OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)
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<td>3.13</td>
<td>vCenter Virtual Servers Disks</td>
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<tr>
<td>3.13.1</td>
<td>Edit vCenter Virtual Servers Disks</td>
</tr>
<tr>
<td>3.13.2</td>
<td>Migrate vCenter Virtual Servers Disks</td>
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<td>3.13.3</td>
<td>Delete vCenter Virtual Servers Disks</td>
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<td>Add Disks to vCenter Virtual Server</td>
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<td>3.14</td>
<td>vCenter Virtual Servers Statistics</td>
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<td>3.14.1</td>
<td>vCenter Virtual Servers CPU Utilization</td>
</tr>
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<td>3.14.2</td>
<td>vCenter Virtual Servers Billing Statistics</td>
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<td>3.14.3</td>
<td>vCenter Virtual Servers Network Interface Statistics</td>
</tr>
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<td>3.14.4</td>
<td>vCenter Virtual Servers Disk IOPS</td>
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<tr>
<td>3.15</td>
<td>Manage vCenter Virtual Servers Recipes</td>
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<td>Manage vCenter Virtual Servers Custom Variables</td>
</tr>
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<td>3.17</td>
<td>VMware Virtual Servers Snapshots</td>
</tr>
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<td>3.18</td>
<td>vCenter VS Console</td>
</tr>
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<td>3.19</td>
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</tr>
<tr>
<td>3.19.1</td>
<td>View vCenter Resource Pool</td>
</tr>
<tr>
<td>3.19.2</td>
<td>Create vCenter Resource Pool</td>
</tr>
<tr>
<td>3.19.3</td>
<td>Edit vCenter Resource Pool</td>
</tr>
<tr>
<td>3.19.4</td>
<td>Delete vCenter Resource Pool</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>4.1</td>
<td>Import vCenter VS</td>
</tr>
<tr>
<td>4.2</td>
<td>Resync vCenter VS</td>
</tr>
<tr>
<td>4.3</td>
<td>Auto Import Rules</td>
</tr>
<tr>
<td>4.3.1</td>
<td>Get List of Auto Import Rules</td>
</tr>
<tr>
<td>4.3.2</td>
<td>Add Auto Import Rule</td>
</tr>
<tr>
<td>4.3.3</td>
<td>Run Auto Import Rule</td>
</tr>
<tr>
<td>4.3.4</td>
<td>Edit Auto Import Rule</td>
</tr>
<tr>
<td>4.3.5</td>
<td>Delete Auto Import Rule</td>
</tr>
<tr>
<td>4.4</td>
<td>Add vCenter VS</td>
</tr>
<tr>
<td>4.5</td>
<td>Clone vCenter VS</td>
</tr>
<tr>
<td>4.6</td>
<td>Add vCenter Compute Zone</td>
</tr>
<tr>
<td>4.7</td>
<td>Add vCenter Compute Resources</td>
</tr>
<tr>
<td>4.8</td>
<td>Edit vCenter Compute Resources</td>
</tr>
<tr>
<td>4.9</td>
<td>vCenter Templates API</td>
</tr>
<tr>
<td>4.9.1</td>
<td>Get List of vCenter Templates</td>
</tr>
<tr>
<td>4.9.2</td>
<td>Update vCenter Template</td>
</tr>
<tr>
<td>4.10</td>
<td>vCenter Resource Pool API</td>
</tr>
<tr>
<td>4.10.1</td>
<td>Get List of Resource Pools</td>
</tr>
<tr>
<td>4.10.2</td>
<td>Add vCenter Resource Pool</td>
</tr>
<tr>
<td>4.10.3</td>
<td>Edit vCenter Resource Pool</td>
</tr>
<tr>
<td>4.10.4</td>
<td>Delete vCenter Resource Pool</td>
</tr>
<tr>
<td>4.10.5</td>
<td>Change vCenter Resource Pool Owner</td>
</tr>
<tr>
<td>4.11</td>
<td>vCenter Servers API</td>
</tr>
<tr>
<td>4.11.1</td>
<td>Get List of vCenter Servers</td>
</tr>
<tr>
<td>4.11.2</td>
<td>Add vCenter Server</td>
</tr>
<tr>
<td>4.11.3</td>
<td>Edit vCenter Server</td>
</tr>
<tr>
<td>4.11.4</td>
<td>Delete vCenter Server</td>
</tr>
</tbody>
</table>
vCenter integration functionality is currently in beta.

This guide provides the info on how you can integrate vCenter into OnApp.

VMware vCenter is a virtualization technology available for integration into OnApp. Use of the VMware vSphere 5 virtualization platform allows you to build a virtualized cloud infrastructure utilizing the highest standards of reliability and performance.

OnApp Cloud integration allows you to run and manage VMware ESXi compute resources alongside with Xen and KVM compute resources using the OnApp Control Panel.

In OnApp all the ESXi compute resources are displayed as a single combined compute resource with a sum of the CPU, RAM and Disk resources rather than individual compute resources.

The following diagram shows how the integration works:
1 Get Started

OnApp provides support for vCenter 7 starting from OnApp 6.3.

OnApp Cloud integration allows you to run and manage VMware ESXi compute resources alongside Xen and KVM compute resources using the OnApp Control Panel. In OnApp, all the ESXi compute resources are displayed as a single combined compute resource with a sum of the CPU, RAM, and Disk resources rather than individual compute resources.

The following diagram shows how the integration works:

![Diagram showing OnApp Cloud integration with vCenter](image)

This guide contains information on how to configure your vCenter and OnApp integration. Refer to one of the following sections for details:

- Install Control Panel Server
- vCenter Installation

For information on how to manage vCenter related resources in OnApp UI, refer to the Administration or the User guide. For information on how to manage vCenter related resources via OnApp API, refer to the API guide.

1.1 Technical Details And Requirements

This chapter provides information on software and hardware requirements for OnApp to integrate with VMware vCenter. You may also find the information on architecture and networking models.

1.1.1 vCenter Cloud Requirements

If you are looking to run VMware ESXi servers through OnApp, then you will require an external installation of vCenter. These can be installed on virtual servers, if necessary, but should not be hosted inside OnApp.

The OnApp Control Panel server communicates with vCenter over the OnApp management network.

The following are the requirements for VMware integration with OnApp Control Panel:

- vCenter ESXi hosts must be organized into Clusters.
OnApp can only deploy and manage vCenter VSs connected to a dvPortGroup. All hosts in your cluster(s) must be connected to a DvSwitch or vSwitch.

Since VSS networks cannot be managed on OnApp side, it will not be possible to configure traffic shaping for them, so the *Port speed* field at the Edit NIC page and the Resources step of the VS Creation wizard will be disabled.

- At least one data store on the ESXi hosts is required for the virtual server provisioning. Make sure that this data store is accessible to all ESXi hosts in a Cluster. NOTE: The data store name will be used on the Control Panel.

- Ensure that the OnApp Control Panel server has admin access to vCenter and all of the ESXi hosts.

### 1.1.2 Networking

The OnApp Control Panel server communicates with vCenter over the OnApp management network. Below you can find a scheme, which shows network creation workflow in OnApp and in vCenter.

The following network mapping shows dependencies between vCenter and OnApp network components:

<table>
<thead>
<tr>
<th>vCenter</th>
<th>OnApp</th>
</tr>
</thead>
<tbody>
<tr>
<td>dvPortGroup</td>
<td>Equals</td>
</tr>
<tr>
<td>dvPortGroup VLAN</td>
<td>Equals</td>
</tr>
<tr>
<td>dvPortGroup Name</td>
<td>Equals</td>
</tr>
<tr>
<td>&lt;Nothing Here&gt;</td>
<td></td>
</tr>
<tr>
<td>dvPortGroup MoRef</td>
<td></td>
</tr>
</tbody>
</table>
1.1.2.1 Requirements

There is a set of requirements for managing vCenter networks, network zones and compute resources in OnApp Control Panel. Follow the requirements listed below to ensure the proper operation of your vCenter.

If you don't meet the requirements listed in this document, you won't be able to upgrade to OnApp 5.8. The upgrade will not be performed if any of the following network issues are detected in your vCenter.

1.1.2.1.1 Network Requirements

The following requirements are applicable to managing vCenter networks in OnApp CP:

- The network cannot be attached to a compute zone if this zone has more than one compute resource and one of them is vCenter-based.
- The network can be attached only to one vCenter compute resource.
- The network cannot be shared between vCenter compute resources.
- If any network in OnApp is already attached to a compute resource, it cannot be attached to a vCenter compute resource.

1.1.2.1.2 Network Zone Requirements

The following network zone requirements are applicable to vCenter:

- In one network zone, you can have networks that are assigned to vCenter and networks that are assigned to Xen/KVM compute resources.
- vCenter networks are imported into one network zone and you can move them to different zones.
1.1.2.1.3 Compute Resource Requirements

The following compute resource requirements are related to vCenter networks:

- The vCenter compute resource cannot be assigned to a compute zone if this zone already has any compute resources and attached networks.
- The compute resource that does not belong to vCenter cannot be assigned to a compute zone if this compute zone has vCenter compute resource and attached networks.

1.1.3 Supported Functionality

Here is the list of the current vCenter 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><strong>Virtual Servers</strong></td>
<td>view</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>import</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>create</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>edit</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>build manually</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>reboot</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>suspend</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>shut down</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>startup</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>rebuild network</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>change owner</td>
<td>5.5 and up</td>
</tr>
<tr>
<td></td>
<td>use VS console</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>back up by Veeam plugin</td>
<td>5.9 and up</td>
</tr>
<tr>
<td></td>
<td>migrate to KVM</td>
<td>5.10 and up</td>
</tr>
<tr>
<td><strong>VS Disks</strong></td>
<td>add</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>edit</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>migrate</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>VS Network Interface</strong></td>
<td>view</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>add</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>view network speed</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>edit network speed</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>VS IP Addresses</strong></td>
<td>allocate</td>
<td>5.4 and up</td>
</tr>
</tbody>
</table>
### Functionality Supported Actions Version

<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>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>view billing statistics</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>view network interface statistics</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>view disk statistics</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>VS Recipes</strong></td>
<td>view</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>assign</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>remove</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>VS Recipe Custom Variables</strong></td>
<td>view</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>create</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>edit</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>VS Snapshots</strong></td>
<td>view</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>create</td>
<td>5.4 and up</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>VS Templates</strong></td>
<td>create</td>
<td>5.4 and up</td>
</tr>
<tr>
<td><strong>OVA</strong></td>
<td>upload</td>
<td>5.4 and up</td>
</tr>
</tbody>
</table>

### 1.1.4 OnApp Hardware Requirements

To integrate OnApp with vCenter you’ll need to configure an environment according to the following hardware requirements in order to host the OnApp platform:

- **Control Panel Server**
  - You simply need to deploy an OnApp Control Panel Server with the following specs:

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Minimum</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>4-8 Cores</td>
<td>8-16 Cores</td>
</tr>
<tr>
<td>Memory</td>
<td>16GB</td>
<td>32GB</td>
</tr>
<tr>
<td>Disk</td>
<td>100GB</td>
<td>250GB</td>
</tr>
<tr>
<td>Network Adapters</td>
<td>Dual port 1Gbps</td>
<td>Dual port 1Gbps</td>
</tr>
<tr>
<td>OS</td>
<td>CentOS 6 x64</td>
<td>CentOS 7 x64</td>
</tr>
</tbody>
</table>

- **Template Server (optional)**
  -
If you wish to build a central template repo you need to deploy an additional template server, with the following specs:

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Minimum</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>2-4 Cores</td>
<td>4-8 Cores</td>
</tr>
<tr>
<td>Memory</td>
<td>8GB</td>
<td>16GB</td>
</tr>
<tr>
<td>Disk</td>
<td>100GB</td>
<td>250GB</td>
</tr>
<tr>
<td>Network Adapters</td>
<td>Dual port 1Gbps</td>
<td>Dual port 1Gbps</td>
</tr>
</tbody>
</table>

- **Network**

The diagram below shows an example of how you should set up your OnApp for vCenter integration:

1.1.5 Implementation Details

This diagram shows the relationship between OnApp and vCenter:
At the moment the following components are synchronized between vCenter and OnApp:

- Networks
- Data stores
- Compute resource changes
- Certain VS changes (amount of CPU, RAM, etc.)

Below you can find the compatibility matrix for vCenter and OnApp versions:

<table>
<thead>
<tr>
<th>Versions</th>
<th>vCenter 5.5</th>
<th>vCenter 6.0</th>
<th>vCenter 6.5</th>
<th>vCenter 6.7</th>
<th>vCenter 7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>OnApp 6.4</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>OnApp 6.3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp 6.2</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp 6.1</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OnApp 6.0</td>
<td>✓**</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓*</td>
</tr>
</tbody>
</table>

*Starting from the [OnApp 6.0.0-98](#) update.

**[OnApp 6.0.0-283](#)** update is the last update that supports vCenter 5.5 in OnApp 6.0.

### 1.2 Installation And Upgrade

This chapter covers the topics on installation procedure and upgrade, as well as the changes in the OnApp Control Panel.

#### 1.2.1 vCenter Installation

There is a set of requirements to vCenter networks, network zones and compute resources in OnApp Control Panel. If you don't meet the requirements listed in the linked document, you won't be able to upgrade to OnApp 6.0. The upgrade will not be performed if any of the network issues are detected in your vCenter.
Follow these guidelines to install and configure VMware vCenter:

- Install the VMware vCenter server by following VMware documentation instructions.
- Create an administrator account on the vCenter server or use the default administrator account with full admin permissions.
- Create a new Datacenter.
- Create a new Cluster and keep DRS enabled.
- Install and add ESXi hosts to the Cluster.
- Create a vSphere Distributed Switch and add the ESXi hosts to the switch.
- Add a data store that is accessible to all ESXi hosts in the Cluster.
- Make sure the vCenter/ESXi TCP 443 port is open for incoming connections from the OnApp Control Panel.
- Use NTP for all environments for correct time synchronization.

1.2.2 Install Control Panel Server

- Use corresponding option of the Control Panel installer in case MySQL is already installed and configured.
- Installer output is redirected to ./onapp-cp-install.log
- All installer critical errors are in /var/log/messages
- This instruction is applicable for installing OnApp 6.0 Patch 2

To install Control Panel server, perform the following procedure:

1. Update your server:

   ```
   # yum update
   ```

2. Download OnApp YUM repository file:

   ```
   # rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-6.5.noarch.rpm
   ```

3. Install OnApp Control Panel installer package:

   ```
   #> yum install onapp-cp-install
   ```

4. (Optional) You can optionally apply the Control Panel custom configuration. It is important to set the custom values before the installer script runs.

   **Edit the /onapp/onapp-cp.conf file to set Control Panel custom values**
# Template server URL

```
TEMPLATE_SERVER_URL='http://templates-manager.onapp.com/
```

# IPs (separated with coma) list for the snmp to trap

```
SNMP_TRAP_IPS=
```

# OnApp Control Panel custom version

```
ONAPP_VERSION=
```

# OnApp MySQL/MariaDB connection data (database.yml)

```
ONAPP_CONN_WAIT_TIMEOUT=15
ONAPP_CONN_POOL=30
ONAPP_CONN_RECONNECT='true'
ONAPP_CONN_ENCODING='utf8'
ONAPP_CONN_SOCKET='/var/lib/mysql/mysql.sock'
```

# MySQL/MariaDB server configuration data (in case of local server)

```
MYSQL_WAIT_TIMEOUT=604800
MYSQL_MAX_CONNECTIONS=500
MYSQL_PORT=3306
```

# Use MariaDB instead of MySQL as OnApp database server

```
WITH_MARIADB=0
```

# Configure the database server relative amount of available RAM

```
TUNE_DB_SERVER=0
```

# The number of C data structures that can be allocated before triggering the garbage collector. It defaults to 8 million

```
RUBY_GC_MALLOC_LIMIT=16000000
```

# sysctl.conf net.core.somaxconn value

```
NET_CORE_SOMAXCONN=2048
```
# The root of OnApp database dump directory (on the Control Panel box)

```
ONAPP_DB_DUMP_ROOT=
```

# Remote server's (to store database dumps) IP, user, path, openssh connection options ans number of dumps to keep

```
DB_DUMP_SERVER=
DB_DUMP_USER=root
DB_DUMP_SERVER_ROOT=/onapp/backups
DB_DUMP_SERVER_SSH_OPT="-o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null -o PasswordAuthentication=no"
KEEP_DUMPS=168
DB_DUMP_CRON='40 * * * *'
```

# Enable monit - tool for managing and monitoring Unix systems

```
ENABLE_MONIT=1
```

# If enabled (the 1 value is set) - install (if local box) and configures RabbitMQ Server (messaging system) for the vCloud support.

```
ENABLE_RABBITMQ=1
```

# Rotate transactions' log files created more then TRANS_LOGS_ROTATE_TIME day(s) ago

```
TRANS_LOGS_ROTATE_TIME=30
```

# Maximum allowed for uploading file size in bytes, from 0 (meaning unlimited) to 2147483647 (2GB). Default is 0.

```
MAX_UPLOAD_SIZE=1073741824
```

# Timeout before ping Redis Server to check if it is started. Default is 5 sec.

```
REDIS_PING_TIMEOUT=5
```

# OnApp Control Panel SSL certificates (please do not change if you aren't familiar with SSL certificates)

```
SSL_CERT_COUNTRY_NAME=UK
SSL_CERT_ORGANIZATION_NAME='OnApp Limited'
SSL_CERT_ORGANIZATION_ALUNITNAME='OnApp Cloud'
SSL_CERT_COMMON_NAME=`hostname --fqdn 2>/dev/null`
```
5. Run the Control Panel installer:

```bash
#> /onapp/onapp-cp-install/onapp-cp-install.sh -i SNMP_TRAP_IPS
```

The full list of Control Panel installer options:

**Usage:**

```
```

**Where:**
Usage:

```
```

<table>
<thead>
<tr>
<th>MYSQL_*</th>
<th>Options are useful if MySQL is already installed and configured.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-m MYSQL_HOST</td>
<td>MySQL host</td>
</tr>
<tr>
<td>-p MYSQL_PASSWD</td>
<td>MySQL password</td>
</tr>
<tr>
<td>-d MYSQL_DB</td>
<td>OnApp MySQL database name</td>
</tr>
<tr>
<td>-u MYSQL_USER</td>
<td>MySQL user</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REDIS_</th>
<th>Options are useful if Redis Server is already installed and configured.</th>
</tr>
</thead>
<tbody>
<tr>
<td>--redis-host=REDIS_HOST</td>
<td>IP address/FQDN where Redis Server runs. The Redis Server will be installed and configured on the current box if localhost/127.0.0.1 or box's public IP address (listed in SNMP_TRAP_IPS) is specified. If local Redis, it will serve as well on the unix socket '/tmp/redis.sock'. Default value is 127.0.0.1.</td>
</tr>
<tr>
<td>--redis-port=REDIS_PORT</td>
<td>Redis Server listen port. Defaults are: 0 - if local server 6379 - if remote server</td>
</tr>
<tr>
<td>--redis-passwd=REDIS_PASSWD</td>
<td>Redis Server password to authentificate. Random password is generated if the option's argument isn't specified. By default no password is used for local Redis.</td>
</tr>
<tr>
<td>--redis-sock=REDIS_PATH :</td>
<td>Path to the Redis Server's socket. Used if local server only. Default is /tmp/redis.sock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADMIN_</th>
<th>Options are used to configure OnApp Control Panel administrator data. Please note, that these options are for NEW INSTALL only and not for upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>-P ADMIN_PASSWD</td>
<td>CP administrator password</td>
</tr>
<tr>
<td>-F ADMIN_FIRSTNAME</td>
<td>CP administrator first name</td>
</tr>
</tbody>
</table>
Usage:

```

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-L ADMIN_LASTNAME</td>
<td>CP administrator last name</td>
</tr>
<tr>
<td>-E ADMIN_EMAIL</td>
<td>CP administrator e-mail</td>
</tr>
<tr>
<td>--rbthost RBT_HOST</td>
<td>IP address/FQDN where RabbitMQ Server runs.</td>
</tr>
<tr>
<td></td>
<td>The RabbitMQ will be installed and configured</td>
</tr>
<tr>
<td></td>
<td>on the current box if localhost/127.0.0.1 or</td>
</tr>
<tr>
<td></td>
<td>box's public IP address (enlisted in SNMP_TRAP_IPS) Default values are 127.0.0.1.</td>
</tr>
<tr>
<td>VCD_*</td>
<td>Options are useful if vCloud/RabbitMQ are</td>
</tr>
<tr>
<td></td>
<td>already installed and configured.</td>
</tr>
<tr>
<td>--vcdlogin VCD_LOGIN</td>
<td>RabbitMQ/vCloud user. Default value is 'rbtvcd'.</td>
</tr>
<tr>
<td>--vcdpasswd VCD_PASSWD</td>
<td>RabbitMQ/vCloud user password. The random</td>
</tr>
<tr>
<td></td>
<td>password is generated if isn't specified.</td>
</tr>
<tr>
<td>--vcdvhost VCD_VHOST</td>
<td>RabbitMQ/vCloud vhost. Default value is '/'</td>
</tr>
<tr>
<td>RBT_*</td>
<td>Options are used to configure RabbitMQ manager</td>
</tr>
<tr>
<td></td>
<td>account. If local RabbitMQ server.</td>
</tr>
<tr>
<td>--rbtlogin RBTLOGIN</td>
<td>RabbitMQ manager login. The default value is</td>
</tr>
<tr>
<td></td>
<td>'rbtmgr'.</td>
</tr>
<tr>
<td>--rbtpassword RBT_PASSWD</td>
<td>RabbitMQ manager password. The random</td>
</tr>
<tr>
<td></td>
<td>password is generated if isn't specified.</td>
</tr>
<tr>
<td>-v ONAPP_VERSION</td>
<td>Install custom OnApp CP version</td>
</tr>
<tr>
<td>-i SNMP_TRAP_IPS</td>
<td>IP addresses separated with coma for snmp to</td>
</tr>
<tr>
<td></td>
<td>trap</td>
</tr>
<tr>
<td>-c CONFIG_FILE</td>
<td>Custom installer configuration file. Otherwise,</td>
</tr>
<tr>
<td></td>
<td>preinstalled one is used.</td>
</tr>
<tr>
<td>-y</td>
<td>update OS packages (except of OnApp provided) on</td>
</tr>
<tr>
<td></td>
<td>the box with 'yum update'.</td>
</tr>
<tr>
<td>-a</td>
<td>do not be interactive. Process with automatic</td>
</tr>
<tr>
<td>-D</td>
<td>do not make database dump, and make sure it is</td>
</tr>
<tr>
<td></td>
<td>disabled in the cron and not running at the</td>
</tr>
<tr>
<td></td>
<td>moment</td>
</tr>
</tbody>
</table>
**Usage:**

```
```

```
-h  print this info
```

6. *(Optional)* Install CloudBoot dependencies:

```
#> yum install onapp-store-install
#> /onapp/onapp-store-install/onapp-store-install.sh
```

7. Install OnApp license to activate the Control Panel. Enter a valid license key via the Web UI (you'll be prompted to do so). Your default OnApp login is *admin/changeme*. The password can be changed via the Control Panel > **Cloud** > **Groups** menu in the Control Panel.

Once you have entered a license it can take up to 15 minutes to activate.

8. Restart the OnApp service:

