>GET</method_data>
    <interval type="integer">0</interval>
    <timeout type="integer">0</timeout>
    <max_retries type="integer">0</max_retries>
    <load_balancer_service_id type="integer">3</load_balancer_service_id>
    <created_at type="dateTime">2019-11-06T10:16:50Z</created_at>
    <updated_at type="dateTime">2019-11-06T10:16:50Z</updated_at>
  </nsx_load_balancer_monitor>
</nsx_load_balancer_monitors>

Where:

id - ID of the service monitor
identifier - identifier of the service monitor
label - label of the service monitor
url - the URL to GET or POST
expected - the string that the monitor expects to match in the status line of HTTP response in the Expected section
send_data - the string sent to the back-end server after a connection is established
receive_data - the string to be matched
extension - advanced monitor parameters as key=value pairs
type - http, https, tcp, icmp or udp
method_data - GET, OPTIONS or POST
interval - the interval in seconds in which a server is to be tested
timeout - the maximum time in seconds within which a response from the server must be received
**max_retries** - the number of times the server is tested before it is declared DOWN

**load_balancer_service_id** - ID of the load balancer service

**created_at** - the date when the service monitor was created in the [YYYY][MM][DD][hh][mm][ss]Z format

**updated_at** - the date when the service monitor was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

### 4.21.5.6.2 Get Service Monitor Details

To get a service monitor details, use the following request:

GET /nsx/edges/:edge_id/load_balancer/service/monitors/:monitor_id.xml
GET /nsx/edges/:edge_id/load_balancer/service/monitors/:monitor_id.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**

```
<nsx_load_balancer_monitor>
    <id type="integer">9</id>
    <identifier>monitor-5</identifier>
    <label>m1</label>
    <url /></url>
    <expected nil="true" />
    <send_data>qwe</send_data>
    <receive_data>qwe</receive_data>
    <extension nil="true" />
    <type>http</type>
    <method_data>GET</method_data>
    <interval type="integer">0</interval>
    <timeout type="integer">0</timeout>
    <max_retries type="integer">0</max_retries>
    <load_balancer_service_id type="integer">3</load_balancer_service_id>
    <created_at type="dateTime">2019-11-06T10:16:50Z</created_at>
    <updated_at type="dateTime">2019-11-06T10:16:50Z</updated_at>
</nsx_load_balancer_monitor>
```

**Where:**

*id* - ID of the service monitor

*identifier* - identifier of the service monitor

*label* - label of the service monitor

*url* - the URL to GET or POST
expected - the string that the monitor expects to match in the status line of HTTP response in the Expected section

send_data - the string sent to the back-end server after a connection is established

receive_data - the string to be matched

extension - advanced monitor parameters as key=value pairs

type - http, https, tcp, icmp or udp

method_data - GET, OPTIONS or POST

interval - the interval in seconds in which a server is to be tested

timeout - the maximum time in seconds within which a response from the server must be received

max_retries - the number of times the server is tested before it is declared DOWN

load_balancer_service_id - ID of the load balancer service

created_at - the date when the service monitor was created in the [YYYY][MM][DD][hh][mm][ss]Z format

updated_at - the date when the service monitor was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

4.21.5.6.3 Add Service Monitor

To add a service monitor, use the following request:

POST /nsx/edges/:edge_id/load_balancer/service/monitors.xml

XML Request Example


JSON Request Example

curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d '{"nsx_monitor": {"label": "TEST", "interval": 5, "timeout": 15, "max_retries": 3, "type": "https", "method_data": "GET", "url": "/", "expected": "asd", "send_data": "asd", "receive_data": "asd", "extension": "asd"}}'

Where:

label - label of the service monitor

interval - the interval in seconds in which a server is to be tested

timeout - the maximum time in seconds within which a response from the server must be received

max_retries - the number of times the server is tested before it is declared DOWN
type - http, https, tcp, icmp or udp

method_data - GET, OPTIONS or POST

url - the URL to GET or POST

expected - the string that the monitor expects to match in the status line of HTTP response in the Expected section

send_data - the string sent to the back-end server after a connection is established

receive_data - the string to be matched

extension - advanced monitor parameters as key=value pairs

4.21.5.6.4 Edit Service Monitor

To edit a service monitor, use the following request:

PUT /nsx/edges/:edge_id/load_balancer/service/monitors/:monitor_id.xml
PUT /nsx/edges/:edge_id/load_balancer/service/monitors/:monitor_id.json

XML Request Example

curl -i -X PUT

JSON Request Example

curl -i -X PUT

Where:

label - label of the service monitor

interval - the interval in seconds in which a server is to be tested

timeout - the maximum time in seconds within which a response from the server must be received

max_retries - the number of times the server is tested before it is declared DOWN

type - http, https, tcp, icmp or udp

method_data - GET, OPTIONS or POST

url - the URL to GET or POST

expected - the string that the monitor expects to match in the status line of HTTP response in the Expected section

send_data - the string sent to the back-end server after a connection is established
**receive_data** - the string to be matched

**extension** - advanced monitor parameters as key=value pairs

### 4.21.5.6.5 Delete Service Monitor
To delete a service monitor, use the following request:

```plaintext
DELETE /nsx/edges/:edge_id/load_balancer/service/monitors/:monitor_id.xml
DELETE /nsx/edges/:edge_id/load_balancer/service/monitors/:monitor_id.json
```

**XML Request Example**

```bash
curl -i -X DELETE -u user:userpass
-H 'Accept: application/xml'
-H 'Content-type: application/xml'
```

**JSON Request Example**

```bash
curl -i -X DELETE -u user:userpass
-H 'Accept: application/json'
-H 'Content-type: application/json'
```

Returns HTTP 204 response on successful deletion, or HTTP 404 when a service monitor with the ID specified is not found.

