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1 General Considerations

Learn the basics: core terms, document conventions, latest updates and more.

The guide contains all the functionality of OnApp cloud starting from 6.4 version, including deployment and management software, and explains how to configure and maintain your cloud using the OnApp Control Panel interface. If you do not see some of the options mentioned here, you can ask your Administrator to enable the permissions.

1.1 Document Conventions

The following document conventions are used in this guide.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Usage</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>Label or button names in the Control Panel, often clickable</td>
<td>On the VS's screen, click the <strong>Tools</strong> button, then select <strong>Delete Virtual Server</strong></td>
</tr>
<tr>
<td><em>Italics</em></td>
<td>Parameters and field labels in the UI</td>
<td><em>Password</em> - set password for remote Vyatta management</td>
</tr>
<tr>
<td>code block</td>
<td>Source code</td>
<td><code>alter if not: eth0 = public interface</code></td>
</tr>
<tr>
<td>A menu selection</td>
<td>Go to <strong>Settings</strong> - &gt; <strong>Networks</strong> - &gt; <strong>Add New Network</strong></td>
<td></td>
</tr>
</tbody>
</table>

We use the following formatting elements to draw your attention to certain pieces of information:

**Info**

An info message emphasizes or explains the information within the chapter.

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

**Note**

A note message contains information essential for task completion.

*The maximum length of a Mount Point is 256 characters.*

**Warning**

A warning message informs you of something you should not do or be cautious.

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

https://onappcloud.typeform.com/to/A64Euy#source=Document%20Conventions

Leave feedback

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1.3 OnApp Cloud Overview

OnApp Cloud software enables service providers to turn their existing infrastructure (or any commodity hardware) into a single pool of resources - “a cloud” which can then be sold to end users on a utility basis. It's a complete cloud deployment and management platform that's designed to make it easy for service providers to sell a wide range of cloud services.

OnApp Cloud can also be used by enterprise IT departments and MSPs to deliver cloud services to end users. For more information, see OnApp Cloud.

To start with, you can check out the quick overview video below to get insights on the main functionality, available through OnApp cloud:

Your browser does not support the HTML5 video element

OnApp UI complies with Web Content Accessibility Guidelines (WCAG) 2.0 AA and AAA (highest) levels of conformance to make content more accessible to a wider audience.
This guide explains how to configure and use OnApp Cloud through the OnApp Control Panel management user interface. Depending on your OnApp Cloud license type (free or full), and how your cloud is configured, you can use the Control Panel to set up your own distributed SAN and DNS services, using OnApp’s companion products and OnApp Storage. All of these functions are covered in this guide.

https://onappcloud.typeform.com/to/A64Euy#source=OnApp%20Cloud%20Overview

Leave feedback

1.3.1 API and Integrations

All cloud functionality is controlled via a customizable web interface and is also accessible via OnApp’s full API. Our comprehensive RESTful JSON API enables full integration of OnApp with third-party applications.

The OnApp Cloud API integrates cloud services with third parties. It is available in REST architecture with JSON as the format and Basic HTTP and API Key as the authentication methods. API methods are available for managing servers, networks, location groups, load balancers, storage backup and much more. OnApp is a cloud management platform with solutions that enable service providers to build public, private, hybrid, and VPS clouds in the datacenter plus CDN solutions.

1.3.1.1 OnApp Integrations

The API makes integration straightforward for other applications too, including other control panels, CRM, support and billing systems. OnApp Cloud integrates both with popular billing applications and with PHP applications via a wrapper. At present, the list of the pre-built integrations includes the following:

- WHMCS
- Hostbill
- Ubersmith
- AWS
- R1Soft Server Backup Manager
- Veeam Backup
- CDN Billing Tool
- Standby Control Panel Server
- StorPool

1.3.1.2 What's Next

- Learn why OnApp API is so great at Why it’s time you fell in love with the OnApp API…
- If you need OnApp API support, you can visit developer support here, or contact support directly at info@onapp.com.
- Check integration modules that are available at Downloads.
- For a detailed API guide with code samples, see OnApp API Guide.

https://onappcloud.typeform.com/to/A64Euy#source=API%20and%20Integrations

Leave feedback

1.3.2 Architecture

OnApp software transforms your server and storage hardware into a virtual network system that employs a KVM compute resource virtualization architecture to control virtual protocols and security. With this infrastructure in place, OnApp users can host a multitude of secure cloud servers with more fluidity and control. A schematic of the OnApp architecture is shown below.
1.3.3 Hardware & Software Requirements

An OnApp installation requires at least two physical machines – one for the Control Panel server, and the other for the compute resource server. You can have as many compute resource servers as you need. You will also need storage for your virtual servers (a data store), and we recommend that you set up a separate server for storing backups and templates.

1.3.3.1 Suggested Specifications

<table>
<thead>
<tr>
<th>OnApp License</th>
<th>Professional Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Control Panel (CP) Servers</td>
<td>1</td>
</tr>
<tr>
<td>Separate Database Server/Cluster</td>
<td>No</td>
</tr>
<tr>
<td>Dedicated Backup Servers</td>
<td>1</td>
</tr>
<tr>
<td>Number of Compute Resources (KVM)</td>
<td>8</td>
</tr>
<tr>
<td>Compute Resource Type (Static / CloudBoot)</td>
<td>CloudBoot</td>
</tr>
</tbody>
</table>
### CP Server

- **Processor**: 2 x 8 Core CPUs  
  eg. Xeon e5-2640 v3
- **Memory**: 32GB RAM
- **Disks**: 4 x 100GB SSD
- **RAID Configuration**: RAID 10
- **Network Adapters**: Dual port 1Gbps + Dual Port 10Gbps  
  eg. Intel I350 + X520

### Backup Server

- **Processor**: 2 x 8 Core CPUs  
  eg. Intel Xeon e5-2620 v3
- **Memory**: 32GB RAM
- **HDDs**: 12x2TB SAS
- **RAID**: RAID10
- **Network Interfaces**: Dual port 1Gbps Intel NIC + Dual port 10Gbps Intel NIC

### Compute Resource

- **Processor**: 2 x 8 Core CPUs  
  eg. Xeon e5-2640 v3
- **Memory**: 256GB
- **HDDs**: 8 x 400GB SSD
- **RAID Controller**: PCIe gen3  
  eg. PERC H730, 1GB cache
- **RAID Configuration**: JBOD
- **Network Interfaces**: 4 x 10Gbps  
  eg.

### iSCSI SAN

- **Type**: Optional Dual-Controller Hardware SAN
- **HDDs**: 12+ SSD
- **RAID Configuration**: RAID10

### Network Hardware

2 x High performances switch with: 48 x 10GbE ports, 4 x 40 GbE ports

1.3.3.2 Storage Hardware Requirements

If you are going to use OnApp **Integrated Storage**, make sure to meet the following requirements:

<table>
<thead>
<tr>
<th>Integrated Storage Platform</th>
<th>Local Storage Only</th>
<th>Enterprise SAN</th>
</tr>
</thead>
</table>
| OnApp Integrated Storage can group together any number of drives across any compute resource. We strongly recommend a minimum of 2 drives per compute resource to enable redundant data store configurations. | minimum 1 dedicated partition in each compute resource  
  separate disk from the primary OS drive recommended | centralisedBlockStorage SAN (iSCSI, ATA over Ethernet or Fibre Channel) accessible to every compute resource  
  at least 1 dedicated 1Gb/s NIC assigned per compute resource for the SAN |
### 1.3.3.3 Hardware Requirements for HA

For information about hardware requirements for High Availability, refer to the Suggested Specifications section of Get Started for Clouds with High Availability guide.

**See also:**
- Architecture
- Zone Types
- API and Integrations

https://onappcloud.typeform.com/to/A64Euy#source=Hardware%20and%20Software%20Requirements

### 1.3.4 Main Components & Features

OnApp cloud handles cloud deployment, VS deployment, VS management & resource allocation, compute resource and SAN management, failover, user management, billing, self-provisioning, CDN and DNS, and other associated functions. Here’s a brief description of the main components and features of the OnApp installation.

#### 1.3.4.1 Servers

There are two required server types in an OnApp configuration – compute resource servers and the Control Panel server. OnApp also requires storage devices for templates, virtual servers, and backups.

#### 1.3.4.1.1 Control Panel Server

The Control Panel server hosts the OnApp user interface and manages all the processes controlled by OnApp.

The Control Panel server:
- Provides a web-based user interface
- Assigns a virtual server to a compute resource
- Creates/starts/stops/deletes virtual servers
- Resizes CPU and storage
- Manages virtual servers through a console session
- Creates backups of virtual servers
- Allows virtual servers to be restored from a backup
- Allows the creation of custom templates from virtual server backups, for future deployment of new virtual servers
- Displays your CPU usage and network utilization
1.3.4.1.2 Compute Resources

Compute resources are Xen, KVM, or VMware-powered servers running on bare metal, with CentOS Linux as the management operating system. This ensures highly efficient use of available hardware and complete isolation of virtual server processes. The management OS controls virtual servers as well as handling network/disk connectivity, monitoring, IP address anti-spoofing and more.

Compute resources:
- Provide system resources such as CPU, memory, and network
- Control the virtual differentiation of entities such as virtual servers and application data being delivered to cloud-hosted applications
- Take care of secure virtualization and channeling of storage, data communications and server processing
- Can be located at different geographical zones
- Can have different CPU and RAM
- Can be of Virtual, Baremetal, Smart and VPC types. The VPC type indicates the VMware Cloud Director compute resources
- Can be associated with the data stores, networks and backup servers of the same type

OnApp cloud supports the following compute resource virtualization platforms:
- KVM
- VMware
- VMware Cloud Director

VMware compute resources operate in a slightly different way. With Xen/KVM, OnApp controls compute resources directly. With VMware, OnApp controls the VMware vCenter. This allows vCenter to control the VSs with the full range of VMware functionality, including DRS and vMotion to ensure that the operation is optimal.

1.3.4.1.3 CloudBoot Compute Resources

CloudBoot functionality is a method of compute resource installation without the presence of a local disk or other local storage, utilizing the PXE and DHCP servers. CloudBoot Compute resources are used for smart and baremetal server provisioning. To start using CloudBoot, you must have Integrated Storage configured and the CloudBoot enabled in the system configuration first. See CloudBoot Compute Resources section for details.

1.3.4.1.4 Virtual Servers

OnApp gives you complete control of your virtual servers (VSs), and all files and processes running on those servers. You can start, stop, reboot, and delete virtual servers. You can move VSs between compute resources with no downtime. OnApp also lets you perform automatic and manual backups, and restore VSs in case of failure.

When creating a virtual server, you can choose a compute resource server with data store attached if you wish. If not, the system will search for the available compute resources with sufficient RAM and storage for that virtual server, and choose the one with the lowest (but sufficient) amount of RAM available.

You can monitor the CPU usage of each virtual server and the network utilization of each network interface. This helps you decide if and when to change the resources available to each VS. OnApp also provides detailed logs of all tasks which are running, pending, have failed, or have been completed.

1.3.4.1.5 Smart Servers

Smart servers are dedicated entities based on CloudBoot compute resources with passthrough enabled. Smart servers are created and managed exactly the same as virtual servers, except only one smart server can be deployed per compute resource. Smart servers can be organized into zones to create different tiers of service - for example, by setting up different zones for
smart appliances, with limits and prices specified per zone. Smart appliance zones can also be used to create private clouds for specific users.

1.3.4.1.6 Baremetal Servers

Baremetal servers are physical servers that reside directly on the hardware without the virtualization layer. Namely, a baremetal server is a compute resource that runs on the OS installed. Baremetal compute resources cannot have more than one baremetal server located on it.

1.3.4.2 Storage Devices

For VS template and backup storage we recommend that you set up a separate server with SSH (preferred) or NFS (for high-end NAS). However, in a CloudBoot environment or for a small scale installation, you can use the Control Panel server to host the templates and backups.

You will also need a storage platform for virtual server disk storage. OnApp provides an integrated storage platform that enables you to expose local storage drives across compute resources as a distributed block SAN with full redundancy and failover properties. Additionally, you can use any block based storage platform, such as local disks in compute resources, an Ethernet SAN such as iSCSI or AoE, or hardware (fiber) SAN. Storage Area Networks are core segments of the cloud system, and OnApp can control their physical and virtual routing. This control enables seamless SAN failover management, including SAN testing, emergency migration, and data backup.

1.3.4.3 Networks

With OnApp you can create complex networks between virtual servers residing on a single host, or across multiple installations of OnApp. You can configure each virtual server with one or more virtual NICs, each with its own IP and MAC address, to make them act like physical servers.

OnApp ensures that each customer has their own dedicated virtual network, isolated and secure. They can only see their traffic, even if they share the same physical server as another customer. OnApp enables you to modify network configurations without changing actual cabling and switch setups. Networks in OnApp can be of Virtual, Baremetal, Smart, and VPC types and can be associated with compute resources and compute zones of the same type. The VPC type indicates the VMware Cloud Director networks.

1.3.4.4 Templates

An OnApp template is a pre-configured OS image that is used to build virtual servers. There are two types of templates for virtual server deployment in OnApp: downloadable templates provided by OnApp, and custom templates you create from existing virtual servers. The OnApp template library includes a wide range of VS templates for various distributions of Windows and Linux, both 32- and 64-bit.

At present OnApp does not support VSs/templates with Active Directory Domain Controllers.

1.3.4.5 Scalability

OnApp is a highly scalable cloud deployment and management tool that allows you to add and remove compute resources, data stores, and resources at any time to meet your changing needs. You can add more CPUs and memory to a specific virtual server to increase its capacity, and increase the total available RAM and CPU by adding new compute resources.

1.3.4.6 High Availability

OnApp provides high reliability and availability in a number of ways:

- Compute resource failover management system — If a compute resource fails, OnApp's self-healing architecture automatically moves virtual servers to another box. Compute resources regularly update the control panel with their status. If they do not return valid data for a period of time, they are marked as offline, and an appropriate new compute resource is selected for a virtual server to boot there. This process is fully
automatic, but may take several minutes. When the crashed compute resource comes online, it will be again available, but virtual servers previously migrated from it will not be migrated back.

- **Virtual servers** — OnApp keeps virtual servers running even if the Control Panel server goes offline. In such an event, you won't be able to perform any actions on virtual servers until access to the Control Panel server has been restored.

- **Backup mechanisms** — There is storage security provided by the backup mechanisms on both virtual and physical storage. Both automatic and manual backups provide the ability to capture the current state of a virtual server. You can always restore the virtual server from a backup if needed. There are also emergency MySQL backups as part of the disaster recovery system.

- **High Availability Control Panel** — OnApp High Availability feature brings new opportunity to deploy more than one Control Panel within one cloud. This allows to improve cloud load balancing, minimize server downtime in case of CP issues, and enhance the scalability of the whole infrastructure. At this stage, OnApp introduces high availability for the following components:
  
  - UI
  - Background services
  - CloudBoot
  - Load Balancer
  - Redis
  - Message Queue
  - Database

### 1.3.4.7 Security

OnApp provides multiple layers of security:

- **Compute resource** — OnApp is a multi-compute resource cloud system that currently supports Xen, KVM, and VMware (Hyper-V and other compute resources will be added in future releases). The first layer of security is provided by the compute resource itself. For example, Xen provides full isolation between virtual servers and allows each virtual server to access its own disk only. When a virtual server makes a request for data, it gets redirected to its correct disk. Xen dictates which virtual servers and resources are allowed to run or be accessed at any given time.

- **Firewall** — In addition to the compute resource security mechanism, there is also an anti-spoof firewall which resides on the server where you store virtual servers. The firewall enables the management operating system of the compute resource to examine packets entering and leaving the virtual server. It blocks packets that do not belong to the virtual server and accepts those meeting the rules. The firewall prevents IP spoofing and packet sniffing.

- **Control Panel** — Virtual servers in OnApp are completely controlled by the administrator. Administrators have full root (Linux) or Administrator (Windows) access to accounts and servers. The Control Panel also lets you assign different levels of user access to virtual servers, compute resources, consoles and disks.

- **Network Security** is provided by completely isolating virtual servers from each other using VLANS. Each customer can be assigned their own VLAN, so using their private IP they can only access addresses within that VLAN. Using a public IP, they can only access those boxes which are manually specified, using the Integrated Console.

See also:

- **Hardware & Software Requirements**
- **API and Integrations**
1.3.5 Zone Types

OnApp reinforces the role of the types for compute, data store, network and backup server zones. The following norms apply to existing and new zones and resources:

- All individual resources (compute resources, data stores, backup servers, and networks) should be assigned to zones. Unassigned resources cannot be used for virtual server creation.
- All compute, data store, network and backup server zones have their type which cannot be changed. The zone’s type also defines the type of the resources assigned to it. All VMware Cloud Director related resources have the VPC type.
- Resources can be moved from one zone to another, but the zones should be of the same type. For example, you can move a data store from a data store zone of the Virtual type to another zone of the Virtual type. However, such a data store cannot be moved to a zone of the VPC type.
- Networks, data stores, and backup servers can only be assigned to compute zones and compute resources of the same type. For example, a network from the Virtual type network zone can be assigned only to a compute zone of the Virtual type.

Below you can find tables that demonstrate the available zone types depending on the resource type:

**Compute Resources and Zones**

<table>
<thead>
<tr>
<th>Compute Resource Type</th>
<th>Compute Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVM</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>VMware</td>
<td>Virtual</td>
</tr>
<tr>
<td>VMware Cloud Director</td>
<td>VPC</td>
</tr>
</tbody>
</table>

**Data Stores and Data Store Zones**

<table>
<thead>
<tr>
<th>Data Store Type</th>
<th>Data Store Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVM</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>Integrated Storage</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>SolidFire</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>VMware Cloud Director</td>
<td>VPC</td>
</tr>
<tr>
<td>VMware</td>
<td>Virtual</td>
</tr>
</tbody>
</table>

**Networks and Network Zones**

<table>
<thead>
<tr>
<th>Network Type</th>
<th>Network Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware Cloud Director</td>
<td>VPC</td>
</tr>
<tr>
<td>Other</td>
<td>Virtual/Smart/Baremetal</td>
</tr>
</tbody>
</table>

**Backup Servers and Backup Server Zones**

The backups server zones are available for the Virtual and the Smart server type. Any backup server can be added to a zone of either type. Once the backup server is added to a zone of a certain type it can be assigned to a backup server zone, compute
resource, or compute zone of that type only.

- **Backup Resources and Backup Resource Zones**
  The backup resource zones are available for the Virtual server type. The backup resource uses a plugin that enables to integrate OnApp with a third-party backup system. Once the backup resource is added to the backup resource zone, the later should be assigned to a compute zone that includes a compute resource on which run virtual servers that should be backed up.

**See also:**
- Data Stores Settings
- Data Store Zones Settings
- Compute Zones
- Compute Resource
- Backup Server Zones Settings
- Network Zones

https://onappcloud.typeform.com/to/A64Euy#source=Zone%20Types
2  What's New in OnApp Cloud 6.7

The OnApp Cloud 6.7 Edge 1 provides new features and improvements. You can find the list of all key enhancements at Release Notes.

2.1 Updated UI

We updated the user interface with the new look and feel for a number of pages. This version of the user interface is aimed to improve the user experience.

2.2 DB Partitioning

Added month-based range partitioning to the billing_statistics_hourly database table, which reduces the time for processing billing statistics queries up to five times as much and decreases the probability of issues related to the performance of the database.

2.3 User Accounts and User Groups

Now, you can view the list of IP addresses assigned to a user and a user's virtual servers, as well as the list of IP addresses assigned to a user within a particular user group and the list of IP addresses assigned to all the virtual servers of users within a user group.
2.4 Manage SSH Keys
Improved the SSH keys functionality with the option to view an SSH key's name and creation date at the SSH-Keys page and added the Name option at the Create SSH-Key and Edit SSH-Key pages.

2.5 Virtual Server Disks
Now, you can make the vDisk size smaller than the template's disk size the VS is built on.

2.6 Virtual Server Recovery Points
After creating a Veeam recovery point, you can see its size synchronized from Veeam to OnApp Control Panel.

2.7 Bucket and Access Control
Now, the user with the Administrator role and the Show Empty Values permission turned on can view empty values in the access control and rate card of any bucket.
2.8 NSX-T Edge Gateway

In the Allocated IPs step of the NSX-T edge gateway creation wizard, added the *IP Range* option allowing you to select the range of available IP addresses and the *Available IPs* option you can use to configure sub-allocated IPs.

2.9 NSX-T IPSec VPN

Added the new functionality [NSX-T IPSec VPN tunnels](#) that allows using the secure connection between private and cloud networks.

2.10 NSX-T NAT Rules

Improved the NSX-T NAT rules functionality with the option to edit an [NSX-T NAT rule](#) and added a new group of the [NSX-T NAT Rules](#) permissions, which allow creating, updating, deleting, and viewing NSX-T NAT rules.

2.11 Orchestration Models

Added the ability to apply NSX-T provider resource pools in [orchestration models](#) that allows using the NSX-T technology when creating and deploying orchestration models.
2.12 Migrate VM from vCenter to KVM with Windows Server 2022

Added the Windows Server 2022 option which you can select in the Distribution box at the Migrate to KVM page when migrating a virtual server from a vCenter instance to a KVM compute resource.

https://onappcloud.typeform.com/to/A64Euy#source=What's%20New

2.13 OnApp 6.7

Updated:

- **User Accounts**: added the View IP Addresses Assigned to User and View IP Addresses Assigned to User's Virtual Servers sections; updated and renamed the Add SSH Key section to the Manage SSH Keys section.
- **User Groups**: added the View User Group Details section.
- **OnApp Permissions**: updated with the new Resize the disk below minimum set by Template permission; added new Show Empty Values permission; deleted the Show Networks on Virtual Server creation, Show Network Zones on Virtual Server creation, Show Data Stores on Virtual Server creation, Show Data Store Zones on Virtual Server creation permissions.
- **Manage Virtual Server Recovery Points**: deleted information about the impossibility of viewing the size of a Veeam recovery point in OnApp Control Panel in the View Recovery Points section.
- **Create and Manage Auto Backup Presets**: updated the Create Auto Backup Preset and Edit Auto Backup Preset section.
- **Instance Packages**: updated the Add instance packages to your cloud section with new information about the capacity to set the maximum value of bandwidth up to 1,000 GB.
- **Disks Settings**: updated the Edit Disk section with the ability to make the disk size smaller than the template's disk size the VS is built on.
- **Create and Manage Networks**: updated the Delete Network section with the information about the impossibility of deleting a vCenter network.
- **Edit System Configuration**: updated the Time of hourly statistics storage (months) parameter with the correct default minimum value, which is now 2.

https://onappcloud.typeform.com/to/A64Euy#source=Document%20Revisions

3 Cloud Configuration

Learn how to configure your own cloud: create different server types and their components. Hover over a button to view a short explanation of a term. Click the button to get to the necessary page.

https://docs.onapp.com/display/TEST2/Service+Catalog Service Catalog
https://docs.onapp.com/display/TEST2/Create+Virtual+Server Virtual Servers
https://docs.onapp.com/display/TEST2/Create+Application+Server Application Servers
https://docs.onapp.com/display/TEST2/Create+Load+Balancers Load Balancers
https://docs.onapp.com/display/TEST2/Create+Edge+Accelerator Edge Accelerator

https://docs.onapp.com/display/TEST2/Create+OVA+Virtual+Server OVA Virtual Servers
https://docs.onapp.com/display/TEST2/Create+ISO+Virtual+Server ISO Virtual Servers
https://docs.onapp.com/display/TEST2/Create+Smart+Server Smart Servers
https://docs.onapp.com/display/TEST2/Create+Baremetal+Server Baremetal Servers

https://docs.onapp.com/display/TEST2/Create+Compute+Resources Compute Resources
https://docs.onapp.com/display/TEST2/Create+Compute+Zones Compute Zones
https://docs.onapp.com/display/TEST2/Create+and+Install+Templates Templates
https://docs.onapp.com/display/TEST2/Create+Recipes Recipes
https://onappcloud.typeform.com/to/A64Euy#source=Cloud%20Configuration Leave feedback

3.1 Service Catalog

- You need to have the *Any action related to service catalog* permission enabled to access the service catalog.
- You need to have the corresponding permissions to create new entities.

The service catalog page gives you quick access to the creation wizards of most common OnApp entities at Control Panel > **Cloud** > **Service Catalog**. You can create the following components using the service catalog:

- Virtual Server
- Application Server
- Load Balancer
- Smart Server
- Baremetal Server
- EC2 Instance
- Edge Accelerator

See also:

- OnApp Cloud Overview
- Appliances
- AWS
3.2 Create Virtual Server

Virtual servers are created from templates and are deployed on compute resources that provide them with CPU, disk, network, and other necessary resources. To create a virtual server, you need to launch a wizard. The wizard walks you through several steps to get your virtual server up and running. In this document, you can find a detailed guide on how to create a virtual server, but first take a look at the following section.

3.2.1 Before You Begin

Before you begin to create a virtual server, 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 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.

- The selected template should reside on a backup server attached to a compute resource or zone on which you want to build a virtual server.

- Learn more about the limitations of OnApp templates in the Templates guide.

- An Estimated Price per Hour in the wizard might be inaccurate if you don't have necessary permissions enabled, such as Show Compute Zones/Compute Resources on Virtual Server Creation; and if you select the Any option for network resources.

To create a virtual server, follow the next procedure:

1. Go to your Control Panel > Cloud > Virtual Servers.
2. Click the + or Create Virtual Server button 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 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 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.

3.2.3 Templates

The Templates step allows you to select a template from which to build your virtual server. The template is extracted when a virtual server is provisioned or when a backup is taken, using this template. While a template is being extracted, it is locked so that it can't be used simultaneously.
in other transactions. After the extraction is finished, the template is unlocked. If another transaction requires the locked template, the transaction will fail after five minutes of standby. If a transaction that locked a template eventually failed, it means that the extracted template is broken. The templates are stored at `/onapp/templates/your_template.tgz`, extracted templates – at `/onapp/backups/templates/your_template`, and locked templates – at `/onapp/backups/templates/your_template.lock`.

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

   **There are three minimum disk space requirements:**
   - Linux - 5 GB
   - Windows - 30 GB
   - Jumpbox - 9 GB

   Sizes for custom templates or templates with additional software installed could differ from the above. If the minimum disk space is not met, virtual server will fail to build.

2. Click a **Virtualization type**
   - Starting from OnApp 6.5, we do not support Xen virtualization type.

3. Click **Estimated Price per Hour** that is calculated for a VS in Mode ON and Mode OFF

   **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 *fsgsbase* CPU flag is required for a destination compute zone. For more information on CPU flags, see [Manage Extended CPU Configuration for Compute Zone](#).

### 3.2.4 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:

- **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 following symbols are not allowed for Windows-based virtual servers:

- percent [%]
- quotation marks [“”]
- angle 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
- **Encryption passphrase** - enter a passphrase for encryption
- **Encryption passphrase confirmation** - repeat the passphrase for encryption
For more information on the password encryption, see FAQ.

Click Next.

3.2.5 Resources

You can create a virtual server from a ready-made instance package or select all the necessary resources manually. The availability of instance packages depends on your permissions and bucket settings. Therefore, the Resources step can provide two options: Instance Packages or Create Your Own. If you select an instance package, then click the Create Your Own tab and proceed to the next step, the system applies resources from Create Your Own even if you don't select any resources.

Instance Packages

Before you create a virtual server from an instance package, consider the following:

- 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.

- Auto-scaling is not supported for virtual servers created from instance packages.

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

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

- Memory - the number of RAM in MB or GB available in the instance package
- CPUs - the number of CPU cores available in this 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 steps of the wizard.

3.2.5.1 Create Your Own

You can define the following resources for your virtual server:
3.2.5.1.1 Compute Resources
- **Compute Zone** - a compute zone where to build the virtual server
- **Compute Resource** - a compute resource from the compute zone. The compute resource may be selected automatically according to the Virtual Server Provisioning.

If the Show Compute Zones/Compute Resources on Virtual Server Creation permissions are disabled, users cannot select compute resources for a virtual server. The compute zone and resource are set automatically according to a virtualization type and other selected resources. The data store is set automatically according to the selected compute zone.

3.2.5.1.2 Resources
Select the following RAM and CPU resources for a virtual server:

- **RAM** - enter the number of RAM. The maximum number depends on your bucket settings and virtualization type.
  
  If you create a FreeBSD virtual server, set RAM to 512 MB. You can increase RAM later while editing the VS.

- **CPU Cores** - enter the number of CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU Topology is enabled. When CPU Topology is enabled, this number specifies how many virtual cores the virtual server will have.

- **CPU Priority (or CPU Units)** - enter the number of CPU Priority in %. If CPU Units are enabled on a user's bucket, the CPU Priority is replaced with CPU Units. Refer to Billing Calculation for details on CPU Units and CPU Priority.

The following options are available only for virtual servers based on KVM, providing that a user has the Enable CPU Topology permission:

- **Use CPU Topology** - move the slider to the right to enable CPU Topology

- **CPU Sockets** - enter the number of how many sockets the CPU cores should be arranged into. This value will affect the number of cores_per_socket.

  **How to determine a correct number of CPU Sockets.**
  If CPU Topology is enabled, the CPU cores indicate a number of vCPUs - the maximum value that can be arranged into CPU sockets and cores per socket. If CPU Topology is disabled, the CPU cores indicate the CPU sockets value with one core per socket. When you enable CPU Topology, the following logic is applied to calculate CPU capacity:
  - You enter the total number of CPU cores and CPU sockets.
  - The value of cores_per_socket is calculated automatically by the formula vCPUs = cpusockets x cores_per_socket.
  - As a result, if you set eight CPU cores and two CPU sockets, the cores_per_socket value will be set to four.

**Primary Disk**
Select the following properties for a primary disk:

- **Primary data store** - select a data store for a primary disk

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

- **Swap data store** - select a data store for a swap disk

- **Swap disk size** - enter a size for a swap disk
- **Disable** - select the checkbox to disable a swap disk

You cannot add a swap disk to a Windows-based virtual server.

**Network Configuration**

Before you apply network configuration, consider the following:

- When you create a virtual server in Federation, you cannot set a network port speed to a value greater than indicated by a seller while adding a zone to Federation.
- Since not every application supports IPv6, at least one IPv4 address must be allocated to a primary network interface.
- The *Show only my IP addresses* checkbox appears only if you select a specific network, not *Any network*.
- The *Selected IP address* option is available in the wizard if it is enabled via Admin > Settings > Configuration > **System** > *Show IP address selection for new VS*.

**Network Interface 1**

- **Network** - select a network from which the VS should get the IP address
- **IP net** - select an IP net from which the IP address should be assigned
- **IP range** - select an IP range from which the IP address should be assigned
- **IP address** - select an IP address to be assigned to the VS

The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to VS.

- **Show only my IP addresses** - select the checkbox to view only your own IP addresses
- **Selected IP address** - if the option is available, you can also assign an IP address for the VS from the drop-down menu. Indicate compute resource and network to have the list of available IPs.
- **Port Speed** - set the port speed for the VS

Click **Next** to proceed to the following step of the wizard where you can add recipes or service add-ons.

### 3.2.6 Recipes or Service Add-ons

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.

#### 3.2.6.1 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**
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.

3.2.6.2 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 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.

When building a VS using a recipe, there is a few minutes’ delay between the two processes: when the VS is up and ready to be used and when the recipe commences. The delay occurs due to a check performed by the OnApp daemon to ensure that the VS is provisioned and booted. By that it is meant that booted=true in the database on the Control server. The delay differs per HV type. Generally (not in VMware or Baremetal cases), it runs an every-minute check to make sure that the VS is provisioned and then another one to check if it is booted.

3.2.7 Confirmation
Before you select settings from the final step, consider the following:

- The Enable Autoscale slider can be dimmed in the wizard if you reached the autoscaling limit in your bucket.
- For autoscaling to work properly, you need to enable autoscaling in the wizard and add auto-scaling rules.
- You can Enable Acceleration if the following requirements are satisfied:
  - Accelerator is enabled on the network attached to a virtual server.
  - The Show IP address selection for new VS option is enabled in Admin > Settings > Configuration.
  - The IP address assigned to a virtual server is in the same network as Accelerator.
  - Only HTTP is supported. Other protocols, including HTTPS, will be passed through to the virtual server directly.

The Confirmation step allows you to 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 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.

• **Enable Autoscale** - move the slider to the right to use autoscaling for the virtual server.

• **Acceleration Allowed** - move the slider to the right to enable acceleration for the virtual server.

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.

https://onappcloud.typeform.com/to/A64Euy#source=Create%20Virtual%20Server

### 3.2.8 Create ISO Virtual Server

ISO virtual servers are created from the ISOS uploaded to the Control Panel and saved as specific ISO templates. The ISOS are uploaded at Control Panel > **Templates** menu. For more information, refer to the **Upload ISOS** section of this guide.

To create a virtual server from the ISO:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu and click **+** button, or click the **Create Virtual Server** button at the bottom of the screen. This will start a VS creation wizard.

2. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.

3. Click the **Create Virtual Server** button to start the creation process. You will be taken to the virtual server details screen.

   It is required that you perform additional network configuration during ISO installation. For more information, refer to **Confirmation** step below.

   **3.2.8.1 Step 1 of 4. Templates**

   At this step, choose a specific ISO template from which your virtual server will be built. To choose a template:

   1. Click the ISO template group.
   2. Select the template.
   3. Click **Next**.

   Proceed to the following steps of the wizard and specify the virtual server properties.

   **3.2.8.2 Step 2 of 4. Virtual Server Properties**

   At this step, you need to indicate your virtual server’s properties.

   Specify the following virtual server properties:

   • **Label** - the label of the virtual server. The required parameter.
   
   • **Hostname** - the hostname of the virtual server. The required parameter. The hostname should consist of letters [A-Z a-z], digits [0-9] and dash [-]. For more info on hostname validation, refer to **RFC standard documentation**.
Particular characters are not allowed for Windows-based virtual servers:
- percent [%]
- quotation marks [" "]
- angle brackets [<>]
- vertical bar [ | ]
- caret [^]
- ampersand [&]
- parentheses [ ( )]

- **Domain** - specify the domain for this VS. The default value is local domain. This parameter is not applicable to Windows virtual servers.

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

- **Time zone** - set the time zone for the virtual server. This parameter is applicable only to Windows KVM virtual servers.

- **Password** - a secure password for the VS. It can consist of 6-99 characters, letters [A-Za-z], digits [0-9], dash [-] and lower dash [ _ ], and the following special characters: ~ ! @ # $ * _ + = ` \ | } [ ] : ; ' , . ?. You can use both lower- and uppercase letters. If you leave password field blank, it will be generated automatically.

- **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.

Click **Next** to proceed to the following steps of the wizard to specify the virtual server resources.

### 3.2.8.3 Step 3 of 4. Resources

At this step, you can choose to create the virtual server either by selecting a predefined instance package or by setting your virtual server's resources, such as disk size, network configuration, and other manually.

- A VS created using instance packages is called an Instance package VS.

- A VS created by setting resources manually is called a custom virtual server.

Depending on the permissions, this step will display either **Instance packages** or **Create your own** tabs, or both of them.

You are forwarded to the next step from the tab you are currently on. If you select an instance package and then click on the **Create Your Own** tab and proceed to the next step, the system will set the resources from the **Create Your Own** tab even if you did not configure any resources there.

### 3.2.8.3.1 Resources

**Instance packages**

Note that Instance package VSs can only be created on compute resources within compute zones where all compute resources are assigned the same amount of CPU units. If there are compute resources with different amount of CPU units set in a zone, it will not be possible to create Instance package VSs in such zones. The reason is that CPU priority for Instance package VSs in this configuration cannot be set to 100%, which is the default value for such virtual servers.
If there are no available IP addresses during VS creation, all instance packages will be grayed out in the wizard.

From this tab, you can choose one of the predefined Instance Packages for your virtual server. If you select a compute zone that does not have enough resources during virtual server creation, you will see all instance packages available to you, but those that have resources incompatible with the chosen compute zone will be grayed out. Grayed out instance packages cannot be selected.

For each of the instance packages the following details are displayed:

- **Memory** - the RAM size (GB) available in the instance package
- **CPUs** - the number of CPU cores available in this instance package
- **Disk Size** - the disk size available in this instance package
- **Bandwidth** - the bandwidth available in this instance package
- **Price per Hour:**
  - **Mode ON** - hourly instance package price for the VS powered on
  - **Mode OFF** - hourly instance package price for the VS powered off
- **Price per Month:**
  - **Mode ON** - monthly instance package price for the VS powered on
  - **Mode OFF** - monthly instance package price for the VS powered on

Click the instance package to select it. After that, the instance package you have chosen will be highlighted in green.

Virtual servers created using instance packages do not support autoscaling.

**Create Your Own**

Using this tab you can define the resources for your virtual server manually:

**Compute Resources**

- **Compute Zone** - the compute zone to build the VS on.
- **Compute Resource** - the specific compute resource to build the VS on. Compute resource may be selected automatically according to the set provisioning type.

**Resources**

- **RAM** - set the amount of virtual server's RAM. The maximum RAM depends on your bucket's settings. The maximum RAM that can be assigned to a VS is 168 GB regardless of the Max RAM value set in the bucket.
- **CPU Cores** - set the amount of virtual server's CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.
- **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 following options are available for VSs based on KVM compute resources only, providing the Enable CPU topology permission is switched on for the user.

- **Use CPU Topology** - move the slider to the right, to set the following parameters:
  - **CPU Sockets** - set the number of sockets.
  - **CPU Threads** - set the number of threads per core.
CPU topology (CPU sockets and CPU threads) is the Labs feature preview. Pay attention that setting CPU sockets and CPU threads are at your own risk only! You may face the following problems when setting CPU topology:

- Currently, you cannot set CPU sockets and threads parameters for existing VSs.
- After setting, the new parameters won't be shown at the VS details screen.
- Some Linux VSs fail to boot up.

**Primary Disk**
- *Primary data store* - choose a data store for VS's primary disk.
- *Primary disk size* - set the primary disk size.

**Swap Disk**
- *Swap data store* - choose a data store for VS's swap disk.
- *Swap disk size* - set the swap disk size. There is no swap disk for Windows-based VSs. In all other cases, swap disk size must be greater than zero.
- *Disable* - select the checkbox to disable swap disk creation

**Network Configuration**

**Network Interface 1**
- *Network* - choose the network from which the VS should get the IP address
- *IP net* - select from the drop-down list the IP net from which the IP address should be assigned
- *IP range* - select from the drop-down list the IP range from which the IP address should be assigned
- *IP address* - select an IP address to be assigned from the drop-down box

> The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to VS.

- *Selected IP address* - if the option is available, you can also assign an IP address for the VS from the drop-down menu. Indicate a compute resource and network to have the list of available IPs.
- *Port Speed* - set the port speed for this VS

> *Selected IP address* option is enabled via the Show IP address selection for new VS slider on the Admin > Settings > Configuration settings screen (under the System tab).

> You can't select unlimited port speed if the Network Zone is not selected. In this case the port speed will be 1 by default. It's possible to create virtual server with unlimited network speed without selecting a network zone only if you have only one Network Zone assigned to your bucket.

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

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**3.2.8.4 Step 4 of 4. Confirmation**

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

- Move the **Boot Virtual Server** slider to the right if you want the virtual server to be started up automatically.
At the Confirmation step you can find the configuration summary of VS, which will be created. You can view the template’s name, RAM size, number of networks, primary disk and swap disk size, number of cores.

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

When a virtual server is created, you will be redirected to the VS details page. Take the following steps to finish the ISO installation process:

1. Go to VS **Networking** tab > **IP Addresses**.
2. Copy the following data: IP Address, netmask, gateway, resolver (DNS).
3. Go to console, where the ISO installation process is running, and enter copied IP Address, netmask, gateway and resolver (DNS).

See also:
- ISOs
- Manage ISO Virtual Servers
- ISO Virtual Server Networks
- ISO Virtual Server Disks
- ISO Virtual Server Statistics

https://onappcloud.typeform.com/to/A64Euy#source=Create%20ISO%20Virtual%20Server

3.2.9 Create OVA Virtual Server

OVA virtual servers are created from the OVAs uploaded to the Control Panel and saved as specific OVA templates. The OVAs are uploaded at Control Panel > **Cloud** > **Templates** menu. For more information, refer to the Upload OVAs section of this guide.

To create a virtual server from the OVA:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu and click + button, or click the **Create Virtual Server** button at the bottom of the screen. This will start a VS creation wizard.
2. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.
3. Click the **Create Virtual Server** button to start the creation process. You will be taken to the virtual server details screen.

3.2.9.1 Step 1 of 4. Templates

At this step, choose a specific OVA template from which your virtual server will be built.

To choose a template:

1. Click the OVA template group.

   If you do not see OVA template group in the Template store, go to your **Profile** > **Bucket** tab and check **Limits for template store** section. If OVA template group is missing, add it by clicking + button in the upper right corner of this section.

2. Select the template.
3. Click **Next**.
Licensing Type for Windows VSs

Choose the license type you require:

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

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

Consider the following when creating a VS on Windows templates:

- 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.
- If there are several virtual servers simply deployed from the same template in the cloud, they will have identical SIDS. This will result in the system conflict.

Windows 10/Windows Server 2016 Virtual Servers

If you want to build Windows 10/Windows Server 2016 VSs, the following limitations apply to KVM compute resources:

- Windows 10/Windows Server 2016 VSs can be built on the CentOS 6/CentOS 7 compute resources with the following CPU models:
  - at least Ivy-Bridge-based Intel Xeon E series v2
  - Opteron G2, G3, G4, G5, and G6
- CPU flag 'fsgsbase' is required. For more information on CPU flags refer to Manage Extended CPU Configuration for Compute Zone.

Proceed to the following step of the wizard and specify the virtual server properties.

3.2.9.2 Step 2 of 4. Virtual Server Properties

At this step you need to indicate your virtual server's properties.

Specify the following virtual server properties:

- **Label** - the label of the virtual server. The required parameter.
- **Hostname** - the hostname of the virtual server. The required parameter. The hostname should consist of letters [A-Z a-z], digits [0-9] and dash [-]. For more info on hostname validation, refer to RFC standard documentation.

  Particular characters are not allowed for Windows-based virtual servers:
  - percent [%]
  - quotation marks [“”]
  - angle brackets [<>]
  - vertical bar [ | ]
  - caret [~]
  - ampersand [%&]
  - parentheses ( )

- **Domain** - specify the domain for this VS. The default value is *localdomain*. This parameter is not applicable to Windows virtual servers.

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

- **Password** - a secure password for the VS. It can consist of 6-99 characters, letters [A-Za-z], digits [0-9], dash [-] and lower dash [ _ ] and the following special characters: ~
You can use both lower- and uppercase letters. If you leave password field blank, it will be generated automatically.

- **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.

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

### 3.2.9.3 Step 3 of 4. Resources

At this step, you get two tabs - Instance Packages and Create Your Own. You can not use instance package (it will be grayed out), as it is already preconfigured package which can differ from OVA configurations. OVA template already includes resource configurations, which are imported to the Create Your Own tab. You can change these resource configurations (except primary disk size).

#### Compute Resources

- **Compute Zone** - the compute zone where the VS should be imported
- **Compute Resource** - the specific compute resource where the VS from OVA will be imported. Compute resource may be selected automatically according to the set provisioning type.
- **RAM** - set the amount of virtual server's RAM. The minimum value is the RAM value taken from OVA file. The maximum RAM depends on your bucket's settings. The maximum RAM that can be assigned to a VS is 168 GB, regardless of the Max RAM value set in the bucket.
- **CPU Cores** - set the amount of virtual server's CPU cores. The minimum value is the amount of CPU cores specified in OVA file. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.
- **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.
- **Use CPU Topology** - move the slider to the right, to set the following parameters:
  - **CPU Sockets** - set the amount of sockets.

#### Storage Resources

When you create a VS from the OVA template, you can select different data stores to put disks on them. During the creation process, all disks are imported from the OVA configuration and their size cannot be changed. The first disk becomes primary and the next disks will be numbered in the subsequent order starting from 2 (Disk 2, Disk 3, etc.). When you select a data store for each of your VS's disks, pay attention to its price and the total free disk capacity.

**How the data store free space is calculated**

Case A. There are no limits in the bucket, so the available space is "unlimited". In this case, the actual free disk space for each data store is displayed. When you select a data store, the free space for this data store will decrease by the number of GB of the disk selected.

Case B. There are some limits in the bucket, and only one data store zone is available. In this case, two options are possible:

- If the maximum space allowed by bucket is less than the actual available space on the data store, then the total free disk space for all data stores for this user is
displayed. When a data store is selected for a disk, the available disk size will decrease per each data store.

- If the data store disk space is less than the bucket limit, then the actual free disk space is displayed. When a data store is selected for a disk, the available disk size will not decrease.

Case C. There are some limits in the bucket, and several data stores are available. In this case, the data stores from different zones in the wizard are displayed. The data store free space will be displayed and calculated similarly to Case B with one exception. When a data store is selected for a disk from zone A, but there are also data stores in the wizard from zone B, the available disk size will not decrease for data stores from zone B.

**Primary Disk**

- **Data Store** - choose a data store for VS's primary disk. Each data store free space is indicated in brackets.
- **Size** - fixed primary disk size imported from OVA configuration

**Disk 2**

- **Data Store** - choose a data store for VS's disk. Each data store free space is indicated in brackets.
- **Size** - fixed disk size imported from OVA configuration

**Network Configuration**

Network Interface 1

When you create a VS from the OVA template, you can select in which network the VS will be created. The first network becomes Network Interface 1 and the next networks will be numbered in the subsequent order starting from 2 (Network Interface 2, Network Interface 3, etc.). The amount of network interfaces will be taken from the OVA configuration. If the OVA has several network interfaces, you can change the following parameters for each of them.

- **Network** - choose the network from which the VS should get the IP address
- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned
- **IP range** - select from the drop-down list the IP range from which the IP address should be assigned
- **IP address** - assign an IP address for the VS from the drop-down menu. Indicate compute resource and network to have the list of available IPs.

The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to VS. Be aware, that you should choose only public IP address. Otherwise VS, built from OVA, will not work properly.

- **Show only my IP address** - tick this checkbox to view only own IP addresses in the IP addresses dropbox.
- **Selected IP address** - if the option is available, you can also assign an IP address for the VS from the drop-down menu. Indicate compute resource and network to have the list of available IPs.
- **Port Speed** - set the port speed for this VS

- **Selected IP address** option is enabled via the "Show IP address selection for new VS" slider on the Settings > Configuration screen (under the System tab).
- You can't select unlimited port speed if the Network Zone is not selected. In this case the port speed will be 1 by default.
It's possible to create virtual server with unlimited network speed without selecting a network zone only if you have only one Network Zone assigned to your bucket.

Click Next to proceed to the last step of the wizard.

3.2.9.4 Step 4 of 4. Confirmation
At this step, configure the automation settings. This is the final step of the virtual server creation wizard.

- 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.

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

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

When virtual server is created, you will be redirected to VS details page.

You can view VS creation logs at VS details page (activity log section). If ProvisionGRUB log fails during VS creation, take the following steps:
1. Go to VS console.
2. Log in with credentials, created at step 2 of the VS creation wizard.
3. Run the following command:
   ```bash
   grub2-install /dev/sda || grub-install /dev/sda
   ```

After running the command, reboot the VS.

See also:
- Manage OVA Virtual Servers
- OVA Virtual Server Networks
- OVA Virtual Server Disks
- OVA Virtual Server Statistics

https://onappcloud.typeform.com/to/A64Euy#source=Create%20OVA%20Virtual%20Server

3.2.10 OVA Virtual Server Wizard Beta

OVA virtual servers are created from the OVAs uploaded to the Control Panel and saved as specific OVA templates. The OVAs are uploaded at Control Panel > Cloud > Templates menu. For more information, refer to the Upload OVAs section of this guide.

Before You Begin
If you do not see OVA template group in the Template store, go to your Profile > Bucket tab and check Limits for template store section. If OVA template group is missing, add it by clicking the "+" button in the upper right corner of this section.

To create a virtual server from the OVA:

1. Go to your Control Panel > Cloud > Virtual Servers menu and click the "+" button, or click the Create Virtual Server button at the bottom of the screen. This will start a VS creation wizard.

2. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.

3. Click the Create Virtual Server button to start the creation process. You will be taken to the virtual server details screen.

3.2.10.1 Step 1 of 6. Templates
At this step, choose a specific OVA template from which your virtual server will be built.

To choose a template:

1. Click the OVA template group.
2. Select the template.
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 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:
  o Ivy Bridge Intel® Xeon® Processor E Series v2 Family
  o AMD Opteron G2, G3, G4, G5, and G6
  o The fsgsbase CPU flag is required for a destination compute zone. For more information on CPU flags, see Manage Extended CPU Configuration for Compute Zone.

3.2.10.2 Step 2 of 6. Virtual Server Properties
At this step you need to indicate your virtual server's properties.
Specify the following virtual server properties:

- **Label** - the label of the virtual server. The required parameter.
- **Hostname** - the hostname of the virtual server. The required parameter. The hostname should consist of letters [A-Z a-z], digits [0-9] and dash [-]. For more info on hostname validation, refer to [RFC standard documentation](https://www.rfc-editor.org/rfc/rfc952).

**Additional Considerations for Windows**

The following symbols are not allowed for Windows-based virtual servers:
- percent sign [%]
- double quotation marks [“]
- brackets [<,>]
- vertical bar [|]
- caret [*]
- ampersand [&]
- parentheses [(,)]

- **Domain** - specify the domain for this VS. 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.
- **Password** - a secure password for the VS. It can consist of 6-99 characters, letters [A-Za-z], digits [0-9], dash [-] and lower dash [ _ ], and the following special characters: ~ ! @ # $ * _ + = ` \ | ; : ; ' , . ? / . You can use both lower- and uppercase letters. If you leave password field blank, it will be generated automatically. The password, set at this step, will overwrite the password specified in OVA file.

- **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.
- **Encryption passphrase** - enter a passphrase for encryption
- **Encryption passphrase confirmation** - repeat the passphrase for encryption

Click **Next** to proceed to the following steps of the wizard to specify the virtual server resources.

---

3.2.10.3 Step 3 of 6. Compute Resources

At this step, you can configure the following compute resources for your OVA VS:

- **RAM** - set the amount of virtual server's RAM. The minimum value is the RAM value taken from OVA file. The maximum RAM depends on your bucket's settings. The maximum RAM that can be assigned to a VS is 168 GB, regardless of the Max RAM value set in the bucket.

- **CPU Cores** - set the amount of virtual server's CPU cores. The minimum value is the amount of CPU cores specified in OVA file. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.

- **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](https://www.onapp.com) section for details on CPU units and CPU priority.

- **Use CPU Topology** - move the slider to the right, to set the following parameters:
3.2.10.4 Step 4 of 6. Storage Resources

Storage Resources

When you create a VS from the OVA template, you can select different data stores to put disks on them. During the creation process, all disks are imported from the OVA configuration and their size cannot be changed. The first disk becomes primary and the next disks will be numbered in the subsequent order, starting from 2 (Disk 2, Disk 3, etc.). When you select a data store for each of your VS’s disks, pay attention to its price and the total free disk capacity.

Primary Disk

- Data Store - choose a data store for VS's primary disk. Each data store free space is indicated in brackets.
- Size - fixed primary disk size imported from OVA configuration

Disk 2

- Data Store - choose a data store for VS's disk. Each data store free space is indicated in brackets.
- Size - fixed disk size imported from OVA configuration

3.2.10.5 Step 5 of 6. Network Resources

Before you apply network configuration, consider the following: (check this out for OVA virtual server)

- When you create a virtual server in Federation, you cannot set a network port speed to a value greater than indicated by a seller while adding a zone to Federation.
- Since not every application supports IPv6, at least one IPv4 address must be allocated to a primary network interface.
- The Show only my IP addresses checkbox appears only if you select a specific network, not Any network.
- The Selected IP address option is available in the wizard if it is enabled via Admin > Settings > Configuration > System > Show IP address selection for new VS.

When you create a VS from the OVA template, you can select in which network the VS will be created. The first network becomes Network Interface 1 and the next networks will be numbered in the subsequent order, starting from 2 (Network Interface 2, Network Interface 3, etc.). The amount of network interfaces will be taken from the OVA configuration. If the OVA has several network interfaces, you can change the following parameters for each of them.

- Network - choose the network from which the VS should get the IP address
- IP net - select from the drop-down list the IP net from which the IP address should be assigned
- IP range - select from the drop-down list the IP range from which the IP address should be assigned
- IP address - assign an IP address for the VS from the drop-down menu. Indicate compute resource and network to have the list of available IPs.
The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to VS. Be aware, that you should choose only public IP address. Otherwise VS, built from OVA, will not work properly.

- **Show only my IP address** - tick this checkbox to view only own IP addresses in the IP addresses dropbox.
- **Selected IP address** - if the option is available, you can also assign an IP address for the VS from the drop-down menu. Indicate compute resource and network to have the list of available IPs.
- **Port Speed** - set the port speed for this VS

- **Selected IP address** option is enabled via the "Show IP address selection for new VS" slider on the **Settings > Configuration** screen (under the **System** tab).
- You can’t select unlimited port speed if the Network Zone is not selected. In this case the port speed will be 1 by default. It’s possible to create virtual server with unlimited network speed without selecting a network zone only if you have only one Network Zone assigned to your bucket.

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

**3.2.10.6  Step 6 of 6. Confirmation**

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

- 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.

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

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

When a virtual server is created, you will be redirected to the VS details page.

You can view VS creation logs at VS details page (activity log section). If ProvisionGRUB log fails during VS creation, take the following steps:

1. Go to VS console.
2. Log in with credentials, created at step 2 of the VS creation wizard.
3. Run the following command:

   ```
   grub2-install /dev/sda || grub-install /dev/sda
   ```

   After running the command, reboot the VS.

See also:

- Manage OVA Virtual Servers
- OVA Virtual Server Networks
- OVA Virtual Server Disks
- OVA Virtual Server Statistics
3.2.11 Virtual Server Creation Workflow

The following scheme describes the steps required to create a virtual server:
User wants to create a virtual server

User fills in the VS creation form

Step 1: Cloud Locations
- Choose the country, where the cloud is located
- Specify the city where the cloud is located

Step 2: Templates
- Choose the required OS
- For Windows-based templates, specify the licensing details

Step 3: VS Properties
- Specify the VS label and hostname
- Set the password

Step 4: Resources
- Choose a compute zone and a compute resource
- Configure RAM, CPU cores, CPU priority or CPU units
- Set the disk space
- Specify network configuration
- OR
- Choose one of the predefined instance types

Step 5: Recipes
- Choose a recipe
- Assign a custom variable

Step 6: Confirmation
If required:
- Enable Automated Backup
- Build Virtual Server
- Startup Virtual Server Automatically
- Enable Autoscale

Click the Create Virtual Server button to start the creation process
See also:

- Virtual Servers
- Create Virtual Server
- Location Groups
- Templates
- Recipes

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Creation%20Workflow

3.2.12 Virtual Server Wizard Beta

Starting with OnApp 6.1, there is a new beta version of the 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 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 virtual servers in the new wizard, using one of the following methods:

- From Custom Set of Resources
- From Instance Package

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Wizard%20Beta

3.2.12.1 Create Custom Virtual Server Beta

Virtual servers are created from templates and are deployed on compute, storage, and networking resources. To create a 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 virtual servers from instance packages or a custom set of resources. In this document, you can find a detailed guidance on how to create a custom virtual server, but first take a look at the following section.

3.2.12.1.1 Before You Begin

Before you begin to create a virtual server, 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 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.
- The selected template should reside on a backup server attached to a compute resource or zone on which you want to build a virtual server.
- You can create a custom virtual server only if you have the Select resources manually on virtual server creation permission enabled.
- An Estimated Price per Hour in the wizard might be inaccurate if you don't have necessary permissions enabled, such as Show Compute Zones/Compute Resources on Virtual Server Creation; and if you don't select specific options for all resources.
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.

3.2.12.1.2 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.

3.2.12.1.3 Templates

The Templates step allows you to select a template from which to build your virtual server. The template is extracted when a virtual server is provisioned or when a backup is taken, using this template. While a template is being extracted, it is locked so that it can't be used simultaneously in other transactions. After the extraction is finished, the template is unlocked. If another transaction requires the locked template, the transaction will fail after five minutes of standby. If a transaction that locked a template eventually failed, it means that the extracted template is broken. The templates are stored at /onapp/templates/your_template.tgz, extracted templates – at /onapp/backups/templates/your_template, and locked templates – at /onapp/backups/templates/your_template.lock.

Starting from OnApp 6.5, Xen virtualization type is not supported.

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 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.

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.

### 3.2.12.1.4 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:

- **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 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 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.

### 3.2.12.1.5 Compute Resources

Before you apply compute configuration, consider the following:

- If the Show Compute Zones/Compute Resources on Virtual Server Creation permissions are disabled, you cannot select a compute resource and zone for a virtual server. The compute resource and zone are set automatically according to a virtualization type and other selected resources. The data store is set automatically according to the selected compute zone.

- The CPU Topology and CPU Sockets options are available only for virtual servers based on KVM, providing that a user has the Enable CPU Topology permission.

You can define the following compute resources for your virtual server:

- **RAM** - enter the number of RAM. The maximum RAM that can be assigned to a virtual server depends on the virtualization type, operating system, and bucket settings. If you create a FreeBSD virtual server, set RAM to 512 MB. You can increase RAM later while editing the VS.

- **CPU Cores** - enter the number of CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU Topology is enabled. When CPU Topology is enabled, this number specifies how many virtual cores the virtual server will have.

- **CPU Priority** (or **CPU Units**) - enter the number of CPU Priority in %. If CPU Units are enabled on a user's bucket, the CPU Priority is replaced with CPU Units. Refer to Billing Calculation for details on CPU Units and CPU Priority.

- **Compute Zone** - a compute zone where to build the virtual server

- **Compute Resource** - a compute resource from the compute zone. The compute resource may be selected automatically according to the Virtual Server Provisioning.

The following options are available only for virtual servers based on KVM:

- **Use CPU Topology** - move the slider to the right to enable CPU Topology

- **CPU Sockets** - enter the number of how many sockets the CPU cores should be arranged into. This value will affect the number of cores per socket.

**How to determine a correct number of CPU Sockets.**

If CPU Topology is enabled, the CPU cores indicate a number of vCPUs - the maximum value that can be arranged into CPU sockets and cores per socket. If

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CPU Topology is disabled, the CPU cores indicate the CPU sockets value with one core per socket.

Click Next.

3.2.12.1.6 Storage Resources
You can specify a data store and disk size for a primary and swap virtual disks. You cannot add a swap disk to a Windows-based virtual server.

3.2.12.1.6.1 Primary Disk
Enter the following properties for a primary disk:

- **Size** - enter a size for a primary disk
- **Data Store Zone** - select a data store zone for a primary disk
- **Data Store** - select a data store for a primary disk

3.2.12.1.6.2 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
- **Disable** - select the checkbox to disable a swap disk
- **Data Store** - select a data store for a swap disk

3.2.12.1.7 Network Resources
Before you apply network configuration, consider the following:

- When you create a virtual server in Federation, you cannot set a network port speed to a value greater than indicated by a seller while adding a zone to Federation.
- Since not every application supports IPv6, at least one IPv4 address must be allocated to a primary network interface.
- The **Show only my IP addresses** checkbox appears only if you select a specific network, not Any network.
- The **Selected IP address** option is available in the wizard if it is enabled via Admin > Settings > Configuration > System > Show IP address selection for new VS.

Enter the following properties for a network interface:

- **Network group** - select a network zone for the VS
- **Network** - select a network from which the VS should get the IP address
- **IP net** - select an IP net from which the IP address should be assigned
- **IP range** - select an IP range from which the IP address should be assigned
- **IP address** - select an IP address to be assigned to the VS

The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to VS.

- **Port Speed** - set the port speed for the VS or select the **Unlimited** checkbox
Click **Next** to proceed to the following step of the wizard where you can add recipes or service add-ons.

### 3.2.12.1.8 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.

#### 3.2.12.1.8.1 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 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 **X** button.

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

#### 3.2.12.1.8.2 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 **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.

### 3.2.12.1.9 Confirmation

Before you select settings from the final step, consider the following:

- The **Enable Autoscale** slider can be dimmed in the wizard if you reached the autoscaling limit in your bucket.
- For autoscaling to work properly, you need to enable autoscaling in the wizard and add auto-scaling rules.
- You can **Enable Acceleration** if the following requirements are satisfied:
Accelerator is enabled on the network attached to a virtual server.

- The Show IP address selection for new VS option is enabled in Admin > Settings > Configuration.
- The IP address assigned to a virtual server is in the same network as Accelerator.
- Only HTTP is supported. Other protocols, including HTTPS, will be passed through to the virtual server directly.

The Confirmation step allows you to 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 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.
- **Enable Autoscale** - move the slider to the right to use autoscaling for the virtual server.
- **Acceleration Allowed** - move the slider to the right to enable acceleration for the virtual server.

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.

See also:

- Create Instance Package Virtual Server Beta
- Template Software Licenses
- Permissions
- Virtual Servers (API)

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Wizard%20BetaLeave feedback

3.2.12.2 Create Instance Package Virtual Server Beta

You can create a 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 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 guide on how to create a virtual server, but first take a look at the following section.

3.2.12.2.1 Before You Begin

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 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.

3.2.12.2.2 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.

3.2.12.2.3 Templates

The Templates step allows you to select a template from which to build your virtual server. The template is extracted when a virtual server is provisioned or when a backup is taken, using this template. While a template is being extracted, it is locked so that it can't be used simultaneously in other transactions. After the extraction is finished, the template is unlocked. If another transaction requires the locked template, the transaction will fail after five minutes of standby. If a transaction that locked a template eventually failed, it means that the extracted template is broken. The templates are stored at /onapp/templates/your_template.tgz, extracted templates - at /onapp/backups/templates/your_template, and locked templates - at /onapp/backups/templates/your_template.lock.
Starting from OnApp 6.5, Xen virtualization type is not supported.

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 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.

**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 fsgsbase CPU flag is required for a destination compute zone. For more information on CPU flags, see Manage Extended CPU Configuration for Compute Zone.

3.2.12.2.4 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:

- **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
Additional Consideration for Windows

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 Virtual Server for details.

Click Next.

3.2.12.2.5 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:
3.2.12.2.6 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.

3.2.12.2.6.1 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
   - 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.

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.

3.2.12.2.7 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.

See also:

• **Instance Packages**
• **Create Custom Virtual Server**
• **Permissions**
• **Buckets**

https://onappcloud.typeform.com/to/A64Euy#source=Create%20Instance%20Package%20Virtual%20Server%20Beta

3.3 Create Compute Zones

Compute zones can be used to create different tiers of service and have data stores and networks attached to them. The combination of compute resource, data store, and network groups can be used to create private clouds for customers. Compute zones have types which are inherited by the compute resources in the zone.

3.3.1 Create Compute Zone

Follow the below procedure to create a compute zone for any type of compute resources apart from VMware. To create a compute zone for VMware compute resources, please, refer to [Create VMware Compute Zone](#).

After you create a compute zone you need to attach compute resources, networks and backup servers to it. Keep in mind that you can attach only those resources that have the same type as the compute zone.

Do not add CloudBoot and static compute resources, as well as Xen and KVM compute resources, to one compute zone. The reason is that KVM virtual servers cannot be migrated to a Xen compute resource.

To create a new compute zone:

1. Go to your Control Panel > **Admin** > **Settings** menu and click the **Compute Zones** icon.
2. Press “+” or click the **Create Compute Zone** button.
3. On the screen that follows the parameters you need to input depend on the type of the compute zone you want to create:
   - Create Compute Zone
   - Create Virtual Compute Zone
   - Create Smart Compute Zone
   - Create Baremetal Compute Zone
4. After you fill in all the parameters, click the **Save** button.
3.3.2 Create Virtual Compute Zone

- **Label** - give your compute zone a name.
- **Server type** - choose the server type from the drop-down box. Choose the virtual server type to create a Xen, KVM, or CloudBoot zone. Only XEN, KVM and VMware compute resources can be attached to a zone of this type.

The zone's type cannot be changed after the zone is created.

- **Location group** - select the location group to which this compute zone will be assigned.
- **Release resource type** - this option allows you to free up the compute resource resources and over-commit RAM, CPU and CPU shares by means of the virtual servers that are shut down. By default, the compute zone is created with the Memory Guarantee option enabled. In this case the over-committing cannot be used. To enable resource releasing, choose either the Ballooning or Only Started Virtual Servers option.
  - **Memory guarantee** - the actual free compute resource memory is calculated. All virtual servers residing on the compute resource will be able to start.
  - **Ballooning** (KVM Compute resources only) - free compute resource memory is calculated with the ability to use memory over-committing.

A 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. When using ballooning option it is impossible to monitor the exact free compute resource memory as it is a floating value. Therefore, some VS edit or start actions may fail.

  - **Only started Virtual Servers** - only the memory of running virtual servers is calculated.

- **Max VS to start at once** - specify the maximum number of virtual servers that can be started simultaneously on a compute resource (5 recommended). This option ensures that virtual servers with VIP status will be booted prior to other servers.
- **Placement type** - specify the compute resource selection algorithm, which will be used on virtual server provisioning and recovery, per compute zone.
  - **Take HV with maximum free RAM (Sparse)** - set this type to select the compute resource with maximum free RAM during the VS recovery. This option allows you to perform faster migration of virtual servers with a lesser (sparse) number of iterations during the failover. 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.
  - **Take HV with minimum free RAM (Dense)** - with this type the system selects the compute resource with minimum required free RAM. This option allows filling a compute resource as densely as possible before starting to use the next compute resource in the zone.

- **Failover timeout** - time period for which the iterations will run during the failover if the compute resource does not respond.
- **CPU units** - set the number of CPU units which will be assigned to each compute resource in this zone by default. Do not apply CPU Units for baremetal servers.
• **Set max memory** (appears only if the Ballooning release resource type is selected) - move the slider to the right to enable a max memory parameter for virtual servers within the compute zone

When you enable the **Set max memory** option, the limit for VSs is calculated as follows:

**Max Memory Limit = Memory × Compute Resource Max Memory Rate**

Where:

- **Memory** - the amount of RAM currently allocated to a virtual server
- **Compute Resource Max Memory Rate** - the default max memory rate is eight (8). To modify the default max memory rate, change a value of the `kvm_max_memory_rate` parameter in the `on_app.yml` file.

If the calculated max memory limit is more than 90% of free RAM available on a compute resource, then the limit is equal to 90% of free RAM available on the compute resource.

You can customize a max memory limit for a particular virtual server. For more information, refer to [Set Max Memory](#).

• **CPU guarantee** - move the slider to the right to ensure there is enough CPU on the compute zone to create a new VS.

• **Run sysprep** - move the slider to enable Windows virtual server deployment with running sysprep. If there are several simple deployed virtual servers from the same template in the cloud, having identical SIDS, joined to the Active Directory Domain, it will provoke the system conflict.

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

• **Extended CPU Configuration** - move the slider to the right to enable [extended CPU flags](#) for all compute resources added to this compute zone.

• **Instance Package VSs** - move the slider to the right if you want the zone to be used when creating Instance Package VSs only. If you enable this option, the zone will not be available in the virtual server creation wizard's Resources step for custom VSs (VSs built by setting resources manually). If this slider does not appear, this zone is inappropriate for creating Instance Package VSs.

Note that [Instance Package VSs](#) can only be created on compute resources within compute zones where all compute resources are assigned the same amount of CPU units. If there are compute resources with different amount of CPU units set in a zone, it will not be possible to create Instance Package VSs in such zones. The reason is that CPU priority for Instance Package VSs in this configuration cannot be set to 100%, which is the default value for such virtual servers.

• **Use Local Read Path** - move the slider to the right to minimize the network throughput dependency for read heavy workloads. When the Use Local Read Path option is enabled, reads go over the local software bridge to a local replica of the data rather than traverse a physical NIC + switch. This parameter is Integrated Storage related.

• **Custom Config** - specify any custom commands you want to run when a compute zone is booted.

### 3.3.3 Create Smart Compute Zone

• **Label** - give your compute zone a name.
• **Server type** - choose the server type from the drop-down box. Choose the *smart* server type to create a smart server zone. Only KVM compute resources can be attached to a zone of this type. Smart servers will be further created on such compute resources.

The zone's type cannot be changed after the zone is created.

• **Location group** - select the location group to which this compute zone will be assigned.

• **Placement type** - specify the compute resource selection algorithm, which will be used on virtual server provisioning and recovery, per compute zone.

  o **Take HV with maximum free RAM (Sparse)** - set this type to select the compute resource with maximum free RAM during the VS recovery. This option allows you to perform faster migration of virtual servers with a lesser (sparse) number of iterations during the failover. 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.

  o **Take HV with minimum free RAM (Dense)** - with this type the system selects the compute resource with minimum required free RAM. This option allows filling a compute resource as densely as possible before starting to use the next compute resource in the zone.

• **Failover timeout** - time period for which the iterations will run during the failover if the compute resource does not respond.

• **Run sysprep** - move the slider to enable Windows virtual server deployment with running sysprep. If there are several simple deployed virtual servers from the same template in the cloud, having identical SIDS, joined to the Active Directory Domain, it will provoke the system conflict.

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

• **Extended CPU Configuration** - move the slider to the right to enable extended CPU flags for all compute resources added to this compute zone.

• **Use Local Read Path** - move the slider to the right to minimize the network throughput dependency to read heavy workloads. When the Use Local Read Path option is enabled, reads go over the local software bridge to a local replica of the data rather than traverse a physical NIC + switch. This parameter is Integrated Storage related.

• **Custom Config** - specify any custom commands you want to run when a compute zone is booted.

---

### 3.3.4 Create Baremetal Compute Zone

- **Label** - give your compute zone a name.

- **Server type** - choose the server type from the drop-down box. Choose the *baremetal* server type to create a baremetal server zone. Only XEN compute resources can be attached to a zone of this type. Baremetal servers will be further created on such compute resources.

The zone's type cannot be changed after the zone is created.

- **Location group** - select the location group to which this compute zone will be assigned.
• **Run sysprep** - move the slider to enable Windows virtual server deployment with running sysprep. If there are several simple deployed virtual servers from the same template in the cloud, having identical SIDS, joined to the Active Directory Domain, it will provoke the system conflict.

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

• **Extended CPU Configuration** - move the slider to the right to enable extended CPU flags for all compute resources added to this compute zone.

• **Custom Config** - specify any custom commands you want to run when a compute zone is booted.

See also:

- [Manage Compute Zone Networks](#)
- [Manage Compute Zone Recipes](#)
- [Manage Compute Zone Backup Servers](#)
- [Compute Zone Extended CPU Configuration](#)

https://onappcloud.typeform.com/to/A64Euy#source=Create%20Compute%20Zones

3.4 Create Compute Resources

Compute resources are used to provide hardware resources for virtual servers ensuring highly efficient use of available hardware and complete isolation of virtual server processes. Compute resources can be organized into compute zones which makes it easy to offer tiered service levels and create private clouds for specific users.

To add a compute resource:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute resources icon.
3. Click + button or the Add a new Compute resource button underneath the list of compute resources on the screen.
4. On the screen that appears:
   - **Label** - enter a compute resource label.
   - **IP Address** - add an IP address.
   - **Compute Resource Type** - choose a compute resource type (KVM, VMware Cloud, or VMware).

Starting from OnApp 6.5, Xen virtualization type is not supported.

For instructions on creating a VMware compute resource, refer to vCenter Implementation Guide.

- **Operating System Type** - choose an operating system type (Any OS, Windows only or Non-Windows).
- Any OS - when this option is selected, any VS with any Operating system will live on compute resource. By default each compute resource will be created with the Any OS option. The existing compute resources also will have the Any OS set.
- Windows only - when this option is selected, only VSs with the operating system Windows will be living on this compute resource. This compute resource will not be available for selection when creating a Linux or FreeBSD VS, nor when migrating a VS.
- Non-Windows - when this option is selected, only VSs with the operating system Linux or FreeBSD will be possible to create on this compute resource. This compute resource will be skipped for Windows-based VSs in VS creation wizard, or when migrating a VS. Also when failover happens, Windows-based VSs won’t migrate to this compute resource.

- **Backups IP address** - add a provisioning network IP address.
- **CPU Units** - adjust the slider to set the desired amount of CPU units for this compute resource. For more info on CPU units, refer to Billing Calculation. Do not apply CPU Units for KVM compute resources running on baremetal servers. Mind that setting a different amount of CPU units will affect your cloud configuration. It will not be possible to create Instance Package VSs on the compute zone to which you assign this compute resource.
- **Enabled** - move the slider to the right to enable a compute resource. Compute resources that are not enabled cannot be used to host VSs.
- **Integrated Storage** - move the slider to the right to enable Integrated Storage on static compute resources.
- **Collect Stats** - move the slider to the right to collect statistics for this compute resource.
- **Disable Failover** - move the slider to the right to disable failover on this compute resource (failover is automatic VS migration to another compute resource if this one goes down).
- **Failover recipe** - select a recipe to run before the failover process.

**Power Cycle Command** - arbitrary command string to be executed by IPMI from the CP server. If the command is entered, a new option **Power Cycle compute resource** - which will execute the entered command will appear at Admin > Settings > Compute Resources > label of a compute resource > Actions > Resource Options.

Currently, a command or commands should be written in one line separated by a semicolon. If the command(s) is written in two lines you will receive a "fail" response, although the transaction will be performed. The power cycle command is executed on Control Panel under user onapp, this may be any script created in bash.

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

For details how to create a CloudBoot compute resource, refer to the Create CloudBoot Compute Resource section.

After you create a compute resource you need to add it to a compute zone of the required type. For more information on compute zone types, refer to Zone Types.

See also:
3.4.1 Create CloudBoot Compute Resources

Compute resources are a critical part of the cloud. Compute resources have types which they inherit from the zone to which they belong. You can select the type of CloudBoot compute resource during the creation process. Also, this section provides information on how to edit CloudBoot compute resources for different types of servers and how to delete them.

CloudBoot compute resources are created via the Admin > Settings menu. To add a compute resource:

1. Configure the IP range which the Control Panel will assign to compute resources.
2. Add specific compute resources to the Control Panel itself.

After you create a compute resource you need to add it to a compute zone of the required type. For more information on compute zone types, refer to Zone Types.

3.4.1.1 Configure IP Range

To configure an IP range:

1. Go to your Control Panel > Admin > Settings menu and click the Compute resources icon.
2. Click the CloudBoot IPs tab – this is where you add IP addresses to the compute resource management interfaces, which compute resources will acquire via DHCP when they boot. It is recommended to locate compute resources management interfaces on a separate subnet with a NIC on the CP server also attached. In this configuration, the management subnet can use private address space and does not need to be externally addressable.
3. Create a CloudBoot IP net.
4. Add an IP range to the IP net.
5. Add a CloudBoot IP address.
6. Next, power on your compute resources. As they boot, the Control Panel will detect and record their MAC addresses.

The dynamic range should be quite a bit larger than the actual IPs that will get assigned. This allows space for reassigning new nodes that come online, without creating address collisions. Compute resource management interfaces must be on the same subnet as the Control Panel server, and addresses must be valid for that addressable subnet. The compute resource management interface must also have PXE boot enabled.

3.4.1.2 Create CloudBoot Compute Resource

To create a CloudBoot compute resource:

1. Go to your Control Panel > Admin > Settings > Compute Resources menu.
2. Click the Add New CloudBoot Compute Resource button at the bottom of the screen.
3. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.

4. Click the **Create CloudBoot Compute Resource** button to start the creation process.

### 3.4.1.2.1 Step 1 of 5. Type

At this step, select the type of CloudBoot compute resource you want to create:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVM - KVM CloudBoot Compute Resource</td>
<td>based on CentOS 6</td>
</tr>
<tr>
<td>KVM - KVM CloudBoot Compute Resource</td>
<td>based on CentOS 7</td>
</tr>
<tr>
<td>Xen 4 - Xen 4 CloudBoot Compute Resource</td>
<td>based on CentOS 6</td>
</tr>
<tr>
<td>Xen 4 - Xen 4 CloudBoot Compute Resource</td>
<td>based on CentOS 7</td>
</tr>
<tr>
<td>Backup - CloudBoot Provisioning and</td>
<td>Backup Resource for backups maintenance, based on CentOS 6</td>
</tr>
<tr>
<td>Backup Resource for backups maintenance,</td>
<td>based on CentOS 7</td>
</tr>
<tr>
<td>Smart - KVM Cloudboot Compute Resource</td>
<td>with hardware pass-through based on CentOS 6</td>
</tr>
<tr>
<td>Smart - KVM Cloudboot Compute Resource</td>
<td>with hardware pass-through based on CentOS 7</td>
</tr>
<tr>
<td>Baremetal - XEN CloudBoot Compute Resource</td>
<td>where you can deploy a baremetal server based on CentOS 6 (legacy provisioning)</td>
</tr>
<tr>
<td>Baremetal - KVM CloudBoot Compute Resource</td>
<td>where you can deploy a baremetal server based on CentOS 7 (new provisioning)</td>
</tr>
</tbody>
</table>

Click **Next** to proceed to the following step of the wizard to specify the MAC Address.