```
#> service onapp restart
```
2 Administration Guide

This guide contains information on how administrators can manage vCenter related resources via OnApp UI. Refer to one of the following sections for detailed information:

- Control Panel Configuration
- Import vCenter Templates
- Manage vCenter Templates
- vCenter OVA Upload to OnApp
- Create vCenter Compute Resource
- Edit vCenter Compute Resource
- Create vCenter Compute Zone
- Manual IP Nets
- Import vCenter Virtual Server
- vCenter Virtual Servers
- vCenter Virtual Server Recipes
- NSX Integration
- Create and Manage vCenter Resource Pools
- vCenter Servers
- Statistic
- vCenter Permissions

For information on the vCenter related functionality available to users with the default role ‘user’ in OnApp, refer to the User Guide.

For information on the API requests, you can use to manage vCenter related resources, refer to the API Guide.

2.1 Control Panel Configuration

Read the steps described in this section carefully to get a common notion of the VMware vCenter configuration within the OnApp cloud.

To configure VMware vCenter on Control Panel:

1. Create new vCenter compute resource in the compute resource settings. See the Create vCenter Compute Resource section for details how to do that. A transaction will be launched to import all networks and data stores:
   a. Go to your Control Panel > Settings > Compute Resources > click the label of the necessary vCenter compute resource to see its details.
   b. On the page that appears, click Tools > Manage Networks > click the label of the newly created network (dvPortGroup Name).
   c. Click the New IP Net button to add the correct IP net for that network.
   d. Fill in the details of the new IP net:
      - Label - the name of the IP net
      - Network address - the network address of the IP net
- **Network mask** - the network mask. Must be less or equal 32.
- **Default gateway** - the default gateway to be added to the IP net automatically
- **Allow gateway to be outside from IP net** - tick this checkbox to allow gateway to be outside from the IP net.
- **Add default IP range** - tick this checkbox for the default IP range to be added to the IP net automatically. Otherwise, you'll need to add the required IP ranges after the IP net is created.

e. Click **Submit** to finish.

f. If required, specify a custom IP range.

**Click here to see the instruction on adding an IP range.**

i. Go to Control Panel > **Settings** > **Compute Resources** > click the label of the necessary vCenter compute resource to see its details.

ii. On the page that appears, click **Tools** > **Manage Networks** > click the label of the newly created network (dvPortGroup Name).

iii. Click the **Actions** icon next to the required IP net and select **Add New IP Range**.

iv. Fill in the start and end address and the default gateway of the new IP range; if necessary, tick the **Allow gateway to be outside from IP net** checkbox to allow gateway to be outside from the IP net.

v. Click **Add** to save the new IP range.

The **Add New IP Range** button is not displayed if there are no IP addresses that can be added to the IP net.

b. Data stores Cluster (PODs) are created as individual zones with their Cluster Name in the zone Name

c. Data stores not in a cluster are created under a single zone

2. Create a VS template by following the instructions in the [Create Template for vCenter Virtual Server](#) chapter. Also, you can upload templates using **OVA import**.

3. Create a new vCenter virtual server or import VS from vCenter.

- To import a VS from vCenter successfully, make sure vCenter resources for compute, network and datastore zones are added in your bucket in the Virtual section.

- In order for a vCenter VS console to work, the **system_host** parameter in `/onapp/interface/config/on_app.yml` file must be changed from its default value `onapp.com` to an appropriate FQDN or IP address of the Control Panel server.

### 2.2 Create vCenter Compute Resource

To add a vCenter compute resource to OnApp:
1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Compute Resources** icon.
3. Click + button or **Add New Compute Resource** underneath the list of compute resources.
4. On the screen that appears:
   - **Label** - enter a compute resource label
   - **Compute Resource Type** - choose the vcenter compute resource type
   - **vCenter server** - select the necessary vCenter server from the dropbox
   - **Cluster** - select the necessary cluster assigned to the specified vCenter server from the dropbox
   - **Compute Zone** - the compute zone to which the compute resource is assigned
5. Click **Save**. The compute resource will be added to the system. You can view it under the **Compute Resources**. The transaction will be launched to import all networks and data stores.
6. If you want to rerun the transaction that imports all networks and data stores, go to **Admin** > **Settings** > **Compute Resources** > vCenter compute resource's label > **Tools** > **Import from vCenter**.
7. Go to **Admin** > **Settings** > **Compute Zones** and create a compute zone.
8. Attach the vCenter compute resource to the compute zone by selecting the resource from the list of unassigned compute resources.

To add a compute resource to a compute zone:
1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Compute Zones** icon.
3. Click the vCenter compute zone's label that you want to add to a compute resource to.
4. In the Unassigned Compute Resources list, find the compute resource that you want to add to the compute zone, and then click **Actions** next to it.
5. Click **Add**.

- The vCenter compute resource cannot be assigned to a compute zone if this zone already has any compute resources and attached networks.
- The compute resource that does not belong to vCenter cannot be assigned to a compute zone if this compute zone has vCenter compute resource and attached networks.

### 2.3 Edit vCenter Compute Resource

This page provides information on how to edit vCenter compute resources and how to manage their data store joins.

#### 2.3.1 Edit details of vCenter compute resource

To edit details of a vCenter compute resource:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Click the Actions button next to the vCenter compute resource you want to edit and then click Edit.
4. On the screen that follows, change details as required:
   - **Label** - enter a compute resource label
   - **Compute Resource Type** - choose the vCenter compute resource type
   - **Operating System Type** - the operating system type of the virtual servers that can live on this compute resource
   - **CPU Units** - adjust the slider to set the desired amount of CPU units for this compute resource
   - **Enabled** - whether the compute resource is enabled or not (compute resources that are not enabled cannot be used to host VSs)
   - **Collect Stats** - move the slider to the right to collect statistics for this compute resource
   - **Compute Zone** - the compute zone to which the compute resource is assigned
   - **API URL** - set the vCenter API URL - e.g. https://example.com
   - **Login** - specify the vCenter login
   - **Password** - specify the vCenter password
5. Click the Save button to save your changes.
6. Go to compute resource label > Tools and click Resync vCenter to import all networks and datastore that are not currently synchronized in OnApp from vCenter.

**On this page:**

- Edit details of vCenter compute resource
- Manage vCenter compute resource data stores

### 2.3.2 Manage vCenter compute resource data stores

Data stores can easily be attached and removed from vCenter compute resources. This association between a compute resource and a data store is called a data store join.

You can add data stores to a compute resource only if they are assigned to the zones of the same type. For more information refer to Zone Types.

To add/remove data store joins:

1. Go to your Control Panel > Admin > Settings menu and click the Compute resources icon.
2. Click the label of the vCenter compute resource you want to manage data stores for.
3. On the screen that appears, click the Tools button, then click Manage Data Stores.
4. On the screen that follows, you'll see a list of all data stores currently associated with this vCenter compute resource.

To remove a data store join, click the Delete icon next to it. You'll be asked for confirmation before the store is removed.

To add a new data store join, choose a data store from the drop-down menu and click the Add Data Store button.

### 2.4 Create vCenter Compute Zone

To create a new vCenter compute zone:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Zones icon.
3. Click + button or Create Compute Zone.
4. On the screen that follows, give your compute zone a name (Label), choose Server Type (virtual), and select Location Group. For more info on location groups, refer to Create and Manage Location Groups.

Please do not proceed with other settings, since they will not be applicable after attaching a vCenter compute resource and converting into vCenter compute zone.

5. Click Save.
6. You will be redirected to the View Compute Zone page, where you can see Unassigned Compute Resources that can be added to this Compute Zone. If you want to assign a vCenter compute resource(s), click + button.

- The vCenter compute resource cannot be assigned to a compute zone if this zone already has any compute resources and attached networks.
- The compute resource that does not belong to vCenter cannot be assigned to a compute zone if this compute zone has vCenter compute resource and attached networks.
- Please do not assign data stores to vCenter compute zones. Instead, you may assign data stores to vCenter compute resources by using this instruction.

### 2.5 Manual IP Nets

The networking functionality available at Control Panel > Admin > Settings > Networks enables you to manage networks and work with IP nets. A network can contain several IP nets which include IP ranges with a default gateway. The network details page shows the list of IP nets in a network with their IP ranges, which include the IPs assigned to virtual servers and/or users, as well as the networks of the Shared type in your cloud with their label, identifier, and VLAN.
OnApp currently offers two types of IP nets: IP Pool and Manual IP. IP Pool nets are the regular type of IP net in OnApp, they contain IPs assigned to users/VGs and are available during server creation. When a VS is imported into OnApp and its IP is within one of the IP ranges from the vCenter networks, the IP is added to the IP net of the corresponding network.

If the IP of a vCenter VS that is being imported is not a part of an IP range in any of the vCenter networks, a special type of an IP net is created, Manual, and the IP of such a VS is added to it. Manual IP nets contain a single IP range which includes the whole space of IPv4 IP addresses. IPs from a Manual IP net are not available in the VS creation wizard. Manual IP nets can be viewed or deleted. A network can contain only one Manual IP net.

For information on IP Pool nets refer to Network Settings.

### 2.5.1 View Manual IP Nets

To view details of an IP net:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Networks icon. The page that loads shows the shared networks in your cloud.
3. Click the label of the network you are interested in. The screen will display the network's label, identifier, VLAN and network zone.
   
   This page also includes the IP nets in the selected network. Click an IP net of the Manual type net to view the list of IPs in it with the user and/or VS they are assigned to.

### 2.5.2 Delete Manual IP Net

You can delete only those IP nets that do not contain any IP ranges.

To delete an IP net:

1. Go to Control Panel > Admin > Settings > Networks. The page that loads shows the shared networks in your cloud.
2. Click the label of the network from which you want to remove an IP net.
3. Click the Actions icon next to the required IP net with the Manual type and select Delete.

### 2.6 Import vCenter Virtual Server

You can import one or more vCenter virtual servers at a time using vCenter compute resource menu. The VS(s) will be imported with limited functionality available. To gain access to the full functionality of the VS(s) you need to set vCenter credentials.

**Prerequisites:**

- Networks connected to Virtual Server(s) must be already imported to OnApp.
- Data stores containing Virtual Servers' disks must be already imported to OnApp.
On this page:

- Manual Import of vCenter VS
- Resync vCenter VS
- Auto Import of vCenter VS
- View Auto Import Rules
- Create Auto Import Rule
- Run Auto Import Rule
- Edit Auto Import Rule
- Delete Auto Import Rule

2.6.1 Manual Import of vCenter VS

To import vCenter virtual server(s):

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource's label > Tools and click Import Virtual Server.
4. On the screen that follows, fill in the following:
   - **VM name** - choose the vCenter virtual server(s) from the drop-down list
   - **Assign to User** - choose a user from the drop-down list, who will be an owner of the virtual server(s)
5. Click Submit.

- You need to set your **vCenter credentials** to gain access to the full functionality of the VS at Control Panel > Cloud > Virtual Server > Label > Tools > Administrative Options > Set Credentials.
- The IPs of VSs imported from vCenter become a part of either IP Pool or Manual IP nets. For more information, refer to **Manual IP Nets**.
2.6.2 Resync vCenter VS

In case you apply any changes to the imported VS on the vCenter side, you may resync the VS to update all the VS's changes to match on both vCenter and OnApp sides. To resync vCenter VS:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the imported VS.
3. Click the Tools button on the VS's screen to expand the VS Tools menu.
4. Click the Resync VS button in the VS Options section to start the re-import transaction.

2.6.3 Auto Import of vCenter VS

If you need a quick import of multiple new VSs from vCenter to OnApp, use the auto import rules functionality. It allows you to apply the rule/rules to the already created but not yet imported virtual servers. After applying auto import rules, vCenter resources are recognized at OnApp side and can be billed immediately.

### Prerequisites

- The auto import rule functionality is available on clouds that run OnApp 6.1 Edge 2 and subsequent versions.
- The Manage auto import rules permission should be enabled for a user who wants to view, create, run, edit or delete auto import rules.
- It only applies to the newly created vCenter virtual servers that are not yet imported to OnApp.

2.6.4 View Auto Import Rules

To view the list of auto import rules:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource's label > Tools and click Auto Import Rules to see a list of all rules and the following details:
   - Label - the name of the vCenter VS
   - Source Type - the type of vCenter source
   - Source - the vCenter resource
   - Target Type - the type of vCenter target user
   - Target - the vCenter user, who is the owner of the virtual server
4. Click the Actions button next to the auto import rule for quick access to the list of available actions.
5. To edit an auto import rule, click the Edit button.
6. To run an auto import rule, click the Run button.

2.6.5 Create Auto Import Rule

To create auto import rules:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter computer resource’s label > Tools and click Auto Import Rules.
4. Click the Create Auto Import Rules button.
5. On the screen that follows, fill in the following:
   - Label - specify the name of the vCenter VS
   - Source Type - choose the type of vCenter source from the drop-down list
   - Source - choose the vCenter resource from the drop-down list
   - Target Type - choose the type of vCenter target user from the drop-down list
   - Target - choose the vCenter user from the drop-down list, who will be an owner of the virtual server
6. Click Submit.

2.6.6 Run Auto Import Rule

To run an auto import rule:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter computer resource’s label > Tools and click Auto Import Rules.
4. Click the Actions button next to the auto import rule you want to run and click the Run button.

After you click the Run button, OnApp system receives the list of vCenter VSs suitable for this rule and schedules proper import transactions.
2.6.7 Edit Auto Import Rule

To edit an auto import rule:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource’s label > Tools and click Auto Import Rules.
4. Click the Actions button next to the auto import rule you want to edit and click the Edit button.
5. Edit the following details:
   - Label - specify the name of the vCenter VS
   - Source Type - choose the type of vCenter source from the drop-down list
   - Source - choose the vCenter resource from the drop-down list
   - Target Type - choose the type of vCenter target user from the drop-down list
   - Target - choose the vCenter user from the drop-down list, who will be an owner of the virtual server
6. Click the Submit button.

2.6.8 Delete Auto Import Rule

To delete an auto import rule:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource's label > Tools and click Auto Import Rules.
4. Click the Actions button next to the auto import rule you want to delete and click the Delete button.
5. Click the OK button to confirm the deletion.

2.7 vCenter Virtual Servers

Virtual servers running on vCenter compute resources are managed almost the same as normal virtual servers. Also, the vCenter cluster is displayed as a pool of resources rather than per compute resource.

OnApp Cloud gives you high-end cloud management features including:

<table>
<thead>
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Certain VS operations are unavailable in OnApp with vCenter:

- **Reboot in recovery**
- **Segregate**
- **VIP status**
- **Autoscaling**
- **Migrate VS.** vCenter utilizes vMotion to ensure that the VSs are optimally placed on the compute resources. However, you can migrate vCenter virtual servers to KVM.
- **Backups.** Backup process for vCenter virtual servers differs from the standard OnApp backup scheme. See [vCenter VS Snapshots](#) section for details.
- Use of IPv6 is not supported for vCenter virtual servers.

**NOTE:** Performing the following VS operations at vCenter may lead to problems with VMware infrastructure management. Please, do not execute the following actions in vCenter:

- Edit the Properties for any VS
- Create and delete Snapshots
- Make changes to the distributed vSwitch
- Remove templates from the data store
- Delete the services account on the virtual server
- Remove or stop VMware tools on the virtual server

Performing the following actions in vCenter will not affect OnApp:

- Migrate VSs between compute resources using vMotion
- Migrate VSs between data stores using Storage vMotion
• Place compute resources into maintenance mode
• Make changes to compute resources when in maintenance mode
• Back up VSs using third party tool (e.g. Veeam)
• Enable, Disable or make changes to DRS

Performing the following actions in vCenter will be synchronized with OnApp:
• Networks Created
• Networks Deleted
• Datastores Created
• Datastores Deleted
• New Compute Added
• Compute Remove
• Updates to Imported VSs (Ex. Changed Resources, added NICs, add Disks)
• VS has been Deleted

2.7.1 Create vCenter Virtual Server
To create a vCenter virtual server:

Go to your Control Panel > Cloud > Virtual Servers menu and click the "+" button or click the Create New Virtual Server button at the bottom of the page. Fill in the VS creation form step by step:

2.7.1.1 Step 1 of 6. Cloud Locations
On this page:

• Step 1 of 6. Cloud Locations
• Step 2 of 6. Templates
• Step 3 of 6. Properties
• Step 4 of 6. Resources
• Step 5 of 6. Add-ons
• Step 6. Confirmation

The Cloud Locations step applies to those users who have compute zones assigned to location groups in their bucket. This step will be present in the wizard if both of the following requirements are met:

• all compute resources available to the user are assigned to location groups
• compute resources are assigned to different locations

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 all compute zones are assigned to the same location this step will be skipped. In this case the wizard will start from the **Templates** step.

1. Indicate your virtual 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.
2. Click **Next** to proceed to the following step of the wizard to specify the virtual server templates

### 2.7.1.2 Step 2 of 6. Templates

1. Click the required group icon on the right (vCenter) to expand the list of templates on the left. Every template contains the following info:
   - **Label**
   - **Min memory size** that is required to create a VS from this template
   - **Min disk size** that is required to create a VS from this template
   - **Virtualization type**
   - **Price per hour**
2. Select the template.
3. Click **Next**.

**To be able to use Ubuntu templates later than 9 version for vCenter virtual server creation, you need to remove the absolute pathnames in /etc/pam.d/vmtoolsd file. For example: /lib/security/pam_unix.so > pam_unix.so**

**Please make sure that the Windows password policy defined inside the template is compliant with the password policy set in the OnApp CP. This will ensure that there are no password related issues when provisioning Windows.**

**OnApp supports templates with no more than one disk.**

**Sometimes, vCenter VS creation may fail if it is based on OVA template with NVRAM file. For more details about the causes of the issue, refer to VMware article [Unable to deploy an OVF from a 6.7 environment](https://kb.vmware.com/kb/2145775). To check one of the possible solutions, refer to [vCenter 6.5 fails to boot OVA (Linux)](https://kb.vmware.com/kb/2150519). If the issue persists, make sure that you have equal version on vSphere and ESXI.**

### Windows Licensing Type

This option only appears if your bucket allows it, and if the relevant licensing options have been configured for the template group this template belongs to.

If this option is available, choose the license type you require:

- For the KMS type, choose the licensing server
- For your own license, type your license key
Please note that for the Windows templates imported from vCenter it is impossible to select the MAK license during the VS creation. Instead, select the **Your own license** option and manually indicate the License Key.

If you don't specify the licensing type, MAK licensing will be set by default.

It is possible to deploy Windows virtual servers without running sysprep. To do so, you need to disable the **Run Sysprep** option for the compute zone the virtual server will be built on. See Create Compute Zone section for details.

It is not possible to set VS password when creating a Windows-based vCenter virtual server without running a sysprep.

---

**2.7.1.3 Step 3 of 6. Properties**

You can create a virtual server having specified only the required parameters and configure it later. Specify the following virtual server properties:

- **Label** - enter the label of the virtual server
- **Hostname** - enter the host name of the virtual server
  - Hostname may contain letters (A-Z), numbers (0-9) and hyphens (-) but no spaces or periods (.). The name may not consists entirely of digits.
  - For Windows-based VSs, the hostname length should be between 1 and 15 characters.
- **Domain** - enter the domain name of the virtual server
- **Password** - enter the password of the virtual server or leave black for the password to be auto generated
- **Password confirmation** - enter the password again to confirm it
- Click **Next**.

**2.7.1.4 Step 4 of 6. Resources**

**Compute Resources**

- **Compute Resource** - select the compute resource
- **vCenter Resource Pool** - select the resource pool

If you pick **Resources** from the dropdown menu, the virtual server will be placed into the default resource pool, so it will not be shown at any user resource pool, just under the cluster.
• **RAM** - set the amount of virtual server's RAM.

• **CPU Cores** - set the amount of virtual server's CPU cores.

• **CPU Priority** (or **CPU Units**) - set virtual server's CPU priority. If the CPU units are switched on in the bucket for this user, then CPU priority is replaced with CPU units. Refer to Billing Calculation section for details on CPU units and CPU priority.

The amount of CPU resource a VS is given is the CPU priority (you can think of this as its "share percentage") multiplied by the number of cores allocated to that VS. This is a minimum number – clients can exceed it, up to 100% multiplied by the number of cores. For example, on a compute resource with 3GHz CPU cores:

- 100% x 1 core = 3GHz (burstable to 3GHz)
- 10% x 2 cores = 600MHZ (burstable to 6GHz)
- 5 % x 4 cores = 600MHz (burstable to 12GHz)

By default, OnApp allows overselling of cloud resources. For example, OnApp will allow users to create 5 VSs with 100% CPU priority/1 CPU core on a compute resource with a 4-core CPU. In this example, OnApp would reduce the guaranteed CPU for each VS.

If you build a VS on a KVM compute resource running CentOS5, the CPU priority settings will be disabled and CPU priority value will be 100 by default.

**Primary Disk**

- **Data Store Zone** - choose a data store zone for this VS's primary disk.
- **Primary data store** - select a primary data store for this VS's primary disk.
- **Primary disk size** - set the primary disk size.

**Swap Disk**

Select the following properties for a swap disk:

- **Size** - enter a size for a swap disk
- **Data Store Zone** - select a data store zone for a swap disk
- **Data Store** - select a data store for a swap disk
- **Disable** - select the checkbox to disable swap disk creation

Only enabled data stores will be available for selection at this step. You can enable or disable a data store at Control Panel > Admin > Settings menu by clicking the Actions button next to the data store you want to change, and then clicking Edit. Move the Enabled slider to the right to enable a data store.

**Network Configuration**

*Network Interface 1*
• **Network group** - select the network zone or leave *Any*

• **Network** - select the network from which the VS should get the IP address or leave *Any*

• **IP net** - select from the drop-down list the IP net from which the IP address should be assigned or leave *Any*

• **IP range** - select from the drop-down list the IP range from which the IP address should be assigned or leave *Any*

• **IP address** - select an IP address to be assigned from the drop-down box or leave *Any*

• **Port Speed** - set the port speed for this VS

Since **VSS networks** cannot be managed on OnApp side, it will not be possible to configure traffic shaping for them, so the **Port speed** field at the Edit NIC page and the Resources step of the VS Creation wizard will be disabled.

### 2.7.1.5 Step 5 of 6. Add-ons

During this step, you can assign service add-ons or recipes to your vCenter virtual server using **Service Addons** or **Recipes** sub-tabs.

You can create a vCenter virtual server either with Service Addons or Recipes, not with both at the same time. From which sub-tab you click **Next**, that option is applied. For example, if you select some recipes, then go to the **Service Addons** sub-tab and select some service add-ons and then click **Next**, service add-ons will be applied not recipes.

### Recipes

The **Recipes** step is available in the wizard if **Manage recipes joins for all virtual servers** permission or **Manage recipes joins for own virtual servers** permission is enabled. To assign a recipe to your vCenter virtual server in the wizard, click **Recipe** under **Add-ons** and then follow the next steps:

1. Select a recipe that you want to assign to this virtual server by dragging the required recipe to the **Assigned recipes** pane.

2. To add a custom variable, click the "+" button next to the **Custom recipe variables** title bar, then specify variable details:
   - Specify the recipe name and its value.
   - Move the **Enabled** slider to the right to allow use of this variable.

3. Click **Next** to proceed to the next step of the wizard that completes the virtual server creation process.

The recipes step can be missing in the wizard if there are no recipes created in the cloud.
Service Add-ons

You can select the service add-ons that you want to assign to your virtual server. This step is optional. You can create a virtual server without choosing service add-ons and add them later if required.

Service add-ons are available if Manage Service Add-ons for all virtual servers permission or Manage Service Add-ons for own virtual servers permission is enabled.

1. 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 types** with which this service add-on is compatible
   - Description of the service add-on
   - Price per hour

2. Select the service add-on by clicking on it. You can select several add-ons from different service add-on groups. Click View Selected Add-ons to see the list of selected service add-ons. You can remove the selected service add-on from the list by clicking the button near the add-on.

3. Click Next to proceed to the next step of the wizard that completes the virtual server creation.

2.7.1.6 Step 6. Confirmation

- Move the Enable Automated Backup slider to the right if you want this VS to be backed up automatically (according to the backup settings configured in the Settings/Auto-backup Presets menu)
- Move the Build Virtual Server slider to the right, if you want the system to automatically build the VS. If you leave this box blank, you will have to build your server manually after it is created.
- Move the Boot Virtual Server slider to the right, if you want the virtual server to be started up automatically.
- Move the Enable Autoscale slider to the right to set autoscaling for this VS.

  - Until the **autoscaling rules** are configured the autoscaling itself will not start working.
  - If the Enable Autoscale slider is grayed out that means that you have reached the autoscaling limit in the bucket (or the max is set as 0).

- Move the Acceleration allowed slider to the right to enable accelerator for this VS. For more information, see Edge Accelerator.

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

After you set up all parameters, click the Create Virtual Server button to start the creation process.
2.7.2 vCenter Virtual Server Wizard Beta

OnApp 6.2 Edge 1 introduces a new beta version of the vCenter virtual server wizard. You can access the beta version of the wizard from the top bar on your Control Panel. To launch the wizard, click Create Virtual Server > Add Virtual Server Beta.

Note that a new beta version of the vCenter virtual server wizard is disabled by default. If you want to enable this version of the wizard, go to on_app.yml file and set the show_new_wizard parameter to true.

In this section you can find the procedures to create vCenter virtual servers in the new wizard, using one of the following methods:

- From Custom Set of Resources
- From Instance Package

2.7.2.1 Create Custom vCenter Virtual Server Beta

Virtual servers are created from templates and are deployed on compute, storage, and networking resources. To create a vCenter virtual server, you need to launch a wizard. The wizard walks you through several steps to get your virtual server up and running. You can create vCenter virtual servers from instance packages or custom set of resources. In this document, you can find a detailed guidance on how to create a custom vCenter virtual server but first take a look at the following section.

2.7.2.1.1 Infrastructure Mode

An infrastructure mode allows you to manage with OnApp only the infrastructure layer without any post actions (e.g. formatting disk after adding it, or assigning an IP address after adding a network interface). To create a vCenter virtual server in infrastructure mode, you need to have the Infrastructure mode permission enabled for your role and move the Infrastructure mode slider to the right at the Properties step in wizard.

To create a vCenter virtual server, follow the next procedure:

1. Go to your Control Panel and click Create Server on the top bar.
2. Click Create Virtual Server Beta to launch the wizard.
3. Follow the step-by-step instructions below to complete the wizard.
4. After you are finished, click the **Create Virtual Server** button.

**On this page:**

- Infrastructure Mode
- Cloud Locations
- Templates
- Properties
- Compute Resources
- Storage Resources
- Network Resources
- Service Add-ons or Recipes
  - Service Add-ons
  - Recipes
- Confirmation

### 2.7.2.1.2 Cloud Locations

The **Cloud Locations** step applies to those users who have compute zones assigned to location groups in their bucket. If Cloud Locations are not available, the wizard starts from the **Templates** step. This Cloud Locations step will be present in the wizard if both of the following requirements are met:

- All compute resources available to the user are assigned to location groups.
- Compute resources are assigned to different locations.

When you are at the **Cloud Locations** step, select a location for your virtual server:

- **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.

### 2.7.2.1.3 Templates

To select a template, follow the next procedure:

1. Click the required group icon on the right (vCenter) to expand the list of templates on the left. Every template contains the following info:
   - **Label**
   - **Min memory size** that is required to create a VS from this template
   - **Min disk size** that is required to create a VS from this template
   - **Virtualization type**
   - **Price per hour**

2. Select the template.

**What template to choose**
• You can use RHEL, Windows and Debian templates to create vCenter virtual servers. For details how to create vCenter templates, refer to Create Template for vCenter Virtual Server section.

• To be able to use Ubuntu templates later than 9 version for vCenter virtual server creation, you need to remove the absolute pathnames in /etc/pam.d/vmtoolsd file. For example: 
\[
\text{/lib/security/pam_unix.so > pam_unix.so}
\]

• Please make sure that the Windows password policy defined inside the template is compliant with the password policy set in the OnApp CP. This will ensure that there are no password related issues when provisioning Windows.

3. Click **Next**.

### Additional Information for Windows Templates

The **Windows Licensing Type** box appears for Windows templates and includes license options that you configure for a corresponding template store. You can select one of the following license types:

- **MAK** - the default licensing type applicable to all Windows-based virtual servers. If you don't select the licensing type, **MAK** is set by default.

- **KMS** - the licensing type applicable to every virtual server since Windows 7, Windows Server 2008, and the following Windows versions. Click **KMS** and then select a licensing **Server**.

- **User license** - type your license key

When you create a virtual server from a Windows template, consider the following:

- You can create Windows-based vCenter virtual servers without running Sysprep. Disable the **Run Sysprep** option while creating or editing a destination **compute zone**.

- If multiple vCenter virtual servers are deployed from the same template without running Sysprep, they will have identical security identifiers (SIDs) that can result in the system conflict.

- You can't select KMS or your own license when you create a Windows vCenter virtual server from a custom template. As a workaround, you can create a vCenter VS from a template used for custom template creation.

- It is not possible to set VS password when creating a Windows-based vCenter virtual server without running a sysprep.
2.7.2.1.4 Properties
You can create a virtual server having specified only the required parameters and configure it later. Specify the following virtual server properties:

- **Infrastructure mode** - move the slider to the right to enable the [Infrastructure mode](#) for this virtual server
- **Label** - enter the label of the virtual server
- **Hostname** - enter the host name of the virtual server

- Hostname may contain letters (A-Z), numbers (0-9) and hyphens (-) but no spaces or periods (.). The name may not consist entirely of digits.
- For Windows-based VSs, the hostname length should be between 1 and 15 characters.

- **Domain** - enter the domain name of the virtual server
- **Password** - enter the password of the virtual server or leave black for the password to be auto generated
- **Password confirmation** - enter the password again to confirm it
- **Encrypt password** - move the slider to the right to encrypt your password. For more information on the password encryption, see [FAQ](#).
- **Encryption passphrase** - enter a passphrase for encryption
- **Encryption passphrase confirmation** - repeat the passphrase for encryption
- **I want to create a VS with custom resources** - move the slider to the right to create a virtual server based on a set of custom resources. If you don't select the checkbox, you can create a virtual server from instance packages.
- **Replace recipes** - move the slider to the right to create a virtual server with service add-ons instead of recipes.

Click [Next](#) to proceed to the following step of the wizard where you select a custom set of resources.

2.7.2.1.5 Compute Resources
- **RAM** - set the amount of virtual server's RAM.
- **CPU Cores** - set the amount of virtual server's CPU cores.
- **CPU Priority** (or **CPU Units**) - set virtual server's CPU priority. If the CPU units are switched on in the bucket for this user, then CPU priority is replaced with CPU units. Refer to [Billing Calculation](#) section for details on CPU units and CPU priority.
- **Datacenter** - select the data center for the data store.
- **Cluster** - select the cluster to import networks and data stores from.

2.7.2.1.6 Storage Resources

**Primary Disk**
OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)

- **Size** - set the primary disk size.
- **Data Store Zone** - choose a data store zone for this VS's primary disk.
- **Data Store** - select a primary data store for this VS's primary disk.

**Swap Disk**
Select the following properties for a swap disk:

- **Size** - enter a size for a swap disk
- **Data Store Zone** - select a data store zone for a swap disk
- **Data Store** - select a data store for a swap disk
- **Disable** - select the checkbox to disable swap disk creation

Only enabled data stores will be available for selection at this step. You can enable or disable a data store at Control Panel > Admin > Settings menu by clicking the Actions button next to the data store you want to change, and then clicking Edit. Move the Enabled slider to the right to enable a data store.

---

2.7.2.1.7 Network Resources

**Network Interface 1**

Selection of IP net, IP range, and IP address is not available for VSs in Infrastructure mode.

- **Network group** - select the network zone or leave Any
- **Network** - select the network from which the VS should get the IP address or leave Any
- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned or leave Any
- **IP range** - select from the drop-down list the IP range from which the IP address should be assigned or leave Any
- **IP address** - select an IP address to be assigned from the drop-down box or leave Any
- **Port Speed** - set the port speed for this VS or select the Unlimited checkbox

Since VSS networks cannot be managed on OnApp side, it will not be possible to configure traffic shaping for them, so the Port speed field at the Edit NIC page and the Resources step of the VS Creation wizard will be disabled.

---

2.7.2.1.8 Service Add-ons or Recipes

This step is not available for VSs in Infrastructure mode.
During this step, you can assign service add-ons or recipes to your virtual server. The availability of service add-ons or recipes depends on the permissions Manage Service Add-ons for all/own virtual servers and Manage Recipes for all/own virtual servers. If you have only one of these permissions enabled, you will see only a corresponding tab in the wizard.

2.7.2.1.8.1 Service Add-ons
To create a virtual server with service add-ons instead of recipes, you should move the slider Replace recipes in the Properties step. If you do not move the slider, you will be able to create a virtual server with recipes.

Replace recipes slider is visible if Manage Service Add-ons for all virtual servers permission or Manage Service Add-ons for own virtual servers permissions are enabled.

Service add-ons are available under the following conditions:

- Manage Service Add-ons for all virtual servers permission or Manage Service Add-ons for own virtual servers permission is enabled
- Service add-on groups are available in your bucket
- The On Provisioning option is enabled for all or some of the service add-ons available to you within a bucket.

You can create a virtual server without service add-ons and add them later if required. To assign a service add-on to your virtual server in the wizard, follow the next steps:

1. 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
   - Description
   - Price per hour
   - Compatible with, for example, Unix, Windows, etc

2. Click the service add-on to select it. You can select several add-ons from different service add-on groups. Click View Selected Add-ons to see the list of selected service add-ons.

3. Click Next to proceed to the next step of the wizard that completes the virtual server creation.

2.7.2.1.8.2 Recipes

Recipes step is available only if you did not move the Replace recipes slider to the right in the Properties step.

The Recipes step is available in the wizard if there are some recipes created in the cloud. You can create a virtual server without a recipe and add them afterwards. To assign a recipe to your virtual server in the wizard, follow the next steps:

1. Drag and drop a recipe from the Available recipes to Assigned for provisioning box.

2. To add a custom variable, click the "+" button next to the Custom recipe variables title bar, then specify variable details:
   - Name & Value - enter a name and value for the custom variable
   - Enabled - move the slider to the right to allow use of this variable
3. Click **Next** to proceed to the next step of the wizard that completes the virtual server creation process.

### 2.7.2.1.9 Confirmation

The **Confirmation** step allows you to apply the following settings:

- **Build Virtual Server** - move the slider to the right to automatically build the virtual server. If you don't select this checkbox, you have to build your server manually after it is created.

- **Boot Virtual Server** - move the slider to the right for the virtual server to be started up automatically.

The **Confirmation** step also provides the configuration summary of the virtual server, including information about the template, CPU cores, RAM, disks size, and network. When you are finished, click the **Create Virtual Server** button to start the creation process. After you click the button, several transactions are run to complete the process. You can check a status of each transaction in **Activity Log** of the virtual server.

### 2.7.2.2 Create Instance Package vCenter Virtual Server Beta

You can create a vCenter virtual server from a ready-made instance package. The instance package is a preconfigured environment with a specific compute, storage, and network capacity. For instance packages to be available in the wizard, you need to follow the next procedures:

- **Enable Permissions**
- **Add Instance Packages to CP**
- **Add Instance Packages to Bucket**

After you complete these steps, you can create vCenter virtual servers from instance packages in the wizard. The wizard walks you through several steps to get your virtual server up and running. In this document, you can find a detailed guidance on how to create a vCenter virtual server but first take a look at the following section.

#### 2.7.2.2.1 Before You Begin

On this page:

- **Before You Begin**
- **Infrastructure Mode**
- **Cloud Locations**
- **Templates**
- **Properties**
- **Instance Packages**
- **Service Add-Ons or Recipes**
- **Confirmation**

See also:

- **Instance Packages**
- **Create Custom Virtual Server**
- **Permissions**
- **Buckets**
Before you begin to create a virtual server from an instance package, take into consideration the following:

- You should have at least one compute resource configured and attached to a compute zone, a data store – to a data store zone and compute resource or zone, a network – to a network zone and compute resource, a backup server – to a backup server zone and compute resource or zone, and a bucket – to a user who creates a virtual server.

- If an instance package applies only to certain compute zones in a bucket, a virtual server is created on one of the compute resources within one of those zones. If an instance package is not limited to certain zones, the compute zone and compute resource are selected automatically from the ones available to a user.

- Instance package virtual servers can be created only in compute zones where all compute resources are assigned the same number of CPU units. If there are compute resources with different number of CPU units, it's not possible to create instance package virtual servers in such zones. The reason is that CPU priority for instance package virtual servers in this configuration cannot be set to 100%, which is the default value for such virtual servers.

- If there are no available IP addresses, all instance packages are dimmed in the wizard.

- Instance packages that have resources incompatible with the available compute zones are dimmed in the wizard.

- Auto-scaling and Accelerator are not supported for virtual servers created from instance packages.

To create Instance Package vCenter Virtual Server, follow the next procedure:

1. Go to your Control Panel and click Create Server on the top bar.
2. Click Create Virtual Server Beta to launch the wizard.
3. Follow the step-by-step instructions below to complete the wizard.
4. After you are finished, click the Create Virtual Server button.

### 2.7.2.2.2 Infrastructure Mode

An infrastructure mode allows you to manage with OnApp only the infrastructure layer without any post actions (e.g. formatting disk after adding it, or assigning an IP address after adding a network interface). To create the Instance Package vCenter virtual server in infrastructure mode, you need to have the Infrastructure mode permission enabled for your role and move the Infrastructure mode slider to the right at the Properties step in wizard.

### 2.7.2.2.3 Cloud Locations

The Cloud Locations step is available for users whose bucket includes compute zones assigned to location groups. If Cloud Locations are not available, the wizard starts from the Templates step. The Cloud Locations step is present in the wizard if the following requirements are satisfied:

- All compute zones that are added to a user’s bucket are assigned to location groups.
- Compute zones that are added to a user's bucket are not assigned to the same location group.

When you are at the Cloud Locations step, select a location for your virtual server:

- **Country** - select a country where the cloud is located
- **City** - select a city from the country where the cloud is located

Click Next to proceed to the following steps of the wizard.

### 2.7.2.2.4 Templates
The Templates step allows you to select a template from which to build your virtual server.

To select a template, follow the next procedure:

1. Click a Template Store icon on the left to see templates that are available in this store. You can see the following details for each template:
   - Label
   - Min memory size that is required to create a VS from this template
   - Min disk size that is required to create a VS from this template
   - Virtualization type that is XEN or KVM
   - Estimated Price per Hour that is calculated for a VS in Mode ON and Mode OFF

2. Click a template to select it.

3. Click Next to proceed.

Additional Information for Windows Templates

The Windows Licensing Type box appears for Windows templates and includes license options that you configure for a corresponding template store. You can select one of the following license types:

- **MAK** - the default licensing type applicable to all Windows-based virtual servers. If you don't select the licensing type, MAK is set by default.
- **KMS** - the licensing type applicable to every virtual server since Windows 7, Windows Server 2008, and the following Windows versions. Click KMS and then select a licensing Server.