### 4.21.5.7 Application Rules
You can write an application rule to directly manipulate and manage application traffic. Below you can find the list of operations for application rules:

- [Get List of Application Rules](#)
- [Get Application Rule Details](#)
- [Add Application Rule](#)
- [Edit Application Rule](#)
- [Delete Application Rule](#)

#### 4.21.5.7.1 Get List of Application Rules
To get the list of application rules, use the following request:

```plaintext
GET /nsx/edges/:edge_id/load_balancer/service/application_rules.xml
GET /nsx/edges/:edge_id/load_balancer/service/application_rules.json
```

**XML Request Example**

```bash
curl -i -X GET -H 'Accept: application/xml' -H 'Content-type: application/xml'
-u user:userpass
http://onapp.test/nsx/edges/3/load_balancer/service/application_rules.xml
```

**JSON Request Example**

```bash
curl -i -X GET -H 'Accept: application/json' -H 'Content-type: application/json'
-u user:userpass
http://onapp.test/nsx/edges/3/load_balancer/service/application_rules.json
```

XML Output Example

```xml
<nsx_load_balancer_application_rules type="array">
  <nsx_load_balancer_application_rule>
    <id type="integer">3</id>
    <identifier>applicationRule-1</identifier>
    <label>ar1</label>
    <script>acl block_ACME path_beg -i /cloud/org/acme</script>
    <load_balancer_service_id type="integer">3</load_balancer_service_id>
    <created_at type="dateTime">2019-11-06T10:16:58Z</created_at>
    <updated_at type="dateTime">2019-11-06T10:16:58Z</updated_at>
  </nsx_load_balancer_application_rule>
  <nsx_load_balancer_application_rule>
    <id type="integer">4</id>
    <identifier>applicationRule-2</identifier>
    <label>ar2</label>
    <script>acl block_ACME path_beg -i /cloud/org/acme</script>
    <load_balancer_service_id type="integer">3</load_balancer_service_id>
    <created_at type="dateTime">2019-11-06T10:16:58Z</created_at>
    <updated_at type="dateTime">2019-11-06T10:16:58Z</updated_at>
  </nsx_load_balancer_application_rule>
</nsx_load_balancer_application_rules>
```

Where:

- id - ID of the application rule
- identifier - identifier of the application rule
- label - label of the application rule
- script - script of the application rule
- load_balancer_service_id - ID of the load balancer service
- created_at - the date when the firewall rule was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- updated_at - the date when the firewall rule was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

4.21.5.7.2 Get Application Rule Details

To get the details of an application rule, use the following request

GET
/nsx/edges/:edge_id/load_balancer/service/application_rules/:rule_id.xml
GET
/nsx/edges/:edge_id/load_balancer/service/application_rules/:rule_id.json

XML Request Example
JSON Request Example

```
```

XML Output Example

```
<nsx_load_balancer_application_rule>
  <id type="integer">4</id>
  <identifier>applicationRule-2</identifier>
  <label>ar2</label>
  <script>acl block ACM path_beg -i /cloud/org/acme</script>
  <load_balancer_service_id type="integer">3</load_balancer_service_id>
  <created_at type="dateTime">2019-11-06T10:16:58Z</created_at>
  <updated_at type="dateTime">2019-11-06T10:16:58Z</updated_at>
</nsx_load_balancer_application_rule>
```

Where:

- **id** - ID of the application rule
- **identifier** - identifier of the application rule
- **label** - label of the application rule
- **script** - script of the application rule
- **load_balancer_service_id** - ID of the load balancer service
- **created_at** - the date when the firewall rule was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the firewall rule was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

4.21.5.7.3 Add Application Rule

To add a new application rule, use the following request:

```
POST /nsx/edges/:edge_id/load_balancer/service/application_rules.xml
POST /nsx/edges/:edge_id/load_balancer/service/application_rules.json
```

XML Request Example

```
```

JSON Request Example
curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url
http://onapp.test/nx/edges/9/load_balancer/service/pools.json -d
'{"nsx_application_rule": {"label": "TEST", "script": "script.sh -r - ololo"}}'}

Where:

- **label** - label of the application rule
- **script** - application rule script

4.21.5.7.4 Edit Application Rule
To edit an application rule, use the following request:

PUT /nsx/edges/:edge_id/load_balancer/service/application_rules/:rule_id.xml
PUT /nsx/edges/:edge_id/load_balancer/service/application_rules/:rule_id.json

XML Request Example

curl -i -X PUT -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -url
http://onapp.test/nx/edges/9/load_balancer/service/application
rules/9.xml -d '<nsx_application_rule><label>TEST</label><script>script.sh
-r -avga</script></nsx_application_rule>'

JSON Request Example

curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -url
'{"nsx_application_rule": {"label": "TEST", "script": "script.sh -r - asf"}}'}

Where:

- **label** - label of the application rule
- **script** - application rule script

4.21.5.7.5 Delete Application Rule
To delete an application rule, use the following request:

DELETE /nsx/edges/:edge_id/load_balancer/service/application_rules/:ru
le_id.xml
DELETE /nsx/edges/:edge_id/load_balancer/service/application_rules/:ru
le_id.json

XML Request Example

curl -i -X DELETE -u user:userpass
http://onapp.test/nx/edges/3/load_balancer/service/application_rules/13.x
ml -H 'Accept: application/xml' -H 'Content-type: application/xml'

JSON Request Example
Returns HTTP 204 response on successful deletion, or HTTP 404 when an application rule with the ID specified is not found.

4.21.6 NSX Managers API

The NSX manager is used to deploy a universal controller cluster that provides the control plane for the NSX-V environment. At OnApp, you can import NSX manager with limited functionality available and set vCloud credentials to gain access to full functionality. Once imported, it allows you to view and edit imported vCloud edge gateways in OnApp interface.