### 3.4.1.2.2 Step 2 of 5. MAC Address

At this step, select MAC IP Address of the new compute resource. It will be picked up automatically when you first PXE boot a new server on your cluster using the Control Panel.

Should you receive the "No available Compute Resources discovered" message, you can wait (this step is auto-refreshed every 30 seconds) or click the **Refresh** button until MAC IP Address appears.

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

### 3.4.1.2.3 Step 3 of 5. Properties

At this step, specify the CloudBoot compute resource properties:

- **Label** - give the compute resource a name
- **Pxe IP address** - select an IP address for this compute resource from the address pool available
- **Enabled** - move the slider to the right to allow VSs to be installed/booted on this compute resource
- **Compute Zone** - select the compute zone, to which this compute resource will be assigned, from the drop-down list
- **Apply Compute Zone Custom Config** - move this slider to the right to apply a *compute zone* custom config
If this check box is selected, a compute zone custom config is applied before a compute resource custom config.

- **Custom Config** - specify any custom commands you want to run when the compute resource is booted

  Centos now defaults to NFSv4. This is known to cause compatibility issues so we strongly recommend that you use NFSv3 for all mounts. This can be done by passing `-t nfs -o vers=3` in any mount commands. We strongly recommend that you recheck if custom config doesn't break any functionality. So before putting in production, the server with changed custom config should be rebooted, and the server behaviour rechecked. We recommend to perform the Storage Health Check and Network Health Check.

- **Show Advanced settings** - move this slider to the right to specify advanced compute resource settings:
  - **Backup IP address** - add a provisioning network IP address
  - **CPU Units** - set the number of CPU units which will be assigned to the compute resource
  - **Collect Stats** - move the slider to the right to collect statistics for this compute resource. If you create a Backup CloudBoot resource type, the Collect Stats parameter is not available
  - **Disable Failover** - move the slider to the right to disable VS migration to another compute resource if this compute resource is marked as offline by the Control Panel server
    - Failover option is not available for baremetal servers.
    - If you use automatic failover with write-back caching you may lose some data in the event of a failover.
  - **MTU** - specify the maximum transportation unit size. You can set the frame size from 1500 to 9000 bytes
    - The maximum transportation unit (MTU) is the maximum size of a unit that can be transmitted transferred via ethernet traffic. Any data that exceed the specified MTU value will be divided into smaller units before being transferred. Utilization of jumbo frames allows you to reduce/increase throughput (depending on a set frame size) and increase CPU utilization during large size file transfers.
  - **SAN bonding mode** - choose bonding mode type from the drop-down menu
    - After editing the SAN bonding mode option, it is required to reboot your Compute Resource to apply the settings. Please note, that using more than one NIC for SAN subnet requires switch support. Please ensure that your network infrastructure supports the utilized NIC bonding and is configured correctly. By default, the utilized NICs bonding mode is IEEE 802.3ad Dynamic link aggregation which requires grouping appropriate ports together according to the section 5 Switch Configuration of Linux Ethernet Bonding Driver guide.
  - **Storage Controller RAM** - specify the storage controller RAM value. You may calculate the amount of memory needed for a storage controller as DB size (128 MB by default) + 10 MB x vDisk parts at the controller.
o **Storage Controller DB size** - select the storage controller DB size value (minimum 128 MB, maximum 256 MB)

o **Drives per Controller** - specify the number of disks per controller virtual server. You can specify from 1 to 4 disks. By default, the controller virtual server is created per 4 disk drives

o **Dom0 RAM** - allocate the amount of memory in MB for Dom0 on Xen compute resources. You need to allocate at least 4096 MB of Dom0 RAM

o **Power Cycle Command** - arbitrary command string to be executed by IPMI from the CP server. If the command is entered, a new option "Power Cycle Compute resource" - which will execute the entered command will appear at Admin > Settings > Compute Resources > label of a compute resource > Actions > Resource Options

Currently, a command or commands should be written in one line separated with semicolon. If the command(s) is written in two lines you will receive a "fail" response, although the transaction will be performed.

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

### 3.4.1.2.4 Step 4 of 5. Devices

At this step the compute resource is rebooted and the new configuration, set in step 3, is applied. It can take some time (the wizard makes 10 attempts with 1 minute interval). Once the compute resource comes back online you will be shown a list of devices that it contains - currently these are disks, cache settings and network interfaces. After the compute resource is created these devices can be further managed from the Control Panel (Admin > Settings > Compute Resources > label of compute resource > Actions > Resource Options > Manage devices).

Devices are unassigned by default. You can assign disks and network interfaces to a particular task.

#### 3.4.1.2.4.1 Disks

Disks can be assigned to Storage (typical option when disk is connected to Integrated Storage) or to Cache (as cache device). To assign disks to one of these tasks, click on the required task near the device. Move the Format all assigned disks slider to the right to enable formatting for all disks, which are assigned to a particular task. You will get a confirmation pop-up window before formatting disks.

When you assign disk to Cache, then SSD caching is enabled. This feature increases disk I/O performance. There are two basic cache modes of operation:

- **Write-through**: improves read I/O performance, no impact on reliability
- **Write-back**: improves both read and write I/O performance, small chance of data loss.

Caching can be configured on two levels: per data store and per disk. For more information, refer to the SSD Caching section of OnApp Storage guide.

#### 3.4.1.2.4.2 Cache Settings

Cache settings include the following options:

- **Number of cache mirrors** - specify the number of cache mirrors for the compute resource

- **Number of cache stripes** - specify the number of cache stripes for the compute resource

#### 3.4.1.2.4.3 Network Interfaces

Network interfaces can be assigned to SAN. Using more than one NIC for SAN subnet requires switch support. Ensure that your network infrastructure supports the utilized NIC bonding and is configured correctly.
Ensure that the *Compute Resource Devices* permissions are on before managing devices. For more information, refer to the [OnApp Permissions](#) section of this guide.

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

3.4.1.2.5 Step 5. Finalize

At this step, wait until compute resource devices configuration is applied. Then you will be indicated that compute resource is successfully configured and ready for operation. Click the **Complete** button. The compute resource will be added to the system. You can view it under the **Compute Resources** menu. You do not need to power cycle the compute resource manually, the Control Panel handles this remotely and takes care of the configuration automatically.

**See also:**
- [Data Stores Settings](#)
- [Networking](#)
- [Backup Servers Zone Settings](#)

https://onappcloud.typeform.com/to/A64Euy#source=Create%20CloudBoot%20Compute%20Resources

**3.5 Create Application Server**

Application server creation process is similar to virtual server creation. The difference is that a specific default template is used automatically during application server creation. For more information refer to the [Application Server Billing](#) section of this guide.

Before creating an application server:

- Make sure that you specified at least two resolvers for the network on which this server will run at **Admin > Settings > Resolvers**
- Configure notifications for your cloud at Control Panel > **Admin > Notifications > Configuration**. For information on how to set up notifications for your cloud, refer to [Notifications](#).
- Fill in the `system_email` parameter in the `on_app.yml` file

To create an application server:

1. Go to your Control Panel > **Admin > Application Servers** menu.
2. On the screen that appears, click the “*+*” button or **Create Application Server** under the list of servers on the screen.
3. Complete the application server creation form described below.

**3.5.1 Step 1. Cloud Locations**

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

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

Indicate your application server's cloud location:

- **Country** - choose the country, where the cloud is located, from the drop-down menu
- **City** - specify the city, where the cloud is located, from the drop-down menu
3.5.2 Step 2. Properties

Specify the following application server properties:

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

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

3.5.3 Step 3 of 4. Resources

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

**Compute Resources**

- **Compute Zone** - the compute zone to build the application server on.
- **Compute resource** - the specific compute resource to build the application server on. Compute resource may be selected automatically according to the set provisioning type.

**Resources**

- **RAM** - set the amount of application server’s RAM. The recommended RAM amount is at least 512 MB.
- **CPU Cores** - set the amount of application server’s CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.
- **CPU Priority** (or **CPU Units**) - set application 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 following options are available for application servers based on KVM compute resources only, providing the **Allow user to set CPU topology** permission is switched on for the user.

- **Use CPU Topology** - move the slider to the right, to set the following parameters:
Primary Disk
- **Data Store** - choose a data store for application server's primary disk.
- **Primary disk size** - set the primary disk size.

Swap Disk
- **Data Store** - choose a data store for application server's swap disk.
- **Swap disk size** - set the swap disk size. There is no swap disk for Windows-based application servers. In all other cases, swap disk size must be greater than zero.
- **Disable** - select the checkbox to disable swap disk creation

Network Configuration
- **Network** - choose the network from which the application server should get the IP address
- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned
- **IP range** - select from the drop-down list the IP range from which the IP address should be assigned
- **IP address** - select an IP address to be assigned from the drop-down box

The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to VS.

- **Selected IP address** - assign an IP address for the application server from the drop-down menu. Only public IP Address can be chosen. Indicate compute resource and network to have the list of available IPs.

Show IP address selection for new application server option is enabled via the "Show IP address selection for new VS" slider on the Admin > Settings > Configuration screen (under the System tab).
You can't select unlimited port speed if the Network Zone is not selected. In this case the port speed will be 1 by default.
It's possible to create application server with unlimited network speed without selecting a network zone only if you have only one Network Zone assigned to your bucket.

- **Show only my IP address** - tick this checkbox to view only own IP addresses in the IP addresses dropdown.
- **Port Speed** - set the port speed for this application server

Click Next.

3.5.4 Step 4. Confirmation
At this final step, configure the automation settings.
- Move the Build Virtual Server slider to the right if you want the system to automatically build the application server. If you leave this box blank, you will have to build your server manually after it is created.
At the Confirmation step you can find the configuration summary of the application server, which will be created. You can view template's name, RAM size, number of networks, primary disk and swap disk size, number of cores.

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

**See also:**
- Manage Application Server
- Application Server Billing
- Application Server Disks
- Application Server Backups

https://onappcloud.typeform.com/to/A64Euy#source=Create%20Application%20Server

3.6 Create Load Balancers

In this document you can find information on how to create Load Balancer or Auto-Scaling cluster in your cloud.

With the **Load Balancer** clusters option, you specify which VSs (nodes) will participate in a load balancer cluster. Incoming traffic is distributed evenly between all the VSs added to a cluster – you still present a single host name to end users, but they actually access the cluster of VSs rather than a single end point. This helps application availability: if one VS fails, traffic is automatically routed to another in the cluster. You can add and remove cluster VSs as required.

VS **Auto-Scaling** clusters increase or decrease your VS capacity by automatically adding or removing nodes to a cluster. The cluster is scaled in (decreased) or out (increased) based on rules you specify in the Control panel. This aids application performance and scalability.

Please note that OnApp Load Balancer supports only IPv4. Load Balancers, both autoscaling clusters and load balancer clusters, can only be created on the basis of Virtual Servers, and are not available for Smart Servers, Baremetal Servers, or VMware Virtual Servers.

3.6.1 Create Load Balancer Cluster

In this scheme, load balancers manage incoming requests one by one, rotating them between the servers added to a cluster (a round-robin method).

OnApp load balancers are based on Layer 4 load balancing which means that requests are distributed at the transport layer, such as TCP or UDP transport protocols. To add an LB cluster:

1. Go to your Control Panel > Cloud > Load Balancers menu.
2. Click the **Add New Balancer** button.
3. On the page that follows, fill in the form that appears:

3.6.1.1 Configuration

**Cluster Configuration**

- **Port** - specify the port for this load balancer to run on (e.g. 9090, 8080, 9008, etc.)

To add multiple load balancer ports, click the "+" button next to the first port.

**Load Balancer Instance**
• **Label** – give a name to your load balancer instance.
• **Hostname** – specify a host name that will identify your load balancer.
• **Compute zone** – choose a Compute zone.
• **Compute resource** – select a Compute resource that will be enabled for the cluster.
• **Network zone** – choose a network zone for this load balancer.
• **Port Speed** – use the slider to set a port speed or tick the **Unlimited** box if required.
• **CPU Priority** - set the load balancer's CPU priority.

**Load Balancer Type**

• **Load Balancer Type** - choose the **Cluster** option and click **Next**.

### 3.6.1.2 Cluster Nodes

This is where you add and configure the nodes in this load balancing cluster. A node is a combination of a VS and an IP address.

• **Virtual Server** - select a virtual server from the drop-down box and click the **Add Node** button.

Click **Save** to create the load balancer cluster.

The only VSs you can add to a cluster are those which are based on the selected Compute resource/Compute zone, have an IP in the defined network zone and are located in the same IP range.

**Enabled anti-spoofing would prevent adding Windows-based virtual servers as nodes to the load balancer cluster. To disable anti-spoofing, reboot Windows-based nodes from Control Panel after they are added to the cluster.**

### 3.6.2 Create Auto-Scaling Cluster

To add an autoscaling cluster to your cloud:

1. Go to your Control Panel > **Cloud** > **Load Balancers** menu.
2. Click the **Add a Balancer** button.
   
   On the page that follows, fill in the form that appears:

### 3.6.2.1 Configuration

#### Cluster Configuration

• **Port** - specify the port for this load balancer to run on (e.g. 9090, 8080)

#### Load Balancer Instance

• **Label** – give a name for your load balancer instance.
• **Hostname** – specify a host name which will identify your load balancer.
• **Compute zone** – choose a Compute zone.
• **Compute resource** – select a Compute resource that will be enabled for the cluster.
• **Network zone** – choose a network zone for this load balancer.
• **Port Speed** – use the slider to set a port speed or tick the Unlimited box if required.
• **CPU Priority** - set the load balancer's CPU priority.
**Load Balancer Type**
- *Load balancer type* - choose the **Autoscaling** option and click **Next**.

### 3.6.2.2 Cluster Nodes
These settings configure the nodes that will be added to your cluster.

**Nodes network**
- *Nodes network group* - the nodes network group for the cluster nodes.

**Cluster Node Template**
- *Image template* – choose a template from the drop-down box: nodes will be built on this template.

  The only templates you can add to a cluster are those based on the selected compute resource/compute zone.

  - *Min node amount* – the minimum number of nodes in this cluster.

  Example: if you set Min node amount = 2 and Max node amount = 5, then the system will scale out the cluster up to 5 nodes, and scale in to 2 nodes if required.

  - *Max node amount* – the maximum number of nodes in this cluster.

**Cluster Node Parameters**
These are the settings for each node of a cluster. Each node added to a cluster will have the following parameters:

  - *Memory* – set the amount of memory allocated per node in MB.
  - *CPUs* – the number CPUs which will form each node.
  - *Rate Limit* – set the port speed for a node.

**Autoscale Out Parameters**
Set the rules defining when the system should add more nodes to your autoscaling cluster. The system will add nodes until the limit set in the Max node amount field is reached.

**Autoscale In Parameters**
Set the rules defining when the system should remove the nodes from your autoscaling cluster. The system will remove nodes until the limit set in the Min node amount field is reached.

Click **Save** to create the autoscaling cluster.

**See also:**
- [Manage Load Balancers](#)
- [Virtual Servers](#)
- [Autoscale Virtual Server](#)

[https://onappcloud.typeform.com/to/A64Euy#source=Create%20Load%20Balancers](https://onappcloud.typeform.com/to/A64Euy#source=Create%20Load%20Balancers)

Leave feedback
3.7 Create Edge Accelerator

Edge accelerator is a type of VS, which is built from specific template and is aimed to serve as a router for traffic between CDN core and CDN-enabled virtual servers. You can further enable edge accelerator for a VS to speed up the traffic flow running for this particular server.

To create an edge accelerator:

1. Ensure that edge accelerator permissions are enabled before you create an edge accelerator. For more information, refer to the Permissions page.

2. Go to your Control Panel > Cloud > Edge Accelerators menu and click the + button, or click the Create Edge Accelerator button at the bottom of the screen. This will start a creation wizard.

3. Fill in the wizard step by step. Each of these steps is described in the corresponding sections below.

4. Click the Create Edge Accelerator button to start the creation process. You will be taken to the edge accelerator details screen.

Below you can find the requirements for edge accelerator creation:

- **Minimum**: 4 cores, 4 GB RAM and 100 GB disks
- **Recommended**: 8 cores, 16 GB RAM and 1 TB disks
- SSD recommended to avoid slowing down access

For information on how to bill your end users for applying acceleration to VSs, refer to Configure Resource Allocation And Prices.
Setting Up OnApp Accelerators

- enable permissions
- start Accelerator creation wizard
- select the location

- confirm
- specify resources
- set the properties

- enable Accelerator for a virtual server
- get your content faster entirely automatic
- accelerated delivery to your customers simple pricing

---

OnApp Cloud 6.7 Admin Guide
3.7.1 Step 1 of 3. Properties

Specify the following edge accelerator properties:

- **Label** - the label of the edge accelerator
- **Compute Zone** - the compute zone to build the edge accelerator on
- **Compute Resource** - the specific compute resource to build the edge accelerator on. Only KVM compute resources are supported

Click **Next** to proceed to the following step of the wizard to specify the edge accelerator resources.

3.7.2 Step 2 of 3. Resources

Define the resources for your edge accelerator:

- **RAM** - set the amount of edge accelerator's RAM.
- **CPU Cores** - set the amount of edge accelerator's CPU cores. For KVM compute resources, this parameter sets CPU sockets by default, unless CPU topology is enabled.
- **CPU Priority** (or **CPU Units**) - set edge accelerator'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 following options are available for VSs based on KVM compute resources only, providing the **Enable CPU topology permission** is switched on for the user.

- **Use CPU Topology** - move the slider to the right, to set the following parameters:
  - **CPU Sockets** - set the amount of sockets
  - **CPU Threads** - set the amount of threads per core

**Primary Disk**

- **Data Store Zone** - choose a data store zone for edge accelerator's primary disk
- **Primary disk size** - set the primary disk size

**Network Configuration**

- **Network Zone** - choose a network zone from the drop-down box. Only one edge accelerator is supported per network
- **Network** - choose the network from which the VS should get the IP address
- **Selected IP address** - assign an IP address for the edge accelerator from the drop-down menu. Only public IP Address can be chosen

The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to edge accelerator.

- **Show only my IP address** - tick this checkbox to view only own IP addresses in the IP addresses dropbox
- **Port Speed** - set the port speed for this edge accelerator (or tick the checkbox below to set unlimited port speed)

During edge accelerator creation special ID is created which is allocated to IP Address.

Click **Next** to proceed to the following step of the wizard.
3.7.3 Step 3 of 3. Confirmation

At this step, configure the automation settings. This is the final step of the edge accelerator creation wizard.

Move the Build Edge Accelerator slider to the right if you want the system to automatically build the edge accelerator.

After you set up these parameters, click the Create Edge Accelerator button to start the creation process.

After you create an edge accelerator, you can enable acceleration for new or existing VSs.

https://onappcloud.typeform.com/to/A64Euy#source=Create%20Edge%20Accelerator

Leave feedback

3.8 Create Smart Server

You need to add and configure a smart CloudBoot compute resource before you can create a smart server. See the Create CloudBoot Compute Resource section for details.

To create a smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. On the screen that appears, click + button or the Add New Smart Server button underneath the list of servers on the screen.
3. Complete the smart server creation form.

It is possible to deploy Windows smart servers without running sysprep. To do so, you need to disable the Run Sysprep option for the compute zone where the smart server will be built. See the Create Compute Zone section for details. When provisioning smart server with simple deploy option, make sure that the template you use has all the necessary drivers inside it, otherwise the smart server network settings will not be configured.

3.8.1 Step 1 of 5. Templates

Choose a template to build a smart server, then click Next. You can use any KVM templates for smart server creation.

Before creating a Windows-based smart server, make sure that the appropriate drivers were added to the /data folder on CP.

3.8.2 Step 2 of 5. Properties

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

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

- **Time zone** - set the time zone set for the smart server. This parameter is applicable only to Windows smart servers.
- **Password** - give your smart server a secure password. If you leave password field blank, it will be generated automatically.
- **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.

Click **Next**.

Currently, the time zone is set at the compute resource side only. Therefore, users need to set the target time zone inside a Windows smart server manually. Setting correct time zone at the compute resource side helps to keep correct time inside a smart server after starting it if time synchronization is not completed for some reason.

### 3.8.3 Step 3 of 5. Resources

Set the resources needed for this smart server:

In order to provision a new smart server, first you must make sure that you have at least one KVM compute resource that is in a separate zone than your normal one. Smart servers should be in their own compute resource zone and should not be mixed in the standard zones you use for normal compute resources.

#### Compute Resources

- **Compute Zone** - choose a smart compute zone to build the smart server on.
- **Compute Resource** - choose a specific smart compute resource to reside the smart server on. Please note: you can only reside your smart server on cloud booted KVM compute resources.

#### Resources

- **RAM** - set the amount of virtual server's RAM. The maximum RAM depends on your bucket settings. The maximum RAM that can be assigned to a smart server is 168 GB regardless of the Max RAM value set in the bucket.
- **CPU Cores** - set the amount of virtual server's CPU cores. This parameter sets CPU sockets by default, unless CPU topology is enabled.
- The following options are available for smart servers providing the **Enable CPU topology permission** is switched on for the user.
  - **Use CPU Topology** - move the slider to the right, to set the following parameters:
    - **CPU Sockets** - set the amount of sockets.

#### Primary Disk

- **Data Store** - choose a data store for the smart server’s primary disk.
- **Primary disk size** - set the primary disk size.
Swap Disk
- **Data Store** - choose a data store for this server’s swap disk.
- **Swap disk size** - set the swap disk size.
- **Disable** - select the checkbox to disable swap disk creation

### Network Configuration

**Network Interface 1**
- **Network** - the network from which the IP address for the smart server will be allocated
- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned
- **IP range** - select from the drop-down list the IP range from which the IP address should be assigned
- **IP address** - select an IP address to be assigned from the drop-down box

The first IP address you add will be marked as primary for the VS. You can further edit the IP addresses assigned to smart server.

- **Show only my IP addresses** - if the option is available, you can also assign an IP address for the smart server.
- **Selected IP address** - IP address for this smart server
- **Port Speed** - set the port speed for this smart server

Click **Next**.

---

Please note that the minimum required NICs for smart servers depends on your choice of storage:
- For local storage, two NICs are enough—one (or more) for the appliance network and one for the management network.
- For OnApp Integrated Storage/iSCSI or FC, you need at least one NIC for the storage network as well.

---

### 3.8.4 Step 4 of 5. Recipes

1. Choose a recipe you want to assign to this smart server by dragging the required recipe from the **Available recipes** pane to the **Assigned for provisioning** pane.
2. To add a custom variable, click **+** button next to the **Custom recipe variables** title bar, then specify the variable details:
   - Specify the recipe name and its value.
   - Move the **Enabled** slider to the right to allow the use of this variable.
3. Click **Next**.

---

### 3.8.5 Step 5. Confirmation

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

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

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

  - 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](#) to allow acceleration for this VS or move this slider to the left to prohibit acceleration for this VS.

  The **Acceleration allowed** slider is available if the following conditions are met:
  - Accelerator is available in the network
  - IP Address, selected during VS creation, is in the same network as Accelerator
  - VS is created by setting own virtual server's resources, not by selecting a predefined instance package
  - The *Show IP address selection for new VS* slider is activated in the Control Panel > Settings menu > Configuration
  - Only HTTP is supported. Other protocols, including HTTPS, will be passed through to the VS directly.
  - In order to route the VS's traffic, the VS must be on the same network with the Accelerator.

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

Click **Submit** button. The smart server will be added to the system. You can view it under the **Smart Servers** menu.

### 3.8.6 Workflow

The following scheme describes the steps required to create a smart server:
User wants to create a smart server

User completes the smart server creation form

Step 1: Templates
- Choose any KVM template

Step 2: VS Properties
- Specify the smart server label and hostname
- Choose a compute zone and a compute resource
- Set the password

Step 3: Resources
- Set RAM, CPU cores, and CPU priority
- Set the disk space
- Choose a data store and network zones
- Set the port speed

Step 4: Recipes
- Choose a recipe
- Assign a custom variable

Step 5: Confirmation
- If required:
  - Enable Automated Backup
  - Build Smart Server
  - Boot Smart Server
  - Primary disk file system
  - Enable Autoscale

Click the Submit button to start the creation process

See also:
- Manage Smart Server
- Smart Server Disks
3.9 Create Baremetal Server

Baremetal servers are provisioned via KVM CloudBoot compute resources. You need to add and configure a baremetal CloudBoot compute resource before you can create a baremetal server. See the Create CloudBoot Compute Resource section for details.

To create a baremetal server:

1. Go to your Control Panel > Cloud > Baremetal Servers menu.
2. On the screen that appears, click + button or click the Add New Baremetal Server button underneath the list of servers on the screen.
3. Complete the baremetal server creation form:

3.9.1 Step 1. Cloud Locations (Optional)

The Cloud Locations step is available for users whose bucket includes compute zones assigned to 2 or more location groups. If Cloud Locations are not available or there are less than 2 location groups, 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 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.

3.9.2 Step 2. Templates

Choose a template to build a baremetal server on, then click Next.

The management network should be disconnected during the baremetal server deployment.

The image templates for provisioning the baremetal servers are stored in the following locations depending on the configuration:
1. If Use SSH File transfer CP configuration option is enabled in Control Panel Admin > Settings > Configuration menu, then the image template will be fetched from the specified server.
2. If Use SSH File transfer option is disabled, the image templates are located at /onapp/templates, which is mounted from server specified in Static Config target CP configuration option (Control Panel > Admin > Settings > Configuration menu). Usually this is set to Control Panel server IP, but you can change it to be any other server.

You can find the list of templates for baremetal server creation under the following links (marked by "Yes" in column "Baremetal"):

http://templates.repo.onapp.com/Linux_templates.html

### 3.9.3 Step 3. Properties

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

For example:

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

- **Time zone** - set the time zone for the virtual server. This parameter is applicable only to Windows KVM virtual servers. Currently, the time zone is set at the compute resource side only. Therefore, users need to set the target time zone inside a Windows VS manually. Setting correct time zone at the compute resource side helps to keep correct time inside a VS after starting it if time synchronization is not completed for some reason.
- **Password** - a secure password for the Baremetal Server. If you leave password field blank, it will be generated automatically.
- **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.
- **Click Next.**

### 3.9.4 Step 4. Resources

For baremetal server creation, all disks in the Control Panel are used in their full size.

**Compute Resources**

- **Compute Zone** - choose a baremetal compute zone to build the baremetal server on.
- **Compute resource** - choose a specific baremetal compute resource to reside the baremetal server on.

**Network Configuration**

Network Interface 1
• **Network** - select the network from which the baremetal server should get the IP address
• **IP net** - select from the drop-down list the IP net from which the IP address should be assigned
• **IP range** - select from the drop-down list the IP range from which the IP address should be assigned
• **IP address** - select an IP address to be assigned from the drop-down list
• **Show only my IP address** - tick this checkbox to view only own IP addresses in the IP addresses drop-down list.

Click **Next**.

| Baremetal servers require a minimum of two NICs - one for the appliance network (or more) and one for the management network. |

### 3.9.5 Step 5. Recipes (Optional)

The **Recipes** step is available only if there are any recipes and recipe groups in the cloud. Otherwise, the **Submit** button will appear at the **Resources** step.

#### Recipes

1. Select the required recipe in the left **Available recipes** pane and hold it down with the left mouse button.
2. Drag the recipe up to the right **Assigned for provisioning** pane and release the mouse button to drop and assign the recipe to the required baremetal server.

#### Custom recipes variables

Click the + button to add a custom variable.

- **Name** - specify the recipe name.
- **Value** - specify the recipe value.
- **Enabled** - move the slider to the right next to the necessary recipe to allow its use.

Click the **Submit** button. The baremetal server will be added to the system. You can view it under the **Baremetal Servers** menu.

### 3.9.6 Workflow

The following scheme describes the steps required to create a baremetal server:
User wants to create a baremetal server

User completes the baremetal server creation form

Step 1: Templates
- Choose a template

Step 2: Properties
- Specify the baremetal server label and hostname
- Choose a compute zone and a compute resource
- Set the password

Step 3: Resources
- Select a network zone

Step 4: Recipes
- Choose a recipe
- Assign a custom variable

Click the Submit button to start the creation process
3.10 Create and Install Templates

OnApp provides separate documents to explain how to create Windows and Linux templates from scratch, rather than from existing VS templates. Please refer to the Miscellaneous Documentation for details.

3.10.1 Install/Update Templates

The Template server URL has to be set at Control Panel > Admin > Settings > Configuration > Backups/Templates tab as a prerequisite for installing/upgrading templates.

VMware vCenter templates are not installed using the template server. For information on installing VMware templates, refer to the Create and Manage vApp Templates section.

OnApp template manager allows you to update the system templates which are already installed to your cloud and download new templates available on a template server.

The OnApp template library includes over 100 VS templates based on various 32-bit and 64-bit flavours of Windows and Linux operating systems. OnApp customers can also access a large number of JumpBox virtual Compute resources and deploy them as templates in OnApp.

Only customers with a Paid license have access to the complete template library, and special deals with JumpBox.

Installing Templates

To download and install a template from a remote template server:

1. Go to your Control Panel > Cloud > Templates menu.
2. Click the System Templates tab. The page that loads will list all the templates installed to your cloud.
3. Click the Available tab.
4. You will see the list of all templates available for installation. You can scroll through the list of templates with the Previous/Next buttons at the bottom of the screen.
5. Click the plus button next to a required template to install.

3.10.1.1 Upgrading Templates

Template manager allows you to update the installed templates from the template server.

To update a template:

1. Go to your Control Panel > Cloud > Templates menu.
2. Click the System Templates tab.
3. On the page that appears, the Updates tab will show the list of templates with more recent version than you have installed.
4. Click the plus button next to a required update to install.
If you update an existing template (by downloading a more recent version) it will not update existing VSs built on the previous version. Only new VSs, or those that are rebuilt, will use the new template.

Installations

You can see the status of the active downloads and cancel/restart them.

For this:

1. Go to the Control Panel > Cloud > Templates menu.
2. Click the System Templates tab. The page that loads will list all the templates installed to your cloud.
3. Click the Installations tab.
4. You will see the list of all templates that are currently being installed to your Cloud with their details and status.
5. Click the Properties icon next to a required template to restart or delete the template installation/update.

3.10.1.2 Where Templates Are Stored

Depending on the configuration of your cloud, new templates are stored at different locations.

**No backup servers and ssh_file_transfer option is disabled**

In this configuration, the templates will be uploaded to all compute resources. If this template already exists somewhere, the action is skipped. In such case NFS or any other sharing service should be enabled between compute resources.

**No backup servers and ssh_file_transfer option is enabled**

The template is uploaded to this ssh_file_transfer server only.

**There are backup servers and ssh_file_transfer option is disabled**

The templates are uploaded to all backup servers. The action is skipped if such a template already exists. In this configuration ensure that some sharing service is between backup servers. Provisioning is performed at backup servers only. If there is more than one backup server in the cloud, the user is prompted to choose to which BS a template will be stored.

**There are backup servers and ssh_file_transfer is enabled**

The templates are uploaded to this ssh_file_transfer server only.

**High Availability is configured for the Cloud**

In this configuration, make sure to store templates at Database&Transactions server or any other server with shared NFS service, so that both Control Panels could access the templates directory.

While creating a virtual server from a template, make sure that the template is located on a backup server that is attached to the compute resource on which you wish to built the VS, otherwise, the creation of the VS will fail.

3.10.2 Create Custom Templates

You can create custom templates by making a backup of an existing virtual server and saving it as a template for future use. To create a custom template:

1. Create a new virtual server and configure it as you would like for your template.
2. Click the Actions icon next to this virtual server, then choose Backups.
3. In the list of backups, click **Convert to Template** next to the backup you want to convert.

4. Click **OK** to proceed.

5. On the next screen, enter the following:
   - A label for your template.
   - The minimum memory size: make sure the minimum memory size takes into account the settings for the template on which the VS was built, plus any modifications you may have made to the template before making the backup.
   - The minimum disk size: ensure the value is based on the template settings and any possible modifications you may have made, e.g. installing additional software.
   - Click the **Convert Backup** button.

6. The backup will be scheduled for creation. When conversion is complete, it will be then listed on the **Templates > Templates List > User Templates** tab, from where you can edit it.

   • If templates limit has been exceeded, you will get the following error message: “You have reached your template creation limit”.
   • During the custom Windows template creation the Admin account is created anew.
   • To select a preferred licensing type (KMS, MAK, own) for a Windows virtual server built on a custom template you need to add this custom template to **My Template Groups** and associate the desired licensing type with such group.
   • When updating a custom template (by converting a more recent backup of a VS, for example), existing VSs built on previous versions will not be updated. Only new VSs, or those that are rebuilt, will use the new template.

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**See also:**
- Manage Template Recipes
- Manage Template Recipe Custom Variables
- Template Software Licenses
- Template Store
- My Template Groups

https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Install%20Templates

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### 3.11 Create Recipes

A recipe is a plugin mechanism used for adding new functionalities to the OnApp cloud. Each recipe is a set of instructions that trigger events at certain stages during the execution of certain services/event in the cloud. Essentially, recipes allow inputting code into virtual servers, appliances or the Control Panel server. This enables administrators to use recipes for configuring the server or report on it, thus providing advanced customization options in a standard environment. In this document you can find information on how to create and manage recipes.

You can create and use recipes for Unix (Linux and FreeBSD) and Windows virtual servers, smart servers, baremetal servers, virtual server templates, compute zones and the Control Panel server.
3.11.1 Create Recipe

Adding a recipe consists of two stages:

Creating a recipe

Creating a recipe step

3.11.1.1 Create Recipe

To create a recipe:

1. Go to your Control Panel > Cloud > Recipes menu.
2. Click the "+" button.
3. Fill in the recipe creation form:

Properties

• Label - give your recipe a label
• Description - provide a short recipe description (optional)
• Compatible with - choose if this recipe can be assigned to Unix or Windows virtual servers. For a Windows compatible recipe, specify the script type. You can select the following script types:
  o BAT
  o VBS
  o PowerShell

4. Click Save.

After that, you'll be redirected to the recipe details screen where you can add steps to this recipe.

3.11.1.2 Create Steps

To create a new recipe step:

1. Click the "+" button in the upper right corner of the Steps screen.
2. In the pop-up window, specify step details as required:

   Script - input the recipe code.

   Result source - specify the step result source:

   o Exit Code - an exit code, for example, 0 is the default value returned on success.

   To use exit code in the VBS or PowerShell scripts, you have to specify it directly in the script. For example:

   VBS
   Script:
   WScript.Echo "test"
   WScript.Quit 95

   PowerShell
   Script:
   get-date -displayhint date exit 227

   o STDOUT - standard output.

   o STDERR - standard error
o STDOUT and STDERR - standard output and standard error.

Move the **Pass anything else** slider to the right if you do not want to specify the pass output value. Otherwise, leave this slider disabled to set the pass values.

**Pass values** - specify the pass output value, for example, 0.

You cannot specify both pass and fail values for one recipe step.
You can specify multiple recipe values. In this case, you have to specify each value from a new line.

**On success** - the recipe behavior on success:
- Proceed - proceed to the next step.
- Fail - terminate the recipe and mark it as failed.
- Stop - terminate the recipe and mark it as successful.
- Go to step - specify the step to proceed to. If you specify the nonexistent step, the recipe will be stopped.

In case you have already specified the recipe pass values, you will get the **Fail anything else** slider enabled automatically, as you cannot specify both pass and fail values for one recipe step. Move this slider to the left if you want to set fail values (**Pass anything else** slider will be enabled automatically).

**Fail values** - specify the pass output value.

**On failure** - the recipe behavior on failure
- Proceed - proceed to the next step.
- Fail - terminate the recipe and mark it as failed.
- Stop - terminate the recipe and mark it as successful.
- Go to step - specify the step to proceed to. If you specify the nonexistent step, the recipe will be stopped.

3. **Click Save.**

Drag and drop steps to change their order. To do so:
1. Select the required step and hold it down with the left mouse button.
2. Drag the recipe up to the required position and release the mouse button to drop it.

**See also:**
- Recipe Permissions
- Recipe Groups
- Recipe Use Examples
- Control Panel Recipes Settings

https://onappcloud.typeform.com/to/A64Euy#source=Create%20Recipes
3.12 Control Panel Configuration

You get detailed control over the configuration of Control Panel in the OnApp Configuration menu accessed at Control Panel > Admin > Settings menu. The menu includes details and settings for the following items:

- Authentication
- Hardware Info
- License
- Configuration Settings
- Look & Feel
- Localization and Customization
- Global Whitelist
- Service Insertion Framework Configuration
- Manage Languages

https://onappcloud.typeform.com/to/A64Euy#source=Control%20Panel%20ConfigurationLeave feedback

3.12.1 Authentication

OnApp offers you a possibility to log in using the credentials from a third-party Identity Provider. This section contains information on SAML, TOTP, and OAuth authentication possibilities.
OAuth - open standard for authorization - enables your users to log into OnApp using their Google and Facebook accounts.

To provide users of your cloud with such login possibility:

- Cloud Administrator must enable OAuth provider
- User must connect the enabled provider to their profile

3.12.1.1.1 Enabling OAuth for Cloud

2. Select the OAuthProviders tab.
3. Move the Enable slider next to the required OAuth providers.

Facebook

1. Select an icon to be displayed during the login.
2. Fill in the app key and app secret from the Facebook application.

Configure Facebook application

To create and configure the Facebook application for your cloud:

1. Log in as Facebook developer at https://developers.facebook.com/
2. Create an application:
   - enter display name
   - select suitable category for your product
On the Dashboard of the created app you will see App ID and App Secret which are required in step 2 above.
go to the Settings menu, press Add Platform and select Website.
in the appearing field Site URL specify the address of your Control Panel.
specify your Contact Email, otherwise your application cannot go live.
go to Status & Review menu and make your application public using the slider in the top right corner.

3.12.1.1.2 Google
1. Select an icon to be displayed during the login.
2. Fill in the app key and app secret from the Google application.

**Configure Google application**
1. Go to the Google Developers Console.
2. Select a project, or create a new one by clicking Create Project. Use a single project to hold all platform instances of your app (Android, iOS, web, etc.), each with a different Client ID.
   a. In the Project name field, type in a name for your project.
   b. In the Project ID field, optionally type in a project ID for your project or use the one that the console has created for you. This ID must be unique worldwide.
   c. Click the Create button and wait for the project to be created. **Note:** There may be short delay of up to 30 seconds before the project is created. The project name appears at the top of the left sidebar, indicating you are now editing the project.
3. In the left sidebar, select APIs & auth. A list of Google web services appears.
4. Find the Google+ API service and set its status to ON—notice that this action moves the service to the top of the list.
5. Enable any other APIs that your app requires.
6. In the sidebar, select Credentials.
7. In the OAuth section of the page, select Create New Client ID.
   In the resulting Create Client ID dialog box, register the origins where your app is allowed to access the Google APIs, as follows. The origin is the unique combination of protocol, hostname, and port.
   a. In the Application type section of the dialog, select Web application.
   b. In the Authorized JavaScript origins field, enter the origin for your app. You can enter multiple origins to allow for your app to run on different protocols, domains, or subdomains. Wildcards are not allowed. In the example below, the second URL could be a production URL.

   | http://onapp.cp |
   | https://myproductionurl.example.com |

   c. In the Authorized redirect URI field, enter your redirect URI callback:

   | http://onapp.cp/users/auth/google/callback |

   It is important to set the configuration indicated in the box above, otherwise the Google will set the default value as http://onapp.cp/callback.
   d. Select Create Client ID.
8. Go into the Consent Screen and add your email address and a product name. The other fields are optional.
9. In the resulting Client ID for web application section, note or copy the **Client ID** and **Client secret** that your app will need to use to access the APIs.
   * Configurations are taken from official Google instructions "Step 1: Create a client ID and client secret".
3.12.1.2.1 Connecting Enabled OAuth Provider to User Profile

To connect a user profile to either of above OAuth providers and be able to log in with it, the user has to:

2. Go to their own profile by clicking the name on the top panel of the dashboard or in the list of users in Users and Groups menu.
3. In the Oauth Authentication section press the Connect button next to the required provider.
4. User will be redirected to confirm such connection.

Upon completion, the user will be able to log in to OnApp with the OAuth Provider they have connected.

See also:
- Authentication
- SAML Authentication
- User Accounts

https://onappcloud.typeform.com/to/A64Euy#source=OAuth

3.12.1.2 SAML Authentication

SAML Authentication enables the integration of OnApp as a Service Provider into third-party systems via Single Sign-On possibility, so the users of third-party systems can use their credentials to access OnApp services, without the need to be previously registered in OnApp Cloud.

This Authentication is enabled by adding an Identity Provider (IdP) instance, which is used to direct OnApp login requests to the server configured with SAML.
• It must be configured properly to be able to store OnApp mapping attributes (user role, time zone, etc.).
• It requires that only HTTPS protocol is used.

Selecting a SAML IdP on OnApp login screen or from the drop-down menu, a user will be redirected to the login screen of that identity provider. Upon logging in there with their email and password (or if they are already logged in), they will be redirected back to OnApp Control Panel. This final redirect will contain an email attribute of that user which is used for their recognition in OnApp system – if such a user already exists, he or she is recognized and authorized, if not - a new OnApp user will be automatically created.

A new user will not be created without the OnApp Key attribute.

The attributes of the third party system users will be synchronized during every login, depending on the available keys for attributes mapping. This will enable a third-party system administrator to preset the main OnApp user properties (user role, time zone, group) without the necessity to enter OnApp and make the required configurations manually.
Users created without these attributes can be located and managed at **Users > Users with Config Problems** on your OnApp Control Panel.

If required, you may configure the cloud access for SAML users only by using SAML credentials. To do so, disable the switch Local Login for SAML Users at Control Panel > Admin > Settings > Configuration > System tab.

See also:

- **Users with Config Problems**
- **Authentication**
- **OAuth**

[https://onappcloud.typeform.com/to/A64Euy#source=SAML%20Authentication](https://onappcloud.typeform.com/to/A64Euy#source=SAML%20Authentication)

3.12.1.2.1 Add New ID Provider

Enabling the possibility to log into OnApp through Identity Provider involves two stages:

1. **Add the Identity Provider (IdP) instance to Service Provider (SP)**
2. **Configure Service Provider at Identity Provider**

Add IdP Instance on CP

It is important to access OnApp CP via HTTPS before the following steps, to ensure the links containing in the **Metadata** file are correct.

To add a new Identity Provider instance, follow these steps:

1. Go to your Control Panel > Admin > Settings > Authentication tab.
2. Click **New SAML Id Provider** or a "+" icon.
3. Fill in the fields in the new window:

   - **Idp sso target url** and **Idp cert** are given by the Identity Provider. **Idp cert fingerprint** will be calculated by the system.
   - **Enabled** - move the slider to the right to enable this identity provider at the login screen
   - **Show on login page** – move the slider to the right to show a SAML provider on the login page
   - **Name** - enter the name of the identity provider
   - **Icon** - select the icon file, which will be displayed on the login page
   - **Issuer** - the name of the service provider; by default - the address of your OnApp Control Panel
   - **Idp sso target url** - the URL to which the login authentication request should be sent
   - **Idp slo target url** - the URL to which the logout request should be sent
   - **Idp cert** - the identity provider's certificate in PEM format
   - **Nameid format** - specify a format of name identifier according to the Oasis SAML specification
It is required that the IdP assertions are encrypted and there is a decrypting private key added to OnApp. The key will be used to sign the Single Logout requests.

4. Upload the Service Provider certificate and key:
   - *Private key* - private key of the service provider in PEM format
   - *Certificate* - the service provider's certificate in x509 format

5. Fill in the keys for attributes mapping.
   
   If the SAML Identity Provider does not send the user's email as *name_id* in response, the user needs to fill in the *User email key* when configuring an ID provider.

   These keys are the names of attributes of the third-party system users that will be synchronized with OnApp. See Attributes Mapping Configuration for more details.

   **Required Attributes Mapping**
   - *User bucket key* - the key to assign the user to a particular bucket under which this user will be billed
   - *OnApp Key* - the key that enables the import and synchronization of user attributes during every login to OnApp; third-party system users who are not yet registered in OnApp will not be created without this key
   - *User email key* - the email of the user
   - *User name key* - login name of the user that cannot be changed or synchronized after creating. If this key is missing, the email address will be utilized as a login name for the user.

   **Optional Attributes Mapping**
   - *First name key* - the key for the first name of the user
   - *Last name key* - the key for the last name of the user
   - *Locale key* - the key for the language in which OnApp Cloud UI will be available to the user
   - *System theme key* - the key for one of the default system themes in which OnApp Cloud UI will be available to the user
   - *Display infoboxes key* - the key that enables or disables the display of infoboxes to the user
   - *Disable auto suspend key* - the key that enables or disables auto-suspending of the user
   - *Suspend after key* - the key that indicates the period of time in hours after which the user will be suspended
   - *Suspend at key* - the key that indicates the date and time when the user will be suspended
   - *User group key* - the group attribute to assign the user to a particular group
   - *Roles key* - the key of the role attribute that will create/sync the user's role in OnApp
   - *Time zone key* - the key of the time zone to which the user will be associated

6. Click **Save** button.
Configure Service Provider

Besides adding the IdP instance, the Identity Provider must also configure the SP instance in their system. To simplify this configuration process, the Identity Provider may use the SP metadata as follows:

1. Upon creation, you will be redirected to the page with details of the Identity Provider. At the bottom of the page, you will see the Link to Metadata.
2. Copy this link and submit it to the Identity Provider in the Select Data Source menu.
3. In the Claim Rules menu, create a new rule by clicking Add Rule and select Transform an Incoming Claim as the template.
   o Select E-mail Address as the Incoming Claim Type.
   o For Outgoing Claim Type, select Name ID.
   o For Outgoing Name ID Format, select Email.

Now, this identity provider may be selected on the login page.

See also:
- Authentication
- SAML Authentication
- Manage Identity Providers

https://onappcloud.typeform.com/to/A64Euy#source=Add%20New%20ID%20Provider

3.12.1.2.2 Attributes Mapping Configuration

To import users into OnApp Cloud already with a number of preset properties (user role, time zone, group, etc.), the administrator of the Identity Provider adds additional attributes to their users. These attributes can be imported into or synchronized with the Server Provider (OnApp Cloud), making it possible to configure SP users in Identity Provider’s system.
To import users with additional attributes, the administrator of the Identity Provider adds the required attribute(s) to users and fills them in with values from OnApp. For example, the administrator of the Identity Provider wants a user imported with a role. For this, the role attribute should be created and given a value of an OnApp role(s). The name of this parameter is entered in the Roles key field.

When a user enters OnApp Cloud through the IdP instance, the system will check whether the synchronization is enabled and then it will look for the OnApp-dedicated attributes. Keys for attributes mapping are the names of the said attributes.

Note that some attributes cannot be changed once the user is imported to OnApp cloud. These include User bucket key for all of the users and User group key for the vCloud users. If there is a mismatch between preset properties and OnApp-dedicated attributes, the user authorization will fail.

The table below lists the mandatory and optional keys for attributes mapping.

### Mandatory keys for attributes mapping

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OnApp key</td>
<td>The key that enables the import and synchronization of user attributes during every login to OnApp; third-party system users who are not yet registered in OnApp will not be created without this key.</td>
</tr>
<tr>
<td>User bucket key</td>
<td>The key to assign the user to a particular bucket under which this user will be billed.</td>
</tr>
<tr>
<td>User email key</td>
<td>The email of the user.</td>
</tr>
<tr>
<td>User name key</td>
<td>The login name of the user that cannot be changed or synchronized after creating. If this key is missing, the email address will be utilized as a login name for the user.</td>
</tr>
</tbody>
</table>

### Optional keys for attributes mapping

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>First name key</td>
<td>The first name of the user.</td>
</tr>
<tr>
<td>Last name key</td>
<td>The last name of the user.</td>
</tr>
<tr>
<td>Locale key</td>
<td>The language in which OnApp Cloud UI will be available to the user.</td>
</tr>
<tr>
<td>System theme key</td>
<td>The default system theme that is available in OnApp. There are light and dark system themes that can be used for this key.</td>
</tr>
<tr>
<td>Display infoboxes key</td>
<td>The option that enables or disables the display of infoboxes for the user.</td>
</tr>
<tr>
<td>Disable auto suspend key</td>
<td>The option that enables or disables auto-suspending of the user.</td>
</tr>
<tr>
<td>Suspend after key</td>
<td>The period of time in hours after which the user will be suspended.</td>
</tr>
<tr>
<td>Suspend at key</td>
<td>The date and time when the user will be suspended.</td>
</tr>
<tr>
<td>User group key</td>
<td>The attribute to assign the user to a particular user group.</td>
</tr>
<tr>
<td>Roles key</td>
<td>The key of the role attribute that will create or sync the user's role in OnApp</td>
</tr>
</tbody>
</table>
### Mandatory keys for attributes mapping

If an irrelevant role attribute is specified for this key, the user will be assigned to a role with no permissions.

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time zone key</strong></td>
<td>The key of the time zone with which the user will be associated.</td>
</tr>
</tbody>
</table>

The SAML Authentication will work if the optional fields are left blank. Do not fill in these fields if the attributes were not added by the administrator of the Identity Provider.

An example of Attribute Mappings keys may look like the following:

- **OnApp key** - `OnApp_Enabled`
- **User bucket key** - `OnApp_Bucket`
- **User email key** - `OnApp_UserEmail`
- **User name key** - `OnApp_UserName`
- **First name key** - `OnApp_FirstName`
- **Last name key** - `OnApp_LastName`
- **Locale key** - `OnApp_Locale`
- **System theme key** - `OnApp_SystemTheme`
- **Display infoboxes key** - `OnApp_DisplayInfoboxes`
- **Disable auto suspend key** - `OnApp_DisableAutoSuspend`
- **Suspend after key** - `OnApp_SuspendAfter`
- **Suspend at key** - `OnApp_SuspendAt`
- **User group key** - `OnApp_UserGroup`
- **Roles key** - `OnApp_Roles`
- **Time zone key** - `OnApp_TimeZone`

These attributes have to contain values which will be imported or synchronized with corresponding OnApp user entries. The attributes are case insensitive and belong to the following types:

- **OnApp_Enabled** - the boolean type with two possible values that are `true` or `false`
- **OnApp_Bucket** - the string type with the value corresponding to the bucket label
- **OnApp_UserEmail** - the string type with the value corresponding to the user email address
- **OnApp_UserName** - the string type with the value corresponding to the username
- **OnApp_FirstName** - the string type with the value corresponding to the user first name
- **OnApp_LastName** - the string type with the value corresponding to the user last name
- **OnApp_Locale** - the string type with the value corresponding to the language label
- **OnApp_SystemTheme** - the string type with the value corresponding to one of the available system theme labels that are `dark` or `light`
- **OnApp_DisplayInfoboxes** - the boolean type with two possible values that are `true` or `false`
- **OnApp_DisableAutoSuspend** - the boolean type with two possible values that are `true` or `false`
- **OnApp_SuspendAfter** - the integer type with the value corresponding to the number of hours after which the user will be suspended
- **OnApp_SuspendAt** - the datetime type with the value corresponding to the date when the user will be suspended
- **OnApp_UserGroup** - the string type with the value corresponding to the user group label
OnApp_Roles - the string type with the value corresponding to the role label that may contain several values separated by a semicolon

OnApp_TimeZone - the string type with the value corresponding to the time zone label

```
"OnApp_Enable" => "TRUE" / "false",
"OnApp_Bucket" => "somebucket",
"OnApp_UserEmail" => "someemail",
"OnApp_UserName" => "someusername",
"OnApp_FirstName" => "Somefirstname",
"OnApp_LastName" => "Somelastname",
"OnApp_Locale" => "en",
"OnApp_SystemTheme" => "light",
"OnApp_DisplayInfoboxes" => "TRUE" / "false",
"OnApp_DisableAutoSuspend" => "TRUE" / "false",
"OnApp_SUSPENDE AFTER" => "90",
"OnApp_SuspendAt" => "2017-10-19 13:10:00",
"OnApp_userGroup" => "Test user group",
"OnApp_Roles" => "Administrator"; "Advanced user",
"OnApp_TimeZone" => "Baghdad"
```

3.12.1.2.3 Manage Identity Providers

To see the list of Identity Providers and manage them:

1. Go to your Control Panel > Admin > Settings > Authentication. You will see all SAML IdPs available in your cloud with their key details:
   - **Name** - name of the Identity Provider
   - **Idp SSO Target Url** - the URL to which the authentication request is sent
   - **Status** - either "Active" or "Disabled"
     - **Action** - click the "gear" button to Edit, Delete or access Metadata of this Identity Provider

2. To see more detailed description of the Identity Provider - click its label.

3. To enable or disable IdP - go to Edit screen.

Edit SAML ID Provider

To edit Identity Provider instance, do the following:

1. Go to your Control Panel > Admin > Settings > Authentication tab.
2. Click the Actions button next to the Identity Provider you want to edit, then click Edit.
3. Fill in the fields in the new window:

   - **Idp sso target url** and **Idp cert** are given by the Identity Provider. **Idp cert fingerprint** will be calculated by the system.

   - **Enabled** - move the slider to the right to enable this identity provider at the login screen
   - **Show on login page** – move the slider to the right to show a SAML provider on the login page
   - **Name** - enter the name of the identity provider
   - **Icon** - select the icon file, which will be displayed on the login page
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- **Issuer** - the name of the service provider; by default - the address of your OnApp Control Panel
- **Idp sso target url** - the URL to which the login authentication request should be sent
- **Idp slo target url** - the URL to which the logout request should be sent
- **Idp cert** - the identity provider's certificate in PEM format
- **Nameid format** - specify a format of name identifier according to the Oasis SAML specification

It is required that the IdP assertions are encrypted and there is a decrypting private key added to OnApp. The key will be used to sign the Single Logout requests.

4. Upload the Service Provider certificate and key:
   - **Private key** - private key of the service provider in PEM format
   - **Certificate** - the service provider's certificate in x509 format

5. Fill in the keys for attributes mapping.

If the SAML Identity Provider does not send the user's email as name_id in response, the user needs to fill in the **User email key** when configuring an ID provider.

These keys are the names of attributes of the third-party system users that will be synchronized with OnApp. See Attributes Mapping Configuration for more details.

**Required Attributes Mapping**

- **User bucket key** - the key to assign the user to a particular bucket under which this user will be billed
- **OnApp Key** - the key that enables the import and synchronization of user attributes during every login to OnApp; third-party system users who are not yet registered in OnApp will not be created without this key
- **User email key** - the email of the user
- **User name key** - login name of the user that cannot be changed or synchronized after creating. If this key is missing, the email address will be utilized as a login name for the user.

**Optional Attributes Mapping**

- **First name key** - the key for the first name of the user
- **Last name key** - the key for the last name of the user
- **Locale key** - the key for the language in which OnApp Cloud UI will be available to the user
- **System theme key** - the key for one of the default system themes in which OnApp Cloud UI will be available to the user
- **Display infoboxes key** - the key that enables or disables the display of infoboxes to the user
- **Disable auto suspend key** - the key that enables or disables auto-suspending of the user
Suspend after key - the key that indicates the period of time in hours after which the user will be suspended

Suspend at key - the key that indicates the date and time when the user will be suspended

User group key - the group attribute to assign the user to a particular group

Roles key - the key of the role attribute that will create/sync the user's role in OnApp

Time zone key - the key of the time zone to which the user will be associated

6. Click Save button.

See also:
- Authentication
- Add New ID Provider
- SAML Authentication

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Identity%20Providers

3.12.1.2.4 SAML Troubleshooting
Some errors you may encounter while setting up a connection between OnApp and Identity Provider and how to solve them:

- missing name_id - make sure that you set up an email for a user on IdP
- fingerprint mismatch - ensure you are using an appropriate certificate or fingerprint. Note, the certificate takes precedence on the fingerprint if both are indicated
- ldap cert - the identity provider's certificate must be in PEM format
- Make sure to access OnApp CP via https before adding the identity provider instance to ensure the links containing in the Metadata file are correct. If the link in the Metadata is incorrect (http instead of https), please delete the IdP instance and create it again having accessed OnApp CP via https.

https://onappcloud.typeform.com/to/A64Euy#source=SAML%20Troubleshooting

3.12.1.3 TOTP Authentication
If you would like your users to utilize Google Authenticator or any similar application with their OnApp account to enhance security, you may enable TOTP authentication for two-factor authentication (2FA).

The admin user with the Update Settings or Any Action on Settings permission enabled can enable or disable TOTP authentication for the cloud. If TOTP is enabled in the cloud settings, the TOTP Authenticator slider will be displayed at the User Profile page, and users will be able to enable this feature for their account. If TOTP authentication is disabled for the entire cloud, the corresponding slider at the User Profile page will not be displayed. If a user has TOTP 2FA enabled, after entering login and password, one-time password must be entered as well to log in successfully.

An OnApp user will be able to enable TOTP two-factor authentication from the User Profile if TOTP is enabled for the entire cloud in settings. TOTP authentication can be enabled for users only by themselves, other users can not enable it for them.

- There is a limitation of one two-factor authentication method per user. However, a cloud admin can enable multiple two-factor authentication methods on the same cloud to be available for the end-users.
• Once the TOTP authentication is enabled successfully for a specific user, the Yubikey switch on User Profile page will become disabled.

3.12.1.3.1 Enable TOTP Authentication
To enable TOTP Authentication for the cloud:

1. Go to your Control Panel > Admin > Settings > Configuration > System tab.
2. Move the TOTP Login slider to the right.
3. Confirm the enablement.

Once TOTP is enabled for the cloud, users will be able to enable TOTP Authentication for themselves by the following instructions:

1. Go to your Control Panel > User Profile.
2. In the 2-factor authentication section, move the TOTP Authenticator slider to the right.
3. In the pop-up window that appears, scan the QR code with your mobile application (Google Authenticator or any other TOTP authentication app that complies with the RFC6238).

   The QR code will be regenerated every time you open the facebox.

4. Enter the generated one-time password to validate that the application works properly.
5. If the password is correct, the TOTP Authentication becomes enabled for the user account.

Once the two-factor TOTP Authentication is enabled, during the next login attempt the user will see a form for a one-time password after entering the login and password. If the one-time password is correct, the user will be logged in.

3.12.1.3.2 Disable TOTP Authentication

3.12.1.3.2.1 Disable TOTP for cloud
To disable TOTP authentication for the entire cloud, go to your Control Panel > Admin > Settings > Configuration > System tab and move the TOTP login slider to the left.

3.12.1.3.2.2 Disable TOTP for user
User can disable TOTP authentication for themselves by using the following instructions:

1. Go to your Control Panel > User Profile.
2. In the 2-factor authentication section, move the TOTP Authenticator slider to the left.
3. In the pop-up window that appears, scan the QR code with your mobile application.
4. Enter the generated one-time password to validate that the application works properly.
5. If the password is correct, the TOTP Authentication will become disabled for the user account.

User with the Disable TOTP authentication permission enabled can disable TOTP for any user without entering one-time password.

https://onappcloud.typeform.com/to/A64Euy#source=TOTP%20Authentication

3.12.2 Hardware Info
OnApp provides an overview of hardware that is used by compute resources and backup servers available in your cloud. On the Hardware Info page, you can view information on CPU, RAM, hard disk drives, networks and other hardware components. You can also create custom
fields to provide additional hardware information that you find necessary. In this document, you can find information on how to view and manage your hardware info.

**Permissions**

The level of user access to the **Admin > Settings > Hardware Info** page is controlled under the following permissions:

- **See all Hardware Info** - the user can see all hardware information in the **Settings** menu
- **Any actions on Custom Fields** - the user can take any action on custom fields

The access to the **Hardware Info** page for a particular compute resource or backup server is controlled under the **See all compute resources/See all backup servers** and **Update any compute resource/Update any backup server** permissions. For more information, refer to **OnApp Permissions**.

### 3.12.2.1 View Hardware Info

**To view the hardware information:**

1. Go to your Control Panel > **Admin > Settings** menu.
2. Click the **Hardware Info** icon.
3. On the page that appears, you will see the list of compute resources and backup servers available in your cloud. Click the **Show/Hide** button next to the label of a resource to expand/collapse the hardware infobox.
4. The hardware infobox provides the following information:
   - **Summary**
     - This section contains the basic information about the compute resource/backup server:
       - **Current Uptime** - the time the compute resource/backup server has been working and available, the number of its users, and the average load
       - **Total CPU** - the total amount of CPU (number of cores/frequency in MHz) allocated to the compute resource/backup server
       - **Memory** - the total amount of memory (GB) allocated to the compute resource/backup server
       - **Type** - the type of the compute resource, for example, KVM, etc. For backup servers, the type is **Backup server**
       - **OS** - the operating system of the compute resource/backup server
       - **Manufacturer/Model** - the manufacturer and model of the motherboard
       - **BIOS/Serial Number** - the system BIOS, its serial number and release date
   - **CPU**
     - This section shows the manufacturer and model of the processor and the processor base frequency in GHz.
   - **RAM**
     - This section provides the list of memory slots that includes information on the memory type, speed, and capacity (e.g. DDR4, 2400 MHz, 16384 MB).
   - **HD**
     - This section shows information on the manufacturer and model of the hard disk drive and the hard disk drive capacity in GB.
   - **Networks**
     - This section contains information about the manufacturer and model of network cards.
3.12.2.2 Add Custom Field

You can add a custom field that will be displayed on the Hardware Info page as an infotip next to the default field, to which the custom field was added.

To add the custom field to the hardware info:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Hardware Info icon.
3. Click the Edit button next to a label of a compute resource/backup server.
4. On the page that appears, you will see the list of sections available in the hardware infobox. Expand the section to which you want to add a custom field and click the + button.
5. In the Properties box, provide the following information:
   - Custom field - the label of the custom field that you want to add
   - Value - the value displayed in the custom field
6. When you have finished, click the Save button.

To view the custom field, hover over the icon that appears next to the default field, to which the custom field was added.
3.12.2.3 Edit Custom Field
To edit the custom field added to the hardware info:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Hardware Info icon.
3. Click the Edit button next to a label of a compute resource/backup server.
4. On the page that appears, you will see the list of sections available in the hardware infobox. Expand the section where you want to edit a custom field and click the Edit button.
5. In the Properties box, edit the following information:
   - Custom field - the label of the custom field that you want to add
   - Value - the value displayed in the custom field
6. When you have finished, click the Save button.
7. To view the custom field, hover over the icon that appeared next to the default field, to which the custom field was added.

3.12.2.4 Delete Custom Field
To delete the custom field added to the hardware info:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Hardware Info icon.
3. Click the Edit button next to a label of a compute resource/backup server.
4. On the page that appears, you will see the list of sections available in the hardware infobox. Expand the section from which you want to delete a custom field and click the Delete button.
5. Click the OK button to confirm the deletion.

See also:
- Manage Compute Resources
- Create and Manage Backup Servers
- OnApp Permissions

https://onappcloud.typeform.com/to/A64Euy#source=Hardware%20Info

3.12.3 License
OnApp Cloud provides two licensing models that enable you to use your Control Panel with a set of available services – Online and Offline or Isolated license. The Isolated license is applicable to a Control Panel that is run in an isolated environment that allows no external access from the public Internet. The Online license can be used for those CPs that are not managed in an isolated environment and allow external access.

For any queries regarding your OnApp license, please contact your account manager.
3.12.3.1 View License Details
To view your OnApp license details:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the License icon.
3. The Licensing page provides the following license details:
   - **License Type** - the license type
   - **License Key** - the license key
   - **License Status** - the license status that can be valid or invalid
   - **License Expires In** - the license expiry date
   - **XEN/KVM Compute Resources Limit** - the current usage and limit of XEN/KVM compute resources
   - **XEN/KVM Compute Resources Core Limit** - the current usage and core limit of XEN/KVM compute resources
   - **VCENTER Compute Resources Core Limit** - the current usage and core limit of vCenter compute resources
   - **Integrated storage Limit** - the current usage and limit of the integrated storage disk size measured in GB
   - **Virtual Server number limit on XEN/KVM Compute Resources** - the current usage and limit on the number of virtual servers on XEN/KVM compute resources
   - **Virtual Server number limit on VCENTER Compute Resources** - the current usage and limit on the number of virtual servers on vCenter compute resources
   - **Trader status** - the status of the trader
   - **Supplier status** - the status of the supplier

If you exceed the limits available in your license, you can no longer use the API and Control Panel. All your requests will be redirected to the Licensing page. If you reach the limit defined in your license, you will not be able to create new resources.

**Licensed Features**
The Licensed Features box contains the list of available features and indicates whether they are enabled or disabled for the present license:

- [Compute Resource Supported](#) - lists supported compute resources (e.g. Xen, KVM, vCloud, VMware that is vCenter, etc.)
- [Software Defined Storage](#) - shows whether [Integrated Storage](#) is enabled for the license
- [Infiniband](#) - shows whether [InfiniBand](#) is enabled for the license
- [AWS](#) - indicates whether [Amazon Web Service](#) is enabled for the license
- [DRaaS](#) - shows whether Disaster Recovery as a Service is enabled for the license
- [CP High Availability](#) - indicates whether [High Availability CP](#) is enabled for the license
- [Application Servers](#) - shows whether [application servers](#) are enabled for the license
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- Edge Accelerator - shows whether the accelerator server for CDN is enabled for the license

Starting from OnApp 6.0, CDN accelerator is free of charge and is enabled in your license by default.

- Service Add-Ons - shows whether service add-ons are enabled for the license
- SDN - shows whether Software-Defined Networking (SDN) is enabled for the license
- NSX for vCenter - shows whether NSX feature for vCenter is enabled for the license
- NSX for vCloud - shows whether NSX feature for vCloud is enabled for the license

At the bottom of the Licensed Features box, you can see the date of the last sync with the licensing server.

3.12.3.2 Online License
If you use an online license, use the following procedure to change your license key:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the License icon.
3. Click the Change License Key button to change the OnApp license key. You will be redirected to the System tab at the Settings > Configuration page where you can change and save a new license key.
4. To accelerate the license validation after changing the license key, click the Restart License Client button.

You can control a user's ability to restart license client by enabling or disabling the Restart Dashboard Client permission.

3.12.3.3 Isolated License
To use an isolated license for your CP, run the following steps:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Configuration icon.
3. In the System tab, move the Enable isolated license slider to the right.

Click the Save Configuration button.

Please be careful when setting licensing mode to isolated for a non-isolated license. The isolated licensing mode disables automatic licensing requests to the licensing server. In isolated mode, you will need to use a web browser to manually perform the licensing request/response exchange between the Control Panel and the licensing server. Only licenses specifically created for isolated operation are compatible with isolated mode. Switching to isolated mode while on an incompatible license will cause it to become invalid.

When the isolated license functionality is enabled, you can go to Control Panel > Admin > Settings > License and download a validation request or upload a validation request:

- Download Validation Request: Click this button to download a validation request. You then need to upload this request to the Licensing collection website. Uploading of the
validation request initiates downloading of the validation response that you will need to upload into your CP.

- **Upload Validation Response** Click this button to upload the validation response that you have earlier downloaded from the Licensing collection website. Choose the response file stored on your computer and click **Submit**.

  - You need to upload the validation response to your Control Panel within 30 minutes after receiving it, otherwise, the response will not be accepted on your Control Panel.
  - After the Control Panel upgrade, you need to manually sync with the dashboard by downloading the validation request and then uploading the validation response as described above.

3.12.3.4 License Expiration

You might see the following message on your Control Panel: **Your license expires in X days. After expiration, the Control Panel will be disabled and your users.**

Click here to see more information about the issue.

There are four reasons that might cause the issue:

- Your license actually expires.
- The OnApp licensing client server is down.
- The OnApp daemon is down.
- There is a communication issue between the Control Panel and OnApp licensing client servers.

Follow the next steps to determine and resolve the issue:

**Your license actually expires**

If your license is due to expire, please renew the license to access your cloud. If your license is not due to expire, but you see the corresponding message on your CP, follow the next steps.

**The OnApp licensing client server is down**

Access your Control Panel via SSH and run the following command:

```
service onapp-licensing status
```

If a response is other than OnApp Licensing Process is active. PID: xxxx, you need to restart the licensing process. Sometimes the PID might be active, but the licensing daemon is down. To troubleshoot the issue, check the dashboard_client.log file in the /onapp/interface/log directory. If there is no information in the dashboard_client.log file, it means that the licensing daemon is down.

To resolve this issue:

- Restart the licensing client by running the following commands:

  ```
  service onapp-licensing stop
  service onapp-licensing start
  ```

To confirm that the issue has been fixed:
Go to your Control Panel to check that the corresponding message is no longer displayed. You can also log in to your admin.onapp.com account and go to the Licenses section. Click a label of the affected license and go to the Debug section. The latest date in the Debug section must be a current date. If the latest date in the Debug section is not the current date and it is not updated in a few minutes, follow the next steps.

**The OnApp daemon is down**

If the OnApp licensing server is up and running, but you still see the message, it might be an indication that the OnApp daemon is down. In such a case, raise a support ticket to have the daemon issue investigated.

**There are communication issues between the Control Panel and OnApp licensing client servers**

Verify that Port 443 is open for outbound traffic from a Control Panel server. The port should be open for the Control Panel server to connect with the OnApp licensing server. For more information, see Required Ports.

If the Port 443 is open, but the licensing client running on your CP can't connect with the OnApp licensing server, you can receive this warning:

_The licensing timeout starts at 14 days - if the CP fails to contact our licensing server within those 14 days then the CP will lock itself out - Virtual Machines on the HVs will continue to run, but all access to the API will fail and access to the UI tries to redirect to the licensing page (which will give a permission error if the user isn't an admin user or otherwise has permissions to view the license details)_

If the CP does lock out, you need to resolve the licensing issue: either the technical one or contact your account managers to renew the license.

https://onappcloud.typeform.com/to/A64Euy#source=License

### 3.12.4 Configuration Settings

The purpose of a user service account is to perform actions inside a virtual server, such as configuring an IP, disk, etc. If the service account is disabled or deleted, all operations related to OS do not work.

The configuration settings screen lets you change various aspects of your OnApp installation.

To edit these OnApp configuration settings:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the **Configuration** icon. Click the tabs to edit the relevant config settings (System, Backups/Templates, Interface, Defaults) – these are explained in the subsections that follow.

https://onappcloud.typeform.com/to/A64Euy#source=Configuration%20Settings

### 3.12.4.1 Edit Backups/Templates Configuration

This section contains information on how to edit backup or template server, backup processes, incremental backups and other application settings.

To edit backups or templates configuration, do the following:

1. Go to your Control Panel > Admin > Settings menu, and click the **Configuration** icon.
2. Click the **Backups/Templates** tab to manage the following settings:
If you change any settings here and save, the Control Panel server will restart OnApp services.

3.12.4.1.1 Manage Templates
To enable template update and install, set the following parameters:


- **Delete template source after install** - enable this option to delete the downloaded templates after they were distributed.

  Do not enable this option if the location of your templates is shared with CP box. Otherwise, recently downloaded templates may be removed.

3.12.4.1.2 Paths to
Sets paths for various OnApp files (shown here with default path examples)

- **Templates** - `/onapp/templates`
- **Recovery templates** - `/onapp/tools/recovery`
- **Backups** - `/onapp/backups`

3.12.4.1.3 Backup/Template Server
Backups and templates can be stored on a remote server or a mounted disk. To store backups and templates remotely, configure the following settings:

- **Allow incremental backups** - move this slider to the right to enable incremental backups. Incremental backups are advanced method of taking backups. During the incremental backup, only the changes made after the last backup are archived instead of backing up the whole target. See Virtual Server Backups for details. Incremental backups are not available for Windows virtual servers, as well as under VMware and SolidFire.

  If the **Allow incremental backups** option is enabled, the new provisioning scheme will be used (with unpacked templates). Otherwise, the system will use the traditional provisioning method.

  When the incremental backups option is enabled, the ability to create full backups will be disabled (except for the servers that do not support incremental backup type).

  Existing full backups will be still accessible via **Backups > Images** menu.

  If you are using incremental backups option AND ssh_file_transfer is disabled, you should either enable dedicated backup servers in your cloud or share the backups and templates folders (paths) between your compute resources.

- **Use SSH file transfer** - move this slider to the right to enable SSH data transfer for your template/backup server. If this option is not enabled, you will need to mount the templates/backup server manually. It is not possible to utilize SSH file transfer option when incremental backups are enabled.

  Skip this option if you are using incremental backups.

- **Server IP** - specify the IP address of the backup/template server.

- **User login** - the login used for remote server authentication. A password is not required, but it is required that you store a host key.
• **SSH options** - the SSH protocol options that set the rules and behavior of how to log into the remote server. By default, the options are set to omit adding new host keys to the host file and skip password authentication. They also specify the path where the host key is stored.

3.12.4.1.4 Backup Processes

- **Total number allowed** - the maximum number of compute resource, backup server and data store backup processes allowed at once on the Control Panel.
- **Total per data store** - if this number exceeds the overall total, the overall total limit will be enforced.
- **Total per compute resource** - if this number exceeds the overall total, the overall total limit will be enforced.
- **Total per backup server** - if this number exceeds the overall total, the overall total limit will be enforced.

For example: if total number allowed is 10, and total per data store is 3, total per backup server is 3, and total per compute resource is set to 4, then up to 10 backups can be taken at once – 3 per data store, 3 per backup server, and 4 per compute resource.

3.12.4.1.5 Incremental Backups

*Minimum Disk Size Calculation Coefficient for Template* - this parameter is for incremental backups only. During the backup conversion to template, backup’s size is multiplied by this coefficient to make sure that template will be slightly bigger than the actual size for correct performance.

3.12.4.1.6 Rsync Options

These options are for clouds with enabled incremental backups. Your cloud must have a dedicated backup server configured with one of the following file systems: ext2, ext3, ext4, reiserfs, or xfs.

- **Store extended attributes** - enable this option to store extended attributes when taking incremental backups.
- **Store ACLs** - enable this option to store access control lists.

3.12.4.1.7 Windows Auto-Backups

*Force Windows Auto-Backups* - enable this option to take raw disk image backups. This option is designed as an extreme measure when the backup cannot be taken due to NTFS file system problems.

3. Click the **Save Configuration** button to finish.

See also:

- [Edit Interface Configuration](#)
- [Edit Defaults Configuration](#)
- [Edit Infrastructure Configuration](#)
- [Edit System Configuration](#)

https://onappcloud.typeform.com/to/A64Euy#source=Edit%20Backups/Templates%20Configuration

3.12.4.2 Edit Defaults Configuration

This section contains information on how to edit password complexity, new virtual servers, firewall, and other application settings.

To edit defaults configuration, do the following:

1. Go to your Control Panel > **Admin** > **Settings** menu, and click the **Configuration** icon.
2. Click the **Defaults** tab to change the following application settings:
Please note that the system will restart OnApp services automatically after you save new configuration.

Enable password protection on user deleting - move this slider to the right to enable confirmation of user deletion by means of administrator password.

Enforce password complexity - move this slider to the right to specify the following password complexity configuration settings:

- **Minimum length** - specify minimum required password length (0-99). The default value is 6.
- **Enforce at least one upper and lower case letter** - move this slider to the right to enforce user using both uppercase and lowercase letters in their password.
- **Enforce at least one letter and number** - move this slider to the right to enforce user using both letters and numbers in their password.
- **Enforce symbols** - move this slider to the right to enforce user using symbols in their password.
- **Enforce unique password every time** - move this slider to the right to make user enter unique password each time they change the password (the last 12 passwords are saved in OnApp configuration). This refers to the user account passwords only.
- **Lockout attempts** - the number of unsuccessful login attempts that are allowed before user’s account is locked out
- **Expire (Months)** - specify the password expiry period in months.

To save password complexity configuration disable the Enforce Password Complexity option and enable it again.

Different passwords are used for each VS. The passwords are stored in the database and are encrypted.