- **User license** - type your license key

When you create a virtual server from a Windows template, consider the following:

- You can create Windows-based virtual servers without running Sysprep. Disable the Run Sysprep option while creating or editing a destination compute zone.
- If multiple virtual servers are deployed from the same template without running Sysprep, they will have identical security identifiers (SIDs) that can result in the system conflict.
- You can't select KMS or your own license when you create a Windows virtual server from a custom template. As a workaround, you can create a virtual server from a template used for custom template creation.
- You can build a Windows 10/Windows Server 2016 virtual server on KVM CentOS 6 and CentOS 7 compute resources that run at least on the following processor:
  - Ivy Bridge Intel® Xeon® Processor E Series v2 Family
  - AMD Opteron G2, G3, G4, G5, and G6
2.7.2.2.5 Properties

There are some obligatory and optional properties that you can provide for your virtual server. The obligatory properties are marked with an asterisk on the list and the optional properties you can edit after creating a virtual server.

Enter the following properties for your virtual server:

- **Infrastructure mode** - move the slider to the right to enable the infrastructure mode for this virtual server
- **Label** - enter a label of the virtual server
- **Hostname** - enter a hostname of the virtual server. The hostname can consist of letters [A-Z a-z], digits [0-9], and dash [-]. For more info on hostname validation, refer to RFC documentation.

**Additional Consideration for Windows**

- The hostname length should be between 1 and 15 characters.
- The following symbols are not allowed for Windows-based virtual servers:
  - percent sign [%]
  - double quotation marks ["]
  - brackets [<,>]
  - vertical bar []
  - caret [^]
  - ampersand [&]
  - parentheses [(,)]

- **Domain** - enter a domain of the virtual server. For example, in test.onapp.com the test is a hostname and onapp.com is a domain. If you don't enter a domain, the default value *localdomain* is used as follows test.localdomain. This parameter is not applicable to Windows virtual servers.

- **Time zone (Windows)** - select a time zone for a Windows virtual server. Most operating systems implies that the hardware clock is in UTC, however, Windows implies a *localtime*. Therefore, you need to select a time zone for it to be properly handled on a compute resource level.

- **Password** - enter a secure password for the virtual server. It can consist of 6-99 symbols, including letters [A-Z a-z], digits [0-9], dash [-], underscore [ _ ], and the following special characters: ~ ! @ # $ * _ + = \` | { } ; ; ' , . ? / . You can use both lower and uppercase letters. If you don't enter a password, it will be generated automatically.

- **Password confirmation** - repeat the password to confirm it

- **Encrypt password** - move the slider to the right to encrypt your password. For more information on password encryption, see FAQ.

- **Encryption passphrase** - enter a passphrase for encryption

- **Encryption passphrase confirmation** - repeat the passphrase for encryption
• **I want to create a VS with custom resources** - move the slider to the right to create a virtual server based on a set of custom resources. The checkbox is displayed only if the **Select resources manually on virtual server creation** permission is enabled. See [Create Custom vCenter Virtual Server](#) for details.

• **Replace recipes** - move the slider to the right to create a virtual server with service add-ons instead of recipes.

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

2.7.2.2.6 **Instance Packages**

To create a virtual server from an instance package, click a box for a corresponding package. The instance package box includes the following details:

- **CPUs** - the number of CPU cores available in this instance package
- **Memory** - the number of RAM in MB or GB available in the instance package
- **Disk Size** - the number of disk size in MB or GB available in this instance package
- **Bandwidth** - the number of bandwidth in MB or GB available in this instance package
- **Price per Hour**:  
  - **Mode ON** - an estimated hourly price if the virtual server is powered on  
  - **Mode OFF** - an estimated hourly price if the virtual server is powered off
- **Price per Month**:  
  - **Mode ON** - an estimated monthly price if the virtual server is powered on  
  - **Mode OFF** - an estimated monthly price if the virtual server is powered off

After you click an instance package box, it becomes highlighted in green. Click **Next** to proceed to the following step of the wizard.

2.7.2.2.7 **Service Add-Ons or Recipes**

During this step, you can assign **service add-ons** or **recipes** to your virtual server. The availability of service add-ons or recipes depends on the permissions **Manage Service Add-ons for all/own virtual servers** and **Manage Recipes for all/own virtual servers**. If you have only one of these permissions enabled, you will see only a corresponding tab in the wizard.

2.7.2.2.7.1 **Service Add-ons**

To create a virtual server with service add-ons instead of recipes, you should move the slider **Replace recipes** in the **Properties** step. If you do not move the slider, you will be able to create a virtual server with recipes.

**Replace recipes** slider is visible if **Manage Service Add-ons for all virtual servers** permission or **Manage Service Add-ons for own virtual servers** permissions are enabled.

Service add-ons are available under the following conditions:
• The Replace Recipes with Service Add-ons on VS Creation permission is enabled.
• Service add-on groups are available in a bucket.
• The On Provisioning option is enabled for all or some of the service add-ons available to you within a bucket.

If these conditions are not satisfied, you will see the Recipes step instead.

You can create a virtual server without service add-ons and add them afterwards. To assign a service add-on to your virtual server in the wizard, follow the next steps:

1. Click a service add-on group on the left to expand the list of service add-ons on the right. You can see the following details about each service add-on:
   - Label
   - Description
   - Price per hour
   - Compatible with, for example, Unix, Windows, etc

2. Click the service add-on to select it. You can select several add-ons from different service add-on groups. Click View Selected Add-ons to see the list of selected service add-ons.

   To remove the selected service add-on from the list, click the button.

3. Click Next to proceed to the final step of the wizard.

Recipes

**Recipes** step is available only if you did not move the Replace recipes slider to the right in the Properties step.

The Recipes step is available in the wizard if there are some recipes created in the cloud. You can create a virtual server without a recipe and add them afterwards. To assign a recipe to your virtual server in the wizard, follow the next steps:

1. Drag and drop a recipe from the Available recipes to Assigned for provisioning box.

2. To add a custom variable, click the "+" button next to Custom Recipe Variables and provide the following details:
   - Name & Value - enter a name and value for the custom variable
   - Enabled - move the slider to the right to allow use of this variable

3. Click Next to proceed to the final step of the wizard.

2.7.2.2.8 Confirmation

The Confirmation step provides the configuration summary of the virtual server, including information about CPU, memory, and disk size. Here you can also apply the following settings:

• **Enable Automated Backup** - move the slider to the right to create automatic backups of the virtual server based on the settings from Auto-Backup Presets.

• **Build Virtual Server** - move the slider to the to the right if you want the system to automatically build the virtual server. If you don't select this checkbox, you have to build your server manually after it is created.
• **Boot Virtual Server** - move the slider to the right if you want the virtual server to be started up automatically.

When you are finished, click the Create Virtual Server button to start the creation process. After you click the button, several transactions are run to complete the process. You can check a status of each transaction in Activity Log of the virtual server.

### 2.7.3 View vCenter Virtual Server Details

To view details of a specific vCenter 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. The screen that appears loads the VS properties, notes, activity log and tools for managing your virtual server.

#### 2.7.3.1 VS Properties

VS properties page gives general overview of the VS details:

- Template this VS is built on
- Power status & On/Off/Reboot buttons.

Clicking the OFF button performs graceful shutdown and then powers off the virtual server after the timeout set in Configuration settings.

- **Compute resource.** Click the compute resource name to see its details
- **Login credentials**
- **Owner.** Click the owner name to see its details.
- **Price per hour**
- **Memory**
- **CPU(s)/shares**
- **Disk Size**
- **Disk backups (irrelevant field)**
- **Network Speed**
- **IP Addresses.** Only the first five IP addresses are displayed on the virtual server properties page. To view the list of all virtual server IP addresses, mouse over IP addresses area or go to the Networking >IP addresses tab.

If the automation options weren’t enabled during this virtual server creation, you’ll be redirected to the form where you can configure them.

#### 2.7.3.2 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. Click the Actions button in the Notes section of the page to add admin's or user's note.
2.7.3.3 VS Management
- Click the **Tools** button to expand the **Tools** menu with the VS management options.
- Use the top menu to manage your virtual servers' statistics/networking/storage options.

2.7.4 Edit vCenter Virtual Server

You can edit CPU and RAM resources for vCenter virtual servers built on Windows and Linux templates, as well as Windows and Linux OVA templates.

To edit CPU and RAM resources, follow the next steps:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click a label of the server you want to resize to display its details screen.
3. Click the **Tools** button and select the **Edit Virtual Server** link.
4. Change the label, CPU core/priority and RAM values, and click the **Save** button.

After you save the settings, the resize is completed automatically and you can see a message indicating the resize was successful.

2.7.5 Delete vCenter Virtual Server

Shut down the VS before destroying it. If you are deleting a VS that is running, the VS will be deleted after the time set in **Timeout Before Shutting Down VSs** configuration parameter.

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 VS's screen, click the **Tools** button, then select **Delete Virtual Server**.
4. Click the **Destroy** button.

You won't be able to restore a VS after deleting it.

2.7.6 Build vCenter Virtual Server Manually

To build/rebuild virtual server *build/rebuild virtual server* must be enabled. This is a new permission which manages build/rebuild functionality independently from *update virtual server* permission which used to regulate the build/rebuild options in the previous versions.

If you haven't checked the **Build Virtual Server** **Automatically** option during the VS creation process, you will have to do this manually after the VS has been created. Building a virtual server is the process of allocating physical resources to that VS.
To build a virtual server manually:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you’re interested in.
3. On the screen that appears, click the Tools button and then click Rebuild Virtual Server.
4. On the screen that pops up, use the drop-down menu to choose a template with which to build the VS.
5. Tick the Required Start Up box to have your VS started automatically after it is built.
6. Click the Build Virtual Server button to finish.

2.7.7 Clone vCenter Virtual Server
You can create a clone of a virtual server based on the same resources as the origin virtual server. To be able to clone virtual servers, you need to have the Clone own virtual servers permission enabled. The cloned virtual server inherits resources from the origin as follows.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Cloned Virtual Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties - owner, hostname,</td>
<td>The same as the origin virtual server with Clone in the label, for example, Clone</td>
</tr>
<tr>
<td>password, and label.</td>
<td>Origin Label.</td>
</tr>
<tr>
<td>Compute, data store, and network</td>
<td>The same as the origin virtual server.</td>
</tr>
<tr>
<td>resources &amp; zones</td>
<td>If there are no available resources on the same data store, network, and compute</td>
</tr>
<tr>
<td>Recipes, recipe variables,</td>
<td>resource, you cannot clone a virtual server.</td>
</tr>
<tr>
<td>and service add-ons</td>
<td></td>
</tr>
<tr>
<td>Firewall rules</td>
<td></td>
</tr>
<tr>
<td>IP address</td>
<td>A random IP address is assigned from an IP range in the origin network.</td>
</tr>
<tr>
<td>Swap disk</td>
<td>A new swap disk is created on the cloned virtual server.</td>
</tr>
<tr>
<td>Backups</td>
<td>The backups of the origin virtual server are not cloned.</td>
</tr>
</tbody>
</table>

To clone a virtual server, follow the next procedure:
1. Go to your Control Panel > Cloud > Virtual Servers.
2. Click a label of the virtual server that you want to clone.
3. Click Tools and then click Clone Virtual Server.
4. In the pop-up box, click Clone Virtual Server to confirm the action.

After you confirm the action, several transactions are run to complete the cloning process. You can check a status of each transaction in Activity Log of the virtual server. After the virtual server is cloned, it is powered off until you start it.

2.7.8 Migrate from vCenter to KVM
OnApp enables you to migrate your vCenter virtual servers from VMware to KVM virtualization. You can initiate the migration from your OnApp Control Panel, using the procedure described in
OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)

Before you proceed further, please note that:

- The migration from vCenter to KVM is available on clouds that run OnApp 5.10 and subsequent versions.
- You can migrate only virtual servers from your vCenter instance to KVM.
- vCenter 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 a virtual server from vCenter to KVM, see Troubleshooting.
2.7.8.2 Migrate Virtual Server to KVM

To migrate a virtual server from a vCenter 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:

2.7.8.2.1 Step 1: Compute Resource

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

- **Hypervisor group** - select a KVM hypervisor group (compute zone) where you want to migrate the VS
- **Hypervisor** - select a destination KVM hypervisor (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

- Hostname may contain letters (A-Z), numbers (0-9) and hyphens (-) but no spaces or periods (.). The name may not consists entirely of digits.
- For Windows-based VSs, the hostname length should be between 1 and 15 characters.

Click **Next**.

2.7.8.2.2 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 on the selected option, one of the following boxes becomes available:
  - **All Disks to One Data Store** - select one data store to migrate all the disks to
  - **Select Data Store for Disk** - select a separate data store to migrate each disk to

Click **Next**.

2.7.8.2.3 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
OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)

- **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**.

### 2.7.8.2.4 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**.

### 2.7.8.2.5 Step 5: Confirmation

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

- **Start VS after migrate** - 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 vCenter 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**.

### 2.7.8.3 Troubleshooting

You may face the following issues while initiating the migration of your virtual server from vCenter 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.
2.7.9 vCenter Virtual Server Power Options
To manage vCenter virtual server power options:
1. Go to your Control Panel > Cloud > Virtual Server menu.
2. Click the label of the required virtual server.
3. Click the Tools button on the VS's screen to expand the VS Tools menu.
4. The Tools menu enables you to perform the following power actions on VSs (the exact list shown depends on the VS status):
   - **Reboot Virtual Server** - powers off and then restarts the VS.
   - **Suspend Virtual Server** - stops a VS, changes its status to suspended and disables all the other actions on VS, unless unsuspended.
   - **Shut Down Virtual Server** – pops up a dialogue box, where you can either Shut Down VS (terminates the VS gracefully), or Power Off VS (terminates the VS forcefully).
   - **Startup Virtual Server** - queues a start-up action for a VS that's currently powered off.

2.7.10 vCenter Virtual Server Administrative Options
To manage a vCenter virtual server administrative options:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required vCenter VS.
3. Click the Tools button on the server's screen to expand the Tools menu.
4. The Tools menu enables you to perform the following administrative actions:
   - **Set Root Password** - set current root/administrator password for a newly imported VS.
     - Password confirmation - repeat the password to confirm it.
     - Encrypt password - move the Encrypt Password slider to the right, to encrypt your password, then enter an encryption key in the field that appears.
   - **Change Owner** - pops up a dialogue box with a drop-down of all users on the system, enabling you to pass ownership of the vCenter VS to the user selected from the list. If you have any recipes for this server, you will be also prompted to confirm if the recipe should be moved to another user.
   - **Set Credentials** - The credentials are required for adding/editing disks and other operations. You need to set your vCenter credentials to gain access to the full functionality of the VS. For that click Control Panel > Cloud > Virtual Server > Label > Tools > Administrative Options > Set Credentials.

2.7.11 vCenter Virtual Server Transactions and Logs
The system records a detailed log of all the transactions happening to your virtual servers. The list of transactions logged by the system includes:
   - Provision virtual server
   - Startup virtual server
   - Stop virtual server
   - Resize virtual server without reboot
   - Configure Operating System
   - Build disk
   - Resize disk
• Format disk
• Destroy disk
• Destroy virtual server
• Destroy template
• Download template
• Update firewall

To view transactions 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. The details screen for that virtual server shows recent transactions in the Activity Log section. To view more transactions, click the More Logs button.

To cancel pending tasks, click Cancel All Pending Tasks for this virtual server.

2.7.12 vCenter Virtual Server Networks

The Networking menu in the Virtual Servers menu enables you to manage network interfaces and allocate IP addresses.

2.7.12.1 Configure vCenter Virtual Server Network Interface

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 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're interested in.
3. Click the Networking tab, then click Network Interfaces.
4. On the page that follows you will see the following fields:
   o Interface – optional label of the network interface.
   o Network join – name of the network and a compute resource or compute zone this network is joined to.
   o Port speed – the speed set to the interface.
   o 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.

To add a network interface:
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 tab, then click Network Interfaces.
4. Click the Add New Network Interface button at the bottom of the screen.
5. On the screen that appears, input values for the following parameters:
   o Label – a human-friendly name for the new interface.
- Physical Network – choose a network join from the drop-down menu, which lists network joins assigned to the compute resource/compute zone on which the VS runs.

- Port speed – set port speed in Mbps, or make it unlimited.

6. Click the Add Network Interface button.

To edit network interface label, port speed or set it as primary (if none is marked as primary), click Edit icon next to the appropriate network interface. After editing the port speed, the virtual server should be power cycled for the change to take effect.

To delete a network interface, click the Delete icon next to the interface you want to delete.

To allocate another physical network, add a new network interface.

---

2.7.12.2 Rebuild vCenter Virtual Server Network

To rebuild network join, added to the virtual server (required after allocating new IP addresses to a vCenter Windows-based VS):

1. Go to your Control Panel > Cloud > Virtual Servers menu.

2. Click the label of a required VS.

3. On the screen that appears, click the Tools button, then click Rebuild Network.

4. In the pop-up window that appears, move the Force Reboot slider to the right, then select the VS shutdown type:
   - Power OFF virtual server
   - Shutdown virtual server
   - Gracefully shutdown virtual server

5. Move the Required Startup slider to the right to start up the VS automatically after the network is rebuilt.

6. Click the Rebuild Network button.

---

2.7.12.3 Allocate/Remove vCenter Virtual Server IP Addresses

In the Networking > IP Addresses tab you can find the list of assigned IP addresses, allocate new IP addresses and rebuild a network.

To allocate a new IP Address to the VS:

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 tab, then click IP Addresses.

4. Click the Allocate New IP Assignment button.

5. Select a network interface from the drop-down menu (only the network interfaces you added to the VS will be available)

6. Select an IP address from the IP Pool associated with the network interface. You may select an IP address that's already assigned to a VS, but only one VS should be online at a time.

   Use Please show me used IP Pool, Show only my IPs and Show only IPv6 checkboxes to narrow the list of IP in the drop-down list.

7. Click the Add IP Address Assignment button.

8. Click Rebuild Network.

To remove an IP address from a VS:
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** > **IP Addresses** tab.
4. Click the **Delete** icon next to the IP address you want to delete.
5. In the pop up window that appears:
   - Choose **Delete with Reboot** option if you want to reboot a VS and rebuild the network immediately after deleting the IP address. After choosing the **Delete with Reboot** option you will be redirected to the VS's Overview page.
   - Choose **Delete without Reboot** option if you don't want to reboot a VS. In this case to apply the changes, you will have to reboot the VS additionally.

2.7.12.4 Display Network Speed for Network Interfaces on vCenter Virtual Server Page

The main **Virtual Servers** screen displays the network speed of each VS's primary network interface. To see the speed of all interfaces assigned to a 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** > **Network Interfaces** tab.
4. On the screen that appears, the **Port Speed** column shows the network speed of the network interface.

2.7.12.5 Edit vCenter Virtual Server Network Speed

To edit a vCenter virtual server's network speed:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Select the virtual server you want to change.
3. Go to the **Network** > **Network Interfaces**, and edit the network speed accordingly.
4. Click the **Save Network Interface** button to save changes.

2.7.12.6 Import VSS Networks from vCenter

To use OnApp vCenter with basic licensing, you may import existing VSS from vCenter to OnApp so that they can be used instead of dvSwitches.

**vSphere Standard Switches**

In vCenter, you can create abstracted network devices called vSphere Standard Switches (VSS). You use standard switches to provide network connectivity to hosts and virtual machines. A standard switch can bridge traffic internally between virtual machines in the same VLAN and link to external networks.

You can add a VSS network for a VS imported from vCenter to OnApp. To successfully import VSS networks from vCenter to OnApp, do the following on the vCenter side:

- make sure that all VSS port group names are the same across ESXi hypervisors, otherwise, issues with migration may appear.
- manually create VSS on each ESXi host for the VSS to be shown in vCenter as one entry.

Once done, you may import your vCenter VS or resync it if the VS was imported previously.
Since VSS networks cannot be managed on OnApp side, it will not be possible to configure traffic shaping for them, so the Port speed field at the Edit NIC page and the Resources step of the VS Creation wizard will be disabled.

2.7.13  vCenter Virtual Server 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. Disk can be set as primary (that is, the disk from which an OS will boot).

Managing disks for the entire cloud is handled through the Control Panel's Settings menu. Disks for individual virtual servers are managed through the Control Panel > Cloud > Virtual Servers menu, where you can:

- See the list of disks allocated to this VS
- Add a new disk
- Resize a disk
- Check disk usage statistics (IOPS)
- Delete a disk

2.7.13.1  Add Disks to vCenter Virtual Servers

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 a VS's label to open its details screen.
3. Click the Storage tab > Disks.
4. Click the Create Disk button.
5. Fill in the details:
   - Data store - select the data store to create a disk on from the drop-down list.
   - Disk size
   - Swap Space - move slider to the right if this disk is swap space.
   - Require Format Disk - move slider to the right if this disk requires formatting.

   For Linux-based vCenter VSs, if the Require Format Disk option is enabled, you'll get a notification that VM will be rebooted. If the option is disabled, disk will not be formatted, but will also not be visible without the VS rescan or reboot.

   - Mounted - move the slider to the right if the disk should be added to Linux FSTAB (for Linux application servers).
   - Mount point - the maximum length of a Mount Point is 256 characters. Spaces are not allowed. No more than one slash is allowed. If the mount point is not specified the default mount point will be used:
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Reboot Virtual Server - move the slider to the right to reboot the VS after adding disk (applies only to Linux-based vCenter VSSs)

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.

2.7.13.2 Edit vCenter Virtual Server Disks
You can easily resize disks when needed. The resize will fail if your current usage is greater than the new size you request.

To change disk size:
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 tab > Disks.
4. Click the Actions button next to the disk you want to change, then click the Edit link.
5. Enter a new disk label and size in GB in the fields provided.
6. Click the Save Disk button.

For Linux-based VSs, it is necessary to rescan or reboot a VS after increasing its disk size.

2.7.13.3 Migrate vCenter Virtual Server Disks
You can migrate disks of your virtual servers to other data stores, which are allocated to the same compute resource or compute zone. Unlike VS migration – disk migration requires reboot of the VS (despite the template it is based on).

To migrate 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 tab > Disks.
4. Click the Actions button next to the disk you want to move to another data store, then click the Import link.
5. On the screen that appears, select a target data store from a drop-down box.

You can only migrate disks to data stores in data store zones assigned to your billing plan.

6. Click Start Migrate.

You cannot migrate a disk to a data store with less capacity than the disk size!
If you move an 850GB disk between aggregates with 10GB actual
usage, the 'dd' image of the local volume manager will take 850GB space, because the entire local volume manager is copied, including zero 'd' space which may not be able to be recovered.

2.7.13.4 Delete vCenter Virtual Server Disks
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 button next to the disk you want to delete, then click Delete.

2.7.14 vCenter Virtual Server Statistics
For your convenience, the system tracks VS performance and generates statistics on:
- VS CPU Utilization
- VS Billing statistics
- Interface Usage
- Disk IOPS

2.7.14.1 vCenter Virtual Server CPU Utilization
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 > 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 time zone settings.
6. To zoom into a time period, click and drag in a chart. Click the Reset Zoom button to zoom out again.
To see what percentage of compute resource’s CPU resource a VS takes, go to your Control Panel > Cloud > 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.

2.7.14.2 vCenter Virtual Server Billing Statistics
OnApp has a record of all the charges applied to your VSs for the last three month period. If a virtual server was created less than three months ago, statistics are recorded for the VS’s existence to date. You can view all statistics available, or those for a shorter period by setting a Start and End time.

To view billing 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 Overview > Billing Statistics tab.
4. Set Start and End time. By default the statistics are generated for the last three months or the actual VS existence period.
5. Tick the Show in my Timezone box to show bandwidth statistics according to your profile’s timezone settings.
6. On the page that appears:
   - **Date** – particular date and time for the generated statistics
   - **Users** – the virtual server owner. Click the owner name to see the User Profile (user details)
   - **Virtual Servers** – the virtual server name with the total due for VS resources (CPU priority, CPUs, memory and template resources) for the point of time specified in the Date column.
   - **Network Interfaces Usage** – the total due for the network interfaces used by this VS for the point of time specified in the Date column. Click the network interface name to see its details.
   - **Disks Usage** – the list of disks assigned to this VS with the total due for the disk space resources (disk size, data read/written, reads/writes completed) for the point of time specified in the Date column. Click the disk name to see its details.
   - **Costs** – the total due for the Virtual servers, Network Interfaces and Disks resources at the point of time specified in the Date column.

Scroll down to see Total Amount (the total due for the whole billing statistics period).

2.7.14.3 vCenter 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 Reset Zoom button to zoom out again.

2.7.14.4 vCenter Virtual Server Disk IOPS
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. Next to the necessary disk, click the Actions button and select the IOPS option.
5. There are four charts on the screen that appears:
   - Instant IOPS - summary of input/output operations per minute
   - Hourly IOPS - summary of input/output operations per hour
   - Instant Data Written/Read - summary of written and read data for the last 24 hours
6. To zoom into a time period, click and drag in a chart. Click the Reset zoom 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.

2.7.15 Manage vCenter Virtual Server Recipes
Established connection between vCenter and ESXi compute resources and having VMware tools pre-installed on virtual servers is required for running recipes on vCenter virtual servers

To manage virtual server recipes:
1. Go to your Control Panel > 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 Control Panel:
   - The left pane shows the list of recipes available in the bucket 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.

Assign recipe
Use drag and drop feature to assign a recipe to a desired event.
You can assign virtual server recipes to the following events:
   - VS provisioning - run the recipe during the virtual server provisioning
   - VS network rebuild - run the recipe while rebuilding a network
- **VS disk added** - run the recipe while adding a disk to the virtual server
- **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 IP address add** - run the recipe while adding an IP address to the virtual server
- **VS IP address remove** - run the recipe while removing an IP address from the virtual server
- **VS start** - run the recipe while starting the virtual server
- **VS reboot** - run the recipe while rebooting the virtual server
- **VS hot migrate** - run the recipe during the hot migration of the virtual server
- **VS hot full migrate** - run the recipe during the hot migration of the virtual server with disk
- **VS failover** - run the recipe during the failover process

**To use drag and drop:**
1. Click the arrow button in front of the required event to unfold it.
2. Select the required recipe in the left pane and hold it down with the left mouse button.
3. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

**Remove recipe**
To remove recipe:
1. Click the arrow button in front of the required event to view the list of recipes assigned to it.
2. Click the Delete button next to the recipe you want to remove.

### 2.7.16 Manage vCenter Virtual Server 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 during the virtual server creation or via the virtual server **Overview** menu.

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**.
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**.

To edit a custom variable, click the **Edit** icon next to the required variable and change its details.

To delete a custom variable, click the **Delete** icon next to the variable you want to remove. You will be asked to confirm the deletion.

---

It is possible to set custom variables for image templates, as well as for virtual servers. Virtual server custom variables will always overlay template custom variables.

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### 2.7.17 Manage Virtual Server Snapshots

VMware snapshot tools are used to perform snapshots by simply locking the filesystem disk (vmdk) and creating a new VMware disk with the changes made alongside, so the procedure for virtual servers running under VMware looks like: vmdk + vmdk(1) + vmdk(#).

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.

To create a snapshot for vCenter 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 **Create New Snapshot** button.
5. Give your snapshot a name.
6. Click **Create Snapshot** button.

To delete a VS snapshot, click the **Actions** button next to the required snapshot, then click **Delete**.

---

### 2.7.18 vCenter Virtual Server Console

- To be able to use the MKS console on vCenter virtual servers, VSs must not be configured for VNC access in vCenter.
- In order for a vCenter VS console to work, the `system_host` parameter in `/onapp/interface/config/on_app.yml` file must be changed from its default value `onapp.com` to an appropriate FQDN or IP address of the Control Panel server.

You can use the virtual server console to manage your virtual servers in command line mode. To use the VS console:
1. Go to Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the **Label** of the appropriate Virtual Server.
3. Go to the **Console** tab and click **MKS**. The console window will appear.

**Public Console Access**

If you want users to have access to the MKS/VMRC console within OnApp then you will need to use a publicly routable IP address/domain name as the "vCloud Director public console proxy address" within your vCloud Director settings.

You can lock this IP/domain access down as required, however, it will need communication to the OnApp Control Panel over port 902 (for MKS) and 443 (for VMRC).

### 2.8 OnApp OVA Import to vCenter

For more information on how to manage OVAs, refer to the [Administration Guide](#).

OnApp OVA template store is used as a central repository to deploy templates into vCenter environments. These templates are stored on the OnApp CP server or backup server and are uploaded to vCenter during deployment via the OVA import procedure. OVA is an archive containing files from the Open Virtualization Format (OVF) package. OVF is an open-source standard for packaging and distributing software applications for virtual servers.

The OVA import procedure involves the following steps:

1. **Uploading OVA to CP**
2. **Converting OVA into a vCenter template**
3. **Adding the template to the template store**
4. **Building a virtual server from the template**

- The template OVF hardware version should be equal to or lower than the version of vCenter compute resource.
- If the OVF template is exported from VirtualBox, the template hardware version should be changed from 'virtualbox-\X' to 'vmx-\X'.

### 2.8.1 Upload OVA

To upload OVAs to your cloud:

1. Go to your **Control Panel** > **Cloud** > **Templates** menu on the left navigation panel.
2. Click the **OVA List** link from the expanding menu.
3. On the page that loads, click the **Upload OVA** button at the bottom of the screen.
4. Fill in the following details:
   - Label - enter a name for OVA
   - Backup server - select the backup server where OVA will be stored
   - It is required to select a backup server where the OVA template should be stored. If the backup server is not selected, it will not be possible to upload an OVA.
   - Version - fill in the version of the OVA
   - Min memory size - specify the minimum required RAM for the OVA (128 MB by default). If you set the RAM value that is smaller than in the OVA file, this amount will be overwritten by the real memory size from the OVA file after upload. If you set the value that is bigger than the RAM in the OVA file, the settings will be applied.

5. Click Next. On the page that appears, click File or File URL tab depending on the upload method:
   - File - click Choose File to select the required OVA file from your file system. The yellow infobox will show the maximum file size for OVAs. The maximum upload size is pre-configured at Admin > Settings > Configuration (the Max upload size field). Click the Upload OVA button.
   - File URL - select this tab if you want to upload OVA from URL and specify the link from which the OVA archive will be uploaded.

6. Click Save to upload the OVA archive.

If an operating system of OVA is Linux and incremental backups are activated on your CP, you will not be able to upload the OVA file. To solve this issue, go to your Control Panel > Admin > Settings > Configuration > Backups/Templates tab and enable the Store extended attributes slider.

After you upload OVA to the cloud, it can be found at Cloud > Templates > OVA List > My OVAs tab. The OVAs uploaded by your users are under the User OVAs tab. You can convert the uploaded OVA into a vCenter-based template by following steps from the next section.

### 2.8.2 Convert OVA

The initially-uploaded OVA file is saved without the attached virtualization so that you can convert it more than once into all supported virtualization formats. To convert the uploaded OVA archive into a vCenter-based template, follow the next steps:

1. Go to your Control Panel > Cloud > Templates menu from the left navigation pane.
2. Click OVA List on the menu.
3. Click the Actions icon > Convert next to the required OVA file.
4. In the open box, select the vCenter virtualization format and fill in the following details:
   - Label - enter a name for a new OVA file that will be created on the basis of the initially-uploaded one
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- Operating system - select the operating system of the OVA (Linux, Windows or Other). Choose the Other operating system if you want to upload an OVA with an operating system other than Windows or Linux.
- Operating system distro - select the operating system distribution of the OVA
- Architecture - select the architecture of the OVA (x86 or x64)
- Edition - select the edition of the OVA (for Windows-based OVAs only)
- R2 - move the slider to the right if you want to use the updated release of Windows OS distribution (for Windows-based OVAs only)
- Initial username - provide a username for the guest operating system
- Initial password - provide a password for the guest operating system
- Make public - move the slider to the right if you want to make the OVA available to all users in the cloud

5. Click Save to convert OVA into the vCenter virtualization format.

- The OVA file is locked for the time period while it is being converted. You can unlock the OVA file to make the following actions instantly available: edit OVA and delete OVA. To unlock OVA, click the Actions button and select the Unlock option.
- The limits on the number of OVAs and disk space allocated for storing OVAs are bound to a user who uploaded an OVA file. Therefore, when the OVA file is being converted, the bucket limits are checked for the user who uploaded OVA and not for the user who converts it.

When the uploaded OVA file is converted into a template, you can proceed to add this template to the template store and then build a VS from this template.

2.9 Import vCenter Templates

As you add a vCenter compute resource to OnApp, the vCenter templates are also imported and stored at the vCenter Template List page in the Pending state. To finalize the import of the vCenter templates and be able to manage them, it is required to update the templates on the OnApp side by specifying the template’s credentials.

Before importing templates from vCenter, make sure that the following conditions are met:
1. Install VMware tools inside the VS by following the VMware instructions.
2. Make sure that Perl is installed on this VS.
   Otherwise, the functionality of the imported templates may be limited.

2.9.1 Update template

To change the status of the vCenter templates to Active:
1. Go to your Control Panel > vCenter Template List.
2. Next to the required template, click the Actions button > select the Edit template option.

3. In the initial username and password fields, indicate the template credentials, set during the template's creation.

4. Click the Save button.

The template's status will change to Active, and it will be possible to select this template while adding a vCenter template to the Template Store.

### 2.9.2 Add template to Template Store

To add a vCenter template to the Template Store:

1. Go to your Control Panel > Templates > Template Store.
2. Select the label of the Template Group you need to add the vCenter template to.
3. Click the ‘+’ button in the Actions column.
4. Select the Add vCenter Template option from the dropbox.
5. Select the vCenter template from the list of available vCenter templates in the dropbox.
6. Click the Save button to save the changes.

Once finished, the template will be available to select on the Templates step of the VS Creation wizard.

- Please note that for the Windows templates imported from vCenter it is impossible to select the MAK license during the VS creation. Instead, select the Your own license option and manually indicate the License Key.
- Windows 2008 and Windows 2008 R2 templates are not supported.

### 2.10 Manage vCenter Templates

After you import a vCenter template and update it's credentials on OnApp side, you can assign system service add-ons and recipes to this template.

Windows 2008 and Windows 2008 R2 templates are not supported.

#### 2.10.1 Manage vCenter Template System Service Add-ons

To assign system service add-ons to a vCenter template:

1. Go to your Control Panel > Cloud > vCenter Template list. You'll see a list of imported vCenter templates, available on your cloud.
2. Next to the template in question click the Actions button and select the Manage Service Add-ons option.
3. Click the '+' button.
4. The screen that follows shows the list of the 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.

5. Click the label of the necessary system service add-on to see its details:
   - Label
   - Type - user or system
   - Description
   - Price
   - Apply to existing Virtual Servers - move the slider to the right to assign the system service add-on to all the VSs in your cloud built from this template

6. Click the Assign button to finish.

2.10.2 Manage vCenter Template Recipes

To assign system service add-ons to a vCenter template:

1. Go to your Control Panel > Cloud > vCenter Template list. You’ll see a list of imported vCenter templates, available on your cloud.

2. Next to the template in question click the Actions button and select the Manage Recipes option.

Use drag and drop feature to assign a recipe to a desired event.

You can assign template 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
- **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 IP address add** - run the recipe while adding an IP address the virtual server
• **VS IP address remove** - run the recipe while removing an IP address from the virtual server
• **VS start** - run the recipe while starting the virtual server
• **VS reboot** - run the recipe while rebooting the virtual server

To use recipes with own Windows templates, the templates must be version 3.1 or later.

Note that a VS related recipe is always executed first, for example:
1. You have two recipes, one assigned to a template and another assigned to a VS.
2. You assign both of them to a required event.
3. After the VS is built, the VS related recipe is run first.
4. Next, the template recipe is run.

This execution order is also relevant when the VS related recipe and template recipe are both assigned to the same event.

**To use drag and drop:**
1. Click the arrow button in front of the required event to unfold it.
2. Select the required recipe in the left pane and hold it down with the left mouse button.
3. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

**2.10.3 Delete Recipe**

To remove a recipe:
1. Click the arrow button in front of the required event to view the list of recipes assigned to it.
2. Click the **Delete** button next to the recipe you want to remove.

**2.11 Create and Manage vCenter Resource Pools**

VMware vCenter resource pool determines how and when the provider virtual data center compute and memory resources are committed to the Org VDC. In other words, the resource
Pool allows you to delegate control over the resources of a host or a cluster. The benefits are evident when you use resource pools to divide into sections all resources in a cluster.

You can view, create, edit, and delete resource pools by using the VMware vCenter Control Panel.

On this page:

- View vCenter Resource Pool
- Create vCenter Resource Pool
- Edit vCenter Resource Pool
  - Change Owner
- Delete vCenter Resource Pool

2.11.1 View vCenter Resource Pool

To view the vCenter 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
   - **Compute Zone** - compute zones which the resource pool is placed on
   - **Compute Resource** - compute resource which the resource pool is placed on
   - **Owner** - owner of resource pool
   - **Actions** - click the Actions button to edit or delete the resource pool
3. The search box at the top right corner of the page allows you to search a Resource Pool by its label.
4. To view vCenter resource pool details, click on the label of resource pool you are interested in.

2.11.2 Create vCenter Resource Pool

To create a vCenter 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 New Resource Pool button just below the list of resource pools
3. On the screen that appears, fill in the resource pool creation form:
   - **Label** - specify a name for the resource pool
   - **Compute Resource** - select the required compute resource from the dropdown menu
4. The CPU and RAM Limits of the new resource pool will be automatically unlimited, all other properties will be set to default.
5. Click the Submit button to save the changes.
2.11.3 Edit vCenter Resource Pool

To edit a vCenter 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, and click Edit.
3. On the screen that appears, edit the necessary parameters, and click Save.

You can also use the button at the resource pool details page.

2.11.3.1 Change Owner

To change the owner of a resource pool:
1. Go to your Control Panel > Cloud > Resource Pools and click the Actions button next to the resource pool you are interested in, then click Change owner.
2. Choose the new owner from the drop-down menu and click the Change Owner button.