Below you can find the list of operations applicable for NSX managers:

- Get List of NSX Managers
- Get NSX Manager Details
- Import NSX Manager
- Update NSX Manager Credentials

4.21.6.1 Get List of NSX Managers

To get the list of NSX managers in your cloud, use the following request:

GET /settings/nsx/managers.xml
GET /settings/nsx/managers.json

XML Request Example

```bash
```

JSON Request Example

```bash
```

XML Output Example
<nsx_managers type="array">
  <nsx_manager>
    <id type="integer">1</id>
    <label>NSX manager for vc-c.onappdev.host</label>
    <api_url>https://nsx-c.onappdev.host:443</api_url>
    <login>admin</login>
    <password>Password1</password>
    <vcenter_type>Nsx::VCloud::VCenter</vcenter_type>
    <vcenter_id type="integer">1</vcenter_id>
    <created_at type="dateTime">2019-11-11T08:00:51Z</created_at>
    <updated_at type="dateTime">2019-11-11T08:28:36Z</updated_at>
    <version>6.4.5 Build 13282012</version>
    <host>nsx-c.onappdev.host</host>
    <status>RUNNING</status>
    <uptime>8 days, 16 hours, 33 minutes</uptime>
  </nsx_manager>
  <nsx_manager>
    <id type="integer">2</id>
    <label>NSX manager for vc-d.onappdev.host</label>
    <api_url>https://nsx-d.onappdev.host:443</api_url>
    <login>admin</login>
    <password nil="true"/>
    <vcenter_type>Nsx::VCloud::VCenter</vcenter_type>
    <vcenter_id type="integer">2</vcenter_id>
    <created_at type="dateTime">2019-11-11T08:00:52Z</created_at>
    <updated_at type="dateTime">2019-11-11T08:00:52Z</updated_at>
    <version nil="true"/>
    <host nil="true"/>
    <status nil="true"/>
    <uptime nil="true"/>
  </nsx_manager>
</nsx_managers>

Where:

- id - the ID of the NSX manager
- label - the label of the NSX manager
- api_url - the URL used to connect to NSX-V
- login - login of the NSX manager
- password - password of the NSX manager
- vcenter_type - Nsx::VCloud::VCenter or Nsx::Hypervisor
- vcenter_id - ID of the vCenter VS
- created_at - the date when the NSX manager was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- updated_at - the date when the NSX manager was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
- version - NSX-V version
- host - hostname of the vCenter VS
- status - STARTING, RUNNING, STOPPING, or STOPPED
- uptime - duration of the uptime

Page History

v.6.3 Edge 1
• removed last_seen_event parameter

4.21.6.2 Get NSX Manager Details
To get an NSX manager details, use the following request:
GET /settings/nsx/managers/:manager_id.xml
GET /settings/nsx/managers/:manager_id.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example

```
<nsx_manager>
  <id type="integer">1</id>
  <label>NSX manager for vc-c.onappdev.lviv</label>
  <api_url>https://nsx-c.onappdev.lviv:443/api_url</api_url>
  <login>admin</login>
  <password>P@ssword1!</password>
  <vcenter_type>Nsx::VCloud::VCenter</vcenter_type>
  <vcenter_id type="integer">1</vcenter_id>
  <created_at type="dateTime">2019-11-11T08:00:51Z</created_at>
  <updated_at type="dateTime">2019-11-11T08:28:36Z</updated_at>
  <version>6.4.5 Build 13282012</version>
  <host>nsx-c.onappdev.lviv</host>
  <status>Running</status>
  <uptime>8 days, 16 hours, 33 minutes</uptime>
</nsx_manager>
```

Where:

- **api_url** - the URL used to connect to NSX-V
- **created_at** - the date when the NSX manager was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date when the NSX manager was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
- **id** - the ID of the NSX manager
- **label** - the label of the NSX manager
- **login** - login of the NSX manager
- **password** - password of the NSX manager
- **vcenter_id** - ID of the vCenter VS
- **vcenter_type** - Nsx::VCloud::VCenter or Nsx::Hypervisor
- **version** - NSX-V version
host - hostname of the vCenter VS
status - STARTING, RUNNING, STOPPING, or STOPPED
uptime - duration of the uptime

Page History
v.6.3 Edge 1
• removed last_seen_event parameter

4.21.6.3 Import NSX Manager
To import an NSX manager, use the following request:
POST /settings/nsx/managers/:manager_id/import.xml
POST /settings/nsx/managers/:manager_id/import.json

XML Request Example
```
```

JSON Request Example
```
```

4.21.6.4 Update NSX Manager Credentials
To update the NSX manager’s credentials, use the following request:
PUT /settings/nsx/managers/:manager_id/credentials.xml
PUT /settings/nsx/managers/:manager_id/credentials.json

XML Request Example
```
```

JSON Request Example
```
curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -d --url http://onapp.test/settings/nsx/managers/4/credentials.json -d '{"nsx_manager_credentials": {"login": "admin", "password": "P@ssword1!"}}'
```

Where:

login - login for this NSX manager
password - the password for this NSX manager
4.21.7 NSX-V NAT API

NAT (Network Address Translation) service translates source or destination IP addresses and port numbers. Below you can find the list of operations applicable for NSX-V NAT services and rules:

- Get NSX-V NAT Service Details
- Edit NSX-V NAT Service
- Get List of NSX-V NAT Rules
- Get NSX-V NAT Rule Details
- Add NSX-V NAT Rule
- Edit NSX-V NAT Rule
- Delete NSX-V NAT Rule

4.21.7.1 Get NSX-V NAT Service Details

To view the details of a particular NSX-V NAT service, use the following request:

GET /nsx/edges/:edge_id/nat/service.xml
GET /nsx/edges/:edge_id/nat/service.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example

```
<nsx_nat_service>
  <id type="integer">3</id>
  <enabled type="boolean">true</enabled>
  <edge_id type="integer">3</edge_id>
  <created_at type="dateTime">2019-11-06T10:16:49Z</created_at>
  <updated_at type="dateTime">2019-11-06T10:16:49Z</updated_at>
  <locked type="boolean">false</locked>
</nsx_nat_service>
```

Where:

- **id** - ID of the NAT service
- **enabled** - true if the NAT service is enabled; otherwise, false
- **edge_id** - the ID of the edge
- **created_at** - the date when the NAT service was created in the [YYYY][MM][DD][T][hh][mm][ss]Z format
- **updated_at** - the date when the NAT service was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format
locked - true, if NAT service is locked; otherwise, false

4.21.7.2 Edit NSX-V NAT Service
To edit the NSX-V NAT service, use the following request:

PUT /nsx/edges/:edge_id/nat/service.xml
PUT /nsx/edges/:edge_id/nat/service.json

XML Request Example

```
curl -i -X PUT -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url http://onapp.test/edges/3/nat/service.xml -d '<nsx_nat_service><enabled type="boolean">true</enabled><nat_rules type="array"><nat_rule><original_port>1</original_port><translated_port>2</translated_port><protocol>tcp</protocol><enabled type="boolean">true</enabled><logging type="boolean">true</logging><rule_type>user</rule_type><interface type="integer">2</interface><action>dnat</action><original_ip>1.1.1.1</original_ip><translated_ip>2.2.2.2</translated_ip><description>desc</description></nat_rule></nat_rules></nsx_nat_service>'
```

JSON Request Example

```
curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass -url http://onapp.test/edges/3/nat/service.json -d '{"nsx_nat_service": {"enabled": true,"nat_rules": [{"original_port": "1","translated_port": "2","protocol": "tcp","enabled": true,"logging": true,"rule_type": "user","interface": 2,"action": "dnat","original_ip": "1.1.1.1","translated_ip": "2.2.2.2","description": " desc"}]}}'}
```

Where:

- enabled - true if the NAT service is enabled; otherwise, false
- nat_rules - an array of the NSX-V NAT rules with the following details:
  - original_port - the port of original IP address
  - translated_port - the port of translated IP address
  - protocol - any, tcp, udp or icpm
  - enabled - true if the rule is enabled; otherwise, false
  - logging - true if logging is enabled; otherwise, false
  - rule_type - user
  - interface - vnic's or sub-interface's index
  - action - DNAT or SNAT
  - original_ip - the original IP address to apply this rule on
  - translated_ip - the IP address to translate the addresses of outgoing packets to
  - description - description of a rule

4.21.7.3 Get List of NAT Rules
To get a list of NSX-V NAT rules, use the following request:

GET /nsx/edges/:edge_id/nat/service/rules.xml
GET /nsx/edges/:edge_id/nat/service/rules.json
XML Request Example


JSON Request Example


XML Output Example

```xml
<nsx_nat_rules type="array">
  <nsx_nat_rule>
    <id type="integer">23</id>
    <action>dnat</action>
    <enabled type="boolean">true</enabled>
    <interface_id type="integer">9</interface_id>
    <identifier>200723</identifier>
    <logging type="boolean">false</logging>
    <nat_service_id type="integer">3</nat_service_id>
    <original_ip>1.1.1.1</original_ip>
    <rule_type>user</rule_type>
    <translated_ip>1.1.1.1</translated_ip>
    <original_port>any</original_port>
    <protocol>any</protocol>
    <icmp_type nil="true"/>
    <description nil="true"/>
    <created_at type="dateTime">2019-11-06T12:45:29Z</created_at>
    <updated_at type="dateTime">2019-11-06T12:45:29Z</updated_at>
    <interface_type>Nsx::NetworkInterface</interface_type>
  </nsx_nat_rule>
</nsx_nat_rules>
```

Where:

- **action** - DNAT or SNAT
- **created_at** - the date when the NAT rule was created in the [YYYY][MM][DD][hh][mm][ss]Z format
- **description** - description of a rule
- **enabled** - true if the rule is enabled; otherwise, false
- **icmp_type** - any, address-mask-request, address-mask-reply, destination-unreachable, echo-request, echo-reply, parameter-problem, redirect, router-advertisement, router-solicitation, source-quench, time-exceeded, timestamp-request and timestamp-reply
- **id** - the ID of the edge
- **identifier** - the identifier of the rule
- **logging** - true if logging is enabled, otherwise, false
- **nat_service_id** - the ID of a NAT service
- **interface_id** - the ID of the network interface
original_ip - the original IP address to apply this rule on
original_port - the port of original IP address
protocol - any, tcp, udp or icpm
rule_type - user or internal_high
translated_ip - the IP address to translate the addresses of outgoing packets to
translated_port - the port of translated IP address
updated_at - the date when the NAT rule was updated in the [YYYY][MM][DD][T][hh][mm][ss]Z format
interface_type - Nsx::NetworkInterface or Nsx::SubInterface

4.21.7.4 Get NSX-V NAT Rule Details
To get details of a particular NSX-V NAT rule, use the following request:

GET /nsx/edges/edge_id/nat/service/rules/:rule_id.xml
GET /nsx/edges/edge_id/nat/service/rules/:rule_id.json

XML Request Example


JSON Request Example


XML Output Example

<nsx_nat_rule>
    <id type="integer">24</id>
    <action>snat</action>
    <enabled type="boolean">true</enabled>
    <interface_id type="integer">9</interface_id>
    <identifier>200724</identifier>
    <logging type="boolean">false</logging>
    <nat_service_id type="integer">3</nat_service_id>
    <original_ip>1.1.1.1</original_ip>
    <rule_type>user</rule_type>
    <translated_ip>1.1.1.1</translated_ip>
    <original_port>any</original_port>
    <protocol>any</protocol>
    <translated_port>any</translated_port>
    <icmp_type nil="true"/>
    <description nil="true"/>
    <created_at type="dateTime">2019-11-06T12:45:29Z</created_at>
    <updated_at type="dateTime">2019-11-06T12:45:29Z</updated_at>
    <interface_type>Nsx::NetworkInterface</interface_type>
</nsx_nat_rule>