Allow advanced VS management - move this slider to the right to enable managing the advanced configuration for virtual servers in your CP

3.12.4.2.1 Virtual Servers
- **Force shutdown on power cycle failure** - move the slider to the right to use Virsh destroy during system shutdown or reboot

3.12.4.2.2 New Virtual Servers
- **Default Image Template** - choose a particular OS template as the default for VS creation. A new virtual server will be created using this template, unless otherwise set in the wizard.
- **Service Account Name** - specify the service account name that will be automatically created on VMware virtual servers to be able to communicate with them.
- **Default acceleration policy** - move this slider to the right to enable default acceleration policy and have all the newly created VSs accelerated by default. Note that when you enable this option here, then the Acceleration slider will be missing in the VS creation wizard.
- **Default virsh console policy** - move this slider to the right to be able to access all the newly created virtual servers via the Virsh console.
VMware client tools are used to communicate with a VS. A user service account is created when provisioning a VS to ensure the same name is used for both Windows-based and Linux-based VSs.

3.12.4.2.3 Firewall
- **Drop firewall policy allowed ips** - enter the IP addresses to be allowed as an exception if the default firewall policy is DROP
- **Default firewall policy** - default settings for a VS’s Networking > Firewall tab (ACCEPT/DROP). Changes in the default firewall policy will be applied only to those VSs that are created after these changes are applied.
- **Allow to start more than one Virtual Server with the same IP** - move this slider to the right to allow starting up virtual servers with one IP address.

3.12.4.2.4 SSH Options
- **SSH port** - specify the port used to connect to compute resources and backup servers.
- **SSH timeout** - specify the timeout used when connecting to the compute resource and backup server. The default value is 10 seconds.

3.12.4.2.5 SSH Keys
- **SSH keys** - click to manage the administrator SSH keys. The keys will be automatically assigned to all VSs which will be created in the cloud later.
  
To assign keys to existing VSs, go to the VS Overview > Properties menu.

3.12.4.2.6 Recipes Options
- **Recipe temporary directory** - specify the temporary recipe directory where all recipe scripts (on Control Panel, compute resources and virtual servers) are generated. The default value is /tmp.

3.12.4.2.7 Migration Options
- **Migration rate limit** - the maximum rate limit per one transaction used for migrating the VS. The default value is 10 MiB.
- **Simultaneous migrations per hypervisor** - the maximum amount of transactions which can be run simultaneously on the target compute resource when migrating a VS. The default value is 5. Applicable only to Migrate VS and Disks.

3. Click the **Save Configuration** button to finish.

See also:
- Edit System Configuration
- Edit Interface Configuration
- Edit Infrastructure Configuration
- Edit Backups/Templates Configuration

https://onappcloud.typeform.com/to/A64Euy#source=Edit%20Defaults%20Configuration

Leave feedback

3.12.4.3 Edit Infrastructure Configuration
This section contains information on how to edit delay between executing background tasks, background processes, RabbitMQ, and other application settings.

To edit infrastructure configuration, do the following:
1. Go to your Control Panel > Admin > Settings menu, and click the **Configuration** icon.
2. Click the **Infrastructure** tab to change the following application settings:
Delay in seconds between executing background tasks

- **Backup taker** - this process schedules auto-backups
- **Billing event processor** - this process generates billing statistics
- **CDN sync** - synchronization between CDN and OnApp. By default, this parameter is set to 20 minutes.
- **Cluster monitor** - this parameter is deprecated
- **Compute resource monitor** - this parameter is deprecated
- **Schedule runner** - this process runs schedules which request auto-backups to be taken
- **Transaction runner** - this process covers the following tasks: transactions_processor - the task which is responsible for running transactions, SupplierRunnerProcessor - this process relates to Federation and starts transactions on the seller cloud which send notifications to the Market, TraderRunnerProcessor - this process relates to Federation and starts transactions which send different requests to the Market and process notifications from the seller
- **Snmp stats level1 period** - this process gathers information about compute resources uptime and virtual servers’ statuses
- **Snmp stats level2 period** - this process gathers information about the disk usage, network usage, CPU usage statistics and the list of virtual servers
- **Snmp stats level3 period** - this process generates the list of volume groups and logical volumes

If you change any of the **Snmp stats** parameters, you need to restart the OnApp Engine to save changes. To restart the OnApp Engine run the following commands in the console:

```
service onapp-engine stop
service onapp-engine start
```

Background processes

- **Amount of service instances** - the number of system processes that perform the OnApp engine tasks simultaneously. Each of the system processes performs the task using a separate CPU core. The default value is 2. Currently, the maximum value is 12. If you input a value larger than 12, the number of system process will still be 12.
- **Transaction standby period** - the time which a transaction spends in stand-by period before requeueing to pending queue. The default value is 30. We recommend increasing this parameter for clouds with thousands of pending long lasting transactions (like backups) in order to decrease CPU/IO load.
- **Time period, given to OnApp Engine to perform graceful stop** - if the OnApp Engine is stopped, running transactions will fail after the amount of time (seconds) indicated by this parameter. By default, this parameter is set to 300 seconds.
- **Log level** - log detailed level: debug, info, warn, error and fatal. This parameter is available only for CPs in development mode. It is not displayed for Control Panels in staging or production modes. By default, this parameter is set to 'info'.

**RabbitMQ**

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

### Zabbix Settings
Starting with the 4.2 version, OnApp uses Zabbix for autoscaling. If you already have a Zabbix server, you can connect it to your cloud by adding the necessary information in the fields provided below:

- **Zabbix host** - the IP address of your Zabbix server
- **Zabbix url** - the path to the Zabbix web-interface
- **Zabbix user** - your Zabbix user
- **Zabbix password** - your Zabbix password

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

### See also:
- **Edit System Configuration**
- **Edit Backups/Templates Configuration**
- **Edit Interface Configuration**
- **Edit Defaults Configuration**

### Leave feedback

### 3.12.4.4 Edit Interface Configuration
This section contains information on how to edit locales, pagination, system themes, and other application settings.

To edit interface configuration, do the following:

1. Go to your Control Panel > **Admin** > **Settings** menu, and click the **Configuration** icon.
2. Click the **Interface** tab to change the following application settings:

   - **Locales** – select locales which will be available for the users from the drop-down menu. You may select multiple locales.
   - **AJAX update rates (ms)**
     - **VS Status** - AJAX pagination update time for virtual servers
     - **Dashboard/logs/other** - AJAX pagination update time for dashboard, logs, and other screens
   - **Pagination**
     - **Max items limit** – set the maximum amount of items which can be displayed per page applying the **Show All** button in the list. If the overall number of the items in the list exceeds the number entered herein, the **Show All** button will not be available in the list menu.
- **Log items pages limit on dashboard** – set the maximum amount of pages to list log items in the Activity Log section at the main Dashboard page. You can view all the available log items at the Logs page, including those items that cannot be displayed at Dashboard within the specified amount of pages.

**System Themes**

- **Default system theme** – select a system theme from a drop-down menu. It can be light or dark.
- **Default custom theme** – select a custom theme that will be automatically applied to all future organizations/user groups. If you do not specify the custom theme, new entities will use the default one.

**Dashboard Statistics**

- **Dashboard stats** – select the statistics, which will be shown on a dashboard, from a drop-down menu.

3. Click the **Save Configuration** button to finish.

**See also:**

- [Edit System Configuration](#)
- [Edit Backups/Template Configuration](#)
- [Edit Defaults Configuration](#)
- [Edit Interface Configuration](#)

https://onappcloud.typeform.com/to/A64Euy#source=Edit%20Interface%20Configuration

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3.12.4.5 Edit System Configuration

This section contains information on how to edit Yubico, CloudBoot, OnApp Storage and other application settings.

To edit system configuration, do the following:

1. Go to your Control Panel > **Admin** > **Settings** menu, and click the **Configuration** icon.
2. Click the **System** tab to change the following application settings:

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

3.12.4.5.1 License Info

- **Key** - the key for your OnApp installation.
- **Enable isolated license** - move this slider to the right to enable the usage of an Isolated License on your CP.

3.12.4.5.2 File Upload Configuration

- **Max upload size** - the maximum file size in bytes for ISOs that can be uploaded to boot a VS.

3.12.4.5.3 TOTP

- **TOTP login** - enabling this feature will force TOTP users to log into the cloud only with their third-party credentials and disable the possibility for them to log with OnApp login and password.
3.12.4.5.4 API Usage
• *Disable plain password usage for API access* - move the slider to the right to restrict the use of plain password and login for API access.

We strongly recommend that you disable plain password usage for API access for security reasons.

3.12.4.5.5 SAML
• *Force SAML login* - enabling this feature will force SAML users to log into the cloud only with their third-party credentials and disable the possibility for them to log with OnApp login and password.

3.12.4.5.6 Yubico
By setting up the *Use Yubico login* option for your cloud, you give your customers the ability to log into OnApp by entering their credentials and using a Yubikey.

• *Use Yubico login* - move the slider to the right to enable logging in using a Yubikey
• *Yubico client ID* - enter your Yubico client ID
• *Yubico secret key* - enter your Yubico secret key
You can retrieve your Yubico client ID and secret key at [https://upgrade.yubico.com/getapikey/](https://upgrade.yubico.com/getapikey/).

3.12.4.5.7 Compute Resources
• *Requests before marked as failed* - determines how many times the Control Panel server will attempt to contact a compute resource before failover is initiated. For the Integrated Storage, we recommend increasing this parameter to 30, so that the storage platform has enough time to mark the compute resources accordingly and allow the VSs to start up after a failed compute resource. In integrated storage statuses of backend, nodes are marked as inactive approximately in 3 minutes after a backend node has stopped reporting its status. Integrated storage is a distributed system and it takes some time to sync/converge metadata across nodes.

The time before the CP initiates failover may differ depending on the number of compute resources and their load.

• *Ping hosted virtual servers before initiating failover* - enable this feature for the VSs to ping the compute resource on which they reside to make sure it is offline before migrating to another compute resource.

3.12.4.5.8 VS Console Ports
These are the ports used to remotely connect to virtual servers using the integrated VNC console.

• Set the port range using the *First port* and *Last port* fields.

3.12.4.5.9 Miscellaneous
• *Support help email* - the email to which requests are sent from the Help form at Control Panel
• *System host* - enter a server IP or URL. Email alerts link to transaction logs for alert events, and those logs are opened from the server configured here.
• **Application name** – here you may change the application name, which is displayed at the welcome screen.

• **Block Size (MB)** - the block size in MB for disks which is used when migrating disks to another data store. This parameter also regulates the block size during backup creation. The default value is 8 MB.

• **Config comment** - this text is added by OnApp to system configuration files and is stored at `etc/resolv.conf`, `etc/network/interfaces` and `etc/hosts` files.

• **Session Timeout (minutes)** - the timeout between sessions within OnApp where the default value is 480 minutes

• **Enable super admin permissions** - move this slider to the right to activate a super admin feature that will help to restrict a user to create roles, assign users to roles and log in to CP as users with permissions exceeding her or his own permissions. Note that the corresponding role does not appear in the list of roles at the Dashboard > Roles and is not assigned to any user. For more information on how to create and manage this role, refer to [Create and Manage Super Admin Role](#).

• **Show IP address selection for new VS** – move this slider to the right to enable IP address assignment during VS creation.

• **Transaction approvals** - move the slider to the right to enable approvals.

• **Number of simultaneous transactions** - the number of transaction runners which the daemon will execute at the same time.

• **Zombie transaction time** - set the duration in minutes after which the transaction running longer than the indicated time will be marked as zombie.

• **System alert reminder period** - the duration in minutes for the system to email alerts to admin if the failover resources are not enough. The default value is 60.

• **Enable wrong activated logical volume alerts** - move the slider to the right to enable system alerts.

• **Wrong activated logical volume minutes** - specify the alert emails frequency in minutes.

• **Timeout Before Shutting Down VSs (30-600 sec)** - specify the VS shutdown period within the given range. This parameter indicates the time during which OnApp will try to shut down a VS gracefully; after the selected period the VS will be shutdown forcefully. This will allow refusing the shutdown if the VS is booting and retry every 30 seconds till it is registered.

• **IP address reservation time** - specify the duration in seconds during which the IP address will be reserved for a user and unavailable for other users. The default value is 60.

• **Max number of IP addresses which can be assigned to user simultaneously** - specify the maximum number of IP addresses that can be assigned to user simultaneously. The default value is 256.

• **Allow VS password encryption** – move this slider to the right to enable root password encryption for virtual servers.

- For more information on the VS password encryption, refer to the [FAQ](#).

• **Allow VMware Compute resource password encryption** – move this slider to the right to enable root password encryption for VMware compute resources.
• **Use HTML 5 VNC console** - move this slider to the right to enable the use of HTML 5 VNC console. VNP ports from the CP server are not required if the HTML 5 console is enabled.

   It is only possible to use HTML 5 console if the Control Panel server is based on CentOS 6 or CentOS 7.

• **Max network interface port speed** - maximum NIC port speed in MB for the appliance network

• **Allow users connect to AWS** - move this slider to the right to enable AWS for the cloud

3.12.4.5.10 CloudBoot

• **Enable CloudBoot** - move this slider to the right to enable/disable the PXE boot system on the cloud

• **Enable InfiniBand boot** - move the slider to enable InfiniBand mode

• **Static Config target** - the IP of NFS server that contains virtual server image templates

• **CP server Cloudboot target** - the IP of Control Panel server

• **CloudBoot Domain Name Servers** - IP of domain name servers

3.12.4.5.11 OnApp Storage

• **Enable OnApp Storage** - move this slider to the right to enable/disable the OnApp storage on the cloud. This option is unavailable if Enable CloudBoot option is switched off.

   *Use Local Read Path, Use unicast, and Enforce datastore redundancy across HVs options are unavailable if Enable OnApp storage option is switched off.*

• **Use Local Read Path** - move this slider to the right to minimize the network throughput dependency for read-heavy workloads. When the Use Local Read Path feature is enabled, reads go over the local software bridge to a local replica of the data rather than traverse a physical NIC + switch.

• **Use unicast** - switch from multicast to unicast mode. Instead of CP server setting a multicast 'channel' and restarting all compute resource control stacks that are added to the zone, the CP server now maintains the list of unicast hosts. This is the list of IDs of all hosts in the same zone separated with a comma. CP server updates the unicast hosts list for all compute resources whenever any member is added or deleted from the set. This parameter is stored in the onappstore.conf file, and the CP server explicitly copies the /rw/onappstore.conf to /onappstore/onappstore.conf on all compute resources whenever a change is made.

   Please, be aware this is a beta option. We suggest switching to unicast mode only in case you are not able to use multicast. Also, if at least one virtual server is running - unicast cannot be turned on.

   When the unicast mode is enabled, compute resources must be kept online to maintain full coherency of the database. In the event when a compute resource is offline but still enabled in the Control Panel, any subsequent reboots of other nodes will cause a delay in a convergence of the Integrated Storage database across the nodes that have been rebooted. To avoid this scenario, either:
• Ensure that all compute resources in the unicast group are active and booted (recommended) or
• Remove compute resources from the Control Panel if they are inactive for an extended period of time

• Enforce datastore redundancy across HVs - when the slider is enabled, it will be possible to create IS data stores only with the disks that are replicated between different compute resources (in one compute zone). In this case, disks will be created only when there are at least two compute resources in the cloud. If this option is disabled, it will be possible to create data stores with disks that are replicated on hard drives of the same compute resource. In this case, if the compute resource crashes, no failover for disks is possible.

3.12.4.5.12 OnApp Storage HealthChecks

- **Content distribution within Compute Resource threshold ratio** - specify the percentage ratio of the average free space for all nodes in the compute resource. The default value is 5%. You will receive a warning in the storage health check if the free space on one of the compute resource's nodes will be smaller by the indicated value as compared to the other nodes on the compute resource.

- **Content distribution across Compute Resources threshold ratio** - specify the percentage ratio of the average free space for all compute resources within one compute zone. The default value is 5%. You will receive a warning in the storage health check if the free space on one of the compute resources in the zone will be smaller by the indicated value as compared to the other resources in the compute zone.

- **Node capacity uniformity within DataStores threshold ratio** - specify the value (%) by which the size of a node in a data store can differ from the average node size in this data store. The default value is 5%. If this value is exceeded, you will receive a warning in the storage health check.

3.12.4.5.13 DRaaS

• **Enable DRaaS** - enable DRaaS locally on your Control Panel

3.12.4.5.14 Billing Management

• **Disable billing** - move this slider to the right to disable prices display. All prices-related pages and fields will be hidden including but not limited to:
  o Rate Cards in the Buckets menu
  o Virtual Servers (all types of the servers)
  o User Profile
  o User Group

Also, all price-related statistics will not be calculated at the VS overview details page and at the User Profile page.

It is possible to disable billing only if there are no compute zones that are added to Federation or any compute zones subscribed from the Federation on your OnApp CP.

**If your OnApp version is older than 5.9**

You can disable the billing-related permissions, to hide the billing information from the Control Panel.
3.12.4.5.15 Statistics Management

- **Time of instant statistics storage (days)** - the number of days the instant statistics from compute resource will be stored. Starting with OnApp version 5.0, the default value for new installations is 1. For the clouds that have been upgraded from OnApp version 4.3, the default value is 10.

- **Enable hourly statistics archiving** - move the slider to the right to switch on archiving for hourly statistics. If enabled, hourly statistics will be converted into monthly and stored as an archive for all the period that exceeds the time specified in the **Time of hourly statistics storage (months)** parameter below.

- **Time of hourly statistics storage (months)** - this parameter configures how long you want the detailed hourly statistics to be stored in the database before being converted into monthly statistics. The minimum default value is 2. For example, if you set that parameter to 10, the hourly statistics will be stored for the current month and the 10 previous months. And everything older than 10 months will be sent to the archive (that is converted into monthly statistics).

- **Period to store IP reports (months)** - the number of months the reports on IP address usage are stored. The statistics older than this period are cleaned. By default, the statistics are stored for six months.

- **Enable logs cleaning** - this parameter enables logs cleaning after the time period, specified in the **Period to store logs (days)** parameter below.

- **Period to store logs (days)** - this parameter configures how many days you want logs to be kept in a database before deletion.

3.12.4.5.16 Custom Tools In Recovery Images

- **URL for custom tools** - specify the full URL to the tools file packed with GNU Tar + Gzip, like `http://domain.com/file.tgz`. These tools will be copied to a recovery VS after rebooting in recovery mode. The users will then be able to unpack and use these tools as they wish to.

If the recovery image file is too large, the virtual servers may fail to start up in the recovery mode. We highly recommend you to test the custom recovery image on the virtual server with minimum RAM size before using it.

3.12.4.5.17 SNMP Trap Settings

- **Snmptrap addresses** - a set of IPv4 management network IP(s) from the CP server separated by a comma. These IP addresses will be used for communication between Control Panel and compute resources.

- **Snmptrap port** - port used for snmptrap. This must be greater than 1024.

We recommend that you do not change the default value. In case you change the port value on your OnApp CP - the corresponding change of the port `VM_STATUS_SNMP_PORT` should be made for all compute resources in `/etc/onapp.conf` file.

3.12.4.5.18 OnApp Dashboard API

- **Access Token** - enter the Access token that is displayed in your OnApp Dashboard for your user account details. This token is used to synchronize locations between OnApp CP and OnApp Dashboard.
3.12.4.5.19 Instance Packages

- **Instance Packages number** - when the specified number is reached, instance packages are shown in the linear view in the virtual server creation wizard for easier instance package selection. The default value is 3.

3.12.4.5.20 Allow Control Panel to Send Crash Reports

- **Allow to collect errors** - move the slider to enable Control Panel to collect, aggregate, encrypt and send crash reports. If you enable this feature, the error list from your Control Panel will be sent to OnApp in a form of an encrypted API call. By default, this option is disabled.

3. Click the **Save Configuration** button to finish.

See also:

- [Edit Backups/Templates Configuration](https://onappcloud.typeform.com/to/A64Euy#source=Edit%20System%20Configuration)
- [Edit Interface Configuration](https://onappcloud.typeform.com/to/A64Euy#source=Edit%20System%20Configuration)
- [Edit Defaults Configuration](https://onappcloud.typeform.com/to/A64Euy#source=Edit%20System%20Configuration)
- [Edit Infrastructure Configuration](https://onappcloud.typeform.com/to/A64Euy#source=Edit%20System%20Configuration)

3.12.5 Look & Feel

You can change the look of OnApp Control Panel in several ways:

- Using Look & Feel UI options
- Adding your custom CSS rules
- Adding your custom Java Scripts

Please be aware that OnApp supports the following:

- Two latest versions of most popular browsers are supported (Google Chrome and Firefox)
- Opera is not supported
- JavaScript must be enabled in the browser

3.12.5.1 Theme

You can manage various aspects of the Control Panel’s look & feel, including the logo displayed, background colors and other graphics and thus receive a unique theme.

To create a custom theme:

1. Go to your Control Panel > **Admin** > **Settings** menu and click the **Look & Feel** icon.
2. On the following page, click .
3. Use the fields provided to manage the UI, as explained below:

**Theme options**

- **Label** – give a name to your theme.
- **Active** – move the slider to specify whether the theme is displayed or not. If this option is enabled, the default colors and graphics are used, irrespective of other settings.
User Group
  o **User groups** - select the groups of users for whom you wish to apply the theme.

General
  o **Title** - enter the title which will be displayed at the top left corner of the browser window.
  o **Logo** - click the **Choose File** button to choose a custom logo.
    ▪ Move the **Disable Logo** slider to the right to prevent a logo from displaying (no logo will be displayed)
  o **Logo mini** - click the **Choose File** button to choose a custom logo mini.
    ▪ Move the **Disable logo mini** slider to the right to prevent a logo mini from displaying (no logo mini will be displayed)
  o **Favicon** - click the **Choose File** button to choose a custom logo.
    ▪ Move the **Disable favicon** slider to the right to prevent the favicon from displaying (no favicon will be displayed)

Powered by
  o **Hide** – move the slider to the right to remove the Powered by OnApp message at the top of the navigation pane.
  o **URL** – enter an URL you wish to link to instead of [http://www.onapp.com/](http://www.onapp.com/).
  o **Color** - this is the color displayed in the main body of the page (e.g. behind the fields you're currently editing).
    ▪ To change the color, click the field to pop up a palette chooser, or enter a CSS color code.
    ▪ To revert to the default color, leave this field blank.
    ▪ The color will not be displayed unless any full-screen Background Image you're using is disabled.
  o **Text** – specify the text which will be added after **Powered by** instead of OnApp.

Header&Footer HTML
  o **Header** - enter the HTML codes to display instead of default header.
  o **Footer** - enter the HTML codes to display instead of default footer.

4. Click **Save Theme** to create and apply a theme.

---

3.12.5.2 Custom CSS Rules
You can add your own CSS rules to customize OnApp Control Panel.
To add CSS rule:

2. Create `custom.css` file with CSS rule code you want to add. For example:

   ```css
   body * {background-color: lightblue;}
   ```
3. Save the file.
4. Go to OnApp Control Panel and refresh it. The background color will be changed:

   If you would like to make custom changes to the CSS of your OnApp Control Panel, the files to edit can be found through ssh on your control server here:

   ```
   /onapp/interface/public/stylesheets
   /onapp/interface/public/assets
   ```

3.12.5.3 Custom Java Scripts

You can add your own Java scripts to customize OnApp Control Panel.

To add a Java script:

2. Create a `custom.js` file with a code you want to add.
3. Save the file.
4. Go to OnApp Control Panel and refresh it.

See also:

- Languages
- Currencies
- Control Panel Configuration

https://onappcloud.typeform.com/to/A64Euy#source=Look%20and%20Feel
3.12.6 Localization and Customization

The search box in the Localization and Customization menu allows you to search by the following parameters:

- Item ID
- English Value
- Translation

3.12.6.1 Search Localization & Customization Menu

To search the Localization and Customization menu:

1. Log in to your Control Panel.
2. Go to Admin > Settings menu.
3. Click the i18n Customization icon.
4. Click the required language Name (e.g. "English").
5. Type the search phrase into the search box and click Search.
6. If required, make changes and click Apply.

https://onappcloud.typeform.com/to/A64Euy?source=Localization and customization

3.12.7 Global Whitelists

Global whitelist enhances the security of your admin account by restricting login from the IP addresses that are not on the list. It is also applied when using the Login as option for an admin to log in as another user.

The whitelists of your end users will not be affected by the global whitelist.

3.12.7.1 Configure Global Whitelists

1. Go to /onapp/interface/config/on_app.yml
2. Specify the IP addresses or CIDR for the global_white_list_ips parameter in the on_app.yml file. Example

   ```yaml
   global_white_list_ips:
   - 127.0.0.1
   - 122.105.78.0/26
   ```
3. After modifying the on_app.yml file, restart the httpd service:

   ```
   service httpd restart
   ```

Once the httpd service is restarted, the global whitelist is configured for your cloud.

See also:

- Advanced Configuration Settings
- User Accounts
- Login Screen

https://onappcloud.typeform.com/to/A64Euy?source=Global%20Whitelist

Leave feedback
3.12.8 Service Insertion Framework Configuration

The Service Insertion Framework allows you to bring other portals into OnApp. Also, you can integrate an insertion framework into OnApp, which will display a web page within the user profile in the OnApp Control Panel (legacy mode).

- Ensure that the Service Insertion Groups and Service Insertion Pages permissions are on before managing service insertion framework. For more information, refer to the OnApp Permissions section of this guide.
- Be aware that insertion framework may not be shown when header has X-Frame-Options. User can be logged in only if embedded source accepts credentials via GET request.

3.12.8.1 Configure Service Insertion Framework

To configure a service insertion framework:

1. Create service insertion group, which is a container for service insertion pages. Service insertion group which is available for a chosen audience.
2. Create service insertion page(s), where you will add a URL, which will be displayed in the frame.
3. When service insertion groups and pages are configured, they will appear at Control Panel sidebar menu. Click the service insertion page's label to display the page in the main content panel.

Below you can find detailed information on how to create and manage service insertion groups and pages.

3.12.8.2 Service Insertion Groups

3.12.8.2.1 Create Service Insertion Group

To create a service insertion group:

1. Log in to your OnApp Control Panel.
2. Go to Admin > Settings > Look & Feel icon.
3. On the page that loads, click the Service Insertion Framework > Service Insertion Groups tab.
4. On the following page, click upper right or the Add Service Insertion Group button lower right.
5. Fill in the following fields:
   - Label - fill in the name for service insertion group
   - Weight - select value from 10 to 0 to determine which group comes first. If all groups are weighted the same, then the list is displayed based on order retrieved from the database.
   - Target - choose the audience, which your service insertion group will be available to:
     - Global - service insertion group will be available to all users
     - User - Users field appears, where you indicate user(s), whom your service insertion group will be available to
     - User group - the User groups field appears, where you indicate user group(s), to which your service insertion group will be available
6. Click Submit.
3.12.8.2.2 Edit Service Insertion Group
To edit a service insertion group:
1. Go to your OnApp Control Panel > Admin > Settings > Look & Feel icon.
2. On the page that loads, click the Service Insertion Framework > Service Insertion Groups tab.
3. The list of all service insertion groups will load. Click the Actions icon next to the required service insertion group, and click Edit or Delete if necessary to edit or remove the group respectively.

3.12.8.3 Service Insertion Pages
3.12.8.3.1 Create Service Insertion Page
To create a service insertion page:
1. Go to your OnApp Control Panel > Admin > Settings > Look & Feel icon.
2. On the page that loads, click the Service Insertion Framework > Service Insertion Pages tab.
3. On the following page, click the upper right or the Add Service Insertion Page button lower right.
4. Fill in the following fields:
   - Label - fill in the name for the service insertion page
   - URL - add URL, which will be displayed in the frame
   - Legacy mode - move the slider to the right to enable legacy mode and fill in the corresponding fields:
     - Users - select the appropriate users whose username will be used to form an URL
     - User field parameter - fill in the user field label
     - User field - select the required user parameter value from the drop-down list. This could be a login, email etc.
     - Password field parameter - fill in the password field label
     - Password field - select the password field value from the drop-down menu. These are the Additional fields of the specified user.
5. If a legacy mode is disabled, fill in the following:
   - Weight - select from 10 to 0 to determine which page comes first in the group. If all pages are weighted the same, then the list is displayed based on order retrieved from the database.
   - Service insertion groups - assign page to service insertion group(s)
   - Choose one of the credentials types (Global static, User based or User group based) from the drop-down list and fill in the corresponding fields:
     - User field parameter - fill in the user field label
     - User field - select the required user parameter value from the drop-down list. This could be a login, email, etc.
     - Password field parameter - fill in the password field label
     - Password field - select the password field value from the drop-down menu. These are the Additional fields of the specified user.
If you want to clean all fields and restart the creation process, click the Reset Form Fields button.

6. Click Submit.

3.12.8.3.2 Edit Service Insertion Page
To edit a service insertion page:
1. Go to your OnApp Control Panel > Admin > Settings > Look & Feel icon.
2. On the page that loads, click the Service Insertion Framework > Service Insertion Pages tab.
3. The list of all service insertion pages will load. Click the Actions icon next to the required service insertion page, and click Edit or Delete if necessary to edit or remove the group respectively.

See also:
- Languages
- Currencies
- Permissions
- Look & Feel
- Control Panel Configuration

3.12.9 Manage Languages
OnApp uses a standard Rails i18n internationalization system. You can add any language to your Control Panel and translate all the interface labels, error messages, and other texts from default language into one or more custom languages.

If you use custom languages on your CP, after the upgrade to OnApp 6.1, import custom languages by following the procedure.

3.12.9.1 Add Custom Language
You can add custom languages by translating the UI phrases from English into a custom language, using the i18n Customization menu on your CP. To add a custom language and provide translations:
1. Go to your Control Panel > Admin > Settings > i18n Customization menu.
2. Click the + button, select the required language from the list and click Submit.
3. Click the label of the required language. On the page that loads, you will see the following tabs with types of translations:
   - Missing translations - lists phrases that are not translated from English into a custom language
   - Completed translations - lists phrases that are translated from English into a custom language. This tab is available if there are some phrases translated into a custom language.
   - Updated translations - lists phrases that exist in English and are translated into a custom language but which were updated in English since the last translation into a custom language. This tab is available if there are some phrases updated in English.
   - Static pages - lists phrases that appear on static pages.
4. In all of the above-listed tabs, you can provide translations in the corresponding boxes next to the texts in English.
• For extended texts that include HTML tags, variables, and other special symbols, click the — button to copy the English variant into a target custom language to preserve the default structure.
• Do not translate the words true and false in a label, preceding a boolean variable. For example: true (Do not translate -- Enter true or false) - you can translate the label into your custom locale but the words true and false must be in English.

5. Click Apply to save the provided translations.

6. When you are finished with translations, return to the Locales menu and click the Save Changes button.

• If you don't click Save Changes, the translations you provided will not be applied to your custom language.
• You should apply and save at least one translation to be able to make your custom language available on CP.

7. Go to Admin > Settings > Configuration > Interface tab, add your custom language into the Locales box and click the Save Configuration button. If a custom language is not added to the interface configuration, users will not be able to use it in your cloud.

3.12.9.2 Export English Language
You can export the English language from your Control Panel to a YAML file. The exported file will contain all the user interface labels, messages, and other texts in English. You can then translate them to your custom language and import the file back to Control Panel.

To export the English locale to a YAML file, run the following rake task:

```
rake onapp:language:default_dump[tmp]
```

Where default_dump is the name of the file and tmp is an example of a directory to save the file to.

3.12.9.3 Import Custom Language
You can also add a custom language to CP by uploading a YAML file with your translations to the config/locales directory. When the file is uploaded to config/locales, your custom language will become available in your cloud. However, in order to be able to edit translations for this language via the i18n Customization menu, you should run the following rake task:

```
rake onapp:language:import
```

After the rake task is executed, a dump file with your custom translations is automatically created in the locales_dump directory. The onapp:language:import rake task also ensures that after a subsequent upgrade to a newer OnApp version, all new UI labels, texts, and messages in the default language will be available for translation into the custom language at Control Panel > Admin > Settings > Locales > language > Missing translations tab.

If you make any changes in the default English translations, you should run the following rake task for these changes to be applied on CP:

```
rake onapp:language:sync
```

3.12.9.4 Enable Custom Language for Specific User
Now that you have added one or more custom languages, you can specify which language a particular user will see in their view of the Control Panel.
1. Make sure that the required locales are added at Control Panel > Admin > Settings > Configuration > Interface > Locales box.

2. Go to Admin > Users menu.

3. Click a user's name.

4. On the page that appears, click the Edit Profile tab.

5. Choose your custom language from the Locales drop-down list.

6. Click Save.

See also:
- Currencies
- Look & Feel
- Service Insertion Framework Configuration
- Control Panel Configuration

3.13 SSL Certificates

OnApp implements SSL certificates management, so that customers can import their SSL certificates to the cloud via OnApp Control Panel. Below you can find instructions on how to add SSL certificates to OnApp Control Panel.

3.13.1 Prerequisites

Ensure that the following conditions are fulfilled before uploading SSL certificate to OnApp Control Panel:

- Manage SSL certificate permission is on. For more information, refer to the OnApp Permissions section of this guide.
- SSL certificate consists of three files with the following names: ca.crt, ca.key, and bundle.crt.
- SSL certificate is not protected by password.

Please note that SSL certificates are supported in PEM format only.

3.13.2 View SSL Certificates

To view the list of SSL certificates:

1. Go to your Control Panel > Admin > Settings menu.

2. Click the SSL Certificate icon.

3. The page that loads, shows all available SSL certificates with their details:
   - Name - the label of SSL certificate
   - Path - the route to SSL certificate

3.13.3 Add SSL Certificate

You can either upload SSL certificate or set up a self-signed one (default self-signed certificate that comes with OnApp CP installation).
To upload SSL certificate:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the SSL Certificate icon.
3. Click the Upload button.
4. Click Choose File to select the required SSL certificate from your file system.
5. Click Submit.

To set up a self-signed SSL certificate:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the SSL Certificate icon.
3. Click the Setup Self-Signed SSL button. This action will set up default self-signed certificates that come with OnApp CP installation. Setting up certificates will restart the CP web server and make it unavailable for a few seconds.
4. In the dialog, move the Confirm setup self-signed SSL slider to the right to confirm your action.
5. Click Submit.

See also:
- Control Panel Configuration
- Permissions
- Tools

https://onappcloud.typeform.com/to/A64Euy#source=SSL%20Certificates

3.14 Location Groups

The location group ties compute resource, network, data store and backup server zones into the same location group. So, when you create a compute resource and choose a compute zone assigned to a specific location group, the network, data store and backup servers will be limited to this location group. This enables you to host different types of servers (virtual, smart, application, edge and storage) in remote locations using a single control panel. Please contact your cloud specialist to enable this feature.

The location group specified per server predefines the selection of compute zones and, consequently, its compute resources.

If a user has compute zones assigned to location groups in their bucket, the Cloud Locations step will appear in the virtual server creation wizard. On this step, the user selects the country and city where the cloud is located. 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.

The location group ties compute resource, network, data store and backup server zones into the same location group. This enables you to host different types of servers (virtual, smart, application, edge and storage) in remote locations using a single control panel. This section contains information on how you can view, add and edit location groups as well as assign zones to location groups and unassign them. Note that you cannot delete location groups with assigned zones.
3.14.1 Add Location Groups

To add a location group:

1. Add and properly configure a location in OnApp Dashboard.
2. Go to your Control Panel > Admin > Settings menu.
3. On the following page, click the Location Groups icon.
4. The page that loads will show the groups of all available locations.
5. Click the Refresh button if the required location is not listed.

After that, configure the resources that will be attached to the location groups. We recommend the following configuration sequence to ensure correct relationships within location groups:

1. Add resources to the zones. For example, attach data stores to the data store zones.
2. Add zones you configured at Step 1 to the required location group.

Create relations between resources themselves: attach data stores and networks to the Compute zones.

Do not delete location groups with assigned zones!

3.14.2 Edit Location Groups

It is possible to modify an existing location in OnApp Dashboard if the location is not used by any zone.

If special requirements are met, you can change the location already assigned to Compute resource/data store/network/backup server zones. For more info on this, refer to the following sections:

- Edit Compute Zone
- Data Store Zone
- Edit Network Zone
- Backup Server Zones

3.14.3 Assign Zones to Location Groups

To properly configure the Location groups in your cloud, assign the compute resource, data store, network and backup server zones to them.

To assign zones to a location group:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Location Groups icon.
3. Click the Country or City of the Location Group in question.
4. The page that loads is organized into the list of compute resource/data store/network/backup server zones. Click the "+" button next to a required zone.
5. In the window that pops up, choose a particular location or zone and click Attach.
6. Repeat the procedure for other zones/locations.

You can also assign a Location Group to a particular Compute resource/Data store/Network/Backup server zone on the following screens:
3.14.4 Unassign Zones from Location Groups

To unassign a compute resource/data store/network/backup server zone from a location group:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Location Groups icon.
3. Click the Country or City of the Location Group in question.
4. The page that loads is organized into the list of compute resource/data store/network/backup server zones. Click the “-” (Delete) button in the last column next to a required zone.
5. Repeat the procedure for other required zones.

You cannot unassign a compute resource/data store/network/backup server zone from a Location Group if such zone is used by any virtual server. It is impossible to unassign a CDN Location, if this location has Edge servers within it.

You can also unassign a location group from a particular compute resource/data store/network/backup server zone on the following screens:

- Edit Compute Zone
- Data Store Zone
- Edit Network Zone
- Backup Server Zones

See also:

- Backup Server Zones
- Compute Resources
- Compute Zones

https://onappcloud.typeform.com/to/A64Euy#source=Location%20Groups

Leave feedback
4 Cloud Provisioning

Here you may find instructions on how to manage servers of different types, components, compute resources, and compute zones.

- **Appliances**: https://docs.onapp.com/display/TEST2/Appliances
- **Virtual Servers**: https://docs.onapp.com/display/TEST2/Virtual+Servers
- **Virtual Routers**: https://docs.onapp.com/display/TEST2/Virtual+Routers
- **Application Servers**: https://docs.onapp.com/display/TEST2/Application+Servers
- **Load Balancers**: https://docs.onapp.com/display/TEST2/Load+Balancers
- **Edge Accelerator**: https://docs.onapp.com/display/TEST2/Edge+Accelerator

- **ISO Virtual Servers**: https://docs.onapp.com/display/TEST2/ISO+Virtual+Servers
- **OVA Virtual Servers**: https://docs.onapp.com/display/TEST2/OVA+Virtual+Servers
- **Smart Servers**: https://docs.onapp.com/display/TEST2/Smart+Servers
- **Baremetal Servers**: https://docs.onapp.com/display/TEST2/Baremetal+Servers

- **Components**: https://docs.onapp.com/display/TEST2/Components
- **Templates**: https://docs.onapp.com/display/TEST2/Templates
- **Service Add-ons**: https://docs.onapp.com/display/TEST2/Service+Add-Ons
- **Recipes**: https://docs.onapp.com/display/TEST2/Recipes

**4.1 Appliances**

Appliances is a collective name for all virtual and physical devices that can be provisioned in the cloud. The term *appliance* seizes the following cloud components:

- **Virtual Servers**
- **VMware vCenter Virtual Servers** (of vCenter Implementation guide)
- **Smart Servers**
- **Baremetal Servers**
- **Load Balancers**
- **Compute Resources**
- **Virtual Routers**
- **Assets**

OnApp Cloud gives you high-end cloud management features for the following appliances including:

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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
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<td>ISO VS</td>
<td>OVA VS</td>
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</tr>
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<td>Rebuild manually</td>
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<td></td>
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</tr>
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<td></td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
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<td>Delete</td>
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<td>Segregate</td>
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<td>✓</td>
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</tr>
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<td>Reboot in recovery</td>
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<td>✓</td>
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</tr>
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<td>Boot from ISO</td>
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<td>Suspend</td>
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<td>Startup on Recovery</td>
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<td><strong>Administrative Options</strong></td>
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<td>Reset Root Password</td>
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<td>Set SSH keys</td>
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<td>Transactions and logs</td>
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<td>Rebuild network</td>
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<td>Display network speed for network interfaces</td>
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## Server Options

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<td>Disks</td>
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<td>Create disks</td>
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<td>Backups</td>
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<td>View</td>
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<td>Restore backup</td>
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<tr>
<td>Delete backup</td>
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<td>Edit backup note</td>
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<tr>
<td>Backup Schedules</td>
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<td>View schedules</td>
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<td>Create schedule</td>
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<td>Edit schedule</td>
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<tr>
<td>Delete schedule</td>
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<tr>
<td>Statistics</td>
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<td>CPU utilization</td>
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<tr>
<td>Billing statistics</td>
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<tr>
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<td>Recipes</td>
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<td>Recipes</td>
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<tr>
<td>Custom variables</td>
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<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### See also:
- [Virtual Servers](#)
- [VMware vCenter Virtual Servers](#)
- [Smart Servers](#)
4.1.1 Virtual Servers

Virtual servers are based on templates and are deployed on compute resources. Compute resources give them access to CPU, disk, and network resources. OnApp Cloud gives you high-end cloud management features including:

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<td>Edit Administrator's note</td>
<td>Virtual server IP addresses</td>
<td>Delete disks</td>
<td>Delete backup</td>
<td>Delete schedule</td>
<td>Disk IOPS statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Segregate</td>
<td>Startup</td>
<td>Integrated console</td>
<td>Display network speed for network interfaces</td>
<td>Edit backup note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set VIP status</td>
<td>Startup on Recovery</td>
<td>Transactions and logs</td>
<td>Edit network speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autoscale</td>
<td>Boot from ISO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Clone</td>
<td>Enable Disaster Recovery</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

OnApp supports two kinds of storage for virtual servers: traditional centralized SANs and the new distributed block storage functionality introduced with OnApp Storage, in which local disks
in Compute resources provide the physical storage space allocated to virtual servers. In each case, the OnApp platform creates virtual data stores from the physical resources and uses these to provide virtual servers with virtual disks.

Administrators in OnApp have full control over the lifecycle of virtual servers. Virtual servers can be in the following states:

- **Created** - A server is created when you successfully Create a Virtual Server from the Virtual servers menu, having selected its template and set its properties, resources, and network requirements.
- **Build** - A virtual server must be built after it is created. Building is the process of actually allocating the physical resources specified during its creation. This can be done manually or automatically if you check the Build Virtual Server Automatically box during the creation process.
- **Powered on** - A power on starts the virtual server, its operating system and processes.
- **Powered off** - If the operating system cannot be stopped, it will be forcefully terminated.
- **Shut down** - A shut down will attempt to gracefully stop a virtual server and its operating system, which typically involves terminating all running applications.
- **Rebooted** - Rebooted means a virtual server has been shut down and then powered on again.
- **Deleted** - When a virtual server is deleted, its backups are still stored on the server and can be restored if required.
- **Re-built** - To rebuild a virtual server means to reinstall the template and reconfigure the resources and network. All data will be lost.
- **Failed** - A failed virtual server is one that is down, for example, because of hardware or network problems. You will have to start the server manually when those problems have been solved.

[https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Servers](https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Servers)

4.1.1.1 Manage Virtual Servers
Virtual servers are based on templates and are deployed on compute resources. Compute resources give them access to CPU, disk, and network resources. OnApp supports two kinds of storage for virtual servers: traditional centralized SANs and the new distributed block storage functionality introduced with OnApp Storage, in which local disks in compute resources provide the physical storage space allocated to virtual servers. In each case, the OnApp platform creates virtual data stores from the physical resources and uses these to provide virtual servers with virtual disks. This document provides information on how you can manage virtual servers in your OnApp cloud.

4.1.1.1.1 View Virtual Servers
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu to see an overview of all virtual servers in the cloud.
2. The page that loads will show the list of VSs together with their:
   - operating system
   - label - click to see the VS details.
   - VIP status - click the icon to enable/disable VIP status of a particular VS
   - IP addresses
   - allocated disk size
   - RAM
   - backups - the number of backups and the space these backups take
• compute resource - the label of compute resource with which VS is associated
• user - the owner of this VS. Click the user name to see the owner details
• CPU(s) - the number of CPU(s) included
• power status - click the on/off buttons to change the status

Click the **Actions** button next to the VS for the quick access to the list of VS actions (the list of actions displayed depends on the VS status):

- Recovery reboot
- Power off a VS
- CPU usage
- Backups
- Shutdown
- Start up
- Recovery start up
- Unlock

If you are viewing the VSs list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, check the columns you want to be displayed and click **Apply**. The narrower your screen is, the more unchecked columns will be hidden from the table. If your screen is too narrow to fit all the columns you have checked, a scrollbar will appear at the bottom of the VSs list. You can always alter your column selection later. Note that by default the VIP and Backups columns are not visible in the table on narrow screens.

<table>
<thead>
<tr>
<th>Column selection is currently set for one browser. If you have checked some columns in one browser and open the list in some other browser, the column selection will be the default one for that other browser.</th>
</tr>
</thead>
</table>

To search for a particular virtual server, click the **Search** icon at the top of the VS list. When the search box appears, type the text you want to search for and click the **Search** button.

### 4.1.1.1.2 View Virtual Server Details

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 VS.

#### 4.1.1.2.1 VS Properties

The VS properties page gives a general overview of the VS details:

- **VIP status**, click the icon to change the status
- Template this VS is built on
- **ON, OFF, and REBOOT** buttons - the greened out button indicates VS's power status

Clicking the OFF button performs a graceful shutdown and then powers off the virtual server after the timeout set in **configuration settings**.
• **Auto-backups** - move the slider to enable/disable automatic backups for this VS. If the incremental backups are enabled in your cloud, you can set auto-backups per VS rather than per disk.

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

• **Autoscale** - move the slider to enable/disable the autoscaling rules set for this VS.
  
  - Until the **autoscaling rules** are configured the autoscaling itself will not start working.
  - If the **Autoscale** slider is greyed out that means that you have reached the autoscaling limit in bucket (or the max is set as 0).

• **Acceleration allowed** - move the slider to the right to allow acceleration for this VS or move this slider to the left to prohibit acceleration for this VS. Acceleration status of the VS will be changed on the next CDN Sync Runner run (default value 20 minutes). To edit CDN Sync Runner delay, refer to the **Edit Infrastructure Configuration** section of this guide.

> Ensure that **Accelerate any Virtual Server/Accelerate own Virtual Servers** permissions are on before enabling acceleration for the VS. For more information about permissions refer to the **Permissions** section of this guide.

To verify whether your VS has been accelerated successfully, curl the IP of your VS.

**Click here for more details**

```
curl -I [VS IP address]
HTTP/1.1 200 OK
Content-Type: text/html
Vary: Accept-Encoding
X-Accelerated-By: InviCDN
```

The **X-Accelerated-By: InviCDN** statement in the output confirms that your VS has been accelerated.

• **Segregated VS** - this field appears if the VS is segregated from another virtual server. Click the label of the virtual server to view the details of the VS from which the current server is segregated.

• **FQDN** - fully qualified domain name

• **Compute Resource** - click the compute resource name to see its details

• **Location** - click to view the details of the location group with which the VS is associated

• **Login** - credentials for this VS

• **Owner** - owner of the VS, click to see the details

• **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. To view external IP addresses, you have to add them via API call first. To add an external IP address, refer to **Add/Edit External IP Address** section of API Guide. Once you’ve added an IP address, you can view it after the -> sign. E.g. 7.7.0.17 -> 8.8.8.7
- **Estimated Price per hour** - this sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here.
- **CPU(s)**
- **CPU priority or CPU units**
- **Disk Size** - the total amount of disk size
- **Memory**
- **Disk backups** - the total amount of backups
- **CPU usage chart**
- **Network usage (data sent and data received in GB per hour) chart**

4.1.1.1.2.2 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.

4.1.1.1.2.3 Service Add-ons
If you have the **service add-on** functionality enabled and service add-on is assigned to the VS, you can view it at the VS overview page together with the following details:
- **Label** - the service add-on name (by clicking on it you can edit the service add-on)
- **Price** - the service add-on price, set for this service add-on in the Service Add-on Store
- **Type** - select user or system
- **Status** - whether the service add-on is active or not
- **Delete icon** - you can unassign the Service Add-on from this Virtual Server by clicking the Delete icon.

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

**VS Management**
- Click **Actions** to see the menu with the VS management options.
- Use the top menu to manage your virtual servers’ statistics/networking/storage options.

4.1.1.1.3 Rebuild/Build Virtual Server Manually

To build/rebuild virtual server **Build/rebuild virtual server and Manage public templates permissions** must be enabled.

If you haven’t checked the **Build Virtual Server** 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 or rebuild the VS on the same (or another) template:
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 **Actions** button, point to **Options** 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.
It is not possible to rebuild a Linux-based virtual server to FreeBSD templates. It is not possible to rebuild a Windows-based virtual server to Linux/FreeBSD template and vice versa.

5. Move the **Start VS after rebuild** slider to the right if you want to have your VS started automatically after it is built.

6. Select the following options if you selected Windows
   - **Windows Licensing type** - KMS, MAK, or OWN
   - **Licensing key** - input license if you selected OWN licensing type
   - Select **Server** for KMS licensing type

7. Click the **Rebuild Virtual Server** button to finish.

- To successfully rebuild the VS, you have to approve this transaction as an administrator. To approve the transaction, go to **Dashboard > Logs** menu and click the **Approve** button.
- After you rebuild your template all data will be lost!
- If the VS was built from a template with system service add-ons assigned, all added system service add-ons will be removed from the VS after the rebuild.

4.1.1.1.4 *Edit Virtual Server*
You can edit resources for all VSs. Depending on the template it is built on, some VSs can have their CPU or RAM or both resized without needing to be powered off ("resize without reboot"). If the VS template allows resizing of the required resource without the reboot, the resize should be completed automatically: you will be returned to the VS details screen and see a message indicating the resize was successful. If the template does not allow this, you will be asked to confirm that the VS will need rebooting so that the resize can take place. On how to determine whether the template you are interested in supports resizing without the reboot of RAM or CPU, refer to the **Hot Resize** page.

- Windows virtual servers cannot be resized without the reboot.
- It is not possible to increase the VSs RAM beyond its max_memory value without rebooting the server. For more information, refer to **Hot Resize**.
- If the template on which the VS is built has the value 'YES' for the resize without reboot option, it might denote that either CPU or RAM can be changed without rebooting the server. Some templates support the resize without reboot only for either CPU or RAM while in other templates both CPU and RAM can be changed without rebooting the server. The virtualization type also influences the resize without reboot option. For more information, refer to **Hot Resize**.

The **Edit Virtual Server** screen will differ depending on the way the VS resources were selected: either manually or using an instance package. To adjust VS resources:

1. Go to your Control Panel > **Cloud > Virtual Servers** menu.
2. Click the label of the server you want to resize, to show its details screen.
3. Click the **Actions** button, point to **Options** and select the **Edit Virtual Server** link.  
   *For virtual servers built by selecting resources manually:*
   
   - Change CPU cores, CPU priority/units and RAM values.
If you are editing a VS in Federation, there are the following resources ratios for VSs built on public federated zones:

- a 4:1 ratio for CPU cores and RAM. For example, if you are building a VS with 8 CPU cores, you need to allocate at least 2 GB of RAM to it.
- a 20:1 ratio for storage and RAM. For example, if you are building a VS with 5 GB of storage, you need to allocate at least 256 MB of RAM to it.

For VSs based on KVM compute resources only, providing the Enable CPU topology permission is switched on for the user:

- Change the number of CPU sockets.

### Setting the correct amount of CPU sockets

- Set the total amount of virtualized CPUs and the number of sockets.
- The value of cores\_per\_socket will be calculated automatically by the formula \( vCPUs = \text{cpu\_sockets} \times \text{cores\_per\_socket} \).
- Thus, if you set the vCPU value 8, and the CPU sockets 2, this means that the cores\_per\_socket value will be set 4.

For virtual servers built using instance packages:

- Choose the new instance package for your virtual server. Click the instance package to select it. After that, the instance package you have chosen will be highlighted in green.
- Those instance packages that have resources incompatible with the compute zone, on which the VS is built, will be greyed out. Greyed out instance packages cannot be selected.
- You can only choose from those instance packages that offer more disk size than the VS currently uses.
- After you select a new instance package you can use the extra disk size to create a new disk for the VS or make the existing VS disk larger.

You can also edit the Time Zone parameter for all Windows KVM virtual servers. After you edit the server's time zone, you need to stop and then start up the VS. Currently, the time zone is set at the compute resource side only. Therefore, users need to set the target time zone inside a Windows VS manually. Setting the correct time zone at the compute resource side helps to keep correct time inside a VS after starting it if time synchronization is not completed for some reason.

After changing VS resources you can see two prices per this VS per hour, depending on VS power status (on/off).

- Click the Save button.

#### 4.1.1.1.5 Clone Virtual Server

This option might not work correctly for the VS build on Cloudboot and Static compute resources with integrated storage.

You can create a clone based on the same resources as the origin virtual server. 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>Owner</td>
<td>The same as the origin virtual server.</td>
</tr>
</tbody>
</table>
| Properties: hostname, password, and label | You can change the properties while cloning a KVM VS. By default, if you clone a virtual server without changing the values of the hostname, password, and label:  
  - The hostname remains the same as it is in the origin virtual server.  
  - The password acquires random values.  
  - The label is the same as the origin virtual server's label, but with **Clone** in the label. For example, **Clone Origin Label**. |
| Compute, data store, and network resources & zones | 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. |
| Recipes, recipe variables, and service add-ons | |
| Firewall rules | |
| IP address | A random IP address is assigned from an IP range in the origin network. If a virtual server is built from an OVA template with the Other OS type or any ISO template, an IP address from the origin virtual server is assigned. After a virtual server is cloned and before you start it, you should assign a new IP address. |
| 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 **Actions**, point to **Options** and then click **Clone Virtual Server**.
4. In the dialog box, you can change the properties if required:
   - **Label**
   - **Hostname** - 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 following symbols are not allowed for Windows-based virtual servers:

- percent [%]
- quotation marks ["’"]
- angle brackets [<>]
- vertical bar [ ]
- caret [^]
- ampersand [&]
- parentheses [( ])

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▪ **Password** - 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

5. 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.

4.1.1.1.6 Migrate Virtual Server

You can migrate virtual servers using a hot or cold migration method:

- **Hot migration** is a live migration of a virtual server with or without disks and NICs between compute resources that share common data stores or data store zones.

- **Cold migration** is a migration of virtual servers with disks between compute resources with local storage or across compute zones.

As an Admin, you can control user access to virtual server migration. Using **OnApp permissions**, you can allow/forbid users to perform migration of all virtual servers or their own servers. This is handled via the Control Panel > Roles menu.

4.1.1.1.6.1 Hot Migration

You can migrate an online virtual server from one compute resource to another compute resource that is both utilizing local/shared/IS storage or across zones. There are two types of hot migration:

- **Compute Resource** - a migration of a virtual server from one compute resource to another.

- **Full Migrate** - a migration of a virtual server with or without disks and NICs between compute resources, data stores, and networks.

4.1.1.1.6.1.1 Hot Migration Between Compute Resources

Before you begin, take into consideration the following:

- Check if your Windows template supports hot migration at the Windows Templates.

- The source and destination compute resources and data stores should be in the same location. Migration between different locations is not possible.

- Migrating a virtual server to a compute resource with Any operating system type has the next implications. It won't be possible to set the Windows Only type for a compute resource, if there are any Linux or FreeBSD VSs residing on it. Likewise, it won't be possible to set the Non Windows type for a compute resource, if there are Windows-based VSs residing on it.

- If both source and destination compute resources have backup IP addresses, VS migration will be performed using those backup IP addresses as an alternative network for traffic. If the migration fails for any reason, it will be retried using destination compute resource IP address in management network.

4.1.1.1.6.1.1.1 Migrate One Virtual Server

To hot migrate a virtual server:

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

2. Click a label of a virtual server that you want to migrate.
3. Click the **Actions** button, point to **Options** and click the **Migrate Virtual Server** button.

4. In the **Migration Type** box, select **Compute Resource** and click **Next**.

5. Select a **Target compute resource** from the box and click **Next**.

6. At the final step of the wizard, you can see the migration summary and select the following checkbox:
   - **Cold-migrate when hot-migration fails** - select the check box to apply cold migration in case of the hot migration failure

7. When you are finished, click the **Submit** button.

4.1.1.1.6.1.1.2 Migrate Multiple Virtual Servers

You can also migrate multiple virtual servers at once from one compute resource to another compute resource of the same type (KVM to KVM). The mass migration is available within compute resources that belong to the same compute zone. To migrate virtual servers, follow the next steps:

1. In the **Admin > Compute Resources** section, click a compute zone label to see the list of compute resources.

2. Click a label of a destination compute resource. On the screen that appears, you will see a list of all virtual servers hosted on the compute resource.

3. Select checkboxes next to the virtual servers that you want to migrate and click the **Migrate** button. To select all virtual servers residing on the compute resource, click the first checkbox. To cancel the selection of all virtual servers, click this checkbox again.

4. In the pop-up box, select the following options:
   - **Target compute resource** - select a destination compute resource to migrate the virtual servers to
   - **Cold-migrate when hot-migration fails** - select the checkbox if you want to apply cold migration in case of the hot migration failure

   If some of the selected virtual servers have disks that run as a local storage on this compute resource, these virtual servers could not be migrated. After the migration, these virtual servers remain on the previous compute resource, while other VSs are migrated to the destination compute resource.

5. When you are finished, click the **Submit** button.

After migration, the power status of your virtual server remains the same as before the migration. If you migrate a virtual server that is running, the whole process is almost unnoticeable.

4.1.1.1.6.1.2 Full Hot Migration

Before you begin, take into consideration the following:

- The hot migration is applicable only to virtual servers running on CentOS 7 KVM compute resources and virtual servers can be migrated only to CentOS 7 KVM compute resources.

- You can hot migrate a virtual server NIC to a VXLAN/VLAN management network that is not shared by the source and destination compute resources. When you migrate a NIC to another network, only one IP address assigned to this NIC is migrated.

- You cannot migrate the VS if its primary IP address is in the same network with Control Panel IP address.

- Before VS migration to the same network, increase the ssh timeout to at least 60 seconds at the **Edit Defaults Configuration** page to avoid migration failure.
• Note that only Windows-based and Linux-based VSs can be migrated with both Migrate Storage and Migrate Networks options enabled.

• The bandwidth from compute resource to compute resource should be sufficient enough to allow transferring of virtual servers.

• Hot migration is applicable to virtual servers with local storage. Be aware that migration will take much more time if you want to perform it between shared data stores.

• If both source and destination compute resources have backup IP addresses, VS migration will be performed using those backup IP addresses as an alternative network for traffic. If the migration fails for any reason, it will be retried using destination compute resource IP address in management network.

• Be aware that disk migration is better than full VS migration in case you want to migrate disks within the same compute zone and if the advanced backup scheme is used. Such scenario is applicable only to shared data stores within the same compute zone.

• The hot migration is available only if a virtual server is online and your Quick Emulator (QEMU) version is later than 2.6.

To run a full hot migration of a virtual server:

1. Go to your Control Panel > Cloud > Virtual Servers.
2. Click a label of a virtual server that you want to migrate.
3. Click the Actions button, point to Options and click the Migrate Virtual Server button.
4. In the Migration Type box, select Full Migrate (Hot).
5. Select Migrate Storage and/or Migrate Networks and click Next.
6. Select the destinations to which to migrate a virtual server:

Compute Resources
   o Target compute zone - select a destination compute zone
   o Target compute resource - select a destination compute resource
      Click Next to proceed to the following step.

Storage Resources
   o Target data store for disk - select a destination data store for each disk. The list includes available data stores associated with the compute zone and compute resource that you selected earlier.
      Click Next to proceed to the following step.

Network Resources
   o Target network - select a destination network for each network interface
   o Target IP net - select an IP net in a destination network
   o Target IP range - select an IP range in a destination network
   o Select and assign IP address - select an IP address to assign to a virtual server. You can click Free IPs or My IPs to select from all free IP addresses or your own IP addresses.
      Click Next to proceed to the following step.

7. At the final step of the wizard, you can see the migration summary. Click Submit to start the migration.
- Hot migration is not performed if a virtual server has temporary disks (attached to or from other virtual server).
- Hot migration is not performed for Integrated Storage data stores if any of the disks has snapshots.
- Hot migration is not applicable for federated virtual servers that are built in compute zones submitted to the Marketplace.
- If you have local backups on the source compute resource, please move them manually to a target compute resource or backup server.
- If both source and destination compute resources have backup IP addresses, VS migration will be performed using those backup IP addresses as an alternative network for traffic. If migration fails for any reason, it will be retried using destination compute resource IP address in management network.
- If you change the compute resource or data store zone, the billing will be changed according to the prices set for that new zone in the bucket.
- Go to Admin > Settings > Configuration > Defaults > Migration options, if you want to set migration rate limit and limit of transactions which can be run simultaneously on the target compute resource when migrating a VS.
- The following disk migration scenarios are applicable:
  - From LVM data store to LVM data store
  - From Integrated Storage data store to Integrated Storage data store
  - From LVM data store to Integrated Storage data store
  - From Integrated Storage data store to LVM data store
  - Hot migration is not applicable for SolidFire storage.
- Disks that are migrated from one LVM data store to another are renamed in the source data store. In case of Integrated Storage, disks remain with the same name at source data store and are marked as offline zombie disks. You need to delete them manually, otherwise, you will get an error during backward migration.

### Cold Migration

Cold migration enables you to migrate virtual servers with or without disks and NICs between compute resources with local storage or across compute zones. There are several prerequisites for the cold migration:

- You should shut down a virtual server before performing the migration.
- You can cold migrate a virtual server NIC to a VXLAN/VLAN management network that is not shared by the source and destination compute resources. When you migrate a NIC to another network, only one IP address assigned to a virtual server is migrated.
- The source and destination compute resources and data stores should be in the same location. Migration between locations is not possible.
- The bandwidth from compute resource to compute resource should be sufficient enough to allow transferring of virtual servers.
- Cold migration is applicable to virtual servers with local storage. Be aware that migration will take more time if you want to perform it between shared data stores.
- Be aware that disk migration is better than full VS migration in case you want to migrate the disks within the same compute zone and if the advanced backup scheme is used. Such scenario is applicable only to the shared data stores within the same compute zone.

To cold migrate a virtual server with disks:

1. Go to your Control Panel > Cloud > Virtual Servers.
2. Click a label of a virtual server that you want to migrate.
3. Click the Actions button, point to Options and click the Migrate Virtual Server button.
4. In the Migration Type box, select Full Migrate (Cold).
5. Select Migrate Storage and/or Migrate Networks and click Next.

6. Select the destinations to which to migrate a virtual server:

**Compute Resources**
- Target compute zone - select a destination compute zone
- Target compute resource - select a destination compute resource

Click Next to proceed to the following step.

**Storage Resources**
- Target data store for disk - select a destination data store for each disk. The list includes available data stores associated with the compute zone and compute resource that you selected earlier.

Click Next to proceed to the following step.

**Network Resources**
- Target network - select a destination network for each network interface
- Target IP net - select an IP net in a destination network
- Target IP range - select an IP range in a destination network

Select and assign IP address - select an IP address to assign to a virtual server. You can click Free IPs or My IPs to select from all free IP addresses or your own IP addresses.

Click Next to proceed to the following step.

7. At the final step of the wizard, you can see the migration summary. Click Submit to start the migration.

- Cold migration is not applicable for federated virtual servers that are built in compute zones submitted to the Marketplace.
- You cannot migrate a virtual server from a compute resource that is offline.
- If you have local backups on source compute resource, please move them manually to a destination compute resource or backup server.
- If you change the compute resource or data store zone, the billing will be changed according to the prices set for that new zone in the bucket. The new estimated price per hour for a VS is displayed at the bottom of the VS migration screen.
- Go to Admin > Settings > Configuration > Defaults > Migration options, if you want to set migration rate limit and limit of transactions which can be run simultaneously on the target compute resource when migrating a VS.
- The following disk migration scenarios are applicable:
  - From LVM data store to LVM data store
  - From Integrated Storage data store to Integrated Storage data store
  - From LVM data store to Integrated Storage data store
  - From Integrated Storage data store to LVM data store

Cold migration is not applicable for SolidFire data stores.
- Disks that are migrated from one LVM data store to another will be renamed in the source data store. In case of Integrated Storage, disks will remain with the same name in the source data store and will be marked as offline zombie disks. You need to check if the transaction is completed and delete them manually, otherwise, you will get an error during the backward migration.

4.1.1.1.7 Autoscale Virtual Server
VS autoscaling allows you to change the RAM, CPU and disk size settings of a virtual server automatically. VS resources scaling is based on rules you specify. For example, you can set up a rule that will add 1000MB of memory to a VS if RAM usage has been above 90% for the last
10 minutes - but add no more than 5000MB in total in 24 hours. You can set autoscaling down settings alongside with autoscaling up.

- For Linux-based VSs and VS primary disks only.
- Disk usage autoscaling is applicable for VS primary disk only.
- Autoscaling for CPU cores is currently not implemented, it is implemented only for CPU units and CPU shares.
- If the VS is based on a template that allows resizing without the reboot - see the Edit Virtual Server section – then the VSs RAM or CPU or both can be increased without rebooting the VS. The resources that can be resized without reboot depend on the template and the virtualization type. Some templates support the resize without reboot only for either CPU or RAM. Disk space autoscaling requires a VS reboot.
- If you autoscale a VS’s memory to a value greater than current VS RAM x 16 (which is a max_memory parameter in a configuration file and database), the VS will be rebooted anyway, regardless of the template it is built on.
- Make sure a VS can be reached via SSH. Otherwise, the autoscaling client installation will fail.
- Starting with version 4.2, OnApp uses Zabbix for autoscaling. Monitis will be used for autoscaling of servers built using OnApp versions previous to 4.2 until you switch autoscaling off for such server(s). If you decide to switch autoscaling back on, autoscaling will be implemented using Zabbix. Zabbix also will be used for autoscaling of newly created VSs.
- Note that Monitis support for OnApp autoscaling will come to its end of life on June 30th, 2019 and will be unavailable for use.
- When autoscaling down is enabled, it will reduce the VS memory and disk size to the minimum, indicated in a template, on which this VS is built. CPU usage can be reduced to the minimum CPU priority allowed by the system(1%).

To configure autoscaling settings:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the appropriate VS.
3. On the page that follows, click the Overview tab, and then click Autoscaling.
4. Click the required tab - Memory Usage, Disk Usage or CPU Usage - to see the statistics for each type of resources.
5. Below you will see UP and DOWN autoscaling options. Move the slider to the right to add the autoscaling rule or move it to the left to remove the rule.
6. Add autoscaling rules as explained below:

Set autoscale up options:

- Time - select a specific time period in which scaling will be executed.
- If RAM usage is above X% for a specific time period, add Y MB – but no more than Z MB in a 24 hour period.
- If CPU usage is above X% for a specific time period, add Y% - but no more than Z% in a 24 hour period.
- If disk usage is above X% for a specific time period, add Y GB - but no more than Z GB in a 24 hour period.

Set autoscale down options:

- Time - select a specific time period in which scaling will be executed
- If RAM usage is below X% for a specific time period, remove Y MB.
If CPU usage is below X% for a specific time period, remove Y%.
If disk usage is below X% for a specific time period, remove Y GB.

7. Click Apply.

Clicking the Apply button does not activate autoscaling if the Autoscale slider at the VS overview page is disabled. You can configure autoscaling rules, press the Apply button, these rules will be saved and will start working only after the Autoscale slider at VS overview page is enabled. Also, you can disable the Autoscale slider, autoscaling will stop working, but the configuration of rules will be saved in case you want to activate them in future.

4.1.1.1.8 Set VIP Status for Virtual Server
If a compute resource fails or reboots, the system migrates virtual servers to another compute resource, one VS at a time. The order VSSs are migrated in is random. However, you can give a virtual server "VIP" status, and this will give that VS priority in the migration queue.

To set or remove VIP status for a VS:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Use the icon in the VIP column next to a required virtual server to change switch on/off the VIP status.

4.1.1.1.9 Segregate Virtual Server
If required, you can instruct OnApp to make sure a VS is never booted on the same compute resource as another specific VS. This may be important if, for example, you have two name servers or a load balanced web server, and you need to keep VSSs on separate physical servers. You can also remove segregation if required.

- Virtual servers can only be segregated from other VSSs built by its owner.
- Virtual servers can only be segregated from VSSs within the same compute zone.
- Virtual servers cannot be segregated from VSSs running on the same compute resource.
- The segregated VS is not automatically migrated to another compute resource.

To isolate one VS from another:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you want to segregate.
3. On the screen that appears, click the Actions button, point to Performance, then click Segregate Virtual Server.
4. In the dialogue box that pops up, use the drop-down menu to choose a VS you want to keep away from.
5. Click the Segregate Virtual Server button to finish.

To remove segregation:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you want to segregate.
3. On the screen that appears, click the Actions button, point to Performance, then click Desegregate Virtual Server.
4. In the dialogue box that pops up, click the OK button to finish.

To remove a segregation rule, go to the OnApp database and run the following:
update virtual_machines set strict_virtual_machine_id=NULL where identifier=XXXXXXXX*;

4.1.1.10 Enable Virsh Console
You can use Virsh console to access a virtual server from a compute resource secure shell and perform various administrative tasks. You can enable Virsh console for the following instances:

- Virtual servers that run on KVM compute resources.
- Virtual servers that are built on Linux templates.
- Virtual servers that are not built from ISO.

You can enable Default Virsh Console Policy via Settings for all newly created virtual servers to have Virsh console by default. For virtual servers that are created before you edit the settings, you can enable the console as follows:

1. Go to your Control Panel > Cloud > Virtual Servers.
2. Click a label of a destination virtual server.
3. Click Actions, point to Options and then click Enable Virsh Console.
4. In the dialogue box, click OK to confirm.

After you confirm the action, the virtual server is rebooted and you can access it via Virsh console.

To access the virtual server via Virsh console, follow the next steps:

1. Connect via SSH to the destination compute resource.
2. Run the following command to list guest VSs using Virsh:

```
 virsh list
```

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>freebsd</td>
<td>running</td>
</tr>
<tr>
<td>2</td>
<td>ubuntu</td>
<td>running</td>
</tr>
<tr>
<td>3</td>
<td>centos</td>
<td>running</td>
</tr>
</tbody>
</table>

3. Run the following command from the compute resource to log in to the guest named ubuntu:

```
 virsh console ubuntu
```

To exit the console, press CTRL + 5.

4.1.1.11 Delete Virtual Server
Shut down the virtual server 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 virtual server’s screen, click the Actions button, point to Options, then select Delete Virtual Server.
4. Move the Move Last Backup to My Templates if it is present slider to the right if you want to save the last VS’s backup as a template.
5. Move the **Destroy All Existing Backups** slider to the right if you want to remove all existing backups of this virtual server.

**IMPORTANT:**
- You won’t be able to restore a virtual server after deleting it.
- Deleting a virtual server removes all data stored on that virtual server. To save the data stored on the virtual server, back up your virtual server and select the **Move Last Backup to My Templates if it is present** box when following the instructions described in this section.
- To delete a virtual server together with its backups, the user needs to have the **Destroy any backup or Destroy own backup** permission enabled. Otherwise, the backups of the VS deleted by the user will remain in the system.

See also:
- Compute Resources
- Permissions
- Service Add-Ons
- Create Virtual Server
- Virtual Server Disks

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4.1.1.2 Migrate VS from Xen to KVM
KVM virtualization becomes more and more popular nowadays due to the number of reasons. With KVM, you get faster and more reliable technology together with more functionality in cloud operation. Because of that, OnApp has chosen to move forward with KVM, migrating current virtual servers running on Xen to KVM compute resources. This feature allows to perform migration of virtual servers hosted on Xen compute resources to KVM compute resources. Migration to KVM is easy and requires few steps before converting Xen virtual servers to KVM. During the migration process, you only need to choose a target compute resource and data store. Additionally, you can enable a backup before or after the migration. You can initiate the migration using the procedure described in this document.

4.1.1.2.1 Before You Begin

**Before you proceed further, please note that:**
- The migration process is straightforward and should succeed on most virtual servers. However, in some cases something might go wrong. OnApp provides several measures to prevent data loss. You can Clone the VS before migration or you can enable the additional backup option in the migration wizard that would allow to convert the backup to a template.
- Migration is irreversible and you cannot migrate from KVM to Xen compute resources.
- During the migration, the billing will be changed due to the increase of disk size (all disks except swap disks increase in size by 1 GB). The new estimated price per hour for a VS is displayed at the bottom of the VS migration screen.
- Migration is not performed if a virtual server has temporary disks (attached to or from other virtual server).
- Migration is not performed for Integrated Storage data stores if any of the disks has active backups running or zombie snapshots. Also, migration is not supported on SolidFire data stores.
- Migration is not applicable for federated virtual servers that are built in compute zones submitted to the Marketplace.
4.1.1.2.2 Migrate Linux Virtual Server to KVM

Go to Admin > Settings > Configuration > Defaults > Migration options, if you want to set limit of transactions number which can be run simultaneously on the target compute resource when migrating a VS.

To migrate Linux VS from Xen to KVM, do the following:
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 the Actions button, point to Options, and click the Migrate Virtual Server button.
4. In the Migration Type box, select Xen to KVM Migrate and click Next.

4.1.1.2.3 Compute Resources

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

Click Next to select storage resources for the migration.

4.1.1.2.4 Storage Resources

At this step, you can specify target data stores running on the compute resource that you indicated previously:
- Target data store for disk - select a destination data store for each disk. The list includes available data stores associated with the compute zone and compute resource that you selected earlier.

Click Next to select additional backup settings before or after migration.

4.1.1.2.5 Backups

Backups created while the VSs were running on Xen compute resources are incompatible with KVM. You may choose to keep them after migration, but they will not be available for recovery. However, such backups might be used to convert to templates.
Select the backups you will need before or after the migration from Xen to KVM is completed:

- **Schedule a backup before the migration** - leave this slider enabled to schedule a backup before the migration. Otherwise, move the slider to the left to disable the option.

- **Schedule a backup after successful migration** - leave this slider enabled to schedule backups in case of successful migration. If you do not need these backups, disable the slider.

- **Delete old backups after successful migration** - leave the slider enabled to remove old backups incompatible with KVM after the migration is completed. If you need these backups, disable the slider.

If enabled, this option deletes all the old backups besides the one that is taken right before the migration provided that you also enabled scheduling a backup before the migration.

Click **Next** to view the migration summary of your configuration.

4.1.1.2.6 Confirmation

At the final step of the wizard, you can see the migration summary. Click **Submit** to start the migration.

Note that manually added/edited disks in fstab will require to be reconfigured after migration.

https://onappcloud.typeform.com/to/A64Euy#source=Migrate%20VS%20from%20Xen%20to%20KVM

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4.1.1.3 Manage Virtual Server Power Options

Virtual Server power options include the list of actions that you can run to change a VS power status. You can manage power options for a specific virtual server or power on/off multiple VSs that reside on the same compute resource.

To manage power options for a specific virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the required virtual server.
3. Click the **Actions** button on the VS's screen and point to **Power** to see the following power actions on VSs (the exact list shown depends on the VS status):

### 4.1.1.3.1 Reboot Virtual Server
1. Click the **Reboot Virtual Server** button.
2. Click the **OK** button in the pop-up box to confirm the reboot.

### 4.1.1.3.2 Reboot in Recovery
1. Click the **Reboot in Recovery** button.
2. Click the **Yes** button in the pop-up box to confirm the reboot in the recovery mode.

For VSs with a password encryption *enabled*, the temporary login is "root" and password is "recovery".

For VSs with a password encryption *disabled*, the "root" password will be used to reboot the VS in recovery.

Windows virtual servers boot from the Linux-based recovery template in the recovery mode. You need to log in as admin via SSH or VNC console and mount a Windows system disk manually.
You cannot work with the "whole" disk (like `mount -t ntfs-3g /dev/sdb1`) while mounting and checking block devices inside the recovery image as Windows disk is split into partitions.

### 4.1.1.3.3 Suspend/Unsuspend Virtual Server

1. Click the **Suspend** button to stop a VS, change its status to suspended and disable all the major actions on VS, unless unsuspended.

   The virtual server is suspended immediately after clicking the **Suspend** button without an additional confirmation.

2. Click the **Unsuspend** button to activate the suspended VS and enable all the major actions.

For more information on actions available on a suspended VS, refer to the Manage Suspended Virtual Server section.

### 4.1.1.3.4 Shut Down Virtual Server

You can shut down a specific virtual server or multiple VSs that reside on the same compute resource. For information on shutting down multiple VSs, refer to the Power On/Off Multiple Virtual Servers section below.