2.11.4 Delete vCenter Resource Pool

To delete a vCenter 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.

Please note that if you delete the resource pool that has a virtual server on it, the VS will be moved to the cluster default resource pool.
2.12 vCenter Servers

To connect to vCenter, you can create a vCenter server logical point on the OnApp side. This option will allow you to add each cluster from the vCenter side as a compute resource on the OnApp side separately.

When your vCenter server is imported, you will see all of your networks and data stores being imported and placed in separate zones. After that, you will be able to create compute resources using clusters that have been imported with the vCenter server. With this feature, you will be able to create your VS now based on the compute resource (cluster) and Resource Pool that you select on VS creation wizard. It brings more logic and comfort to your user experience.

You can also set up billing for each cluster separately in the corresponding bucket by specifying the necessary compute zone in the Limits for compute zones section.

Add vCenter Server

To add a vCenter server:
1. Go to your Control Panel > Admin > Settings > vCenter Servers menu.
2. Click the Add button.
3. On the page that appears, specify the following details:
   - Label
   - IP / Hostname
   - Login
   - Password
4. Click the Save button.

2.12.1 Edit vCenter Server Details

To edit vCenter server details:
1. Go to your Control Panel > Admin > Settings > vCenter Servers menu.
2. Next to the necessary VS, click the Actions button and select the Edit option.
3. Apply the required changes in the corresponding field(s):
   - Label
   - Login
   - Password
4. Click the Save button.

2.12.2 Delete vCenter Server
If you delete a vCenter server, all the data stores, networks, resource pools, or any other entities related to it (except of compute zone) will be deleted as well.

To delete a vCenter virtual server:
1. Go to your Control Panel > Admin > Settings > vCenter Servers menu.
2. Next to the necessary VS, click the Actions button and select the Delete option.
3. Confirm the deletion.

2.13 Statistic

This section provides information on statistics related to your vCenter virtual server. Please note that in order for performance and resource reporting to be shown within OnApp, we require a connection between OnApp and your vCenter environment(s) over port 443.

2.13.1 Dashboard

After you log in to the system, you can see the OnApp dashboard. The dashboard provides resource usage statistics, activity log, and your cloud summary. The sidebar menu consists of the following tabs:

- **Cloud** that includes Dashboard, Service Catalog, Appliances, vCenter, vCloud and Components such as templates, service add-ons, recipes, etc.
- **CDN** that contains CDN related resources and server instances.
- **Metrics** that provides statistics on the usage of Cloud, Storage, CDN, and other available resources.
- **Admin** that allows administrators to manage compute resources, users, billing, notifications, settings, etc.

On this page:

- **Statistics**
- **Your Summary**
- **Activity Log**
- **Additional Navigation**

2.13.1.1 Statistics

You can choose the time period (24 hours, 7 or 30 days), for which the 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>CPU</td>
<td>Total virtual cores assigned to running VSs (may be higher than OnApp</td>
<td>Total physical cores on all compute resources which are configured in OnApp</td>
<td>The points on the graph show daily peaks of used CPU (in cores) for a particular time period. Hover over a particular</td>
</tr>
<tr>
<td>Resource</td>
<td>Used</td>
<td>Total</td>
<td>Chart</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Active cores if overallocated</td>
<td></td>
<td></td>
<td>point, to view the peak of used CPU that will appear below the chart.</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>Total amount of memory allocated to VSs managed by Control Panel</td>
<td>Total amount of RAM of all KVM/XEN/vCenter/vCloud compute resources</td>
<td>The points on the graph show daily peaks of used memory (in MB) for a particular time period. Hover over a particular point, to view the peak of used memory that will appear below the chart.</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Total amount of storage allocated to VSs managed by Control Panel</td>
<td>Total amount of datastores managed by OnApp, including vCenter/vCloud/Integrated Storage and orphan disks capacities</td>
<td>The points on the graph show daily peaks of used storage space (in GB) for a particular time period. Hover over a particular point, to view the peak of used storage space that will appear below the chart.</td>
</tr>
<tr>
<td>IOPS /h usage</td>
<td>The amount of input/output requests for the entire cloud (blue part of the bar - data read, dark blue - data written) for the last hour.</td>
<td></td>
<td>The points on the graph show the total amount of input/output requests for a particular time period. Hover over a particular point, to view the peak of input/output requests that will appear below the chart.</td>
</tr>
<tr>
<td><strong>vCloud CPU</strong></td>
<td>vCloud peak CPU usage per hour, calculated only for the powered-on VSs</td>
<td></td>
<td>The points on the graph show the hourly peaks (in GHz) for a particular time period. Hover over a specific point to view the peak of CPU usage that will appear below the chart.</td>
</tr>
<tr>
<td><strong>vCloud Storage</strong></td>
<td>Summarized vCloud storage used by powered-on vApps/VSs</td>
<td></td>
<td>The points on the graph show the sum of disk usage (in GB) by powered-on vApps/VSs for a particular period. Hover over a particular point to view the peak vCloud storage usage by powered-on vApps/VSs that will appear below the chart.</td>
</tr>
</tbody>
</table>
Click the Admin tab and go to Settings > Configuration > Interface > Dashboard Statistics to choose which statistics will be shown on the dashboard.

2.13.1.2 Your Summary
This section shows details of the entire cloud:

- For users, it shows the total number of virtual servers, RAM, data stores, backups, and disk space they’re using.
- For administrators, it shows the total number of virtual servers, compute resources, data stores, and backups on the entire cloud.
2.13.1.3 Activity Log
At the bottom of the screen is a record of recent transactions. To view details of a transaction, click a Ref number.

- Users see recent transactions for their virtual servers.
- Administrators see recent transactions for the entire cloud.

2.13.1.4 Additional Navigation
From the top pane, you can run the following actions:

- Click the Arrow button to hide the sidebar menu.
• Use **Search** to run a global search across the cloud.
• Click your login to view **My Profile** or to log out.
• Click the **Create Server** button to create a new virtual server, application server, load balancer, edge server, or storage server.
• To hide the infobox on a particular page, click the **Close** button in the upper-right corner of the infobox. For more infobox settings, refer to **User Profile** section.

### 2.13.2 vCenter Cloud Usage

For your convenience, the system tracks VS performance and generates statistics on CPU utilization, billing, network interface usage, and disk IOPS.

In this document you can find information on how to view the vCenter virtual server statistics.

**On this page:**

- **CPU Usage for Virtual Server**
- **Billing Statistics**
  - Save as CSV
- **Virtual Server Network Interface Statistics**
- **Virtual Server Disk IOPS Statistics**
- **Metrics Used for Data Analysis**

#### 2.13.2.1 CPU Usage for Virtual Server

To view the CPU usage statistics of your cloud:

1. Go to your Control Panel > **Cloud** > **Virtual Servers**
2. Click the **Actions** button next to the virtual server you are interested in and then click **CPU Usage**

You can also see the statistic by clicking **Control Panel** > **Cloud** > **Virtual Servers** > **Label** > **Overview** > **CPU Usage** tab.

The charts show the total CPU usage statistics for all the cores of the particular VS for a specified time period. The vertical axis indicates the CPU usage percentage (CPU percentage is the core-independent quantity) and the horizontal axis defines a time period.

The Instant CPU Usage graph shows the usage of cores on per-minute basis for the last 24 hours.

The Hourly CPU Usage graph shows the usage of cores for the last three months (if there is enough data). If there is less data available, the chart will show utilization for the time available.

To specify another period, set the start and end time in the filter and click the **Apply** button.

Click the **Show in my timezone** checkbox if you want to show statistics according to your profile's timezone settings.

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

OnApp has a record of all the charges applied to your vCenter resources. You can view the resource statistics under the statistics available, or those for a shorter period by setting a filter.

- The price parameters on this page do not take into consideration the free limits for resources set in the bucket.
- When generating billing statistics, OnApp takes the last state of the VS during the hour. For example, if a VS was turned on at 6.15 and turned off at 6.59 it will be considered as being off for the whole hour and its resources will be billed according to the OFF prices set in the bucket. However, the VS’s disk and network interface usage can still be billed in case the VS was on during that hour.

To view the billing statistics of a particular virtual server:

1. Go to your Control Panel > Cloud > Virtual Servers and then click on the label of the virtual server you are interested in
2. On the page that loads, click the Overview tab, then click Billing Statistics
3. To filter the statistics by date and time, select the time period from the drop-down menu. By default the statistics are generated for the last three months or the actual VS existence period.
4. Click the Use local time checkbox to show statistics according to the user’s profile’s timezone settings
5. Click the Apply button

On the screen that appears, you will see the following billing statistics details, according to the set price:

- Date - particular date and time for the generated statistics
• **Users** - the user to which the vCenter VS belongs to. Click on the owner name to see the User Profile (user details)

• **Virtual Servers** - the virtual server name with the total due for VS resources (CPU priority, CPUs, memory and template resources) for the point of time specified in the *Date* column.

• **Virtual Server** - summarized values of CPU, RAM disks, and NICs

• **Network Interfaces Usage** - the total due for the network interfaces used by this VS for the point of time specified in the *Date* column. Click the network interface name to see its details

• **Disk Usage** - the list of disks assigned to this VS. The charges for the disk size resource are included into the *Costs* column

• **Costs** - the total due for the CDN resource at the point of time specified in the *Date* column.

Scroll down to see **Total Amount** (the total due for the whole billing statistics period).

2.13.2.2.1 *Save as CSV*

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:

• **stat_time** - a particular hour for which the statistics were generated

• **vs_id** - an ID of a virtual server

• **resource_category** - a resource for which the statistics were generated. The resource category can be a disk, network_interface, compute, template, instance_package, and service_add_on.

• **resource_id** - an ID of a resource

• **metric_name** - a name of a metric for which the statistics were generated. The metric can be a disk_size, data_read, data_written, reads_completed, writes_completed, ip_addresses, rate, data_received, data_sent, cpu_shares, cpus, memory, cpu_usage, template, count (for instance packages, templates, and service add-ons), etc.

• **usage** - the amount of used resources that can be the following:
  
  o GBs of disk size, Kbs of data read/written, the number of reads/writes.
  o the number of IPs, the port speed in Mb per second, the data sent and received in KBs.
  o the count for the instance package, template, and service add-on categories.

• **cost** - the total due for the VS usage for a particular hour specified in the *stat_time* field

For virtual servers created from instance packages, the resource category is *instance_package*, the metric name is *count* and the usage is "1".
2.13.2.3 Virtual Server Network Interface Statistics

OnApp tracks network usage for vCenter virtual servers and generates charts that help to analyze network performance. To see statistics on network utilization 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 **Interface usage** icon next to the network you're interested in.
5. On the screen that appears, the following charts are available:
   - **Instant Bandwidth** - the chart shows the average inbound and outbound speed in Megabits per second (Mbps) of data received and sent over the network respectively. The average speed is shown on a per-minute basis for the last 24 hours.
   - **Hourly Data Transfer** - the chart shows how much data in Gigabytes (GB) is received and sent over the network per hour. The amount of received and sent data is shown on a per-hour basis for a period of time up to three months.
6. To zoom into a time period, click and drag in a chart. Click the **Reset zoom** button to zoom out again.
7. To filter the statistics by date and time, select the time period from the drop-down menu above the charts and click the **Apply** button.

2.13.2.4 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 were 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. 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 (in Gb) for the last hour
6. To zoom into a time period, click and drag in a chart. Click the **Reset Zoom** button to zoom out again.

7. You can filter the statistics by date and time - select the time period from the drop-down menu and click the **Apply** button.

### 2.13.2.5 Metrics Used for Data Analysis

The statistics shown above are based on the [metrics vCenter reports for a virtual server](#).

The **virtual server CPU usage** statistics are prepared based on the metrics that indicates the percentage of CPU that was used out of all the CPU that was allocated to the VM (**CPU|Usage (%)**) and CPU use in megahertz (**CPU|Usage (MHz)**).

For **virtual server network interface** statistics, we analyze the rate of data being sent by the VS per second (**Net|Data Transmit Rate (KBps)**) and the rate of data received by the VS per second (**Net|Data Receive Rate (KBps)**).

For **virtual server disk IOPS** statistics, we analyze the amount of data read in the performance interval (**Disk|Read Throughput KBps**)) and amount of data written to disk in the performance interval (**Disk|Write Throughput (KBps)**).

### 2.14 vCenter Permissions

The list below includes the permissions related to vCenter Resources.

- Users with the Administrator role in OnApp have vCenter related permissions enabled by default. They can create and manage vCenter resources if there is a vCenter compute resource in the cloud.

- Users with vCenter User role have all **OnApp User permissions**, **default permissions for vCenter User role**, and two extra permissions necessary to create a vCenter VS:
  - Read all public OVAs
  - See Compute Resource during virtual server creation

- Users with OnApp User role have limited vCenter permissions enabled by default, and cannot create a vCenter VS.

- The vCenter permissions list is not updated in OnApp for custom roles imported from vCenter.
2.14.1 Default Permissions for vCenter User Role

2.14.1.1 vCenter Clusters
OnApp administrators can control users’ ability to manage vCenter clusters through the Control Panel's Roles menu. You can set the following cluster permissions for user roles:

- *Any actions on vCenter Clusters* - the user can take any action on vCenter clusters
- *Show vCenter Clusters on Virtual Server creation* - the user can see vCenter Clusters on Add New Virtual Server screen

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

- *Any actions on vCenter Datacenters* - the user can take any action on vCenter Datacenters
- *Show vCenter Datacenters on Virtual Server creation* - the user can see vCenter Datacenters on Add New Virtual Server screen

2.14.1.3 vCenter Servers
- *Any actions on vCenter Servers* - the user can take any action on vCenter servers
- *Create a new vCenter Server* - the user can create new vCenter servers
- *Delete any vCenter Server* - the user can delete any vCenter server
- *Import any vCenter Server* - the user can import any vCenter server to OnApp
- *See any vCenter Server* - the user can see the list of all vCenter servers in the cloud
- *Update any vCenter Server* - the user can edit any vCenter server within the cloud

For more details, refer to the vCenter Servers section of this guide.

2.14.1.4 vCenter Templates
- *Any actions on vCenter Templates* - the user can take any action on vCenter templates
- *See any vCenter Templates* - the user can see any vCenter templates
- *Update any vCenter Templates* - the user can edit any vCenter templates

2.14.1.5 vCenter Resource Pool
- *Add a new vCenter Resource Pool* - the user can add a vCenter Resource Pool
- *Delete own vCenter Resource Pool* - the user can delete own vCenter Resource Pool
- *See own vCenter Resource Pool* - the user can see own vCenter Resource Pool
- *Update own vCenter Resource Pool* - the user can update own vCenter Resource Pool

2.14.1.6 Virtual Servers
- *Resync vCenter VS* - the user can run the re-import vCenter VS transaction

2.14.2 Other vCenter Permissions
2.14.2.1 NSX Edges
OnApp administrators can control users’ ability to manage NSX edges through the Control Panel’s Roles menu. You can set the following NSX edges permissions for user roles:

- **Any action on edge** - the user can take any action on NSX edges
- **See any edge** - the user can see any NSX edge

2.14.2.2 NSX Firewall Rules
OnApp administrators can control users’ ability to manage NSX 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 firewall rules
- **Create any firewall rule** - the user can create a new NSX firewall rule
- **Delete any firewall rule** - the user can delete any NSX firewall rule
- **See any firewall rules** - the user can see any NSX firewall rules
- **Update any firewall rule** - the user can edit any NSX firewall rule

2.14.2.3 NSX Firewall Services
OnApp administrators can control users’ ability to manage NSX 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 firewall services
- **See any firewall service** - the user can see any NSX firewall service
- **Update any firewall service** - the user can edit any NSX firewall service

2.14.2.4 NSX IPSec Services
OnApp administrators can control users’ ability to manage NSX 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 IPSec services
- **See any IPSec service** - the user can see any NSX IPSec service
- **Update any IPSec service** - the user can edit any NSX IPSec service

2.14.2.5 NSX IPSec Sites
OnApp administrators can control users’ ability to manage NSX 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 IPSec sites
- **Create IPSec sites** - the user can create an NSX IPSec site
- **Delete any IPSec site** - the user can delete any NSX L2 VPN IPSec site
- **See any IPSec site** - the user can see any NSX IPSec sites
- **Update any IPSec site** - the user can edit any NSX IPSec site

2.14.2.6 NSX L2 VPN Peer Sites
OnApp administrators can control users’ ability to manage NSX 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 L2 VPN peer sites
- **Create L2 VPN peer sites** - the user can create an NSX L2 VPN peer site
- **Delete any L2 VPN peer site** - the user can delete any NSX L2 VPN peer site
See any L2 VPN peer site - the user can see any NSX L2 VPN sites
Update any L2 VPN peer site - the user can edit any NSX L2 VPN sites

2.14.2.7 NSX L2 VPN Services
OnApp administrators can control users' ability to manage NSX 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 L2 VPN service
- Update any L2 VPN service - the user can edit any NSX load balancer L2 VPN services

2.14.2.8 NSX Load Balancer Application Profiles
OnApp administrators can control users' ability to manage NSX 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 load balancer application profiles
- Create any application profile - the user can create a new NSX load balancer application profile
- Delete any application profile - the user can delete any NSX load balancer application profile
- See any application profile - the user can see any NSX load balancer application profile
- Update any application profile - the user can edit any NSX load balancer application profile

2.14.2.9 NSX Load Balancer Application Rules
OnApp administrators can control users' ability to manage NSX 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 load balancer application rule
- Delete any application rule - the user can delete any NSX load balancer application rule
- See any application rule - the user can see any NSX load balancer application rules
- Update any application rule - the user can edit any NSX load balancer application rules

2.14.2.10 NSX Load Balancer Monitors
OnApp administrators can control users' ability to manage NSX 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 load balancer monitors
- Create any monitor - the user can create a new NSX load balancer monitor
- Delete any monitor - the user can delete any NSX load balancer monitor
- See any monitor - the user can see any NSX load balancer monitors
- Update any monitor - the user can edit any NSX load balancer monitors

2.14.2.11 NSX Load Balancer Pools
OnApp administrators can control users' ability to manage NSX load balancer pools through the Control Panel's Roles menu. You can set the following load balancer pools permissions for user roles:
OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)

- **Any action on pool** - the user can take any action on NSX load balancer pools
- **Create any pool** - the user can create a new NSX load balancer pool
- **Delete any pool** - the user can delete any NSX load balancer pool
- **See any pool** - the user can see any NSX load balancer pools
- **Update any pool** - the user can edit any NSX load balancer pools

### 2.14.2.12 NSX Load Balancer Services

OnApp administrators can control users' ability to manage NSX 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 load balancer services
- **See any load balancer service** - the user can see any NSX load balancer service
- **Update any load balancer service** - the user can edit any NSX load balancer service

### 2.14.2.13 NSX Load Balancer Virtual Servers

OnApp administrators can control users' ability to manage NSX 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 load balancer virtual servers
- **Create any virtual server** - the user can create a new NSX load balancer virtual server
- **Delete any virtual server** - the user can delete any NSX load balancer virtual servers
- **See any virtual server** - the user can see any NSX load balancer virtual servers
- **Update any virtual server** - the user can edit any NSX load balancer virtual servers

### 2.14.2.14 NSX Managers

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

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

### 2.14.2.15 NSX NAT Rules

OnApp administrators can control users' ability to manage NSX 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 NAT rules
- **Create any nat rule** - the user can create a new NSX NAT rule
- **Delete any nat rule** - the user can delete any NSX NAT rule
- **See any nat rule** - the user can see any NSX NAT rules
- **Update any nat rule** - the user can edit any NSX NAT rules

### 2.14.2.16 NSX NAT Services

OnApp administrators can control users' ability to manage NSX 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 NAT services
- **See any nat service** - the user can see any NSX NAT services
• *Update any nat service* - the user can edit any NSX NAT services

2.14.2.17 vCenter Resource Pools
OnApp administrators can manage vCenter resource pools. You can set the following permissions for user roles:

- *Any actions on vCenter Resource Pools* - the user can take any action on vCenter Resource Pool
- *Delete any vCenter Resource Pool* - the user can delete a vCenter Resource Pool
- *See any vCenter Resource Pool* - the user can see any vCenter Resource Pool
- *Update any vCenter Resource Pool* - the user can update any vCenter Resource Pool
- *Change an owner of any vCenter Resource Pool* - the user can change the owner of any vCenter Resource Pool

2.14.2.18 Virtual Servers
• *Infrastructure Mode* - the user can build managed vCenter VSs

See *Create Custom vCenter VS* for more details.

**On this page:**

- Default permissions for vCenter User role
- Other vCenter permissions

Synonyms for "update" updating, upgrading, modernization, refresh, discounting, modernize, inform, brief, notify, advise, apprise
## 3 User Guide

Virtual servers running on vCenter compute resources are managed almost the same as normal virtual servers. Also, the vCenter cluster is displayed as a pool of resources rather than per compute resource.

OnApp Cloud gives you high-end cloud management features including:

<table>
<thead>
<tr>
<th>vCenter Virtual Server Options</th>
<th>Power Options</th>
<th>Networks</th>
<th>Disks</th>
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</thead>
<tbody>
<tr>
<td>Edit</td>
<td>Reboot</td>
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</tr>
<tr>
<td>Rebuild manually</td>
<td>Suspend</td>
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<td>Delete</td>
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<td>Edit network speed</td>
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<tr>
<td>Startup</td>
<td>vCenter virtual server IP addresses</td>
<td>Delete disks</td>
<td>Disk IOPS statistics</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Display network speed for network interfaces</td>
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</tbody>
</table>

Certain VS operations are unavailable in OnApp with vCenter:

- **Reboot in recovery**
- **Segregate**
- **VIP status**
- **Autoscaling**
- **Migrate VS.** vCenter utilizes vMotion to ensure that the VSs are optimally placed on the compute resources
- **Backups.** Backup process for vCenter virtual servers differs from the standard OnApp backup scheme. See vCenter VS Snapshots section for details.
- Use of IPv6 is not supported for vCenter virtual servers.

**NOTE:** Performing the following VS operations at vCenter may lead to problems with VMware infrastructure management. Please, do not execute the following actions in vCenter:

- Power On/Off or Suspend VSs
- Edit the Properties for any VS
- Create and delete Snapshots
- Make changes to the distributed vSwitch
• Remove templates from the data store
• Rename templates
• Delete the services account on the virtual server
• Remove or stop VMware tools on the virtual server

Performing the following actions in vCenter will not affect OnApp:
• Migrate VSs between compute resources using vMotion
• Migrate VSs between data stores using Storage vMotion
• Place compute resources into maintenance mode
• Make changes to compute resources when in maintenance mode
• Back up VSs using third party tool (e.g. Veeam)
• Enable, Disable or make changes to DRS

Performing the following actions in vCenter will be synchronized with OnApp:
• Networks Created
• Networks Deleted
• Datastores Created
• Datastores Deleted
• New Compute Added
• Compute Remove
• Updates to Imported VSs (Ex. Changed Resources, added NICs, add Disks)
• VS has been Deleted

3.1 Create vCenter Virtual Servers

To create a vCenter virtual server:
Go to your Control Panel > Cloud > Virtual Servers menu and click the "+" button or click the Create New Virtual Server button at the bottom of the page. Fill in the VS creation form step by step:

3.1.1 Step 1 of 6. Cloud Locations

On this page:

• Step 1 of 6. Cloud Locations
• Step 2 of 6. Templates
• Step 3 of 6. Properties
The Cloud Locations step applies to those users who have compute zones assigned to location groups in their bucket. This step will be present in the wizard if both of the following requirements are met:

- all compute resources available to the user are assigned to location groups
- compute resources are assigned to different locations

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 all compute zones are assigned to the same location this step will be skipped. In this case the wizard will start from the Templates step.

1. Indicate your virtual 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.
2. Click **Next** to proceed to the following step of the wizard to specify the virtual server templates

### 3.1.2 Step 2 of 6. Templates

1. Click the required group icon on the right (vCenter) to expand the list of templates on the left. Every template contains the following info:
   - **Label**
   - **Min memory size** that is required to create a VS from this template
   - **Min disk size** that is required to create a VS from this template
   - **Virtualization type**
   - **Price per hour**
2. Select the template.
3. Click **Next**.

---

1. You can use RHEL, Windows and Debian templates to create vCenter virtual servers. For details how to create vCenter templates, refer to [Create Template for vCenter Virtual Server](#) section.

2. To be able to use Ubuntu templates later than 9 version for vCenter virtual server creation, you need to remove the absolute pathnames in /etc/pam.d/vmtoolsd file. For example: `/lib/security/pam_unix.so > pam_unix.so`

3. Please make sure that the Windows password policy defined inside the template is compliant with the password policy set in the OnApp CP. This
will ensure that there are no password related issues when provisioning Windows.

4. OnApp supports templates with no more than one disk.

**Windows Licensing Type**

This option only appears if your bucket allows it, and if the relevant licensing options have been configured for the template group this template belongs to.

If this option is available, choose the license type you require:

- For the KMS type, choose the licensing server
- For your own license, type your license key

Please note that for the Windows templates imported from vCenter it is impossible to select the MAK license during the VS creation. It will be necessary to choose the **Your own license** option and manually indicate the License Key.

If you don't specify the licensing type, MAK licensing will be set by default.

It is possible to deploy Windows virtual servers without running sysprep. To do so, you need to disable the **Run Sysprep** option for the compute zone the virtual server will be built on. See [Create Compute Zone](#) section for details.

It is not possible to set VS password when creating a Windows-based vCenter virtual server without running a sysprep.

### 3.1.3 Step 3 of 6. Properties

You can create a virtual server having specified only the required parameters and configure it later. Specify the following virtual server properties:

- **Label** - enter the label of the virtual server
- **Hostname** - enter the host name of the virtual server

- Hostname may contain letters (A-Z), numbers (0-9) and hyphens (-) but no spaces or periods (.). The name may not consists entirely of digits.
- For Windows-based VSs, the hostname length should be between 1 and 15 characters.

- **Domain** - enter the domain name of the virtual server
• **Password** - enter the password of the virtual server or leave black for the password to be auto generated
• **Password confirmation** - enter the password again to confirm it
• Click Next.

### 3.1.4 Step 4 of 6. Resources

#### Compute Resources
- **Compute Resource** - select the compute resource
- **vCenter Resource Pool** - select the resource pool

If you pick *Resources* from the dropdown menu, the virtual server will be placed into the default resource pool, so it will not be shown at any user resource pool, just under the cluster.

#### Resources
- **RAM** - set the amount of virtual server’s RAM.
- **CPU Cores** - set the amount of virtual server's CPU cores.
- **CPU Priority** *(or CPU Units)* - set virtual server's CPU priority. If the CPU units are switched on in the bucket for this user, then CPU priority is replaced with CPU units. Refer to Billing Calculation section for details on CPU units and CPU priority.

The amount of CPU resource a VS is given is the CPU priority (you can think of this as its "share percentage") multiplied by the number of cores allocated to that VS. This is a minimum number – clients can exceed it, up to 100% multiplied by the number of cores. For example, on a compute resource with 3GHz CPU cores:

- 100% x 1 core = 3GHz (burstable to 3GHz)
- 10% x 2 cores = 600MHZ (burstable to 6GHz)
- 5% x 4 cores = 600MHz (burstable to 12GHz)

By default, OnApp allows overselling of cloud resources. For example, OnApp will allow users to create 5 VSs with 100% CPU priority/1 CPU core on a compute resource with a 4-core CPU. In this example, OnApp would reduce the guaranteed CPU for each VS.

If you build a VS on a KVM compute resource running CentOS5, the CPU priority settings will be disabled and CPU priority value will be 100 by default.

- **Note that CPU priority amount does not reflect the number of VMware CPU Resource Shares. It is calculated as follows:**
  
  \[
  \text{CPU Resource Shares (VMware)} = \text{CPU Priority (OnApp)} \times 20.
  \]
  
  For example, 25% of CPU Priority (in OnApp) transforms into 500 CPU Resource shares (in VMware):
Primary Disk
- **Data Store Zone** - choose a data store zone for this VS’s primary disk.
- **Primary data store** - select a primary data store for this VS's primary disk.
- **Primary disk size** - set the primary disk size.

Swap Disk
Select the following properties for a swap disk:
- **Size** - enter a size for a swap disk
- **Data Store Zone** - select a data store zone for a swap disk
- **Data Store** - select a data store for a swap disk
- **Disable** - select the checkbox to disable swap disk creation

Network Configuration
**Network Interface 1**
- **Network group** - select the network zone or leave Any
- **Network** - select the network from which the VS should get the IP address or leave Any
- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned or leave Any
- **IP range** - select from the drop-down list the IP range from which the IP address should be assigned or leave Any
- **IP address** - select an IP address to be assigned from the drop-down box or leave Any
- **Port Speed** - set the port speed for this VS

Please note that it is possible to create a vCenter virtual server from a vCenter template with only one network interface added.

### 3.1.5 Step 5 of 6. Recipes or Service Add-ons

**Recipes**
You can select recipes that you want to assign to your virtual server. This step is optional. You can create a virtual server without choosing recipes and add them later if required.

1. Select a recipe that you want to assign to this virtual server by dragging the required recipe to the **Assigned recipes** pane.
2. To add a custom variable, click the "+" button next to the **Custom recipe variables** title bar, then specify variable details:
   - Specify the recipe name and its value.
3. Click Next to proceed to the next step of the wizard that completes the virtual server creation process.

The recipes step can be missing in the wizard if there are no recipes created in the cloud.

Service Add-ons

Prerequisites
Ensure that the following requirements are met to be able to assign service add-on to a VS:

- Replace Recipes with Service Add-ons on VS creation permission is enabled
- Service add-on groups are available in your bucket
- The On Provisioning option is enabled for all or some of the service add-ons available to you within a bucket.

In case there are no available service add-ons, this step of the wizard is not available.

You can select the service add-ons that you want to assign to your virtual server. This step is optional. You can create a virtual server without choosing service add-ons and add them later if required.

1. 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 types with which this service add-on is compatible
   - Description of the service add-on
   - Price per hour

2. Select the service add-on by clicking on it. You can select several add-ons from different service add-on groups. Click View Selected Add-ons to see the list of selected service add-ons. You can remove the selected service add-on from the list by clicking the button near the add-on.

3. Click Next to proceed to the next step of the wizard that completes the virtual server creation.

3.1.6 Step 6. Confirmation

- Move the Enable Automated Backup slider to the right if you want this VS to be backed up automatically (according to the backup settings configured in the Settings/Auto-backup Presets menu)
• Move the **Build Virtual Server** slider to the right, if you want the system to automatically build the VS. If you leave this box blank, you will have to build your server manually after it is created.

• Move the **Boot Virtual Server** slider to the right, if you want the virtual server to be started up automatically.

• Move the **Enable Autoscale** slider to the right to set autoscaling for this VS.

  - Until the [autoscaling rules](#) are configured the autoscaling itself will not start working.
  - If the **Enable Autoscale** slider is grayed out that means that you have reached the autoscaling limit in the bucket (or the max is set as 0).

• Move the **Acceleration allowed** slider to the right to enable accelerator for this VS. For more information, see [Edge Accelerator](#).

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

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

### 3.2 vCenter Virtual Server Beta Wizard

OnApp 6.2 Edge 1 introduces a new beta version of the vCenter virtual server wizard. You can access the beta version of the wizard from the top bar on your Control Panel. To launch the wizard, click **Create Virtual Server > Add Virtual Server Beta**.

Note that a new beta version of the vCenter virtual server wizard is disabled by default. If you want to enable this version of the wizard, go to the `on_app.yml` file and set the `show_new_wizard` parameter to `true`.

In this section you can find the procedures to create vCenter virtual servers in the new wizard, using one of the following methods:

• [From Custom Set of Resources](#)

• [From Instance Package](#)
3.2.1 Create Custom vCenter Virtual Servers Beta

Virtual servers are created from templates and are deployed on compute, storage, and networking resources. To create a vCenter virtual server, you need to launch a wizard. The wizard walks you through several steps to get your virtual server up and running. You can create vCenter virtual servers from instance packages or custom set of resources. In this document, you can find a detailed guidance on how to create a custom vCenter virtual server but first take a look at the following section.

3.2.1.1 Infrastructure Mode

An infrastructure mode allows you to manage with OnApp only the infrastructure layer without any post actions (e.g. formatting disk after adding it, or assigning an IP address after adding a network interface). To create a vCenter virtual server in infrastructure mode, you need to have the infrastructure mode permission enabled for your role and move the Infrastructure mode slider to the right at the Properties step in wizard.

To create a vCenter virtual server, follow the next procedure:

1. Go to your Control Panel and click Create Server on the top bar.
2. Click Create Virtual Server Beta to launch the wizard.
3. Follow the step-by-step instructions below to complete the wizard.
4. After you are finished, click the Create Virtual Server button.

On this page:

- Infrastructure Mode
- Cloud Locations
- Templates
- Properties
- Compute Resources
- Storage Resources
- Network Resources
- Service Add-ons or Recipes
• **Confirmation**

See also:
• Create Instance Package Virtual Server Beta
• Virtual Servers (API)

### 3.2.1.2 Cloud Locations

The **Cloud Locations** step applies to those users who have compute zones assigned to location groups in their bucket. If Cloud Locations are not available, the wizard starts from the **Templates** step. This Cloud Locations step will be present in the wizard if both of the following requirements are met:

- All compute resources available to the user are assigned to location groups.
- Compute resources are assigned to different locations.

When you are at the **Cloud Locations** step, select a location for your virtual server:

- **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.

### 3.2.1.3 Templates

To select a template, follow the next procedure:

1. Click the required group icon on the right (vCenter) to expand the list of templates on the left. Every template contains the following info:
   - **Label**
   - **Min memory size** that is required to create a VS from this template
   - **Min disk size** that is required to create a VS from this template
   - **Virtualization type**
   - **Price per hour**

2. Select the template.

**What template to choose**

- You can use RHEL, Windows and Debian templates to create vCenter virtual servers. For details how to create vCenter templates, refer to [Create Template for vCenter Virtual Server](#) section.

- To be able to use Ubuntu templates later than 9 version for vCenter virtual server creation, you need to remove the absolute pathnames in `/etc/pam.d/vmtoolsd` file. For example: `/lib/security/pam_unix.so` > `pam_unix.so`

- Please make sure that the Windows password policy defined inside the template is compliant with the password policy set in the OnApp CP. This will ensure that there are no password related issues when provisioning Windows.

3. Click **Next**.
Additional Information for Windows Templates

The **Windows Licensing Type** box appears for Windows templates and includes license options that you configure for a corresponding template store. You can select one of the following license types:

- **MAK** - the default licensing type applicable to all Windows-based virtual servers. If you don't select the licensing type, MAK is set by default.
- **KMS** - the licensing type applicable to every virtual server since Windows 7, Windows Server 2008, and the following Windows versions. Click KMS and then select a licensing Server.
- **User license** - type your license key

When you create a virtual server from a Windows template, consider the following:

- You can create Windows-based vCenter virtual servers without running Sysprep. Disable the **Run Sysprep** option while creating or editing a destination compute zone.
- If multiple vCenter virtual servers are deployed from the same template without running Sysprep, they will have identical security identifiers (SIDs) that can result in the system conflict.
- You can't select KMS or your own license when you create a Windows vCenter virtual server from a custom template. As a workaround, you can create a vCenter VS from a template used for custom template creation.
- It is not possible to set VS password when creating a Windows-based vCenter virtual server without running a sysprep.

### 3.2.1.4 Properties

You can create a virtual server having specified only the required parameters and configure it later. Specify the following virtual server properties:

- **Infrastructure mode** - move the slider to the right to enable the Infrastructure mode for this virtual server
- **Label** - enter the label of the virtual server
- **Hostname** - enter the host name of the virtual server

  - Hostname may contain letters (A-Z), numbers(0-9) and hyphens (-) but no spaces or periods (.). The name may not consist entirely of digits.
  - For Windows-based VSs, the hostname length should be between 1 and 15 characters.

- **Domain** - enter the domain name of the virtual server
• **Password** - enter the password of the virtual server or leave black for the password to be auto generated

• **Password confirmation** - enter the password again to confirm it

• **Encrypt password** - move the slider to the right to encrypt your password. For more information on the password encryption, see FAQ.

• **Encryption passphrase** - enter a passphrase for encryption

• **Encryption passphrase confirmation** - repeat the passphrase for encryption

• **I want to create a VS with custom resources** - select the checkbox to create a virtual server based on a set of custom resources. If you don't select the checkbox, you can create a virtual server from instance packages.

Click **Next** to proceed to the following step of the wizard where you select a custom set of resources.

### 3.2.1.5 Compute Resources

- **RAM** - set the amount of virtual server's RAM.
- **CPU Cores** - set the amount of virtual server's CPU cores.
- **CPU Priority (or CPU Units)** - set virtual server's CPU priority. If the CPU units are switched on in the bucket for this user, then CPU priority is replaced with CPU units. Refer to Billing Calculation section for details on CPU units and CPU priority.
- **Datacenter** - select the data center for the data store.
- **Cluster** - select the cluster to import networks and data stores from.

### 3.2.1.6 Storage Resources

#### Primary Disk

- **Size** - set the primary disk size.
- **Data Store Zone** - choose a data store zone for this VS's primary disk.
- **Data Store** - select a primary data store for this VS's primary disk.

#### Swap Disk

Select the following properties for a swap disk:

- **Size** - enter a size for a swap disk
- **Data Store Zone** - select a data store zone for a swap disk
- **Data Store** - select a data store for a swap disk
- **Disable** - select the checkbox to disable swap disk creation

### 3.2.1.7 Network Resources

#### Network Interface 1

- **Network group** - select the network zone or leave Any
- **Network** - select the network from which the VS should get the IP address or leave Any
- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned or leave Any
• **IP range** - select from the drop-down list the IP range from which the IP address should be assigned or leave Any
• **IP address** - select an IP address to be assigned from the drop-down box or leave Any
• **Port Speed** - set the port speed for this VS or select the *Unlimited* checkbox

### 3.2.1.8 Service Add-ons or Recipes
During this step, you can assign service add-ons or recipes to your virtual server. The availability of service add-ons or recipes depends on your cloud configuration.

#### 3.2.1.8.1 Service Add-ons
Service add-ons are available under the following conditions:

- The *Replace Recipes with Service Add-ons on VS creation* permission is enabled
- Service add-on groups are available in your bucket
- The *On Provisioning* option is enabled for all or some of the service add-ons available to you within a bucket.

If these conditions are not satisfied, you will see the *Recipes* step instead.

You can create a virtual server without service add-ons and add them later if required. To assign a service add-on to your virtual server in the wizard, follow the next steps:

1. 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**
   - **Description**
   - **Price per hour**
   - **Compatible with**, for example, Unix, Windows, etc

2. Click the service add-on to select it. You can select several add-ons from different service add-on groups. Click *View Selected Add-ons* to see the list of selected service add-ons.

   You can remove the selected service add-on from the list by clicking the **button near the add-on.

3. Click *Next* to proceed to the next step of the wizard that completes the virtual server creation.

#### 3.2.1.8.2 Recipes
The *Recipes* step is available in the wizard if there are some recipes created in the cloud. You can create a virtual server without a recipe and add them afterwards. To assign a recipe to your virtual server in the wizard, follow the next steps:

1. Drag and drop a recipe from the *Available recipes* to *Assigned for provisioning* box.

2. To add a custom variable, click the “+” button next to the *Custom recipe variables* title bar, then specify variable details:
   - **Name & Value** - enter a name and value for the custom variable
   - **Enabled** - move the slider to the right to allow use of this variable

3. Click *Next* to proceed to the next step of the wizard that completes the virtual server creation process.

### 3.2.1.9 Confirmation
The *Confirmation* step allows you to apply the following settings:
• **Build Virtual Server** - move the slider to the right to automatically build the virtual server. If you don't select this checkbox, you have to build your server manually after it is created.

• **Boot Virtual Server** - move the slider to the right for the virtual server to be started up automatically.

The **Confirmation** step also provides the configuration summary of the virtual server, including information about the template, CPU cores, RAM, disks size, and network. When you are finished, click the **Create Virtual Server** button to start the creation process. After you click the button, several transactions are run to complete the process. You can check a status of each transaction in **Activity Log** of the virtual server.

### 3.2.2 Create Instance Package vCenter Virtual Servers Beta

You can create a vCenter virtual server from a ready-made instance package. The instance package is a preconfigured environment with a specific compute, storage, and network capacity. For instance packages to be available in the wizard, your Administrator needs to configure an environment where:

- Instance packages permissions are enabled
- Instance packages are added to your Control Panel
- Instance packages are added to your bucket

After you complete these steps, you can create vCenter virtual servers from instance packages in the wizard. The wizard walks you through several steps to get your virtual server up and running. In this document, you can find a detailed guidance on how to create a vCenter virtual server, but first take a look at the following section.

#### 3.2.2.1 Before You Begin

**On this page:**

- Before You Begin
- Infrastructure Mode
- Cloud Locations
- Templates
- Properties
- Instance Packages
- Service Add-Ons or Recipes
- Confirmation

**See also:**

- Create Custom Virtual Server
- Permissions
- Buckets

Before you begin to create a virtual server from an instance package, take into consideration the following:

- You should have an environment properly configured by your Administrator. The environment must provide at least one compute resource configured and attached to a compute zone, a data store – to a data store zone and compute resource or zone,
a network – to a network zone and compute resource or zone, a backup server – to a backup server zone and compute resource or zone, and a bucket – to a user who creates a virtual server.

- If an instance package applies only to certain compute zones in a bucket, a virtual server is created on one of the compute resources within one of those zones. If an instance package is not limited to certain zones, the compute zone and compute resource are selected automatically from the ones available to a user.

- Instance package virtual servers can be created only in compute zones where all compute resources are assigned the same number of CPU units. If there are compute resources with different number of CPU units, it’s not possible to create instance package virtual servers in such zones. The reason is that CPU priority for instance package virtual servers in this configuration cannot be set to 100%, which is the default value for such virtual servers.

- If there are no available IP addresses, all instance packages are dimmed in the wizard.

- Instance packages that have resources incompatible with the available compute zones are dimmed in the wizard.

- Auto-scaling and Accelerator are not supported for virtual servers created from instance packages.

To create a virtual server, follow the next procedure:

1. Go to your Control Panel and click Create Server on the top bar.
2. Click Create Virtual Server Beta to launch the wizard.
3. Follow the step-by-step instructions below to complete the wizard.
4. After you are finished, click the Create Virtual Server button.

3.2.2.2 Infrastructure Mode

An infrastructure mode allows you to manage with OnApp only the infrastructure layer without any post actions (e.g. formatting disk after adding it, or assigning an IP address after adding a network interface). To create the Instance Package vCenter virtual server in infrastructure mode, you need to have the Infrastructure mode permission enabled for your role and move the Infrastructure mode slider to the right at the Properties step in the wizard.

3.2.2.3 Cloud Locations

The Cloud Locations step is available for users whose bucket includes compute zones assigned to location groups. If Cloud Locations are not available, the wizard starts from the Templates step. The Cloud Locations step is present in the wizard if the following requirements are satisfied:

- All compute zones that are added to a user’s bucket are assigned to location groups.
- Compute zones that are added to a user’s bucket are not assigned to the same location group.

When you are at the Cloud Locations step, select a location for your virtual server:

- Country - select a country where the cloud is located
- City - select a city from the country where the cloud is located

Click Next to proceed to the following steps of the wizard.
3.2.2.4 Templates

The Templates step allows you to select a template from which to build your virtual server. To select a template, follow the next procedure:

1. Click a Template Store icon on the left to see templates that are available in this store. You can see the following details for each template:
   - Label
   - Min memory size that is required to create a VS from this template
   - Min disk size that is required to create a VS from this template
   - Virtualization type that is XEN or KVM
   - Estimated Price per Hour that is calculated for a VS in Mode ON and Mode OFF
2. Click a template to select it.
3. Click Next to proceed.

Additional Information for Windows Templates

The Windows Licensing Type box appears for Windows templates and includes license options that you configure for a corresponding template store. You can select one of the following license types:

- **MAK** - the default licensing type applicable to all Windows-based virtual servers. If you don't select the licensing type, MAK is set by default.
- **KMS** - the licensing type applicable to every virtual server since Windows 7, Windows Server 2008, and the following Windows versions. Click KMS and then select a licensing Server.
- **User license** - type your license key

When you create a virtual server from a Windows template, consider the following:

- You can create Windows-based virtual servers without running Sysprep. Disable the Run Sysprep option while creating or editing a destination compute zone.
- If multiple virtual servers are deployed from the same template without running Sysprep, they will have identical security identifiers (SIDs) that can result in the system conflict.
- You can't select KMS or your own license when you create a Windows virtual server from a custom template. As a workaround, you can create a virtual server from a template used for custom template creation.
- You can build a Windows 10/Windows Server 2016 virtual server on KVM CentOS 6 and CentOS 7 compute resources that run at least on the following processor:
  - Ivy Bridge Intel® Xeon® Processor E Series v2 Family
  - AMD Opteron G2, G3, G4, G5, and G6
The *fsqsgsbase* CPU flag is required for a destination compute zone. For more information on CPU flags, see Manage Extended CPU Configuration for Compute Zone.

### 3.2.2.5 Properties

There are some obligatory and optional properties that you can provide for your virtual server. The obligatory properties are marked with an asterisk on the list and the optional properties you can edit after creating a virtual server.

Enter the following properties for your virtual server:

- **Infrastructure mode** - move the slider to the right to enable the *Infrastructure mode* for this virtual server
- **Label** - enter a label of the virtual server
- **Hostname** - enter a hostname of the virtual server. The hostname can consist of letters [A-Z a-z], digits [0-9], and dash [-]. For more info on hostname validation, refer to RFC documentation.

**Additional Consideration for Windows**

- The hostname length should be between 1 and 15 characters.
- The following symbols are not allowed for Windows-based virtual servers:
  - percent sign [%]
  - double quotation marks ['"]
  - brackets [<,>]
  - vertical bar [|]
  - caret [^]
  - ampersand [&]
  - parentheses [(,)]
- **Domain** - enter a domain of the virtual server. For example, in `test.onapp.com` the `test` is a hostname and `onapp.com` is a domain. If you don't enter a domain, the default value `localdomain` is used as follows `test.localdomain`. This parameter is not applicable to Windows virtual servers.
- **Time zone** (Windows) - select a time zone for a Windows virtual server. Most operating systems implies that the hardware clock is in UTC, however, Windows implies a `localtime`. Therefore, you need to select a time zone for it to be properly handled on a compute resource level.
- **Password** - enter a secure password for the virtual server. It can consist of 6-99 symbols, including letters [A-Z a-z], digits [0-9], dash [-], underscore [ _ ], and the following special characters: ! @ # $ * _ + - \ ` { } [ ] ; : ' , . ? / . You can use both lower and uppercase letters. If you don't enter a password, it will be generated automatically.
- **Password confirmation** - repeat the password to confirm it
- **Encrypt password** - move the slider to the right to encrypt your password. For more information on password encryption, see FAQ.
• **Encryption passphrase** - enter a passphrase for encryption
• **Encryption passphrase confirmation** - repeat the passphrase for encryption
• **I want to create a VS with custom resources** - select the checkbox to create a virtual server based on a set of custom resources. The checkbox is displayed only if the **Select resources manually on virtual server creation** permission is enabled. See [Create Custom vCenter Virtual Server](#) for details.

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

### 3.2.2.6 Instance Packages

To create a virtual server from an instance package, click a box for a corresponding package. The instance package box includes the following details:

- **CPUs** - the number of CPU cores available in this instance package
- **Memory** - the number of RAM in MB or GB available in the instance package
- **Disk Size** - the number of disk size in MB or GB available in this instance package
- **Bandwidth** - the number of bandwidth in MB or GB available in this instance package
- **Price per Hour**:
  - **Mode ON** - an estimated hourly price if the virtual server is powered on
  - **Mode OFF** - an estimated hourly price if the virtual server is powered off
- **Price per Month**:
  - **Mode ON** - an estimated monthly price if the virtual server is powered on
  - **Mode OFF** - an estimated monthly price if the virtual server is powered off

After you click an instance package box, it becomes highlighted in green. Click **Next** to proceed to the following step of the wizard.

### 3.2.2.7 Service Add-Ons or Recipes

During this step, you can assign **service add-ons** or **recipes** to your virtual server. The availability of service add-ons or recipes depends on your cloud configuration.

#### 3.2.2.7.1 Service Add-ons

Service add-ons are available under the following conditions:

- The **Replace Recipes with Service Add-ons on VS Creation** permission is enabled.
- Service add-on groups are available in a bucket.
- The **On Provisioning** option is enabled for all or some of the service add-ons available to you within a bucket.

If these conditions are not satisfied, you will see the **Recipes** step instead.

You can create a virtual server without service add-ons and **add** them afterwards. To assign a service add-on to your virtual server in the wizard, follow the next steps:

1. Click a service add-on group on the left to expand the list of service add-ons on the right.
   You can see the following details about each service add-on:
   - **Label**
   - **Description**
2. Click the service add-on to select it. You can select several add-ons from different service add-on groups. Click **View Selected Add-ons** to see the list of selected service add-ons. To remove the selected service add-on from the list, click the button.

3. Click **Next** to proceed to the final step of the wizard.

**Recipes**

The **Recipes** step is available in the wizard if there are some recipes created in the cloud. You can create a virtual server without a recipe and add them afterwards. To assign a recipe to your virtual server in the wizard, follow the next steps:

1. Drag and drop a recipe from the **Available recipes** to **Assigned for provisioning** box.
2. To add a custom variable, click the "+" button next to **Custom Recipe Variables** and provide the following details:
   - **Name & Value** - enter a name and value for the custom variable
   - **Enabled** - move the slider to the right to allow use of this variable
3. Click **Next** to proceed to the final step of the wizard.

### 3.2.2.8 Confirmation

The **Confirmation** step provides the configuration summary of the virtual server, including information about CPU, memory, and disk size. Here you can also apply the following settings:

- **Enable Automated Backup** - move the slider to the right to create automatic backups of the virtual server based on the settings from **Auto-Backup Presets**.
- **Build Virtual Server** - move the slider to the right if you want the system to automatically build the virtual server. If you don't select this checkbox, you have to build your server manually after it is created.
- **Boot Virtual Server** - move the slider to the right if you want the virtual server to be started up automatically.

When you are finished, click the **Create Virtual Server** button to start the creation process. After you click the button, several transactions are run to complete the process. You can check a status of each transaction in **Activity Log** of the virtual server.

### 3.3 View vCenter Virtual Servers Details

To view details of a specific vCenter 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. The screen that appears loads the VS properties, notes, activity log and tools for managing your virtual server.

#### 3.3.1 VS Properties

VS properties page gives the general overview of the VS details:
• Template this VS is built on
• Power status & On/Off/Reboot buttons.

Clicking the OFF button performs graceful shutdown and then powers off the virtual server after the timeout set in Configuration settings.

• Compute resource. Click the compute resource name to see its details
• Login credentials
• Owner. Click the owner name to see its details.
• Price per hour
• Memory
• CPU(s)/shares
• Disk Size
• Disk backups (irrelevant field)
• Network Speed
• IP Addresses. Only the first five IP addresses are displayed on the virtual server properties page. To view the list of all virtual server IP addresses, mouse over IP addresses area or go to the Networking > IP addresses tab.

If the automation options weren’t enabled during this virtual server creation, you’ll be redirected to the form where you can configure them.

3.3.2 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. Click the Actions button in the Notes section of the page to add admin's or user's note.

3.3.3 VS Management
• Click the Tools button to expand the Tools menu with the VS management options.
• Use the top menu to manage your virtual servers' statistics/networking/storage options.

3.4 Edit vCenter Virtual Servers
You can edit CPU and RAM resources for vCenter virtual servers built on Windows and Linux templates, as well as Windows and Linux OVA templates.
To edit CPU and RAM resources, follow the next steps:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of the server you want to resize to display its details screen.
3. Click the Tools button and select the Edit Virtual Server link.
4. Change the label, CPU core/priority and RAM values, and click the **Save** button.

After you save the settings, the resize is completed automatically and you can see a message indicating the resize was successful.

### 3.5 Delete vCenter Virtual Servers

Shut down the VS before destroying it. If you are deleting a VS that is running, the VS will be deleted after the time set in **Timeout Before Shutting Down VSs** configuration parameter.

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 VS's screen, click the Tools button, then select **Delete Virtual Server**.
4. Click the **Destroy** button.

You won't be able to restore a VS after deleting it.

### 3.6 Build vCenter Virtual Servers Manually

To build/rebuild virtual server **build/rebuild virtual server** must be enabled. This is a new permission which manages build/rebuild functionality independently from **update virtual server** permission which used to regulate the build/rebuild options in the previous versions.

If you haven't checked the **Build Virtual Server Automatically** option during the **VS creation process**, you will have to do this manually after the VS has been created. Building a virtual server is the process of allocating physical resources to that VS.

To build a virtual server manually:

1. Go to your Control Panel > **Cloud > Virtual Servers** menu.
2. Click the label of the virtual server you're interested in.
3. On the screen that appears, click the **Tools** button and then click **Rebuild Virtual Server**.
4. On the screen that pops up, use the drop-down menu to choose a template with which to build the VS.
5. Tick the **Required Start Up** box to have your VS started automatically after it is built.
6. Click the **Build Virtual Server** button to finish.
3.7 Clone vCenter Virtual Servers

You can create a clone of a virtual server based on the same resources as the origin virtual server. To be able to clone virtual servers, you need to have the *Clone own virtual servers* permission enabled. The cloned virtual server inherits resources from the origin as follows.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Cloned Virtual Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties - owner, hostname, password, and label.</td>
<td>The same as the origin virtual server with <strong>Clone</strong> in the label, for example, <strong>Clone Origin Label</strong>.</td>
</tr>
<tr>
<td>Compute, data store, and network resources &amp; zones</td>
<td>The same as the origin virtual server. If there are no available resources on the same data store, network, and compute resource, you cannot clone a virtual server.</td>
</tr>
<tr>
<td>Recipes, recipe variables, and service add-ons</td>
<td>The same as the origin virtual server.</td>
</tr>
<tr>
<td>Firewall rules</td>
<td>The same as the origin virtual server.</td>
</tr>
</tbody>
</table>

IP address
A random IP address is assigned from an IP range in the origin network.

Swap disk
A new swap disk is created on the cloned virtual server.

Backups
The backups of the origin virtual server are not cloned.

To clone a virtual server, follow the next procedure:

1. Go to your Control Panel > **Cloud** > **Virtual Servers**.
2. Click a label of the virtual server that you want to clone.
3. Click **Tools** and then click **Clone Virtual Server**.
4. In the pop-up box, click **Clone Virtual Server** to confirm the action.

After you confirm the action, several transactions are run to complete the cloning process. You can check a status of each transaction in **Activity Log** of the virtual server. After the virtual server is cloned, it is powered off until you **start it**.

3.8 Auto Import vCenter Virtual Server

If you need a quick import of multiple new VSs from vCenter to OnApp, use the auto import rules functionality. It allows you to apply the rule/rules to the already created but not yet imported virtual servers. After applying auto import rules, vCenter resources are recognized at OnApp side and can be billed immediately.

**Prerequisites**

- The auto import rule functionality is available on clouds that run OnApp 6.1 Edge 2 and subsequent versions.
The Manage auto import rules permission should be enabled for a user who wants to view, create, run, edit or delete auto import rules.

It only applies to the newly created vCenter virtual servers that are not yet imported to OnApp.

**On this page:**

- View Auto Import Rules
- Create Auto Import Rule
- Run Auto Import Rule
- Edit Auto Import Rule
- Delete Auto Import Rule

### 3.8.1 View Auto Import Rules

To view the list of auto import rules:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource's label > Tools and click Auto Import Rules to see a list of all rules and the following details:
   - Label - the name of the vCenter VS
   - Source Type - the type of vCenter source
   - Source - the vCenter resource
   - Target Type - the type of vCenter target user
   - Target - the vCenter user, who is an owner of the virtual server
4. Click the Actions button next to the auto import rule for quick access to the list of available actions.
5. To edit an auto import rule, click the Edit button.
6. To run an auto import rule, click the Run button.

### 3.8.2 Create Auto Import Rule

To create auto import rules:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource's label > Tools and click Auto Import Rules.
4. Click the **Create Auto Import Rules** button.

5. On the screen that follows, fill in the following:
   - **Label** - specify the name of the vCenter VS
   - **Source Type** - choose the type of vCenter source from the drop-down list
   - **Source** - choose the vCenter resource from the drop-down list
   - **Target Type** - choose the type of vCenter target user from the drop-down list
   - **Target** - choose the vCenter user from the drop-down list, who will be an owner of the virtual server

6. Click **Submit**.

---

3.8.3 Run Auto Import Rule

To run an auto import rule:

1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Compute Resources** icon.
3. Go to vCenter compute resource's label > Tools and click **Auto Import Rules**.
4. Click the **Actions** button next to the auto import rule you want to run and click the **Run** button.

After you click the **Run** button, OnApp system receives the list of vCenter VSs suitable for this rule and schedules proper import transactions.

---

3.8.4 Edit Auto Import Rule

To edit an auto import rule:

1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Compute Resources** icon.
3. Go to vCenter compute resource's label > Tools and click **Auto Import Rules**.
4. Click the **Actions** button next to the auto import rule you want to edit and click the **Edit** button.
5. Edit the following details:
   - **Label** - specify the name of the vCenter VS
   - **Source Type** - choose the type of vCenter source from the drop-down list
   - **Source** - choose the vCenter resource from the drop-down list
   - **Target Type** - choose the type of vCenter target user from the drop-down list
6. Click the Submit button.

### 3.8.5 Delete Auto Import Rule

To delete an auto import rule:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Go to vCenter compute resource’s label > Tools and click Auto Import Rules.
4. Click the Actions button next to the auto import rule you want to delete and click the Delete button.
5. Click the OK button to confirm the deletion.

### 3.9 vCenter Virtual Servers Power Options

To manage vCenter virtual server power options:

1. Go to your Control Panel > Cloud > Virtual Server menu.
2. Click the label of the required virtual server.
3. Click the Tools button on the VS’s screen to expand the VS Tools menu.
4. The Tools menu enables you to perform the following power actions on VSs (the exact list shown depends on the VS status):
   - **Reboot Virtual Server** - powers off and then restarts the VS.
   - **Suspend Virtual Server** - stops a VS, changes its status to suspended and disables all the other actions on VS, unless unsuspended.
   - **Shut Down Virtual Server** – pops up a dialogue box, where you can either Shut Down VS (terminates the VS gracefully), or Power Off VS (terminates the VS forcefully).
   - **Startup Virtual Server** - queues a start-up action for a VS that's currently powered off.

### 3.10 vCenter Virtual Servers Console

Currently, vCenter virtual server console is not available if you are using vCenter version 6.0 update 3 or later.

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

1. Go to Control Panel > Cloud > Virtual Servers menu.
2. Click the Label of appropriate Virtual Server.
3. Go to Console tab and click MKS. The console window will appear.
3.11 vCenter Virtual Servers Transactions and Logs

The system records a detailed log of all the transactions happening to your virtual servers. The list of transactions logged by the system includes:

- Provision virtual server
- Startup virtual server
- Stop virtual server
- Resize virtual server without reboot
- Configure Operating System
- Build disk
- Resize disk
- Format disk
- Destroy disk
- Destroy virtual server
- Destroy template
- Download template
- Update firewall

To view transactions 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. The details screen for that virtual server shows recent transactions in the Activity Log section. To view more transactions, click the More Logs button.

To cancel pending tasks, click Cancel All Pending Tasks for this virtual server.

3.12 vCenter Virtual Servers Networks

The Networking menu in the Virtual Servers menu enables you to manage network interfaces and allocate IP addresses.

3.12.1 Configure vCenter Virtual Servers Network Interface

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 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're interested in.
3. Click the Networking tab, then click Network Interfaces.
4. On the page that follows you will see the following fields:
   - Interface – optional label of the network interface.
• **Network join** – name of the network and a compute resource or compute zone this network is joined to.
• **Port speed** – the speed set to the interface.
• **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.

To add a network interface:
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** tab, then click **Network Interfaces**.
4. Click the **Add New Network** Interface button at the bottom of the screen.
5. On the screen that appears, input values for the following parameters:
   - **Label** – a human-friendly name for the new interface.
   - **Physical Network** – choose a network join from the drop-down menu, which lists network joins assigned to the compute resource/compute zone on which the VS runs).
   - **Port speed** – set port speed in Mbps, or make it unlimited.
6. Click the **Add Network Interface** button.

To edit network interface label, port speed or set it as primary (if none is marked as primary), click **Edit** icon next to the appropriate network interface. After editing the port speed, the virtual server should be power cycled for the change to take effect.

To delete a network interface, click the **Delete** icon next to the interface you want to delete.

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.

### 3.12.2 Rebuild vCenter Virtual Servers Network

To rebuild network join, added to the virtual server (required after allocating **new IP addresses**):
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of a required VS.
3. On the screen that appears, click the **Tools** button, then click **Rebuild Network**.
4. In the pop-up window that appears, move the **Force Reboot** slider to the right, then select the VS shutdown type:
   - Power OFF virtual server
   - Shutdown virtual server
   - Gracefully shutdown virtual server
5. Move the **Required Startup** slider to the right to start up the VS automatically after the network is rebuilt.
6. Click the **Rebuild Network** button.
3.12.3 Allocate/Remove vCenter Virtual Servers IP Addresses

In the Networking > IP Addresses tab you can find the list of assigned IP addresses, allocate new IP addresses and rebuild a network.

To allocate a new IP Address to the VS:

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 tab, then click IP Addresses.
4. Click the Allocate New IP Assignment button.
5. Select a network interface from the drop-down menu (only the network interfaces you added to the VS will be available).
6. Select an IP address from the IP Pool associated with the network interface. You may select an IP address that's already assigned to a VS, but only one VS should be online at a time.
   Use Please show me used IP Pool, Show only my IPs and Show only IPv6 checkboxes to narrow the list of IP in the drop-down list.
7. Click the Add IP Address Assignment button.
8. Click the Rebuild Network button to rebuild the network.

You must rebuild the network after making changes to IP address allocations.

To remove an IP address from a VS:

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 > IP Addresses tab.
4. Click the Delete icon next to the IP address you want to delete.
5. In the pop up window that appears:
   - Choose Delete with Reboot option if you want to reboot a VS and rebuild the network immediately after deleting the IP address. After choosing the Delete with Reboot option you will be redirected to the VS's Overview page.
   - Choose Delete without Reboot option if you don't want to reboot a VS. In this case to apply the changes, you will have to the reboot the VS additionally.

You can't delete an IP address that is in use.

3.12.4 Display Network Speed for Network Interfaces on vCenter Virtual Servers Page

The main Virtual Servers screen displays the network speed of each VS's primary network interface. To see the speed of all interfaces assigned to a 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 > Network Interfaces tab.
4. On the screen that appears, the Port Speed column shows the network speed of the network interface.

3.12.5 Edit vCenter Virtual Servers Network Speed

To edit a vCenter virtual server's network speed:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Select the virtual server you want to change.
3. Go to the Network > Network Interfaces, and edit the network speed accordingly.
4. Click the Save Network Interface button to save changes.

3.13 vCenter Virtual Servers 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. Disk can be set as primary (that is, the disk from which an OS will boot). Managing disks for the entire cloud is handled through the Control Panel's Settings menu. Disks for individual virtual servers are managed through the Control Panel > Cloud > Virtual Servers menu, where you can:
- See the list of disks allocated to this VS
- Add a new disk
- Resize a disk
- Check disk usage statistics (IOPS)
- Delete a disk

3.13.1 Edit vCenter Virtual Servers Disks

You can easily resize disks when needed. The resize will fail if your current usage is greater than the new size you request.

To change disk size:
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 tab > Disks.
4. Click the Actions button next to the disk you want to change, then click the Edit link.
5. Enter a new disk label and size in GB in the fields provided.
6. Click the Save Disk button.

For Linux-based VSs, it is necessary to rescan or reboot a VS after increasing its disk size.

3.13.2 Migrate vCenter Virtual Servers Disks

You can migrate disks of your virtual servers to other data stores, which are allocated to the same compute resource or compute zone. Unlike VS migration – disk migration requires reboot
To migrate 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.
4. Click the Actions button next to the disk you want to move to another data store, then click the Import link.
5. On the screen that appears, select a target data store from a drop-down box.

You can only migrate disks to data stores in data store zones assigned to your bucket.

6. Click Start Migrate.

You cannot migrate a disk to a data store with less capacity than the disk size!
If you move an 850GB disk between aggregates with 10GB actual usage, the 'dd' image of the local volume manager will take 850GB space, because the entire local volume manager is copied, including zero 'd' space which may not be able to be recovered.

3.13.3 Delete vCenter Virtual Servers Disks

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 button next to the disk you want to delete, then click Delete.

3.13.4 Add Disks to vCenter Virtual Server

Adding a disk to a virtual server will require 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 a VS's label to open its details screen.
3. Click the Storage > Disks.
4. Click the **Create Disk** button.

5. Fill in the details:
   - **Data store** - select the data store to create a disk on from the drop-down list.
   - **Disk size**
   - **Swap Space** - move slider to the right if this disk is swap space.
   - **Require Format Disk** - move slider to the right if this disk requires formatting.

   **For Linux-based vCenter VSs,** if the **Require Format Disk** option is enabled, you'll get a notification that VM will be rebooted. If the option is disabled, disk will not formatted, but will also not be visible without the VS rescan or reboot.

   - **Mounted** - move slider to the right if the disk should be added to Linux FSTAB (for Linux application servers).
   - **Mount point** - the maximum length of a Mount Point is 256 characters. Spaces are not allowed. No more than one slash is allowed. If the mount point is not specified the default mount point will be used:
     
     ```
     /mnt/onapp-disk-#{disk.identifier}
     ```
   - **Reboot Virtual Server** - move the slider to the right to reboot the VS after adding disk (applies only to Linux-based vCenter VSs)

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.

### 3.14 vCenter Virtual Servers Statistics

For your convenience, the system tracks VS performance and generates statistics on:

- VS CPU Utilization
- VS Billing statistics
- Interface Usage
- Disk IOPS

#### 3.14.1 vCenter Virtual Servers CPU Utilization

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

To see what percentage of compute resource's CPU resource a VS takes, go to your Control Panel > Cloud > 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.

3.14.2 vCenter Virtual Servers Billing Statistics

OnApp has a record of all the charges applied to your VSs for the last three month period. If a virtual server was created less than three months ago, statistics are recorded for the VS's existence to date. You can view all statistics available, or those for a shorter period by setting a Start and End time.

To view billing 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 Overview > Billing Statistics tab.
4. Set Start and End time. By default the statistics are generated for the last three months or the actual VS existence period.
5. Tick the Show in my Timezone box to show bandwidth statistics according to your profile's timezone settings.
6. On the page that appears:
   - Date – particular date and time for the generated statistics
   - Users – the virtual server owner. Click the owner name to see the User Profile (user details)
   - Virtual Servers – the virtual server name with the total due for VS resources (CPU priority, CPUs, memory and template resources) for the point of time specified in the Date column.
   - Network Interfaces Usage – the total due for the network interfaces used by this VS for the point of time specified in the Date column. Click the network interface name to see its details.
   - Disks Usage– the list of disks assigned to this VS with the total due for the disk space resources (disk size, data read/written, reads/writes completed) for the point of time specified in the Date column. Click the disk name to see its details.
   - Costs – the total due for the Virtual servers, Network Interfaces and Disks resources at the point of time specified in the Date column.

Scroll down to see Total Amount (the total due for the whole billing statistics period).
3.14.3 vCenter Virtual Servers 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 Reset zoom button to zoom out again.

3.14.4 vCenter Virtual Servers Disk IOPS
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. Next to the necessary disk, click the Actions button and select the IOPS option.
5. There are four charts on the screen that appears:
   - Instant IOPS - summary of input/output operations per minute
   - Hourly IOPS - summary of input/output operations per hour
   - Instant Data Written/Read - summary of written and read data for the last 24 hours
6. To zoom into a time period, click and drag in a chart. Click the Reset zoom 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.

3.15 Manage vCenter Virtual Servers Recipes
SSH connection between VS and Control Panel is required for running recipes on vCenter virtual servers.

To manage 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 an event to expand the list of recipes assigned to it.

**Assign recipe**

Use drag and drop feature to assign a recipe to a desired event.

You can assign virtual server recipes to the following events:

- **VS provisioning** - run the recipe during the virtual server provisioning
- **VS network rebuild** - run the recipe while rebuilding a network
- **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 IP address add** - run the recipe while adding an IP address to the virtual server
- **VS IP address remove** - run the recipe while removing an IP address from the virtual server
- **VS start** - run the recipe while starting the virtual server
- **VS reboot** - run the recipe while rebooting the virtual server
- **VS hot migrate** - run the recipe during the hot migration of the virtual server
- **VS hot full migrate** - run the recipe during the hot migration of the virtual server with disk
- **VS failover** - run the recipe during the failover process

**To use drag and drop:**

1. Click the arrow button in front of the required event to unfold it.
2. Select the required recipe in the right pane and hold it down with the left mouse button.
3. Drag the recipe up to the left pane and release the mouse button to drop the recipe and add it to the required event.

**Remove recipe**

To remove a recipe:

1. Click the arrow button in front of the required event to view the list of recipes assigned to it.
2. Click the **Delete** button next to the recipe you want to remove.
### 3.16 Manage vCenter Virtual Servers Custom Variables

SSH connection between VS and Control Panel is required for running recipes on vCenter virtual servers.

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 during the virtual server creation or via the virtual server Overview menu.

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.
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.

To edit a custom variable, click the Edit icon next to the required variable and change its details.

To delete a custom variable, click the Delete icon next to the variable you want to remove. You will be asked to confirm the deletion.

It is possible to set custom variables for image templates, as well as for virtual servers. Virtual server custom variables will always overlay template custom variables.

### 3.17 VMware Virtual Servers Snapshots

VMware snapshot tools are used to perform snapshots by simply locking the filesystem disk (vmdk) and creating a new VMware disk with the changes made alongside, so the procedure for virtual servers running under VMware looks like: vmdk + vmdk(1) + vmdk(#).

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.

To create a snapshot for vCenter 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 **Create New Snapshot** button.
5. Give your snapshot a name.
6. Click **Create Snapshot** button.

To delete a VS snapshot, click the **Actions** button next to the required snapshot, then click **Delete**.

### 3.18 vCenter VS Console

- Currently, vCenter virtual server console is not available if you are using vCenter version 6.0 update 3 or later.
- To be able to use the MKS console on vCenter virtual servers, VSs must not be configured for VNC access in vCenter.

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

1. Go to **Control Panel** > **Cloud** > **Virtual Servers** menu.
2. Click the **Label** of appropriate Virtual Server.
3. Go to **Console** tab and click **MKS**. The console window will appear.

### 3.19 vCenter Resource Pools

VMware vCenter resource pool determines how and when the provider virtual data center compute and memory resources are committed to the Org VDC. Resource pool allows you to delegate control over the resources of a host or a cluster. For instance, you may use it to divide all resources in a cluster into sections.

Below you can find instructions on how to manage the vCenter resource pools.

This functionality is available for users with the following permissions enabled:

- Any actions on vCenter Resource Pools - the user can take any action on vCenter Resource Pool
- Add a new vCenter Resource Pool - the user can add a vCenter Resource Pool
- Delete any vCenter Resource Pool - the user can delete a vCenter Resource Pool
- Delete own vCenter Resource Pool - the user can delete own vCenter Resource Pool
- See any vCenter Resource Pool - the user can see any vCenter Resource Pool
See own vCenter Resource Pool - the user can see own vCenter Resource Pool
Update any vCenter Resource Pool - the user can update any vCenter Resource Pool
Update own vCenter Resource Pool - the user can update own vCenter Resource Pool
Change an owner of any vCenter Resource Pool - the user can change the owner of any vCenter Resource Pool

3.19.1 View vCenter Resource Pool

To view the vCenter 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
   - Compute Zone - compute zone on which the resource pool is placed
   - Compute Resource - compute resource on which the resource pool is placed
   - Owner - the resource pool owner
   - 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.
To view vCenter resource pool details, click on the label of resource pool are interested in.

3.19.2 Create vCenter Resource Pool

To create a vCenter resource pool:
Go to your Control Panel > Cloud > Resource Pools menu to see an overview of all resource pools in the cloud.
Click the New Resource Pool button just below the list of resource pools.
On the screen that appears, fill in the resource pool creation form:
   - Label - specify a name for the resource pool
   - Compute Resource - select the required compute resource from the dropdown menu
The CPU and RAM Limits of the new resource pool will be automatically unlimited, all other properties will be set to default.

Click the Submit button to save the changes.
3.19.3 Edit vCenter Resource Pool

To edit a vCenter 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, then click **Save**.

You can also use the **button at the resource pool details page.

To change the owner of a resource pool:

1. Go to your Control Panel > **Cloud** > **Resource Pools** and click the Actions button next to the resource pool you are interested in, then click **Change owner**.
2. Choose the new owner from the drop-down menu and click the **Change Owner** button.

3.19.4 Delete vCenter Resource Pool

To delete a vCenter 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.

Please note that if you delete the resource pool that has a virtual server on it, the VS will be moved to the cluster default resource pool.
4 API

The following sections provide the list of API requests to manage the vCenter components in OnApp. Refer to one of the following sections for details:

- Import vCenter VS
- Resync vCenter VS
- Auto Import Rules
- Add vCenter VS
- Clone vCenter VS
- Add vCenter Compute Zone
- Add vCenter Compute Resources
- Edit vCenter Compute Resources
- vCenter Templates API
- vCenter Resource Pool API
- vCenter Servers API

For information on how to manage vCenter related resources in OnApp UI, refer to the Administration or the User guide.

4.1 Import vCenter VS

To import a vCenter virtual server into OnApp, use the following request:

**POST /settings/hypervisors/:hypervisor_id/virtual_machines.xml**

**POST /settings/hypervisors/:hypervisor_id/virtual_machines.json**

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

Where:

- **vm_moref** - moref of the virtual server on vCenter
- **user_id** - the ID of a new owner in OnApp

4.2 Resync vCenter VS

To resync a vCenter virtual server into OnApp, use the following request:
POST /virtual_machines/:id/resync.xml
POST /virtual_machines/:id/resync.json

XML Request Example

curl -i -X POST -u 'user:userpass' --url
https://onapp.test/virtual_machines/4/resync.xml -H 'Accept:
application/xml' -H 'Content-type: application/xml'

JSON Request Example

curl -i -X POST -u 'user:userpass' --url
https://onapp.test/virtual_machines/4/resync.json -H 'Accept:
application/json' -H 'Content-type: application/json'

XML Output Example
<virtual_machine>
  <id type="integer">2022</id>
  <hypervisor_id type="integer">156</hypervisor_id>
  <template_id nil="true"/>
  <identifier>bohpzakuuvzrwu</identifier>
  <hostname>mscentossnap</hostname>
  <memory type="integer">384</memory>
  <cpus type="integer">1</cpus>
  <cpu_shares type="integer">20</cpu_shares>
  <created_at type="dateTime">2019-09-03T11:41:52+03:00</created_at>
  <updated_at type="dateTime">2019-09-03T11:44:38+03:00</updated_at>
  <built type="boolean">true</built>
  <locked type="boolean">false</locked>
  <booted type="boolean">false</booted>
  <xen_id nil="true"/>
  <remote_access_password nil="true"/>
  <local_remote_access_port nil="true"/>
  <label>ms.centossnapfu</label>
  <recovery_mode nil="true"/>
  <user_id type="integer">376</user_id>
  <operating_system>linux</operating_system>
  <operating_system_distro>centos64Guest</operating_system_distro>
  <allowed_swap type="boolean">true</allowed_swap>
  <template_label nil="true"/>
  <min_disk_size nil="true"/>
  <allowed_hot_migrate nil="true"/>
  <note nil="true"/>
  <admin_note nil="true"/>
  <suspended type="boolean">false</suspended>
  <strict_virtual_machine_id nil="true"/>
  <enable_autoscale type="boolean">false</enable_autoscale>
  <add_to_marketplace nil="true"/>
  <state>delivered</state>
  <initial_root_password_encrypted type="boolean">false</initial_root_password_encrypted>
  <storage_server_type nil="true"/>
  <firewall_notrack type="boolean">false</firewall_notrack>
  <service_password nil="true"/>
  <preferred_hvs type="array"/>
  <local_remote_access_ip_address nil="true"/>
  <cpu_units type="integer">200</cpu_units>
  <cpu_sockets nil="true"/>
  <draas_keys type="array"/>
  <iso_id nil="true"/>
  <cores_per_socket type="integer">0</cores_per_socket>
  <instance_package_id nil="true"/>
  <hot_add_cpu type="boolean">false</hot_add_cpu>
  <hot_add_memory type="boolean">false</hot_add_memory>
  <time_zone nil="true"/>
  <autoscale_service nil="true"/>
  <cdboot type="boolean">false</cdboot>
  <draas_mode type="integer">0</draas_mode>
  <vapp_id nil="true"/>
  <vmware_tools nil="true"/>
  <vcenter_moref>vm-4532</vcenter_moref>
  <template_version nil="true"/>
  <openstack_id nil="true"/>
  <domain>localdomain</domain>
  <vcenter_reserved_memory type="integer">0</vcenter_reserved_memory>
  <deleted_at nil="true"/>
  <properties>
   <acceleration_allowed type="boolean">true</acceleration_allowed>
   <vcenter_cluster_id type="integer">6</vcenter_cluster_id>
   <virsh_console_type boolean=false</virsh_console>
Where:

`id` - id of the virtual server
`hypervisor_id` - id of the compute resource
`template_id` - id of the template
`identifier` - the VS identifier in the DB
`hostname` - the VS's host name
`memory` - the amount of RAM allocated to this VS
`cpus` - the number of CPU cores assigned to the VS
`cpu_shares` - the CPU priority value
`created_at` - the date, when the VS was created in the [YYYY][MM][DD][hh][mm][ss]Z format
`updated_at` - the date, when the VS was updated in the [YYYY][MM][DD][hh][mm][ss]Z format
`built` - true if the virtual server is built, otherwise false
`locked` - true if the virtual server is locked, otherwise false
`booted` - true if the virtual server is booted, otherwise false
`xen_id` - this parameter is not applicable to vCenter VS
`remote_access_password` - the password for remote access
`local_remote_access_port` - the port ID used for console access
`label` - label of the VS
`recovery_mode` - true if recovery mode is allowed, otherwise false
`user_id` - the ID of a new owner in OnApp
`operating_system` - the OS on which the virtual server is based
`operating_system_distro` - the distribution of the OS
`allowed_swap` - true, if swap is allowed; otherwise, false
`template_label` - label of the template
`allowed_hot_migrate` - true, if hot migration for the VS is allowed; otherwise, false
`note` - optional text, added as a note
`admin_note` - optional text note
`suspended` - true, if the VS is suspended; otherwise, false
`enable_autoscale` - true, if autoscale is enabled for the VS; otherwise, false
`add_to_marketplace` - this parameter is not applicable to vCenter VS