Where:

id - the ID of the rule
**action** - DNAT or SNAT

**enabled** - true if the rule is enabled; otherwise, false

**interface_id** - the ID of the network interface

**identifier** - the identifier of the rule

**logging** - true if logging is enabled; otherwise, false

**nat_service_id** - the ID of the NAT service

**original_ip** - the original IP address to apply this rule on

**rule_type** - user or internal_high

**translated_ip** - the IP address to translate the addresses of outgoing packets to

**original_port** - the port of original IP address

**protocol** - any, tcp, udp or icmp

**translated_port** - the port of translated IP address

**icmp_type** - any, address-mask-request, address-mask-reply, destination-unreachable, echo-request, echo-reply, parameter-problem, redirect, router-advertisement, router-solicitation, source-quench, time-exceeded, timestamp-request and timestamp-reply

**description** - description of the rule

**created_at** - the date when the NAT rule was created in the [YYYY][MM][DD][hh][mm][ss]Z format

**updated_at** - the date when the NAT rule was updated in the [YYYY][MM][DD][hh][mm][ss]Z format

**interface_type** - Nsx::NetworkInterface or Nsx::SubInterface

### 4.21.7.5 Add NSX-V NAT Rule

To create a new NSX-V NAT rule, use the following request:

**POST** /nsx/edges/:edge_id/nat/service/rules.xml
**POST** /nsx/edges/:edge_id/nat/service/rules.json

**XML Request Example**

```bash
curl -i -X POST -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass --url http://onapp.test/NSX/edges/3/nat/service/rules.xml -d '<nsx_nat_rule><original_port>1</original_port><translated_port>2</translated_port><protocol>tcp</protocol><enabled type="boolean">true</enabled><logging type="boolean">true</logging><rule_type>user</rule_type><interface type="Integer">2</interface><action>dnat</action><Original_ip>1.1.1.1</Original_ip><Translated_ip>2.2.2.2</Translated_ip><description>dsc</description></nsx_nat_rule>_
```

**JSON Request Example**

```bash
curl -i -X POST -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url http://onapp.test/nxse/edges/3/nat/service/rules.json -d '{"nsx_nat_rule": {"original_port": "1","translated_port": "2","protocol": "tcp","enabled": true,"logging": true,"rule_type": "user","interface": 2,"action": "dnat","original_ip": "1.1.1.1","translated_ip": "2.2.2.2","description": "desc"}}'
```
Where:

original_port - the port of original IP address
translated_port - the port of translated IP address
protocol - any, tcp, udp or icpm
enabled - true if the rule is enabled; otherwise, false
logging - true if logging is enabled, otherwise, false
rule_type - user
interface - vnic's or sub-interface's index
action - DNAT or SNAT
original_ip - the original IP address to apply this rule on
translated_ip - the IP address to translate the addresses of outgoing packets to
description - the description of a NAT rule

4.21.7.6 Edit NAT Rule
To edit a NAT rule, use the following request:

PUT /nsx/edges/:edge_id/nat/service/rules/:rule_id.xml
PUT /nsx/edges/:edge_id/nat/service/rules/:rule_id.json

XML Request Example


JSON Request Example

4.21.7.7 Delete NAT Rule
To delete a NAT rule, use the following request:

DELETE /nsx/edges/:edge_id/nat/service/rules/:rule_id.xml
DELETE /nsx/edges/:edge_id/nat/service/rules/:rule_id.json

XML Request Example


JSON Request Example


Returns HTTP 204 response on successful deletion, or HTTP 404 when a NAT rule with the ID specified is not found.

4.22 NSX-T Integration API

This section provides the API calls you can use to manage NSX-T items imported from vCloud.

• NSX-T Edge Gateways API
• NSX-T Firewall Rules API

4.22.1 NSX-T Edge Gateways API

This section provides the API calls you can use to manage NSX-T edge gateways. Here you can find the following pages:

• Get List of NSX-T Edge Gateways
• Get NSX-T Edge Gateway Details
• Create NSX-T Edge Gateway
• Edit NSX-T Edge Gateway
• Delete NSX-T Edge Gateway

4.22.1.1 Get List of NSX-T Edge Gateways
To view the list of NSX-T edge gateways, use the following request:

GET /nsxt_edge_gateways.xml
GET /nsxt_edge_gateways.json

XML Request Example

curl -i -X GET http://onapp.test/nsxt_edge_gateways.xml -u user:userpass
JSON Request Example

curl -i -X GET http://onapp.test/nsxt_edge_gateways.json -u user:userpass

XML Output Example

```xml
<vcloud_nsxt_edge_gateways type="array">
  <vcloud_nsxt_edge_gateway>
    <id type="integer">5</id>
    <identifier>f0ccf5b-2cfa-4148-a0ee-9e3221c9eace</identifier>
    <label>T1-a1</label>
    <status>REALIZED</status>
    <description>ge changed</description>
    <distributed_routing_enabled type="boolean">true</distributed_routing_enabled>
    <vdc_id type="integer">11</vdc_id>
    <created_at type="dateTime">2021-02-17T00:25:00+02:00</created_at>
    <updated_at type="dateTime">2021-03-15T17:36:24+02:00</updated_at>
  </vcloud_nsxt_edge_gateway>
  <vcloud_nsxt_edge_gateway>
    <id type="integer">20</id>
    <identifier>795c0909-41e7-4e25-a67a-7bba1734a354</identifier>
    <label>RD-NSXT-test-3</label>
    <status>REALIZED</status>
    <distributed_routing_enabled type="boolean">true</distributed_routing_enabled>
    <vdc_id type="integer">29</vdc_id>
    <created_at type="dateTime">2021-02-22T14:05:05+02:00</created_at>
    <updated_at type="dateTime">2021-02-22T14:05:05+02:00</updated_at>
  </vcloud_nsxt_edge_gateway>
</vcloud_nsxt_edge_gateways>
```