To shut down a particular virtual server:

1. Click the **Shut Down Virtual Server** button.

2. In the pop-up box, select either the **Gracefully shutdown** option to terminate the VS gracefully or the **Power OFF** option to terminate the VS forcefully.

   If you select the **Gracefully shutdown** option and the system fails to shut down the VS gracefully in the time period indicated in the **Timeout Before Shutting Down VSs (30-600 sec)** parameter at Admin > Settings > Configuration > System, the VS will be shut down forcefully.

3. Click the **Apply** button to shut down the VS.

### 4.1.1.3.5 Startup Virtual Server

You can start up a specific virtual server or multiple VSs that reside on the same compute resource. For information on starting multiple VSs, refer to the Power On/Off Multiple Virtual Servers section below.

To queue a start-up action for a VS that is currently powered-off, click the **Startup Virtual Server** button.

When you start up a VS, it might be implicitly cold migrated if the current compute resource does not have sufficient resources. For more information, refer to Virtual Server Provisioning.

### 4.1.1.3.6 Startup on Recovery

To start a VS in the recovery mode:

1. Click the **Startup on Recovery** button to start up a VS in the recovery mode.

2. In the pop-up box, click the **Yes** button to confirm the startup.

For VSs with a password encryption enabled, the temporary login is "root" and password is "recovery".
For VSs with a password encryption disabled, the "root" password will be used to start up the VS.

4.1.1.3.7 Boot from ISO
You can boot virtual servers from your own ISOs or the ISOs that are uploaded and made publicly available by other users. If you boot a VS from an ISO with the RAM requirement larger than the VS’s RAM, the transaction will fail. Make sure that you have enabled the Any power action on own virtual servers and Allow own virtual servers to boot from ISO permissions for the user to have access to this feature.

To boot a VS from an ISO:
1. Click the Boot from ISO button.
2. Select the ISO image from which the VS will be booted.
3. Click the Boot button.

As soon as you boot a VS from the installation ISO, OnApp may lose control of any components (backups, networks, disks). The migration option is not available for VSs booted from ISO. The only available actions will be to start and stop a VS. Be aware that all the contents of the disk may be also deleted.

4.1.1.3.8 Power On/Off Multiple Virtual Servers
To power on and power off virtual servers that are run on the same compute resource, follow the next steps:

1. In the Settings section, expand the Compute Resources menu and click a label of a compute zone where a target compute resource runs.
2. Click a label of a compute resource. On the screen that appears, you will see a list of all virtual servers hosted on the compute resource.
3. Choose virtual servers that you want to power on or power off by selecting the required checkboxes in the first column of the table.

- To select all virtual servers residing on the compute resource, click the first checkbox. To cancel the selection of all virtual servers, click this checkbox again.
- If you select all virtual servers, only the powered-off VSs will be powered on, while the already powered-on VSs will be skipped and vice versa.

Depending on the current power status of the selected VSs, one of the following options will become available.

**Power On**
To power on the selected VSs:

- Click the Power On button.
- In the pop-up box, click the YES button to confirm your action.
- As a result, the multiple transactions will be scheduled to start up all the selected virtual servers one by one.

**Power Off**
To power off the selected VSs:

- Click the Power Off button.
- In the pop-up box, select one of the following methods:
Gracefully shut down - to run a graceful shutdown of VSs
Power Off - to run a forceful shutdown of VSs

- Click the Submit button to confirm your action.
- As a result, the multiple transactions will be scheduled to power off all the selected virtual servers one by one.

The bulk power on/off actions are available only to virtual servers that are run on KVM compute resources.

See also:
- Virtual Server Administrative Options
- Permissions
- Manage Virtual Server
- Manage Suspended Virtual Server

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Power%20%20Options

4.1.1.4 Manage Virtual Server Administrative Options

Virtual Server administrative options include the list of actions that you can run as a VS administrator.

To manage a virtual server administrative options:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. Click the Actions button on the VS's Details page and then point to Administration.

The Administration menu enables you to perform the following administrative actions on VSs:

4.1.1.4.1 Reset Root Password

1. Click the Reset Root Password button.
2. Move the Set password slider to the right and type your new password twice into the corresponding boxes.
3. To enable the password encryption, move the Encrypt password slider to the right and type an encryption passphrase twice into the corresponding boxes.
4. Click the Set Password button to save your new password.

- The virtual server will be rebooted after resetting the password.
- Particular characters are not allowed for Windows-based virtual servers:
  - percent sign [%]
  - double quotation marks ['"]
  - brackets [<>]
  - vertical bar [|]
  - caret ['^']
  - ampersand [&]
  - parentheses [(),]

Click here to find more details about resetting the administrator password for a Windows-based virtual server via SSH

If you cannot reset the administrator password for a Windows-based virtual server via the UI:

1. Connect to Control Panel via SSH:
ssh root@CP_IP_ADDRESS
su onapp

Please note that port 22 should be open to proceed with the following steps.

2. Connect to the Windows-based virtual server:
   • For 4.x templates:
     ssh -o StrictHostKeyChecking=no Administrator@VM_IP_ADDRESS

Make sure that A in Administrator is a capital letter.

If a virtual server has a private IP address, make sure that CP has access to the virtual server network.

3. At the command prompt, run:
   cmd

4. Change the administrator password (recommended to set the password in the UI):
   net user administrator newpassword

In case this is a Windows-based virtual server with ADDS (Active Directory Domain Services) installed, run:
   net user administrator newpassword /domain

5. Close the SSH connection.

Reboot is not required. Now you can log in normally with the password from the UI.

OnApp Cloud supports active directory domain controllers. The only limitation is that from the UI. OnApp cannot change or reset the password if the Windows virtual server is used as a domain controller.

4.1.1.4.2 Set Max Memory
You can set a limit on RAM that can be allocated to virtual servers built on KVM compute resources. Setting the custom max memory limit is available for:
   • Virtual servers from KVM compute zones with the Ballooning release resource type and the Set max memory option enabled
   • Virtual servers that are built on templates that support Hot Resize
   • Users who have the Set Max Memory permission enabled in the Virtual Servers permissions set

To set a max memory limit for a virtual server:
   1. Click the Set Max Memory button.
   2. Move the Max Memory override slider to the right.
   3. Enter the Max Memory limit in MB.
   4. Click the Save button.
After you save a max memory limit, reboot a virtual server to apply changes.

If you do not set the max memory limit for a virtual server but enable the Ballooning release resource type and the Set max memory option for a compute zone, the limit for VSs is calculated as follows:

**Max Memory Limit** = Memory × Compute Resource Max Memory Rate

Where:

- **Memory** - the amount of RAM currently allocated to a virtual server
- **Compute Resource Max Memory Rate** - the default max memory rate is eight (8)

You can modify the default max memory rate (8) that is used to calculate a max memory limit. Change a value of the `kvm_max_memory_rate` parameter in the `on_app.yml` file.

The max memory limit for a virtual server is handled as follows:

- If the calculated max memory limit is more than 90% of free RAM available on a compute resource, then the limit is equal to 90% of free RAM available on the compute resource.
- If the calculated max memory limit is less than 90% of free RAM available on a compute resource, then the limit is equal to the calculated value.

You can modify the default percentage (90%) that is used to calculate a max memory limit. Change a value of the `kvm_available_free_memory_percentage` parameter in the `on_app.yml` file.

4.1.1.4.3 Set Custom CPU Quota

- To edit CPU Quota for a virtual server, you need to enable the default value for the compute resource first.
- This feature is available only for KVM compute resources.

The default value of CPU quota can be customized according to your needs. You can overwrite the default value set for the compute resource for any particular virtual server you need. For example, if the default CPU quota for the compute resource is set to 50%, you can increase it to 90% depending on the priority of your virtual server.

To set a custom value for the particular virtual server:

1. Click the **Set custom CPU Quota** button.
2. Move the **CPU Quota enabled** slider to the right to enable CPU quota to override the default value.
3. Set CPU quota. The maximum value is 99%. Also, you can select the ∞ checkbox to set an unlimited amount of CPU quota.
4. Click the **Save** button.

Custom CPU quota change can be done live without virtual server restart.

CPU Quota value can be changed automatically during migrating virtual server to another compute resource.
- If migrating to the compute resource that does not have CPU Quota enabled, then CPU Quota value will be set to unlimited.
- If migrating to the compute resource that has CPU Quota enabled, check the custom value for virtual server. The custom CPU quota will remain unchanged after the migration, while the unspecified custom value will change into the default value.

4.1.1.4.4 Change Owner
To change an owner of a virtual server:
1. Click the Change Owner button.
2. In the dialog box, select a target user from the drop-down list that shows all users in the system.
3. If you have any recipes or backups for this VS, you need to confirm if the recipe/backup should be moved to another user. Select Yes if you want to make the recipes or backups of the virtual server available to the new owner. Otherwise, select No.

If you select No, all the backups for this virtual server are deleted.
4. Click the Change Owner button to grant ownership to the selected user.

- If you want to change an owner of the VS, which was built using an instance package, ensure that the new owner has permission to create VS using instance package and appropriate instance package in the bucket. Otherwise, you will not be able to change the ownership of this VS.
- Note that you cannot change the ownership of a recipe which you do not own, even if it is assigned to your virtual server.

4.1.1.4.5 Set SSH Keys
To set SSH keys for a virtual server:
1. Click the Set SSH keys button to assign SSH keys of the admin and a VS owner to the VS.
2. In the pop-up dialog box, click the Set SSH keys button to confirm the action.

- The virtual server will be rebooted after setting SSH keys.
- If a VS owner does not have any SSH keys, the system will only assign admin keys.

4.1.1.4.6 Edit FQDN
To edit FQDN (fully qualified domain name):
1. Click the Edit FQDN button.
2. In the pop-up dialog box, edit the hostname and the domain name.
3. Move the Force reboot slider to the right to enable FQDN update in case the transaction fails with a running virtual server.

- If the Force reboot is disabled, the FQDN will be changed on the fly if possible. If it is not possible, the transaction will fail and the FQDN won't be changed.
- If the Force option is enabled, you will see two more options, Shutdown type and Required startup.
4. Select the shutdown type from the dropdown list (Gracefully shutdown or power off).
4. Gracefully shutdown - to run a graceful shutdown of VSs
5. Power Off - to run a forceful shutdown of VSs

5. Tick the Required startup checkbox to start up the virtual server automatically after the FQDN is updated.
6. Click the Submit button.

See also:
- Virtual Server Power Options
- Permissions
- Defaults Configuration
- Instance Packages
- Recipes

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Administrative%20Options

4.1.1.5 Manage Virtual Server Advanced Configuration
You can manage your virtual servers at a raw configuration level by editing the XML configuration file available for each VS in your Control Panel. The functionality is available for virtual servers that are built on KVM compute resources.

IMPORTANT
Virtual servers with modified XML configuration are not supported by the OnApp support team.

4.1.1.5.1 Enable Advanced Configuration
To enable managing the advanced configuration for virtual servers in your Control Panel:
1. Go to the Control Panel > Admin > Settings > Configuration menu.
2. Open the Defaults tab.
3. Move the Allow advanced VS management slider to the right.
4. Click the Save Configuration button.

Please note that the system will restart OnApp services automatically after you save new configuration.

4.1.1.5.2 Edit XML Configuration
To edit the XML config file of a virtual server, follow the next steps:
1. Go to your Control Panel > Cloud > Virtual Servers menu and click a label of a specific virtual server.
2. Expand the Actions menu, point to Options, then click the Edit XML Config button.
3. Click the Unlock button to be able to edit the XML file. In the pop-up box, click Yes to confirm your action.
4. Edit configuration and click the Save button to apply changes. In the pop-up box, select whether you want to save changes with or without a reboot.

- To revert changes that you made before saving configuration, click the Cancel button.
5. If you want to discard all changes, click the Reset to default button at the Edit XML Config page. In the pop-up box, select whether you want to reset configuration with or without a reboot. This action initiates deletion of all changes you have applied in the XML configuration except for RAM and CPU related modifications. As a result, the XML configuration file will be reset to default and locked.

4.1.1.5.3 Important Considerations

If you edit RAM or CPU Cores for virtual server:

- After clicking the Save button, the RAM and CPU cores are validated according to the bucket settings and the price for the resources can be changed. If the bucket does not allow the changes you applied, the appropriate message will be displayed.

- The Reset to default button will not restore the RAM and CPU values to the previous state.

You cannot perform the following actions after you save changes in the VS XML configuration file:

- Edit VS
- Create/edit/migrate/delete VS disks and set disk IOPS limits
- Create/edit/delete network interfaces

The failover and migration for the VS with modified XML config is available only if you select the Enable failover and migration checkbox while editing the config file.

See also:

- Manage Virtual Server Power Options
- Manage Virtual Server Administrative Options

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Advanced%20ConfigurationLeave feedback

4.1.1.6 Manage Acceleration Settings

If you have accelerated virtual servers, the Acceleration tab is available to you. At this tab, you can view accelerated virtual server statistics, blacklist domains and remove cache content. The functionality is available for accelerated virtual servers and smart servers.

4.1.1.6.1 Accelerated Virtual Server Statistics

This section provides the information on how you can view bandwidth statistics and cache utilization statistics of accelerate-enabled virtual server.

Ensure that Accelerate any Virtual Server/Accelerate own Virtual Servers permissions are on before managing accelerated VS statistics. For more information about permissions, refer to the Permissions section of this guide.

To see the bandwidth and cache utilization statistics:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the accelerate-enabled virtual server you're interested in.
3. Click the Acceleration tab > Reporting.
4. On the screen that appears, specify the period in the From and To fields and click the Apply button. The default period is the last week.
5. The first chart shows bandwidth statistics: the total/cached/non-cached statistics. The second chart shows cache utilization statistics: the number of pages cached on the Edge (hits) as well as the number of misses - the pages which are not cached.

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

4.1.1.6.2 Blacklist Domains
Blacklisting domains allow you to block a number of websites from being accelerated. This feature enables blacklisted websites to load from Origin again, while other websites hosted on the same VS remain accelerated.

To blacklist a domain, do the following:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the accelerate-enabled virtual server you're interested in.
3. Click the Acceleration tab > Blacklist domains.
4. Fill in the domains you want to blacklist.
5. Click the Save button.

Now, when the domains of choice are blacklisted, all the requests will be forwarded to origin directly and the response header will bypass Accelerator without any additional optimization.

4.1.1.6.3 Purge Content
This tool allows instant removal of cache content for the accelerated virtual servers. You can purge all content or one/several files. In cases when you want to purge one or several files, the system will compare the checksum of the cached file and the new one. The cached file will only be purged if the checksums vary, that is, the files are different. If the checksum of the two files is the same, the cached file will not be purged. When you purge all content, the checksums of the cached and new files are not taken into account.

Limitations and prerequisites:

- This tool applies only to virtual servers with acceleration enabled.
- You need to have CDN enabled for the cloud to use the purge feature.
- You need to have the Allow to purge content of all Virtual Servers or the Allow to purge content of Own Virtual Servers permission enabled to use this feature. For more information, refer to the OnApp Permissions section.
- If several customers accelerate their VSs using one Accelerator, they can purge each other's files, provided that they enter the correct URL.

To purge a single file:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the accelerate-enabled virtual server you're interested in.
3. Click the Acceleration tab > Purge.
4. In the input field, specify the path(s). You may indicate only one path per line. You can fill in either the original URL, the one prior to acceleration or the accelerated URL.
5. Click the Submit button to finish.

To purge all content:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the accelerate-enabled virtual server you're interested in.
3. Click the Acceleration tab > Purge.
4. Click the Purge All Contents of this Site button to purge all content.

See also:
4.1.1.7 Manage Suspended Virtual Server

For information on how to suspend a virtual server, refer to the Virtual Server Power Options section.

Suspending a virtual server makes it inactive, but still present on the system. All the major actions on the suspended VS are disabled except for some actions related to:

- Properties
- CPU Usage
- Billing Statistics
- Recipes
- Service Add-ons
- Network Interfaces
- Firewall Rules
- Disks
- Backups

To run all the available VS-related actions on a suspended instance, you should unsuspend it.

4.1.1.7.1 Properties
You can view general properties of the suspended VS at Control Panel > Cloud > Virtual Servers menu, including such details as hostname, compute resource, location group, owner, IP addresses, and others. You can also view the Notes section that lists brief comments or reminders for the suspended VS but you cannot create new notes.

For more information on the VS properties, refer to the Virtual Server Details section.

4.1.1.7.2 CPU Usage
You can view charts on the CPU usage of the suspended VS at 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.

For more information on CPU usage, refer to the Virtual Server CPU Utilization section.

4.1.1.7.3 Billing Statistics
You can view billing statistics of the suspended VS at Control Panel > Cloud > Virtual Servers > Label > Overview > Billing Statistics tab. The Billing Statistics page contains a record of billing operations relevant to the last three-month period. If a virtual server was created less than three months ago, statistics are recorded starting from the VS's creation...
date. You can view all available statistics or those for a shorter period by setting a Start and End time.

For more information on how to view billing statistics, refer to the Virtual Server Billing Statistics page.

4.1.1.7.4 Recipes
You can view recipes assigned to the suspended VS at Control Panel > Cloud > Virtual Servers > Label > Overview > Recipes tab. If you have some custom recipe variables attached to the suspended VS, you can view them at Control Panel > Cloud > Virtual Servers > Label > Overview > Recipe Variables tab. For other operations related to recipes, you need to unsuspend your virtual server.

For more information on recipes and custom recipe variables, refer to the linked pages.

4.1.1.7.5 Service Add-Ons
You can view service add-ons assigned to the suspended VS at Control Panel > Cloud > Virtual Servers > Label > Overview > Service add-ons tab. You can also unassign a service add-on from the suspended VS. For other operations related to service add-ons, you need to unsuspend your virtual server.

For more information on service add-ons, refer to the Service Add-Ons section.

4.1.1.7.6 Network Interfaces
You can view the virtual network interfaces allocated to the suspended VS at Control Panel > Cloud > Virtual Servers > Label > Networking > Network Interfaces tab, including details about the network join, port speed, and primary network interface. For other operations related to managing network interfaces, you need to unsuspend your virtual server.

For more information on managing network interfaces, refer to the Virtual Server Network Interface section.

4.1.1.7.7 Firewall Rules
You can view firewall rules that were added to VS before its suspension at Control Panel > Cloud > Virtual Servers > Label > Networking > Firewall tab. You can also remove a firewall rule from the suspended VS. For other operations related to firewall settings, you need to unsuspend your virtual server.

For more information on firewall rules, refer to the Set Virtual Server Firewall Rules page.

4.1.1.7.8 Disks
You can view the list of disks allocated to the suspended VS at Control Panel > Cloud > Virtual Servers > Label > Storage > Disks tab. In the same tab, you can also access the disk IOPS (Input/Output Operations per Second) statistics. For other operations related to disks settings, you need to unsuspend your virtual server.

For more information on how to manage disks, refer to the Virtual Server Disks and Virtual Server Disk IOPS Statistics sections.
4.1.1.7.9 Backups

You can view the suspended VS backups that have already been taken and that are scheduled to be taken at Control Panel > Cloud > Virtual Servers > Label > Backups tab, take the backup and convert it to a template. For other operations related to managing backups, you need to unsuspend your virtual server.

For more information on the VS backups, refer to the Virtual Server Backups page.

See also:
- Manage Virtual Servers
- Virtual Server Statistics
- Virtual Server Recipes
- Virtual Server Service Add-ons
- Virtual Server Networks
- Virtual Server Disks
- Virtual Server Backups

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Suspended%20Virtual%20Server

4.1.1.8 Manage Virtual Server Backup Resources

Backup resources are based on plugins that enable running virtual server backups on third-party systems. Backup resources become available for your virtual servers if you complete the following procedures:
- Install Backup Plugin
- Create Backup Resource
- Create Backup Resource Zone
- Attach Backup Resource to Backup Resource Zone
- Attach Backup Resource Zone to Compute Zone
- Add Auto Backup Presets

When all the procedures are completed, you can add a backup resource to virtual servers from a compute zone to which you attached a backup resource zone. In this document, you can find information on how to manage backup resources for your virtual servers.

You can use the Veeam plugin only for VMware resources such as VMware Cloud Director and vCenter.

- Auto installation of R1Soft backup agent on a virtual server might fail on some versions of Windows templates. If you face any issues with using R1Soft on Windows virtual servers, please contact OnApp Support.
- If you want to delete a virtual server that has an attached backup resource, first detach the resource. If you delete a VS with the attached backup resource, synchronization between OnApp and your third-party backup system fails. It can affect other virtual servers that use this backup resource since the list of available recovery points will not be updated in OnApp CP.

4.1.1.8.1 View Backup Resources

To view the list of backup resources available for your virtual server, follow the next steps:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a required virtual server.
3. Expand the Backups menu and click the Backup resources button.
4. On the page that appears, you will see the list of backup resources and the following details:
   - **Label** - the name of the backup resource
   - **Enabled** - the status that indicates whether the backup resource is enabled (YES) or not (NO)
   - **Plugin** - the name of the backup plugin
5. Click a label of a required backup resource to view the following details:
   - **Label** - the name of the backup resource
   - **Backup resource zone** - the backup resource zone to which the backup resource is assigned
   - **Enabled** - the status that indicates whether the backup resource is enabled (YES) or not (NO)
   - **Plugin** - the name of the backup plugin
   - **Primary host** - the primary address (either hostname or IP address) used to connect to the third-party backup system
   - **Secondary host** - the secondary address (either hostname or IP address) used to connect to the third-party backup system
   - **Username** - the username used to connect to the third-party backup system

To enable or disable a backup resource for a virtual server, refer to the sections below.

---

### 4.1.1.8.2 Attach Backup Resource to Virtual Server

To attach a backup resource to a virtual server, follow the next steps:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a required virtual server.
3. Expand the Backups menu and click the Backup resources button.
4. Click the "+" button next to the backup resource that you want to enable for this virtual server.

- When the backup resource is attached to VS, backups of the virtual server are run according to the Auto Backup Presets configured for the backup resource. To view the list of available recovery points and restore the virtual server from a recovery point, refer to the Recovery Points section.
- You can view a log of all backup plugin related operations in the Activity Log section of a destination virtual server.

---

### 4.1.1.8.3 Remove Backup Resource from Virtual Server

To remove a backup resource from a virtual server, follow the next steps:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a required virtual server.
3. Expand the Backups menu and click the Backup resources button.
4. Click the "-" button next to the backup resource that you want to disable for this virtual server.
After you remove a Veeam-based backup resource from a virtual server, a corresponding backup schedule remains on the Veeam side. You can disable the schedule via Veeam Backup & Replication UI.

See also:
- Install Plugins
- Recovery Points
- Create and Manage Backup Resources
- Create and Manage Backup Resource Zones
- Create and Manage Auto Backup Presets

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Backup%20Resources

4.1.1.9  Manage Virtual Server Backups
This document provides the information how backups are implemented and managed in OnApp and aims at helping to design and manage the backup strategy for your cloud.

If required, you can change the block size which is used during backup creation at Control Panel > Admin > Settings > Configuration by editing the Block Size (MB) parameter.

4.1.1.9.1  Types of Backups
OnApp allows you to create two backup types: normal and incremental.

<table>
<thead>
<tr>
<th>Normal</th>
<th>Incremental</th>
</tr>
</thead>
<tbody>
<tr>
<td>The full copy of target data that is stored in an archive, whether it has changed or not.</td>
<td>Only the changes made after the last backup are archived instead of backing up the whole target.</td>
</tr>
<tr>
<td>Auto-backups are created per disk.</td>
<td>Auto-backups are created per virtual server.</td>
</tr>
</tbody>
</table>

The backup type is configured at Admin > Settings > Configuration > Backups/Templates menu. If you tick the Allow incremental backups checkbox, the incremental backups will be enabled for your cloud. Otherwise, if this box is disabled, normal backups will be created for your cloud.

4.1.1.9.2  How Do Incremental Backups Work?
Incremental backups only copy files that have changed since the last backup. The benefit is that incremental copies take less space than full backups. Be aware that when you want to perform a complete restore, the most recent full backup and all of the subsequent incremental copies must be restored.
For example, we have a disk with three files: File1 - 3Gb, File2 - 2Gb, File3 - 4Gb

- The first backup will be a full backup of 9 GB (sum of all files). If you decide to take another incremental backup soon thereafter, the backup size will 0, as the files have not been changed since the first backup. However, if your backup has complicated directory structure, it could be more than 0, as file system could store some system data.

- If you delete File2, the target size will now be 7Gb. The subsequent incremental backup size will be 0, as new data has not been added.

- If you add File4 of 4 GB size, the subsequent incremental backup ours, will equal 4 GB (the size of new data added).

- If you increase File3 disk size to 6 GB, the subsequent incremental backup size will equal 6 GB, although the target is increased by 3 GB. This happens because the incremental system takes the update of the existing file as the deletion of the existing file and adding the new file with the same name (the first version of File3 has been deleted and the new one with 6GB size has been added).

<table>
<thead>
<tr>
<th>Backup Support by VS / Virtualization / OS</th>
<th>Normal backup</th>
<th>Incremental backup</th>
<th>Convert to template</th>
</tr>
</thead>
<tbody>
<tr>
<td>BaremetalServer</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>EdgeServer</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>StorageServer</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>LoadBalancer</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>SmartServer</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>KVM</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>VMware</td>
<td>snapshot</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>
Manual / Auto-Backups

You can take backups manually or automatically.

- **Manually** - the user logs into OnApp CP and clicks the “Take backup” button when required.
- **Automatically** - the user enables backup schedule (daily, weekly, monthly, yearly). There are two types of auto-backups that supplement each other: auto-backup presets and schedules.

Auto-backup presets are a simple way to set up an automatic backup schedule when virtual servers are created. Once configured globally for the cloud, they can be applied to a VS automatically when the Automatic Backups Required box is checked during VS creation. A number of preset backup time periods are available (daily, weekly, monthly and annual backups) which are configured further by specifying how often each backup is taken. So, for example, you can set up automatic backups every 2 days, every 1 month, or even every 12 months (the same as every 1 year). Each type of backup can be enabled or disabled.

Schedules are created either per virtual server or per disk depending on the backup type set in your cloud settings:

- If you are using normal backups, the schedules are created per disk.
- Despite the auto-backup presets configuration, for normal backups (when disk is the target) the rotation period is always 1.
- If you are using incremental backups, the schedules are created per virtual server.

Schedules allow configuring that auto-backups run for specific VSs only, at a particular date and time.

You can also configure the re-run period for auto-backup in case of auto-backup transaction failure. By default, it is set to 3 hours, but you may change the time value in the info_hub.yaml configuration file.

The combination of **Auto-backup Presets** and **Scheduled VS backups** provides a great deal of flexibility in the way backups are handled for the cloud, and for individual VSs. Auto-backup Presets can be applied to all new VSs added to the cloud. Scheduled VS backups enable specific backups to be scheduled for individual VSs, outside of the auto-backup pattern.

For the instructions on setting up auto-backups, refer to the following docs:
- **Schedules Settings**
- **Auto-Backup Presets Settings**

Where Backups Are Stored?

Depending on the cloud configuration and the backup scheme, the backups are stored at different locations. See the illustration below for the explanation.
*- make sure to share the location on compute resources where backups are stored between all compute resources in a zone.

**Normal:**

- If you have an SSH File transfer server configured in Admin > Settings > Configuration menu, the backups are stored on this SSH file transfer server.
- If you have added one or more backup servers, all backups will be stored on these servers.
- If there is more than one backup server, backups are stored on the server according to the balancing scheme.
- If you have no backup servers in the cloud, the backups are stored on compute resources.

**Incremental:**

- If you have added one or more backup servers, all backups will be stored on these servers.
- If there is more than one backup server, backups are stored on the server according to the balancing scheme.
- If you have no backup servers in the cloud, the backups are stored on compute resources.

You can also use dedicated CloudBoot backup servers in your cloud. Please refer to the Create CloudBoot Backup Server for details.

**4.1.1.9.6 Backup Server Balancing**

Backups can be stored either to a compute resource or to a dedicated backup server. When saving a backup, the system calculates if there is enough physical/ bucket resources to save a backup in the selected destination.

When saving a backup to a compute resource, the system does not check if the compute resource has enough disk space to save a backup and only checks if the user has enough bucket limits. When saving a backup to a dedicated backup server, the system checks both disk space and bucket limits.

The choice of a specific backup server on which a backup will be performed is called backup server balancing. When you send a command to take a backup, the system schedules a
corresponding transaction and when the transaction is launched, the system will reassign it to the most appropriate backup server.

OnApp supports two backup types: normal and incremental, each of them having its own procedure of selecting the most appropriate server to take a backup:

For **Normal Backups** the system will follow the sequence below to take a backup:

1. Check which backup servers are assigned to this location group
2. Which of them are available to the user
3. Which of those have enough space and bucket limits. Free disk size on a target must be at least equal to the disk's size for which the backup is taken.
4. From those remaining, the most appropriate backup server will be the one with the smallest count of "take backup" transactions at the moment of the check
5. If for several backup servers this quantity is equal (0, 1, 2, ...,n), the backup server with the lowest load (highest cpu_idle parameter) will be selected as the most appropriate

In case of **Incremental Backups**, the server for the first full backup will be selected the same as for normal backups:

1. Check which backup servers are assigned to this location group
2. Which of them are available to the user
3. Which of those have enough space and bucket limits. Free disk size on a target must be at least equal to all VS disk size.
4. From those remaining, the most appropriate backup server will be the one with the smallest count of "take backup" transactions at the moment of the check
5. If for several backup servers this quantity is equal (0, 1, 2, ...,n), the backup server with the lowest load (highest cpu_idle parameter) will be selected as the most appropriate

All consequent backups will be performed at the same backup server as long as it is available and has enough storage space. If not - the alternative backup server will be selected following the principle described above.

For the instructions on setting up backup servers, refer to the following docs:
- [Backup Servers Settings](#)
- [Edit Backups/Templates Configuration](#)

4.1.1.9.7 Backup Limits in Buckets

Buckets allow you to set limits for backups for a user who is signed up with this plan.

If the backups are stored on compute resources or an SSH file transfer server, the Templates, ISOs & Backups Storage and Backups User VS Limits can be applied:

- free disk space for backups
- the total amount of disk space
- the number of backups users can create for free
- the maximum number of backups

If the backups are stored on backup servers, you can set the Backups and Backup Disk Size Backup Server Zones limits:

For auto-backups
- free disk space for backups
- total amount of backup server space

For manual backups
- free disk space for backups
- total amount of backup server space
- the amount of backups users get for free
- the total amount of backups

Please also set the Backups max limit to 0 in the [User VS limits](#) if you store the backups on backup servers.

For the instructions on setting up backup limits, refer to [Configure Resource Allocation and Prices](#).

### 4.1.1.9.8 Take Virtual Server Backup

To take an incremental backup:

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 Backups tab, then select Files.
4. To take a backup, click the Take a Backup button.

Backups in the OnApp Control Panel are associated with a particular user instead of being associated with a virtual server. To view the list of user backups, refer to [View User Backups](#) section.

Template extraction is performed during server provisioning or taking a backup when using a particular template. To prevent the template from being used in other transactions during extraction, the template is locked during the extraction and unlocked on accomplishment. If other transaction tries to use the locked template, it will fail after 5 minutes of standby. The transaction, which locked template and failed, means that extracted template is broken.

**Storing scheme:**
- template /onapp/templates/your_template.tgz
- extracted template /onapp/backups/templates/your_template
- locked template /onapp/backups/templates/your_template.lock

### 4.1.1.9.9 Take Virtual Server Disk Backup

To back up a virtual server:

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 Storage tab > Disks. You'll see a list of the disks allocated to that virtual server.
4. Click the Actions icon next to a disk you want to take a backup of, then click Backup. You'll see a list of all the backups taken and pending for that disk, along with the tools to restore backups, delete them, and convert them to templates.
   - To make a backup, click the Take a Backup button at the end of the list. You may add a note and also [Force Windows Backup](#)
This option for Windows virtual servers is designed as a last resort, when the backup cannot be taken due to NTFS file system problems. Switching this option will bring up a dialog box with the following message: "If you enable this option there is no guarantee that backup will be consistent.
Select "Yes" to proceed.

- To restore a backup, click the Restore link next to the backup you want to revert to.
- To convert a backup into the custom template, click Convert to Template link next to the backup (see Create custom templates).

- For Windows VS: make sure that disk filesystem (NTFS) is consistent (not corrupted) before backup conversion to a custom template. It is highly recommended to take a backup after VS shutdown, otherwise, proper template provisioning is not guaranteed.
- Backups in the OnApp Control Panel are associated with a particular user instead of being associated with a virtual server. To view the list of user backups, refer to View User Backups section.

4.1.1.9.10 Convert Virtual Server Backup to Template
To convert virtual server backup to template:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, click the Actions icon next to the backup and choose the Convert to Template (see Create custom templates).

For Windows VS: make sure that disk filesystem (NTFS) is consistent (not corrupted) before backup conversion to custom template. It is highly recommended to take backup after VS shutdown. Otherwise proper template provisioning is not guaranteed.

4.1.1.9.11 Restore Virtual Server Backup
To restore a backup:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, click the Actions icon next to the backup you want to revert to and choose Restore.

- If the file system on the disk is corrupted, it won't be possible to restore the files from incremental backup. In that case, you can force a backup restore and rebuild a file system on a disk. To do this, move the Force Restore slider to the right.
Note that Force Restore option is unavailable for incremental backups of FreeBSD virtual servers.

5. Click the **Restore Backup** button.

### 4.1.1.9.12 Add Virtual Server Backup Note

**To edit virtual server backup's note:**

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the required virtual server.
3. Click the **Backups** tab, then select the appropriate backup type:
   - **Images** - full backups
   - **Files** - incremental backups
4. On the screen that appears, click the **Actions** icon next to the required backup and choose **Add Note**. Make necessary changes and click **Submit**.

### 4.1.1.9.13 Delete Virtual Server Backup

**To delete a backup:**

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the required virtual server.
3. Click the **Backups** tab, then select the appropriate backup type:
   - **Images** - full backups
   - **Files** - incremental backups
4. On the screen that appears, click the **Actions** icon next to the backup you want to remove and choose **Delete**.

See also:

- **Schedules Settings**
- **Auto-Backup Presets Settings**
- **Edit Backups/Templates Configuration**
- **Resource Allocation and Prices**
- **View User Backups**

### 4.1.1.10 Manage Virtual Server Backup Schedules

**The schedules screen lists the virtual servers’ scheduled backups. Depending on the backup type set in your cloud settings, schedules are created either per virtual server or per disk. To view all backup schedules in the cloud, see Schedules Settings. In this document, you can find information on how to manage Virtual Server backup schedules.**

#### 4.1.1.10.1 View Virtual Server Backup Schedules

**To view the list of backup schedules for a particular virtual server:**

If normal backup options is selected for the cloud:

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** tab, then select **Disks**.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.

5. On the screen that appears, you will see the list of backup schedules along with their details:
   - **Date** - the time when the schedule was created
   - **Target** - the server or disk for which the schedule was created (depending on the backup type)
   - **Action** - the scheduled action
   - **Period** - how frequently the backup will occur according to a period type set in the next step.

   For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this filed is set 1.

   - **Period type** - the backup period: days, weeks, months, or years
   - **Rotation period** - the number of backups, after which the first backup will be deleted.

   By default, in this filed is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this filed, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

   - **Next Start** - the date and the hour of the next backup
   - **User** - the user who created the backup schedule
   - **Status** - schedule status

   If incremental backup option is selected for the cloud

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

2. Click the label of the virtual server you're interested in.

3. Select **Backups** > **Schedules** tab, or click **Auto-backups** under the **Options** section to view incremental backups schedules only.

4. On the screen that appears, you will see the list of backup schedules along with their details:
   - **Date** - the time when the schedule was created
   - **Target** - the server or disk for which the schedule was created (depending on the backup type)
   - **Action** - the scheduled action
   - **Period** - how frequently the backup will occur according to a period type set in the next step.

   For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this filed is set 1.

   - **Period type** - the backup period: days, weeks, months, or years
   - **Rotation period** - the number of backups, after which the first backup will be deleted.
By default, in this filed is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this filed, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

- **Next Start** - the date and the hour of the next backup
- **User** - the user who created the backup schedule
- **Status** - schedule status

### 4.1.1.10.2 Create Virtual Server Backup Schedule

In addition to the system auto-backup presets, you can schedule backups of virtual servers (VS disks) as required. For example, you can set up a schedule to back up your disks once a week.

The combination of Scheduled VS backups and **Auto-backup Presets** provide a great deal of flexibility in the way backups are handled for the cloud and for individual VSs. Auto-backup Presets can be applied to all new VSs added to the cloud. Scheduled VS backups enable specific backups to be scheduled for individual VSs, outside of the auto-backup pattern.

Depending on your cloud settings, you can schedule either normal or incremental backup schedules:

- [Adding normal backup schedule](#)
- [Adding incremental backup schedule](#)

#### 4.1.1.10.2.1 Adding a normal backup schedule

**To add a normal backup schedule:**

1. Go to your Control Panel > **Cloud > Virtual Servers** menu.
2. Click the label of the virtual server you want to schedule a backup for.
3. Click the **Storage** tab, then select **Disks**.
4. On the screen that appears, click the **Actions** button next to the disk you want to back up, then select **Schedule for Backups**.
5. On the screen that follows, click the **New Schedule** button.
6. Specify schedule details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted. For example, if the rotation period is 5 then the last 5 backups would be stored on the backup server. If you create one more backup (the sixth one), it will replace the first backup on the backup server.
   - **Start time** - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).
7. Click the **Save** button to finish.

#### 4.1.1.10.2.2 Adding an incremental backup schedule

1. Go to your Control Panel > **Cloud > Virtual Servers** menu.
2. Click the label of the virtual server you want to schedule a backup for.
3. Click the **Backups** tab, then choose **Schedules**, or click **Auto-backups** under the **Options** menu to view incremental backup schedules only.

4. Click the **New Schedule** button.

5. On the screen that appears, specify new schedule's details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted.
   - **Start time** - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).

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

You can also configure the re-run period for auto-backup in case of auto-backup transaction failure. By default, it is set to 3 hours, but you may change the time value in the info_hub.yaml configuration file. You will receive an event notification whenever any backup is postponed.

4.1.1.10.3 Edit Virtual Server Backup Schedule

To edit a normal backup schedule:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you want to schedule a backup for.
3. Click the **Storage** tab, then select **Disks**.
4. On the screen that appears, click the **Actions** button next to the disk you want to back up, then select **Schedule for Backups**.
5. Click the **Edit** icon next to a schedule to change its details.
6. Specify schedule details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted. For example, if the rotation period is 5 then the last 5 backups would be stored on the backup server. If you create one more backup (the sixth one), it will replace the first backup on the backup server.
   - **Enabled** - move the slider to enable or disable the schedule.

   For a schedule with the **Failed** status, you can move the **Enabled** slider to the right to run the schedule once again.

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

To edit an incremental backup schedule:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you’re interested in.
3. Select **Backups** > **Schedules** tab, or click **Auto-backups** under the **Options** menu to view incremental backup schedules only.
4. Click the **Edit** icon next to a schedule to change its details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted. This parameter is for incremental backup schedules only.
   - **Enabled** - move the slider to enable or disable the schedule

   For a schedule with the **Failed** status, you can move the **Enabled** slider to the right to run the schedule once again.

5. Click the **Save** button to save your changes.

4.1.1.10.4 Delete Virtual Server Backup Schedule

To delete a normal backup schedule:
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** tab, then select **Disks**.
4. On the screen that appears, click the **Actions** button next to the disk with a backup schedule, then select **Schedule for Backups**.
5. Click the **Actions** icon next to the schedule you want to remove, then choose **Delete**.

To delete an incremental backup schedule:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you’re interested in.
3. Select **Backups** > **Schedules** tab, or click **Auto-backups** under the **Options** section to view incremental backups schedules only.
4. On the screen that appears, you will see the list of backup schedules.
5. Click the **Actions** icon next to the schedule you want to remove, then choose **Delete**.

See also:
- **Auto-Backup Presets**
- **Schedules Settings**
- **View User Backups**
- **Virtual Server Statistics**
- **Virtual Server Integrated Console**

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Backup%20Schedules
4.1.1.11 Manage 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. Disks can be assigned as the standard or swap disks (there are no swap disks for Windows-based templates). They can also 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:

- Add Disks to Virtual Servers
- Edit Virtual Server Disks
- Migrate Virtual Server Disks
- Assign Disk to VS
- Delete Virtual Server Disks

Do not create multiple partitions on one disk for virtual servers. OnApp Control Panel supports only one partition per disk. In cases when you change disk partition, the CP might lose control of such a disk and the VS associated with it. If required, create additional disks instead.

4.1.11.1 Add Disks to Virtual Servers

Adding a disk to a virtual server will require that VS should 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 "+" button or the Create Disk button.
5. Fill in the details:
   - Specify disk label.
   - Choose the data store to create a disk on from the drop-down list.
   - Move the slider to the right to specify the desired disk size.

- The disk size should not exceed 2 TB when a new disk is added. You can later resize the disk if you need it to be larger than 2 TB.
- Resizing disks to a value larger than 2 TB is not supported for Windows VSs and all VSs on KVM.
- OnApp provides support only for the MS-DOS partition table. If your disk size exceeds 2 TB, the MS-DOS partition table can be changed to GUID Partition Table (GPT) from inside a virtual server and extended to more than 2 TB. However, such disks will be partially manageable by OnApp and the subsequent resizing operations will not be supported anymore and could lead to data loss.
- Move the Hot Attach slider to the right if you want to enable the hot adding of a disk. In this case, a virtual server is not stopped when the disk is added.
To run hot attach, a virtual server template should support VirtIO virtualization. The hot attach option is available only on KVM compute resources based on CentOS 6.x/7.x for virtual servers with VirtIO support.

- Move the **Swap Space** slider to the right if this disk is swap space.
- Move the **Require Format Disk** slider to the right if this disk requires formatting.
- Move the **Mounted** slider to the right if the disk should be added to Linux or FreeBSD FSTAB (for Linux/FreeBSD virtual servers).
- Specify its 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}
```

- Indicate the **file system** - ext3, ext4 or xfs - for Linux-based VS.

6. Click the **Add Disk** button to finish.

**Restrictions:**

- If you choose a Solidfire data store, the minimum disk size will be regulated by Solidfire Data Store Zone settings.
- If virtual server and the Control Panel server belong to different networks, the hot attach transaction will fail.
- If an additional disk has been created without the **Require format disk** option and formatted/partitioned in another way, resize disk action may work incorrectly. Use the **Require format disk** option when creating an additional disk, otherwise, use disk resize option at your own risk.
- Make sure to enable **Require format disk** option when you add a new VS disk. Otherwise taking normal backups for your additional disk might fail.
- To be able to take incremental backups for virtual server’s disk, you must mount this disk to FSTAB (either Linux or FreeBSD) and specify the proper mount point manually.
- You cannot back up Swap disks.
- When you add a new disk to a virtual server, it automatically becomes available to that server.

### 4.1.1.11.2 Edit Virtual Server Disks

#### 4.1.1.11.2.1 Primary and Swap disks

For primary and swap (Linux, FreeBSD) disks you can only change the label and size. You can resize the disks when you need. The resize will fail if your current usage is greater than the new size you request. Note that any changes to the disk size require rebooting of your VS. For Windows-based virtual server disks, you can enable or disable virtio mode.

To edit a disk:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Make sure your virtual server is powered off and click the VS label.
3. Click the **Storage** tab > **Disks**.
4. Click the **Actions** button next to the target disk and then click **Edit**.
5. On the page that appears, you can edit the following:
   - **Label** - specify the name of the disk
• **Size** - move the slider to the right to specify the desired disk size in GB
• **Enable Virtio** - move the slider to the right to enable virtio mode

Please note that the **Enable Virtio** option is available only for Windows-based virtual servers with the template supporting `kvm_virtio`.

6. Click the **Save Disk** button.

- It is recommended to take a backup of a virtual server before editing the VS disk. In case of any issues during the VS disk editing, you will be able to restore the VS from the backup.
- You cannot resize a disk that uses GUID Partition Table (GPT).
- You cannot decrease the size of the Integrated Storage data store disks.
- You cannot decrease the disk size for Windows-based and FreeBSD-based virtual servers. Only the increase disk size option is available.
- You cannot resize the primary disk for FreeBSD-based virtual servers.
- Decreasing disk size for Linux-based virtual servers may lead to filesystem inconsistencies. Make sure you have current backups before proceeding.
- If the disk file system cannot be detected (disk has more than one partition or some special partition table/file system), you can only increase disk physical volume size.
- If you start the disk resize and then decide to cancel it, there may be complications such as the file system corruption.

### 4.1.1.11.2.2 New disks

For new disks - those which were added after the virtual server was created - you can edit the following:

<table>
<thead>
<tr>
<th>Linux</th>
<th>Windows</th>
<th>FreeBSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Label</td>
<td>• Label</td>
<td>• Label</td>
</tr>
<tr>
<td>• Size</td>
<td>• Size</td>
<td>• Size</td>
</tr>
<tr>
<td>• Require format</td>
<td>• Require format</td>
<td>• Require format</td>
</tr>
<tr>
<td>• Mounted</td>
<td>• Enable Virtio</td>
<td>• Mounted</td>
</tr>
<tr>
<td>• Mount point</td>
<td></td>
<td>• Mount point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• File system</td>
</tr>
</tbody>
</table>

### 4.1.1.11.3 Migrate Virtual Server Disks

OnApp allows hot and cold migration of virtual server disks:

- **Hot migration** - the migration of disks between compute resources that share common data stores (or data store zones)
- **Cold migration** - the migration of disks between compute resources with local storage or across compute zones

You can migrate disks of your virtual servers to other data stores, which are allocated to the same compute resource. Unlike **VS migration**, disk cold migration requires the reboot of the VS (despite the template it is based on).

- The hot migration will work only when the VS is running on CentOs 7 KVM compute resources, and they can be migrated only to CentOs 7 KVM compute resources.
The hot migration option appears only if the VS is online and your Quick Emulator (QEMU) version is later than 2.6

To migrate a disk:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of your virtual server 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 Migrate button.
5. On the screen that appears, select the following options:
   - **Type** - select the cold or hot migration type
   - **Data store** - select the target data store to migrate the disk
6. Click the Start Migrate button.

- It is recommended to take a backup of a virtual server before migrating the VS disk. In case of any issues during VS disk migration, you will be able to restore the VS from the backup.
- You can only migrate disks to data stores in data store zones assigned to your bucket.
- You cannot migrate a disk to a data store with less capacity than the disk size.
- Integrated Storage disks cannot be migrated if they have snapshots.
- 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 'dspace which may not be able to be recovered.
- If required, you can change the block size which is used during disk migration at Control Panel > Admin > Settings > Configuration by editing the **Block Size (MB)** parameter.

4.1.1.11.4 Assign Disk to VS
You can temporarily assign a disk to another virtual server that has the same data store in use. The disk will be attached to the target VS, but it is necessary to reboot the target VS and mount the disk manually to make it available. Later you can re-assign the disk back to the primary VS at any appropriate moment.

Ensure that the **Assign any disk to VS/Assign own disk to VS** permissions are on before assigning disk to another VS. For more information, refer to the Permissions section of this guide.
- Assigning disk functionality is not applicable for swap disks.
- The target VS owner should be the same as for the source VS.
- Both target and source VSs cannot be deleted as soon as the disk is assigned to a new VS. To delete target and source VSs, as well as the disk, it is required to re-assign a disk to a source VS.

To assign a disk to another VS:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of a virtual server to open its details screen.
3. Click the Storage tab > Disks.
4. Click the **Actions** button next to the disk you want to assign to another VS, then click the **Assign to VS** button.

5. On the screen that appears, select a target VS from a drop-down box.

6. Click **Assign**.

   Be aware, that the source VS will be automatically powered off after assigning a disk to another VS.

To re-assign the disk back to the primary VS:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of a virtual server to open its details screen.
3. Click the **Storage** tab > **Disks**.
4. Click the **Actions** button next to the disk you want to reassign to source VS, then click the **Assign back** button. Confirm the action.

4.1.1.11.5 **Delete 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**.

   Steps 5 and 6 apply to disks of VSs that are on.

5. In the pop-up window, move the **Force Reboot** slider to the right, then select the VS shutdown type.

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

7. Click the **Destroy Disk** button.

   This will schedule the *Destroy disk* transaction.

See also:

- **Virtual Servers**
- **Create Virtual Server**
- **Manage Virtual Server**
- **Virtual Server Backups**
- **Virtual Server Backup Schedules**

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Disks

4.1.1.12 **Manage Virtual Server Networks**

The Networking menu in the **Virtual Servers** menu enables you to manage network interfaces, allocate IP addresses, and set firewall rules for virtual servers. In this document you can find information on how to manage Virtual Server networks.
• 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.

4.1.1.12.1 Configure 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:
   - 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 New Network Interface button at the bottom of the screen.
5. On the screen that appears, input values for the following parameters:
   - Label – 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 Submit button.

To edit the network interface label, port speed or set it as primary (if none is marked as primary), click 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 next to the interface you want to delete.

4.1.1.12.2 Rebuild Virtual Server Network

To rebuild a 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 Actions button, point to Options, then click Rebuild Network.

4. In the pop-up window, move the Force Reboot slider to the right, then select the VS shutdown type.

   During the network rebuild, the system tries to reach a VS's network interface without rebooting a virtual server. Then, if it is not possible, the transaction will quit. The force reboot action allows to rebuild a VS network with the reboot action if live rebuild is impossible. In case the force reboot option is disabled and system cannot enter the virtual server, the network rebuild operation will fail.

5. Move the Required Startup slider to the right to start up a VS when you're rebuilding network of a powered off VS.

6. Click the Rebuild Network button.

In case of network interface replacement for Windows VSs running on Xen compute resources, the user has to add new network interface, rebuild network, then remove the old network interface and perform network rebuild again.

4.1.1.12.3 Set Virtual Server Firewall Rules

With OnApp you can set firewall rules for the network interfaces of virtual servers. There are two types of firewall rule:

- **ACCEPT** – defines the packets that will be accepted by the firewall
- **DROP** – defines the packets that will be rejected by the firewall

Ensure that the following permissions are enabled before setting firewall rules for your virtual server:

- Create own firewall rules
- Destroy own firewall rules
- Read own firewall rules
- Update own firewall rules
- Update own virtual server
- Read own virtual server

You cannot apply firewall rules to virtual servers which are parts of a blueprint.

You can set the following:

- **add a specific firewall rule** - you can configure a firewall rule with specific parameters (source, destination port, protocol type, etc.)
- **set default firewall rules** - you can set default firewall rules for an entire network interface

4.1.1.12.3.1 Add a specific firewall rule

To configure a specific firewall rule:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the VS for which you want to configure a firewall rule.
3. Click the Networking tab, then click Firewall.
4. On the page that appears, set the following:
   a. **Interface** - choose the network interface.
b. **Command** - specify if the rule defines requests that should be accepted or dropped.

c. **Source** - set the IP address for which this rule is active.
   - Leave the empty field to apply this rule to all IPs
   - Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
   - Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)

d. **Destination Port** - set the port for which this rule is effective.
   - Leave the empty field to apply the rule to all ports
   - Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
   - Enter comma-separated ports to apply the rule to the list of ports (e.g. 80,443,21)

e. **Protocol Type** (for ICMP protocol only) - indicate a type of the ICMP protocol (range from 0 to 255)

f. **Protocol** - choose the protocol (TCP, UDP, DCCP, SCTP or ICMP).

g. **Comment** - enter the comment to the firewall rule.

5. Save the rule by clicking the **Add Rule** button. The rule will be saved in the UI, but the transaction won’t be started until you click the **Apply Firewall Rules** button.

6. To start the transaction which runs firewall rules for a VS, click **Apply Firewall Rules** button.

7. Use **Up** and **Down** arrow buttons in the left column to change firewall rule position.

8. To edit or delete a firewall rule click the appropriate icon in the last column.

### 4.1.1.12.3.2 Default firewall rules

To set default firewall rules for a network interface:

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

2. Click the label of the VS for which you want to configure a firewall rule.

3. Click the **Networking** tab, then click **Firewall**.

4. On the page that appears, go to **Default Firewall Rules** section.

5. Choose **ACCEPT** or **DROP** command next to the network interface and click **Save Default Firewall Rules**. The rule will be saved in the UI, but the transaction won’t be started until you click the **Apply Firewall Rules** button.

**Example:**

The Int1 ACCEPT 122.158.111.21 22 TCP firewall rule means that the Int1 network interface will accept all requests and packets addressed from 122.158.111.21 using the TCP protocol on port 22.

The Int2 DROP 122.158.111.21 22 UDP firewall rule means that the Int2 network interface will reject all requests and packets from 122.158.111.21 using the UDP protocol on port 22.

If you reboot a Xen-based VS from the console, the firewall rules for this VS will be lost, and you will need to update the firewall rules again.

**Protocols:**
For IPv4, only the ICMP, IPv6-ICMP, TCP, UDP, DCCP, SCTP protocols are available by default. However, if required, you can enable other protocols for IPv4.

1. Go to the /onapp/interface/config/network_protocols.yml file.
2. The list contains all protocols available (IPv4). Set 'true' for the required protocols.
3. Restart httpd by running one of the following commands:

   ```
   service httpd restart
   ```
   or
   ```
   etc/init.d/httpd restart
   ```
4. The protocols you have enabled are now available at Control Panel > Cloud > Virtual Servers > Label > Networking tab > Firewall while adding new firewall rules.

   The following protocols can be enabled in the /onapp/interface/config/network_protocols.yml file:

   - IP
   - HOPOPT
   - ICMP
   - IGMP
   - GGP
   - IP-ENCAP
   - ST
   - TCP
   - CBT
   - EGP
   - IGP
   - BBN-RCC-MON
   - NVP-II
   - PUP
   - ARGUS
   - EMCON
   - XNET
   - CHAOS
   - UDP
   - MUX
   - DCN-MEAS
   - HMP
   - PRM
   - XNS-IDP
   - TRUNK-1
   - RDP
   - IRTP
   - ISO-TCP
   - NETBLT
   - MFE-NSP
   - MERIT-IPN
   - DCCP
   - 3PC
   - IDPR
   - XTP
   - DDP
   - IDPR-CMTP
   - TP
   - IL
   - SDRP
   - IDRP
   - RSVP
   - GRE
   - DSR
   - BNA
   - ESP
   - AH
   - I-NLSP
   - SWIPE
   - NARP
   - TLSP
   - SKIP
   - CFTP
   - SAT-EXPAK
   - KRYPTOLAN
   - RVD
   - IPPC
   - SAT-MON
   - VISA
   - IPCV
   - CPNX
   - CPHB
   - WSN
   - PVP
   - BR-SAT-MON
   - SUN-ND
   - WB-MON
   - WB-EXPAK
   - ISO-IP
   - VMTP
   - SECURE-VMTP
   - VINES
   - TTP
   - NSFNET-IGP
   - DGP, TCF
   - AX.25
   - IPIP
   - MICP
   - SCC-SP
   - ETHERIP
   - ENCAP
   - GMTCP
   - IFMP
   - PNNI
   - PIM
   - ARIS
   - SCPs
   - QNX
   - A/N
   - IPComp
   - SNP
   - Compaq Peer
   - IPX-in-IP
   - VRRP
   - PGM
   - L2TP
   - DDX
   - IATP
   - STP
   - SRP
4.1.1.12.4 Virtual Server IP Addresses

In the Networking > IP Addresses tab you can find the list of assigned IP addresses, allocate new IP addresses and define primary one, 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 > IP Addresses.
4. Click the Allocate New IP Address button.
5. Select a network interface from the drop-down menu (only the network interfaces you added to the VS will be available). The IP Address will be allocated automatically.
6. (Not available for federated VSs) As an alternative, you can manually select an IP address from the network interface. To enable this option, move the Specify IP Address slider to the right and choose IP Address from the drop-down list. 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 button.
8. Click the Rebuild Network button to rebuild the network.

- You must rebuild the network after making changes to IP address allocations.
- Currently, it is possible to assign only up to 320 IPs to an Ubuntu virtual server.
- The external IP address can be managed by API only. If you want to add external IP address, refer to the Add/Edit External IP Address section of API Guide.
- Currently, it is not possible to assign IPv6 addresses of the following ranges:
  - ::/128
  - ::/127
  - 001::/32
  - e80::/10
  - fec0::/10
  - fc00::/7
  - ff00::/8

4.1.1.12.4.1 Edit IP address assigned to 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 Edit button next to the IP address you want to edit.
5. On the page that loads, you can mark the IP address as primary by selecting *Primary IP Address?* checkbox. Accordingly, this IP address will be used as source IP for outgoing traffic by default.

### 4.1.1.12.4.2 Remove IP address from 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** button next to the IP address you want to delete.
5. In the pop-up window that appears:
   - Choose the **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 the **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.

If you delete IP address that is used as primary - the next available IP will be marked as primary.

### 4.1.1.12.5 Display Network Speed for Network Interfaces on 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.

### 4.1.1.12.6 Edit Virtual Server Network Speed

To edit a virtual server’s network speed:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you want to change.
3. Go to the **Networking** tab > **Network Interfaces**.
4. In the last column click the **Edit** button.
5. Change the port speed.
6. Click the **Submit** button to save changes.

### 4.1.1.12.7 Virtual Server as Gateway

You can set up your virtual server configuration so that it can function as a gateway for the network interface. Such a configuration overrides firewall rules and accepts all traffic to the VS from the selected network interface. This functionality provides the ability for third party gateways and load balancers to be used as OnApp virtual server.

For the VS to function as a gateway at least two IPs are required: one private and one public. A VS cannot be used as a gateway for a network interface if the network interface does not contain IPs or if it contains only public IPs.

To use a virtual server as a gateway for a network interface:
1. Go to your Control Panel > Cloud > Virtual Servers > Label > Networking > Firewall. On the page that loads the Default firewall rules section displays the list of network interfaces for which this VS can function as a gateway.

2. Select the command for the network interface, it can be either ACCEPT or DROP. If you select the DROP option, the Use as Gateway slider will become inactive, but you can save the configuration and all the traffic from the network interface will be dropped.

3. Move the Use as Gateway slider to the right if you want the VS to function as a gateway for the network interface.

4. Click the Save Default Firewall Rules button to apply changes.

The configurations in steps 5 and 6 are only examples that were tested on CentOS 6. You can use them at your own risk. You may require different configurations for other operating systems.

5. Add the following commands in the console of the gateway VS:

```
:cho 1 > /proc/sys/net/ipv4/ip_forward
iptables -t nat -A POSTROUTING -s IP_range ! -d IP_range -o public_network_interface_name -j MASQUERADE
iptables -I FORWARD -i private_network_interface_name -o public_network_interface_name -j ACCEPT
iptables -I FORWARD -i public_network_interface_name -o private_network_interface_name -j ACCEPT
```

The changes added in step 5 are not preserved after a reboot. The corresponding changes should be performed again after the reboot.

Where you need to indicate the range of IPs for which the VS will serve as a gateway and the name of the public and private network interfaces for the gateway VS. The IP range should contain only the IPv4 IPs (e.g. 10.10.10.0/24).

6. Add the following commands in the console of the VS that is to send traffic through the gateway VS:

```
route delete -net default
route add -net default gw gateway_VS_IP
```

Where you need to indicate the IP of the gateway VS for this server.

You can view the list of virtual servers that are used as gateways on a compute resource by going to your Control Panel > Admin > Settings > Compute Resources > Label > Tools > Gateway Servers. The page that loads shows the list of gateway servers on a compute resource with their details.

When you set default firewall rules for a VS two additional iptables rules are added on the compute resource on which the VS is built. The iptables rules will contain the range of IPs for which the VS will serve as a gateway and the identifier of the gateway VS.
See also:

- Virtual Servers
- Create Virtual Server
- Manage Virtual Server
- Virtual Server Disks
- Virtual Server Backups

https://onappcloud.typeform.com/to/A64Eu#source=Manage%20Virtual%20Server%20Networks

4.1.1.13 Manage Virtual Server Recovery Points

Recovery points are created as a result of the virtual server data replication on a third-party backup service. Integration with the backup service is handled by means of a plugin that you can install to your Control Panel.

The recovery point represents a point-in-time full backup from which you can restore a virtual server. In OnApp CP, recovery points become available after you:

- Attach a backup resource to a virtual server
- Create an auto backup preset and the preset runs according to a schedule

You can also create a recovery point manually after you complete the preceding steps. In this document, you can find information on how to create and manage recovery points for a virtual server.

- For the R1Soft backup plugin, you can set the total amount of recovery points that will be created for a VS by the Max recovery points option while creating an auto backup preset. After the maximum limit is reached, new recovery points overwrite the existing ones.
- For the Veeam backup plugin, you use Retention Policy in Veeam Backup & Replication UI to control the number of recovery points that are retained on a disk. After the specified number of recovery points is exceeded, the earliest recovery points are automatically deleted to retain the new ones.
- The Recovery Points related permissions are disabled by default for the User role. To enable users to access and manage recovery points, edit the corresponding permissions set for the User role.

You can use the Veeam plugin only for VMware resources such as VMware Cloud Director and vCenter.

Starting with OnApp 6.3, the R1Soft backup plugin that we support is 6.12.0. If your R1Soft version is more recent than 6.12.0, we suggest downgrading to this version if possible.
4.1.1.13.1 View Recovery Points
To view the list of recovery points available for a virtual server, follow the next steps:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a required virtual server.
3. Click the Backups menu and then click the Recovery points button.
4. On the page that appears, you will see the list of recovery points and the following details:
   - Size - the size of the recovery point from which the VS can be restored
   - Created at - the date when the recovery point was created
   - State - the state of the recovery point (e.g. available, locked, merged, etc.)
   - Resource - the backup resource on which the recovery point is created

To create a recovery point or restore a virtual server from a recovery point, refer to the following sections.

4.1.1.13.2 Create Recovery Point
To create a recovery point, follow the next steps:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a required virtual server.
3. Click the Backups tab and then click the Recovery points button.
4. Click the Backup now button.
5. In the pop-up box, select a backup resource and click the Backup now button.

After you complete the procedure, the ImmediateVirtualServerBackup action is initiated to create a new recovery point. The log of the action is available in the Activity Log section of a virtual server.

4.1.1.13.3 Restore Virtual Server from Recovery Point
To restore a virtual server from a recovery point, follow the next steps:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click a label of a required virtual server.
3. Click the Backups tab and then click the Recovery points button.
4. Click the Restore button next to the recovery point from which you want to restore the virtual server.
5. Click the Ok button to confirm your action.

The action for restoring the virtual server from the recovery point will be scheduled. The log of the action is available in the Activity Log section of a virtual server.

- For the R1Soft backup plugin, virtual servers that are based on KVM compute resources are rebooted in recovery mode before restoration. To configure your plugin to apply the same logic, refer to Create Backup Plugin.
- For the Veem backup plugin, you can set advanced options to automatically power on virtual servers after restoring or to perform an incremental restore. For more information, see Manage Advanced Options.

4.1.1.13.4 Browse Through Recovery Point
You can browse through files and directories available within a recovery point. To browse through a recovery point, follow the next steps:
1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click a label of a required virtual server.
3. Click the **Backups** tab and then click the **Recovery points** button.
4. Click the **Browse** button next to the recovery point you are interested in.
5. On the page that appears, you will see the list of files and directories. You can expand and collapse directories to see more or fewer subentries. You will also see the following details:
   - **Size** - a size that is available only for files
   - **Last modified** - a date when a file or directory was last modified

At the Browse recovery point page, you can restore particular files and directories from a recovery point. For more information on restoring files and directories, see the following section.

### 4.1.1.13.5 Restore Files from Recovery Point

You can restore particular files and directories from a recovery point. To select and restore the required entries, follow the next steps:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click a label of a required virtual server.
3. Click the **Backups** tab and then the **Recovery points** button.
4. Click the **Browse** button next to the recovery point you are interested in.
5. Select checkboxes next to the files and directories that you want to restore.
6. Click the **Restore selected files** button.
7. Click the **Ok** button to confirm your action.

After you click the button, the **RestoreFileEntries** action is scheduled to restore the selected files from the recovery point. The log of the action is available in the **Activity Log** section of a virtual server.

**See also:**
- Install Plugins
- Manage Virtual Server Backup Resources
- Create and Manage Backup Resources
- Create and Manage Auto Backup Presets

https://onappcloud.typeform.com/to/A64Ey#source=Manage%20Virtual%20Server%20Recovery%20Points

### 4.1.1.14 Manage Virtual Server Statistics

For your convenience, the system tracks VS performance and generates statistics on CPU utilization, billing, network interface usage, disk IOPS and accelerated virtual servers. In this document you can find information on how to view virtual server statistics.

### 4.1.1.14.1 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 tab > CPU Usage.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there is less data available, the chart will show utilization for the time available.
5. Move the Show in My Timezone slider to the right if you want to show bandwidth statistics according to your profile’s timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the 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.

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

4.1.1.14.2 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.

- 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 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. You can filter the statistics by date and time - select the time period from the drop-down menu and click the Apply button. By default the statistics are generated for the last three months or the actual VS existence period.
5. Move the Show in my Timezone slider to the right if you want to view billing statistics according to your profile's timezone settings. By default, billing statistics is shown in UTC.
6. On the page that appears you will see the report with the following details:
   - **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 "data_read", "data_written", "reads_completed", "writes_completed" resources for particular disk. The charges for the disk size resource are included into the Costs column.

• **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).

4.1.1.14.2.1 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:
  - GBs of disk size, Kbs of data read/written, the number of reads/writes.
  - The number of IPs, the port speed in Mb per second, the data sent and received in KBs.
  - 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".

4.1.1.14.3 Virtual Server Network Interface Statistics
OnApp tracks network usage for 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.
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4.1.1.14.4 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:
   - IOPS for the last hour
   - IOPS for the last 24 hours
   - Data written/read (in Kb) for the last 24 hours
   - Data written/read (in Kb) 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.

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.

See also:
- Resource Allocation And Prices
- Accelerator
- Permissions
- User Billing Statistics

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Virtual%20Server%20Statistic

4.1.1.15 Virtual Server Integrated Console
OnApp provides an integrated VNC console that gives users direct access to their virtual servers through the Control Panel UI. The noVNC console is provided for virtual servers that are built on KVM CentOS 7 based on WebSockets. Users with the Administrator role can access all virtual server consoles for support and troubleshooting purposes. The console connects a user browser to a VNC port or VNC WebSocket port available via a compute resource for the guest console.

To access the virtual server VNC console via the Control Panel:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the destination virtual server.

3. Click the **Console** tab.

For the HTML5 console, click the **Re-connect** button if the connection is lost. The re-connection to the console runs as follows:

- If the console runs as expected, clicking the **Re-connect** button causes disconnection and the console is re-connected automatically after 1.5 seconds.
- If the console gets stuck, clicking the **Re-connect** button runs your request once again and re-connects the console without reloading.
- If the console gets disconnected with a status code and an error message, the console is re-connected automatically after 1.5 seconds.

To use the Java console instead of HTML5, go to **Admin > Settings > Configuration** and edit settings on the **System** tab. For more information, refer to **System Configuration**.

**See also:**

- [Virtual Server Transactions and Logs](#)
- [Virtual Server Recipes](#)
- [Virtual Server Recipe Custom Variables](#)
- [Virtual Server Service Add-ons](#)

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Integrated%20Console

4.1.1.16 Virtual Server Recipe Custom Variables

You can define custom variables for particular virtual servers. Each custom variable is a name-value set that can be used during the virtual server recipe implementation. Custom variables are set on a per-server basis. You can create custom variables 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. Click the label of a virtual server for which you want to create a variable.
3. On the virtual server details screen, click the **Overview** tab, then select **Recipes Variables**.
4. On the screen that appears, click the "+" button.
5. Specify the recipe label 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. Note: virtual server custom variables will always overlay template custom variables.

**See also:**

- [Virtual Server Integrated Console](#)
- [Virtual Server Transactions and Logs](#)
- [Virtual Server Recipes](#)
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- [Virtual Server Service Add-ons](https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Recipe%20Custom%20Variables)

Leave feedback

4.1.1.17 Virtual Server Recipes

In this document, you can find information on how to manage virtual server recipes.

4.1.1.17.1 Assign Recipe

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you're interested in.
3. Click the Overview tab and click Recipes. 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. Click the arrow button next to an event to expand the list of recipes assigned to it.
4. Drag and drop a recipe to assign it to the required event.

You can assign virtual server recipes to the following events:

- **VS provisioning** - run the recipe during the virtual server provisioning
- **VS 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 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

4.1.1.17.2 Remove Recipe

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you're interested in.
3. Click the Overview tab > Recipes.
4. Click the arrow button next to the required event to view the list of recipes assigned to it.

5. Click the Delete button next to the recipe you want to remove.

See also:
- Virtual Server Integrated Console
- Virtual Server Transactions and Logs
- Virtual Server Recipe Custom Variables
- Virtual Server Service Add-ons

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Recipes

4.1.1.18 Virtual Server Service Add-ons

Service add-ons can be added to VS during its creation or later.

Ensure that the following requirements are met to be able to assign service add-on to VS during its creation:
- 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 the bucket.

If you have the service add-on functionality enabled and properly configured, you can assign additional services to your VS.

- To manage user service add-ons for a VS, ensure that Manage Service Add-ons for all virtual servers and/or Manage Service Add-ons for own virtual servers permissions are on before managing VS service add-ons.
- To manage system service add-ons for a VS, you need the Manage System Service Add-ons and/or Manage own System Service Add-ons permissions enabled. For more information about permissions, refer to the Permissions section of this guide.

Below you can find information on how to assign service add-on to already created VS.

4.1.1.18.1 View VS Service Add-Ons

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

2. On the following page, click the label of the server you’re interested in.

3. Click the Overview tab and choose Service Add-ons.

4. On the page that appears, you can see the details of all the service add-ons assigned to the VS, if there are any:
- Label - the service add-on name
- Price - the service add-on price, set for this service add-on in the bucket
- Type - select user or system
- Status - whether the service add-on is active or not

You can unassign the service add-on from this virtual server by clicking . This action won’t delete the service add-on itself but only remove the assignment.

Also, if any service add-on is already assigned to the VS, you can view it at the VS's details page.
4.1.1.18.2 Assign Service Add-on to a VS

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. On the following page, click the label of the server you’re interested in.
3. Click the Overview tab and choose Service Add-ons.
4. On the page that appears, click the + upper right. You will get the list of service add-on groups (availability is configured in the bucket).
5. Click the label of the necessary user or system service add-on to see its details:
   - Label
   - Type - user or system
   - Description
   - Price
6. Click Assign. The transaction to execute the On add event(s) will be scheduled for running. If you rebuild VS, the On VS Rebuild event(s) will be scheduled for running and in case of VS deletion - the On VS Destroy event(s) will be scheduled for running.

Alternatively, if any service add-on is already assigned to the VS, you can assign another one at the VS’s details page.

4.1.1.18.3 Unassign Service Add-on from a VS

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. On the following page, click the label of the server you’re interested in.
3. Click the Overview tab and choose Service Add-ons.
4. On the page that appears, click the trash icon next to the service add-on you want to unassign. Confirm the deletion. The transaction to execute the On remove event(s) will be scheduled.

Alternatively, you can unassign the service add-on at the VS’s details page.

See also:

- Service Add-ons
- Manage Service Add-ons
- Service Add-on Store

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Service%20Add-ons

Leave feedback

4.1.1.19 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
• Take backup
• Convert backup
• Restore backup
• Destroy backups
• 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 cancel all pending tasks, click the Cancel All Pending Tasks for this virtual server button.

To cancel the TakeBackup transaction which is running longer and exceeding the time set for a zombie transaction:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. On the following page, in the Activity Log section, hover over the icon of the transaction and then click that appears on the icon of this transaction.

Please note that this option becomes available if the transaction has been running for the period of time specified in the Zombie transaction time parameter, which can be found at your Control Panel > Admin > Settings > Configuration icon.

4. In the dialog box, click Proceed.

The rollback is executed starting from the command which has been canceled.

You can also view the details of a particular log item by clicking its Ref number. The page that loads shows the log output and the following details:

• date - time in the [YYYY][MM][DD][hh][mm][ss]Z format
• action - the action name
• status - the action status (Complete, Warn, Pending, or Failed)
• ref - the log item’s Ref number
• target - the action target
• started at - the time when the action was started
• completed at - the time when the action was completed
• template - template of the server the action refers to
• compute resource - the label of compute resource
• initiator - the user who initiated the action
If you want to see only the detailed output, you can hide log info with the arrow button in the upper right corner.

**See also:**
- Virtual Server Integrated Console
- Virtual Server Recipes
- Virtual Server Recipe Custom Variables
- Virtual Server Service Add-ons

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Transactions%20and%20Logs

### 4.1.1.20 Virtual Server Provisioning

Under certain circumstances, your virtual servers that are offline might be implicitly cold migrated to another compute resource within one compute zone. This occurs after manual startup with no additional information in the logs, when the compute resource cannot provide sufficient resources for the VS or is offline. If the compute resource is offline or OnApp considers that there are not enough resources to start the VS, usually because there is not enough free RAM available, the VS is implicitly cold migrated to a compute resource with sufficient resources and started there.

The mentioned conditions may also appear if a compute resource was rebooted, then came back online, but the information about its free and total RAM has not yet been obtained from the compute resource and you attempt to start up the VS. In such a case, OnApp considers that the compute resource does not have sufficient resources and migrates the VS.

To avoid such behavior, check the compute resources list at Control Panel > Settings > Compute Resources to see whether a compute resource you are interested in is online and actual information about its RAM is displaying. If there is enough free RAM for the VS, starting the virtual server will be done on the checked compute resource.

Note that you should also check the Operating System Type option of a target compute resource before the VS migration. A Windows-based VS can be only migrated to a compute resource with Any option or Windows only option enabled. The Linux-based or FreeBSD-based VS can be only migrated to a compute resource with Any option or Non-Windows option enabled.

**See also:**
- Reset Control Panel Administrator Password
- Transaction Server
- Advanced Configuration Settings
- Track Daemon Process Activity

https://onappcloud.typeform.com/to/A64Euy#source=Virtual%20Server%20Provisioning

### 4.1.2 Virtual Routers

Virtual routers are appliances converted from the virtual servers based on KVM including OVA templates. Once converted, virtual routers preserve all the data and functionality of the virtual servers. Virtual routers provide the users with the possibility to manage their private SDN networks independently from the cloud owner. Virtual routers allow independent IP nets routing management and so save time spent on networking configuration. Also, they provide an additional level of security for private networks as all traffic inside SDN is isolated.
4.1.2.1 Convert Virtual Server to Virtual Router

Note that you cannot convert a virtual router to a virtual server.

To convert a virtual server to a router, do the following:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the Actions button next to the virtual server you want to convert to a router and select Convert to Virtual Router.
3. Click the Convert button.

After the VS has been converted to a router, it disappears from the VSs list and is present in the routers' list at Control Panel > Cloud > Virtual Routers menu. Virtual routers preserve all the functionality of the virtual servers.

4.1.2.2 Assign IP Net to Router

Users can assign IP nets to virtual routers from their SDN networks.

To assign IP net to a router:

1. Go to your Control Panel's Virtual Routers menu.
2. Click the label of the virtual router you're interested in.
3. Click the Routing tab. The page that loads will show the list of already assigned IP nets and IP nets that you can assign. One IP net can be associated with one router.
4. Click the "+" button next to the IP net you want to assign to a router.

4.1.2.3 Unassign IP Net from Router

To unassign IP net from a router:

1. Go to your Control Panel's Virtual Routers menu.
2. Click the label of the virtual router you're interested in.
3. Click the Routing tab. The page that loads will show the list of already assigned IP nets and IP nets that you can assign.
4. Click the "-" button next to the IP net you want to unassign from a router.

See also:
4.1.3 Application Servers

Application Server is a regular VS based on the default CentOS template with pre-installed additional software. This software allows you to install and have up & running various PHP/Perl/Python frameworks (like Drupal, Joomla, WordPress, etc.) on a server using web interface.

To activate Application Server functionality you need to activate an appropriate license on the OnApp dashboard. Also, he following field in OnApp configuration should be necessarily filled in, as system_email is used for proper configuration of application server: Control Panel > Admin > Settings > Configuration > System > Email > From.

Application servers allow you to deploy different applications on your cloud. For more info, refer to Applications.

Application Server gives you high-end cloud management features including:

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<tr>
<th>Application Server Options</th>
<th>Power Options</th>
<th>Administerative Options</th>
<th>Network</th>
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</thead>
<tbody>
<tr>
<td>Edit</td>
<td>Reboot</td>
<td>Change owner</td>
<td>Configures network interface</td>
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<td>Migrate</td>
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<td>Delete</td>
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<td>Segregate</td>
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<tr>
<td>Set VIP status</td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>
The following options are not available for application servers:

- Reset Root Password
- Set SSH keys
- Integrated console
- Convert backup to template
- Recipes
- Recipe Custom Variables

https://onappcloud.typeform.com/to/A64Euy#source=Application%20Servers

### 4.1.3.1 Applications

Application is a piece of software that brings additional features into the basic functionality. Application Server is a regular VS based on CentOS Application Server template but with pre-installed software. OnApp allows you to deploy a wide range of applications by means of additional software. To install different applications on your Cloud you should create an application server first. Then, you can install the applications on that server (like Drupal, Joomla, WordPress, etc.) using a web interface. As an administrator, you can charge for the template (by means of Template store) on which the application server has been built.

You can perform the following actions with the applications:

- view
- create
- backup
- delete

For more details, refer to the appropriate sections.

**See also:**

- Application Servers
- Create Application Server
- Application Server Billing
- Application Servers (API)

https://onappcloud.typeform.com/to/A64Euy#source=Applications
4.1.3.1.1.1 View Applications

To view an application:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you’re interested in.
3. Click the Applications tab > Applications.
4. The page that loads will show the list of applications together with their:
   • Application - the name of the application installed on this application server
   • Software version - the version of the application software
   • Software URL - the URL that is a link to the application itself
   • Admin URL - the URL that is a link for administrator, where one can enter credentials to log into application
   • Actions - you can click the Actions button to perform the following procedures with the application:
     ▪ Backup
     ▪ Remove

There is one more possibility to view an application:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you’re interested in.
3. On the screen that appears, under statistic data, you can see the list of all applications, deployed on this application server.

4.1.3.1.1.2 Create Application

Application Servers allow you to install various applications (like Drupal, Joomla, Wordpress, etc.) on a server using a web interface.

To create an application:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you’re interested in.
3. Click the Applications tab > Applications.
4. On the screen that appears, click 
   
5. Complete the application creation form:

   Application Select

   Popular Applications

In this section you can see the logos of the most popular applications. Choose one of them by clicking the appropriate logo.

Application Catalog

Category - choose the application category from the drop-down list (cms, blogs, eCommerce, forums, etc.)

Application - choose the application from the drop-down list
Application Description

The following page will provide you with the description of the application, which you have chosen from the catalog, its features and screenshots.

6. Click Proceed.
7. On the screen that appears the following application settings will be specified:

Settings are filled in automatically. In case you want to change automatic settings, fill in the appropriate field with your alternative settings. Settings vary depending on every application. The field Directory will be present in every case, while the field Database, for example, is relevant only for those applications, which require databases for their functioning.

Software Setup
Directory - the name of the directory, where the application is stored. Only lowercase letters can be used (for example, "drupal" for Drupal application).
Database - the name of database, used by the application

Site Settings
Site name - name of the application site
Site description - description of the application site

Database Settings
Table prefix - prefix, which is used for database tables
Import sample data - choose language type from the drop-down list

Admin Account
Admin username - username of administrator
Admin password - password of administrator
Real name - real name of administrator
Admin email - email of administrator

Choose Language
Select language - choose application language from the drop-down list

Advanced Options
Auto upgrade - tick the checkbox to enable auto upgrade for the application

8. Click the Install button.

There is one more possibility to create an application:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. On the screen that appears, under statistic data, you can see the list of all applications, deployed on this application server. Click + in the upper right corner and complete the application creation form as described above in step 5.

4.1.3.1.1.3 Delete Application
To delete an application:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Applications.
4. The page that loads will show the list of applications. Click the Actions button next to a required application and choose the Remove button.
5. Move the Remove directory slider to the right if you want to remove the directory.
6. Move the Remove database slider to the right if you want to remove the database.
7. Move the Remove database user slider to the right if you want to remove the database user.
8. Click Remove.

See also:
- Application Servers
- Applications
- The List of Available Applications
- Create and Manage Application Backups
- Application Server Backups

https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Applications

4.1.3.1.2 Create and Manage Application Backups
To back up an application means to put it in an archive. Single application could have multiple backups taken. Application backups are used for copying and archiving applications in order not to lose important information. You can view/create/edit/restore or delete application backups.

4.1.3.1.2.1 View Application Backups
To view an application backup:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you’re interested in.
3. Click the Applications tab > Backups.
4. The page that loads will show the list of application backups together with their details:
   o Application - the name of the application that is backed up
   o Size - the size of the application
   o Version - the version of the application software
   o Software URL - the link to the application itself
   o Backup Note - an optional note to the backup
   o Actions - you can click the Actions button to restore or remove the backup.

4.1.3.1.2.2 Create Application Backup
To back up an application:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you’re interested in.
3. Click the Applications tab > Applications.
4. The page that loads will show the list of applications. Click the Actions button next to a required application and choose the Backup button.
5. Move the Backup directory slider to the right if you want to back up the directory.
6. Move the Backup database slider to the right if you want to back up the database.
7. Click the **Backup** button.

### 4.1.3.1.2.3 Restore Application Backup

To restore an application backup:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Backups**.
4. The page that loads will show the list of application backups. Click the **Actions** button next to a required backup and choose the **Restore** button.
5. Move the **Restore directory** slider to the right if you want to restore the directory.
6. Move the **Restore database** slider to the right if you want to restore the database.
7. Click the **Restore** button.

### 4.1.3.1.2.4 Delete Application Backup

To delete an application backup:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Backups**.
4. The page that loads will show the list of application backups. Click the **Actions** button next to a required backup and choose the **Remove** button.
5. You will be asked for confirmation before the application backup is deleted. Click the **Remove** button.

**See also:**

- Application Server Backups
- Application Servers
- Create and Manage Applications
- The List of Available Applications
- Manage FTP Users

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4.1.3.1.3 Manage Databases

Starting with OnApp 5.0 version, you can create and manage databases available for your application server.

Ensure that **See all application servers** or **See own application servers** permission is on before managing databases. For more information about permissions, refer to the list of OnApp Permissions.

4.1.3.1.3.1 View Databases and Database Users

If you want to see the list of databases available for your application server, you can view it in OnApp Control Panel.

To view a database list:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Databases**.
4. On the screen that appears, you will get the list of databases together with their:
   
   - **Name** - the name of a database
   - **Users** - the names of users, assigned to the database
   - **Actions** - you can click the **Actions** button to perform the following with the database:
     - Privileges
     - Remove

To view the list of database users:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Databases**.
4. Click the **Database Users** tab.
5. On the screen that appears, you will get the list of database users together with their:
   
   - **Name** - the name of a user
   - **Actions** - you can click the **Actions** button to perform the following with the database users:
     - Change password
     - Remove

4.1.3.1.3.2 Create Database
You can create database available for your application server.

To create a database:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Databases**.
4. On the screen that appears, click **+**.
5. Complete the creation form:
   - **Name** - specify database name
6. Click the **Submit** button.

4.1.3.1.3.3 Create and Manage Database Users
You should create a user, who will be able to manage a database.

To create a database user:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Databases**.
4. On the screen that appears, click the **Database Users** tab and click **+**.
5. Complete the creation form:
   - **Name** - specify database user's name. The length of the name should not exceed 11 characters.
6. Click the Submit button.

You can also change database user password or delete database user.

To change database user password:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Databases.
4. On the screen that appears, click the Database Users tab.
5. Click the Actions button next to the specific database user and click Change password.
6. Enter new password and click the Submit button.

To delete database user:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Databases.
4. On the screen that appears, click the Database Users tab.
5. Click the Actions button next to the specific database user and click Remove.
6. Confirm deletion by clicking the Remove button.

4.1.3.1.3.4 Assign User and Set Privileges for Database

After user creation you should assign the user to a database and set privileges (permissions) for the database. For example, the assigned user can create temporary tables, execute, drop, lock tables in the database.

To assign a user and set privileges for a database:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Databases.
4. Click the Actions button > Privileges next to the database you're interested in.
5. Click to assign a user to the database. On the screen that appears, set the following:
   o User - chose the user from the drop-down list.
   o Privileges - tick the checkbox next to a privilege that you want to assign to the user. Tick the checkbox "All" if you want to chose all privileges.
   o Host - chose a host (local host or any host) from the drop-down list. You can also chose "Use text field" and specify the host name in a blank field.
6. Click the Submit button.

4.1.3.1.3.5 Edit Users Assigned to Database

If you want to change a set of privileges, given to a specific user, you can edit it.

To change the privileges of a user, assigned to a database:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Databases.
4. Click the **Actions** button > **Privileges** next to the database you’re interested in. You will get a list of users, assigned to this database.

5. Click the **Actions** button > **Change Privileges** next to the user you’re interested in.

6. Select the checkbox next to a privilege which you want to assign to the user. Select the **All** checkbox if you want to chose all privileges.

7. Click the **Submit** button.

If you do not want a specific user to manage a database, you can unassign user from the database.

To unassign user from a database:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you’re interested in.
3. Click the **Applications** tab > **Databases**.
4. Click the **Actions** button > **Privileges** next to the database you’re interested in. You will get a list of users, assigned to this database.
5. Click the **Actions** button > **Unassign** next to the user you’re interested in.
6. Confirm unassignment by clicking the **Remove** button.

---

### 4.1.3.1.3.6 Remove Database

If there is no need to use a specific database anymore, you can delete it.

#### To delete a database:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you’re interested in.
3. Click the **Applications** tab > **Databases**.
4. Click the **Actions** button > **Remove** next to the database you’re interested in.
5. Confirm deletion by clicking the **Remove** button.

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**See also:**

- [Application Servers](#)
- [Applications](#)
- [Application Backups](#)

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Databases

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### 4.1.3.1.4 Manage Domains

You can add domains to resolve the **Application Servers** IP address. You can view, create, and delete application domains.

#### View Domains

To view domains:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you’re interested in.
3. Click the **Applications** tab > **Domains**.
4. The page that loads will show the list of domains together with their:
   - **Name** - the domain name
   - **Path to Application** - the route to application
   - **Type** - whether the domain is addon or parked
4.1.3.1.4.1 Create Domain
To create a domain:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Domains.
4. On the screen that appears, click +.
5. Complete the creation form:
   - Domain - enter the domain name
   - Choose the domain path using one of the following tabs:
     - Application - choose application-based path from the drop-down list
     - Addon - enter the domain path manually
     - Parked - /home/onapp/public_html directory is chosen by default
6. Click the Submit button.

4.1.3.1.4.2 Delete Domain
To delete a domain:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > Domains.
4. The page that loads will show the list of domains. Click the Actions button next to a required domain and choose the Remove button.
5. You will be asked to confirm the deletion. Click Remove.

See also:
- Applications
- Application Backups
- Application Servers

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Domains

4.1.3.1.5 Manage Email Accounts
Now you can create an email account for your domains. Also the email server deployment is needed before creating email accounts.

View Email Accounts
To view email accounts for your application servers:

1. Go to your Control Panel > Cloud > Application servers > Applications > Email Accounts.
2. You will get the list of email accounts with their details.
3. You can filter email accounts for a specific domain by choosing it from the drop-down menu and clicking the Apply button.
   - Space - the disk space amount (in KB), occupied by email
   - Count - the number of email messages
2. Click the Actions button to view the actions you can perform with the email account.

If email server is not deployed, you will get a warning with the link to System apps, where you can download email services.

**Deploy Email Server**

To install email services:

1. Go to your Control Panel > Cloud > Application servers > Applications > System Apps.
2. Click for Dovecot and Exim system apps.

When these system apps are downloaded, you can proceed to email account creation.

**Create Email Account**

To create an email account:

1. Go to your Control Panel > Cloud > Application servers > Applications > Email Accounts.
2. Click and fill in the following:
   - **User** - add text, which will be the part of the email account before the @ symbol
   - **Domain** - choose a domain from the drop-down list
   - **Password** - create a password for this email account
   - **Confirm password** - repeat the password to confirm it
3. Click the Add New Email Account button.

**Remove Email Account**

To remove an email account:

1. Go to your Control Panel > Cloud > Application servers > Applications > Email Accounts.
2. Click the Actions button next to the email account you want to delete and select Remove.
3. In the dialog, click Remove to confirm the deletion.

See also:

- Application Servers
- Manage Domains
- Applications

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Email%20Accounts

### 4.1.3.1.6 Manage FTP Users

Application server users can transfer images and other files to and from an application server by means of FTP. To enable this function you should create FTP user accounts. You can view, create, and delete FTP users of an application server.

**View FTP Users**

To view FTP users:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you're interested in.
3. Click the Applications tab > FTP Users.
4. The page that loads will show the list of FTP users together with their:

- **Login** - the user's login name (name_IP address)
- **Path** - the route to FTP folder
- **Usage** - the amount of FTP folder space used by this user (in MB)
- **Actions** - you can click the **Actions** button to perform the following procedures with FTP users:
  - **Remove**

### Create FTP User

To create an FTP user:

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **FTP Users**.
4. On the screen that appears, click **+**.
5. Complete the creation form:
   - **Login** - provide user's login name
   - **Password** - create user's password
   - **Password confirmation** - enter user's password one more time
   - **Path** - indicate the route to FTP folder
6. Click **Submit**.

### Delete FTP User

To delete an FTP user:

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **FTP Users**.
4. The page that loads will show the list of FTP users. Click the **Actions** button next to a required FTP user and choose the **Remove** button.
5. You will be asked to confirm the deletion. Click **Remove**.

**See also:**

- **Applications**
- **Application Backups**
- **Application Servers**

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Leave feedback

4.1.3.1.7 Manage Services

You can view the list of pre-installed services, available on your application server, as well as start, stop, and restart them.

4.1.3.1.7.1 View Services

To view the services of your application server:

1. Go to your **Cloud > Application servers > Applications > Services**.
2. You will get the list of services together with their details:
OnApp Cloud 6.7 Admin Guide

- **Name** - the name of the service
- **Service name** - the name of the service in the system
- **Status** - the service status (Running, Stop)

Clicking the **Actions** button will show actions that you can perform with services (**Start**, **Stop**, and **Restart**).

### 4.1.3.1.7.2 Start/Stop/Restart Services

To manage services:

1. Go to your **Cloud** > **Application servers** > **Applications** > **Services**.
2. Click the **Actions** button next to the service you want to manage and click **Start**, **Stop**, or **Restart**.
3. The corresponding transaction will be fulfilled.

**See also:**

- **Application Servers**
- **Applications**
- **Manage Application Servers**

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### 4.1.3.1.8 System Application Settings

Applications are created using PHP scripting language. Different applications can require different versions of PHP. There are system applications within an application server. You can install or switch PHP versions within one application server by means of system applications.

Below you can find information on how to manage system applications.

#### 4.1.3.1.8.1 List of System Applications

To see the list of system apps available for an application server:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **System Apps**.
4. The page that loads will show the list of system applications together with their:
   - **Name** - the name of a system application
   - **Version** - the version number of an application
   - Click ![download](download.png) to download the application or click ![delete](delete.png) to delete it.

#### 4.1.3.1.8.2 PHP Version Switching

You can switch PHP versions in case you have more than one PHP version in the list of system applications.

To switch the PHP version:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the server you're interested in.
3. Click the **Applications** tab > **Settings**.
4. Choose the appropriate PHP version from the drop-down list and click **Switch**.

**See also:**

- **Applications**
4.1.3.1.9 The List of Available Applications

Below you can find the full list of applications available for deployment using an application server.

4.1.3.1.9.1 Forums

- phpBB
- Simple Machines Forum
- MyBB
- Advanced Electron Forums
- Vanilla
- PunBB
- XMB
- FluxBB
- Phorum
- bbPress
- FUDforum
- miniBB
- Beehive
- my little forum
- ElkArte

4.1.3.1.9.2 Blogs

- WordPress
- Open Blog
- Serendipity
- Dotclear
- b2evolution
- Textpattern
- Ghost
- Nibbleblog
- LifeType
- Pixie
- Nucleus
- Chyrp
- eggBlog
- PivotX
- Movable Type
- FlatPress
- HTMLy

4.1.3.1.9.3 CMS
- Joomla 2.5
- Joomla
- Drupal 7
- Drupal
- PHP-Fusion
- Concrete5
- MODX
- CMS Made Simple
- Open Real Estate
- e107
- Xoops
- Zikula
- Drupal 6
- Website Baker
- PHP-Nuke
- ocPortal
- Subrion
- Typo3 45
- Pligg
- PyroCMS
- Typo3 6
- Typo3
- Tiki Wiki CMS Groupware 9
- Contao
- Mambo
- Geeklog
- SilverStripe
- sNews
- jCore
- ImpressPages
- ProcessWire
- Quick.CMS
- Monstra
• Redaxscript
• ImpressCMS
• phpWcms
• Silex
• Sitemagic CMS
• Mahara
• SiteCake
• Fork
• Saurus
• Jamroom
• Pimcore
• Tiki Wiki CMS Groupware
• Bolt
• Microweber
• razorCMS
• SeoToaster CMS
• Pluck
• Kirby
• Croogo
• Hotaru CMS
• Fiyo CMS
• Concrete5 5.6
• Cotonti
• Zenario
• Anchor
• appRain
• ClipperCMS
• CMSimple
• Typesetter
• Bludit
• GRAV
• Open Business Card
• PopojiCMS
• PluXml
• Precurio
• Koken

4.1.3.1.9.4  E-commerce
• AbanteCart
• PrestaShop
• OpenCart 1.5
• Magento
• WHMCS
• CubeCart
• osCommerce
• Open eShop
• Loaded 7
• Zen Cart
• OpenCart
• TheHostingTool
• TomatoCart
• BoxBilling
• Avactis
• LiteCart
• Quick.Cart
• X-Cart
• SimpleInvoices
• ShopSite
• CS-Cart
• Open Source Point of Sale
• AlegroCart
• Axis
• Blesta
• phpCOIN
• PrestaShop 1.4
• SeoToaster Ecommerce
• Thelia 2
• Zeuscart
• Invoice Ninja
• ClientExec
• Shopware
• Arastta
• Magento
• InvoicePlane
• Magento 1.8
• PEEL SHOPPING
• SurfShopCART
• osCmax
• Logic Invoice
• Magento 2

4.1.3.1.9.5 Social networking
• Dolphin
• Oxwall
• Jcow
• Elgg
• Open Source Social Network
• Beatz
• pH7CMS
• Etano
• PeoplePods
• Family Connections

4.1.3.1.9.6 Educational
• Moodle 2.8
• Chamilo
• Claroline
• eFront
• Moodle 2.0
• Moodle 2.6
• DoceboLMS
• Dokeos
• Moodle
• TCExam
• ATutor
• Omeka
• Gibbon
• Moodle 2.7
• Moodle 2.9

4.1.3.1.9.7 Video
• ClipBucket
• VidiScript
• videoDB
• CumulusClips
• Prisomatube Express
• Ampache
4.1.3.1.9.8 Admanager
- OpenClassifieds
- Prosper202
- OSClass
- Revive Adserver
- GPixPixel

4.1.3.1.9.9 Galleries
- Gallery
- Piwigo
- Coppermine
- Zenphoto
- TinyWebGallery
- phpAlbum
- 4images
- Pixelpost
- Plogger
- iGalerie
- Gallery 2
- Lychee

4.1.3.1.9.10 Projectman
- qdPM
- Feng Office
- eyeOS
- Collabtive
- dotProject
- ProjectPier
- Mantis Bug Tracker
- The Bug Genie
- PHPProjekt
- TaskFreak
- todoyu
- Flyspray
- phpCollab
- Traq
- SiteDove
- Admidio
- Eventum
- Trac
- Burden
• Rukovoditel
• WebCollab
• ZenTao
• Bugs
• TestLink

4.1.3.1.9.11 Files
• ownCloud
• ProjectSend
• PHPfileNavigator
• Pydio
• eXtplorer
• Arfooo
• LetoDMS
• OpenDocMan
• eSyndiCat
• MONSTA Box

4.1.3.1.9.12 Wikis
• MediaWiki
• DokuWiki
• PmWiki
• WikkaWiki
• MediaWiki 1.19

4.1.3.1.9.13 Frameworks
• CodeIgniter
• Laravel
• yii
• Bootstrap
• Zend
• CakePHP
• Symfony2
• Kohana
• Smarty
• PHPDevShell
• FuelPHP
• HTML Purifier
• PRADO
• UIkit
- DIY
- Webasyst
- WidelImage
- Symfony3

### 4.1.3.1.9.14 Mail
- Roundcube
- phpList
- WebMail Lite
- SquirrelMail
- poMMo
- Webinsta Maillist
- OpenNewsletter
- ccMail
- Dada Mail
- Postfix Admin
- RainLoop Webmail

### 4.1.3.1.9.15 Customer support
- Vision Helpdesk
- osTicket
- HESK
- Mibew Messenger
- Help Center Live
- phpOnline
- Live helper chat
- iQDesk
- Crafty Syntax
- Trellis Desk
- phpMyFAQ
- ExoPHPDesk
- Maian Support
- HelpDeskZ
- HelpDEZk
- Support Incident Tracker
- Faveo Helpdesk

### 4.1.3.1.9.16 ERP
- Vtiger
- Dolibarr
- SugarCRM
- FrontAccounting
- OrangeHRM
- EPESI
- EGroupware
- X2CRM
- Zurmo
- Group Office
- Tine 2.0
- SuiteCRM
- webERP
- EsboCRM
- OpenBiz Cubi
- YetiForce CRM

### 4.1.3.1.9.17 DBtools
- SIDU
- phpMyAdmin
- MyWebSQL
- Adminer
- SQLiteManager
- Chive
- phpLiteAdmin
- RockMongo
- Vty

### 4.1.3.1.9.18 Music
- kPlaylist
- Podcast Generator
- AmpJuke
- Impleo

### 4.1.3.1.9.19 Polls
- LimeSurvey
- Piwik
- LittlePoll
- phpESP
- Aardvark Topsites
- Advanced Poll
- EasyPoll
- Simple PHP Poll
- Open Web Analytics
- CJ Dynamic Poll
- Logaholic
- Little Software Stats

4.1.3.1.9.20 Guestbook
- Advanced Guestbook
- Lazarus
- BellaBook
- phpBook
- PHPKode Guestbook
- VX Guestbook
- RicarGBooK
- PHP Address Book

4.1.3.1.9.21 Calendars
- WebCalendar
- Booked
- phpicalendar
- ExtCalendar
- LuxCal

4.1.3.1.9.22 Games
- BlackNova Traders
- Shadows Rising
- Multiplayer Checkers
- Word Search Puzzle

4.1.3.1.9.23 RSS
- Gregarius
- Tiny Tiny RSS
- Feed On Feeds
- selfoss
- SimplePie

4.1.3.1.9.24 Microblog
- StatusNet
- PageCookery
- Storytlr

4.1.3.1.9.25 Others
- Seo Panel
- phpFreeChat
- WeBid
- YOURLS
• SLiMS
• phpLD
• phpFormGenerator
• Form Tools
• SPIP
• Question2Answer
• Soholaunch
• Open Journal Systems
• PASTE
• ArticleSetup
• jobberBase
• PHP QR Code
• Privacy Policy Generator
• PhpGedView
• Codiad
• Hablator
• webtrees
• wallabag
• GLPI
• JoobsBox
• InfiniteWP
• PHPWeby
• Mautic
• OpenBiblio
• Open Conference Systems
• phpDocumentor
• XCloner
• Commentics
• u-Auctions
• SVNManager
• AJAX Chat
• XMS
• Brushtail
• BlaB
• Agora-Project
• Open Monograph Press

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4.1.3.2 Manage Application Servers

Application Server is a regular VS based on default CentOS template with pre-installed additional software. This software allows you to install and have up & running various PHP/Perl/Python frameworks (like Drupal, Joomla, Wordpress, etc.) on a server using web interface. In this document you can find information on how to manage Application Servers in your cloud.

- To activate Application Server functionality you need to activate appropriate license at OnApp dashboard.
- Application servers allow you to deploy different applications on your cloud. For more info, refer to Applications.
- The following field in OnApp configuration should be necessarily filled in, as system_email is used for proper configuration of application server: Control Panel > Admin > Settings > Configuration > System > Email > From.

4.1.3.2.1 View Application Servers

To view an application:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. The page that loads will show the list of application servers together with their:
   - Operating system
   - Label. Click the label to see details.
   - IP Addresses
   - Disk Size
   - RAM
   - Backups - the number of backups and the space these backups take.
   - Compute Resource - the label of compute resource with which application server is associated
   - User- the owner of this application server. Click the user name to see the owner details.
   - CPU(s) - the number of CPU(s) included
   - Power status. Click the on/off buttons to change the status
3. Click the Actions button next to the application server for the quick access to the list of application server actions (the list of actions displayed depends on the application server status):
   - Reboot
   - Recovery reboot
   - Shutdown
   - Startup
   - Recovery startup
   - Unlock

If you are viewing the application servers list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, check the columns you want to be displayed and click Apply. The narrower your screen is, the more unchecked columns will be hidden from the table. If your screen is too narrow to fit all the columns you have checked, a scrollbar will appear at the bottom of the application servers list. You can always alter you column selection later. Note that by default the VIP and Backups columns are not visible in the table on narrow screens.
Column selection is currently set for one browser. If you have checked some columns in one browser and open the list in some other browser, the column selection will be the default one for that other browser.

To search for a particular application server, click the Search icon at the top of the application server list. When the search box appears, type the text you want to search for and click the Search button.

4.1.3.2.2 View Application Server Details
To view details of a specific application server:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you’re interested in.
3. The screen that appears loads the application server properties, application list, notes, activity log and tools for managing your application server.

4.1.3.2.2.1 Application Server Properties
Application server properties page gives a general overview of the server details:
- **Label**
- **VIP status** - click the icon to change the status
- **Template this server is built on** - click to see the template's details
- **Power status** and **ON/OFF/REBOOT** buttons
  - Clicking the OFF button performs a graceful shutdown and then powers off the application server after the timeout set in Configuration Settings.
- **Auto-backups** - move the slider to enable/disable automatic backups for this application server. If the incremental backups are enabled in your cloud, you can set auto-backups per application server rather than per disk
  - If the automation options weren’t enabled during this application server creation, you’ll be redirected to the form where you can configure them.
- **Autoscale** - move the slider to enable/disable the autoscaling rules set for this AS
  - Until the autoscaling rules are configured the autoscaling itself will not start working.
  - If the Autoscale slider is greyed out that means that you have reached the autoscaling limit in a bucket (or the max is set as 0).
- **FQDN** (fully qualified domain name)
- **Compute Resource** - click the compute resource name to see its details
- **Location**
- **Owner** - click the owner name to see its details
- **IP Addresses** - only the first five IP addresses are displayed on the application server properties page. To view the list of all application server IP addresses, mouse over IP addresses area or go to the Networking > IP addresses tab
- **Estimated Price per hour** - this sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here
4.1.3.2.2 Applications
In this section, you can see the list of all applications deployed on this server.

4.1.3.2.3 Notes
The Notes section lists brief comments or reminders for an application server. You can add either Admin's or User's notes. The Admin's note will be available to cloud administrators.

4.1.3.2.3.1 Application Server Management
- Click the Actions button to expand the menu with the application server management options.
- Use the top menu to manage your application servers’ statistics/networking/storage options.

4.1.3.2.4 Edit Application Server
You can edit CPU and RAM resources for application servers. To adjust CPU & RAM resources:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you want to resize, to show its details screen.
3. Click the Actions button, point to AS Options, and select the Edit Application Server link.
4. Change label, CPU cores, CPU priority/units and RAM values, and click the Save button.

4.1.3.2.5 Rebuild/Build Application Server Manually
If you haven’t checked the Build Application Server option during the application server creation process, you will have to do this manually after the application server has been created. Building an application server is the process of allocating physical resources to that application server.

To build an application server manually or rebuild the application server on the same (or another) template:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you’re interested in.
3. On the screen that appears, click Actions, point to AS Options, and then click Rebuild Application Server.
4. On the screen that pops up, use the drop-down menu to choose a template with which to build the application server.
5. Move the Start AS after rebuild slider to the right if you want to have your application server started automatically after it is built.
6. Click the Rebuild Application Server button to finish.
After you rebuild your template all data will be lost!

4.1.3.2.6 Migrate Application Server
You can migrate application servers using a hot or cold migration method:

- **Hot migration** is the migration of application servers with or without disks between compute resources that share common data stores or data store zones.

- **Cold migration** is the migration of application servers with disks between compute resources with local storage or across compute zones.

4.1.3.2.6.1 Hot Migration

Check if your Windows template supports hot migration at the Windows Templates.

You can migrate an online application server from one compute resource to another compute resource that is both utilizing local/shared/IS storage or across zones. There are two types of hot migration:

- **Compute Resource** - migration of an application server from one compute resource to another

- **Compute Resource and Storage** - migration of an application server with disk from one compute resource and data store to another

**Compute Resource**

To hot migrate an application server:

1. Go to your Control Panel > Cloud > Application Servers.
2. Click a label of an application server that you want to migrate.
3. Click Actions, point to AS Options, and click the Migrate Application Server button.
4. In the Migration Type box, select Compute Resource and click Next.
5. Select a Target compute resource from the box and click Next.
6. At the final step of the wizard, you can see the migration summary and select the following check boxes:
   - **Cold-migrate when hot-migration fails** - select the check box to apply cold migration in case of the hot migration failure
   - **Are you sure you want to migrate?** - select the check box to confirm the hot migration
7. When you are finished, click the Submit button.

**Compute Resource and Storage**

To hot migrate an application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you want to migrate.
3. Click Actions, point to AS Options, and click the Migrate Application Server button.
4. In the Migration Type box, select Compute Resource and Storage (Hot) and click Next.
5. Select the following destination resources:
   - **Target compute zone** - select a destination compute zone. The list includes compute zones that you have access to within the same network (i.e. KVM to KVM).
4.1.3.2.6.2 Cold Migration
Cold migration enables you to migrate application servers with disks between compute resources with local storage or across compute zones. To cold migrate an application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you want to migrate.
3. Click Actions, point to AS Options, and click the Migrate Application Server link.
4. In the Migration Type box, select Compute Resource and Storage (Cold) and click Next.
5. Select the following destination resources:
   - Target compute zone - select a destination compute zone. The list includes compute zones that you have access to within the same network (i.e. KVM to KVM).
   - Target compute resource - select a destination compute resource
   - Target data store for disk - select a destination data store for each disk. The list includes available data stores associated with the compute zone and compute resource that you selected earlier.
6. At the final step of the wizard, you can see the migration summary and select the Are you sure you want to migrate? check box to confirm the migration.
7. When you are finished, click the Submit button.

If you change the compute resource or data store zone, the billing will be changed according to the prices set for that new zone in the bucket. The new estimated price per hour for a VS is displayed at the bottom of the VS migration screen.

4.1.3.2.7 Autoscale Application Server
Application server autoscaling allows you to change the RAM, CPU, and disk size settings of an application server automatically. Application server resources scaling is based on rules you specify. For example, you can set up a rule that will add 1000MB of memory to an application server if RAM usage has been above 90% for the last 10 minutes - but add no more than 5000MB in total in 24 hours. You can set autoscaling down settings alongside with autoscaling up.

- For Linux-based application servers only.
• If you autoscale an application server's memory to a value greater than current application server RAM x 16 (which is a max_memory parameter in a configuration file and database), the application server will be rebooted anyway, regardless of the template it is built on.
• Make sure an application server can be reached via SSH. Otherwise, the autoscaling client installation will fail.
• Starting with version 4.2, OnApp uses Zabbix for autoscaling. Monitis will be used for autoscaling of servers built using OnApp versions previous to 4.2 until you switch autoscaling off for such server(s). If you decide to switch autoscaling back on, autoscaling will be implemented using Zabbix. Zabbix also will be used for autoscaling of newly created VSs.

To configure autoscaling settings:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the appropriate application server.
3. On the page that follows, click the Overview tab, and then click Autoscaling.
4. Press the required tab - Memory Usage, Disk Usage or CPU Usage - to see the statistics for each type of resources.
5. Below you will see UP and DOWN autoscaling options. Move the slider to the right to add the autoscaling rule or move it to the left to remove the rule.
6. Add autoscaling rules as explained below:

   Set autoscale up options:
   
   o If RAM usage is above X% for a specific time period, add Y MB – but no more than Z MB in a 24 hour period.
   o If CPU usage is above X% for a specific time period, add Y% - but no more than Z% in a 24 hour period.
   o If disk usage is above X% for a specific time period, add Y GB - but no more than Z GB in a 24 hour period.

   Set autoscale down options:
   
   o If RAM usage is below X% for a specific time period, remove Y MB.
   o If CPU usage is below X% for a specific time period, remove Y%.
   o If disk usage is below X% for a specific time period, remove Y GB.

7. Click Apply.

Clicking the Apply button does not activate autoscaling if the Autoscale slider at the AS overview page is disabled. You can configure autoscaling rules, press the Apply button, these rules will be saved and will start working only after the Autoscale slider at VS overview page is enabled. Also, you can disable the Autoscale slider, autoscaling will stop working, but the configuration of rules will be saved in case you will want to activate them in future.

4.1.3.2.8 Set VIP Status for Application Server
If a compute resource fails or reboots, the system migrates application servers to another compute resource, one server at a time. The order servers are migrated in is random. However, you can give an application server "VIP" status, and this will give that server priority in the
migration queue.

To set or remove VIP status for an application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Use the VIP button next to a required application server to change its VIP status.

4.1.3.2.9 Segregate Application Server
To isolate one application server from another:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you want to segregate.
3. On the screen that appears, click the Actions button, point to Performance, then click Segregate Application Server.
4. In the dialogue box that pops up, use the drop-down menu to choose an application server you want to keep away from.
5. Click Segregate Application Server to finish.

4.1.3.2.10 Application Server Power Options
To manage an application server power options:

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

4.1.3.2.11 Application Server Administrative Options
To manage an application server power options:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the required application server.
3. Click the Action button on the application server's screen and point to Administration to expand the menu.
4. The Administration menu enables you to perform the following administrative actions on application servers:
   - Change Owner - pops up a dialogue box with a drop-down of all users on the system, enabling you to pass ownership of the application server to the user selected from the list. If you have any backups for this application server, you will be also prompted to confirm if the backup should be moved to another user.

4.1.3.2.12 Delete Application Server
Shut down the application server before destroying it. If you are deleting an application server that is running, the application server will be deleted after the time set in Timeout Before
Shutting Down application servers configuration parameter.
To remove the application server from the cloud:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. On the screen that appears, you'll see the list of all application servers in the cloud. Click the label of the application server you want to delete.
3. On the application server's screen, click the Actions button, point to AS Options, then select Delete Application Server.
4. Move the Move Last Backup to My Templates if it is present slider to the right if you want to save the last application server's backup as a template.
5. Move the Destroy All Existing Backups slider to the right if you want to remove all existing backups of this application server.

**IMPORTANT:**
- You won't be able to restore application server after deleting it.
- Deleting an application server removes all data stored on that application server. To save the data stored on the application server, back up your application server and tick the Destroy All Existing Backups box when following the instructions described in this section.

6. Click Destroy.

See also:
- License
- Applications
- Configuration Settings
- Create Application Server
- Application Server Networks

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4.1.3.3 Application Server Billing

Applications are deployed on application servers, which are created based on the default Application Server template. This Application Server template is provided as a system template. Based on this, you can arrange applications as a paid resource for your end-users. For this, set the price per Application Server template per hour in Template store. So, each server deployed on this template will be billed according to the price set.

To charge for application server:

1. Add Application Server template to the required template group.
2. Add the template group to the Access Control of the bucket at Control Panel > Admin > Buckets > Label > Access Control > Other so that users assigned to the bucket have access to the required templates.
3. Specify the maximum number of application servers users can create in the Miscellaneous section of the bucket's Access Control.
4. Add the template store to the Rate Card of the bucket at Control Panel > Admin > Buckets > Label > Rate Card > Other to set the price for using the required template.
   As a single template can be included in multiple template stores, the same template will have the same price in all the template stores added to the rate card of a single bucket. If you add/edit the price of a template in one template store, the price of the same template will change to the new value in all the template stores in the rate card.
Once you add a template to the Rate Card, all the template stores that contain that template will be added to that Rate Card with a price set only for that template.

5. When the relevant template group is added to the bucket, a user can deploy an application server.

See also:
- Create Application Server
- Manage Application Servers
- Application Server Disks
- Application Server Transactions and Logs

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4.1.3.4 Application Server Transactions and Logs
The system records a detailed log of all the transactions happening to your application servers. The list of transactions logged by the system includes:
- Provision application server
- Startup application server
- Stop application server
- Resize application server without reboot
- Configure Operating System
- Build disk
- Resize disk
- Format disk
- Destroy disk
- Take backup
- Convert backup
- Restore backup
- Destroy backups
- Destroy application server
- Destroy template
- Download template
- Update firewall

To view transactions for an application server:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you’re interested in.
3. The details screen for that application server shows recent transactions in the Activity Log section.

To cancel pending tasks, click the Cancel Pending button.

To cancel the TakeBackup transaction which is running longer and exceeding the time set for a zombie transaction:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. On the following page, in the Activity Log section, hover over the icon of the transaction and then click the icon that appears on the icon of this transaction.

Please note that this option becomes available if the transaction has been running for the period of time specified in the Zombie transaction time parameter, which can be found at your Control Panel > Admin > Settings > Configuration icon.

4. In the dialog box, click Proceed.

The rollback is executed starting from the command which has been canceled.

You can also view the details of a particular log item by clicking its Ref number. The page that loads shows the log output and the following details:

- **date** - time in the [YYYY][MM][DD][hh][mm][ss]Z format
- **action** - the action name
- **status** - the action status (Complete, Warn, Pending, or Failed)
- **ref** - the log item’s Ref number
- **target** - the action target
- **started at** - the time when the action was started
- **completed at** - the time when the action was completed
- **compute resource** - the label of compute resource
- **initiator** - the user who initiated the action

If you want to see only the detailed output, you can hide log info with the arrow button in the upper right corner.

**See also:**

- Create Application Server
- Manage Application Servers
- Application Server Disks
- Application Server Billing

https://onappcloud.typeform.com/to/A64Euy#source=Application%20Server%20Transactions%20and%20Logs

4.1.3.5 Manage Application Server Backups

It is strongly recommended that you take backups while an application server is not running. Make sure that your application server is stopped before taking any backups.

Backups are used for copying and archiving target data (target is either a disk or an application server as a single whole of all disks used).

- **Images** menu lists the normal backups of an application server
- **Files** menu lists the application server’s incremental backups
- **Schedules** menu allows you to schedule automatic backups for an application server. See Schedules Settings section of this guide for details.

OnApp supports two backup types: normal and incremental.

- **Normal** - simple method of taking backups by making a full copy of target data and storing it in an archive.
Ensure that you do not use XFS or other filesystems not supported by OnApp for Linux backups as OnApp will address them as ext3/4 filesystems.

- **Incremental** - advanced method of taking backups. During the incremental backup, only the changes made after the last backup are archived instead of backing up the whole target. You must have dedicated backup servers configured in your cloud to be able to utilize the incremental backups' functionality. Incremental backups are enabled via Admin > Settings > Configuration > Backups/Templates menu.

It is not possible to take incremental backups if you are using location group functionality without a backup server added to the group - the following error message will appear:
"Backup cannot be made at this time: This disk cannot be backed up, check Location Group settings." This issue will be fixed in next releases. As a workaround, add an empty backup server zone to your location group.

Each backup type can be taken in two ways:

- **Manually** - the user logs into OnApp CP and clicks the Take Backup button.
- **Automatically** - the user enables backup schedule (daily, weekly, monthly, yearly). To enable auto-backups for application servers that support incremental backups which used auto-backups option before the upgrade, re-enable automatic backups by switching them off and on again.

- If you are using incremental backups option, you should either enable dedicated backup servers in your cloud or share the backups and templates folders (paths) between your compute resources. SSH file transfer option will be skipped for application servers using incremental backups. Existing full backups will be still accessible via Backups > Images menu.
- If required, you can change the block size which is used during backup creation at Control Panel > Admin > Settings > Configuration by editing the Block Size (MB) parameter.

4.1.3.5.1 How Do Incremental Backups Work?
For example, we have a disk with three files:

- File1 - 4Gb
- File2 - 2Gb
- File3 - 3Gb

The first incremental backup will be 9 GB (sum of all files). If you decide to take another incremental backup soon thereafter, the backup size will be equal to 0, as the files have not been changed since the first backup (if your backup has complicated directory structure, it could be more than 0, as file system could store some system data).

Then:

- If the user decides to delete File2, the target size will now be 7Gb. The subsequent incremental backup size will be 0, as new data has not been added.
- If the user adds File4 of 4 GB size, the subsequent incremental backup will equal 4 GB (the size of new data added).
- If the user increases File3 disk size to 6 GB, the subsequent incremental backup size will equal 6 GB, although the target is increased by 3 GB. This happens because the incremental system takes the update of the existing file as the deletion of the existing
file and adding the new file with the same name (the first version of File3 has been deleted and the new one with 6GB size has been added).

Backups can be saved either to a compute resource or to a dedicated backup server. When saving a backup, the system calculates if a user has enough physical/bucket resources to save a backup in the selected destination.

When saving a backup to a compute resource, the system does not check if a compute resource has enough disk space to save a backup and only checks if a user has enough bucket limits.

When saving a backup to a dedicated backup server, the system checks both disk space and bucket limits.

Free disk size on a target must be at least equal to the disk’s size for which the backup is taken (or to a size of all application server disks for incremental backup).

In some cases (for example, if a user has scheduled several disk backups simultaneously, but there are only free space/billing limits for the first one) the system may allow taking all the backups but will not be able to save them. This will result in a system error and over-billing.

4.1.3.5.2 View Application Server Backups

To view the list of application server’s backups:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the required application server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, you’ll see a list of application server backups sorted by category.
5. Click the label of the required application server backup to see the following tools - restore backup, delete backup and add/edit note.

4.1.3.5.3 Take Application Server Backup

To take an incremental backup:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you want to back up.
3. Click the Backups tab, then select Files.
4. To take a backup, click the Take a Backup button at the end of the list.

Backups in the OnApp Control Panel are associated with a particular user instead of being associated with an application server. To view the list of user backups, refer to the View User Backups section.

Template extraction is performed during server provisioning or taking a backup when using a particular template. To prevent the template from being used in other transactions during extraction, the template is locked during the extraction and unlocked on accomplishment. If other transaction tries to use the locked template, it will fail after 5 minutes of standby. The transaction that locked template and failed means that the extracted template is broken.

Storing scheme:
- template /onapp/templates/your_template.tgz
• extracted template /onapp/backups/templates/your_template
• locked template /onapp/backups/templates/your_template.lock

4.1.3.5.4  Take Application Server Disk Backup
To back up an application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the server you want to back up.
3. Click the Storage tab > Disks. You'll see a list of the disks allocated to that application server.
4. Click the Actions icon next to a disk you want to take a backup of, then click Backup. You'll see a list of all the backups taken and pending for that disk, along with the tools to restore backups, delete them, and convert them to templates.
   o To make a backup, click the Take a Backup button at the end of the list. You may add a note and also Force Windows Backup. This option for Windows application servers is designed as a last resort, when the backup cannot be taken due to NTFS file system problems. Switching this option will bring up a dialog box with the following message: “If you enable this option there is no guarantee that backup will be consistent.” Select “Yes” to proceed.
   o To restore a backup, click the Restore link next to the backup you want to revert to.

Backups in the OnApp Control Panel are associated with a particular user instead of being associated with an application server. To view the list of user backups, refer to the View User Backups section.

4.1.3.5.5  Restore Application Server Backup
To restore a backup:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the required application server.
3. Click the Backups tab, then select the appropriate backup type:
   o Images - full backups
   o Files - incremental backups
4. On the screen that appears, click the Actions icon next to the backup you want to revert to and choose Restore.

4.1.3.5.6  Add Application Server Backup Note
To edit application server backup's note:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the required application server.
3. Click the Backups tab, then select the appropriate backup type:
   o Images - full backups
   o Files - incremental backups
4. On the screen that appears, click the **Actions** icon next to the required backup and choose **Add Note**. Make necessary changes and click **Submit**.

4.1.3.5.7 Delete Application Server Backup

To delete a backup:

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the required Application server.
3. Click the **Backups** tab, then select the appropriate backup type:
   - **Images** - full backups
   - **Files** - incremental backups
4. On the screen that appears, click the **Actions** icon next to the backup you want to remove and choose **Delete**.

See also:

- Schedules Settings
- User Backups
- Application Server Backup Schedules
- Application Server Disks
- Application Server Statistics

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Application%20Server%20Backups

4.1.3.6 Manage Application Server Backup Schedules

Schedules screen lists application servers' scheduled backups. Depending on the backup type set in your cloud settings, schedules are created either per application server or per disk. To view all backup schedules in the cloud, see Schedules Settings. In this document you can find information on how to manage Application Server backup schedules.

**View Application Server Backup Schedules**

To view the list of backup schedules for a particular application server:

**If the normal backup option is selected for the cloud:**

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the application server you're interested in.
3. Click the **Storage** tab, then select **Disks**.
4. On the screen that appears, click the **Actions** button next to the disk you want to back up, then select **Schedule for Backups**.
5. On the screen that appears, you will see the list of backup schedules along with their details:
   - **Date** - the time when the schedule was created
   - **Target** - the server or disk for which the schedule was created (depending on the **backup type**)
   - **Action** - the scheduled action
   - **Period** - how frequently the backup will occur according to a period type set in the next step.

For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this filed is set 1.
• **Period type** - the backup period: days, weeks, months, or years
• **Rotation period** - the number of backups, after which the first backup will be deleted.

By default, in this field is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this field, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

• **Next Start** - the date and the hour of the next backup
• **User** - the user who created the backup schedule
• **Status** - schedule status

**If the incremental backup option is selected for the cloud:**

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the application server you're interested in.
3. Select **Backups > Schedules** tab or click **Auto-backups** under the **Options** section to view incremental backups schedules only.
4. On the screen that appears, you will see the list of backup schedules along with their details:
   - **Date** - the time when the schedule was created
   - **Target** - the server or disk for which the schedule was created (depending on the **backup type**)
   - **Action** - the scheduled action
   - **Period** - how frequently the backup will occur according to a period type set in the next step.

   For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this field is set 1.

   - **Period type** - the backup period: days, weeks, months, or years
   - **Rotation period** - the number of backups, after which the first backup will be deleted.

   By default, in this field is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this field, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

   - **Next Start** - the date and the hour of the next backup
   - **User** - the user who created the backup schedule
   - **Status** - schedule status

Create Application Server Backup Schedule

In addition to the system auto-backup presets, you can schedule backups of application servers (application server disks) as required. For example, you can set up a schedule to back up your disks once a week.

The combination of Scheduled application server backups and **Auto-backup Presets** provide a great deal of flexibility in the way backups are handled for the cloud and for individual application servers. Auto-backup Presets can be applied to all new application servers added to
the cloud. Scheduled application server backups enable specific backups to be scheduled for individual application servers, outside of the auto-backup pattern.

Depending on your cloud settings, you can schedule either normal or incremental backup schedules:

- **Adding normal backup schedule**
- **Adding incremental backup schedule**

**Adding a normal backup schedule**

To add a normal backup schedule:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you want to schedule a backup for.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that follows, click the New Schedule button.
6. Specify schedule details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted.
   - **Start time** - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).
7. Click the Save button to finish.

**Adding an incremental backup schedule**

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you want to schedule a backup for.
3. Click the Backups tab, then choose Schedules, or click Auto-backups under the Options menu to view incremental backup schedules only.
4. Click the New Schedule button.
5. On the screen that appears, specify new schedule’s details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted.
   - **Start time** - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run
according to the queue (the transactions created earlier or with higher priority will be launched first).

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

**Edit Application Server Backup Schedule**

4.1.3.6.1 To edit a normal backup schedule:
   1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
   2. Click the label of the application server you want to schedule a backup for.
   3. Click the **Storage** tab, then select **Disks**.
   4. On the screen that appears, click the **Actions** button next to the disk you want to back up, then select **Schedule for Backups**.
   5. Click the **Edit** icon next to a schedule to change its details.
   6. Specify schedule details:
      - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
      - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
      - **Rotation period** - the number of backups after which the first backup will be deleted.
      - **Enabled** - move the slider to enable or disable the schedule

   For a schedule with the **Failed** status, you can move the **Enabled** slider to the right to run the schedule once again.

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

4.1.3.6.2 To edit an incremental backup schedule:
   1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
   2. Click the label of the application server you're interested in.
   3. Select **Backups** > **Schedules** tab, or click **Auto-backups** under the **Options** menu to view incremental backup schedules only.
   4. Click the **Edit** icon next to a schedule to change its details:
      - **Period** - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
      - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
      - **Rotation period** - the number of backups after which the first backup will be deleted.
      - **Enabled** - move the slider to enable or disable the schedule

   For a schedule with the **Failed** status, you can move the **Enabled** slider to the right to run the schedule once again.

5. Click the **Save** button to save your changes.

**Delete Application Server Backup Schedule**
4.1.3.6.3 To delete a normal backup schedule:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you're interested in.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk with a backup schedule, then select Schedule for Backups.
5. Click the Actions icon next to the schedule you want to remove, then choose Delete.

4.1.3.6.4 To delete an incremental backup schedule:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you're interested in.
3. Select Backups > Schedules tab, or click Auto-backups under the Options section to view incremental backups schedules only.
4. On the screen that appears, you will see the list of backup schedules.
5. Click the Actions icon next to the schedule you want to remove, then choose Delete.

See also:
- Schedules Settings
- Auto-Backup Presets
- Application Server Disks
- Application Server Statistics
- Application Server Transactions and Logs

4.1.3.7 Manage Application Server Disks
Application server storage is provided by disks. A disk is a partition of a data store that is allocated to a specific application server. Disks can be assigned as standard or swap disks (there are no swap disks for Windows-based templates). They can also be set as primary (that is, the disk from which an OS will boot).

You can also utilize incremental backups. For details, see the Application Server Backups section of this guide.

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

Creating multiple partitions on one disk is forbidden for all application servers.

Add Disks to Application Servers
Adding a disk to an application server will require that application server should be rebooted. If an application server 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 an application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click an application server's label to open its details screen.
3. Click the Storage tab > Disks.
4. Click the "+" button or the Create Disk button.
5. Fill in the details:
o Specify disk label.

o Choose the data store to create a disk on from the drop-down list.

o Move the slider to the right to specify the desired disk size.

The disk size should not exceed 2 TB when a new disk is added. You can later resize the disk if you need it to be larger than 2 TB.

o Move the Hot Attach slider to the right if you want to enable disk hot attaching. In this case, the application server will not be stopped when adding a disk. Prerequisite: virtual server template should support virtio virtualization and Linux OS. Hot attach option is only available for KVM 6/ CentOS 6 application servers.

o Move the Swap Space slider to the right if this disk is swap space.

o Move the Require Format Disk slider to the right if this disk requires formatting.

o Move the Mounted slider to the right if the disk should be added to Linux FSTAB (for Linux application servers).

o Specify its 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}
```

o Indicate the file system - ext3 or ext4 - for Linux based application server.

6. Click the Add Disk button to finish.

Restrictions:

- If you choose a Solidfire data store, the minimum disk size will be regulated by Solidfire Data Store Zone settings.
- If application server and the control panel server belong to different networks, the hot attach transaction will fail.
- If an additional disk has been created without the require format disk option and formatted/partitioned in another way, resize disk action may work incorrectly. Use the require format disk option when creating an additional disk, otherwise use disk resize option at your own risk.
- To be able to take incremental backups for application server’s disk, you must mount this disk to FSTAB (either Linux or FreeBSD) and specify the proper mount point manually.
- You cannot back up Swap disks.
- When you add a new disk to an application server, it automatically becomes available to that server.

Edit Application Server Disks

4.1.3.7.1 Primary and Swap Disks

For primary and swap (Linux, FreeBSD) disks you may only change the label and the size. You can resize disks when needed. The resize will fail if your current usage is greater than the new size you request. Note that any changes to the disk size require rebooting of your application server. For Windows-based application server disks, you can enable or disable virtio mode.

To edit a disk:

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

2. Make sure your application 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. On the page that appears, you can edit the following:
   - **Label**: specify the name of the disk
   - **Size**: move the slider to the right to specify the desired disk size in GB
   - **Enable Virtio**: move the slider to the right to enable virtio mode

   Please note that the **Enable Virtio** option is available only for Windows-based application servers with the template supporting *kvm_virtio*.

6. Click the **Save Disk** button.

   - You cannot decrease size of Integrated Storage data store disks.
   - You cannot decrease disk size for Windows-based and FreeBSD-based application servers. Only the increase disk size option is available.
   - You cannot resize the primary disk for FreeBSD-based application servers.
   - Decreasing disk size for Linux-based application servers may lead to filesystem inconsistencies. Make sure you have current backups before proceeding.

### 4.1.3.7.2 New Disks

For new disks - those which were added after the application server was created - you can edit the following:

<table>
<thead>
<tr>
<th>Linux</th>
<th>Windows</th>
<th>FreeBSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Label</td>
<td>• Label</td>
<td>• Label</td>
</tr>
<tr>
<td>• Size</td>
<td>• Size</td>
<td>• Size</td>
</tr>
<tr>
<td>• Require format</td>
<td>• Require format</td>
<td>• Require format</td>
</tr>
<tr>
<td>• Mounted</td>
<td>• Enable Virtio</td>
<td>• Mounted</td>
</tr>
<tr>
<td>• Mount point</td>
<td></td>
<td>• Mount point</td>
</tr>
<tr>
<td>• File system</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Migrate Application Server Disks**

You can migrate disks of your application servers to other data stores, which are allocated to the same compute resource. Unlike application server migration, disk migration requires reboot of the application server (despite the template it is based on).

**To migrate a disk:**

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Make sure your application 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 **Migrate** button.
5. On the screen that appears, select a target data store from a drop-down box.
6. Click **Start Migrate**.
- You can only migrate disks to data stores in data store zones assigned to your bucket.
- You cannot migrate a disk to a data store with less capacity than the disk size.
- If you move a 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.

Delete Application Server Disk

To delete a disk:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Make sure your application 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.
5. In the pop-up window, move the Force Reboot slider to the right, then select the application server shutdown type.
6. Move the Required Startup slider to the right to start up the application server automatically after the network is rebuilt.

Steps 5 and 6 apply to disks of application servers that are on.

7. Click the Destroy Disk button.

See also:
- Create Application Server
- Application Server Backups
- Application Server Backup Schedules
- Application Server Statistics
- Application Server Transactions and Logs

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Application%20Server%20Disks

Leave feedback

4.1.3.8 Manage Application Server Networks

The Networking menu in the Application Servers menu enables you to manage network interfaces, allocate IP addresses, and set firewall rules for application servers. In this document you can find information on how to manage Application Server networks.

- To run the application server, at least one network interface with an assigned IP address (or addresses) is required!
- To allocate another physical network, add a new network interface.

4.1.3.8.1 Configure Application Server Network Interface

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

When you create an application server, 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 an application server’s primary network interface. To see the list of all network interfaces allocated to the application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application 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).

4.1.3.8.1.1 To add a network interface:
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application 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 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 application server runs
   - Port speed – set port speed in Mbps, or make it unlimited
6. Click the Submit button.

To edit the network interface label and 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 application 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.

4.1.3.8.2 Rebuild Application Server Network
To rebuild a network join, added to the application server (required after allocating new IP addresses):
1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of a required application server.
3. On the screen that appears, click the Actions button, point to Network, then click Rebuild Network.
4. In the pop-up window, move the Force Reboot slider to the right, then select the application server shutdown type.

During rebuild of a network, the system tries to reach application server’s network interface without rebooting application server. Then, if it is not possible, transaction will quit. Force reboot action allows to rebuild application server network with reboot action if live rebuild is impossible. In case the force reboot
option is disabled and system can not enter the application server, the network rebuild operation will fail.

5. Move the **Required Startup** slider to the right to start up an application server when you're rebuilding network of a powered off application server.

6. Click the **Rebuild Network** button.

In case of network interface replacement for Windows application servers running on Xen compute resources, the user has to add new network interface, rebuild network, then remove the old network interface, and perform network rebuild again.

### 4.1.3.8.3 Set Application Server Firewall Rules

With OnApp you can set firewall rules for the network interfaces of application servers. There are two types of firewall rule:

- **ACCEPT** – defines the packets that will be accepted by the firewall
- **DROP** – defines the packets that will be rejected by the firewall

You cannot apply firewall rules to application servers which are parts of a blueprint.

You can set the following:

- **add a specific firewall rule** - you can configure a firewall rule with specific parameters (source, destination port, protocol type etc.)
- **set default firewall rules** - you can set default firewall rules for an entire network interface

#### 4.1.3.8.3.1 Add a specific firewall rule

To configure a firewall rule:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the application server for which you want to configure a firewall rule.
3. On the screen that appears, click the **Actions** button, point to **Network**, then click **Edit Firewall Rules**.
4. On the page that appears, set the following:
   a. Choose the network interface.
   b. Specify if the rule defines requests that should be accepted or dropped.
   c. Set the IP address for which this rule is active.
      - Leave the empty field to apply this rule to all IPs
      - Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
      - Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
   d. Set the port for which this rule is effective.
      - Leave the empty field to apply the rule to all ports
      - Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
      - Enter comma-separated ports to apply the rule to the list of ports (e.g. 80,443,21)
Choose the protocol (TCP, UDP or ICMP).

f. Enter a comment to the firewall rule.

d. To save the rule, click the Add Rule button. The rule will be saved in the UI, but the transaction won't be started until you click the Apply Firewall Rules button.

e. To start the transaction that runs firewall rules for an application server, click Apply Firewall Rules button.

7. Use Up and Down arrow buttons in the left column to change firewall rule position.

### 4.1.3.8.3.2 Default firewall rules

To set default firewall rules for a network interface:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server for which you want to configure a firewall rule.
3. Click the Networking tab, then click Firewall.
4. On the page that appears, go to Default firewall rules section.
5. Choose ACCEPT or DROP command next to the network interface and click Save Default Firewall Rules. The rule will be saved in the UI, but the transaction won't be started until you click the Apply Firewall Rules button.

#### Example:

The Int1 ACCEPT 122.158.111.21 22 TCP firewall rule means that the Int1 network interface will accept all requests and packets addressed from 122.158.111.21 using the TCP protocol on port 22.

The Int2 DROP 122.158.111.21 22 UDP firewall rule means that the Int2 network interface will reject all requests and packets from 122.158.111.21 using the UDP protocol on port 22.

### 4.1.3.8.4 Application 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 application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you’re interested in.
3. Click the Networking tab, then click IP Addresses.
4. Click the Allocate New IP Address button.
5. Select a network interface from the drop-down menu (only the network interfaces you added to the application server 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 an application server, but only one application server 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 button.
8. Click the Rebuild Network button to rebuild the network.

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

### 4.1.3.8.4.1 Edit IP address assigned to application server

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you're interested in.
3. Click the Networking > IP Addresses tab.
4. Click the **Edit** button next to the IP address you want to edit.

5. On the page that loads, you can mark the IP address as primary by selecting **Primary IP Address?** checkbox. Accordingly, this IP address will be used as source IP for outgoing traffic by default.

4.1.3.8.4.2 Remove IP address from an application server

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the application 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 an application server and rebuild the network immediately after deleting the IP address. After choosing the Delete with Reboot option you will be redirected to the application server's Overview page.
   - Choose **Delete without Reboot** option if you don't want to reboot an application server. In this case to apply the changes, you will have to the reboot the application server additionally.

If you delete IP address that is used as primary - the next available IP will be marked as primary.

4.1.3.8.5 Display Network Speed for Network Interfaces on Application Server Page

The main **Application Servers** screen displays the network speed of each application server's primary network interface. To see the speed of all interfaces assigned to an application server:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the application 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.

4.1.3.8.6 Edit Application Server Network Speed

To edit an application server's network speed:

1. Go to your Control Panel > **Cloud** > **Application Servers** menu.
2. Click the label of the application server you want to change.
3. Go to the **Networking** tab > **Network Interfaces**.
4. In the last column, click the **Edit** button.
5. Change the port speed.
6. Click the **Submit** button to save changes.

See also:

- [Create Application Server](#)
- [Application Server Disks](#)
- [Application Server Backups](#)
- [Application Server Backup Schedules](#)
- [Application Server Statistics](#)
4.1.3.9 Manage Application Server Statistics

For your convenience, the system tracks application server performance and generates statistics on CPU utilization, billing, network interface, and Disk IOPS usage. In this document you can find information on how to manage Application Server statistics.

4.1.3.9.1 Application Server CPU Utilization

OnApp tracks CPU usage for application servers and generates charts that help analyze application server performance. The charts show the total CPU usage for all the cores on this particular application server 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 > Application Servers menu.
2. Click the label of the application server you're interested in.
3. Click the Overview tab > CPU Usage.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there is less data available, the chart will show utilization for the time available.
5. Move the Show in My Timezone slider to the right if you want to show bandwidth statistics according to your profile's timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the 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.

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

4.1.3.9.2 Application Server Billing Statistics

OnApp has a record of all the charges applied to your application servers for the last three month period. If an application server was created less than three months ago, statistics are recorded for the application server'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 an application server:

1. Go to your Control Panel > Cloud > Application Servers menu.
2. Click the label of the application server you're interested in.
3. Click the Overview > Billing Statistics tab.
4. You can filter the statistics by date and time - select the time period from the drop-down menu and click the Apply button. By default the statistics are generated for the last three months or the actual application server existence period.
5. Move the Show in my Timezone slider to the right if you want to show bandwidth statistics according to your profile's timezone settings.
6. On the page that appears:
The price parameters on this page do not take into consideration the free limits for resources set in the bucket.

- **Date** – particular date and time for the generated statistics
- **Users** – the application server owner. Click the owner name to see the User Profile (user details)
- **Virtual Servers** – the application server name with the total due for application server 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 application server 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 application server 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 Application 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).

4.1.3.9.3 Application Server Network Interface Statistics
OnApp tracks network usage for application servers and generates charts that help analyze network performance. To see network utilization statistics for an application server:

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the application 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.
7. You can filter the statistics by date and time - select the time period from the drop-down menu and click the **Apply** button.

4.1.3.9.4 Application Server Disk IOPS Statistics
The system tracks IOPS (Input/Output Operations per Second) for application servers and generates charts that help analyze application server disk performance. The data presented in the chart are for the periods during which the statistics were gathered, typically three minutes. To see IOPS for an application server:

1. Go to your Control Panel > **Cloud > Application Servers** menu.
2. Click the label of the application 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:
   - IOPS for the last hour
   - IOPS for the last 24 hours
   - Data written/read (in Kb) for the last 24 hours
   - Data written/read (in Kb) 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.

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.

See also:
- Resource Allocation and Prices
- Permissions
- User Accounts

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Application%20Server%20Statistics

### 4.1.4 Load Balancers

Load balancing improves the level of application availability and scalability: with this feature you may ensure the VS will be available and working smoothly even in the condition of high traffic.

Load Balancers, both autoscaling clusters and load balancer clusters, can only be created on the basis of virtual servers and are not available for smart servers, baremetal servers, or VMware virtual servers.

There are two load balancing options in OnApp:

- **Load balancer clusters**

  With this option, you specify which VSs (nodes) will participate in a load balancer cluster. Incoming traffic is distributed evenly between all the VSs added to a cluster – you still present a single host name to end users, but they actually access the cluster of VSs rather than a single end point. This helps application availability: if one VS fails, traffic is automatically routed to another in the cluster. You can add and remove cluster VSs as required.

- **Autoscaling clusters**

  VS Autoscaling increases or decreases your VS capacity by automatically adding or removing nodes to a cluster. The cluster is scaled in (decreased) or out (increased) based on rules you specify in the Control Panel. This aids application performance and scalability.

  For instance, you can create a rule that will add 3 more nodes to a cluster if CPU usage has been more than 90% for the last 5 minutes; or rules that remove a node if there has been more than 256 MB RAM free for the last 20 minutes.

See also:
- Create Load Balancers
- Manage Load Balancers
- Virtual Servers

https://onappcloud.typeform.com/to/A64Euy#source=Load%20Balancers

### 4.1.4.1 Manage Load Balancers

Load balancing aids application availability and scalability. There are two load balancing options in OnApp - Load Balancer clusters and Auto-Scaling clusters. In this document you can find information on how to manage Load Balancer and Auto-Scaling clusters in your cloud.
Load Balancers, both autoscaling clusters and load balancer clusters, can only be created on the basis of virtual servers and are not available for smart servers, baremetal servers, or VMware virtual servers.

4.1.4.1.1 View Load Balancers
To view the list of load balancers in your cloud go to your Control Panel’s Load Balancers menu. The page that loads shows the following details of your load balancers:

- **OS** - the OS on which the load balancer is based
- **Label** - the name of the load balancer. Click on the label to see the load balancer details.
- **IP Addresses** - IP addresses assigned to the load balancer

Note that you will be given two IP addresses. The first IP address is used by the OnApp CP to access the load balancer. The second IP address is the shared IP for the balanced nodes.

- **Disk Size** - disk size assigned to the load balancer in GB
- **RAM** - RAM assigned to the load balancer in GB
- **Nodes** - the number of nodes in the load balancer
- **Compute Resource** - the label of compute resource with which load balancer is associated
- **Power** - whether the load balancer is powered ON or OFF. Click the on/off buttons to change the status.
- **Actions icon** - click the icon for the quick access to the list of load balancer actions

If you are viewing the load balancers list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, check the columns you want to be displayed and click **Apply**. The narrower your screen is, the more unchecked columns will be hidden from the table. If your screen is too narrow to fit all the columns you have checked, a scrollbar will appear at the bottom of the load balancers list. You can always alter your column selection later.

Column selection is currently set for one browser. If you have checked some columns in one browser and opened the list in some other browser, the column selection will be the default one for that other browser.

4.1.4.1.2 View Load Balancer Details
1. Go to your Control Panel > **Cloud** > **Load Balancers** menu.
2. Click the label of the load balancer you are interested in.
3. The screen that appears loads the load balancer properties, billing statistics, and tools for managing your load balancer.

**Load Balancer Overview**
Load balancer properties page gives a general overview of the load balancer details:

- **Label**
- **Power status & On/Off buttons**
- **Compute resource**
- **Owner**
• IP addresses
• Estimated Price per hour. This sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here.
• Allocated memory
• CPUs
• Disk size
• Network speed
• IPs
• Hostname and login
• Administrator's/user's notes
• List of cluster nodes
• Activity log

Add admin's or user's note to create a brief comment or reminder.

To expand the load balancer options menu, click the Actions button on the load balancer's details screen. Actions menu enables you to perform the following actions on load balancers (the exact list shown depends on the load balancer status):

Actions

The exact list of load balancer tools shown depends on the load balancer status:

Power Options:
• Startup Balancer - queues a start-up action for a balancer that's currently powered off
• Reboot Balancer - powers off and then restarts the balancer
• Shut Down Balancer - terminates the balancer forcefully
• Suspend Balancer - stops a balancer and changes its status to suspended

Options:
• Rebuild Balancer - pops up the balancer rebuild dialogue, where you can rebuild the balancer on the same (or another) template. After rebuild all data will be lost.
• Edit Balancer - redirects to the edit load balancer details page
• Migrate Balancer - pops up the balancer migration dialogue, enabling you to move the balancer to a different compute resource
• Delete Balancer - removes the balancer from the system

Network:
• Network Interfaces - redirects to the network interfaces page

Cluster Nodes:
This is the list of the nodes which form the load balancer. Here you can:
• Power on/off the node.
• Delete a node from a cluster.

To view load balancer's billing statistics or autoscaling monitors, click the appropriate tab.

4.1.4.1.3 View Load Balancer Billing Statistics
1. Go to your Control Panel > Cloud > Load Balancers menu.
2. Click the label of the balancer you're interested in.
3. Click the **Billing Stats** tab.

4. You can filter the statistics by date and time - select the time period from the drop-down menu and click the **Apply** button. By default the statistics are generated for the last three months or the actual VS existence period.

5. Move the **Show in my Timezone** slider to the right if you want to show bandwidth statistics according to your profile’s timezone settings.

6. On the page that appears:

   
   The price parameters on this page do not take into consideration the free limits for resources set in the bucket.

   - **Date** – particular date and time for the generated statistics
   - **Users** – the load balancer owner. Click the owner name to see the User Profile (user details)
   - **Virtual Servers** – the virtual server name with the total due for LB 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 LB 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 LB 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).

---

4.1.4.1.4  View Load Balancer Autoscaling Monitors
Autoscaling monitors provide information about the cluster load.

To view the load balancer's autoscaling monitors:

1. Go to your Control Panel > **Cloud > Load Balancers** menu.
2. Click the label of the balancer you're interested in.
3. Click the **Autoscaling Monitors** tab.
4. On the screen that appears, you will see the list of autoscaling monitors along with the following details:

   - monitor name
   - virtual server label

Click the label of a monitor you are interested in to view its details:

Depending on the monitor type, the monitor details screen page will show the the following info:

   - memory monitor details screen
   - CPU monitor details screen

4.1.4.1.4.1  Memory Monitor
Memory Monitor Info:

   - **Name of the memory test** - test label
   - **IP of the device agent** - IP address of the agent running on the server
• **Platform** - OS platform
• **The name of the agent** - virtual server identifier
• **Free memory limit** - free memory limit in MB
• **Free swap limit** - free swap limit in MB

**Memory Last Results:**
• **Free memory** - free virtual server memory in MB
• **Total memory** - total virtual server memory in MB
• **Free swap** - free swap disk size in MB
• **Total swap** (MB)
• **Buffered memory** (MB)
• **Cached memory** (MB)
• **Status** - monitor status: OK, if the monitor is correct or NOK, if the autoscaling configuration does not match. Monitor status is refreshed once in 5 minutes.

4.1.4.1.4.2 CPU Monitor

**CPU Monitor Info**

- **Name of the CPU test** - CPU test label
- **IP of the device agent** - virtual server IP address
- **Max value for kernel** - maximum CPU value for kernel
- **Max value for iowait** - maximum CPU value for iowait
- **Platform** - virtual server OS
- **Max allowed value for user** - maximum CPU value for user processes
- **The name of the agent** - virtual server identifier
- **Tag of the CPU test** - CPU test tag
- **Min allowed value for idle** - minimum CPU value for idle mode
- **Max allowed value for nice** - maximum CPU value for nice

Max value is a CPU priority set during the server creation.

**CPU Last Results**

- **CPU index** - CPU number
- **User Value** - percentage of CPU used in user mode
- **Kernel Value** - percentage of CPU used by kernel
- **Nice Value** - percentage of CPU time occupied by processes with positive CPU value
- **Idle Value** - percentage of CPU used in idle mode
- **IO Wait Value** - percentage of time the CPU was idle during the IO request

**Status** - monitor status: OK, if the monitor is correct or NOK, if the autoscaling configuration does not match. Monitor status is refreshed once in 5 minutes.

4.1.4.1.5 Edit Load Balancer

1. Go to your Control Panel > **Cloud** > **Load Balancers** menu.
2. Click the **Actions** icon next to a required load balancer, then choose **Edit Cluster**.
3. When the page loads, edit necessary parameters and click **Save**.
When you increase the RAM of the nodes of a load balancer (autoscaling type) to a value greater than the current node RAMx16 (which is a max_mem parameter in a configuration file and database), the load balancer will be cold resized. When deleting load balancer ports, you can remove all but the first port.

4.1.4.1.6 Delete Load Balancer
1. Go to your Control Panel > Cloud > Load Balancers menu.
2. Click the Delete icon next to a required load balancer.
3. Click OK to confirm the deletion.

4.1.4.1.7 Troubleshooting
If your load balancer is not working, please check the following parameters:

- Are the VSs online?
- Are the VSs on the same subnet?
- Is traffic between the LB and VS restricted? Check the firewall rules on the VSs by visiting Control Panel > Cloud > Virtual Servers menu > label of the virtual server > Networking tab > Firewall. The load balancer will not work if it cannot communicate with each VS.

Please note that the load balancer has two IP addresses. The first one is for the CP server to connect and manage the LB, and the other one is for the web traffic.

See also:
- Create Load Balancers
- Virtual Servers
- Autoscale Virtual Server

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Load%20Balancers

Leave feedback

4.1.5 Edge Accelerators

- Starting from OnApp 6.0, the CDN accelerator is free of charge. You can enable acceleration for a network and the Edge Accelerator instance is created automatically.
- For details on how to install Accelerator functionality, refer to Edge Accelerator Deployment at Install Compute Resources.

OnApp introduces a new type of virtual server - Edge Accelerator. Edge Accelerator empowers any websites/VS hosted on OnApp Cloud to use CDN with just one single button without any modification. Edge Accelerator gives your customers all the benefits of a global CDN without any of the hassles of configuring and maintaining a CDN platform. Edge Accelerator requires no modifications to the web applications running on virtual servers. All optimization is entirely automatic, and using minification & lossless compression of pages, scripts, and images, will not modify or reduce the quality of the source content.

Edge Accelerator is a new type of VS, which is built from a specific template and is aimed to serve as a router for traffic between CDN core and CDN-enabled Virtual Servers.
- Contact your account manager to enable Edge Accelerator on your Cloud Licence.
- Ensure that RabbitMQ is configured for the proper usage of Edge Accelerator.
- Only HTTP (TCP port 80) and HTTPS (TCP port 443) are supported. Other protocols will be passed through to the VS directly.
- In order to route the VS traffic, the VS must be on the same network with the Edge Accelerator.
- CDN Accelerator does not support Internet Protocol version 6 (IPv6).

A schematic of the process architecture is shown below:

https://onappcloud.typeform.com/to/A64Euy#source=Edge%20Accelerators

4.1.5.1 Edge Accelerator Console Access

The integrated VNC console tab gives users direct access to the accelerators and the possibility to establish the connection through the Control Panel UI.

To establish the connection via the Control Panel:

1. Go to your Control Panel > CDN > Edge Accelerators menu.
2. Click the label of the edge accelerator you’re interested in.
3. Click the Console tab.
4. If the connection is lost, click the Re-connect button.
   The re-connection to the console runs as follows:
   - If the console runs as expected, clicking the Re-connect button causes disconnection and the console is re-connected automatically after 1.5 seconds.
If the console gets stuck, clicking the **Re-connect** button runs your request once again and re-connects the console without reloading.

If the console gets disconnected with a status code and an error message, the console is re-connected automatically after 1.5 seconds.

5. Click the **OK** button to confirm the re-connection request.

https://onappcloud.typeform.com/to/A64Euy#source=Edge%20Accelerator%20Console%20Access

4.1.5.2 **Edge Accelerator Disks**

Edge accelerator storage is provided by disks. A disk is a partition of a data store that is allocated to a specific accelerator. You can view/edit/migrate disks and check disk usage statistics (IOPS).

4.1.5.2.1 **View Disks**

To view edge accelerator disks:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you're interested in.
3. On the screen that appears, click the **Storage** tab and then click **Disks**.
4. On the screen that appears you can see the list of disks allocated to this edge accelerator.

4.1.5.2.2 **Edit Disk**

To edit a disk:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you're interested in.
3. On the screen that appears, click the **Storage** tab and then click **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.

4.1.5.2.3 **Migrate Disk**

To migrate a disk:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you're interested in.
3. On the screen that appears, click the **Storage** tab and then click **Disks**.
4. Click the **Actions** button next to the disk you want to change, then click the **Migrate** link.
5. On the screen that appears, select a target data store from a drop-down box.
6. Click **Start Migrate**.

4.1.5.2.4 **Disk Usage Statistics (IOPS)**

The system tracks IOPS (Input/Output Operations per Second) for edge accelerators and generates charts that help analyze edge accelerator 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 an edge accelerator:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you're interested in.
3. On the screen that appears, click the Storage tab and then click Disks.
4. Click the Actions button next to the disk you want to change, then click the IOPS link.
5. There are four charts on the screen that appears:
   - IOPS for the last hour
   - IOPS for the last 24 hours
   - Data written/read for the last 24 hours
   - Data written/read 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.

https://onappcloud.typeform.com/to/A64Euy#source=Edge%20Accelerator%20Disks

4.1.5.3 Edge Accelerator IP Addresses
The Networking menu enables you to manage network interfaces and allocate IP addresses for edge accelerators. The Networking > IP Addresses menu shows the list of IP addresses assigned to the edge accelerator. This menu also lets you rebuild the edge accelerator's network.