```xml
<ip_addresses type="array"/>
<montly_bandwidth_used type="decimal">0.0</monthly_bandwidth_used>
<total_disk_size type="integer">3</total_disk_size>
<support_incremental_backups type="boolean">false</support_incremental_backups>
<cpu_priority type="integer">20</cpu_priority>
<built_from_iso type="boolean">false</built_from_iso>
<acceleration type="boolean">false</acceleration>
<brhvisor_type>vcenter</hypervisor_type>
</virtual_machine>
```
initial_root_password_encrypted - true, if root password for the VS is encrypted on the vCenter side; otherwise, false

devicereport - this parameter is not applicable to vCenter

storage_server_type - this parameter is not applicable to vCenter

firewall_notrack - true if the NOTRACK rule is set in iptables

service_password - service account password

preferred_hvs - the array of preferable compute resources based on compute zone that meet some virtual server configuration settings

local_remote_access_ip_address - IP address used for remote access

cpu_units - the amount of CPU units per core if the CPU priority is replaced with CPU units in the user bucket

cpu_sockets - the amount of CPU sockets per core

core_per_socket - the number of CPU cores per socket

instance_package_id - id of the instance package

hot_add_cpu - true, if the CPU parameter can be changed without rebooting the VS; otherwise, false

hot_add_memory - true, if the memory parameter can be changed without rebooting the VS; otherwise, false

time_zone - the time zone of the user

autoscale_service - this parameter is not applicable to vCenter

vapp_id - this parameter is not applicable to vCenter

vcenter_moref - moref of the virtual server on vCenter

template_version - the version of the template

deleted_at - time when the VS was deleted in the [YYYY][MM][DD][hh][mm][ss]Z format

acceleration_allowed - true, if acceleration is allowed for the VS; otherwise, false

vcenter_cluster_id - ID of the vCenter cluster

virsh_console - true, if Virsh console is enabled for the VS, otherwise, false

ip_addresses - an array of IP addresses assigned to this virtual server

monthly_bandwidth_used - VS's monthly bandwidth

total_disk_size - the total disk size in GB of all disks assigned to the VS

support_incremental_backups - true, if incremental backups are supported; otherwise, false

cpu_priority - it has the same value as cpu_shares parameter

built_from_iso - true, if the VS was built from an ISO template; otherwise, false

built_from_ova - true, if the VS was built from an OVA template; otherwise, false

acceleration - true, if acceleration is allowed for the VS; otherwise, false

hypervisor_type - the type of the compute resource (vCenter)

### 4.3 Auto Import Rules

If you need a quick import of multiple new VSs from vCenter to OnApp, use the auto import rules functionality. This section contains requests for management of auto import rules.
4.3.1 Get List of Auto Import Rules

To get the list of all available auto import rules, use the following request:

GET /settings/hypervisors/:hypervisor_id/auto_import_rules.xml
GET /settings/hypervisors/:hypervisor_id/auto_import_rules.json

XML Request Example