Where:

- `vcloud_nsxt_edge_gateways` - array of NSX-T edge gateways
- `vcloud_nsxt_edge_gateway` - an array of parameters related to the NSX edge:
  - `id` - ID of the NSX-T edge gateway
  - `identifier` - identifier of NSX-T edge gateway
  - `label` - the name of the edge gateway
  - `status` - edge gateway status
  - `description` - the description of the edge gateway
  - `distributed_routing_enabled` - true if distributed routing is enabled, otherwise false
  - `vdc_id` - ID of the VDC the edge gateway is associated with
  - `created_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
  - `updated_at` - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
  - `firewalls_locked` - true if transaction UpdateNsxtFirewallRulesOfEdgeGateway is in progress, otherwise false

4.22.1.2 Get NSX-T Edge Gateway Details
To view the details of an edge gateway, use the following request:
GET /nsxt_edge_gateways/:id.xml
GET /nsxt_edge_gateways/:id.json

XML Request example

curl -i -X GET http://onapp.test/nsxt_edge_gateways/22.xml -u
user:userpass

JSON Request Example

curl -i -X GET http://onapp.test/nsxt_edge_gateways/22.json -u
user:userpass

XML Output Example

```xml
<vcloud_nsxt_edge_gateway>
  <id type="integer">5</id>
  <identifier>ef0ccf5b-2cfa-4148-a0ee-9e3221c9eace</identifier>
  <label>T1-a1</label>
  <status>REALIZED</status>
  <description>ge changed</description>
  <distributed_routing_enabled type="boolean">true</distributed_routing_enabled>
  <vdc_id type="integer">11</vdc_id>
  <created_at type="dateTime">2021-02-17T00:25:00+02:00</created_at>
  <updated_at type="dateTime">2021-03-15T17:36:24+02:00</updated_at>
  <firewalls_locked type="boolean">false</firewalls_locked>
</vcloud_nsxt_edge_gateway>
```

Where:

- **id** - ID of NSX-T edge gateway
- **identifier** - identifier of NSX-T edge gateway
- **label** - the name of NSX-T edge gateway
- **status** - NSX-T edge gateway status
- **updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **description** - the description of the edge gateway
- **distributed_routing_enabled** - true if distributed routing is enabled for the edge gateway, otherwise false
- **vdc_id** - ID of the vDC the edge gateway is associated with
- **created_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **updated_at** - the date in the [YYYY][MM][DD][hh][mm][ss]Z format
- **firewalls_locked** - true if transaction UpdateNsxtFirewallRulesOfEdgeGateway is in progress; otherwise false

4.22.1.3 Create NSX-T Edge Gateway

To create an NSX-T edge gateway, use the following request:

PUT /nsxt_edge_gateways/wizard/summary.xml
PUT /nsxt_edge_gateways/wizard/summary.json
XML Request Example

```bash
curl -i -X PUT -u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml' -d '"<vcloud_nsxt_edge_gateway><label>"nsx-t label"</label><description></description><distributed_routing_enabled>true</distributed_routing_enabled><organization_id>"org_id"</organization_id><vdc_id>"vdc_id"</vdc_id><external_network_id>"external_network_id"</external_network_id><primary_ip>"primary_ip"</primary_ip><ip_ranges type="array"><element><start_address>"start_address"</start_address><end_address>"end_address"</end_address></element><element><start_address>"start_address"</start_address><end_address>"end_address"</end_address></element></ip_ranges></vcloud_nsxt_edge_gateway>"
```

JSON Request Example

```bash
curl -i -X PUT -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json' -d '{"vcloud_nsxt_edge_gateway": {"label": "<nsx-t label>", "description": "<nsx-t description>", "distributed_routing_enabled": "false", "organization_id": "<org_id>", "vdc_id": "<vdc_id>", "external_network_id": "<external_network_id>", "primary_ip": "<primary_ip>", "ip_ranges": [{"start_address": "<start_ip>", "end_address": "<end_ip>"}], {"start_address": "<start_ip>", "end_address": "<end_ip>"}]}'}
```

Where:

- `label` - the name of the edge gateway
- `description` - the description of the edge gateway
- `distributed_routing_enabled` - true if distributed routing is enabled, otherwise false
- `organization_id` - ID of vCloud organization on CP
- `vdc_id` - ID of the VDC the edge gateway is associated with
- `external_network_id` - the ID of the external network which will be connected to the edge gateway
- `primary_ip` - public IP address of edge gateway
- `ip_ranges` - allocated IP addresses of an external network to an edge gateway, where:
  - `start_address` - start of the IP addresses range
  - `end_address` - end of the IP addresses range

4.22.1.4 Edit NSX-T Edge Gateway

To edit an edge gateway, use the following request:

PATCH /nsxt_edge_gateways/:id.xml
PATCH /nsxt_edge_gateways/:id
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```bash
curl -i -X PATCH -u 'user:userpass' --url
http://onapp.test/nsxt_edge_gateways/:id>.xml -H 'Accept: application/xml'
-H 'Content-type: application/xml' -d
'\<vcloud_nsxt_edge_gateway\><label>example.label\</label><description>example.description\</description>\</vcloud_nsxt_edge_gateway>'
```

**JSON Request Example**