CDN edge accelerator does not support the Internet Protocol version 6 (IPv6).

4.1.5.3.1 View IP Addresses
To view edge accelerator IP addresses:
1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the edge accelerator you're interested in.
3. On the screen that appears, click the Networking tab and then click IP addresses.
4. On the screen that appears you can see the list of IP addresses allocated to this edge accelerator.

4.1.5.3.2 Allocate New IP Address
To allocate a new IP Address to the edge accelerator:
1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the edge accelerator you're interested in.
3. Click the Networking tab > IP Addresses.
4. Click the Allocate New IP Address button.
5. Select a network interface from the drop-down menu (only the network interfaces you added to the edge accelerator will be available).
6. (Not available for federated VSS) Select an IP address manually from the IP Pool associated with the network interface. To enable this option, move the Specify IP Address slider to the right and choose IP Address from the drop-down list.
7. Click the Add IP Address button.

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

If you change IP Address for edge accelerator, acceleration for VSSs will start working in 15-20 minutes.
4.1.5.3.3 Edit IP Address
   1. Go to your Control Panel > Cloud > Edge Accelerators menu.
   2. Click the label of the edge accelerator server you’re interested in.
   3. Click the Networking > IP Addresses tab.
   4. Click the Edit button next to the IP address you want to edit.
   5. On the page that loads, you can mark the IP address as primary by selecting Primary IP Address? checkbox. Accordingly, this IP address will be used as source IP for outgoing traffic by default.

4.1.5.3.4 Delete IP Address
To remove an IP address from an edge accelerator:
   1. Go to your Control Panel > Cloud > Edge Accelerators menu.
   2. Click the label of the edge accelerator 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:
      o Choose Delete and rebuild the network option if you want to rebuild the network immediately after deleting the IP address. After choosing this option you will be redirected to the edge accelerator's Overview page.
      o Choose Delete without rebuilding the network option if you don't want to rebuild a network immediately. In this case to apply the changes, you will have to rebuild the network additionally.

If you delete IP address that is used as primary - the next available IP will be marked as primary.

4.1.5.3.5 Rebuild Network
To rebuild a network join, added to the edge accelerator (required after allocating new IP addresses):
   1. Go to your Control Panel > Cloud > Edge Accelerators menu.
   2. Click the label of the edge accelerator you're interested in.
   3. On the screen that appears, click the Actions button, point to Edge Accelerator Options, then click Rebuild Network.
   4. In the pop-up window, the Force Reboot slider is moved to the right by default. Select the edge accelerator shutdown type – gracefully shutdown or power off.
   5. Move the Required Startup slider to the right to start up an edge accelerator when you're rebuilding a network of a powered off edge accelerator.
   6. Click the Rebuild Network button.

4.1.5.4 Edge Accelerator Networks
The Networking menu enables you to manage network interfaces and allocate IP addresses for edge accelerators. The Networking > Network Interfaces menu shows the virtual network interfaces allocated to this edge accelerator. Network interfaces join the physical network to the edge accelerator. When you create an edge accelerator, 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. At least one IPv4 address must be allocated to an edge accelerator's primary network interface.

https://onappcloud.typeform.com/to/A64Euy#source=Edge%20Accelerator%20IP%20Addresses
Leaves feedback
- Two networks cannot be used for one edge accelerator simultaneously. Only one edge accelerator can be created per network.
- Do not use two accelerated networks for one VS.
- CDN edge accelerator does not support the Internet Protocol version 6 (IPv6).

The content is distributed to 29 locations via the global Content Delivery Network managed by OnApp.

Click here to see the list of PoPs provided by OnApp

America
- Dallas
- Montreal
- San Jose
- Seattle
- Toronto
- Queretaro
- Washington
- Houston
- Atlanta
- Santa Clara
- Newark
- Ashburn
- Chicago
- Sao Paulo

Europe
- Amsterdam
- Frankfurt
- London
- Milan
- Paris
- Stockholm
- Karlskrona
- Malmo
- Goteborg

Asia
- Singapore
- Tokyo
- Hanoi
- Hong Kong

Australia
- Melbourne
- Sydney

Apart from the global PoPs provided by OnApp, you may also include your own edge location to serve your local visitors or audience. By default, your own edge locations are included. If you want to enable only several particular locations, submit a ticket to Support with the details below:
- If you deploy multiple edge locations, specify the locations to be added to the accelerator network.
- Select which locations should be enabled: either your own edge locations, default global PoPs provided by OnApp, or both.

4.1.5.4.1 View Network Interfaces
To see the list of all network interfaces allocated to the edge accelerator:

1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the edge accelerator 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.

4.1.5.4.2 Create Network Interface

To add a network interface:
1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator 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 edge accelerator runs).
   - **Port speed** – set port speed in Mbps, or make it unlimited.
6. Click the **Submit** button.

4.1.5.4.3 Edit Network Interface

To edit a network interface:
1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you’re interested in.
3. Click the **Networking** tab, then click **Network Interfaces**.
4. On the page that follows click the **Edit** icon next to the network interface you want to change.
5. On the screen that appears, change the following parameters:
   - **Label** – a human-friendly name for the new interface.
   - **Port speed** – set port speed in Mbps, or make it unlimited.
6. Click the **Submit** button.

4.1.5.4.4 View Network Interface Usage Statistics

To view interface usage statistics:
1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator 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.
4.1.5.5 Edge Accelerator Statistics
If you want to track the amount of CPU used by accelerator, you can view edge accelerator CPU usage statistics.

To see CPU usage statistics:

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

4.1.5.6 Manage Edge Accelerators
When an edge accelerator is created, you can spread the VS content faster by enabling acceleration for this VS.

Edge accelerator, as a type of virtual server, has its own options. You can find the edge accelerator on Control Panel > Cloud > Edge Accelerators menu. Click the label of the edge accelerator to view its details. You can manage the edge accelerator using the Actions button and Overview/Networking/Storage/Console tabs.

4.1.5.6.1 Edge Accelerator Options

4.1.5.6.1.1 Rebuild/Build Edge Accelerator
If you haven't checked the Build Edge Accelerator option during the edge accelerator creation process, you will have to do this manually after the edge accelerator has been created. Building an edge accelerator is the process of allocating physical resources to that edge accelerator.

To build an edge accelerator manually or rebuild the edge accelerator on the same template:

1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the edge accelerator you're interested in.
3. On the screen that appears, click the Actions button, point to Edge Accelerator Options, and then click Rebuild Edge Accelerator.
4. Move the Start Edge Accelerator after rebuild slider to the right if you want to have your edge accelerator started automatically after it is built.
5. Click the Rebuild Edge Accelerator button to finish.

4.1.5.6.1.2 Edit Edge Accelerator
To edit edge accelerator's resources:

1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the edge accelerator you want to resize, to show its details screen.
3. Click the Actions button, point to Edge Accelerator Options, and select the Edit Edge Accelerator. Change the following parameters:
   - Label - the name of edge accelerator
4. Click **Save**.

### 4.1.5.6.1.3 Migrate Edge Accelerator

To migrate an edge accelerator:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you want to migrate.
3. Click the **Actions** button, point to **Edge Accelerator Options**, and click the **Migrate Edge Accelerator**.
4. In the window that appears, choose the target Compute resource from the drop-down menu.
5. Click the **Start Migration** button.

Currently, edge accelerators support only cold migration.

### 4.1.5.6.1.4 Delete Edge Accelerator

To remove the edge accelerator from the cloud:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the edge accelerator you want to delete.
3. On the edge accelerator's screen, click the **Actions** button, point to **Edge Accelerator Options**, then select **Delete Edge Accelerator**.
4. Click **Destroy**.

If there are accelerated virtual servers in the cloud, and there're some prices set for the acceleration, these VSs will be still billed for acceleration even if you delete the edge accelerator.

### 4.1.5.6.2 Power Options

#### 4.1.5.6.2.1 Reboot Edge Accelerator

To reboot an edge accelerator:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the required edge accelerator.
3. On the screen that appears, click the **Reboot** button. Confirm the action. It will power off and then restart the edge accelerator.

#### 4.1.5.6.2.2 Shut down Edge Accelerator

To shut down an edge accelerator:

1. Go to your Control Panel > **Cloud** > **Edge Accelerators** menu.
2. Click the label of the required edge accelerator.
3. On the screen that appears, click the **Actions** button, point to **Power**, and then click **Shut down Edge Accelerator**. A dialogue box pops up, where you can either Gracefully Shutdown (terminates the edge accelerator gracefully), or Power Off (terminates the edge accelerator forcefully).

#### 4.1.5.6.2.3 Suspend Edge Accelerator

To suspend an edge accelerator:
1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the required edge accelerator.
3. On the screen that appears, click the Actions button, point to Power, and then click Suspend. This action stops an edge accelerator, changes its status to suspended, and disables all the other actions on the edge accelerator, unless unsuspended.

4.1.5.6.2.4  Startup Edge Accelerator

To startup a powered off edge accelerator:

1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the required edge accelerator.
3. On the screen that appears, click the Actions button, point to Power, and then click Startup Edge Accelerator. This action queues a start-up action for an edge accelerator that is currently powered off.

4.1.5.6.3  Performance and Administrative Options

4.1.5.6.3.1  Segregate Edge Accelerator

To isolate one edge accelerator from another:

1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the edge accelerator you want to segregate.
3. On the screen that appears, click the Actions button, point to Performance, then click Segregate Edge Accelerator.
4. In the dialogue box that pops up, use the drop-down menu to choose an edge accelerator you want to keep away from.
5. Click the Segregate VS button to finish.

4.1.5.6.3.2  Change Owner

To change the owner of an edge accelerator:

1. Go to your Control Panel > Cloud > Edge Accelerators menu.
2. Click the label of the appropriate edge accelerator.
3. On the screen that appears, click the Actions button, point to Administration, then click Change Owner. Then a dialogue box with a drop-down of all users on the system pops up, enabling you to pass ownership of the edge accelerator to the user selected from the list. Choose a user and click Change Owner.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Edge%20Accelerators Leave feedback

4.1.6  ISO Virtual Servers

OnApp introduces ability to build a virtual server from ISO. Such virtual servers are based on specific ISO templates, which you upload to the cloud.

- It is required that you perform additional network configuration during ISO installation. For more information, refer to Confirmation step of ISO VS creation wizard.
- Creating a server from ISO is applicable for virtual and smart servers only.
- Upload the required ISO first to the cloud before creating a server based on it.

4.1.6.1  View ISO Virtual Server Details

To view details of a specific virtual server:
1. Go to your Control Pane > 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 VS.

The VS properties page gives a general overview of the VS details:

- **VIP status** (on/off). Click the icon to change the status.
- 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.

- **Auto-backups** - move the slider to enable or disable auto-backups for this server. For more information refer to ISO Virtual Server Backup Schedules.

- **Acceleration allowed** - move the slider to the right to allow acceleration for this VS or move this slider to the left to prohibit acceleration for this VS. Acceleration status of the VS will be changed on the next CDN Sync Runner run (default value 20 minutes). To edit CDN Sync Runner delay, refer to the Edit Infrastructure Configuration section of this guide.

- **Boot from CD** - move the slider to the right to boot a VS from the location where ISOs are stored. If this slider is disabled, then VS will be booted from the disk where VS is provisioned.

- **Built from ISO** - green tick indicates that this VS is built from ISO.

- **Compute resource** - click the Compute resource name to see its details.

- **Location** - click the location to view the details of the location group with which the VS is associated.

- **Owner** - click the owner name to see its details.

- **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.

- **Estimated Price per hour** - this sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here.

- **CPU(s)**

- **CPU priority or CPU units**

- **Disk Size** - the total amount of disk size

- **Memory**

- **Disk backups** - the total amount of backups

- **CPU usage chart**

- **Network usage chart** - data sent and data received in GB per hour

---

### 4.1.6.2 View ISO 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 cancel pending tasks, click the Cancel All Pending Tasks for this virtual server button.

You can also view the details of a particular log item by clicking its Ref number. The page that loads shows the log output and the following details:

- **date** - time in the [YYYY][MM][DD][hh][mm][ss]Z format
- **action** - the action name
- **status** - the action status (Complete, Warn, Pending, or Failed)
- **ref** - the log item's Ref number
- **target** - the action target
- **started at** - the time when the action was started
- **completed at** - the time when the action was completed
- **template** - template of the server the action refers to
- **compute resource** - the label of compute resource
- **initiator** - the user who initiated the action

If you want to see only the detailed output, you can hide log info with the arrow button in the upper right corner.

**See also:**
- **ISOs**
- Create ISO Virtual Server
- Manage ISO Virtual Servers
- ISO Virtual Server Networks
- ISO Virtual Server Disks
- ISO Virtual Server Statistics
4.1.6.3 Manage ISO Virtual Servers

OnApp Cloud gives you high-end cloud management features for virtual servers that are built from ISOs including:

<table>
<thead>
<tr>
<th>Virtual Server Options</th>
<th>Power Options</th>
<th>Administrative Options</th>
<th>Networks</th>
<th>Disks</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit</td>
<td>Reboot / Reboot in recovery</td>
<td>Change owner</td>
<td>Configure network interface</td>
<td>Create disks</td>
<td>CPU utilization</td>
</tr>
<tr>
<td>Migrate</td>
<td>Suspend</td>
<td></td>
<td>Set firewall rules</td>
<td>Edit disks</td>
<td>Billing statistics</td>
</tr>
<tr>
<td>Delete</td>
<td>Shut down</td>
<td></td>
<td>Virtual server IP addresses</td>
<td>Migrate disks</td>
<td>Network interface statistics</td>
</tr>
<tr>
<td>Segregate</td>
<td>Startup / Startup on Recovery</td>
<td></td>
<td>Display network speed for network interfaces</td>
<td>Delete disks</td>
<td>Disk IOPS statistics</td>
</tr>
<tr>
<td>Clone</td>
<td>Boot from ISO</td>
<td></td>
<td>Edit network speed</td>
<td></td>
<td>Accelerated ISO VS Statistics</td>
</tr>
</tbody>
</table>

Ensure that ISO permissions are on before managing ISO virtual servers. For more information about permissions, refer to the OnApp Permissions section of this guide.

This document provides the information on how you can manage the virtual servers built from ISO.

4.1.6.3.1 Edit ISO Virtual Server

You can edit resources for all VSs. Depending on the OS it is built on, some VSs can have their CPU and RAM resized without needing to be powered off ("resize without reboot"). If the VS template allows resize without reboot, the resize should be completed automatically: you will be returned to the VS details screen and see a message indicating the resize was successful. If the template does not allow this, you will be asked to confirm that the VS will need rebooting so that the resize can take place.

Windows virtual servers cannot be resized without reboot.

The Edit Virtual Server screen will differ depending on the way the VS resources were selected: either manually or using an instance package. To adjust VS resources:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the server you want to resize, to show its details screen.
3. Click the Actions button, point to Options, and select the Edit Virtual Server link.

For virtual servers built by selecting resources manually:

- Change CPU cores, CPU priority/units and RAM values.

For virtual servers built using instance packages:
Choose the new instance package for your virtual server. Click the instance package to select it. After that, the instance package you have chosen will be highlighted in green.

Those instance packages that have resources incompatible with the compute zone, on which the VS is built, will be greyed out. Greyed out instance packages cannot be selected.

You can only choose from those instance packages that offer more disk size than the VS currently uses.

After you select a new instance package you can use the extra disk size to create a new disk for the VS or make the existing VS disk larger.

You can also edit the Time Zone parameter for all Windows KVM virtual servers. After you edit the server's time zone, you need to stop and then, start up the VS. Currently, the time zone is set at the compute resource side only. Therefore, users need to set the target time zone inside a Windows VS manually. Setting the correct time zone at the compute resource side helps to keep correct time inside a VS after starting it if time synchronization is not completed for some reason.

4. Click Save.

4.1.6.3.2 Segregate ISO Virtual Server
If required, you can instruct OnApp to make sure a VS is never booted on the same compute resource as another specific VS (contact OnApp Support or your account manager on amteam@onapp.com). This may be important if, for example, you have two name servers or a load balanced web server, and you need to keep VSs on separate physical servers.

To isolate one VS from another:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you want to segregate.
3. On the screen that appears, click the Actions button, point to Performance, and then click Segregate Virtual Server.
4. In the dialogue box that pops up, use the drop-down menu to choose a VS you want to keep away from.
5. Click the Segregate Virtual server button to finish.

4.1.6.3.3 Clone ISO Virtual Server
You can create a clone based on the same resources as the origin ISO virtual server. 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>Owner</td>
<td>The same as the origin virtual server.</td>
</tr>
<tr>
<td>Hostname, password, and label</td>
<td>When cloning an ISO VS, you can only change its label. By default, the label remains the same as the origin ISO virtual server's one, but with Clone in the label, if you clone the server without changing the label. For example, Clone Origin Label.</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>
</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 Actions, point to Options, and then click Clone Virtual Server.
4. In the dialog box, you can change the following properties for the KVM VS:
   - Label
   - Hostname - 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.
5. Then click Clone Virtual Server to confirm the action.

Additional Consideration for Windows
The following symbols are not allowed for Windows-based virtual servers:
- percent [%]
- quotation marks [“ ”]
- angle brackets [<>]
- vertical bar [|]
- caret[^]
- ampersand [&]
- parentheses [( )]
- Password - 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

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.
4.1.6.3.4 Migrate ISO Virtual Server

Hot migration is available for VSs created from ISO if *Allowed hot migrate* slider was enabled during [ISO upload](https://example.com) or during [ISO editing](https://example.com).

OnApp allows migration of ISO virtual servers between compute resources that share common data stores (or data store zones).

To migrate a virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you want to migrate.
3. Click the **Actions** button, point to **Options**, and click the **Migrate Virtual Server** link.
4. In the window that appears, choose the target compute resource from the drop-down menu.
5. Click the **Start Migration** button.

After migration, the power status of your virtual server remains the same as before the migration.

OnApp administrators can control user access over virtual server migration. Using OnApp permissions, you can allow/forbid users to perform migration of all virtual servers, or their own servers only. This is handled via the Control Panel's **Roles and Sets** menu.

4.1.6.3.5 Delete ISO Virtual Server

Shut down the virtual server 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 virtual server's screen, click the **Actions** button, point to **Options**, then select **Delete Virtual Server**.
4. Confirm by clicking the **Destroy** button.

**IMPORTANT:**

- You won't be able to restore a virtual server after deleting it.
- Deleting a virtual server removes all data stored on that virtual server.

4.1.6.3.6 ISO Virtual Server Power Options

To manage a virtual server power options:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the required virtual server.
3. Click the **Actions** button on the VS's screen and then point to **Power** to expand the menu.
4. This 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.
   - **Reboot in Recovery** - powers off and then restarts the VS in the recovery mode.
   - **Suspend** - 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.

  When you start up a VS, it might be implicitly cold migrated if the current compute resource does not have sufficient resources. For more information, refer to [Virtual Server Provisioning](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20ISO%20Virtual%20Servers).

- **Startup on Recovery** - starts the VS in recovery mode.

- **Boot from ISO** - boots the VS from an ISO. You can boot virtual servers from your own ISOs or the ISOs that are uploaded and made publicly available by other users. If you boot a VS from an ISO with the RAM requirement larger than the VS's RAM, the transaction will fail. Make sure that you have enabled the *Any power action on own virtual servers and Allow own virtual servers to boot from ISO permissions* for the user to have access to this feature.

  As soon as you boot a VS from the installation ISO, OnApp may lose control of any components (networks, disks, etc.). The only available actions will be start and stop a VS. Be aware, that all the contents of the disk may be also deleted.

4.1.6.3.7 Change Owner of ISO Virtual Server

To change owner of the ISO virtual server:

1. Go to your Control Panel > **Cloud > Virtual Servers** menu.
2. Click the label of the required virtual server.
3. Click the **Actions** button on the VS's screen, point to **Administrations** and select **Change Owner**.
4. Choose a user to whom you want to pass ownership of the VS from the drop-down list.
5. Click the **Change Owner** button.

If you want to change an owner of the VS, which was built using an instance package, ensure that the new owner has permission to create VS using instance package and appropriate instance package in the bucket. Otherwise you will not be able to change the ownership of this VS.

See also:

- **ISOs**
- **ISO Virtual Server Networks**
- **ISO Virtual Server Disks**
- **ISO Virtual Server Statistics**

[[source](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20ISO%20Virtual%20Servers)]

4.1.6.4 ISO Virtual Server Networks

The Networking menu in the Virtual Servers menu enables you to manage network interfaces, allocate IP addresses, and set firewall rules for virtual servers.

4.1.6.4.1 Configure ISO 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:
   - 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 the 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 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 Submit button.

To edit a 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.
• When managing Network Interfaces in OnApp, make sure to reflect all the changes in the ISO VS configuration manually.

4.1.6.4.2 Set ISO Virtual Server Firewall Rules
With OnApp you can set firewall rules for the network interfaces of virtual servers. There are two types of firewall rule:

• ACCEPT – defines the packets that will be accepted by the firewall
• DROP – defines the packets that will be rejected by the firewall
Ensure that the following permissions are enabled before setting firewall rules for your virtual server:

- Create own firewall rules
- Destroy own firewall rules
- Read own firewall rules
- Update own firewall rules
- Update own virtual server
- Read own virtual server

You cannot apply firewall rules to virtual servers which are parts of a blueprint.

You can set the following:

- **add a specific firewall rule** - you can configure a firewall rule with specific parameters (source, destination port, protocol type etc.)
- **set default firewall rules** - you can set default firewall rules for an entire network interface

4.1.6.4.2.1 Add a specific firewall rule

To configure a firewall rule:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the VS for which you want to configure a firewall rule.
3. Click the **Networking** tab, then click **Firewall**.
4. On the page that appears, set the following:
   a. Choose the network interface.
   b. Specify if the rule defines requests that should be accepted or dropped.
   c. Set the IP address for which this rule is active.
      - Leave the empty field to apply this rule to all IPs
      - Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
      - Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
   d. Set the port for which this rule is effective.
      - Leave the empty field to apply the rule to all ports
      - Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
      - Enter comma-separated ports to apply the rule to the list of ports (e.g. 80,443,21)
   e. Protocol type (for ICMP protocol only) - indicate a type of the ICMP protocol (range from 0 to 255)
   f. Choose the protocol (TCP, UDP, DCCP, SCTP or ICMP).
   g. Enter a comment to the firewall rule.
5. Save the rule by clicking the **Add Rule** button. The rule will be saved in the UI, but the transaction won't be started until you click the **Apply Firewall Rules** button.
6. To start the transaction which runs firewall rules for a VS, click **Apply firewall rules** button.
7. Use **Up** and **Down** arrow buttons in the left column to change firewall rule position.
8. To edit or delete a firewall rule, click the appropriate icon in the last column.
4.1.6.4.2.2  Default firewall rules

To set default firewall rules for a network interface:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the ISO VS for which you want to configure a firewall rule.
3. Click the Networking tab, then click Firewall.
4. On the page that appears, go to Default firewall rules section.
5. Choose ACCEPT or DROP command next to the network interface and click Save Default Firewall Rules. The rule will be saved in the UI, but the transaction won't be started until you click the Apply Firewall Rules button.

Example:
The Int1 ACCEPT 122.158.111.21 22 TCP firewall rule means that the Int1 network interface will accept all requests and packets addressed from 122.158.111.21 using the TCP protocol on port 22.
The Int2 DROP 122.158.111.21 22 UDP firewall rule means that the Int2 network interface will reject all requests and packets from 122.158.111.21 using the UDP protocol on port 22.

If you reboot a Xen-based VS from the console, the firewall rules for this VS will be lost, and you will need to update the firewall rules again.

4.1.6.4.3  ISO 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 > IP Addresses.
4. Click the Allocate New IP Address button.
5. Select a network interface from the drop-down menu (only the network interfaces you added to the VS will be available). The IP Address will be allocated automatically.
6. (Not available for federated VSs) As an alternative you can manually select an IP address from the IP Pool associated with the network interface. To enable this option move the Specify IP Address slider to the right and choose IP Address from the drop-down list. 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 button.

After Allocating New IP address(es) for ISO virtual server, configure this IP Address manually for ISO in console.

4.1.6.4.3.1  Edit IP address assigned to 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 Edit button next to the IP address you want to edit.
5. On the page that loads, you can mark the IP address as primary by selecting *Primary IP Address?* checkbox. Accordingly, this IP address will be used as source IP for outgoing traffic by default.

### 4.1.6.4.3.2 Remove IP address from 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.

If you delete IP address that is used as primary - the next available IP will be marked as primary.

### 4.1.6.4.4 ISO Virtual Server Network Speed

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.

To edit a virtual server’s network speed:

1. Go to your Control Panel > *Cloud* > *Virtual Servers* menu.
2. Click the label of the virtual server you want to change.
3. Go to the *Networking* tab > *Network Interfaces*.
4. In the last column, click the *Edit* button.
5. Change the port speed.
6. Click the *Submit* button to save changes.

See also:

- ISOs
- Create ISO Virtual Server
- Manage ISO Virtual Servers
- ISO Virtual Server Disks
- ISO Virtual Server Statistics

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4.1.6.5 ISO 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. Disks can be assigned as the standard or swap disks (there are no swap disks for Windows based templates). They can also 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's Virtual Servers menu.

Creating multiple partitions on one disk is forbidden for all virtual servers.

4.1.6.5.1 Add Disks to ISO Virtual Servers

Adding a disk to a virtual server will require that VS should 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 "+" button or the Create Disk button.
5. Fill in the details:
   - Specify disk label.
   - Choose the data store to create a disk on from the drop-down list.
   - Move the slider to the right to specify the desired disk size.
   
   The disk size should not exceed 2 TB when a new disk is added. You can later resize the disk if you need it to be larger than 2 TB.
6. Click the Add Disk button to finish.

Restrictions:
- If you choose a Solidfire data store, the minimum disk size will be regulated by Solidfire Data Store Zone settings.
- If virtual server and the control panel server belong to different networks, the hot attach transaction will fail.
- When you add a new disk to a virtual server, it automatically becomes available to that server.

4.1.6.5.2 Edit ISO Virtual Server Disks

For primary and swap (Linux, FreeBSD) disks you may only change the label and the size. You can resize disks when needed. The resize will fail if your current usage is greater than the new size you request. Note that any changes to the disk size require rebooting of your VS. For Windows-based ISO virtual server disks, you can enable or disable virtio mode.

To edit a disk:

1. Go to your Control Pane > 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 Edit.
5. On the page that appears, you can edit the following:
   - **Label** - specify the name of the disk
   - **Size** - move the slider to the right to specify the desired disk size in GB
   - **Enable Virtio** - move the slider to the right to enable virtio mode

   Please note that the **Enable Virtio** option is available only for Windows-based ISO virtual servers with the template supporting *kvm_virtio*.

6. Click the **Save Disk** button.

   - You cannot decrease disk size. Only the increase disk size option is available.
   - You cannot resize the primary disk for FreeBSD-based virtual servers.

4.1.6.5.3 Migrate ISO Virtual Server Disks

You can migrate disks of your virtual servers to other data stores, which are allocated to the same Compute resource. Unlike VS migration – disk migration requires a 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 **Migrate** button.
5. On the screen that appears, select a target data store from a drop-down box.
6. Click **Start Migrate**.

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

4.1.6.5.4 Delete ISO 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**.
5. In the pop-up window, move the **Force Reboot** slider to the right, then select the VS shutdown type.
6. Move the **Required Startup** slider to the right to start up the VS automatically.

   Steps 5 and 6 apply to disks of VSs that are on.
7. Click the **Destroy Disk** button.

This will schedule the *destroy disk* transaction.

See also:
- ISOs
- Create ISO Virtual Server
- Manage ISO Virtual Servers
- ISO Virtual Server Networks
- ISO Virtual Server Statistics

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### 4.1.6.6 ISO Virtual Server Statistics


### 4.1.6.6.1 ISO 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 tab** > **CPU Usage**.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there is less data available, the chart will show utilization for the time available.
5. Move the **Show in My Timezone** slider to the right if you want to show bandwidth statistics according to your profile's timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the **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.

To see what percentage of Compute resource CPU resource a VS takes, go to your Control Panel's **Virtual Servers** menu and click the label of the VS you're interested in. On the screen that appears, the CPU(s)/Shares parameter displays the amount of CPU resource given to this VS.
4.1.6.6.2 ISO 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. You can filter the statistics by date and time - select the time period from the drop-down menu and click the Apply button. By default the statistics are generated for the last three months or the actual VS existence period.
5. Move the Show in my Timezone slider to the right if you want to view billing statistics according to your profile's timezone settings. By default, billing statistics is shown in UTC.
6. On the page that appears:

   The price parameters on this page do not take into consideration the free limits for resources set in the bucket.

   - **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).

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

4.1.6.6.4 ISO Virtual Server Disk IOPS Statistics

The system tracks IOPS (Input/Output Operations per Second) for virtual servers and generates charts that help analyze VS disk performance. The data presented in the chart are for the periods during which the statistics was gathered, typically 3 minutes. To see IOPS for a virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you're interested in.
3. Click the **Storage** > **Disks** tab.
4. Click the **Actions** button next to the required disk, and then choose **IOPS**.
5. There are four charts on the screen that appears:
   - IOPS for the last hour
   - IOPS for the last 24 hours
   - Data written/read (in Kb) for the last 24 hours
   - Data written/read (in Kb) 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.

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.

4.1.6.6.5 Accelerated ISO Virtual Server Statistics

This page provides the information on how you can view bandwidth statistics and cache utilization statistics of accelerate-enabled virtual server.

Ensure that **Accelerate any Virtual Server/Accelerate own Virtual Servers** permissions are on before managing accelerated VS statistics. For more information about permissions, refer to the **OnApp Permissions** section of this guide.

To see the bandwidth and cache utilization statistics:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the accelerate-enabled virtual server you're interested in.
3. Click the **Acceleration** tab > **Reporting**.
4. On the screen that appears, specify the period in the From and To fields and click the **Apply** button. The default period is the last week.
5. The first chart shows bandwidth statistics: the total/cached/non-cached statistics. The second chart shows cache utilization statistics: the number of pages cached on the Edge (hits) as well as the number of misses - the pages which are not cached.
6. To zoom into a time period, click and drag in a chart. Click the **Reset Zoom** button to zoom out again.
See also:

- ISOs
- Create ISO Virtual Server
- Manage ISO Virtual Servers
- ISO Virtual Server Networks
- ISO Virtual Server Disks

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4.1.6.7 ISO Virtual Server Backups

OnApp supports normal backups for ISO virtual servers. Normal backups contain all the information stored on a server’s disk. If you have switched on incremental backups for the cloud, normal backups will still be made for ISO virtual servers. For detailed information on backups, refer to Virtual Server Backups.

- Backups in the OnApp Control Panel are associated with a particular user instead of being associated with a virtual server. To view the list of user backups, refer to View User Backups section.
- ISO virtual server backups cannot be converted into templates.
- If required, you can change the block size which is used during backup creation at Control Panel > Settings > Configuration by editing the Block Size (MB) parameter.

4.1.6.7.1 View ISO Virtual Server Backups

To view the list of ISO virtual server’s backups:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required ISO virtual server.
3. Click the Backups tab, then select Images. Images are full backups of ISO virtual server disks.
4. On the screen that appears, you’ll see a list of ISO virtual server backups.
5. Click the label of the required ISO virtual server backup to see the following tools - restore backup, delete backup and add/edit note.

4.1.6.7.2 Take ISO Virtual Server Disk Backups

To back up an ISO virtual server disk:

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 Storage tab and select Disks. You’ll see a list of the disks allocated to that ISO virtual server.
4. Click the Actions icon next to a disk you want to take a backup of, then click Backup. You’ll see a list of all the backups taken and pending for that disk, along with the tools to restore backups and delete them.
   - To make a backup, click the Take a Backup button at the end of the list. If required, you can add a note to a new backup. You can also select Force Windows Backup.
This option for Windows virtual servers is designed as a last resort, when the backup cannot be taken due to NTFS file system problems. Switching on this option will bring up a dialog box with the following message: "If you enable this option there is no guarantee that backup will be consistent." Select "Yes" to proceed.

4.1.6.7.3 Restore ISO Virtual Server Backup
To restore a backup:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required ISO virtual server.
3. Click the Backups tab, then select Images.
4. On the screen that appears, click the Actions icon next to the backup you want to revert to and choose Restore.

4.1.6.7.4 Delete ISO Virtual Server Backup
To delete a backup:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required ISO virtual server.
3. Click the Backups tab, then select Images.
4. On the screen that appears, click the Actions icon next to the backup you want to remove and choose Delete.

4.1.6.7.5 Add ISO Virtual Server Backup Note
To add/edit virtual server backup's note:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required ISO virtual server.
3. Click the Backups tab, then select Images.
4. On the screen that appears, click the Actions icon next to the required backup and choose Add Note. Make necessary changes and click Submit.

See also:
- Virtual Servers
- Smart Servers
- Application Servers
- Backup Settings
- Edit Backups/Templates Configuration

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4.1.6.8 ISO Virtual Server Backup Schedules
In addition to the system auto-backup presets, you can schedule backups of virtual servers (VS disks) as required. For example, you can set up a schedule to back up your disks once a week.

The combination of scheduled ISO VS backups and Auto-Backup Presets provides a great deal of flexibility in the way backups are handled for the cloud, and for individual VSSs. Auto-backup
Presets can be applied to all new VSs added to the cloud. Scheduled VS backups enable specific backups to be scheduled for individual VSs, outside of the auto-backup pattern.

OnApp supports only normal backups for ISO virtual servers, which include all the data from the server's disk.

4.1.6.8.1 View ISO Virtual Server Backup Schedules

To view the list of backup schedules for an ISO virtual server:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the ISO virtual server you're interested in.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that appears, you will see the list of backup schedules along with their details:
   - Date - the time when the schedule was created
   - Target - the server or disk for which the schedule was created (depending on the backup type)
   - Action - the scheduled action
   - Period - how frequently the backup will occur according to a period type set in the next step.

   For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this filed is set 1.

   - Period type - the backup period: days, weeks, months, or years
   - Rotation period - the number of backups, after which the first backup will be deleted.

   By default, in this filed is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this filed, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

   - Next Start - the date and the hour of the next backup
   - User - the user who created the backup schedule
   - Status - schedule status
   - Actions - click the Actions icon to edit or delete the backup schedule

4.1.6.8.2 Create ISO Virtual Server Backup Schedule

To add a backup schedule:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the ISO virtual server you want to schedule a backup for.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that follows, click the New Schedule button.
6. Specify schedule details:
Period - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.

Period type - the backup period: days, weeks, months or years

Rotation period - the number of backups after which the first backup will be deleted

Start time - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).

7. Click the Save button to finish.

4.1.6.8.4 Delete ISO Virtual Server Backup Schedule
To delete a backup schedule:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the ISO virtual server you’re interested in.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk with a backup schedule, then select Schedule for Backups.
5. Click the Actions icon next to the schedule you want to remove, then choose Delete.

See also:
4.1.7 OVA Virtual Servers

OnApp introduces ability to build a virtual server from OVA. These virtual servers are based on specific OVA templates, which are created after you upload OVA file to the cloud.

- OVA virtual server backups cannot be converted into templates.
- Be aware that, at the moment, OnApp provides only limited functionality to import from OVA with no actual VS management after import (only start/stop) and manual network configuration if the operating system is set as 'other'.

The following options are not available for OVA virtual servers:

- Recipes
- Rebuild network
- Autoscaling
- Rebuild VS

4.1.7.1 View OVA Virtual Servers

To view all virtual servers deployed in the cloud:

1. Go to your Control Panel > Cloud > Virtual Servers menu to see an overview of all virtual servers in the cloud.
2. The page that loads will show the list of VSs together with their details on OS, Disk size, RAM as well as the following:
   - **label**. Click the label to see the VS details.
   - **VIP status** (enabled or disabled). If a compute resource fails or reboots, the system migrates virtual servers to another compute resource, one VS at a time. The order VSs are migrated in is random. However, you can give a virtual server "VIP" status, and this will give that VS priority in the migration queue. Click the icon to enable/disable VIP status of a particular VS.
   - **IP addresses**. If more than one IP address is assigned to this VS, mouse over the information icon to see the list of IP addresses.
   - **Backups**. The number of backups and the space these backups take.
   - **compute resource**. The label of compute resource with which VS is associated. Click a compute resource label to see its details.
   - **user**. The owner of this VS. Click the user name to see the owner details.
   - **power status**. Click the on/off buttons to change the status.
3. Click the **Actions** button next to the VS for the quick access to the list of VS actions (the list of actions displayed depends on the VS status):
   - **Reboot a VS**
   - **Recovery reboot**
4.1.7.2 View OVA Virtual Server Details

To view details of a specific 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 VS.

VS properties page gives a general overview of the VS details:

- **Template this VS is built on**
- **VIP status** (on/off). Click the icon to change the status.
- **Power status & On/Off/Reboot buttons.**

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

- **Auto-backups** - move the slider to enable or disable auto-backups for this server. For more information, refer to OVA Virtual Server Backup Schedules.
- **FQDN** (fully qualified domain name).
- **Compute resource**. Click the Compute resource name to see its details.
- **Location**. Click the location to view the details of the location group with which the VS is associated.
- **Login credentials**
- **Owner**. Click the owner name to see its details.
- **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.

  **Estimated Price per hour.** This sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here.

4.1.7.2.1 View OVA 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
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 cancel pending tasks, click the Cancel All Pending Tasks for this virtual server button.

You can also view the details of a particular log item by clicking its Ref number. The page that loads shows the log output and the following details:

- **date** - time in the [YYYY][MM][DD][hh][mm][ss]Z format
- **action** - the action name
- **status** - the action status (Complete, Warn, Pending, or Failed)
- **ref** - the log item's Ref number
- **target** - the action target
- **started at** - the time when the action was started
- **completed at** - the time when the action was completed
- **template** - template of the server the action refers to
- **compute resource** - the label of compute resource
- **initiator** - the user who initiated the action

If you want to see only the detailed output, you can hide log info with the arrow button in the upper right corner.

**See also:**

- Create OVA Virtual Server
- Manage OVA Virtual Servers
- OVA Virtual Server Networks
- OVA Virtual Server Disks
- OVA Virtual Server Statistics

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4.1.7.3 Manage OVA Virtual Servers

OnApp Cloud gives you high-end cloud management features for virtual servers that are built from OVAs including:
### Virtual Server Options

<table>
<thead>
<tr>
<th>Power Options</th>
<th>Administrative Options</th>
<th>Networks</th>
<th>Disks</th>
<th>Statistics</th>
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<tr>
<td><strong>Edit</strong></td>
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<td>Change owner</td>
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<tr>
<td><strong>Migrate</strong></td>
<td>Suspend</td>
<td>Reset Root Password</td>
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</tr>
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<td><strong>Delete</strong></td>
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<tr>
<td><strong>Segregate</strong></td>
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</tr>
<tr>
<td><strong>Clone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Set VIP status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ensure that OVA permissions are on before managing OVA virtual servers. For more information about permissions, refer to the OnApp Permissions section of this guide.

This document provides the information on how you can manage the virtual servers built from OVA.

#### 4.1.7.3.1 Edit OVA Virtual Server

You can edit resources for all VSs. Depending on the OS it is built on, some VSs can have their CPU and RAM resized without needing to be powered off ("resize without reboot"). If the OVA template allows resizing without reboot, the resize should be completed automatically: you will be returned to the VS details screen and see a message indicating the resize was successful. If the template does not allow this, you will be asked to confirm that the VS will need rebooting so that the resize can take place.

Windows virtual servers cannot be resized without reboot.

To adjust VS resources:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the server you want to resize to show its details screen.
3. Click the Actions button, point to Options and select the Edit Virtual Server link.
4. Change CPU cores, CPU priority/units, and RAM values.
5. Click the Save button.

#### 4.1.7.3.2 Segregate OVA Virtual Server

If required, you can instruct OnApp to make sure a VS is never booted on the same compute resource as another specific VS. To do that, contact OnApp Support or your account manager on amteam@onapp.com. It may be important to ensure that a VS is never booted if, for example, you have two name servers or a load balanced web server, and you need to keep VSs on separate physical servers.

To segregate one VS from another:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you want to segregate.
3. On the screen that appears, click the **Actions** button, point to **Performance**, then click **Segregate Virtual Server**.

4. In the dialogue box that pops up, use the drop-down menu to choose a VS you want to keep away from.

5. Click the **Segregate Virtual server** button to finish.

4.1.7.3.3 Clone OVA Virtual Server

You can create a clone based on the same resources as the origin OVA virtual server. 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>Owner</td>
<td>The same as the origin virtual server.</td>
</tr>
</tbody>
</table>
| Hostname, password, and label     | You can change the properties while cloning a KVM VS. By default, if you clone a virtual server without changing the values of the hostname, password, and label:  
  - The hostname remains the same as it is in the origin virtual server.  
  - The password acquires random values.  
  - The label is the same as the origin virtual server's label, but with *Clone* in the label. For example, *Clone Origin Label*. |
| Compute, data store, and network resources & zones  
  - Recipes, recipe variables, and service add-ons  
  - Firewall rules | 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. |
| IP address                        |  
  - Virtual servers built from Windows or Linux OVA templates - a random IP address is assigned from an IP range in the origin network.  
  - Virtual servers built from OVA templates with *Other OS* type - an IP address from the origin virtual server is assigned. After a virtual server is cloned and before you start it, you should [assign a new IP address](#). |
| 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 **Actions**, point to **Options**, and then, click **Clone Virtual Server**.
4. In the dialog box, you can change the following properties for the KVM VS:
   - **Label**
   - **Hostname** - 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 following symbols are not allowed for Windows-based virtual servers:

- percent [%]
- quotation marks [" “]
- angle brackets [<>]
- vertical bar [ | ]
- caret [^]
- ampersand [&]
- parentheses [( )]
- Password - 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

5. 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.

4.1.7.3.4 Migrate OVA Virtual Server

Hot migration is available for VSs created from OVA if **Allowed hot migrate** slider was enabled during **OVA upload** or during **OVA editing**.

Note that both full hot migration and full cold migration do not apply to OVA VSSs.

OnApp allows migration of OVA virtual servers between compute resources that share common data stores (or data store zones).

To migrate a virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you want to migrate.
3. Click the **Actions** button, point to **Options**, and click the **Migrate Virtual Server** link.
4. In the window that appears, choose the target compute resource from the drop-down menu.
5. Click the **Start Migration** button.

After migration, the power status of your virtual server remains the same as before the migration.

OnApp administrators can control user access over virtual server migration. Using OnApp permissions, you can allow/forbid users to perform migration of all virtual servers, or their own servers only. This is handled via the Control Panel's **Roles** menu.
4.1.7.3.5 Delete OVA Virtual Server

Shut down the virtual server 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 virtual server's screen, click the Actions button, point to Options, then select Delete Virtual Server.
4. Confirm by clicking the Destroy button.

**IMPORTANT:**
- You won't be able to restore a virtual server after deleting it.
- Deleting a virtual server removes all data stored on that virtual server.

4.1.7.3.6 OVA Virtual Server Power Options

To manage a virtual server power options:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. Click the Actions button on the VS's screen and point to Power to expand the menu.
4. The 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.
   - **Reboot in Recovery** - powers off and then, restarts the VS in the recovery mode.
   - **Suspend** - 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.

When you start up a VS, it might be implicitly cold migrated if the current compute resource does not have sufficient resources. For more information, refer to Virtual Server Provisioning.

- **Startup on Recovery** - starts the VS in recovery mode.

4.1.7.3.7 Change Owner of OVA Virtual Server

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. Click the Actions button on the VS's screen and click Administration to expand the menu.
4. Click the Change Owner link.
5. Choose a user to whom you want to pass ownership of the VS from the drop-down list.
6. Click the Change Owner button.

4.1.7.3.8 Set SSH Keys for OVA Virtual Server

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. Click the **Actions** button on the VS's screen, point to **Administration**, and click the **Set SSH keys** link. SSH keys of the administrator and a VS owner will be assigned to the VS. If a VS owner does not have any SSH keys, the system will only assign admin keys.

4. Click the **Set SSH-keys** button.

### 4.1.7.3.9 Reset Root Password for OVA Virtual Server

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the required virtual server.
3. Click the **Actions** button on the VS's screen, point to **Administration**, then click the **Reset Root Password** link.
4. Move the **Set password** slider to the right to enter and confirm new password. Move the **Encrypt password** slider to the right to encrypt your password.
5. Click the **Set Password** button.

### 4.1.7.3.10 Set VIP Status for OVA Virtual Server

If a compute resource fails or reboots, the system migrates virtual servers to another compute resource, one VS at a time. The order VSs are migrated in is random. However, you can give a virtual server "VIP" status, and this will give that VS priority in the migration queue.

To set or remove VIP status for a VS:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Use the icon in the **VIP** column next to a required virtual server to change switch on/off the VIP status.

See also:

- [Create OVA Virtual Server](#)
- [OVA Virtual Server Networks](#)
- [OVA Virtual Server Disks](#)
- [OVA Virtual Server Statistics](#)

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### 4.1.7.4 Manage OVA Virtual Server Advanced Configuration

You can manage your OVA virtual servers at a raw configuration level by editing the configuration file available for each VS in your Control Panel.

- This functionality is available only for virtual servers created from the OVAs with the Network Appliance operating system.
- You can only edit configuration file for OVA virtual servers that are built on CentOS 7 KVM compute resources.

### 4.1.7.4.1 Upload OVA VS Configuration

To edit the config file of an OVA virtual server, follow the next steps:

1. Go to Control Panel > **Cloud** > **Virtual Servers** menu and click a label of a specific virtual server.
2. Click the **Configuration** tab > **Network Appliance Config**.
3. On the page that loads you can add-edit the network appliance config for the OVA server:
You can insert a network appliance config file from your local computer at the File tab by clicking the Choose File button. After the file is uploaded, network appliance config will appear in the corresponding field.

You can add a URL to your network appliance config file in the File url field at the File url tab

4. Click Submit to save changes.

5. After you edit the network appliance config, you need to reboot the OVA server at Control Panel > Cloud > Virtual Servers > Label > Actions > Power > Reboot Virtual Server. Changes to the network appliance config will not take effect if the server is not rebooted. The reboot should be done via OnApp Control Panel. If the reboot command is issued inside the OVA server, the changes to the network appliance config will not take effect.

4.1.7.4.2 Upload OVA VS License
To edit the config license file of an OVA virtual server, follow the next steps:

1. Go to Control Panel > Cloud > Virtual Servers menu and click a label of a specific virtual server.

2. Click the Configuration tab > Network Appliance License.

3. On the page that loads you can add-edit the network appliance license for the OVA server:
   - You can insert a license file from your local computer at the File tab by clicking the Choose File button. After the file is uploaded, network appliance config will appear in the corresponding field.
   - You can add a URL to your license file in the File url field at the File url tab

4. Click Submit to save changes.

5. After you edit the network appliance config, you need to reboot the OVA server at Control Panel > Cloud > Virtual Servers > Label > Actions > Power > Reboot Virtual Server. Changes to the network appliance config will not take effect if the server is not rebooted. The reboot should be done via OnApp Control Panel. If the reboot command is issued inside the OVA virtual server, the changes to the network appliance config will not take effect.

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4.1.7.5 OVA Virtual Server Networks
The Networking menu in the Virtual Servers menu enables you to manage network interfaces, allocate IP addresses and set firewall rules for virtual servers.

4.1.7.5.1 Configure OVA 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.

4.1.7.5.1.1 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.

4.1.7.5.1.2 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 Submit button.

4.1.7.5.1.3 To edit the network interface label, port speed or set it as primary (if none is marked as primary):

   click the 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.

4.1.7.5.1.4 To delete the 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.

4.1.7.5.2 Set OVA Virtual Server Firewall Rules

With OnApp you can set firewall rules for the network interfaces of virtual servers. There are two types of firewall rule:

- **ACCEPT** – defines the packets that will be accepted by the firewall
- **DROP** – defines the packets that will be rejected by the firewall

Ensure that the following permissions are enabled before setting firewall rules for your virtual server:

- Create own firewall rules
- Destroy own firewall rules
- Read own firewall rules
- Update own firewall rules
You cannot apply firewall rules to virtual servers which are parts of a blueprint.

You can set the following:

- **add a specific firewall rule** - you can configure a firewall rule with specific parameters (source, destination port, protocol type, etc.)
- **set default firewall rules** - you can set default firewall rules for an entire network interface

### 4.1.7.5.2.1 Add a specific firewall rule

To configure a firewall rule:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the VS for which you want to configure a firewall rule.
3. Click the **Networking** tab, then click **Firewall**.
4. On the page that appears, set the following:
   a. Choose the network interface.
   b. Specify if the rule defines requests that should be accepted or dropped.
   c. Set the IP address for which this rule is active.
      - Leave the empty field to apply this rule to all IPs
      - Enter hyphen-separated IPs to apply the rule to an IP range (e.g. 192.168.1.1-192.168.1.10)
      - Enter the IPs with slash to apply the rule to CIDR (e.g. 192.168.1.1/24)
   d. Set the port for which this rule is effective.
      - Leave the empty field to apply the rule to all ports
      - Enter colon-separated ports to apply the rule to a port range (e.g. 1024:1028)
      - Enter comma-separated ports to apply the rule to the list of ports (e.g. 80,443,21)
   e. Protocol type (for ICMP protocol only) - indicate a type of the ICMP protocol (range from 0 to 255)
   f. Choose the protocol (TCP, UDP, DCCP, SCTP or ICMP).
   g. Enter a comment to the firewall rule.
5. Save the rule by clicking the **Add Rule** button. The rule will be saved in the UI, but the transaction won't be started until you click the **Apply Firewall Rules** button.
6. To start the transaction which runs firewall rules for a VS, click **Apply firewall rules** button.
7. Use **Up** and **Down** arrow buttons in the left column to change firewall rule position.
8. To edit or delete a firewall rule, click the appropriate icon in the last column.

### Default firewall rules

To set default firewall rules for a network interface:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the OVA VS for which you want to configure a firewall rule.
3. Click the **Networking** tab, then click **Firewall**.
4. On the page that appears, go to Default firewall rules section.

5. Choose ACCEPT or DROP command next to the network interface and click **Save Default Firewall Rules**. The rule will be saved in the UI, but the transaction won't be started until you click the **Apply Firewall Rules** button.

**Example:**
The Int1 ACCEPT 122.158.111.21 22 TCP firewall rule means that the Int1 network interface will accept all requests and packets addressed from 122.158.111.21 using the TCP protocol on port 22.
The Int2 DROP 122.158.111.21 22 UDP firewall rule means that the Int2 network interface will reject all requests and packets from 122.158.111.21 using the UDP protocol on port 22.

---

4.1.7.5.3 OVA 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 > IP Addresses.
4. Click the Allocate New IP Address button.
5. Select a network interface from the drop-down menu (only the network interfaces you added to the VS will be available). The IP Address will be allocated automatically.
6. Click the Add IP Address button.

As an alternative, you can manually select an IP address from the IP Pool associated with the network interface. To enable this option move the Specify IP Address slider to the right and choose IP Address from the drop-down list. You may select an IP address that's already assigned to a VS, but only one VS should be online at a time. Use Show only used IPs, my IPs and IPv6 buttons to narrow the list of IP in the drop-down list. This option is not available for the federated VSs.

---

4.1.7.5.3.1 Edit IP address assigned to 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 Edit button next to the IP address you want to edit.
5. On the page that loads, you can mark the IP address as primary by selecting Primary IP Address checkbox. Accordingly, this IP address will be used as source IP for outgoing traffic by default.

---

4.1.7.5.3.2 Remove IP address from 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.
If you delete IP address that is used as primary - the next available IP will be marked as primary.

4.1.7.5.4 OVA Virtual Server Network Speed
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.

To edit a virtual server's network speed:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the virtual server you want to change.
3. Go to the Networking tab > Network Interfaces.
4. In the last column, click the Edit button.
5. Change the port speed.
6. Click the Submit button to save changes.

See also:

- Create OVA Virtual Server
- Manage OVA Virtual Servers
- OVA Virtual Server Disks
- OVA Virtual Server Statistics

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4.1.7.6 OVA 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.

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.

The primary disk is imported from OVA configuration during OVA VS creation. You can add new disks after the VS is created and built. That will be totally new disks without the information from OVA.

4.1.7.6.1 Add Disks to OVA Virtual Servers
Adding a disk to a virtual server will require that VS should 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 + button or the Create Disk button.
5. Fill in the details:
   
   o Specify disk label.
   o Choose the data store to create a disk on from the drop-down list.
   o Move the slider to the right to specify the desired disk size.

   The disk size should not exceed 2 TB when a new disk is added. You can later resize the disk if you need it to be larger than 2 TB.

6. Click the Add Disk button to finish.

Restrictions:
- If you choose a Solidfire data store, the minimum disk size will be regulated by Solidfire Data Store Zone settings.
- If virtual server and the control panel server belong to different networks, the hot attach transaction will fail.
- When you add a new disk to a virtual server, it automatically becomes available to that server.

4.1.7.6.2 Edit OVA Virtual Server Disks
You can resize disks when needed. The resize will fail if your current usage is greater than the new size you request. Note that any changes to the disk size require rebooting of your VS. For Windows-based OVA virtual server disks, you can enable or disable virtio mode.

To edit 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 change, then click the Edit link.
5. On the page that appears, you can edit the following:
   • Label - specify the name of the disk
   • Size - move the slider to the right to specify the desired disk size in GB
   • Enable Virtio - move the slider to the right to enable virtio mode

   Please note that the Enable Virtio option is available only for Windows-based OVA virtual servers with the template supporting kvm_virtio.

6. Click the Save Disk button.

You cannot decrease disk size. Only the increase disk size option is available. Be aware, that increasing of disk size will not increase the disk partitions.

4.1.7.6.3 Migrate OVA Virtual Server Disks
You can migrate disks of your virtual servers to other data stores, which are allocated to the same compute resource. Unlike VS migration – disk migration requires a 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 **Migrate** button.

5. On the screen that appears, select a target data store from a drop-down box.

6. Click **Start Migrate**.

- You can only migrate disks to data stores in data store zones assigned to your bucket.
- You cannot migrate a disk to a data store with less capacity than the disk size.
- If you move a 850 GB disk between aggregates with 10 GB actual usage, the ‘dd' image of the local volume manager will take 850 GB space, because the entire local volume manager is copied, including zero ‘d’ space which may not be able to be recovered.

**4.1.7.6.4 Delete OVA 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**.

5. In the pop-up window, move the **Force Reboot** slider to the right, then select the VS shutdown type.

6. Move the **Required Startup** slider to the right to start up the VS automatically.

Steps 5 and 6 apply to disks of VSs that are on.

7. Click the **Destroy Disk** button.

This will schedule the **destroy disk transaction**.

See also:

- Create OVA Virtual Server
- Manage OVA Virtual Servers
- OVA Virtual Server Networks
- OVA Virtual Server Statistics

https://onappcloud.typeform.com/to/A64Euy#source=OVA%20Virtual%20Server%20Disks

**4.1.7.7 OVA Virtual Server Statistics**

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

**4.1.7.7.1 OVA 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 tab > CPU Usage.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there is less data available, the chart will show utilization for the time available.
5. Move the Show in My Timezone slider to the right if you want to show bandwidth statistics according to your profile's timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the 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.

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

4.1.7.7.2 OVA 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 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. You can filter the statistics by date and time - select the time period from the drop-down menu and click the Apply button. By default, the statistics are generated for the last three months or the actual VS existence period.
5. Move the Show in my Timezone slider to the right if you want to view billing statistics according to your profile's timezone settings. By default, the billing statistics is shown in UTC.
6. On the page that appears:

The price parameters on this page do not take into consideration the free limits for resources set in the bucket.

- **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).

---

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

---

**4.1.7.7.4 OVA Virtual Server Disk IOPS Statistics**

The system tracks IOPS (Input/Output Operations per Second) for virtual servers and generates charts that help analyze VS disk performance. The data presented in the chart are for the periods during which the statistics was gathered, typically 3 minutes. To see IOPS for a virtual server:

1. Go to your Control Panel > **Cloud** > **Virtual Servers** menu.
2. Click the label of the virtual server you're interested in.
3. Click the **Storage** > **Disks** tab.
4. Click the **Actions** button next to the required disk, and then choose **IOPS**.
5. There are four charts on the screen that appears:
   - IOPS for the last hour
   - IOPS for the last 24 hours
   - Data written/read for the last 24 hours
   - Data written/read 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.
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.

See also:
- Create OVA Virtual Server
- Manage OVA Virtual Servers
- OVA Virtual Server Networks
- OVA Virtual Server Disks

https://onappcloud.typeform.com/to/A64Euy#source=OVA%20Virtual%20Server%20Statistics

4.1.7.8 OVA Virtual Server Backups
OnApp supports normal backups for OVA virtual servers. Normal backups contain all the information stored on a server’s disk. If you have switched on incremental backups for the cloud, normal backups will still be made for OVA virtual servers. For detailed information on backups, refer to Virtual Server Backups.

- Backups in the OnApp Control Panel are associated with a particular user instead of being associated with a virtual server. To view the list of user backups, refer to the View User Backups section.
- If required, you can change the block size which is used during backup creation at Control Panel > Admin > Settings > Configuration by editing the Block Size (MB) parameter.

4.1.7.8.1 View OVA Virtual Server Backups
To view the list of OVA virtual server’s backups:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required OVA virtual server.
3. Click the Backups tab, then select Images. Images are full backups of OVA virtual server disks.
4. On the screen that appears, you’ll see a list of OVA virtual server backups.
5. Click the label of the required OVA virtual server backup to see the following tools - restore backup, delete backup and add/edit note.

4.1.7.8.2 Take OVA Virtual Server Disk Backups
To back up an OVA virtual server disk:

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 Storage tab and select Disks. You’ll see a list of the disks allocated to that OVA virtual server.
4. Click the Actions icon next to a disk you want to take a backup of, then click Backup. You’ll see a list of all the backups taken and pending for that disk, along with the tools to restore backups and delete them.
   - To make a backup, click the Take a Backup button at the end of the list. If required, you can add a note to a new backup. You can also select Force Windows Backup.
This option for Windows virtual servers is designed as a last resort, when the backup cannot be taken due to NTFS file system problems. Switching on this option will bring up a dialog box with the following message: "If you enable this option there is no guarantee that backup will be consistent." Select "Yes" to proceed.

4.1.7.8.3 Restore OVA Virtual Server Backup
To restore a backup:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required OVA virtual server.
3. Click the Backups tab, then select Images.
4. On the screen that appears, click the Actions icon next to the backup you want to revert to and choose Restore.

4.1.7.8.4 Delete OVA Virtual Server Backup
To delete a backup:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required OVA virtual server.
3. Click the Backups tab, then select Images.
4. On the screen that appears, click the Actions icon next to the backup you want to remove and choose Delete.

4.1.7.8.5 Add OVA Virtual Server Backup Note
To add/edit virtual server backup's note:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required OVA virtual server.
3. Click the Backups tab, then select Images.
4. On the screen that appears, click the Actions icon next to the required backup and choose Add Note. Make necessary changes and click Submit.

See also:
- Virtual Servers
- Smart Servers
- Application Servers
- Backup Settings
- Edit Backups/Templates Configuration

In addition to the system auto-backup presets, you can schedule backups of virtual servers (VS disks) as required. For example, you can set up a schedule to back up your disks once a week. The combination of scheduled OVA VS backups and Auto-Backup Presets provides a great deal of flexibility in the way backups are handled for the cloud and for the individual VSs. Auto-backup Presets can be applied to all new VSs added to the cloud. Scheduled VS backups enable specific backups to be scheduled for individual VSs, outside of the auto-backup pattern.
OnApp supports only normal backups for OVA virtual servers, which include all the data from the server's disk.

4.1.7.9.1 View OVA Virtual Server Backup Schedules

To view the list of backup schedules for an OVA virtual server:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the OVA virtual server you're interested in.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that appears, you will see the list of backup schedules along with their details:
   - **Date** - the time when the schedule was created
   - **Target** - the server or disk for which the schedule was created (depending on the backup type)
   - **Action** - the scheduled action
   - **Period** - how frequently the backup will occur according to a period type set in the next step.

   For example, if you set "2" as a period and "days" as a period type, the backup will take place at the same time every two days. By default, in this field is set 1.

   - **Period type** - the backup period: days, weeks, months, or years
   - **Rotation period** - the number of backups, after which the first backup will be deleted.

   By default, in this field is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this field, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

   - **Next Start** - the date and the hour of the next backup
   - **User** - the user who created the backup schedule
   - **Status** - schedule status
   - **Actions** - click the Actions icon to edit or delete the backup schedule

4.1.7.9.2 Create OVA Virtual Server Backup Schedule

To add a backup schedule:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the OVA virtual server you want to schedule a backup for.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that follows, click the New Schedule button.
6. Specify schedule details:
4.1.7.9.3 Edit OVA Virtual Server Backup Schedule

To edit a backup schedule:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the OVA virtual server you want to schedule a backup for.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. Click the Edit icon next to a schedule to change its details.
6. Specify schedule details:
   - Period - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   - Period type - the backup period: days, weeks, months, or years. The period type must be unique for each backup target (disk or server).
   - Rotation period - the number of backups after which the first backup will be deleted.
   - Start time - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).
   - Enabled - move the slider to enable or disable the schedule.
7. Click the Save button to finish.

For a schedule with the Failed status, you can move the Enabled slider to the right to run the schedule once again.

4.1.7.9.4 Delete OVA Virtual Server Backup Schedule

To delete a backup schedule:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the OVA virtual server you’re interested in.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk with a backup schedule, then select Schedule for Backups.
5. Click the Actions icon next to the schedule you want to remove, then choose Delete.
4.1.8 Smart Servers

Smart servers are dedicated entities based only on the KVM CloudBoot Compute resources with passthrough enabled. Smart servers are created and managed exactly the same as virtual servers, the only difference is that only one smart server can be created per compute resource. Using a smart server feature, you can create and manage servers on smart appliances with passthrough enabled. You can set the minimum specifications for the smart servers (minimum size, resource price, etc.) in the same way as for virtual servers.

Smart servers can be organized into zones to create different tiers of service - for example, by setting up different zones for smart appliances, with limits and prices specified per zone. Smart compute zones can also be used to create private clouds for specific users.

Smart servers required IOMMU support:

- Intel-based Servers => Vt-d
- AMD-based servers => AMD-Vi

Smart servers are based on templates and are deployed on compute resources. Compute resources give them access to CPU, disk and network resources. OnApp Cloud gives you high-end cloud management features including:

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<td></td>
</tr>
</tbody>
</table>
The following options are not available for smart servers:

- hot migration
- segregation
- VIP status
- firewall rules
- Network interface statistics
- Edit network speed

Also, VLANs are not configured automatically on smart servers. You need to configure them manually in accordance with your OS and hardware settings.

- smart servers support LVM and integrated storage types.
- the Passthrough to Guest must be enabled for one of the smart server's network interfaces.
- all conventional PCI devices behind a PCIe-to-PCI/PCI-X bridge or conventional PCI bridge can only be collectively assigned to the same guest. PCIe devices do not have this restriction.
- limits and prices are specified individually for each smart appliance zone assigned to the bucket.

If the smart compute resource (where the smart server will be deployed) has a NIC device that features multiple ports, make sure the appliance NIC can perform a FLR reset:
1. Log in as root to a compute resource where it is deployed
2. Run the following command:
   ```bash
   # lspci -vv|egrep "Ethernet|FLR" --color=always
   ```
   If it returns the `FLReset` you need to install another NIC if possible. If not - the smart server cannot be deployed on this compute resource.

See also:
- CloudBoot Compute Resources
- Create Smart Server
4.1.8.1 Manage Smart Servers

Smart servers are dedicated entities based on the KVM CloudBoot compute resources with the passthrough enabled. Smart servers are created and managed exactly the same as virtual servers, the only difference is that only one smart server can be created per compute resource. Using a smart server feature, you can create and manage servers on smart appliances with passthrough enabled. You can set the minimum specifications for the smart servers (minimum size, resource price, etc.) in the same way as for virtual servers.

Smart servers can be organized into zones to create different tiers of service - for example, by setting up different zones for smart appliances, with limits and prices specified per zone. Smart compute zones can also be used to create private clouds for specific users.

In this document you can find information on how to manage Smart Servers in your OnApp cloud.

4.1.8.1.1 View Smart Servers

To view the list of smart servers deployed in the cloud:

1. Go to your Control Panel > Cloud > Smart Servers menu to see an overview of all smart servers in the cloud with their details:
   - OS
   - Label
   - IP addresses
   - Disk size
   - RAM
   - CPU cores
   - CPU priority
   - Backups
   - Power status

2. Click the Actions button next to the server for the quick access to the list of available actions (the list of actions displayed depends on the server status).

3. To change the smart server power status, click the required status icon.

4. To view particular smart server details, click the label of a required server.

5. To add a new smart server, press "+" or click the Add New Smart Server button.

4.1.8.1.2 View Smart Server Details

To view details of a specific smart server:

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

2. Click the label of the smart server you're interested in.

3. The screen that appears loads the smart server properties, notes, activity log, and tools for managing your smart server.
4.1.8.1.2.1 Smart Server Properties

Smart server properties page gives a general overview of the smart server details:

- Template this smart server is built on
- Power status & ON/OFF/REBOOT buttons.

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

- Auto-backups
- Acceleration allowed - move the slider to the right to allow acceleration for this VS or move this slider to the left to prohibit acceleration for this VS. Acceleration status of the VS will be changed on the next CDN Sync Runner run (default value 20 minutes). To edit CDN Sync Runner delay, refer to the Edit Infrastructure Configuration section of this guide. If VS is accelerated, you can also view the actual Acceleration Status - active or inactive.

  Ensure that Accelerate any Virtual Server/Accelerate own Virtual Servers permissions are on before enabling acceleration for the VS. For more information about permissions, refer to the OnApp Permissions section of this guide.

- FQDN (fully qualified domain name)
- Smart compute resource
- Login credentials
- Owner
- IP Addresses
- Estimated Price per hour. This sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here.

- Memory
- CPU(s)
- CPU priority
- Disk Size
- Disk backups
- Network Speed
- Notes
- Activity log

  Autoscaling and VIP status options are not available for smart servers.

4.1.8.1.2.2 Notes

The Notes section lists brief comments or reminders for a Smart server. You can add either Admin's or User's notes. The Admin's note will be available to cloud administrators.

4.1.8.1.2.3 Smart Server Management

- Click the Actions button to expand the menu with the Smart Server management options.
4.1.8.1.3 Rebuild/Build Smart 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 Smart Server option during the smart server creation process, you will have to do this manually after the SS has been created. Building a smart server is the process of allocating physical resources to that smart server.

To build a smart server manually or rebuild the server on the same (or another) template:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the server you're interested in.
3. On the screen that appears, click the Actions button, point to Power, and then click Rebuild Smart Server.
4. On the screen that pops up, use the drop-down menu to choose a template with which to build the server.
5. Move the Start VS after rebuild slider to the right if you want to have your server started automatically after it is built.
6. Click the Rebuild Virtual Server button to finish.

After you rebuild your template, all data will be lost.

4.1.8.1.4 Edit Smart Server

To edit smart compute resource settings:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the server you want to edit.
3. Click the Actions button, point to Options, and select the Edit Smart Server link. You can edit the label, pricing, CPU, RAM, CPU priority resources for all smart servers. You can also edit the time zone for Windows smart servers.

After you edit the server's time zone, you need to stop and then start up the smart server. Currently, the time zone is set at the compute resource side only. Therefore, users need to set the target time zone inside a Windows smart server manually. Setting correct time zone at the compute resource side helps to keep correct time inside a smart server after starting it if time synchronization is not completed for some reason.

Depending on the OS it is built on, some smart servers can have their CPU and RAM resized without needing to be powered off ("resize without reboot").

4. Click the Save button to save your changes.

If the smart server template allows resize without reboot, the resize should be completed automatically: you will be returned to the server details screen and see a message indicating the resize was successful. If the template does not allow this, you will be asked to confirm that the smart server will need rebooting so that the resize can take place.
4.1.8.1.5  Edit XML Configuration

You can manage your smart servers at a raw configuration level by editing the XML configuration file available for each smart server in your Control Panel.

Important
Smart servers with modified XML configuration are not supported by the OnApp support team.

To edit the XML config file of a smart server, follow the next steps:

1. Go to your Control Panel > Cloud > Smart Servers menu and click a label of a specific smart server.
2. Expand the Actions menu, point to Options, and click the Edit XML Config button.
3. Click the Unlock button to be able to edit the XML file. In the pop-up box, click Yes to confirm your action.
4. Edit configuration and click the Save button. In the pop-up box, select whether you want to save changes with or without a reboot. Changes will be applied only after the VS reboot, so if you select the Save without reboot option, the update will be postponed until the next VS reboot.

To revert changes that you made before saving configuration, click the Cancel button.

If you want to discard all changes, click the Reset to default button at the Edit XML Config page. In the pop-up box, select whether you want to reset configuration with or without a reboot. Changes will be applied only after the VS reboot, so if you select the Reset without reboot option, the update will be postponed until the next VS reboot.

This action initiates deletion of all changes you have applied in the XML configuration except for RAM and CPU related modifications. As a result, the XML configuration file will be reset to default and locked.

If you edit RAM or CPU Cores for smart server:

- After clicking the Save button, the RAM and CPU cores are validated according to the bucket settings and the price for the resources can be changed. If the bucket does not allow the changes you applied, the appropriate message will be displayed.
- The Reset to default button will not restore the RAM and CPU values to the previous state.

You can not perform the following actions after you save changes in the smart server XML configuration file:

- Edit smart server
- Create/edit/migrate/delete smart server disks and set disk IOPS limits
- Create/edit/delete network interfaces

4.1.8.1.6  Migrate Smart Server

To migrate Smart Servers between different compute resources the network interface configuration of those compute resources should be identical.

OnApp allows cold migration of smart servers between hosts that share common data stores (or data store zones). Cold migration means moving smart servers that are shut down.

To migrate a smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Shut down the smart server you want to migrate.
3. Click the Actions button, point to Options, and click the Migrate Smart Server link.
4. In the window that appears, choose the target smart server from the drop-down menu.

5. Click the Start Migration button.

OnApp administrators can control user access over smart server migration. Using OnApp permissions, you can allow/forbid users to perform migration of all smart servers, or their own servers only. This is handled in the Control Panel's Roles and Sets menu.

4.1.8.1.7 Smart Server Power Options

To manage the smart server power options:

1. Go to your Control Panel > Cloud > Smart Server menu.
2. Click the label of the smart server in question.
3. Click the Actions button on the Smart server's screen and point to Power.
4. The Power menu enables you to perform the following power actions on smart servers (the exact list shown depends on the smart server status):
   - **Reboot Smart Server** - powers off and then restarts the smart server.
   - **Reboot in Recovery** - powers off and then restarts the Smart Server Recovery mode with a temporary login ("root") and password ("recovery") for servers where password encryption is enabled. For servers with password encryption disabled, the root password will be used to reboot in recovery.
   - Windows smart servers boot from the Linux-based recovery template in a recovery mode. You need to log in as admin via SSH or VNC console, then mount a Windows system disk manually.
   - Note that smart servers can be rebooted only from Control Panel > Tools menu. If you try to restart smart server from VNC console, the reboot will fail.
   - You cannot work with the "whole" disk (like `mount -t ntfs-3g /dev/sdb1`) while mounting and checking block devices inside the recovery image, as Windows disk is split into partitions.
   - **Suspend Smart Server** - stops a smart server, changes its status to suspended and disables all the other actions on SS, unless unsuspended.
   - **Shut Down Smart Server** – pops up a dialog box, where you can either Shut Down SS (terminates the SS gracefully), or Power Off SS (terminates the SS forcefully).
   - **Startup Smart Server** - queues a start-up action for an SS that's currently powered off.

When you start up a smart server, it might be implicitly cold migrated if the current compute resource does not have sufficient resources. For more information, refer to Server Provisioning.

- **Startup on Recovery** - starts the SS in recovery mode with a temporary login ("root") and password ("recovery").
- **Boot from ISO** - boots the VS from an ISO. You can boot virtual servers from your own ISOS or the ISOS that are uploaded and made publicly available by other users. If you boot a VS from an ISO with the RAM requirement larger than the VS's RAM, the transaction will fail. Make sure that you have enabled the Any power action on own virtual servers and Allow own virtual servers to boot from ISO permissions for the user to have access to this feature.

As soon as you boot a VS from the ISO, OnApp cannot control any components (backups, networks, disks). The only available actions will be start and stop a VS. Be aware that all the contents of the disk will be deleted.
4.1.8.1.8 Smart Server Administrative Options

To manage the smart server power options:

1. Go to your Control Panel > Cloud > Smart Server menu.
2. Click the label of the smart server in question.
3. Click the Actions button on the smart server's screen and point to Administration to expand the menu.
4. The menu enables you to perform the following administrative actions on smart servers:
   - Reset Root Password - resets the root password for this SS (the password is displayed in SS Information).
   - Change Owner - pops up a dialogue box with a drop-down of all users on the system, enabling you to pass ownership of the SS to the user selected from the list.
   - Set SSH keys – assigns SSH keys of the admin and an SS owner to the SS. If an SS owner does not have any SSH keys, the system will only assign admin keys.

4.1.8.1.9 Delete Smart Server

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

To remove the smart server from the cloud:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. On the screen that appears, you'll see the list of all servers in the cloud. Click the label of the smart server you want to delete.
3. On the server screen, click the Actions button, point to Options, then select Delete Smart Server.
4. Confirm the deletion.

See also:

- Compute Resources
- Compute Zones
- Create Smart Server
- Smart Server Networks
- Permissions

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4.1.8.2 Manage Smart Server Networks

The Networking menu enables you to manage network interfaces, allocate IP addresses, and set firewall rules for smart servers. In this document you can find information on how to manage smart server networks.

- To run the smart server, at least one network interface with an assigned IP address (or addresses) is required.
- To allocate another physical network, add a new network interface.

4.1.8.2.1 Configure Smart Server Network Interfaces

The Networking > Network Interfaces menu shows the virtual network interfaces allocated to the smart server. Network interfaces join the physical network to the smart server.
When you create a smart server, 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 smart server primary network interface.

To see the list of all network interfaces allocated to the smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the smart 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 edit and delete network interfaces (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 > Smart Servers menu.
2. Click the label of the smart 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 – 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 smart server runs

   - Click the Submit button.

To edit network interface label, port speed or set it as primary (if none is marked as primary), click the Edit icon next to the appropriate network interface. After editing the port speed, the smart 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.

### 4.1.8.2.2 Rebuild Smart Server Network

To rebuild a network join, added to the smart server (required after allocating new IP addresses):

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the required smart server.
3. On the screen that appears, click the Actions button, point to Options, then click Rebuild Network.
4. In the pop-up window, move the Force Reboot slider to the right, then select the smart server shutdown type:
   - Power OFF smart server
   - Shutdown smart server
   - Gracefully shutdown smart server
Smart servers are rebooted by default after rebuilding the network.

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

6. Click the **Rebuild Network** button.

### 4.1.8.2.3 Manage Smart 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.

#### 4.1.8.2.3.1 Allocate a new IP Address to the smart server

1. Go to your Control Panel > **Cloud > Smart Servers** menu.
2. Click the label of the server you’re interested in.
3. Click the **Networking** tab, then click **IP Addresses**.
4. Click the **Allocate New IP Address** button.
5. Select a network interface from the drop-down menu (only the [network interfaces](#) you added to the smart server will be available)
6. Select an IP address from the IP Pool associated with the network interface.
7. Click the **Add IP Address** button.
8. Click the **Rebuild Network** button to rebuild the network.

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

#### 4.1.8.2.3.2 Edit IP address assigned to VS

1. Go to your Control Panel > **Cloud > Smart Servers** menu.
2. Click the label of the server you’re interested in.
3. Click the **Networking > IP Addresses** tab.
4. Click the **Edit** button next to the IP address you want to edit.
5. On the page that loads, you can mark the IP address as primary by selecting *Primary IP Address?* checkbox. Accordingly, this IP address will be used as source IP for outgoing traffic by default.

#### 4.1.8.2.3.3 Remove IP address from smart server

1. Go to your Control Panel > **Cloud > Smart Servers** menu.
2. Click the label of the 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 and rebuild the network** option if you want to reboot a smart server and rebuild the network immediately after deleting the IP address. After choosing the **Delete and rebuild the network** option you will be redirected to the smart server **Overview** page.
   - Choose **Delete without rebuilding the network** option if you don’t want to reboot a smart server. In this case to apply the changes, you will have to the reboot the smart server additionally.
If you delete IP address that is used as primary - the next available IP will be marked as primary.