```bash
```

JSON Request Example

```bash
```

XML Output Example

```xml
<auto_import_rules type="array">
  <auto_import_rule>
    <id type="integer">18</id>
    <event_type>vm_created</event_type>
    <label>All DC machines</label>
    <source_type>VCenter::Datacenter</source_type>
    <source_id type="integer">452</source_id>
    <target_type>User</target_type>
    <target_id type="integer">513</target_id>
    <hypervisor_id type="integer">862</hypervisor_id>
  </auto_import_rule>
  <auto_import_rule>
    <id type="integer">20</id>
    <event_type>vm_created</event_type>
    <label>test_rule</label>
    <source_type>VCenter::ResourcePool</source_type>
    <source_id type="integer">184</source_id>
    <target_type>User</target_type>
    <target_id type="integer">1</target_id>
    <hypervisor_id type="integer">862</hypervisor_id>
  </auto_import_rule>
</auto_import_rules>
```

Where:

- id - the ID of an auto import rule
- event_type - the type of event with which this rule will be associated
- label - the label of auto import rule specified by the user
- source_type - the type of vCenter source
- source_id - the ID of the vCenter source
- target_type - the type of target user
- target_id - the ID of the user
- hypervisor_id - the ID of the compute resource

4.3.2 Add Auto Import Rule

To add an auto import rule, use the following request:
POST /settings/hypervisors/:hypervisor_id/auto_import_rules.xml
POST /settings/hypervisors/:hypervisor_id/auto_import_rules.json

XML Request Example

```sh
curl -i -X POST
http://onapp.test/settings/hypervisors/152/auto_import_rules.xml -d
  '<?auto_import_rule><label>Test auto import label</label><source_type>VCenter::Cluster</source_type><source_id type="integer">1</source_id><target_type>User</target_type><target_id type="integer">1</target_id></auto_import_rule>' -u user:userpass -H
  'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example

```sh
curl -i -X POST
http://onapp.test/settings/hypervisors/152/auto_import_rules.json -d
  '{"label": "Test auto import label", "source_type": "VCenter::Cluster", "source_id": 1, "target_type": "User", "target_id": 1}' -u user:userpass -H
  'Accept: application/json' -H 'Content-type: application/json'
```

Where:

- `label` - the label of auto import rule specified by the user
- `source_type` - the type of vCenter source
- `source_id` - the ID of the vCenter source
- `target_type` - the type of target user
- `target_id` - the ID of the user

4.3.3 Run Auto Import Rule

To run an auto import rule, use the following request:

POST /settings/hypervisors/:hypervisor_id/auto_import_rules/:rule_id/run.xml
POST /settings/hypervisors/:hypervisor_id/auto_import_rules/:rule_id/run.json

XML Request Example

```sh
curl -i -X POST
-u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example
4.3.4 Edit Auto Import Rule

To edit an auto import rule, use the following request:

PUT
/settings/hypervisors/:hypervisor_id/auto_import_rules/:rule_id.xml
PUT
/settings/hypervisors/:hypervisor_id/auto_import_rules/:rule_id.json

**XML Request Example**

```bash
curl -i -X PUT
http://onapp.test/settings/hypervisors/12/auto_import_rules/3.xml -d
  '<auto_import_rule><label>Test auto import label EDITED</label><source_type>VCenter::Cluster</source_type><source_id type="integer">1</source_id><target_type>User</target_type><target_id type="integer">1</target_id>' -u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

**JSON Request Example**

```bash
curl -i -X PUT
http://onapp.test/settings/hypervisors/12/auto_import_rules/3.json -d
  '{"label": "Test auto import label EDITED", "source_type": "VCenter::Cluster", "source_id": 1, "target_type": "User", "target_id": 1}' -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'
```

Where:

- **label** - the label of auto import rule specified by the user
- **source_type** - the type of vCenter source
- **source_id** - the ID of the vCenter source
- **target_type** - the type of target user
- **target_id** - the ID of the user

4.3.5 Delete Auto Import Rule

To delete an auto import rule, use the following request:

DELETE
/settings/hypervisors/:hypervisor_id/auto_import_rules/:rule_id.xml
DELETE
/settings/hypervisors/:hypervisor_id/auto_import_rules/:rule_id.json

**XML Request Example**

```bash
curl -i -X POST
   -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'
```
4.4 Add vCenter VS

Virtual servers running on vCenter compute resources are managed exactly the same as normal virtual servers. The only difference is the creation process.