```bash
curl -i -X PATCH -u 'user:userpass' --url
http://onapp.test/nsxt_edge_gateways/:id>.json -H 'Accept: application/json'
-H 'Content-type: application/json' -d
'\{\"vcloud_nsxt_edge_gateway\":\{\"label\":\"example.label\",
\"description\":\"example.description\"\}\}'
```

Where:

- **label** - the name of the edge gateway
- **description** - the description of the edge gateway

4.22.1.5 Delete NSX-T Edge Gateway

To delete an edge gateway, use the following request:

DELETE /nsxt_edge_gateways/:id.xml

DELETE /nsxt_edge_gateways/:id.json

**XML Request Example**

```bash
curl -i -X DELETE http://onapp.test/nsxt_edge_gateways/:id>.xml -u
user:userpass
```

**JSON Request Example**

```bash
curl -i -X DELETE http://onapp.test/nsxt_edge_gateways/:id>.json -u
user:userpass
```

4.22.2 NSX-T Firewall Rules API

This section contains the API requests you can use to manage NSX-T firewall rules:

- [View Firewall Rules for NSX-T Edge Gateway](#)
- [Create NSX-T Firewall Rule](#)
- [Delete NSX-T Firewall Rule](#)
- [Edit NSX-T Firewall Rule](#)

4.22.2.1 View Firewall Rules for NSX-T Edge Gateway

To get a list of NSX-T firewall rules assigned to the NSX-T edge gateway, use the following request:

GET /nsxt_edge_gateways/id/nsxt_firewall_rules.xml

GET /nsxt_edge_gateways/id/nsxt_firewall_rules.json
XML Request Example

```
curl -i -X GET
http://onapp.test/nsxt_edge_gateways/26/nsxt_firewall_rules.json -u
user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json'
```

JSON Request Example

```
curl -i -X GET
http://onapp.test/nsxt_edge_gateways/26/nsxt_firewall_rules.xml -u
user:userpass -H 'Accept: application/xml' -H 'Content-Type: application/xml'
```

XML Output Example
Where:

- `vcloud_nsxt_firewall_rules` - an array of firewalls rules assigned to NSX-T edge gateway
- `id` - ID of firewall rule
- `identifier` - identifier of firewall rule, which is using to synchronize the firewall rules between vCloud and OnApp
**label** - name of a firewall rule  
**status** - parameter imported from VCD side, is always **nil**  
**description** - parameter imported from VCD side, is always **nil**  
**direction** - direction of traffic from the point of view of the destination object. It can be IN, OUT, and IN_OUT, the default value is IN_OUT. IN means that only traffic to the object is checked, OUT means that only traffic from the object is checked, and IN_OUT means traffic in both directions is checked  
**ip_protocol** - Internet Protocol version, only **IPv4** is supported  
**rule_action** - action applied by the rule. It can be **ALLOW** or **DROP**. The default is **ALLOW**.  
**rule_type** - type of firewall rule in OnApp. It can be only **user_defined**, created on the OnApp side.  
**enabled** - **true**, if the service is enabled; otherwise, **false**  
**logging** - **true**, if logging is enabled for this rule; otherwise, **false**  
**vcloud_nsxt_edge_gateway_id** - ID of NSX-T edge gateway  
**created_at** - the date when the firewall service was created in the [YYYY][MM][DD][hh][mm][ss]Z format  
**updated_at** - the date when the firewall service was updated in the [YYYY][MM][DD][hh][mm][ss]Z format  
**version** - version of a firewall rule. It is 0 when a rule is just created, 1 if it was edited once, 2 if it was edited twice, and so on  

### 4.22.2.2 Create NSX-T Firewall Rule

To create a firewall rule for NSX-T edge gateway, use the following request:

**PUT /nsxt_edge_gateways/:id/nsxt_firewall_rules.xml**

**PUT /nsxt_edge_gateways/:id/nsxt_firewall_rules.json**

**XML Request Example**

```
curl -s -i -X PUT  
http://onapp.test/nsxt_edge_gateways/17/nsxt_firewall_rules.xml  
-u user:userpass  
-H 'Accept: application/xml'  
-H 'Content-type: application/xml'  
-d '<?xml version="1.0" encoding="UTF-8"?>  
<nsxt_firewall_rules type="array">  
<nsxt_firewall_rule>  
<label>label</label>  
<direction>IN</direction>  
<logging>true</logging>  
<action>DROP</action>  
</nsxt_firewall_rule>  
<nsxt_firewall_rule>  
<label>label2</label>  
<direction>IN</direction>  
<logging>true</logging>  
<action>DROP</action>  
</nsxt_firewall_rule>  
</nsxt_firewall_rules>  
```  

**JSON Request Example**

```
curl -s -i -X PUT  
http://onapp.test/nsxt_edge_gateways/17/nsxt_firewall_rules.json  
-u user:userpass  
-H 'Accept: application/json'  
-H 'Content-type: application/json'  
-d '{"nsxt_firewall_rules": [{"label":"label555","action":"DROP","logging":"true","sources": [{"type":"ip_set","identifier":"b26fae09-b13f-42dc-be8a-16cbff5dc467"}]}, {"label":"label77","action":"DROP","logging":"true","destinations": [{"type":"security_group","identifier":"f87b2635-2f82-4f5f-a429-d46f0c188f381"}]}}'  
```  

Where:  
**nsxt_firewall_rules** - an array of firewall rules assigned to an NSX-T edge gateway  
**label** - the name of the NSX-T firewall rule  
**direction** - the direction of traffic from the point of view of the destination object. Can **IN**, **OUT**, and **IN/OUT**; **IN** means that only traffic to the object is checked, **OUT** means that only traffic
from the object is checked, and IN/OUT means traffic in both directions is checked. The default is IN/OUT.

logging - true if logging is enabled for the rule; otherwise false.

action - action applied by the rule; can be ALLOW or DROP. The default is ALLOW.

4.22.2.3 Delete NSX-T Firewall Rule

4.22.2.3.1 Delete NSX-T Firewall Rule

To delete a particular firewall rule assigned to an NSX-T edge gateway, use the following request:

PUT /nsxt_edge_gateways/:id/nsxt_firewall_rules.xml
PUT /nsxt_edge_gateways/:id/nsxt_firewall_rules.json

JSON Request Example