4.1.8.2.4 Display Network Speed for Network Interfaces on Smart Server Page

The main Smart Servers screen displays the network speed of each smart server primary network interface. To see the speed of all interfaces assigned to a smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the smart 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.

See also:
- Smart Server Disks
- Smart Server Backups
- Smart Server Backup Schedules
- Smart Server Statistics
- Smart Server Integrated Console

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4.1.8.3 Manage Smart Server Disks

Smart server storage is provided by disks. A disk is a partition of a data store that is allocated to a specific smart server. Disks can be assigned as standard or swap disks (there are no swap disks for Windows-based templates). They can also be set as primary (that is, the disk from which an OS will boot).

It is possible to use incremental backups. For details, see the Smart Server Backups section of this guide.

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

Please note that creating multiple partitions on one disk is forbidden for Windows-based virtual servers.

4.1.8.3.1 Add Disks to Smart Server

Adding a disk to a smart server will require that server to be rebooted. If a smart server 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 smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click a smart server label to open its details screen.
3. Click the Storage tab > Disks.
4. Click the "+" button or the Create Disk button.
5. Fill in the details:
   - Specify disk's label
   - Choose the data store to create a disk on from the drop-down menu
o Set the desired disk size

The disk size should not exceed 2 TB when a new disk is added. You can later resize the disk if you need it to be larger than 2 TB.

o Specify if this disk is swap space, and requires formatting

o Specify whether the disk should be added to Linux FSTAB, and its 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:

```plaintext
/mnt/onapp-disk-#{disk.identifier}
```

To be able to take incremental backups for virtual server’s disk, you must mount this disk to FSTAB (either Linux or FreeBSD) and specify the proper mount point manually. Swap disks are not backed up.

6. Click the Add Disk button to finish.

When you add a new disk to a smart compute resource it will automatically become available to that compute resource.

4.1.8.3.2 Edit Smart 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. Note that any changes to the disk size require rebooting of your smart server. For Windows-based smart server disks, you can enable or disable virtio mode.

To edit a disk:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Make sure your smart 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. On the page that appears, you can edit the following:
   • Label - specify the name of the disk
   • Size - move the slider to the right to specify the desired disk size in GB
   • Enable Virtio - move the slider to the right to enable virtio mode

Please note that the Enable Virtio option is available only for Windows-based smart servers with the template supporting kvm_virtio.

6. Click the Save Disk button.

4.1.8.3.3 Migrate Smart Server Disks
You can migrate disks of your smart servers to other data stores, which are allocated to the same smart compute resource or smart compute zone. Disk migration requires reboot of the smart server (despite the template it is based on).

To migrate a disk:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Make sure your smart 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 **Migrate** button.

5. On the screen that appears, select a target data store from a drop-down box.

6. Click **Start Migrate**.

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

### 4.1.8.3.4 Delete Smart Server Disks

To delete a disk:

1. Go to your Control Panel > **Cloud** > **Smart Servers** menu.

2. Make sure your smart 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**.

See also:

- **Smart Server Backups**
- **Smart Server Backup Schedules**
- **Smart Server Statistics**
- **Smart Server Integrated Console**

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### 4.1.8.4 Manage Smart Server Backups

Backups are used for copying and archiving target data (target is either a disk or a smart server as a single whole of all disks used).

OnApp supports two backup types: normal and incremental:

- **Normal backup** - simple method of taking backups by making a full copy of target data and storing it in an archive.

- **Incremental** - advanced method of taking backups. During the incremental backup, only the changes made after the last backup are archived instead of backing up the whole target. You must have dedicated backup servers configured in your cloud to be able to utilize the incremental backups functionality. Incremental backups are enabled via **Admin > Settings > Configuration > Backups/Templates** menu.

It is not possible to take incremental backups if you are using location group functionality without a backup server added to the group - the following error message will appear:

"Backup cannot be made at this time: This disk cannot be backed up, check Location Group settings."
This issue will be fixed in next releases. As a workaround, add an empty backup server zone to your location group. If required, you can change the block size which is used during backup creation at Control Panel > Admin > Settings > Configuration by editing the Block Size (MB) parameter.

Each backup type can be taken in two ways:

- Manually - the user logs into OnApp CP and clicks the Take backup button.
- Automatically - the user enables automatic backup option (daily, weekly, monthly, yearly). To enable auto-backups for virtual servers that support incremental backups which used auto-backups option before the upgrade, re-enable automatic backups by switching them off and on again.

If you are using incremental backups option, you should either enable dedicated backup servers in your cloud or share the backups and templates folders (paths) between your compute resources. SSH file transfer option will be skipped for virtual servers using incremental backups. Existing full backups will be still accessible via Backups > Images menu.

4.1.8.4.1 How Do Incremental Backups Work?
For example, we have a disk with three files:

- File1 - 4 GB
- File2 - 2 GB
- File3 - 3 GB

The first incremental backup will be 9 GB (sum of all files). If you decide to take another incremental backup soon thereafter, the backup size will be equal to 0, as the files have not been changed since the first backup (if your backup has complicated directory structure, it could be more than 0, as file system could store some system data).

Then:

- If the user decides to delete File2, the target size will now be 7 Gb. The subsequent incremental backup size will be 0, as new data has not been added.
- If the user adds File4 of 4 GB size, the subsequent incremental backup will equal 4 GB (the size of new data added).
- If the user increases File3 disk size to 6 GB, the subsequent incremental backup size will equal 6 GB, although the target increases by 3 GB. This happens because the incremental system takes the update of the existing file as the deletion of the existing file and adding the new file with the same name (the first version of File3 has been deleted and the new one with 6GB size has been added).

Backups can be saved either to a compute resource or to a dedicated backup server. When saving a backup, the system calculates if a user has enough physical/bucket resources to save a backup in the selected destination.

When saving a backup to a compute resource, the system does not check if compute resource has enough disk space to save a backup and only checks if a user has enough bucket limits.

When saving a backup to a dedicated backup server, the system checks both disk space and bucket limits.

Free disk size on a target must be at least equal to the disk’s size for which the backup is taken (or to a size of all VS disks for incremental backup).

In some cases (for example, if a user has scheduled several disk backups simultaneously, but there are only free space/billing limits for the first one) the system may allow taking all the backups but will not be able to save them. This will result in a system error and over-billing.
4.1.8.4.2 Backup Support by VM / Virtualization / OS

<table>
<thead>
<tr>
<th></th>
<th>Normal backup</th>
<th>Incremental backup</th>
<th>Convert to template</th>
</tr>
</thead>
<tbody>
<tr>
<td>BaremetalServer</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>EdgeServer</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>StorageServer</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>LoadBalancer</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>SmartServer</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>KVM</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>VMware</td>
<td>snapshot</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Windows</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>*nix</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>CloudBoot / IS</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>SolidFire</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

4.1.8.4.3 View Smart Server Backups
To view the list of smart server's backups:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the required smart server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, you'll see a list of smart server backups sorted by category.
5. Click the label of the required smart server backup to see the following tools - restore backup, delete backup, convert it to template and add note:

4.1.8.4.4 Take Smart Server Backup
To take an incremental backup:
1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the server you want to back up.
3. Click the Backups tab, then select Files. You'll see a list of the disks allocated to that smart server.
4. Click the Actions icon next to a disk you want to take a backup of, then click Backup. You'll see a list of all the backups taken and pending for that disk, along with the tools to restore backups, delete them, and convert them to templates.
5. To take a backup, click the Take a Backup button at the end of the list.

Backups in the OnApp Control Panel are associated with a particular user instead of being associated with a smart server. To view the list of user backups, refer to the View User Backups sections.

Template extraction is performed during server provisioning or taking a backup when using a particular template. To prevent template from being used in other transactions during extraction, template is locked during the extraction and unlocked on accomplishment. If other transaction tries to use the locked template, it will fail after 5 minutes of standby. Transaction which locked template and failed, means that extracted template is broken.

Storing scheme:
- template /onapp/templates/your_template.tgz
- extracted template /onapp/backups/templates/your_template
- locked template /onapp/backups/templates/your_template.lock

4.1.8.4.5 Take Smart Server Disk Backup

To back up a smart server:
1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the appliance you want to back up.
3. Click the Storage tab > Disks. You'll see a list of the disks allocated to that smart server.
4. Click the Actions icon next to a disk you want to take a backup of, then click Backup. You'll see a list of all the backups taken and pending for that disk, along with the tools to restore backups, delete them, and convert them to templates.
5. To take a backup, click the Take a Backup button at the end of the list.

Backups in the OnApp Control Panel are associated with a particular user instead of being associated with a smart server. To view the list of user backups, refer to the View User Backups sections.

4.1.8.4.6 Convert Smart Server Backup to Template

To convert smart server backup to template:
1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the required smart server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, click the Actions icon next to the backup and choose the Convert to Template.

4.1.8.4.7 Restore Smart Server Backup
To restore a backup:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the required smart server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, click the Actions icon next to the backup you want to revert to and choose Restore.

- If the file system on the disk is corrupted, it won't be possible to restore the files from incremental backup. In that case, you can force a backup restore and rebuild a file system on a disk. To do this, move the Force Restore slider to the right.
- Note that Force Restore option is unavailable for incremental backups of FreeBSD virtual servers.
5. Click the Restore Backup button.

4.1.8.4.8 Edit Smart Server Backup Note
To edit smart server backup's note:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the required smart server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, click the Actions icon next to the required backup and choose Add Note. Make necessary changes and click Submit.

4.1.8.4.9 Delete Smart Server Backup
To delete a backup:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the required smart server.
3. Click the Backups tab, then select the appropriate backup type:
   - Images - full backups
   - Files - incremental backups
4. On the screen that appears, click the Actions icon next to the backup you want to remove and choose Delete.

See also:
- Edit Backups/Templates Configuration
- View User Backups
- Smart Server Backup Schedules
- Smart Server Statistics
- Smart Server Integrated Console
4.1.8.5 Manage Smart Server Backup Schedules

Schedules screen lists smart servers’ scheduled backups. Depending on the backup type set in your cloud settings, schedules are created either per smart server or per disk. To view all backup schedules in the cloud, see Schedules Settings. In this document you can find information on how to manage Smart Server backup schedules.

4.1.8.5.1 View Smart Server Backup Schedules

To view the list of backup schedules for a particular Smart Server:

4.1.8.5.1.1 If normal backup options is selected for the cloud:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the Smart Server you’re interested in.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that appears, you will see the list of backup schedules along with their details:
   - **Date** - the time when the schedule was created
   - **Target** - the server or disk for which the schedule was created (depending on the backup type)
   - **Action** - the scheduled action
   - **Period** - how frequently the backup will occur according to a period type set in the next step.

   For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this filed is set 1.

   - **Period type** - the backup period: days, weeks, months, or years
   - **Rotation period** - the number of backups, after which the first backup will be deleted.

   By default, in this filed is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this filed, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

   - **Next Start** - the date and the hour of the next backup
   - **User** - the user who created the backup schedule
   - **Status** - schedule status

4.1.8.5.1.2 If incremental backup option is selected for the cloud

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the Smart Server you’re interested in.
3. Select Backups > Schedules tab, or click Auto-backups under the Options section to view incremental backups schedules only.
4. On the screen that appears, you will see the list of backup schedules along with their details:
Date - the time when the schedule was created

Target - the server or disk for which the schedule was created (depending on the backup type)

Action - the scheduled action

Period - how frequently the backup will occur according to a period type set in the next step.

For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this filed is set 1.

Period type - the backup period: days, weeks, months, or years

Rotation period - the number of backups, after which the first backup will be deleted.

By default, in this filed is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this filed, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

Next Start - the date and the hour of the next backup

User - the user who created the backup schedule

Status - schedule status

4.1.8.5.2 Create Smart Server Backups Schedule

In addition to the system auto-backup presets, you can schedule backups of Smart Servers (VS disks) as required. For example, you can set up a schedule to back up your disks once a week.

The combination of Scheduled VS backups and Auto-backup Presets provide a great deal of flexibility in the way backups are handled for the cloud, and for individual VSs. Auto-backup Presets can be applied to all new VSs added to the cloud. Scheduled VS backups enable specific backups to be scheduled for individual VSs, outside of the auto-backup pattern.

Depending on your cloud settings, you can schedule either normal or incremental backup schedules:

- Adding normal backup schedule
- Adding incremental backup schedule

4.1.8.5.2.1 Adding a normal backup schedule

To add a normal backup schedule:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the Smart Server you want to schedule a backup for.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. On the screen that follows, click the New Schedule button.
6. Specify schedule details:
   - Period - how frequently the backup will take place according to a period type set. For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days.
Period type - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).

Rotation period - the number of backups after which the first backup will be deleted.

Start time - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).

7. Click the Save button to finish.

4.1.8.5.2.2 Adding an incremental backup schedule
1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the Smart Server you want to schedule a backup for.
3. Click the Backups tab, then choose Schedules, or click Auto-backups under the Options menu to view incremental backup schedules only.
4. Click the New Schedule button.
5. On the screen that appears, specify new schedule’s details:
   o Period - how frequently the backup will take place according to a period type set. For example, the period of 2 and the period type of days will take a backup every two days.
   o Period type - the backup period: days, weeks, months, or years. The period type must be unique for each backup target (disk or server).
   o Rotation period - the number of backups after which the first backup will be deleted.
   o Start time - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).
6. Click the Save button to finish.

4.1.8.5.3 Edit Smart Server Backup Schedule

4.1.8.5.3.1 To edit a normal backup schedule:
1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the Smart Server you want to schedule a backup for.
3. Click the Storage tab, then select Disks.
4. On the screen that appears, click the Actions button next to the disk you want to back up, then select Schedule for Backups.
5. Click the Edit icon next to a schedule to change its details.
6. Specify schedule details:
   o Period - how frequently the backup will take place according to a period type set. For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days.
   o Period type - the backup period: days, weeks, months, or years. The period type must be unique for each backup target (disk or server).
   o Rotation period - the number of backups after which the first backup will be deleted.
   o Start time - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run
according to the queue (the transactions created earlier or with higher priority will be launched first).

- *Enabled* - move the slider to enable or disable the schedule

For a schedule with the *Failed* status, you can move the *Enabled* slider to the right to run the schedule once again.

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

### 4.1.8.5.3.2 To edit an incremental backup schedule:

1. Go to your Control Panel > **Cloud** > **Smart Servers** menu.
2. Click the label of the Smart Server you're interested in.
3. Select **Backups** > **Schedules** tab, or click **Auto-backups** under the **Options** menu to view incremental backup schedules only.
4. Click the **Edit** icon next to a schedule to change its details:
   - **Period** - how frequently the backup will take place according to a period type set. For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days.
   - **Period type** - the backup period: days, weeks, months or years. The period type must be unique for each backup target (disk or server).
   - **Rotation period** - the number of backups after which the first backup will be deleted.
   - **Start time** - set the exact time of creating the transaction for backups scheduling. The transaction will be created at the specified time but run according to the queue (the transactions created earlier or with higher priority will be launched first).
   - **Enabled** - move the slider to enable or disable the schedule

For a schedule with the *Failed* status, you can move the *Enabled* slider to the right to run the schedule once again.

5. Click the **Save** button to save your changes.

### 4.1.8.5.4 Delete Smart Server Backup Schedule

#### 4.1.8.5.4.1 To delete a normal backup schedule:

1. Go to your Control Panel > **Cloud** > **Smart Servers** menu.
2. Click the label of the Smart Server you're interested in.
3. Click the **Storage** tab, then select **Disks**.
4. On the screen that appears, click the **Actions** button next to the disk with a backup schedule, then select **Schedule for Backups**.
5. Click the **Actions** icon next to the schedule you want to remove, then choose **Delete**.

#### 4.1.8.5.4.2 To delete an incremental backup schedule:

1. Go to your Control Panel > **Cloud** > **Smart Servers** menu.
2. Click the label of the Smart Server you're interested in.
3. Select **Backups** > **Schedules** tab, or click **Auto-backups** under the **Options** section to view incremental backups schedules only.
4. On the screen that appears, you will see the list of backup schedules.
5. Click the **Actions** icon next to the schedule you want to remove, then choose **Delete**.
4.1.8.6 Manage Smart Server Statistics

For your convenience, the system tracks VS performance and generates statistics on CPU utilization, billing, and Disk IOPS usage. In this document you can find information on how to view Smart Server statistics.

4.1.8.6.1 Smart Server CPU Utilization

OnApp tracks CPU usage for smart servers and generates charts that help analyze smart server performance.

The charts show the total CPU usage for all the cores of this particular smart server 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 > Smart Servers menu.
2. Click the label of the virtual server you're interested in.
3. Click the Overview tab > CPU Usage.
4. On the screen that appears, the top chart shows CPU usage for the last 24 hours. The bottom chart shows usage for the last three months (if there is enough data). If there is less data available, the chart will show utilization for the time available.
5. Move the Show in My Timezone slider to the right if you want to show bandwidth statistics according to your profile's timezone settings.
6. To zoom into a time period, click and drag in a chart. Click the 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.

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

4.1.8.6.2 Smart Server Billing Statistics

OnApp has a record of all the charges applied to your smart servers for the last three month period. If a smart server was created less than three months ago, statistics are recorded for the smart server'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 smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the smart server you're interested in.
3. Click the Overview > Billing Statistics tab.
4. You can filter the statistics by date and time - select the time period from the drop-down menu and click the Apply button. By default the statistics are generated for the last three months or the actual smart server existence period.

5. Move the Show in my Timezone box to slider to the right if you want to show bandwidth statistics according to your profile's timezone settings.

6. On the page that appears:

   The price parameters on this page do not take into consideration the free limits for resources set in the bucket.

   - **Date** – particular date and time for the generated statistics
   - **Users** – the server owner. Click the owner name to see the User Profile (user details)
   - **Virtual Servers** – the server name with the total due for smart server resources (CPU priority, CPUs, memory and template resources) for the point of time specified in the Date column.
   - **Disks Usage** – the list of disks assigned to this smart server 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 smart server, 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).

4.1.8.6.3 Smart Server Disk IOPS Statistics
The system tracks IOPS (Input/Output Operations per Second) for smart servers and generates charts that help analyze smart server 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 smart server:

1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the 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:

   o IOPS for the last hour
   o IOPS for the last 24 hours
   o Data written/read (in Kb) for the last 24 hours
   o Data written/read (in Kb) 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.

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.
See also:
- User Billing Statistics
- Resource Allocation and Prices
- Permissions

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Smart%20Server%20Statistic

4.1.8.7 Smart Server Integrated Console
OnApp provides an integrated VNC console that gives users direct access to their smart servers through the Control Panel UI. The noVNC console is provided for smart servers that are built on KVM CentOS 7 based on WebSockets. Users with the Administrator role can access all smart server consoles for support and troubleshooting purposes. The console connects a user browser to a VNC port or VNC WebSocket port available via a compute resource for the guest console.

To access the smart server VNC console via the Control Panel:
1. Go to the Cloud > Smart Servers menu.
2. Click a label of a destination smart server.
3. Click the Console tab.

For the HTML5 console, click the Re-connect button if the connection is lost. The re-connection to the console runs as follows:
- If the console runs as expected, clicking the Re-connect button causes disconnection and the console is re-connected automatically after 1.5 seconds.
- If the console gets stuck, clicking the Re-connect button runs your request once again and re-connects the console without reloading.
- If the console gets disconnected with a status code and an error message, the console is re-connected automatically after 1.5 seconds.

To use the Java console instead of HTML5, go to Admin > Settings > Configuration and edit settings in the System tab. For more information, refer to System Configuration.

See also:
- Smart Server Transactions and Logs
- Smart Server Recipes
- Smart Server Recipe Custom Variables
- Smart Server Billing

https://onappcloud.typeform.com/to/A64Euy#source=Smart%20Server%20Integrated%20Console

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

To view transactions for a smart server:
1. Go to your Control Panel > Cloud > Smart Servers menu.
2. Click the label of the server you're interested in.
3. The details screen for that server shows recent transactions in the Activity Log section.

To cancel pending tasks, click the Cancel All Pending Tasks for this Smart Server button.

To cancel the TakeBackup transaction which is running longer and exceeding the time set for a zombie transaction:
1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. Click the label of the required virtual server.
3. On the following page, in the Activity Log section, hover over the icon of the transaction and then click that appears on the icon of this transaction.

   Please note that this option becomes available if the transaction has been running for the period of time specified in the Zombie transaction time parameter, which can be found at your Control Panel > Admin > Settings > Configuration icon.

4. In the dialog box, click Proceed.

   The rollback is executed starting from the command which has been canceled.

See also:
• Smart Server Recipes
• Smart Server Recipe Custom Variables
• Smart Server Billing

https://onappcloud.typeform.com/to/A64Euy#source=Smart%20Server%20Transactions%20and%20Logs

4.1.8.9  Smart Server Recipes
In this document, you can find information on how to manage smart server recipes.

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

### 4.1.8.9.2 Assign Recipe

Drag and drop recipe to assign it to the 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 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.

### 4.1.8.9.3 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** icon next to the recipe you want to remove.

See also:
4.1.8.10 Smart Server Recipe Custom Variables

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

To create a new custom variable:

1. Go to your Control Panel > **Cloud** > **Smart Servers** menu.
2. You'll see a list of all smart servers in your cloud. Click the name of a smart server for which you want to create a variable.
3. On the smart 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 the 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 smart servers. Note: smart server custom variables will always overlay template custom variables.

See also:

- **Smart Server Integrated Console**
- **Smart Server Transactions and Logs**
- **Smart Server Recipes**
- **Smart Server Billing**
5. Create a smart server under this user's account, and allocate the required smart server on a compute zone that you've just added to the bucket.

Smart servers are also charged for IP addresses and the maximum port speed value (set in Admin > Settings > Defaults configuration).

See also:
- Buckets
- Smart Server Integrated Console
- Smart Server Transactions and Logs
- Smart Server Recipe Custom Variables

https://onappcloud.typeform.com/to/A64Euy#source=Smart%20Server%20Billing

4.1.8.12 Smart Server Acceleration Settings
If you have accelerated smart servers, the Acceleration tab is available to you. At this tab, you can view accelerated smart server statistics, blacklist domains and remove cache content. The functionality is available for accelerated virtual servers and smart servers.

4.1.8.12.1 Accelerated Smart Server Statistics
This section provides the information on how you can view bandwidth statistics and cache utilization statistics of an accelerate-enabled smart server.

Ensure that Accelerate any Virtual Server/Accelerate own Virtual Servers permissions are on before managing accelerated VS statistics. For more information about permissions, refer to the OnApp Permissions section of this guide.

To see the bandwidth and cache utilization statistics:
1. Go to your Control Panel's Smart Servers menu.
2. Click the label of the accelerate-enabled smart server you're interested in.
3. Click the Acceleration tab > Reporting.
4. On the screen that appears, specify the period in the From and To fields and click the Apply button. The default period is the last week.
5. The first chart shows bandwidth statistics: the total cached/non-cached statistics. The second chart shows cache utilization statistics: the number of pages cached on the Edge (hits) as well as the number of misses - the pages which are not cached.
6. To zoom into a time period, click and drag in a chart. Click the Reset Zoom button to zoom out again.

4.1.8.12.2 Blacklist Domains
Blacklisting domains allows you to block a number of websites from being accelerated. This feature enables blacklisted websites to load from Origin again, while other websites hosted on the same smart server remain accelerated.

To blacklist a domain, do the following:
1. Go to your Control Panel's Smart Servers menu.
2. Click the label of the accelerate-enabled smart server you're interested in.
3. Click the Acceleration tab > Blacklist domains.
4. Fill in the domains you want to blacklist.
5. Click the **Save** button.  

Now when domains of choice are blacklisted, all the requests will be forwarded to origin directly and the response header will bypass Accelerator without any additional optimization.

### 4.1.8.12.3 Purge Content

This tool allows instant removal of cache content for the accelerated smart servers. You can purge all content or one/several files. In cases when you want to purge one or several files, the system will compare the checksum of the cached file and the new one. The cached file will only be purged if the checksums vary, that is, the files are different. If the checksum of the two files is the same, the cached file will not be purged. When you purge all content, the checksums of the cached and new files are not taken into account.

#### Limitations and prerequisites:

- This tool applies only to accelerated smart servers.
- You need to have CDN enabled for the cloud to use the purge feature.
- You need have the **Allow to purge content of all Virtual Servers** or the **Allow to purge content of Own Virtual Servers** permission enabled to use this feature. For more information, refer to [OnApp Permissions](https://onappcloud.typeform.com/to/A64Euy#source=Smart%20Server%20Accelerator%20Settings).  
- If several customers accelerate their smart servers using one Accelerator, they can purge each other's files, provided that they enter the correct URL.

To purge one/several files:

1. Go to your Control Panel > **Smart Servers**.
2. Click the label of the required smart server.
3. Click the **Acceleration** tab > **Purge**.
4. In the input field, specify the path(s). You may indicate only one path per line. You can fill in either the original URL, the one prior to acceleration or the accelerated URL.
5. Click the **Submit** button to finish.

To purge all content:

1. Go to your Control Panel > **Smart Servers**.
2. Click the label of the required smart server.
3. Click the **Acceleration** tab > **Purge**.
4. Click the **Purge All Contents of this Site** button to purge all content.

https://onappcloud.typeform.com/to/A64Euy#source=Smart%20Server%20Accelerator%20Settings

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### 4.1.9 Baremetal Servers

Baremetal servers are physical servers that reside directly on the hardware without the virtualization layer. Baremetal servers are hosted on the dedicated baremetal compute resources, deployed for a single user. Utilization of baremetal servers allows locating customer's servers on a single piece of hardware. Use of baremetal servers in the cloud makes hardware resource utilization more efficient.

The advantages of baremetal servers:

- full access to the entire server
- tight security

Baremetal servers are provisioned via KVM CloudBoot compute resources that can be then organized into zones to create different tiers of service - for example, by setting up different zones for baremetal servers, with limits and prices specified per zone. Baremetal compute
zones can also be used to create private clouds for specific users. Limits and prices are specified individually for each baremetal compute zone assigned to the bucket.

You can enable recovery mode for baremetal servers. For details, see [Enable Recovery Mode for Baremetal Servers](#).

- Autoscale, Segregate and VIP status options are not available for baremetal servers. Also, it’s not possible to wipe disks, as OnApp cloud administrators do not have access to baremetal server disks.
- VLANs are not configured automatically on baremetal servers. You need to configure them manually in accordance with your OS and hardware settings.

See also:
- [Create Baremetal Server](#)
- [Manage Baremetal Servers](#)
- [Baremetal Servers (API)](#)

https://onappcloud.typeform.com/to/A64Euy#source=Baremetal%20Servers

### 4.1.9.1 Manage Baremetal Servers

Baremetal servers are physical servers that reside directly on the hardware without the virtualization layer. Baremetal servers are hosted on dedicated baremetal compute resources, deployed for a single user. Utilization of baremetal servers allows locating customer's servers on a single piece of hardware. Use of baremetal servers in the cloud makes hardware resource utilization more efficient. In this document, you can find information on how to manage baremetal servers.

#### 4.1.9.1.1 View Baremetal Server Details

1. Click the label of the server you're interested in.
2. On the screen that appears, you'll see the baremetal server properties and activity log:
   - Template this server is built on
   - *FQDN* (fully qualified domain name)
   - Baremetal compute resource group the server belongs to
   - Login credentials
   - Owner
   - *IP Addresses*
   - *Estimated Price per hour*. This sum does not take into consideration the free limits for resources set in the bucket. Therefore, the final price for the server might differ from the sum indicated here.
   - *Admin Notes*
   - *User Notes*
   - Activity log
3. To remove all pending tasks from the log, click the [Cancel all pending tasks for this Baremetal Server](#) button at the bottom of the screen.

#### 4.1.9.1.2 Baremetal Server Recovery Mode

To reboot a baremetal server in the recovery mode:
1. Go to your Control Panel > **Cloud > Baremetal Servers** menu.
2. On the screen that appears, click the label of the baremetal server you want to reboot in the recovery mode.
3. On the baremetal server screen, click the **Actions** button, then choose **Enable Recovery Mode**.

To disable recovery mode for a baremetal server:
1. Go to your Control Panel > **Cloud > Baremetal Servers** menu.
2. On the screen that appears, click the label of the required baremetal server.
3. On the baremetal server screen, click the **Actions** button, then choose **Disable Recovery Mode**.

### 4.1.9.1.3 Delete Baremetal Server

To remove a baremetal server from the cloud:

1. Go to your Control Panel > **Cloud > Baremetal Servers** menu.
2. On the screen that appears, you’ll see the list of all baremetal servers in the cloud. Click the label of the server you want to delete.
3. On the baremetal server screen, click the **Actions** button, then choose **Delete Baremetal Server**.

After a user has been deleted a baremetal server, OnApp administrator receives an email notification. After that, administrator must reclaim a baremetal compute resource by manually rebooting it, to make it available for new baremetal server creation.

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**See also:**
- Compute Resources
- Virtual Servers
4.1.9.2 Manage Baremetal Server Recipes

In this document, you can find information on how to manage baremetal server recipes.

4.1.9.2.1 Assign Recipe

You can assign baremetal server recipes to the VS provisioning event to run the recipe during baremetal server provisioning.

To assign a recipe to the desired event:

1. Go to your Control Panel > Cloud > Baremetal 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 the available recipes the cloud:
5.   - 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.
6. Click the arrow button in front of the required event to unfold it.
7. Select the required recipe in the left pane and hold it down with the left mouse button.
8. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

4.1.9.2.2 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.

See also:

- Recipes
- Baremetal Server Recipe Custom Variables
- Baremetal Server Billing
- Manage Baremetal Servers

4.1.9.3 Manage Baremetal Server Recipe Custom Variables

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

To create a new custom variable:
1. Go to your Control Panel > **Cloud** > **Baremetal Servers** menu.
2. You'll see a list of all baremetal servers in your cloud. Click the name of a server for which you want to create a variable.
3. On the baremetal server details screen, click the **Overview** tab, then choose **Custom Recipe 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 the 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 baremetal servers.

Baremetal server custom variables will always overlay template custom variables.

See also:
- **Recipes**
- **Baremetal Server Recipes**
- **Baremetal Server Billing**
- **Manage Baremetal Servers**

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Baremetal%20Server%20Recipe%20Variables

**4.1.9.4 Baremetal Server Billing**

Baremetal servers are billed in a slightly different way than other server types. You can only set the IP address and template limits and prices for your baremetal servers.

To charge for baremetal server resources:

1. Create a **baremetal server compute zone** and attach baremetal compute resources to this zone.
2. Create a **bucket**.
3. Add the compute zone (baremetal server type) to the bucket and set the limits and prices in the bucket's Access Control and Rate Card for this zone.
4. Add a network zone to the bucket's Access Control.
5. Set the IP address limits for VSs powered off in the bucket's Access Control and set the price in the Rate Card. Each server deployed will take an IP from the network zone added to the bucket, and will be billed for each IP address taken. For more information, see [Configure Resource Allocation and Prices](#).
6. Go to the Template Store section of the bucket menu, add the required store to the Access Control. In the bucket's Rate Card set the add the required template store and set the price for each of the templates. Each time a baremetal server is built on the
specific template, the user will be charged the amount set. For more details, see Template Store.

7. Assign a user to this bucket.

8. Create a baremetal server under this user’s account based on the baremetal compute resource in a compute zone that you’ve just added to the bucket.

Do not set any other limits except the ones described above.

See also:
- Buckets
- Baremetal Server Recipes
- Baremetal Server Recipe Custom Variables
- Manage Baremetal Servers

https://onappcloud.typeform.com/to/A64Euy#source=Baremetal%20Server%20Billing Leave feedback

4.1.10 Hot Resize

Hot resize enables scaling of such resources as RAM and CPU without rebooting the virtual server.

Such ability depends on many factors:
- template properties (whether template itself supports such functionality)
- type of virtualization of the compute resource on which the virtual server is running
- used hardware
- other peculiarities of the overall cloud environment

Below you can find hot resize template matrix and several considerations about max memory.

4.1.10.1 Hot Resize Matrix for Templates

Hot resize matrix is reflected in resize_without_reboot_policy parameter, introduced since OnApp 3.3.1 which can be checked with API call for templates. The API request will return the following parameter:

- resize_without_reboot_policy - all specifically tested templates (all newly added templates and some of the most frequently used ones) will have this parameter which indicates the hot resize possibility for a particular template considering its OS version and virtualization type:
OnApp Cloud 6.7 Admin Guide

```xml
<resize_without_reboot_policy>
  <xen>
    <centos5 type="integer">14</centos5>
    <centos6 type="integer">14</centos6>
    <centos7 type="integer">14</centos5>
  </xen>
  </kvm>
</resize_without_reboot_policy>
```

<table>
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<th>Binary</th>
<th>000</th>
<th>001</th>
<th>010</th>
<th>011</th>
<th>100</th>
<th>101</th>
<th>110</th>
<th>111</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decimal</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
</tbody>
</table>

The indicated integer is a decimal representation of a 4-bit binary code, which indicates whether CPU or RAM can (1) or cannot (0) be resized without reboot, where:

- 1st bit defines the ability to increase cpu
- 2nd bit defines the ability to decrease cpu
- 3rd bit defines the ability to increase RAM
- 4th bit defines the ability to decrease RAM

Be aware that bits are counted from right to left.

- Some of the older and less common templates may not be tested according to Hot Resize Matrix, hence the `resize_without_reboot_policy` parameter will not be set, and `allow_resize_without_reboot` parameter will define whether the template supports resize without reboot.
- `allow_resize_without_reboot` defines the template’s resize capabilities but does not consider the virtualization type, thus may not be entirely accurate.
- For the test results which consider the templates’ resize without reboot possibilities under different virtualization types, refer to this document.

### 4.1.10.2 Max Memory Considerations

When a template and virtualization type supports a resize of RAM, the amount of memory allocated to a VS cannot exceed the `max_memory` parameter or the virtual server will be rebooted.

The `max_memory` value depends on the type of a compute resource virtualization and is calculated as follows:

- **XEN**
  
  \[ \text{max\_memory} = \text{current\_memory} \times 16 \]
  
  For example, if a virtual server is allocated with 2 GB of RAM, the VS may be scaled up to 32 GB without a reboot.
- KVM
  
  \( \text{max\_memory} = \text{current\_memory} \) (is set after each reboot)

Thus, you may scale RAM down and then back to the original value without reboot; value exceeding \( \text{max\_memory} \) will require reboot, and will constitute \( \text{current\_memory} \) afterwards.

There are several workarounds to scale up RAM for virtual servers running on KVM:

1) To hot resize KVM CentOS 6.x x64 virtual servers:
   - Enable ballooning release resource type (Control Panel > Settings > Compute zones > Edit Compute Zone)
   - Additional Set max memory slider appears automatically. Move the slider to the right to enable max memory parameter for every VS within the compute zone. When you enable the Set max memory option, the limit for VSs is calculated as follows:

   \( \text{max\_memory} = \text{current\_memory} \times \text{compute\_resource\_max\_memory\_rate} \)

   The default compute resource max memory rate is eight (8). To modify the default max memory rate, change a value of the \( \text{kvm\_max\_memory\_rate} \) parameter in the on_app.yml file. If the calculated max memory limit is more than 90% of free RAM available on a compute resource, then the limit is equal to 90% of free RAM available on the compute resource. You can also customize a max memory limit for a particular virtual server. For more information, refer to Set Max Memory.

2) If you enable Autoscale Virtual Server and set autoscaling rule for RAM, then the \( \text{max\_memory} \) value will be ignored and RAM can be increased within the value set in 24hr limit (up_to parameter) field without reboot. The RAM increase can be either triggered by the set autoscaling rule or manually, using the Edit menu.

   \textbf{NOTE:} If you manually increase the RAM over the 24hr limit value - the virtual server will be rebooted.

### 4.2 Components

There are three main components at OnApp that you can use to customize your virtual server or another appliance:

- [https://docs.onapp.com/display/TEST2/Templates](https://docs.onapp.com/display/TEST2/Templates) Templates
- [https://docs.onapp.com/display/TEST2/Service+Add-Ons](https://docs.onapp.com/display/TEST2/Service+Add-Ons) Service Add-ons
- [https://docs.onapp.com/display/TEST2/Recipes](https://docs.onapp.com/display/TEST2/Recipes) Recipes
- [https://onappcloud.typeform.com/to/A64Euy#source=Components](https://onappcloud.typeform.com/to/A64Euy#source=Components) Leave feedback

#### 4.2.1 Templates

This chapter provides an overview on what templates in OnApp are, the management tips, the information on creating your own templates and providing them as a paid resource for your customers.

4.2.1.1 What Are Templates?

A template is a fully preconfigured operating system environment – a tar + gzip archive that contains the root directory of an operating system. A basic template includes the data needed for a minimum OS installation, but templates may also include applications and additional OS components.

OnApp templates are used to deploy virtual servers in your cloud. The OnApp template library includes over 100 VS templates based on various 32-bit and 64-bit versions of Windows and Linux operating systems. OnApp customers can also access a large number of JumpBox virtual compute resources and deploy them as templates in OnApp.
4.2.1.2 Windows Templates

Windows 2008 and Windows 2008 R2 templates are not supported after 6.2 Patch 1.

To create a virtual server from a template which is based on paid software, such as MS Windows, you must have a valid license. The system verifies if you have a license before allowing the VS to be created, so before creating a VS you must first upload the license keys you've bought to OnApp, or connect to a licensing server.

OnApp supports three license types:

- **MAK licensing**: the default licensing type applied to all Windows-based VSs.
- **KMS licensing**: this is applicable to Windows 2008 and up.
- **User licenses**: allow end users to input a license key when creating a VS.

Windows Server 2003/XP OSs have come to their end-of-life on July 14th, 2015 and are no longer supported. Thus OnApp version 4.0 introduces new Windows templates version 4.x with Cygwin as SSH server (instead of CopSSH as in versions 3.x).

- New 4.0 templates cannot be used in OnApp version 3.x or below.
- Windows templates version 3.x can be used in OnApp version 4.0 without restrictions.

For more information, refer to the Template Software Licenses page.

4.2.1.3 Types of Templates

There are two different kinds of template:

- **System templates**: These are provided by OnApp and downloaded from an online library. They comprise an operating system with the latest set of packages installed. Most Linux templates require 2–10 GB. Some Windows Templates with additional software may require minimum disk size of 30 GB - e.g. `win12_x64_std-sqlweb-ver3.2-kvm_virtio`. Minimum disk size for new 4.0 Windows templates is 30 GB (40 GB for templates with MS SQL).

- **Custom/user templates**: These are templates you create by backing up an existing virtual server, and converting that backup to a template. This allows you to pre-configure virtual servers (for example with specific OS settings, or pre-installed applications) and use the same configuration again and again.

For more details on how to create a custom templates from a backup, refer to the Convert Virtual Server Backup to Template and Create Custom Templates sections.

You can use the following templates for smart servers and baremetal server creation:

<table>
<thead>
<tr>
<th>OS</th>
<th>Baremetal Servers</th>
<th>Smart Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>CentOS 6 64 bit</td>
<td>CentOS 6 64 bit</td>
</tr>
<tr>
<td></td>
<td>Red Hat Enterprise Linux 6.0 x64</td>
<td>Red Hat Enterprise Linux 6.0 x64</td>
</tr>
<tr>
<td></td>
<td>Debian 6.0 LAMP x64</td>
<td>Debian 6.0 LAMP x64</td>
</tr>
<tr>
<td></td>
<td>Ubuntu 19.04 x64</td>
<td>Ubuntu 20.04 x64</td>
</tr>
</tbody>
</table>
The templates with embedded Microsoft SQL have been removed from OnApp repository. You can use a new template with Microsoft SQL Express in it, which is free to use. If you require a full SQL version, you should build a new template from a base Windows platform.

4.2.1.4 Where Templates Are Stored

Depending on the configuration of your cloud, new templates are stored at different locations:

<table>
<thead>
<tr>
<th>Configuration of your cloud</th>
<th>Storage locations for templates</th>
</tr>
</thead>
<tbody>
<tr>
<td>No backup servers and ssh_file_transfer option is disabled</td>
<td>In this configuration, the templates will be uploaded to all compute resources. If this template already exists somewhere, the action is skipped. In such case NFS or any other sharing service should be enabled between compute resources.</td>
</tr>
<tr>
<td>No backup servers and ssh_file_transfer option is enabled</td>
<td>The template is uploaded to this ssh_file_transfer server only.</td>
</tr>
<tr>
<td>There are backup servers and ssh_file_transfer option is disabled</td>
<td>The templates are uploaded to all backup servers. The action is skipped if such a template already exists. In this configuration ensure that some sharing service is between backup servers. Provisioning is performed at backup servers only. If there is more than one backup server in the cloud, the user is prompted to choose to which BS a template will be stored.</td>
</tr>
<tr>
<td>There are backup servers and ssh_file_transfer is enabled</td>
<td>The templates are uploaded to this ssh_file_transfer server only.</td>
</tr>
<tr>
<td>High Availability is configured for the Cloud</td>
<td>In this configuration, make sure to store templates at Database&amp;Transactions server or any other server with shared NFS service, so that both Control Panels could access the templates directory.</td>
</tr>
</tbody>
</table>

The following scheme demonstrates the possible template storage locations depending on your system's configuration:
4.2.1.5 Template Store
Template store enables you to organize individual templates into groups that can be used as a paid resource for buckets. This allows you to easily create groups of templates which can be added to the bucket. Only those groups which are added to a bucket will be available to a user.

For detailed instructions, refer to the Template Store section.

4.2.1.6 My Template Group
My Template Groups allow you to create own license groups for your own personal/custom templates. The groups cannot be shared amongst the users. Also, for Windows based templates, My Template Groups provide the possibility to use your own licensing type regardless of your bucket.

For detailed instructions, refer to the My Template Groups section.

4.2.1.7 Configuration Options
You can set template configurations for your cloud in the settings menu at Dashboard > Admin > Settings > Configuration > Backups/Templates tab. This menu lets you set the following template-related parameters:

- The URL of the required template server
- Whether you want to delete the downloaded templates after they were distributed
- The system path to templates and recovery templates

During Control panel install/upgrade process, the following values are set by default:

- Template server URL - http://templates-manager.onapp.com
- Path to Templates - /onapp/templates
- Path to Recovery templates - /onapp/tools/recovery
Templates and backups can be stored on a remote server or a mounted disk. If you wish to store templates and backups remotely, you should also configure the following settings:

- Template/backup server IP, user login and SSH options
- Whether to use SSH file transfer for your template/backup server or not

For more information, refer to Edit Backups/Templates Configuration.

4.2.1.8 Installation and Update

The OnApp template library includes over 100 VS templates based on various 32-bit and 64-bit flavours of Windows and Linux operating systems. You can also access a large number of JumpBox virtual compute resources and deploy them as templates in OnApp. The templates library is constantly updated. You can manage new templates with the OnApp template manager that connects to template server and allows you to:

- update the system templates which are already installed to your cloud
- download and install new templates available on a template server.

The Template server URL has to be set at Control Panel > Admin > Settings > Configuration > Backups/templates tab as a prerequisite for installing/upgrading templates.

For detailed instructions, refer to the Install/Update Templates section.

4.2.1.9 Billing

You can set up templates as a paid resource in several ways.

To set the pricing for the individual templates, go to the buckets Rate Card at Control Panel > Admin > Buckets > Label > Rate Card > Other and add the required template stores. Here you can set a price for each individual template per hour. As a single template can be included in multiple template stores, the same template will have the same price in all the template stores added to the rate card of a single bucket. If you add/edit the price of a template in one template store, the price of the same template will change to the new value in all the template stores in the rate card.

Once you add a template to the Rate Card, all the template stores that contain that template will be added to that Rate Card with a price set only for that template.

You can also configure the pricing for the template storage space and the amount of templates allowed per account.

If the templates are stored on compute resources or SSH file transfer server, you can apply the Templates, ISOs & Backups Storage and Template limits in the Miscellaneous section of the bucket.

If the templates are stored on backup servers, apply the limits and pricing for Backup Server Zone limits.

For more info, refer to Template Store and Configure Resource Allocation and Prices.

If you add template related resources only to the bucket's Rate Card, users under the bucket will not have access to the templates. You need to configure the bucket's Access Control to make resources available to the users under the bucket.

See also:

- Template Software Licenses
- Manage Template Recipes
- Template Store
4.2.1.10 Manage ISOs

OnApp allows uploading your custom bootable ISOs for recovery purposes. These could be different images for Windows/Linux/FreeBSD or any additional software. As a cloud administrator, you can limit user's ability to upload and manage ISOs by permissions and in buckets. You can boot virtual servers from your own ISOs or the ISOs that are uploaded and made publicly available by other users. The default maximum size for uploading ISOs from the file system is 1 GB, this value can be changed at Control Panel > Admin > Settings > Configuration > Max upload size in bytes. There are no space limitations for the ISOs uploaded form the URL (except for your disk space limitations).

- OnApp supports rebooting existing virtual and smart servers from ISO.
- To build a new server from an ISO, create a server using the creation wizard and then reboot this VS from the appropriate ISO.
- As soon as you boot a VS from the installation ISO, OnApp cannot control any VS components (backups, networks, disks).
- Be aware that all the contents of the disk might be deleted if a VS is booted from the ISO that installs a new distributive.
- If you boot a VS from an ISO with the RAM requirement larger than the VS's RAM, the transaction will fail.
- If your cloud deployment is not a fresh installation, make sure that permissions on ISOs are enabled. For more info, refer to OnApp Permissions.

You can upload your own ISOs and make them available to all users of the cloud (the way the templates work in OnApp). After the ISO is uploaded, it is possible to select the Boot from ISO option on VS management screen.

Starting from OnApp 6.5, Xen virtualization type is not supported.

View ISOs

To view the ISOs available to you:

1. Go to your Control Panel > Cloud and click Templates.
2. Select ISO list from the menu that expands.
3. The page that loads, will show the list of ISOs available to you separated into four tabs:
   - All ISOs - the list of all ISOs available on your system
   - System ISOs - the list of the ISOs that are publicly available to all users
   - My ISOs - the list of custom ISOs uploaded by the user who is currently logged in
   - User ISOs - the list of the ISOs uploaded by your users

For each ISO listed, you see the following details displayed:

- Log status - the status of the last log item of the ISO (complete/pending/failed). Click the status to view the log details for the ISO (available to the ISOs that were uploaded through an URL).
- OS - the icon that indicates the operating system of the ISO
- Label - the name of the ISO
- Min memory size - the minimum RAM size required for the ISO
- Operating systems - the operating system on the ISO
- **Virtualization** - the virtualization type chosen for the ISO
- **Actions** - click the Actions icon to perform the following procedures with the ISO:
  - Edit ISO
  - Delete ISO
  - Make Public - only for the images from the My ISOs and User ISOs tabs

4.2.1.10.1 Boot from ISO

4.2.1.10.1.1 Share Location Where ISOs are Stored

The default configuration is to upload ISOs on the Control Panel server. Then it is required to mount and share the location where the ISOs are stored at CP with all the compute resources. When the virtual servers are booted from the ISOs, the ISO is taken from the compute resource server. The location is preconfigured at on_app.yml config file which can be found in /onapp/interface/config/on_app.yml.

- `iso_path_on_cp` - specifies the location where ISOs are stored on the Control Panel server. By default the location is /data. You can change it to any other suitable location. Make sure that this location is shared with the specified `iso_path_on_hv` location.

- `iso_path_on_hv` - specifies the location where ISOs are located on the compute resource servers. By default the location is /data. You can change it to any other suitable location with the onapp owner and read/write access. Make sure that this location is mounted to the specified `iso_path_on_cp` location.

CloudBoot compute resources mount the /data location automatically at boot to the /onapp/tools/recovery on HV. ISOs can be hosted on a dedicated server at any desired location with an arbitrary name if you wish. In this case it is necessary to mount the ISOs' location on this server to the Control Panel `iso_path_on_cp` directory and all the compute resources' `iso_path_on_hv` locations. This can be a backup server to avoid the excess usage of the Control Panel's space.

4.2.1.10.1.2 Enable ISO Permissions

If your cloud deployment is not a fresh installation, make sure to enable the following permissions for your Admin and other roles as appropriate:

- **Any action on ISOs** - the user can take any action on ISOs
- **Create a new ISO** - the user can create a new ISO
- **Destroy any ISO** - the user can delete any ISO (own, user, and public)
- **Destroy own ISO** - the user can only delete own ISO
- **Destroy user ISO** - the user can delete ISOs created by any user, but not public ISOs
- **Make any ISO public** - the user can make public any ISO available to all users
- **Make own ISO public** - the user can make public own ISOs only
- **Make user ISO public** - the user can make public ISOs created by any user
- **Create and manage own ISOs** - the user can create and edit/delete/view own ISOs
- **Manage all ISOs** - the user can manage own/user/public ISOs
- **Create and manage user ISOs** - the user can view/create/edit/delete ISOs created by any user
- **See all ISOs** - the user can view all ISOs in the cloud
- **See own ISOs** - the user can only view the ISOs created by themselves
- **See all public ISOs** - the user can view all public ISOs
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- See user ISOs - the user can view the ISOs created by any user in the cloud
- Update any ISO - the user can edit any ISO in the cloud
- Update own ISO - the user can only edit own ISO
- Update user ISO - the user can edit the ISOs created by any user in the cloud

For more info, refer to OnApp Permissions.

4.2.1.10.1.3 Upload ISO(s) into the Cloud

Before uploading ISO for the first time, a root user has to create a /data folder in one's Control Panel.

Once you've configured the locations for storing ISOs and enabled the necessary permissions, you can add new ISOs to the system. You can also make your ISOs public so that other users can boot their virtual servers from the ISOs you have uploaded.

To upload an ISO file, follow the next steps:

1. Go to your Control Panel > Cloud and click the Templates menu from the left navigation pane.
2. Select ISO list from the menu that expands.
3. On the page that loads, click the Upload ISO button at the bottom of the screen.
4. Choose the ISO to upload and fill its details:
   - Make public - move the slider to the right if you want to make the ISO publicly available
   - Allowed hot migrate - move the slider to the right if you want to be able to hot-migrate VS created from this ISO
   - Label - choose a name for the ISO
   - Version - fill in the version of the ISO
   - Min disk size - specify the minimum required disk size for the ISO (1 GB by default)
   - Min memory size - specify the minimum required RAM for the ISO (128 MB by default)
   - Operating system - choose the operating system of the ISO
   - Operating system distro - fill in the operating system distribution of the ISO in free form
   - Virtualization - tick the required virtualization type(s): KVM or KVM+Virtio
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 ISO file from your file system. The yellow infobox will show the maximum file size for ISOs. The max upload size is pre-configured at Settings > Configuration (the Max upload size in bytes). Click the Upload ISO button.
   - File URL - select this tab if you want to upload the ISO from URL and specify the link from which the ISO will be uploaded.
6. Click Save to upload the ISO.

After you upload an ISO to the cloud, it can be found at Cloud > Templates > ISO List > My ISOs tab. The ISOs uploaded by your users are under the User ISOs tab.
4.2.1.10.1.4 Make ISO(s) Public
By default ISOs are available only to those users who uploaded them. These ISO images are available in the My ISOs tab. To make your ISO public and accessible for all users:

1. Go to your Control Panel > Cloud > Templates > ISO List menu.
2. Click My ISOs tab.
3. Click the Actions button next to the ISO you want to make public, then select Make public.
4. Confirm the window that pops up.

When you make a user ISO public, it is moved to the System ISOs tab.

- Make sure that you have enabled the Any power action on own virtual servers and Allow own virtual servers to boot from ISO permissions for the user to be able to boot servers from ISO.
- Note that you should track the Operating System Type option of the compute resource where the current VS lives.
  - If the compute resource is set to Any, any ISO that has other suitable requirements is available to boot from.
  - If the compute resource has Windows only option enabled, the ISO that has Windows operating system is available for selection.
  - If the compute resource has the Non-Windows option enabled, the ISOs with OSs Linux and FreeBSD are available for selection.

4.2.1.10.1.5 Boot Virtual or Smart Server from ISO
Once you have shared the location where ISOs are stored and uploaded ISOs into the system, you can boot virtual or smart servers from them using the server's power options menu. To boot a virtual/smart server from ISO:

1. Go to your Control Panel > Cloud > Virtual Servers/Smart Servers menu.
2. Click the label of the required server.
3. Click the Actions button on the server's screen, point to Power, and select Boot from ISO. You can boot virtual/smart servers from your own ISOs or the ISOs that are uploaded and made publicly available by other users. If you boot a server from an ISO with the RAM requirement larger than the server's RAM, the transaction will fail.

4.2.1.10.2 Edit ISOs
To edit the ISOs available to you:

1. Go to your Control Panel > Cloud and click Templates.
2. Select ISO list from the menu that expands. The page that loads shows the list of ISOs available to you.
3. Click the Actions button next to the required ISO and choose Edit ISO.
4. On the page that loads you can edit the following ISO details:
   - Allowed hot migrate - move the slider to the right if you want to be able to hot-migrate VS created from this ISO
   - label - choose the name for the ISO
   - version - fill in the version of the ISO
   - min disk size - specify the minimum required disk size for the ISO
   - min memory size - specify the minimum required RAM for the ISO
   - operating system - choose the operating system of the ISO
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4.2.1.10.3 Delete ISOs

To delete an ISO:

1. Go to your Control Panel > Cloud and click Templates.
2. Select ISO list from the menu that expands. The page that loads shows the list of ISOs available to you.
3. Click the Actions button next to the required ISO and choose Delete ISO.

See also:

- ISO Virtual Servers
- Virtual Server Power Options
- Smart Server Power Options

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20ISOs

4.2.1.11 Manage OVs

You can import virtual servers created at other virtualization platforms into OnApp, using the OVA functionality. OVA is a file with the Open Virtualization Format (OVF) package contents all zipped into a single archive. OVF is an open-source standard for packaging and distributing software applications for virtual servers.

The OVA import procedure involves uploading the OVA file to CP, converting it into a KVM and/or vCenter template, adding the template to the template store and building a virtual server from the template. This procedure consists of the following steps:

1. **Uploading OVA**
   To start with, you need to upload the OVA archive to your OnApp CP.

2. **Converting OVA**
   Next, you can convert OVA into a KVM-based and/or vCenter-based template with the VS configuration predefined in the OVA file.

3. **Adding Template to Template Store**
   After converting OVA, you need to add the template to any group in the template store so that it would be possible to build VSs from the template.

4. **Configuring Billing**
   Also, you can add a template group created during the previous step to a bucket in order to provide different levels of accessibility to the template group for different users.

5. **Building VS from Template**
   Finally, you can build a virtual server based on the OVA template.

Before you proceed to uploading OVA, take into account Limitations and Prerequisites and learn how to Convert OVF to OVA.
• OVA functionality is supported for KVM and vCenter compute resources.

• It is required to have at least one backup server running on CentOS 6 or CentOS 7 in the cloud to import OVA and build virtual servers from OVA templates.

• Ext3, Ext4 and XFS file systems are supported for OVAs. The XFS file system is supported for Linux OSs imported from OVA, both for primary and secondary disks.

• XFS partitions created on CentOS 7 cannot be mounted on CentOS 6, so it is recommended to use a CentOS7 backup server.

• If your cloud deployment is not a fresh installation, make sure that permissions on OVAs are enabled. For more info, refer to OnApp Permissions.

• OVAs based on Windows 10 can be supported if the required CPU flags are enabled on the compute resource where the OVA virtual server will be built.

• It is not possible to create a VS based on OVA using instance packages at this time.

• Be aware, that when the backup server and OVA use default CentOS, the volume group names are identical and this can cause a conflict.

• Currently, the following file formats are supported for virtual hard disk drives: VMDK, VHD, RAW, IMG, VDI.

• Be aware that files inside OVA should not be archived, otherwise OVA upload will fail.

• Recipes and backups are not compatible with VSs built from Windows OVA.

• If you want to upload OVA with Network Appliance OS, set Min Memory size to 5 GB.

• Ensure that there is enough free space in the /tmp directory in CP since Apache uses this directory to temporarily store files while uploading OVA to CP.

• The size of the OVA that could be uploaded to CP depends on the browser settings, Apache configurations and amount of free space available on CP.

• To increase the upload size, in the /onapp/onapp-cp.conf file, set the LimitRequestBody and MAX_UPLOAD_SIZE parameters to 0 (unlimited). The LimitRequestBody parameter restricts the total size of the HTTP request body sent from the client and can be set (in bytes) from 0 (unlimited) to 2147483647 (2GB). The MAX_UPLOAD_SIZE parameter indicates the maximum file size allowed for uploading (in bytes) from 0 (unlimited) to 2147483647 (2GB).

To apply changes committed to the LimitRequestBody and MAX_UPLOAD_SIZE parameters in the /onapp/onapp-cp.conf file, you should edit the file before installing or upgrading the Control Panel server.

• The limits on OVAs are configured within the Backup Server Zone Limits resource type in the Access Control of the bucket. You can set the maximum amount of OVAs users can create in a backup server zone under the bucket and the maximum amount of disk space (GB) users get for storing their OVAs in this backup server zone under the bucket.

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.

4.2.11.1 Convert OVF to OVA
You can import virtual servers only from OVA. If you want to import from OVF, you should create an OVA file from OVF. The OVA file is a TAR archive, containing the .ovf and .vmdk files. Below you can find an example:
To create an OVA file (called centos6.ova for example) on Linux via command line, run the following:

```
[root@OVA ~]# tar -tvf centos6.ova
centos6ovalvm.ovf
centos6ovalvm-disk1.vmdk
```

4.2.11.2 View OVAs
1. Go to your Control Panel > Cloud and click Templates.
2. Click OVA List on the menu.
3. The open page shows the list of available OVAs separated into four tabs:
   - **All OVAs** - the list of all OVAs available on your system
   - **System OVAs** - the list of the OVAs that are publicly available to all users
   - **My OVAs** - the list of custom OVAs uploaded by the user who is currently logged in
   - **User OVAs** - the list of the OVAs uploaded by your users

For each OVA listed, you see the following details displayed:

- **Log status** - the icon that indicates the status of the last log item of the OVA (complete/pending/failed). Click the status to view the log details for the OVA (available to the OVAs that were uploaded through the URL).
- **OS** - the icon that indicates the operating system of the OVA (Linux, Windows or Other)
- **Label** - the name of the OVA
- **Min memory size** - the minimum RAM size required for the OVA
- **Operating system** - the operating system of the OVA
- **Backup server** - the backup server where the OVA is stored
- **Virtualization** - the virtualization type (KVM or vCenter). For the non-converted OVA files, no virtualization is specified in this column.

- **Actions** - click the Actions button to perform the following procedures with the OVA:
  - Convert
  - Make public
  - Edit
  - Manage System Service Add-ons
  - Delete

4.2.11.3 Upload OVAs
The OVA upload is the first step of the OVA import. When OVA is uploaded, you can convert it into a KVM-based or vCenter-based template and add this template to the template store. When the template is available in the template store, then you will be able to build OVA-based VS from this template.
To upload OVA into your cloud:

1. Go to your Control Panel > Cloud and click the Templates menu from the left navigation pane.
2. Click OVA List on the menu.
3. On the page that loads, click the Upload OVA button under the OVAs list.
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 OVA.
     - If you are using local data store and plan to create a VS based on this template later, you have to copy your OVA template from the backup server to the /onapp/templates folder via ssh.
     - If you are using local data store with multiple backup servers, it will not be possible to create OVA virtual server.
   - **Version** - fill in the version of 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 real memory size from the OVA file after upload. If you set the value that is bigger than 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 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's Settings menu > Configuration > Backups/Templates tab and enable the Store extended attributes slider.

After you upload OVA to the cloud, it can be found at Templates > OVA List > My OVAs tab. The OVAs uploaded by your users are under the User OVAs tab.

To use the OVA to build virtual server next you need to convert the uploaded OVA into a KVM-based and/or vCenter-based template.

---

**4.2.1.11.4 Convert OVAs**

The uploaded OVA file is saved without the attached virtualization so that you can convert it more than once into both virtualization formats. To convert the uploaded OVA archive into a template:

1. Go to your Control Panel > Cloud and click the Templates menu from the left navigation panel.
2. Click the **OVA List** link in the menu.

3. Click the **Actions** icon > **Convert** next to the required OVA file.

4. In the pop-up window, select the **Virtualization** format (KVM or vCenter) and fill in other fields depending on the selected virtualization:

**KVM Virtualization**

- **Label** - enter a name for a new OVA file that will be created on the basis of the initially-uploaded one
- **Operating system** - select the operating system of the OVA (Linux, Windows, Network Appliance or Other). Choose the **Other** operating system if you want to convert the OVA with any other operating system (FreeBSD, Debian, etc) besides Windows and 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)
- **Allowed hot migrate** - move the slider to the right if you want to be able to run hot migration of the VSs created from this OVA
- **Make public** - move the slider to the right if you want to make the OVA available to all users in the cloud

**vCenter Virtualization**

If you select the vCenter virtualization type, the additional fields will appear. For more information on how to convert OVA into a vCenter-based template, refer to the OnApp **OVA Import to vCenter** section.

5. Click **Save** to convert the OVA into the selected 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.

---

4.2.1.11.5 **Make OVAs Public**

It is possible to make the OVA template public after converting. To make OVA public:

1. Go to your Control Panel > **Cloud** and click **Templates**.

2. Click **OVA List** on the menu. The page that loads shows the list of OVAs available to you.

3. Click the **Actions** button next to the required converted OVA and click the **Make public** button.

4. Click the **OK** button in the pop-up box to confirm the action.
4.2.11.6 Edit OVAs

To edit the OVAs available to you:

1. Go to your Control Panel > Cloud and click Templates.
2. Click OVA List on the menu. The page that loads shows the list of OVAs available to you.
3. Click the Actions button next to the required OVA and click the Edit button.
4. On the page that loads, you can edit the following OVA details:

**No Virtualization**
- **Label** - specify the name for OVA
- **Version** - fill in the version of OVA
- **Min memory size** - specify the minimum required RAM for OVA (128 MB by default). If you set smaller amount than in OVA file, this amount will be overwritten by real memory size from the OVA file after upload. If you set bigger amount than in the OVA file, the settings will be applied.

**KVM Virtualization**
- **Allowed hot migrate** - move the slider to the right if you want to be able to run hot migration of VS created from this OVA
- **Label** - specify the name for OVA
- **Version** - fill in the version of OVA
- **Min memory size** - specify the minimum required RAM for OVA (128 MB by default). If you set smaller amount than in OVA file, this amount will be overwritten by real memory size from the OVA file after upload. If you set bigger amount than in the OVA file, the settings will be applied.

**vCenter Virtualization**
- **Allowed hot migrate** - move the slider to the right if you want to be able to run hot migration of VS created from this OVA
- **Label** - specify the name for OVA
- **Version** - fill in the version of OVA
- **Min memory size** - specify the minimum required RAM for OVA (128 MB by default). If you set smaller amount than in OVA file, this amount will be overwritten by real memory size from the OVA file after upload. If you set bigger amount than in the OVA file, the settings will be applied.
- **Initial username** - the initial vCenter username
- **Initial password** - the initial vCenter password

5. Click Save when you are finished.
4.2.1.11.7 Manage System Service Add-ons

4.2.1.11.7.1 Assign System Service Add-ons to OVA

1. Go to your Control Panel > Cloud and click Templates.
2. Click OVA List on the menu. The page that loads shows the list of OVAs available to you.
3. Click the Actions button next to the required OVA (converted or initially-uploaded) and click the Manage System Service Add-on button.
4. Click the + button.
5. 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.
6. 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 VSs built from this OVA
7. Click the Assign button to finish.

4.2.1.11.7.2 Unassign System Service Add-ons from OVA

1. Go to your Control Panel > Cloud > Templates > OVA List menu.
2. Click the Actions button next to the OVA you want to change, then choose Manage System Service Add-ons option.
3. The screen that follows shows the list of the system service add-ons assigned to this OVA.
4. Click the Delete button next to the system service add-on you want to remove.
5. Confirm the deletion.

4.2.1.11.8 Delete OVAs

You can delete uploaded OVA files of a converted template, so that the billing will not be calculated for the storage space. The files will be deleted, but the record in a database will be left. On the other hand, you can totally delete OVA (both converted and initially-uploaded).

If you delete the initially-uploaded OVA file, templates converted from this file are not deleted.
4.2.1.11.8.1 Delete OVA Files
1. Go to your Control Panel > Cloud and click Templates.
2. Click OVA List on the menu. The page that loads shows the list of OVAs available to you.
3. Click the Actions button next to the required converted OVA and click the Delete files button.

When deleting OVA files, the OVA disk size (backup server limits section of buckets) will not be calculated, but the OVAs limit will be still charged.

4.2.1.11.8.2 Delete OVA
1. Go to your Control Panel > Cloud and click Templates.
2. Click OVA List on the menu. The page that loads shows the list of OVAs available to you.
3. Click the Actions button next to the required OVA (converted or initially-uploaded) and click the Delete button.

You can delete a converted OVA template only if there are no VSs running on it.

4.2.1.11.9 Use OVA on CloudBoot Backup Server
To use OVA functionality on a Cloudboot Backup Server, take the following steps:
1. Log in via SSH to the Control Panel Server
2. Edit the '/etc/exports' file, on the line " /data X.X.X.X/YY(ro,no_root_squash)" - where X.X.X.X/YY is your network/subnet. Change the "ro," to "rw," and save the file.
3. Restart the NFS service
"/etc/init.d/nfs restart"

Please note that restarting NFS server at the same time when files are in use from the NFS share may cause issues.

5. Go to your Control Panel > Admin > Settings > Compute Resources > Label of the required CloudBoot compute resource.
6. Click the Actions icon > Edit next to the Cloudboot Backup Server.
7. Add the following to the Custom Config field:

```
.cp /etc/lvm/lvm.conf /etc/lvm/lvm.conf.orig
sed -i 's/^([[:space:]]*filter = .*/filter = \[ "r\|\|\dev\|\nbd\]\]" \])/g' /etc/lvm/lvm.conf
```

8. Click Save.
9. Reboot your Cloudboot Backup Server

You can also execute the custom config command directly on the backup server to apply it without reboot.

See also:
- Template Store
4.2.1.12 Manage Template Recipe Custom Variables

You can define custom variables for image templates. To do so:

1. Go to your Control Panel > Cloud > Templates > Templates List menu.
2. Click the Actions icon next to the template you want to change, then select Manage Custom Recipe Variables.
3. On the screen that appears, click the + button to add a new recipe variable.
4. Specify the recipe name and its value.
5. Move the Enabled slider to the right to allow the use of this recipe.
6. 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.

Custom variables are set on a per-server/template basis. It is possible to set custom variables for image templates, as well as for virtual servers. Each custom variable is a name-value set that can be used during the virtual server recipe execution. Virtual server custom variables will always overlay template custom variables.

See also:

- Manage Template Recipes
- Template Software Licenses
- Template Store
- My Template Groups

4.2.1.13 Manage Template Recipes

In this document, you can find information on how to manage template recipes.

4.2.1.13.1 Assign Recipe

1. Go to your Control Panel > Cloud > Templates > Templates List menu. You'll see a list of templates on your system.
2. Click the Actions icon next to the template you want to change, then select Manage Recipes.
3. The screen that follows shows details of all the recipes in the cloud:
   - The right pane displays the list of events to which the recipes can be assigned to.
   - The left pane shows the list of all recipes in the cloud.
4. Use drag and drop feature to assign a recipe to a desired event:
   - Click the arrow button in front of the required event to unfold it.
b. Select the required recipe in the left pane and hold it down with the left mouse button.

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

You can assign template 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 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 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.

---

4.2.1.13.2 Delete Recipe

1. Go to your Control Panel > Cloud > Templates > Templates List menu. You'll see a list of templates on your system.
2. Click the **Actions** icon next to the template you want to change, then select **Manage Recipes**.
3. Click the arrow button in front of the required event to view the list of recipes assigned to it.
4. Click the **Delete** button next to the recipe you want to remove.

See also:
- Manage Template Recipe Custom Variables
- Template Software Licenses
- Template Store
- My Template Groups

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Template%20Recipes

4.2.1.14 Manage Templates

You can perform a set of actions with the templates:

- view/edit/delete system templates
- create/edit/delete/make public custom templates
- manage template recipes and recipe variables
- manage template system service add-ons
- download new and update existing templates

4.2.1.14.1 View Template Details

The Control Panel's Templates List menu lists all of the templates available on your system, their version number, the number of recipes assigned to the template, the Operating System they install, whether swap disk is allowed, whether you can adjust their CPU cores/priority & RAM without rebooting a virtual server based on that template ("resize without reboot"), and whether hot migration is allowed.

The templates are organized into four tabs:

- **System templates** - the OS images provided by OnApp.
- **My templates** - the list of custom templates created by the user who is currently logged in.
- **User templates** - the list of templates converted by all users in the cloud from VS backups. To see user templates, make sure the **See User Templates** permission is enabled.
- **Inactive** - the templates that are currently unavailable to build VS on.

To see which virtual servers are based on a specific template:

1. Go to your Control Panel > **Cloud** > **Templates** > **Templates List** menu to bring up the list of templates.
2. Click the template's label (name) in the list.

If you are viewing the templates list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, check the columns you want to be displayed and click **Apply**. The narrower your screen is, the more unchecked columns will be hidden from the table. If your screen is too narrow to fit all the columns you have checked, a scrollbar will appear at the bottom of the templates list. You can always alter your column selection later. Note that by default the Backup server column is not visible in the table on narrow screens.

Column selection is currently set for one browser. If you have checked some columns in one browser and open the list in some other browser, the column selection will be the default one for that other browser.
4.2.1.14.2 Edit Template Details

You can edit a range of template details through the Control Panel, including minimum disk size required, version number, filename and label. To do so:

1. Go to your Control Panel > **Cloud** > **Templates** > **Templates List** menu. You'll see a list of templates on your system.
2. Click the **Actions** icon next to the template you want to change, then choose **Edit Template**.
3. On the screen that follows, enter template details as required:
   - **Label** – change the template name
   - **File name** – edit the template filename
   - **Version** – the template version
   - **Min disk size** – the minimum VS disk size required to build a VS on this template (in GB)
   - **Min memory size** – the minimum VS RAM required to build a VS on this template (in MB)

   The maximum RAM that can be assigned to a VS is 168 GB regardless of the Max RAM value set in the bucket.

   - **Allowed hot migrate** - move the slider to the right if you want to be able to hot-migrate VS created from this template.

4. Click **Save** to finish.

---

4.2.1.14.3 Delete System Templates

To delete a template:

1. Go to the Control Panel > **Cloud** > **Templates** > **Templates List** menu.
2. Click the **Actions** icon next to the template you wish to delete, then choose **Delete Template**.

You cannot delete a template if there are virtual servers in your system built on that template. To delete the said template you will have to destroy such virtual server first.

---

4.2.1.14.4 Edit Custom Templates

You can edit your custom templates at any time. To do so:

1. Go to your Control Panel > **Cloud** > **Templates** > **Templates List** menu and click the **User Templates** tab. Your custom templates will be listed there.
2. Click the **Actions** icon next to the template you want to change.
3. Choose **Edit Template**, make your changes on the screen that follows.
4. Click **Save**.

---

4.2.1.14.5 Delete Custom Templates

You can delete your custom templates at any time. To do so:

1. Go to your Control Panel > **Cloud** > **Templates** > **Templates List** menu and click the **User Templates** tab. Your custom templates will be listed there.
2. Click the **Actions** icon next to the template you want to delete.
3. Choose the **Delete Template** button next to a template if you want to delete it.
You cannot delete a template if there are virtual servers in your system built on that template. To delete the said template you will have to destroy such virtual server first.

Make Templates Public

The template list is organized into three tabs. The User templates tab lists all the custom templates created from the backups. By default those templates are available only to those users who created them. When you make templates public, you make your templates available to all users:

1. Go to your Control Panel > Cloud > Templates > Templates List menu.
2. Click User templates tab.
3. Click the Actions button next to the template you want to make public, then select Make public.
4. Confirm the window that pops up.

When you make a custom template public, it is moved to a System templates tab.

4.2.1.14.6 Allow Users to Make Templates Public

All custom templates are private by default, which means they are only available to the users who created them. As the administrator, you can give users the right to create templates that are available to all users – i.e. to create public templates. This is handled through the Control Panel's Roles menu:

1. Go to your Control Panel > Admin > Roles menu.
2. Click the Edit icon next to the role you want to edit.
3. On the screen that follows, check the box next to the Make own template public permission and click Save.

See also:

- Manage Template Recipes
- Manage Template Recipe Custom Variables
- Template Software Licenses
- Template Store

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Templates

4.2.1.15 Manage Template Software Licenses

To create a virtual server from a template which is based on paid software, such as MS Windows, you must have a valid license. The system verifies if you have a license before allowing the VS to be created, so before creating a VS you must first upload the license keys you’ve bought to OnApp, or connect to a licensing server.

OnApp supports three license types:

- **MAK licensing**: the default licensing type applied to all Windows-based VSs.
- **KMS licensing**: this is applicable to every VS since Windows 7 \ Server 2008 or newer Windows versions.
- **User licenses**: allow end users to input a license key when creating a VS.

Please note that OnApp will support Windows Server 2022 template starting from the 6.6 version.

The template licenses in OnApp are managed in two places:

- **Cloud > Templates > Template Store** – where you specify which license types can be applied to templates assigned to the particular template group.
Admin > Buckets – where you specify which license types a user on this plan can apply to their Windows-based VSs.

To avoid billing issues, do not use different Windows licensing types for the same template in one bucket. In case you assign a template to template groups with different licensing types or different prices, it will be charged at a smaller price.

The bucket settings override the template group settings. For example, if the KMS licensing is allowed by template group settings, but is not enabled in bucket configuration, the user will not be able to create VSs using KMS licensing.

The user specifies the license type for a particular virtual server during the VS creation process. The list of available license types depends on the template which is chosen for the VS and the bucket the user is signed up to.

To enable users to choose the license type:
1. Create a template group
2. Specify licenses that can be used within this group
3. Assign the templates to this group

If you do not assign a template to a template group, the default MAK licensing is applied to that template.

4. Create a bucket
5. Specify which license types can be used within this bucket
6. Assign template groups to a bucket (optional)

If you do not assign any template group to a bucket, the user can build VSs on any template available in the cloud. The choice of licenses will depend on the settings specified for the template group to which this template belongs.

7. Assign a user to this bucket

4.2.1.15.1 KMS Licensing

To allow your users to create virtual servers (applicable to every VS since Windows 7 \ Server 2008 or newer Windows versions) using KMS licensing:

1. Log in to your Control Panel as an Admin.
2. Enable KMS licensing for a particular template group, and attach the templates for which you plan to enable KMS licensing to this group (see Template Store in the next section).

Windows 2003 and XP templates do not support KMS licensing.

3. Enable KMS licensing for a bucket, and assign this template group to a bucket.
4. Sign up a user to this bucket.

4.2.1.15.2 MAK Licensing

To add a MAK license to OnApp:

1. Go to your Control Panel > Cloud > Templates > Software Licenses menu.
2. Click the Add new License button.
3. Set the necessary parameters in the form that appears:
- **R2** – move the slider to the right if your license is for the second edition of Windows OS distribution
- **Architecture** - select x64 or x86
- **Edition** – select the edition of the OS: STD (Standard), ENT (Enterprise), WEB (web), DC (Data Center), PRO (Professional)
- **License** – enter the license code, e.g. TZXTC-R4GGG-9TT3V-DYDY4-T628B
- **Total** - the total number of servers allowed by the license (the amount of licenses you bought from Microsoft)

4. Click **Save**.

To view MAK license details, go to your Control Panel > **Cloud** > Templates > Software Licenses menu. This screen lists all the licenses you've added to your OnApp installation with their details:

- **Label** – the license name specifying the OS distribution, architecture and edition, e.g. Windows 2008 R2 x64 STD/ENT
- **License** - the license code
- **Total** - the number of VSs allowed by the license
- **Count** - the number of licenses used

To edit/delete an existing MAK license:

1. Go to your Control Panel > **Cloud** > Templates > Software Licenses menu. This screen lists all the licenses you've added to your OnApp installation.
2. Click the **Edit/Delete** buttons next to the license you're interested in.

**See also:**
- Template Store
- Template Groups
- Buckets

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Template%20Software%20Licenses

**4.2.1.16 Manage Template System Service Add-ons**

A system service add-on provides the ability for you to add to a template obligatory services, which cannot be removed by an end user. In this document, you can find information on how to manage template system service add-ons.