Currently, the use of IPv6 is not supported for vCenter virtual servers.

To create a vCenter virtual server, use the following request:

POST /virtual_machines.xml
POST /virtual_machines.json

XML Request Example

```xml
curl -i -X POST -H 'Accept: application/xml' -H 'Content-type: application/xml' -u user:userpass -d '<virtual_machine><template_id>267</template_id><infrastructure_mode>false</infrastructure_mode><label>new_vs</label><hostname>new_hostname</hostname><initial_root_password>qwaszx</initial_root_password><initial_root_password_confirmation>qwaszx</initial_root_password_confirmation><hypervisor_id>29</hypervisor_id><vcenter_resource_pool_id>14</vcenter_resource_pool_id><datacenter_id>56</datacenter_id><memory>128</memory><cpus>1</cpus><cpu_shares>1</cpu_shares><data_store_group-primary_id>84</data_store_group-primary_id><primary_data_store_id>7</primary_data_store_id><primary_disk_size>25</primary_disk_size><network_group_id>2</network_group_id><network_id>7</network_id><ip_net_id>3</ip_net_id><ip_range_id>4</ip_range_id><ip_address>11.111.111.111</ip_address><rate_limit>200</rate_limit><recipe_joins_attributes type="array"><recipe_id>11</recipe_id></recipe_joins_attributes><custom_recipe_variable><enabled>true</enabled><id>62</id><name>custom_variable</name><value></value></custom_recipe_variable><service_addon_ids type="array"><service_addon_id>273</service_addon_id><service_addon_id>274</service_addon_id></service_addon_ids><required_virtual_machine_build>true</required_virtual_machine_build><required_virtual_machine_startup>true</required_virtual_machine_startup></virtual_machine>'
```

JSON Request Example

```json
curl -i -X DELETE
```

Where:

**template_id** - the ID of a template from which the VS should be built

**infrastructure_mode** - true, if Infrastructure mode should be enabled for this VS; otherwise, false

**label** - the label of the VS

**hostname** - set the host name for the VS

**domain** - specify the domain for the VS. The default value is `localdomain`. You can edit the default value for domain in `/onapp/interface/config/on_app.yml`. This parameter is not applicable for Windows virtual servers.

**initial_root_password** - the root password for a VS. Optional, if none specified, the system will provide a random password. It can consist of 6-32 characters, letters [A-Za-z], digits [0-9], dash [-] and lower dash [ _ ]. You can use both lower- and uppercase letters.

**initial_root_password_confirmation** - confirm the root password for the VS

**hypervisor_id** - the ID of a compute resource where the VS will be built. Optional: if no compute resource ID is specified, the VS will be built on the compute resource with the least available RAM (but sufficient RAM for the VS).

**vcenter_resource_pool_id** - ID of the vCenter Resource Pool

**datacenter_id** - the ID of a data center for the data store. Optional: if no data center is set, the VS will be built in any available compute zone.

**memory** - the amount of RAM assigned to the VS

**cpus** - the number of CPU cores assigned to the VS

**cpu_shares** - the CPU priority value

**cpu_units** - the amount of CPU units per core if the CPU priority is replaced with CPU units in the user bucket

**data_store_group_primary_id** - set the ID of the data store zone to which this primary disk is allocated

**NOTE:** It is not possible to set VS password when creating a Windows-based vCenter virtual server without running a sysprep.
**primary_data_store_id** - the ID of a primary data store for the VS primary disk

**primary_disk_size** - set the disk space for the VS

**network_group_id** - the ID of the network zone. Optional parameter.

**network_id** - the ID of the network. Optional parameter that can be used only if it is assigned to the network zone.

💡 **ip_net_id** - the ID of the IP net from which the IP address should be assigned

💡 **ip_range_id** - the ID of the IP range from which the IP address should be assigned

💡 **ip_address** - the ID of an IP address for the VS

**rate_limit** - set the max port speed in Mbps or set 0 to get maximum port speed allowed by your bucket. If this parameter is omitted or sent without value, the default port speed will be configured for the VS. The default port speed depends on the maximum port speed set in your bucket and the Max network interface port speed parameter at Control Panel > Settings > Configuration. The system identifies which of the two values (in the bucket or in the configuration) is lower and sets it as the default port speed during VS creation.

**recipe_joins_attributes** - an array of the recipe IDs that you want to run on the virtual server provisioning

**recipe_id** - the ID of the recipe that you want to assign to the VS

**custom_recipe_variable** - the array of custom variables with the following details:

- **enabled** - true, if the variable is enabled, otherwise false
- **id** - variable ID
- **name** - variable name
- **value** - variable value script

**service_addon_ids** - the array of service add-on IDs that you want to add to VS. You can assign service add-on only if they are enabled on your license.

**service_addon_id** - the ID of the service add-on that you want to add to VS

**required_virtual_machine_build** - set 1 to build VS automatically

**required_virtual_machine_startup** - set 1 to start up the VS automatically, otherwise, set 0 (default state is "1")

**licensing_server_id** - the ID of a template group where the KMS server details are indicated and to which the template belongs (either directly or through the child group). This parameter is for Windows virtual machines with KMS licensing type only.

**licensing_type** - the type of a license: **mak**, **kms**, or user **own** license. This parameter is required for Windows virtual machines only.

**licensing_key** - the key of a license, required if you have selected **own** licensing type, and not required for MAK and KMS licensing types. This parameter is required for Windows virtual machines only.

---

**Page History**

v.6.4 Edge 1

- added the **vcenter_resource_pool_id** parameter
- removed the **hypervisor_group_id** and **cluster_id** parameters

v.6.3 Edge 2
• added the *infrastructure_mode* parameter

v.6.0
• added the following parameters:
  o *ip_net_id*
  o *ip_range_id*
  o *ip_address*

v.5.9
• added the following parameters:
  o *datacenter_id*
  o *cluster_id*
  o *primary_data_store_id*

v.3.1
• added the following parameters:
  o *custom_variables*
  o *enabled*
  o *id*
  o *name*
  o *value*

### 4.5 Clone vCenter VS

To clone a virtual server, use the following request:

POST /virtual_machines/:virtual_machine_id/clone.xml

POST /virtual_machines/:virtual_machine_id/clone.json

**XML Request Example**

```bash
```

**JSON Request Example**

```bash
```

### 4.6 Add vCenter Compute Zone

To add a new compute zone, use the following request:
POST /settings/hypervisor_zones.xml
POST /settings/hypervisor_zones.json

XML Request Example

```bash
curl -i -X POST http://onapp.test/settings/hypervisor_zones.xml -d '  <pack><label>zaza</label><server_type>virtual</server_type><location_group_id>38</location_group_id><release_resource_type>memory_guarantee</release_resource_type><max_vms_start_at_once>5</max_vms_start_at_once><recovery_type>roundrobin</recovery_type><failover_timeout>15</failover_timeout><run_sysprep>1</run_sysprep><default_gateway></default_gateway><cpu_units>1000</cpu_units></pack>' -u user:userpass -H 'Accept: application/xml' -H 'Content-type: application/xml'
```

JSON Request Example

```bash
curl -i -X POST http://onapp.test/settings/hypervisor_zones.json -d '{"pack":{"label":"zaza","server_type":"virtual","location_group_id":"38","release_resource_type":"memory_guarantee","max_vms_start_at_once":"5","recovery_type":"roundrobin","failover_timeout":"15","run_sysprep":"1","default_gateway":null,"cpu_units":1000}}' -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'
```

Where:

- **label**: title of a new compute zone
- **server_type**: specify the type of servers that will reside within this compute zone:
  - **virtual**: choose the virtual type to create a Xen, KVM, VMware or CloudBoot zone
  - **smart**: choose the smart server type to create a smart server zone
  - **baremetal**: choose the baremetal server type to create a baremetal server zone
- **location_group**: specify the location group to which the compute zone will be assigned
- **release_resource_type**: specify the release resource type. Release resource option allows to free up compute resources by over-committing RAM, CPU and CPU shares of virtual servers that are shut down. By default, the compute zone is created with the Memory Guarantee option enabled. In this case the release resources option is not used. Then, to enable resource over-committing you should choose either the Ballooning or Only Started VS option.
  - **memory_guarantee**: the actual free compute memory is calculated. All virtual servers residing on the compute resource will be able to start.
  - **ballooning**: free compute memory is calculated with the ability to use memory over-committing. The ballooning option is only available for KVM compute resources. **NOTE**: Virtual server may be migrated to another compute resource if there is not enough memory for it to start up on the compute resource with the ballooning option enabled.

Do not use the ballooning option if there is at least one edge or storage server within the compute zone.
• **only_started_vms** - only the memory of running virtual servers is calculated.

**max_vms_start_at_once** - the maximum number of virtual servers that can be started simultaneously within this compute zone

**recovery_type** - specify the compute resource selection algorithm, which will be used on virtual server provisioning and recovery, per compute zone:

• **roundrobin** - set the roundrobin type to select the compute resource with maximum free RAM during the VS recovery

> Note: this option behaves in different ways, depending on the event:

• On provisioning, the round-robin algorithm will be used on compute resource selection.

• On recovery, the compute resource with maximum free RAM will be selected.

• **fillnext** - select the fillnext type to select the compute resource with minimum required free RAM. This option allows to fill compute resource as tightly as possible before starting to use next appliance in the zone

**failover_timeout** - time period for which the iterations will run during the failover if the compute resource does not respond

**prefer_local_reads** - set 1 to minimise the network throughput dependency for read heavy workloads. When this option is enabled, reads go over the local software bridge to a local replica of the data rather than traverse a physical NIC + switch.

**run_sysprep** - set 1 to enable Windows virtual server deployment without running sysprep

> NOTE: It is not possible to set VS password when creating a Windows-based VMware virtual server without running a sysprep.

**cpu_units** - set the number of cpu units for applied to each compute resource in this compute zone

**VMware parameters:**

**default_gateway** - external gateway IP address. All virtual servers within the compute zone will be rerouted to this gateway.

**Page History**

v. 3.3:

• added **cpu_units** parameters

v. 3.1:

• added the following parameters:
  
  o **server_type**
  
  o **release_resource_type**
  
  o **recovery_type**
  
  o **run_sysprep**
OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)

4.7 Add vCenter Compute Resources

To add a vCenter compute resource, use the following request:

- POST /settings/hypervisors.xml
- POST /settings/hypervisors.json

**XML Request Example**

```sh
curl -i -X POST http://onapp.test/settings/hypervisors.xml -d
   '<hypervisor><label>vcenter_compute_resource</label><hypervisor_type>vcenter</hypervisor_type><vcenter_server_id>1</vcenter_server_id><vcenter_cluster_id>1</vcenter_cluster_id><hypervisor_group_id>3</hypervisor_group_id></hypervisor>' -u user:userpass -H 'Accept:application/xml' -H 'Content-type:application/xml'
```

**JSON Request Example**

```sh
curl -i -X POST http://onapp.test/settings/hypervisors.json -d
   '{"hypervisor": {"label": "cluster_label", "hypervisor_type": "vcenter", "vcenter_server_id": 1,"vcenter_cluster_id": 1, "hypervisor_group_id": 3}}' -u user:userpass -H 'Accept: application/json' -H 'Content-Type: application/json'
```

Where:

- **label** - the name of the compute resource
- **hypervisor_type** - specify compute resource type (vcenter)
- **vcenter_server_id** - the ID of the vCenter server
- **vcenter_cluster_id** - the ID of the necessary vCenter cluster
- **hypervisor_group_id** - the ID of the necessary compute zone

**Page History**

v. 6.4 Edge 1
- added the following parameters:
  - **vcenter_server_id**
  - **vcenter_cluster_id**
  - **hypervisor_group_id**
- removed the following parameters:
  - **enabled**
  - **collect_stats**
  - **cpu_units**
  - **disable_failover**
  - **connection_options**
  - **login**
4.8 Edit vCenter Compute Resources

To edit a vCenter compute resource, use the following request:

PATCH /settings/hypervisors/:hypervisor_id.xml

PATCH /settings/hypervisors/:hypervisor_id.json

XML Request Example

```bash
curl -i -X PATCH http://onapp.test/settings/hypervisors/:hypervisor_id.xml -d
'\<hypervisor\><label>vcenter_compute_resource_label</label><hypervisor_group_id>41</hypervisor_group_id></hypervisor>' -u user:userpass -H 'Accept:application/xml' -H 'Content-type:application/xml'
```

JSON Request Example

```bash
curl -i -X PATCH http://onapp.test/settings/hypervisors/:hypervisor_id.json -d
'\{"hypervisor": \{"label": "vcenter_compute_resource_label", "hypervisor_group_id": 41\}\}' -u user:userpass -H 'Accept:application/json' -H 'Content-type:application/json'
```

Where:

- `label` - the name of the compute resource
- `compute zone` - the name of the compute zone

Please note that an ability to edit a compute zone is available only if no virtual server is imported.

Page History

v. 6.4 Edge 1

- removed the following parameters:
  - `enabled`
  - `collect_stats`
  - `cpu_units`
  - `disable_failover`
v.6.0

- removed the following parameters:
  - ip_address
  - backup_ip_address
- added the api_url parameter

4.9 vCenter Templates API

As you add a vCenter compute resource to OnApp, the vCenter templates are also imported. To finalize the import of the vCenter templates and be able to manage them, it is required to update the templates on the OnApp side. This section contains requests to view and update vCenter templates.

4.9.1 Get List of vCenter Templates

To get the list of vCenter templates in your cloud, use the following request:

GET /vcenter/templates.xml
GET /vcenter/templates.json

XML Request example

```
```

JSON Request Example

```
```

XML Output Example
Where:

id - the ID of the vCenter template

label - the label of the vCenter template

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

version - version of the template file

file_name - the name of the template file

operating_system - the operating system's name
operating_system_distro - the operating system's distribution

allowed_swap – true, if swap is allowed; otherwise, false

state - state of the template (active, inactive, pending)

checksum - file checksum

allow_resize_without_reboot - true if resize without reboot is allowed, otherwise false

min_disk_size - minimum disk size required to build a VS on this template (GB)

user_id - the ID of a template's user in OnApp

template_size - the size of the template

allowed_hot_migrate - true, if hot migration for the VS is allowed; otherwise, false

operating_system_arch - architecture of the operating system

operating_system_edition - edition of the OS

operating_system_tail - tail of the OS

parent_template_id - the ID of the target template group

virtualization - type of virtualization (xen, kvm or kvm_virtio) which is compatible with this template

min_memory_size - minimum memory size required to build a VS on this template (MB)

disk_target_device - the prefix indicating the method of translating the disk to a VS by compute resource

cdn - true if this template can be used for building edge servers; otherwise, false

backup_server_id - the ID of the backup server

ext4 - true if ext4 file system is supported; otherwise, false

smart_server - true if a smart server can be built from this template; otherwise, false

baremetal_server - true if a baremetal server can be built from this template; otherwise, false

initial_password - the initial password for the template on the vCenter side

initial_username - the initial username for the template on the vCenter side

remote_id - ID of the template on the vCenter side

manager_id - ID of the template on the template server

resize_without_reboot_policy - the hot resize possibility for a particular template considering its OS version and virtualization type

application_server - true if an application server can be built from this template; otherwise, false

draas - true if DRaaS is allowed; otherwise, false

properties - the attributes of template

nics - the array of parameters associated with the NICs

locked - true if the template is locked; otherwise, false

4.9.2 Update vCenter Template

To update a vCenter template's initial credentials, use the following request:

PUT /vcenter/templates/template_id.xml
PUT /vcenter/templates/template_id.json

XML Request Example
OnApp Cloud 6.5 Edge 3 vCenter Implementation Guide (OnApp 5.4 and up)

4.10 vCenter Resource Pool API

This section provides the API calls you can use to manage vCenter Resource Pool.

4.10.1 Get List of Resource Pools

To get the list of vCenter resource pools in your cloud, use the following request:

GET /vcenter/resource_pools.xml
GET /vcenter/resource_pools.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

**XML Output Example**
<vcenter_resource_pools type="array">
  <vcenter_resource_pool>
    <id type="integer">2</id>
    <label>RP1</label>
    <identifier>resgroup-2357</identifier>
    <cluster_id type="integer">1</cluster_id>
    <parent_id type="integer">1</parent_id>
    <user_id nil="true"/>
  </vcenter_resource_pool>
  <vcenter_resource_pool>
    <id type="integer">3</id>
    <label>RP2</label>
    <identifier>resgroup-2358</identifier>
    <cluster_id type="integer">1</cluster_id>
    <parent_id type="integer">1</parent_id>
    <user_id nil="true"/>
  </vcenter_resource_pool>
  <vcenter_resource_pool>
    <id type="integer">21</id>
    <label>RD-vcd-c.onappdev.com-resource-pool</label>
    <identifier>resgroup-11092</identifier>
    <cluster_id type="integer">4</cluster_id>
    <parent_id type="integer">17</parent_id>
    <user_id nil="true"/>
  </vcenter_resource_pool>
</vcenter_resource_pools>

Where:

- id - ID of the vCenter resource pool
- label - the name of the vCenter resource pool
- identifier - the resource pool identifier
- cluster_id - ID of the cluster the resource pool is based in
- parent_id - ID of the default resource pool
- user_id - equal to nil if resource pool is imported into CP or equal to user_id if created by the user via CP

4.10.2 Add vCenter Resource Pool

To create a new resource pool, use the following request:

POST /vcenter/resource_pools.xml
POST /vcenter/resource_pools.json

XML Request Example

```
```

JSON Request Example
curl -i -X POST http://onapp.test/vcenter/resource_pools.json -d 
'{"vcenter_resource_pool": {"label": "resource_pool_label", "hypervisor_id": 3}}' -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'

XML Output Example

```xml
<vcenter_resource_pool>
  <id type="integer">43</id>
  <label>new_resource_pool_via_api</label>
  <identifier>yfbbqriebulai</identifier>
  <cluster_id type="integer">4</cluster_id>
  <parent_id type="integer">17</parent_id>
  <user_id type="integer">1</user_id>
</vcenter_resource_pool>
```

Where:
- id - the resource pool ID
- label - the name of a new resource pool
- identifier - the resource pool identifier
- cluster_id - ID of the cluster the resource pool is based on
- parent_id - ID of the default resource pool
- user_id - user ID in Control Panel

4.10.3 Edit vCenter Resource Pool

To edit vCenter Resource Pool, use the following request:

PATCH /vcenter/resource_pools/:resource_pool_id.xml
PATCH /vcenter/resource_pools/:resource_pool_id.json

XML Request Example

```bash
'<?xml version="1.0" encoding="UTF-8"?>
<vcenter_resource_pool>
  <label>new_resource_pool_via_api_EDITED</label>
</vcenter_resource_pool>
```

JSON Request Example

```bash
curl -i -X PATCH http://onapp.test/vcenter/resource_pools/43.json -d 
'{"vcenter_resource_pool": {"label": "resource_pool"}}' -u user:userpass -H 'Accept: application/json' -H 'Content-type: application/json'
```

Where:
- label - the resource pool name
4.10.4 Delete vCenter Resource Pool

To delete a vCenter resource pool, use the following request:

DELETE /vcenter/resource_pools/:resource_pool_id.xml
DELETE /vcenter/resource_pools/:resource_pool_id.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

Returns HTTP 204 response on successful deletion, or HTTP 404 when a vCenter resource pool with the ID specified is not found.

4.10.5 Change vCenter Resource Pool Owner

To change the owner of a vCenter resource pool, use the following request:

PUT /vcenter/resource_pools/:owner_id/owner.xml
PUT /vcenter/resource_pools/:owner_id/owner.json

**XML Request Example**

```
```

**JSON Request Example**

```
```

Returns HTTP 204 response on successful change of the owner, or HTTP 422 when a vCenter resource pool owner with the ID specified is not found.

Where:

`new_owner_id` - the ID of the new vCenter resource pool owner

4.11 vCenter Servers API

This section contains requests for management of vCenter servers.
4.11.1 Get List of vCenter Servers

To get the list of vCenter servers in your cloud, use the following request:

GET /settings/vcenter_servers.xml
GET /settings/vcenter_servers.json

XML Request Example

```
```

JSON Request Example

```
```

XML Output Example
<vcenter_vcenter_servers type="array">
    <vcenter_vcenter_server>
        <id type="integer">1</id>
        <label>RD-vCenter-vc-c.onappdev.lviv</label>
        <api_url>vc-c.onappdev.lviv</api_url>
        <login>qa@vsphere.local</login>
        <online type="boolean">true</online>
        <host>vc-c.onappdev.lviv</host>
        <machine>linux-x64</machine>
        <release>6.7.3</release>
        <instance_uid>f2df5ee8-6bb4-4379-9155-0540a92b209</instance_uid>
        <cpu_mhz>2800</cpu_mhz>
        <cpus type="integer">4</cpus>
        <cpu_cores type="integer">24</cpu_cores>
        <total_mem type="integer">122873</total_mem>
        <free_mem type="integer">20478</free_mem>
        <public_key_hash>9384a4af045b20ab13aef4da54a45984ba06ec512884ba6eeb69c0699e96a4</public_key_hash>
    </vcenter_vcenter_server>
    <vcenter_vcenter_server>
        <id type="integer">2</id>
        <label>RD-vCenter-vc-g.onappdev.lviv</label>
        <api_url>vc-g.onappdev.lviv</api_url>
        <login>qa@vsphere.local</login>
        <online type="boolean">true</online>
        <host>vc-g.onappdev.lviv</host>
        <machine>linux-x64</machine>
        <release>7.0.0</release>
        <instance_uid>1a7cb88e-3790-46f4-888c-a5e32c0e6866</instance_uid>
        <cpu_mhz>2799</cpu_mhz>
        <cpus type="integer">4</cpus>
        <cpu_cores type="integer">4</cpu_cores>
        <total_mem type="integer">20478</total_mem>
        <free_mem type="integer">20478</free_mem>
        <public_key_hash>0e1988e239c42f7c2ec6ec160a555ff0e07d470acc7f0329805127908b45f7f</public_key_hash>
    </vcenter_vcenter_server>
    <vcenter_vcenter_server>
        <id type="integer">3</id>
        <label>RD-vCenter-vc-qa.onappdev.lviv</label>
        <api_url>vc-qa.onappdev.lviv</api_url>
        <login>administrator@vsphere.local</login>
        <online type="boolean">true</online>
        <host>vc-qa.onappdev.lviv</host>
        <machine>linux-x64</machine>
        <release>6.7.1</release>
        <instance_uid>aa62944-d65b-431d-albb-f94b11783d82</instance_uid>
        <cpu_mhz>2933</cpu_mhz>
        <cpus type="integer">4</cpus>
        <cpu_cores type="integer">8</cpu_cores>
        <total_mem type="integer">16382</total_mem>
        <free_mem type="integer">8191</free_mem>
        <public_key_hash>114869c8d6f919d8ace1b28a6f9e6b760ab277cb9104bb689be6bf8a243cc</public_key_hash>
    </vcenter_vcenter_server>
</vcenter_vcenter_servers>

Where:

id - the ID of the vCenter server
label - the label of the vCenter server
api_url - the API URL of the vCenter server on the vCenter side
login - vCenter login
online - true, if the server is online; otherwise, false
host - the hostname of the vCenter server
machine - operation system type of vCenter server
release - the vCenter version
instance_uuid - universally unique identifier of an instance
cpu_mhz - CPU frequency
cpus - number of CPUs for this vCenter server
threads_per_core - threads per core
cpu_cores - number of CPU cores for this vCenter server
total_mem - the total amount of RAM for this vCenter server
free_mem - the amount of free RAM for this vCenter server
public_key_hash - hash of a public key

4.11.2 Add vCenter Server
To add a new vCenter server, use the following request:
POST /settings/vcenter_servers.xml
POST /settings/vcenter_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/settings/vcenter_servers.json -d '{"vcenter_server":{"label": "vcenter_server_label", "api_url": "vc-b.onappdev.lviv", "login": "administrator@vsphere.local", "password": "vsphere_pass"}}'
```

Where:
label - the label of the vCenter server
api_url - the API URL of the vCenter server on the vCenter side
login - your vCenter login
password - your vCenter password

4.11.3 Edit vCenter Server
To edit a vCenter server, use the following request:
PUT /settings/vcenter_servers/:vcenter_server_id.xml
PUT /settings/vcenter_servers/:vcenter_server_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/settings/vcenter_servers/5.xml -d
'<?xml version='1.0'?><vcenter_server><label>new_label</label><login>new_login</login><password>new_password</password></vcenter_server>'
```

JSON Request Example
```
curl -i -X PUT -H 'Accept: application/json' -H 'Content-type: application/json' -u user:userpass --url
http://onapp.test/settings/vcenter_servers/4.json -d '{"vcenter_server": {"label": "updated_label", "login": "updated_login", "password": "updated_password"}}'
```

Where:
- **label** - the label of the vCenter server
- **login** - your vCenter login
- **password** - your vCenter password

### 4.11.4 Delete vCenter Server

To remove a vCenter server, use the following request:

DELETE /settings/vcenter_servers/:vcenter_server_id.xml
DELETE /settings/vcenter_servers/:vcenter_server_id.json

XML Request Example
```
curl -i -X DELETE -u user:userpass
```

JSON Request Example
```
curl -i -X DELETE -u user:userpass
```

Returns HTTP 204 response on successful deletion, or HTTP 404 when a vCenter server with the ID specified is not found.