```
curl -s -i -X PUT
http://onapp.test/nsxt_edge_gateways/17/nsxt_firewall_rules.json -u
user:userpass -H 'Accept: application/json' -H 'Content-type:
application/json' -d
"{"nsxt_firewall_rules": [{"id": 34, "label": "label32", "action": "DROP", "logging": "true", "identifier": "ee6c52db-0106-4d22-9881-b7eb7f88f72", "sources": [{"type": "ip_set", "identifier": "b26fae09-b13f-42dc-be8a-16cbff5dc467"}]}}}"
```

XML Request Example

```
curl -s -i -X PUT
http://onapp.test/nsxt_edge_gateways/17/nsxt_firewall_rules.xml -u
user:userpass -H 'Accept: application/xml' -H 'Content-type:
application/xml' -d '<nsxt_firewall_rules type="array">
<nsxt_firewall_rule>
  <label>label3</label>
  <identifier>4ed62bf3-dd22-44ec-90f1-1780ccccf6e</identifier>
  <direction>IN</direction>
  <logging>true</logging>
  <action>DROP</action>
</nsxt_firewall_rule>
</nsxt_firewall_rules>
```

Where:

nsxt_firewall_rules - an array of firewall rules assigned to NSX-T edge gateway

label - the name of NSX-T firewall rule

identifier - identifier of NSX-T firewall rule

direction - the direction of traffic from the point of view of the destination object. Can IN, OUT, and IN/OUT; IN means that only traffic to the object is checked, OUT means that only traffic from the object is checked, and IN/OUT means traffic in both directions is checked. The default is IN/OUT.

logging - true if logging is enabled for the rule; otherwise false.

action - action applied by the rule; can be ALLOW or DROP. The default is ALLOW.

4.22.2.3.2 Delete All NSX-T Firewall Rules

To delete all firewall rules assigned to a particular NSX-T edge gateway, use the following request:

PUT /nsxt_edge_gateways/:id/nsxt_firewall_rules.xml
PUT /nsxt_edge_gateways/:id/nsxt_firewall_rules.json

JSON Request Example
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```
curl -s -i -X PUT
http://onapp.test/nsxt_edge_gateways/17/nsxt_firewall_rules.json -u
user:userpass -H 'Accept: application/json' -H 'Content-type:
application/json' -d '{"nsxt_firewall_rules":[]}'
```

**XML Request Example**

```
curl -s -i -X PUT
http://onapp.test/nsxt_edge_gateways/17/nsxt_firewall_rules.xml -u
user:userpass -H 'Accept: application/xml' -H 'Content-type:
application/xml' -d '<?xml version="1.0" encoding="UTF-8"?>
<nsxt_firewall_rules type="array"> <nsxt_firewall_rule>
  <label>label</label>
  <direction>IN</direction>
  <logging>true</logging>
  <action>DROP</action>
  <sources type="array">
    <source>
      <type>ip_set</type>
      <identifier>9BC5E5CD-DB19-114F-11AE-F6511649581C</identifier>
    </source>
  </sources>
  <destinations type="array">
    <destination>
      <type>security_group</type>
      <identifier>9958CBF9-D3BA-24D2-B62D-3A322371E190</identifier>
    </destination>
  </destinations>
  <applications type="array">
    <application>
      <identifier>5235603B-6DC9-6E77-C584-B2F209CA647</identifier>
    </application>
  </applications>
</nsxt_firewall_rule>
</nsxt_firewall_rules>'
```

**JSON Request Example**

```
curl "http://onapp.test/nsxt_edge_gateways/13/nsxt_firewall_rules.xml" -d
'<?xml version="1.0" encoding="UTF-8"?>
<nsxt_firewall_rules type="array">
  <nsxt_firewall_rule>
    <label>label</label>
    <direction>IN</direction>
    <logging>true</logging>
    <action>DROP</action>
    <sources type="array">
      <source>
        <type>ip_set</type>
        <identifier>9BC5E5CD-DB19-114F-11AE-F6511649581C</identifier>
      </source>
    </sources>
    <destinations type="array">
      <destination>
        <type>security_group</type>
        <identifier>9958CBF9-D3BA-24D2-B62D-3A322371E190</identifier>
      </destination>
    </destinations>
    <applications type="array">
      <application>
        <identifier>5235603B-6DC9-6E77-C584-B2F209CA647</identifier>
      </application>
    </applications>
  </nsxt_firewall_rule>
</nsxt_firewall_rules>'
```
You will get a 204 status response on success, and 404 if there is no such NSX-T edge gateway with a requested ID or you entered an incorrect URL.

**Where:**

- **nsxt_firewall_rules** - an array of firewall rules assigned to an NSX-T edge gateway
- **label** - the label of the firewall rule
- **direction** - the direction of traffic from the point of view of the destination object. Can IN, OUT, and IN/OUT; IN means that only traffic to the object is checked, OUT means that only traffic from the object is checked, and IN/OUT means traffic in both directions is checked. The default is IN/OUT
- **logging** - true, if logging is enabled for this rule; otherwise, false
- **action** - accept or deny
- **sources** - an array of IP sets and security groups
  - **type** - type of source, can be either `ip_set` or `security_group`
  - **identifier** - identifier of a source
- **destinations** - an array of destinations for the rule
  - **type** - type of a destination, can be either `security_group` or `ip_set`
  - **identifier** - identifier of a destination
- **applications** - an array of application port profiles used for the rule
  - **identifier** - identifier of an application port profile