**4.2.1.16.1 View System Service Add-ons Assigned to Template**

1. Go to your Control Panel > **Cloud** > Templates > Templates List menu. You'll see a list of templates on your system.
2. Click the **Actions** icon next to the template you want to change, then choose the **Manage System Service Add-ons** option.
3. The screen that follows shows the list of the system service add-ons assigned to this template.

**4.2.1.16.2 Assign system service add-on to template**

If you assign a system service add-on to the template, the system service add-on will be assigned to the virtual servers later built from this template.

To assign a system service add-on to a template:

1. Go to your Control Panel > **Cloud** > Templates > Templates List menu.
2. Click the **Actions** icon next to the template you want to change, then choose the **Manage System 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 the VSs built from this template

6. Click the **Assign** button to finish.

Please note if you rebuild a virtual server from a different OS template, all added system service add-ons will be removed from it.

4.2.1.16.3 Unassign System Service Add-on from Template

To unassign a system service add-on from a template:

1. Go to your Control Panel > **Cloud** > **Templates** > **Templates List** menu.
2. Click the **Actions** icon next to the template you want to change, then choose the **Manage System Service Add-ons** option.
3. The screen that follows shows the list of the system service add-ons assigned to this template.
4. Click the **Delete** button next to the system service add-on you want to remove.
5. Confirm the deletion.

If you unassign a system service add-on from a template, the system service add-on stays assigned to the existing virtual server based on this template by default.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Template%20System%20Service%20Add-onsLeave feedback

4.2.1.17 My Template Groups

My Template Groups allow you to create your own license groups for your own personal/custom templates. The groups cannot be shared amongst the users. Also, for Windows-based templates, My Template Groups provide the possibility to use your own licensing type regardless of your bucket.

For your convenience, My Template Groups have hierarchical (tree) structure:

- Template group – e.g. OS
- Child group
- Templates

You may assign templates directly to the group, or create a child group(s) and assign templates there.

4.2.1.17.1 Add Template Group

To add a template group:
1. Go to your Control Panel > Cloud > Templates > My Template Groups menu.

2. On the page that follows, click the + button.

3. Give a name to your group in the window that appeared.

4. If you are planning to use this group for Windows templates, specify the Windows Licensing type: MAK, KMS, or Own (user license).

   This licensing type will apply to all templates directly in the group and in the child groups.

5. For KMS licensing, set the following parameters:
   - **Server label** – the name of the KMS server
   - **KMS server host** – the hostname of the licensing server
   - **KMS server port** – the port used to connect to the licensing server

6. Click **Save**.

On the page that appears, you can add a template or a child to the group, edit the group, or delete it.

4.2.1.17.2 Add Child Group
To add a child group to the group:

1. Go to your Control Panel > Cloud > Templates > My Template Groups menu.

2. Click the + button next to the required group.

3. Select **Add Child** from a drop-down list.

4. In the screen that appears fill in:
   - **Label** – the name of the child group
   - If you are planning to use this group for Windows templates, specify the Windows Licensing type: MAK, KMS, or Own (user license)

   This licensing type will apply to all templates in the child group. Providing you have indicated the licensing type for the parent group - both types will apply

   o For KMS licensing, set the following parameters:
     - **Server label** – the name of the KMS server
     - **KMS server host** – the hostname of the licensing server
     - **KMS server port** – the port used to connect to the licensing server

   Providing the KMS licensing was selected for the parent group, both KMS servers will be available for selection while creating a virtual server based on the templates in the child group.

5. Click **Save**.

4.2.1.17.3 Assign Template to Template Group / Child Group
To assign a template to a template group or child group:

1. Go to your Control Panel > Cloud > Templates > My Template Groups menu.
2. Click the + button next to the required group's label, then select **Add Template**, or click on the group's label to expand it, then click the + button next to the required child group's label.

3. Choose the template from the drop-down box at the **Add a template** section.

   Only your custom templates will be available for selection.

4. Click **Save**.

---

### 4.2.1.17.4 Remove Template from Template Group

To remove a template from a template group:

1. Go to your Control Panel > **Cloud** > **Templates** > **My Template Groups** menu.

2. Click the template group's label or click the name of the template group from which you wish to remove a template.

3. Click the **Delete** icon next to a template you want to remove.

4. Confirm the deletion.

---

### 4.2.1.17.5 Edit or Delete Template Group

To edit or delete a template group:

1. Go to your Control Panel > **Cloud** > **Templates** > **My Template Groups** menu.

2. On the page that follows, you'll see the list of all template groups created within your cloud:

   • Click the group's label to see the child groups or the list of templates assigned to this group; click the child group label to see the list of templates assigned to the child group.

   • Click the **Edit** icon next to a group or a child group to edit its name and the type of Windows licensing; click **Save** button upon making the necessary changes.

   • Click **Delete** icon to delete a group or a child group. The templates which were assigned to this group/child group will become your ungrouped templates.

---

**See also:**

- **Template Store**
- **Template Software Licenses**
- **Manage Templates**

https://onappcloud.typeform.com/to/A64Euy#source=My%20Template%20Groups

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### 4.2.1.18 Template Store

Template store enables you to organize individual templates into groups that can be used as a paid resource for buckets. This allows you to easily create groups of templates which can be added to the bucket to limit the amount or types of templates that are available to a user. Also you can add ISO and OVA templates to the template store and set prices for these templates in the bucket. After ISO or OVA template is added to the template store, you can create a VS using this template.

Prices for templates are set in the bucket's Rate Card. For more information, refer to [Configure Resource Allocation And Prices](#).

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### 4.2.1.18.1 Template Group Management

The template groups have hierarchical (tree) structure:

- Template group – e.g. OS
• Child group
• Templates

Click the Template group's label to expand the list of child groups, then click the template group's label to view the list of templates, respectively.

4.2.1.18.1.1 Add Template Group
To add a template group:

1. Go to your Control Panel > Cloud > Templates > Template Store menu.
2. Click the + button in the upper right corner of the page.
3. Give a name to your group.
4. Specify the Windows Licensing type: MAK, KMS, or User license.
5. For KMS licensing, set the following parameters:
   - Server Label – the name of the KMS server
   - KMS Server Host – the hostname of the licensing server
   - KMS Server Port – the port used to connect to the licensing server
6. Click Save.
7. You can add child template groups to your template group by clicking the + button > Add Child next to your template group.

4.2.1.18.1.2 Assign Template to Template Group

1. Go to your Control Panel > Cloud > Templates > Template Store menu.
2. Click the + button next to the required child group's label, then select Add Template.
3. Choose the template from the drop-down list and click Save.

4.2.1.18.1.3 Remove Template from Template Group

1. Go to your Control Panel > Cloud > Templates > Template Store menu.
2. Click the template group's label, then click the name of the template group from which you wish to remove a template.
3. Click the Delete icon next to a template you want to remove.
4. Confirm the deletion.

4.2.1.18.1.4 Edit or Delete Template Group

1. Go to your Control Panel > Cloud > Templates > Template Store menu.
2. On the page that follows, you'll see the list of all template groups created within your cloud:
   - Click the group's label, then click the child group label to see the list of templates assigned to this group.
   - Click the Edit icon next to a group to edit its name.
   - Click Delete icon to delete a group.

4.2.1.18.2 Add ISO to Template Store
Before VDI creation from ISO, you should add ISO to the Template store. To add ISO template to the template store:

1. Go to your Control Panel > Cloud > Templates > Template Store menu.
2. Click the + button next to specific template group and click Add ISO.
3. Choose ISO from the drop-down menu.
4. Click Save.
4.2.1.18.3 Add OVA to Template Store
When the OVA file is uploaded and converted into a template, you should add this template to the template store before creating a virtual server. To add an OVA template to the template store:

1. Go to your Control Panel > Cloud > Templates > Template Store menu.
2. Click the + button next to OVA template group and click Add OVA.
3. Choose the required OVA from the drop-down menu.
4. Click Save.

See also:
- Configure Resource Allocation and Prices
- Template Groups

https://onappcloud.typeform.com/to/A64Euy#source=Template%20Store

4.2.2 Service Add-Ons
This chapter provides an overview on what service add-ons in OnApp are, the management tips, the information on creating your own service add-ons and providing them as a paid resource for your customers.

Service Add-ons functionality allows you to present to your customers additional services on top of your current IaaS Virtual Server offering. You can offer features such as Managed Services, Software Installations and components currently not integrated in OnApp.

4.2.2.1 System Service Add-Ons
In OnApp, there are two types of service add-ons: user and system. User service add-on can be optionally assigned or removed by users upon their desire to use or not the specific extra resources you offer. A system service add-on provides the ability for you to add obligatory services to a virtual server, template, or OVA, which cannot be removed by an end user.

Below you can find more details on each step of the workflow.
4.2.2.2 Create Service Add-On

1. Go to your Control Panel > Cloud > Service Add-ons menu in the left navigation pane.

2. On the following page, click + upper right.

3. On the screen that follows:
   - **Label** – give your service add-on a name
   - **Description** – add the service add-on description
   - **Icon** – upload the service add-on icon (click Choose File to select a necessary image)
   - **Available on VS provisioning** - move the slider to the right to be able to choose this service add-on when creating a VS (providing that the Replace recipes permission is enabled and the billing settings allow).
   - **System service add-on** - move the slider to the right to make the add-on obligatory for a user and impossible to remove.
   - **Compatible with** – choose if the service add-on can be assigned to Unix-based, Windows-based, or both types Virtual servers upon creation.

4. Click **Save**. The service add-on will be created and you will be redirected to the Edit page, where you can manage On Add and On Remove events.

For details on service add-on creation, refer to the **Manage Service Add-ons** section of this guide.

4.2.2.3 Add Events to Service Add-On

Service add-on events let you configure which actions will be run on the VS, to which the service add-on is assigned. The transactions for running the **On Add** events will be scheduled at the moment when the service add-on is assigned to a VS. The transactions for running the **On Remove** events will be scheduled at the moment when the service add-on is re-assigned from a VS. The transactions for running the **On VS Destroy** events will be executed before
'Destroy VS' transaction. The transactions for running the **On VS Rebuild** events will be executed after VS rebuild.

Currently the following events are available:

1) Run Recipe actions are available for service add-on configuration, in particular the recipes that run on Virtual Servers.

**Prerequisite**
The recipes should be created beforehand, properly configured and tested.

The list of recipes that can be assigned to a service add-on depends on the user plan settings - it is possible to choose only from those recipe groups which are added to the bucket. Also it is required to have the View recipes permission to be able to attach a recipe event to a service add-on. Make sure that the recipe **Compatible with** parameter and the service add-on **Compatible with** parameter are consistent. Otherwise, running the event will fail for a VS.

2) Raise Event action type that sends notification to all subscribed recipients. The subscriptions and the messages are configured at **Subscription**.

For more information on how to manage **On add events** and **On remove events** for service add-on, refer to the **Manage Service Add-ons** section of this guide.

4.2.2.4 Service Add-On Store
After you have created the service add-ons and properly configured events for them, proceed to arranging the service add-ons into a group of services. A Service add-on store enables you to organize individual service add-ons into groups that can be further added to a plan to control user access. Only those groups which are added to a bucket will be available to a user. You can arrange the service add-ons into groups depending on their type, price, or whatever other attribute.

The prices for the individual service add-ons are also set in the Service add-ons store per service add-on per hour. This is the additional price that will be calculated for the VS besides the resources cost.

For detailed instructions, refer to the **Manage Service Add-on Store** section of this guide.

4.2.2.5 Pricing and Access Control
To make service add-on available to users, go to the bucket’s Access Control section and add the required service add-on groups. The users under the bucket will have access only to the service add-on groups which were added to their Access Control.

To set the pricing for the individual service add-ons, go to the bucket’s Rate Card section menu and indicate the price for required service add-ons per service add-on per hour as well as the additional cost for VS CPU, RAM and disk size. These prices will be charged additionally to the VS price.

For more info, refer to the **Manage Service Add-on Store** and **Configure Resource Allocation And Prices** sections of this guide.

4.2.2.6 Permissions
The following permissions regulate service add-on functionality:

**Service Add-ons**

- **Any actions on Service Add-ons** - the user can perform any operations on Service Add-ons - **view, create, edit and delete** service add-ons

- **Create new Service Add-ons** - the user can create new Service Add-ons (Control Panel > Service Add-ons menu > **+**)

- **Delete Service Add-ons** and **Delete own Service Add-ons** - the user can delete Service Add-ons (Control Panel > Service Add-ons menu > the **Actions** button > **Delete**)
- **Edit any Service Add-on and Edit own Service Add-ons** - the user can update Service Add-ons (Control Panel > **Service Add-ons** menu > the **Actions** button > **Edit**)
- **Read all Service Add-ons and Read own Service Add-ons** - the user can view Service Add-ons (Control Panel > **Service Add-ons** menu)

**Service Add-on Groups**
- **Any action on Service Add-on Groups** - the user can take any action on Service Add-on Groups - [view, create, edit and delete] service add-on groups
- **Create a new Service Add-on group** - the user can create a new Service Add-on group and add child service add-on groups (Control Panel > **Service Add-ons** menu > **Store** > and **Add Child** button)
- **Destroy any Service Add-on group and Destroy own Service Add-on group** - the user can delete Service Add-on groups (Control Panel > **Service Add-ons** menu > **Store** > next to the service add-on group you want to delete)
- **See all Service Add-on groups** - the user can see all Service Add-on groups (Control Panel > **Service Add-ons** menu > **Store**)
- **Manage any Service Add-on group** - the user can manage a Service Add-on group (the user can edit a service add-on group, assign a particular service add-on to a service add-on group, remove service add-on from the service add-on group, edit service add-on price).

**Virtual Servers**
- **Manage Service Add-ons for all virtual servers and Manage Service Add-ons for own virtual servers** - the user can manage Service Add-ons for virtual servers (Control Panel > **Virtual Servers** menu > **VS label** > **Overview** > **Service Add-ons**)
- **Manage System Service Add-ons** - the user can manage the system service add-ons of all VSs in the cloud
- **Manage own System Service Add-ons** - the user can manage system service add-ons assigned to one’s own virtual servers

**Virtual Machine Statistics**
- **See Virtual Machine Statistics** - the user can see the system service add-ons usage report

**Replace Recipes**
- **Replace recipes** - the user can replace Recipes with Service Add-ons in VS creation wizard. The Service Add-ons step will appear in wizard if the other conditions are met (such as availability in buckets, etc.). This permission is disabled by default.

**OVAs**
- **Manage System Service Add-ons** - the user can manage the system service add-ons assigned to all OVAs in the cloud
- **Manage own System Service Add-ons** - the user can manage system service add-ons assigned to the OVAs uploaded by the user

**Templates**
- **Manage System Service Add-ons** - the user can manage the system service add-ons assigned to all templates in the cloud
- **Manage own System Service Add-ons** - the user can manage system service add-ons assigned to the templates uploaded by this user

For more information about permissions, refer to the **Permissions** chapter of this guide.
4.2.2.7 Assign Service Add-On to VS

Service add-ons can be assigned to the VS during its creation or later.

Service add-ons in VS creation wizard

Ensure that the following requirements are met to be able to assign service add-on to VS during its creation:

- *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 the bucket.

If the requirements are met, you will get Service Add-ons step in VS creation wizard, where you should fulfill the following 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
   - 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 near the add-on.
3. Click Next to proceed to the next step of the wizard that completes the virtual server creation process.

Service add-on assignment to already created VS

When the events and the prices are configured for service add-ons, you can assign a service add-on to any of their VSs.

To assign service add-on to a VS:

1. Go to your Control Panel > Cloud > Virtual Servers menu.
2. On the following page, click the label of the server you’re interested in.
3. Click the Overview tab, then choose Service Add-ons.
4. On the page that appears, click upper right. You will get the list of service add-on groups (availability is configured in the bucket).
5. Click the label of the necessary user or system service add-on to see its details:
   - Label
   - Type - user or system
   - Description
   - Price
6. Choose the necessary service add-on and click Assign. The transaction to execute the add-on event(s) will be scheduled for running. If you rebuild VS, the On VS Rebuild event(s) will be scheduled for running and in case of VS deletion - the On VS Destroy event(s) will be scheduled for running.

For more information, refer to the Virtual Server Service Add-ons section of this guide.
Also, you can view the list of VSs assigned to the service add-on. For details, refer to the Manage Service Add-ons section of this guide.

4.2.2.8 System Service Add-Ons Statistics

For your convenience, the system tracks the system service add-ons' usage and generates statistics on it. It is possible to generate it for a specific period.

To generate the statistics:

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

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

The CSV file includes the following information:

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

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

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

See also:

- Manage Service add-ons
- Service Add-on Store
- Configure Resource Allocation and Prices

https://onappcloud.typeform.com/to/A64Euy#source=Service%20Add-ons
4.2.2.9 Manage Service Add-ons
This chapter provides an overview on how to manage user and system service add-ons in OnApp. You can view, create, edit, delete service add-ons and manage their On add, On remove, On VS Destroy and On VS Rebuild events.

- To manage user service add-ons, ensure that Service Add-ons permissions are on.
- To manage system service add-ons, ensure that Manage System Service Add-ons permissions are on. For more information about permissions, refer to the Permissions section of this guide.

4.2.2.9.1 Create Service Add-on
When creating a service add-on, at first you specify its properties, and then attach On add, On remove, On VS Destroy, and On VS Rebuild events.

To create a service add-on:
1. Go to your Control Panel > Cloud > Service Add-ons menu.
2. On the following page, click + upper right.
3. On the page that appears, fill in the following:
   - Label – give your service add-on a name
   - Description – add the service add-on description
   - Icon – upload the service add-on icon (click Choose file to select a necessary image)
     The icon should have width less than or equal to 200px and should have height less than or equal to 200px.
   - Available on VS provisioning - move the slider to the right to be able to choose this service add-on when creating a VS (providing that the Replace recipes permission is enabled and the billing settings allow)
   - System service add-on - move the slider to the right to make the add-on obligatory for a user and impossible to remove
   - Compatible with – choose the OS system, with which the service add-on is compatible (Windows, Unix or both)
4. Click Save. The service add-on will be created and you will be redirected to the Manage Service Add-ons page, where you can manage On Add, On Remove, On VS Destroy, and On VS Rebuild events. For more details, refer to the section below.

4.2.2.9.2 Service Add-on Events
Service add-on events let you configure which actions will be run on the VS, to which the service add-on is assigned.

- The transactions for running the On Add events will be scheduled at the moment when the service add-on is assigned to a VS.
- The transactions for running the On Remove events will be scheduled at the moment when the service add-on is re-assigned from a VS.
- The transactions for running the On VS Destroy events will be executed before 'Destroy VS' transaction.
- The transactions for running the On VS Rebuild events will be executed after VS rebuild. Currently the following events are available:
4.2.2.9.2.1 Run Recipe Actions

Recipes are available for service add-on configuration. The recipes will run on Virtual servers and vCloud director virtual servers.

Prerequisite
The recipes should be created beforehand, properly configured and tested.

The list of recipes that can be assigned to a service add-on depends on the user plan settings - it is possible to choose only from those recipe groups which are added to the bucket. Also it is required to have the View recipes permission to be able to attach a recipe event to a service add-on. The recipes are not filtered according to compatible with type. Make sure that the recipe Compatible with parameter and the service add-on Compatible with parameter are consistent. Otherwise, running the event will fail for a VS.

Be aware, that if you add several recipes to the event, they will be fulfilled in the top-down order.

To create a Run Recipe action:
1. Go to your Control Panel > Cloud > Service Add-ons menu. You'll see a list of service add-ons on your system.
2. Click the Actions button next to the service add-on you want to change, then choose Edit.
3. On the screen that follows, click + > Add Recipe Action at On add, On remove, On VS Destroy, or On VS Rebuild event menu.
4. Choose recipe from the drop-down list.
5. Choose destination:
   - Run on Virtual Server - choose it if you want to run this recipe action only on VS, to which this service add-on will be assigned
   - Run on Control Panel - choose it if you want to run this recipe action on the whole Control Panel. For more information, refer to Control Panel Recipes Settings.
6. Click Add.

To edit a Run Recipe action:
1. Go to your Control Panel > Cloud > Service Add-ons menu. You'll see a list of service add-ons on your system.
2. Click the Actions button next to the service add-on you want to change, then choose Edit.
3. On the page that appears, click pencil next to the Run Recipe action you want to edit.
4. Choose recipe from the drop-down list and click Update Action.

To delete a Run Recipe action:
1. Go to your Control Panel > Cloud > Service Add-ons menu. You'll see a list of service add-ons on your system.
2. Click the Actions button next to the service add-on you want to change, then choose Edit.
3. On the following page, click pencil next to the recipe you want to delete.
4. Confirm the deletion.

4.2.2.9.2.2 Raise Event Actions

Raise event actions become available starting with OnApp 5.5 version. This is an action type that sends notification to all subscribed recipients.

Notification Configuration

To configure a notification, which will be sent when adding a ‘Raise Event” action, fulfill the following steps:

1. Ensure that notifications are enabled for your cloud.
2. Go to your Control Panel > Admin > Notifications > Recipients Lists and create a new recipient list of users whom you want to notify about certain event.
3. Go to your Control Panel > Admin > Notifications > Notification Templates and create message text that will be sent to your users.
   
   If you add a '%{message}' text to the template, the notification will contain the information about the service add-on name, VS name and identifier. For example: "The Test Service Add-on has been added to a Test Virtual Server with the ID abcdedfghijk."
   
   If you add a '%{name}' text to the template, the notification will contain the user’s name.

4. Go to your Control Panel > Admin > Notifications > Gateways and determine in what way users will be contacted: via email or internal notifications in CP.

5. A subscription is the final step of a notifications configuration which ties together a recipients list, a gateway and a notification template. Go to your Control Panel > Notifications > Subscriptions > New Subscription and fill in the following details:
   
   o Name - the label for the subscription
   o Event - select the Service add-on event from the drop-down list.
   o Recipients list - select the recipients list which you have configured in the second step on this instruction.
   o Notification template - select the notifications template which you have configured in the third step on this instruction.
   o Gateway - select the gateway which you have configured in the fourth step on this instruction.

6. Click Save.

For more information about subscriptions and messages configuration, refer to Subscriptions.

Then you have to create a Raise Event action. For this:

1. Go to your Control Panel > Cloud > Service Add-ons menu. You’ll see a list of service add-ons on your system.
2. Click the Actions button next to the service add-on you want to change, then choose Edit.
3. On the page that follows, click + > Raise Event at On add, On remove, On VS Destroy or On VS Rebuild event menu.
4. Click Add.

To delete a Raise Event action:
1. Go to your Control Panel > **Cloud** > **Service Add-ons** menu. You'll see a list of service add-ons on your system.

2. Click the **Actions** button next to the service add-on you want to change, then choose **Edit**.

3. On the page that follows, click next to the Raise Event action you want to delete.

4. Confirm the deletion.

---

**4.2.2.9.3 Edit Service Add-on**

1. Go to your Control Panel > **Cloud** > **Service Add-ons** menu. You'll see a list of service add-ons on your system.

2. Click the **Actions** button next to the service add-on you want to change, then choose **Edit**.

3. On the screen that follows, enter service add-on details as required:
   - **Label** – change the service add-on name
   - **Description** – edit the service add-on description
   - **Icon** – change the service add-on icon (click **Choose File** to select a necessary image)
   - **Available on VS provisioning** - move the slider to the right to be able to choose this service add-on when creating a VS (providing that the **Replace recipes** permission is enabled and the billing settings allow)
   - **Compatible with** – choose the OS system, with which the service add-on is compatible (Windows, Unix, or both)

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

Also you can manage On add, On remove, On VS Destroy, and On VS Rebuild events at the **Edit** page.

---

**4.2.2.9.4 View Service Add-on Applied to VSs**

You can view the list of VSs, to which the service add-on is assigned. For this:

1. Go to your Control Panel > **Cloud** > **Service Add-ons** menu. You'll see a list of service add-ons on your system.

2. Click the **Actions** button next to the service add-on you are interested in, then choose **Applied to VS**.

3. On the screen that follows, you will get:
   - **Label** - the service add-on name
   - **Description** – the service add-on description
   - The list of virtual servers, to which the service add-on is assigned, if there are any

For more information on how to assign service add-on to VS, refer to the **Virtual Server Service Add-ons** section of this guide.

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**4.2.2.9.5 Assign System Service Add-ons to Template**

If you assign a system service add-on to a template, the system service add-on will be assigned to the virtual servers later built from this template.
To assign system service add-ons to a template:

1. Go to your Control Panel > Cloud > Template list. You'll see a list of 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. On the following page, click .
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.

Please note if you rebuild a virtual server from a different OS template, all added system service add-ons will be removed from it.

4.2.2.9.6 Delete Service Add-on
1. Go to the Control Panel > Cloud > Service Add-ons menu.
2. Click the Actions button next to the service add-on you wish to delete, then choose Delete.
3. Confirm the deletion. The transaction to execute the On remove event(s) will be scheduled.

See also:
- Service Add-Ons
- Service Add-on Store
- Virtual Server Service Add-ons

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Service%20Add-ons

Leave feedback

4.2.2.10 Manage Service Add-on Store
Service add-on store enables you to organize individual service add-ons into groups that can be used as a paid resource for the buckets. This allows you to easily create groups which can be added to the bucket to limit the amount or types of service add-ons that are available to a user.

Ensure that Service Add-on Groups permissions are on before managing service add-on Store. For more information about permissions, refer to the Permissions section of this guide.
The service add-on groups have hierarchical (tree) structure:

- service add-on group
- child group
- service add-ons

Click the service add-on group's label to expand the list of child groups, then click the service add-on group's label to view the list of service add-ons, respectively.

4.2.2.10.1 Add Service Add-On Groups
To add a service add-on group:

1. Go to your Control Panel > Cloud > Service Add-ons menu > Store.
2. Click the "+" button in the upper right corner of the page.
3. Give a name to your group.
4. Upload the service add-on group icon (click Choose File to select a necessary image).
5. Click Save.
6. To add child service add-ons to your service add-on group, click the "+" button > Add Child next to your service add-on group.

4.2.2.10.2 Assign Service Add-ons to Service Add-on Groups
To assign a service add-on to a service add-on group:

1. Go to your Control Panel > Cloud > Service Add-ons menu > Store.
2. Click the "+" button next to the required child group's label, then select Add Service Add-on.
3. Choose the service add-on from the drop-down box at the Service add-on section.
4. Click Save.

4.2.2.10.3 Remove Service from Service Add-on Group
To remove a service add-on from a service add-on group:

1. Go to your Control Panel > Cloud > Service Add-ons menu > Store.
2. Click the service add-on group's label, then click the name of the service add-on group from which you wish to remove a service add-on.
3. Click the Delete icon next to a service add-on you want to remove.
4. Confirm the deletion.

4.2.2.10.4 Edit/Delete a Service Add-on Group
To edit/delete a service add-on group:

1. Go to your Control Panel > Cloud > Service Add-ons menu > Store.
2. On the page that follows, you'll see the list of all service add-on groups created within your cloud:
   - Click the group's label, then click the child group label to see the list of service add-ons assigned to this group.
   - Click the Edit icon next to a group to edit its name or upload a service add-on group icon.
   - Click Delete icon to delete a group.

See also:

- Service Add-Ons
- Manage Service Add-ons
4.2.2.11 SPLA report

SPLA report gives possibility to track licenses usage, which is required according to Microsoft Per Core licensing model. Having generated the report, you will see how many CPU cores have been used by the system service add-ons in your cloud for a specified time period, and how many Microsoft licenses are required to cover its usage. Hence, you can add the necessary amount of licenses either to the template or the virtual server, based on the report data.

For service providers with Windows-based VSS, it is required to report their usage to Microsoft by sending an SPLA report monthly. Following the new Microsoft requirement, OnApp is implementing a possibility to generate an SPLA (Services Provider License Agreement) report for Windows-based VSS.

4.2.2.11.1 Generate SPLA Report

You can generate an SPLA Report for system service add-ons the following way:

1. Go to your Control Panel > Dashboard > Admin > Users.
2. Click the Full Name of the required user to get to the User Profile.
3. In the Billing Details section, click the SPLA Report button.
4. Select the time period from the drop-down menu and click the Apply button to generate the report.
5. On the page that appears:
   - **Label** - the label of the system service add-on the statistics is generated for
   - **From** - the beginning of the specified time period for the statistics generation
   - **Till** - the end of the specified time period for the statistics generation
   - **Virtual server** - the VS the system service add-on in question is assigned to
   - **Cores (peak usage)** - the number of CPU cores used
   - **Required Cores Licenses** - the number of licenses required
   - **Total** - the general number of licenses required for the system service add-on
4.2.2.11.2 Download SPLA Report

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

The CSV file includes the following information:

- **from** - the beginning of the specified time period for the statistics generation
- **till** - the end of the specified time period for the statistics generation
- **user_id** - the ID of the user
- **virtual_machine_id** - the ID of the VS the system service add-on in question is assigned to
- **service_addon_id** - the ID of the system service add-on
- **cpus** - the number of cores used
- **required_cpus_licenses** - the number of licenses required

The generated reports will be stored at the SPLA Report page. However, if you have **statistics archiving** enabled for your cloud, the reports will be stored according to the period, specified for the archiving.

See also:
• Service Add-ons
• Manage Service Add-ons
• Manage Service Add-on Store

https://onappcloud.typeform.com/to/A64Euy#source=SPLA%20Report

Leave feedback

4.2.3 Recipes

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

Recipes run over SSH, and all commands triggered can run on virtual servers, appliances or the Control Panel server.

SSH connection is not required for running recipes on VMware virtual servers.

Sorry, the widget is not supported in this export. But you can reach it using the following URL:
https://vimeo.com/530822753

Recipes can range from very simple actions to complex multi step automations interacting with other internal and external systems. OnApp Support will not be able to create custom recipes based on your requirements, or troubleshoot/debug the lines of code within your own recipes via our support channels. If you would like to commission your own recipes but don't have resources to do it internally, please contact your account manager for a custom quote.

OnApp CP does not update the status of the recipe if it takes longer than 1 hour to complete the transaction.

4.2.3.1 Recipe Use

Recipes allow admins to perform the following operations:

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

Use of recipes brings cloud administrators more control over their cloud environment and allows them to self-maintain such tasks as custom template creation, etc.
You can use recipes for Unix (Linux and FreeBSD) and Windows virtual servers, smart servers, baremetal servers, virtual server templates, compute zones and the control panel server. For details, refer to the relevant sections of the Admin guide:

- Template Recipes
- Virtual Server Recipes
- vCenter Virtual Server Recipes
- vCloud Virtual Server Recipes
- Smart Server Recipes
- Baremetal Server Recipes
- Compute Zone Recipes

To be able to use recipes in the cloud, you must enable recipe permissions first.

4.2.3.2 Recipe Variables
The recipes run when the appropriate events are triggered on the compute resources, virtual servers or the CP server. Depending on the object where the event occurs, the recipe runs on compute resource/VS/CP and contains the variables for that object. When the recipe execution on compute resource is triggered by the event happening on a virtual server, then the recipe also contains the variables for the virtual server object. The same relates to the CP server.

Here is the list of variables that you can define in recipes:

**Compute resource variables**

- IP_ADDRESS - an IP address of a compute resource
- HV_IP_ADDRESS - a management IP address of a compute resource
- IPJOIN_HYPERVERSOR_IP_ADDRESS - a compute resource management IP address where a virtual server (with a network interface with an assigned IP) is located on
- VIRTUALIZATION - a compute resource virtualization type: KVM or VMware
- SERVER_TYPE - a server type: virtual, smart, or baremetal

**Virtual Server variables**

- VM_IDENTIFIER - a virtual server identifier
- IP_ADDRESS - an IP address of a virtual server
- IP_EXTERNAL_ADDRESS - an external IP address of a virtual server
- IPJOIN_IP_ADDRESS - an IP address as a string
- IPJOIN_IP_ADDRESS_ID - an ID of an IP Address
- IPJOIN_NETWORK_IDENTIFIER - a MAC address of a network interface an IP address is assigned to
- IPJOIN_NIC_MAC_ADDRESS - a MAC address of a network interface
- HOSTNAME - a hostname of a virtual server
- ROOT_PASSWORD - a server root password
- OPERATING_SYSTEM - a virtual server operating system
- OPERATING_SYSTEM_DISTRO - a virtual server OS distribution
- OPERATING_SYSTEM_ARCH - an architecture of an operating system
- OPERATING_SYSTEM_EDITION - an edition of an operating system
- VM_USER_ID - an ID of a virtual server user
- VM_USER_FIRSTNAME - the first name of a virtual server user
VM_USER_LASTNAME - the last name of a virtual server user
VM_USER_EMAIL - an email of a virtual server user
VM_NETWORK_INTERFACES - a JSON string with information about network interfaces of the virtual server, for example:

```
"VM_NETWORK_INTERFACES"="{{"id":520,"identifier":"eoa","mac_address":"00:16:4e:ca:5f:6b","primary":true,"network_join":{"id":8,"network_identifier":"mcy","interface":"eth12"},"ip_addresses":{{"id":63,"address":"69.168.227.55","prefix":24,"gateway":"69.168.247.1","external_address":""}}}"
```

All recipes have access to these variables:

- **CP_ADDRESS** - an IP address of a control panel server
- **RESPONSE_FROM_PREVIOUS** - a response from the previous recipe step
- **TRIGGERING_EVENTS** - events that triggered execution of a recipe
- **TRIGGERED_BY_TRANSACTION** - a JSON string with information about a transaction that triggers the recipe. The string can include the transaction id, parent_type, parent_id, action, status, params, dependent_transaction_id, etc. The variable can be blank if there is no transaction that triggers the recipe.
- **RESOURCE_DIFF** - a JSON string with information about changes within resources that happened as a result of the transaction that triggered the recipe. The variable can be blank if no changes within resources occur as a result of the transaction.

Each user can set custom recipe variables for different appliances. For details, refer to the following sections:
- Virtual Server Recipe Custom Variables
- Smart Server Recipe Custom Variables
- Baremetal Server Recipe Custom Variables
- Manage Template Recipe Custom Variables

See also:
- Manage Recipes
- Recipe Permissions
- Recipe Groups

https://onappcloud.typeform.com/to/A64Euy#source=Recipes

4.2.3.3 Control Panel Recipe Settings

Recipes are sets of instructions that are triggered during the certain stages of events defined. By managing recipes via the **Settings** menu, you can assign recipes to the control panel server.

To manage this functionality, make sure that you have the **Manage recipes for Control Panel** permission enabled.

4.2.3.3.1 Assign Recipe

To manage Control Panel recipes settings:

1. Go to your Control Panel > Admin > Settings menu and click the **Recipes** icon.
2. On the screen that appears, you will see the details of all recipes in the cloud:
3. Drag and drop recipe to assign it to a desired control panel event:
   a. Click the arrow button in front of the required event to unfold it.
   b. Select the required recipe in the left pane and hold it down with the left mouse button.
   c. Drag the recipe up to the right pane and release the mouse button to drop the recipe and add it to the required event.

You can assign recipes to the following events:

- **KVM compute resource goes online** - run the recipe when the KVM compute resource comes online
- **KVM compute resource goes offline** - run the recipe when the KVM compute resource goes offline
- **VMware compute resource goes online** - run the recipe when the VMware compute resource comes online
- **VMware compute resource goes offline** - run the recipe when the VMware compute resource goes offline

The recipe will be triggered when the statistics are not received from a compute resource for a certain period of time for some reason. If the compute resource is offline, the recipe will not run.

- **Compute resource added** - run the recipe when the new compute resource is added
- **Compute resource removed** - run the recipe when compute resource is removed
- **VS Provisioning** - run the recipe during VS provisioning
- **VS Network rebuild** - run the recipe when rebuilding a network
- **VS Disk added** - run the recipe when adding a disk
- **VS Network Interface added** - run the recipe when adding a network interface
- **VS Disk resized** - run the recipe when resizing a VS disk
- **VS Resize** - run the recipe when resizing a VS

### 4.2.3.3.2 Delete 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.

See also:

- [Manage Recipes](https://onappcloud.typeform.com/to/A64Euy#source=Control%20Panel%20Recipe%20Settings)
- [Recipe Permissions](https://onappcloud.typeform.com/to/A64Euy#source=Control%20Panel%20Recipe%20Settings)
- [Recipe Groups](https://onappcloud.typeform.com/to/A64Euy#source=Control%20Panel%20Recipe%20Settings)
4.2.3.4 Manage Recipes
A recipe is a plugin mechanism used for adding new functionalities to the OnApp cloud. Each recipe is a set of instructions that trigger events at certain stages during the execution of certain services/event in the cloud. Essentially, recipes allow inputting code into virtual servers, appliances or the Control Panel server. This enables administrators to use recipes for configuring the server or report on it, thus providing advanced customization options in a standard environment. In this document you can find information on how to create and manage recipes.

You can create and use recipes for Unix (Linux and FreeBSD) and Windows virtual servers, smart servers, baremetal servers, virtual server templates, compute zones and the Control Panel server.

4.2.3.4.1 View List of All Recipes
1. Go to your Control Panel > Cloud > Recipes menu.
2. On the screen that appears, you’ll see the list of all recipes in the cloud.

Use the tabs above to view a particular recipe type:

- **All**
  
  To view the list of all recipes, click the All Recipes tab.

- **Unix compatible**
  
  To view the list of Unix compatible recipes, click the Unix Compatible tab.

- **Windows compatible**
  
  To view the list of Windows compatible recipes, click the Windows Compatible tab.

- **Unowned**
  
  To view the list of recipes which owners have been deleted, click the Unowned Recipes tab.
  Recipes that run on other user's resources are not deleted after their owners are removed. These recipes can be accessed via Recipes > Unowned recipes menu. A user with global permissions can become an owner of any of the unowned recipes by choosing Actions > Become an owner.

4.2.3.4.2 View Recipe Details
1. Go to your Control Panel > Cloud > Recipes menu.
2. On the screen that appears, you’ll see the list of all recipes in the cloud.
3. Click the required recipe's label to view the following recipe details, along with the recipe step information:
   - **Label** - the label of the recipe
   - **Description** - the description of the recipe
   - **Unix compatible** - whether the recipe is compatible with Unix virtual servers
   - **Windows compatible** - whether the recipe is compatible with Windows virtual servers.
   For a Windows compatible recipe, specify the script type. You can select the following script types:
     - **BAT**
     - **BS**
     - **PowerShell**
   - Recipe steps along with their details:
     - **Script** - step code
     - **Result source** - step result source
4.2.3.4.3 View List of Assigned Servers
1. Go to your Control Panel > Cloud > Recipes menu.
2. On the screen that appears, click the Actions button next to the required recipe and select Applied to VS.
3. On the following screen, you will see the list of the servers this recipe is assigned to.

4.2.3.4.4 Assign Recipe to Multiple Servers
You can assign recipe to several virtual or smart servers at once. To do so:
1. Go to your Control Panel > Cloud > Recipes menu.
2. On the screen that appears, you’ll see the list of all recipes in the cloud.
3. Click the Actions icon next to required recipe and click the Run Recipe on Vs(s) button.
4. On the screen that appear, select the check boxes next to the servers you want to assign the recipe to.
5. Click the Run on Selected button to confirm the selection.

Assigning several recipes to the same server may lead to simultaneous recipe implementation and performance issues.

- When assigning one recipe to several servers via API, there is possibility to run the recipe incompatible with the server type (Unix recipe on Windows servers or vice versa). In this case the transaction will be scheduled and completed, but the recipe will not do anything.
- Note that a VS related recipe is always executed first.

Click here to see an 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 desired 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.

4.2.3.4.5 Edit Recipe
1. Go to your Control Panel > Cloud > Recipes menu.
2. Click the label of a recipe you want to edit, and then click the Edit icon. You can edit the following recipe details:

- Label - recipe label
- Description - recipe description
- Compatible with - select Unix or Windows to use this recipe for Unix or Windows virtual servers. For a Windows compatible recipe, specify the script type. You can select the following script types:
  - BAT
  - VBS
  - PowerShell
3. Click the **Save** button to save your changes.

To edit a recipe step, click the edit icon next to the required step, then change its details as required. Refer to the **Edit Recipe Step** section below for details.

### 4.2.3.4.6 Edit Recipe Step

1. Go to your Control Panel > **Cloud** > **Recipes** menu.
2. Click the **Actions** icon next to the recipe you want to change, then click the **Edit** button.
3. On the screen that appears, you'll see the list of recipe steps. Click the **Edit** icon next to the step you want to edit.
4. In the pop-up window, edit the step details as required:

   **Script** - input the recipe code.

   **Result source** - specify the step result source:
   - Exit Code - an exit code, for example, 0 is the default value returned on success.
   - STDOUT - standard output.
   - STDERR - standard error
   - STDOUT and STDERR - standard output and standard error.

   Move the **Pass anything else** slider to the right if you do not want to specify the pass output value. Otherwise leave this slider disabled to set the pass values.

   **Pass values** - specify the pass output value, for example, 0.

   You cannot specify both pass and fail values for one recipe step. You can specify multiple recipe values. In this case, you have to specify each value from a new line.

   **On success** - the recipe behavior on success:
   - Proceed - proceed to the next step.
   - Fail - terminate the recipe and mark it as failed.
   - Stop - terminate the recipe and mark it as successful.
   - Go to step - specify the step to proceed to. If you specify the nonexistent step, the recipe will be stopped.

   In case you have already specified the recipe pass values, you will get the **Fail anything else** slider enabled automatically, as you cannot specify both pass and fail values for
on one recipe step. Move this slider to the left if you want to set set fail values (Pass anything else slider will be enabled automatically).

**Fail values** - specify the pass output value.

*On failure* - the recipe behaviour on failure

- Proceed - proceed to the next step.
- Fail - terminate the recipe and mark it as failed.
- Stop- terminate the recipe and mark it as successful.
- Go to step - specify the step to proceed to. If you specify the nonexistent step, the recipe will be stopped.

5. Press **Save**.

Drag and drop steps to change their order. To do so:

1. Select the required step and hold it down with the left mouse button.
2. Drag the recipe up to the required position and release the mouse button to drop it.

### 4.2.3.4.7 Delete Recipe

1. Go to your Control Panel > **Cloud** > **Recipes** menu.
2. Click the **Delete** icon next to the recipe you want to remove.
3. Confirm the deletion.

**See also:**

- Recipe Permissions
- Recipe Groups
- Recipe Use Examples
- Control Panel Recipes Settings

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Recipes

### 4.2.3.5 Recipe Groups

Recipe groups allow OnApp administrators to organize individual recipes into groups that can be used as a bucket resource. This allows you to easily create groups of recipes which can be added to the bucket to limit the recipes that are available to a user.

The recipe groups have hierarchical (tree) structure:

- recipe group
- child group
- recipes

You can also add a recipe directly to the recipe group section without assigning it to a child group.

Click the recipe group's label to expand the list of child groups, then click the recipe group's label to view the list of recipes, respectively.

### 4.2.3.5.1 Add Recipe Group

To add a recipe group:

1. Go to your Control Panel > **Cloud** > **Recipes** > **Recipe Groups** menu.
2. On the page that follows, click the "+" button.
3. Give a name to your group.
4. Click Save.
5. On the page that appears, you'll be prompted to assign a recipe to a group.

### 4.2.3.5.2 Add Child Group to Recipe Group
To add a child group to a recipe group:

1. Go to your Control Panel > Cloud > Recipes > Recipe Groups menu.
2. Click the "+" button next to the required group's label, then select Add Child.
3. Give a name to your child group.
4. Click the Save button to confirm.

### 4.2.3.5.3 Assign Recipe to Recipe Group
To assign a recipe to a recipe group:

1. Go to your Control Panel > Cloud > Recipes > Recipe Groups menu.
2. Click the "+" button next to the required group's or child group's label, then select Add Recipe.
3. Choose the required recipe from the drop-down menu.
4. Click the Save button to confirm.

### 4.2.3.5.4 Remove Recipe from Recipe Group
To remove a recipe from a recipe group:

1. Go to your Control Panel > Cloud > Recipes > Recipe Groups menu.
2. Click the arrow button next to the required recipe group to expand the list of recipes.
3. Click the Delete icon next to a required recipe.
4. Confirm the deletion.

### 4.2.3.5.5 Edit Recipe Group
To edit a recipe group:

1. Go to your Control Panel > Cloud > Recipes > Recipe Groups menu.
2. On the page that follows, you'll see the list of all recipe groups created within your cloud.
3. Click the Edit icon next to a group to edit its name.
4. Click the Save button to save your changes.

### 4.2.3.5.6 Delete Recipe Group
To delete a recipe group:

1. Go to your Control Panel > Cloud > Recipes > Recipe Groups menu.
2. On the page that follows, you'll see the list of all recipe groups created within your cloud.
3. Click the Delete icon next to the required group to remove it.
4. Confirm the deletion.

See also:
- Manage Recipes
- Recipe Permissions
- Recipe Use Examples
- Control Panel Recipes Settings
4.2.3.6 Recipe Permissions
You can control user access to recipes functionality by giving different user roles certain permissions. The list below includes all the recipe permissions that can be set up in OnApp.

4.2.3.6.1 Recipes
- Any actions on recipes (recipes) - the user can take any action on recipes
- Create new recipes (recipes.create) - the user can create a new recipe
- Delete any recipe (recipes.delete) - the user can delete any recipe
- Delete own recipes (recipes.delete.own) - the user can delete own recipes
- Edit any recipe (recipes.edit) - the user can edit any recipe
- Edit own recipes (recipes.edit.own) - the user can edit own recipes
- Read any recipe (recipes.read) - the user can view all recipes
- Read own recipes (recipes.read.own) - the user can view own recipes

4.2.3.6.2 Recipe Groups
- Any action on recipe groups - the user can take any action on recipe groups
- Create a new recipe group – the user can create a new recipe group
- Destroy any recipe group - the user can delete any recipe group
- See list of all recipe groups – the user can view the list of recipe groups
- See all recipe groups – the user can view any recipe group details
- Update any recipe group – the user can edit all recipe groups

4.2.3.6.3 Recipe Group Relations
- Any action on recipe group relations - the user can take any action on recipe relation group
- Create a new recipe group relation - the user can create a new recipe relation group
- Destroy any recipe group relation - the user can delete any recipe relation group
- See list of all recipe group relations - the user can view the list recipe relation groups
- See all recipe group relations – the user can see recipe relation group details
- Update any recipe group relation – the user can edit any recipe relation group

4.2.3.6.4 Control Panel
- Add recipe to control panel (control_panel.recipe_add) - the user can add recipes to the control panel
- Remove recipe from control panel (control_panel.recipe_delete) - the user can remove recipes from the control panel

4.2.3.6.5 Compute Zones
- Add recipe to Compute zone (hypervisor_zones.recipe_add) - the user can add recipes to compute zone
- Remove recipe from Compute zone (hypervisor_zones.recipe_delete) - the user can remove recipes from compute zone

4.2.3.6.6 Virtual Servers
- Add recipe to virtual machine (virtual_machines.recipe_add) - the user can detach recipes from own virtual servers
• *Remove recipe from virtual machine* (virtual_machines.recipe_delete) - the user can detach recipes from all virtual servers

### 4.2.3.6.7 Smart Servers
- *Add recipe to any smart server* (smart_servers.recipe_add) - the user can add recipes to any smart servers
- *Add recipe to own smart server* (smart_servers.recipe_add.own) - the user can add recipes to own smart servers
- *Remove recipe from any smart server* (smart_servers.recipe_delete) - the user can remove recipes from any smart servers
- *Remove recipe from own smart server* (smart_servers.recipe_delete.own) - the user can remove recipes from own smart servers

### 4.2.3.6.8 Baremetal Servers
- *Add recipe to any baremetal server* (baremetal_servers.recipe_add) - the user can add recipes to any baremetal servers
- *Add recipe to own baremetal server* (baremetal_servers.recipe_add.own) - the user can add recipes to own baremetal servers
- *Remove recipe from any baremetal server* (baremetal_servers.recipe_delete) - the user can remove recipes from any baremetal servers
- *Remove recipe from own baremetal server* (baremetal_servers.recipe_delete.own) - the user can remove recipes from own baremetal servers

### 4.2.3.6.9 Templates
- *Add recipe to any template* (templates.recipe_add) - the user can add a recipe to any template
- *Add recipe to own templates* (templates.recipe_add.own) - the user can add recipes to own templates
- *Remove recipe from any template* (templates.recipe_delete) - the user can remove recipes from any template
- *Remove recipe from own templates* (templates.recipe_delete.own) - the user can remove recipes from own templates

See also:
- Permissions
- Recipe Groups
- Recipe Use Examples
- Control Panel Recipes Settings

https://onappcloud.typeform.com/to/A64Euy#source=Recipe%20Permissions

4.2.3.7 Recipe Use Examples
The set of examples aimed to illustrate the recipe utilization.

#### 4.2.3.7.1 Recipe 1
Runs on VSs for Apache server installation and default web page configuration.

Can be used for the following events:
- VS provisioning (starts Apache server during the VS creation)
- Network rebuild
- Network interface added
Consists of 5 steps. Each step depends on the previous step result.

**Step 1**

```bash
#if echo $OPERATING_SYSTEM_DISTRO |grep rhel ; then
  if rpm -qa |grep httpd |grep -v grep ; then
    yum -y update httpd
  else
    yum -y install httpd
  fi
#else
# exit 1
#else
#fi
```

*Result source: Exit code*

*Pass values: 0*

*On success: Proceed*

*Fail values: Fail anything else*

*On failure: Fail*

**Step 2**

```bash
```

*Result source: Exit code*

*Pass values: 0*

*On success: Go to step 5*

*Fail values: Fail anything else*

*On failure: Go to step 4*

**Step 3**

```bash
service httpd restart
```

*Result source: Exit code*

*Pass values: 0*

*On success: Stop*

*Fail values: Fail anything else*

*On failure: Fail*

**Step 4**

```bash
echo "Can not write to file" > /var/log/recipes.log
```

*Result source: Exit code*

*Pass values: 0*

*On success: Stop*

*Fail values: Fail anything else*

*On failure: Fail*

**Step 5**

**Result source:** Exit code
**Pass values:** 0
**On success:** Go to step 3
**Fail values:** Fail anything else
**On failure:** Go to step 4

### 4.2.3.7.2 Recipe 2
Runs on compute resources to check the virtualization type.

Can be used for the following events:

- When KVM compute resource goes online

**Step 1**

```bash
if rpm -qa | grep -q $qayd ; then
    ps aux | grep xend || exit 1
else
    ps aux | grep libvirtd || exit 1
fi
```

**Result source:** Exit code
**Pass values:** 0
**On success:** Proceed
**Fail values:** Fail anything else
**On failure:** Fail

### 4.2.3.7.3 Recipe 3
Runs on compute resources to check the snmpd and snmpd trap services and restarts them.

Can be used for compute resource and control panel server events.

**Step 1**

```bash
service snmpd restart && service snmptrapd restart
```

**Result source:** Exit code
**Pass values:** 0
**On success:** Proceed
**Fail values:** Fail anything else
**On failure:** Fail

### 4.2.3.7.4 Recipe 4
Runs on Windows virtual servers to check if the Apache folder is present and deletes it, otherwise installs Apache.

Can be used for Windows virtual server events.

**Step 1**
$files = dir 'C:\Program Files (x86)\Apache*' $process = "ApacheMonitor*"

if ($files -ne $null)
{
    "there's installed apache. Removing apache ..."
    $installer = dir 'c:\apache.msi'
    Stop-Process -Name $process
    Start-Sleep -Second 5
    Remove-Item $files -Force -Recurse
    Remove-Item $installer -Force -Recurse
    $files = dir 'C:\Program Files (x86)\Apache*' $process
    if ($files -ne $null)
    {
        "Failed to remove apache"
        return 1
    }
    else
    {
        "apache has been removed"
        return 0
    }
}
else
{
    "Apache has not been installed."
    "Downloading installer.."

    "silence apache installation.."
    c:\apache.msi /quiet
    return 0
}

Result source: Exit code
Pass values: 0
On success: Proceed
Fail values: Fail anything else
On failure: Fail

4.2.3.7.5 Recipe 5
Runs on Windows virtual servers to install Firefox web browser.
Virtual Server variable "VM_IDENTIFIER" is used in this example.

Step 1
# Silent Install Firefox
# Download URL: https://www.mozilla.org/en-US/firefox/all/

# Path for the workdir
$workdir = "c:\installer-$env:VM_IDENTIFIER"

# Check if work directory exists if not create it
if (Test-Path -Path $workdir -PathType Container)
{
    Write-Host "$workdir already exists" -ForegroundColor Red
}
ELSE
{
    New-Item -Path $workdir -ItemType directory
}

# Download the installer

if ( $env:PROCESSOR_ARCHITECTURE -eq 'x86' ) {
    echo "Running 32-bit PowerShell"
}  
else {
    echo "Running 64-bit PowerShell"
    $source = "https://download.mozilla.org/?product=firefox-latest&os=win64&lang=en-US"
}

$destination = "$workdir\firefox.exe"

# Check if Invoke-WebRequest exists otherwise execute WebClient
if (Get-Command 'Invoke-WebRequest')
{
    Invoke-WebRequest $source -OutFile $destination
}
else
{
    $webclient.DownloadFile($source, $destination)
}

# Start the installation
Start-Process -FilePath "$workdir\firefox.exe" -ArgumentList "/S"

# Wait XX Seconds for the installation to finish
Start-Sleep -s 60

# Remove the installer
rm -Force $workdir\firefox*

Result source: Exit code
Pass values: 0
On success: Proceed
Fail values: Fail anything else
On failure: Fail

See also:

- Manage Recipes
- Recipe Permissions
4.3 Compute Zones

Compute zones can be used to create different tiers of service - for example, by setting up different zones for high-performance compute resource servers, with different prices for virtual servers deployed on that zone. Compute zones can have data stores and networks attached to them. The combination of compute resource, data store, and network groups can be used to create private clouds for customers.

Compute zones have types which are inherited by the compute resources in the zone. These types also define the type of resources (data stores, networks, and backup servers) that can be associated with a compute zone or compute resource. Compute resources can be later moved from one compute zone to another, but the zones should be of the same type. For more information, refer to Zone Types. The table below demonstrates the available compute zone types for different compute resources:

<table>
<thead>
<tr>
<th>Compute Resource Type</th>
<th>Compute Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVM</td>
<td>Virtual</td>
</tr>
<tr>
<td></td>
<td>Smart</td>
</tr>
<tr>
<td>VMware</td>
<td>Virtual</td>
</tr>
<tr>
<td>VMware Cloud Director</td>
<td>VPC</td>
</tr>
</tbody>
</table>

If there is only one compute resource located in the compute zone, it will not be marked as offline during the management network failure. This is expected OnApp behavior.

4.3.1 Manage Compute Zones

Compute zones can be used to create different tiers of service and have data stores and networks attached to them. The combination of compute resource, data store and network groups can be used to create private clouds for customers. Compute zones have types which are inherited by the compute resources in the zone.

4.3.1.1 View Compute Zone Details

1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Click the label of the zone you’re interested in. The screen that follows shows details of that zone:
   - **Label** - the compute zone’s name.
   - **Location group** - the location group where this zone is located.
   - **Max VS to start at once** - the maximum number of VSs which can run simultaneously in this zone.
o **Placement type** - the compute resource selection algorithm, which will be used on virtual server provisioning and recovery.

o **Failover timeout** - the time period for which the iterations will run during the failover if the compute resource does not respond.

o **Release resource type** - shows which option is set for over-committing RAM, CPU and CPU shares.

o **Extended CPU Configuration** - shows whether the Extended CPU Configuration is enabled for this zone.

o **Assigned Compute resources** - the list of compute resources assigned to the zone.

o **Unassigned Compute resources** - the list of compute resources in the cloud that are not assigned to the zone. This list depends on the compute zone type. Only compute resource that can be assigned to a compute zone of this type, will be shown here. For the details, see the Zone Types doc.

### 4.3.1.2 Add Compute Resource to Compute Zone

When adding several compute resources to a zone, you can arrange the servers running on particular compute resources into a paid service. Besides, adding several compute resources into one zone provides the failover capabilities to your services.
Only compute resources of relevant type can be added to a zone. For more information, refer to Zone Types. When you add a compute resource to a compute zone, the compute resource inherits the zone's type.

To add a compute resource to a zone:

1. Go to your Control Panel's Settings menu and click the Compute Zones icon.
2. Click the label of the zone you want to add a compute resource to. The screen that appears will show you the list of compute resources in the cloud, organized into two lists – those assigned to the zone already, and those that are unassigned.
3. In the unassigned list, find the compute resource you want to add to the zone and click the Actions button next to it, then click Add.

Be careful when adding new compute resources to compute zone with Extended CPU Configuration enabled. For more information, refer to the Manage Extended CPU Flags for Compute Zone section of this guide.

4.3.1.3 Remove Compute Resource from Compute Zone

1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Click the label of the zone you want to remove a compute resource from. The screen that appears will show you all compute resources in the cloud, organized into two lists – those assigned to the zone already, and those that are unassigned.
3. In the assigned list, find the compute resource you want to remove and click in the the Actions section next to it.

- You cannot remove a vCloud Director compute resource from a compute zone.
- You can only remove a compute resource from a compute zone if it currently hosts no virtual servers.
- It is possible to re-assign compute resources only between compute zones of the same type. For more information, refer to Zone Types.

4.3.1.4 Edit Compute Zone

1. Go to your Control Panel > Admin > Settings menu, and click the Compute Zones icon.
2. The screen that appears will show all zones currently set up in the cloud.
3. Click the Actions button next to the required compute zone, then click Edit. You can edit the following compute zone details:

**Properties**

- **Label** - Compute zone's name
- **Location group** - location group to which the compute zone is assigned. You can change the already set location if there are no virtual servers built on compute resources of this zone.
- **Release resource type** - compute zone's resource type. This option allows you to free up the compute resource resources and over-commit RAM, CPU and CPU shares by means of the virtual servers that are shut down. By default, the compute zone is created with the Memory Guarantee option enabled. In this case, the over-committing cannot be used. To enable resource releasing, choose either the Ballooning or Only Started VS option.
Memory guarantee - the actual free compute resource memory is calculated. All virtual servers residing on the compute resource will be able to start.

Ballooning (KVM Compute resources only) - free compute resource memory is calculated with the ability to use memory over-committing.

- A 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.
- When using ballooning option it is impossible to monitor the exact free compute resource memory as it is a floating value. Therefore some VS edit or start actions may fail.

Only started VS - only the memory of running virtual servers is calculated.

Max VS to start at once - the maximum number of virtual servers that can be started simultaneously on this compute resource (5 recommended). This option ensures that virtual servers with VIP status will be booted prior to other servers.

Placement type - specify the compute resource selection algorithm, that will be used on virtual server provisioning and recovery, per compute zone:

- Take HV with maximum free RAM (Sparse) - set this type to select the compute resource with maximum free RAM during the VS recovery. This option allows performing faster migration of virtual servers with the lesser (sparse) number of iterations during the failover.

  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.

- Take HV with minimum free RAM (Dense) - with this type the system selects the compute resource with the minimum required free RAM. This option allows filling compute resource as densely as possible before starting to use next compute resource in the zone.

Failover timeout - the time period in minutes for which the iterations will run during the failover if the compute resource does not respond. To manage failover, refer to Manage Failover section of this guide.

CPU Units - edit a number of CPU units assigned to each compute resource in this zone by default.

Set max memory (appears only if ballooning release resource type is chosen) - move the slider to the right to enable max memory parameter for every VS within the compute zone. The max memory parameter will be set as 90% of free compute resource memory.

CPU guarantee - move the slider to the right to ensure there is enough CPU on the compute zone to create a new VS.

Update Compute resource CPU units - move the slider to apply the edited number of CPU units to all the compute resources in this zone.

Run Sysprep - enable or disable Windows virtual server deployment without running sysprep.
It is not possible to set VS password when creating a Windows-based VMware virtual server without running a sysprep.

- **Extended CPU Flags** - move the slider to the right to enable CPU flags functionality for all compute resources added to this compute zone.

- **Instance Package VSs** - move the slider to the right if you want the zone to be used when creating Instance Package VSs only. If you enable this option, the zone will not be available in the virtual server creation wizard's Resources step for custom VSs (VSs built by setting resources manually). If this slider does not appear, this zone is inappropriate for creating Instance Package VSs.

Note that **Instance Package VSs** can only be created on compute resources within compute zones where all compute resources are assigned the same amount of CPU units. If there are compute resources with different amount of CPU units set in a zone, it will not be possible to create Instance Package VSs in such zones. The reason is that CPU priority for Instance Package VSs in this configuration cannot be set to 100%, which is the default value for such virtual servers.

- **Custom Config** - add or edit any custom commands you want to run when a compute zone is booted.

The custom configs are only applicable to virtual, smart, and Baremetal compute zones.

### Integrated Storage

- **Use local reads path** - minimize the network throughput dependency for read-heavy workloads. When the Use Local Read Path option is enabled, reads go over the local software bridge to a local replica of the data rather than traverse a physical NIC + switch.

4. Click the **Save** button to save your changes.

### 4.3.1.5 Delete Compute Zone

1. Go to your Control Panel > Admin > Settings menu, and click the Compute Zones icon.

2. The screen that appears will show all zones currently set up in the cloud.

3. Click the Actions button next to the zone you want to remove, then choose **Delete** to remove it from the cloud. You will be asked to confirm the deletion.

See also:

- Manage Compute Zone Networks
- Manage Compute Zone Recipes
- Manage Compute Zone Backup Servers

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zones

### 4.3.2 Manage Compute Zone Data Stores

Data stores can easily be attached and removed from compute zones. This association between a compute zone and a data store is called a data store join.
1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Click the label of the compute zone you want to manage data stores for.
3. On the screen that appears, click the Manage Data Stores link in the Tools section.
4. On the screen that follows you'll see a list of all data stores currently associated with this compute zone.

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

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

4.3.3 Manage Compute Zone Networks

Networks can easily be attached and removed from compute zones. This association between a compute zone and a network is called a network join.

1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Click the label of the compute zone you want to manage data stores for.
3. On the screen that appears, click the Manage Networks link in the Tools section.
4. On the screen that follows you'll see a list of all networks currently associated with this compute zone.

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

To add a new network, choose one from the drop-down menu, enter its interface name (eth0, eth1), and click the Add Network button.

- If the compute zone loses network connection, a warning message All compute resources are not responsive will be displayed.
- You can add networks to a compute zone only if the network belongs to a network zone of the same type as the compute zone. For more information, refer to Zone Types.

4.3.4 Manage Compute Zone Recipes

To manage compute zone recipes:

1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Click the label of the zone you're interested in.
3. On the compute zone details page click the Tools button, then select Manage Recipes.
4. The screen that follows shows details of all the recipes in the cloud:
• The right pane displays the list of compute zone events to which the recipes can be assigned to.

• The left pane shows the list of all recipes in the cloud.

Assign recipe

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

You can assign template recipes to the following events:

• Compute resource comes online - run the recipe when the compute resource comes online
• Compute resource goes offline - run the recipe when the compute resource goes offline
• KVM compute resource goes online - run the recipe when the KVM compute resource goes online
• KVM compute resource goes offline - run the recipe when the KVM compute resource goes offline
• vCenter compute resource goes online - run the recipe when the vCenter compute resource goes online
• vCenter compute resource goes offline - run the recipe when the vCenter compute resource goes offline
• Baremetal compute resource goes online - run the recipe when the Baremetal compute resource goes online
• Baremetal compute resource goes offline - run the recipe when the Baremetal compute resource goes offline

The X compute resource goes offline recipe will be triggered when the statistics are not received from a compute resource for a certain period of time for some reason. If the compute resource is offline, the recipe will not run.

• 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 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. Click the arrow button in front of the required recipe group to unfold it. 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**
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.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Recipes

**4.3.5 Manage Compute Zone Backup Servers**

When you attach a backup server to a specific compute zone, the backups on current backup server will be created only for compute resources within this compute zone.

Ensure that **Update any compute zone** permission is on before managing compute zone backup servers. For more information about permissions, refer to the **Permissions** section of this guide.

**4.3.5.1 View Compute Zone Backup Servers**

To view compute zone backup servers:
1. Go to your Control Panel > **Admin** > **Settings** menu and click the **Compute Zones** icon.
2. Click the label of the compute zone.
3. On the screen that appears, click the **Manage Backup Servers** link in the **Tools** section.
4. On the screen that follows you'll see a list of all backup servers currently associated with this compute zone together with their details:
   - **Label** - the name of the backup server
   - **IP Address** - backup server IP Address
   - **Enabled** - whether backup server is enabled or not

**4.3.5.2 Add Backup Server to Compute Zone**

You can add backup servers to a compute zone only if the the backup server belongs to a backup server zone of the same type as the compute zone. For more information, refer to **Zone Types**.

To add backup server to a compute zone:
1. Go to your Control Panel > **Admin** > **Settings** menu and click the **Compute Zones** icon.
2. Click the label of the Compute zone you want to manage backup servers for.
3. On the screen that appears, click the **Manage Backup Servers** link in the **Tools** section.
4. On the screen that follows you'll see a list of all backup servers currently associated with this compute zone.

5. Choose one from the drop-down menu and click the **Add Backup Server** button.

### 4.3.5.3 Remove Backup Server from Compute Zone

To remove a backup server from the compute zone:

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

2. Click the label of the Compute zone you want to manage backup servers for.

3. On the screen that appears, click the **Manage Backup Servers** link in the **Tools** section.

4. On the screen that follows you'll see a list of all backup servers currently associated with this compute zone.

5. Click the icon next to backup server you want to remove. You'll be asked for confirmation before the backup server is removed.

Be cautious when detaching a backup server from compute zone. It will still be possible to restore a backup and convert the backups to templates, though you will not be able to provision a server from that template.

See also:

- [Manage Compute Zone Data Stores](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)
- [Manage Compute Zone Networks](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)
- [Manage Compute Zone Recipes](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)

### 4.3.6 Manage Compute Zone Backup Resource Zones

Backup resource zones include backup resources built on plugins that enable integration of a third-party backup service with OnApp. You can attach backup resource zones to compute zones if you complete the following procedures:

- [Install Backup Plugin](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)
- [Create Backup Resource](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)
- [Create Backup Resource Zone](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)
- [Attach Backup Resource to Backup Resource Zone](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backups%20Servers)

Adding a backup resource zone to the destination compute zone enables you to handle virtual server backups on the integrated system. As a result, virtual servers that run on compute resources in this compute zone can be backed up by means of a backup plugin.

In this document, you can find information on how to attach and remove backup resource zones to and from compute zones.

Backup Plugin System is available in preview mode and is subject to change in the future OnApp releases.
4.3.6.1  Attach Backup Resource Zone to Compute Zone
To attach a backup resource zone to compute zone, follow the next steps:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Zones icon.
3. Click a label of a compute zone you want to attach a backup resource zone to.
4. Expand the Tools menu and click Manage Backup Resource Zones button.
5. On the page that appears, you will see a list of backup resource zones that you can add to the compute zone.
   You can attach a backup resource zone from the same location group as a compute zone. The backup resource zones from unmatching location groups are not displayed on this page.
6. Select the required backup resource zone from the drop-down menu and click the Submit button.

4.3.6.2  Remove Backup Resource Zone from Compute Zone
To remove a backup resource zone from a compute zone, follow the next steps:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Zones icon.
3. Click a label of a compute zone you want to remove a backup resource zone from.
4. Expand the Tools menu and click Manage Backup Resource Zones button.
5. On the page that appears, you will see a list of backup resource zones added to the compute zone.
6. Click the '-' button next to the required backup resource zone to remove it from the compute zone.

4.3.6.3  What's Next?
- Create Auto Backup Preset
- Add Backup Resource Zone to Bucket
- Attach Backup Resource to Virtual Server

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Zone%20Backup%20Resource%20Zones
Leave feedback

4.3.7  Manage Failover
Compute resource failover means VS migration to another compute resource if the compute resource on which it is running goes offline.

If you want to enable/disable failover for all compute resources within the compute zone, do the following:

1. Go to your Control Panel > Admin > Settings menu and click the Compute Zones icon.
2. Click the label of the Compute zone you want to manage failover for.
3. On the screen that appears, click the Manage Failover link in the Tools section.
4. Click the Enable All button to enable failover for all compute resources within this zone.
5. If the failover is already enabled you can disable it by clicking the Disable All button. When you change the compute zone's failover status, this change will be applied to all compute resources within this zone.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Failover

Leave feedback

4.3.8 Compute Zone Extended CPU Configuration

OnApp provides a possibility to use the extended CPU configuration to group compute resources with similar CPU performance characteristics into compute zones. The extended CPU configuration allows to ensure consistent CPU performance within similar compute resources in the compute zone. The hot migration inside compute zones with the extended CPU configuration is more reliable. Moreover, you can set different prices in buckets for compute zones according to their CPU performance.

The extended CPU configuration is implemented on a per-compute-zone basis. The compute zone with the extended CPU configuration is automatically assigned to a CPU model with a set of default and additional CPU flags. The CPU model is selected based on the CPU characteristics common for all compute resources assigned to one compute zone. The default CPU flags are assigned to the zone automatically and you cannot edit them; the additional flags are optional and you can enable or disable them. In this document, you can find information on how to enable and manage the extended CPU configuration.

The extended CPU configuration is applicable only to KVM compute resources. For better performance, it is not recommended to create mixed KVM compute zones.

4.3.8.1 Enable Extended CPU Configuration

You can enable the extended CPU configuration functionality while creating or editing a compute zone. After this functionality is enabled for the compute zone, all compute resources in this zone are automatically attached to a CPU model with a default set of CPU flags that are common for all compute resources within this zone and that cannot be disabled. You can also select some additional CPU flags that are applicable to all compute resources in the compute zone.

To view and manage the list of the CPU flags available for a compute zone, proceed to the following section.

4.3.8.2 Manage Extended CPU Configuration

After the extended CPU configuration is enabled for a compute zone, you can view and manage CPU configuration of this zone as follows:

1. Go to your Control Panel > Admin > Settings menu.
2. On the following page, click the Compute Zones icon.
3. Click the label of the required compute zone.
4. Click the Tools button and select Manage CPU Configuration.
5. On the page that appears, you will see the following information on CPU configuration:
OnApp Cloud 6.7 Admin Guide

- CPU Model Configuration - provides a label of a CPU model set for this compute zone, as well as the list of default CPU flags that are enabled for each compute resource in this zone. You cannot edit the list of default CPU flags.

- CPU Blacklisted Flags - lists CPU flags which a virtual server should skip when starting. You can add a CPU flag to the CPU Blacklisted Flags table using the info_hub.xml file. CPU blacklisted flags are set up at the cloud level.

- Additional CPU Flags - includes the list of additional CPU flags available for each compute resource in this zone. Click a CPU flag to enable or disable it. The enabled CPU flags are displayed in green boxes and the disabled CPU flags are dimmed. You can also click the Select All and Deselect All buttons to manage additional flags. Any changes you make with additional flags are applied immediately.

  - If a compute zone is attached to a CPU model and then one of the compute resources of this zone goes to maintenance mode, the set of CPU flags can be different when it goes back online. For more information, refer to the Maintenance Mode for KVM Compute Resources section.
  - Be careful when adding new compute resources to a compute zone with extended CPU configuration. For more information, refer to the following section.

To keep your blacklisted CPU flag list after your Control Panel is updated, you need to create an info_hub.local.yml file and add the cpu_blacklisted_flags section to this file.

4.3.8.3 Adding New Compute Resources to Compute Zone with Extended CPU Configuration

There are several scenarios that can take effect when a new compute resource is added to a compute zone with extended CPU configuration:

- If the new compute resource has the same CPU configurations as those resources that are already in a compute zone, the new compute resource inherits the CPU model and CPU flags set in this compute zone.

- If the new compute resource has CPU with better performance characteristics than those resources that are already in a compute zone, the new compute resource inherits the CPU model and CPU flags set in this compute zone. The other flags will be disabled and listed in the Unmatching CPU Flags box at the Admin > Settings > Compute Resources > compute resource label > Tools > Extended CPU Configuration page.

- If the new compute resource has CPU with worse performance characteristics than those resources that are already in a compute zone, the CPU model of the entire compute zone and all compute resources in this zone is automatically downgraded. The list of default and additional CPU flags will be updated in order to include only those flags that are common for each compute resource in the compute zone.

  - If a compute resource with worse performance characteristics than other resources is removed from a compute zone, the CPU model of the entire compute zone and all compute resources in this zone is automatically upgraded. The list of default and additional CPU flags will be updated in order to include only those flags that are common for each compute resource in the compute zone.
  - To achieve a CPU consistency between compute resources in a compute zone, assign the compute resource with worse or better CPU performance.
characteristics to the compute zone, where a CPU model would correspond to the actual CPU performance.

- When you add a new compute resource to a compute zone with extended CPU configuration, wait for CPU flags to be updated after all the related transactions are finished.

4.3.8.4 Additional Considerations for Virtual Servers

There are some additional considerations that you should take into account while creating VSs on compute resources with the extended CPU configuration:

- When a new compute resource with worse CPU performance characteristics is added to a compute zone, as a result, the CPU model is downgraded and unmatching CPU flags are disabled for this zone and all the compute resources with better CPU, virtual servers that were earlier built in this zone on compute resources with a bigger set of flags will preserve all their flags. However, since such a VS has more flags than the compute zone and all the compute resources in this zone, it will not be possible to migrate this VS.

- The migration of virtual servers with a set of flags different from those available on the compute zone level will become available only after the reboot of VS or its shutdown and subsequent startup. After the boot, the VS configuration is updated to include the relevant set of CPU flags. Consequently, the migration of the rebooted virtual server will become available again.

For more information on how to reboot a VS, refer to the Virtual Server Power Options document.

See also:

- Buckets
- Maintenance Mode for KVM Compute Resources
- Manage Compute Zones
- Create Virtual Servers
- Compute Resource Extended CPU Configuration

https://onappcloud.typeform.com/to/A64Euy#source=Compute%20Zone%20Extended%20CPU%20Configuration

4.4 Compute Resources

Compute resources are KVM platforms running on bare metal with CentOS Linux as the management operating system or VMware ESXi servers. They are used to provide hardware resources for virtual servers ensuring highly efficient use of available hardware and complete isolation of virtual server processes. Each virtual server in the cloud is hosted by a specific physical compute resource server, from which it receives CPU time, RAM, and storage capacity from the data stores attached to that compute resource. OnApp supports multiple compute resource platforms including KVM and VMware.

We strongly recommend that you avoid adding CloudBoot and static compute resources to one compute zone.

Compute resources have types that they inherit from the zone to which they belong. These types also define the type of resources (data stores, networks, and backup servers) that can be associated with a compute zone or compute resource. Compute resources can be later moved from one compute zone to another, but the zones should be of the same type. For more
information, refer to Zone Types. The table below demonstrates the available compute zone types for different compute resources:

<table>
<thead>
<tr>
<th>Compute Resource Type</th>
<th>Compute Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVM</td>
<td>Virtual</td>
</tr>
<tr>
<td></td>
<td>Smart</td>
</tr>
<tr>
<td>VMware</td>
<td>Virtual</td>
</tr>
<tr>
<td>VMware Cloud Director</td>
<td>VPC</td>
</tr>
</tbody>
</table>

4.4.1

Sorry, the widget is not supported in this export. But you can reach it using the following URL: https://vimeo.com/530822132

4.4.2 Compute Resource Features

- Provide system resources such as CPU, memory, and network to virtual servers
- Control the virtual differentiation of entities such as virtual servers and application data being delivered to cloud-based applications
- Take care of secure virtualization and channeling of storage, data communications, and server processing
- Can be located in different geographical zones
- Can have different CPU and RAM

Compute resources can also be organized into compute zones that make it easy to offer tiered service levels and create private clouds for specific users.

Compute resources can be dynamically booted over the network using the CloudBoot technology, or statically installed from a CentOS base. Note that enabling the OnApp storage platform requires compute resources to be provisioned using the CloudBoot interface. Refer to the CloudBoot Compute Resources section for details.

When a compute resource is inaccessible for a period of time, commands queued during that period of time will be marked as failed. This is expected OnApp behavior.

4.4.3 Compute Resource Management

The main Compute Resources section in the left Control Panel menu provides access to basic tools for viewing, editing, and rebooting compute resources.

Tools for advanced compute resource management and controlling compute zones are located on the Settings menu in Control Panel (Settings > Compute Resources, and Settings > Compute Resource Zones). For details, refer to the Compute Resources section of this guide.

https://onappcloud.typeform.com/to/A64Euy#source=Compute%20Resources

4.4.4 Manage Compute Resources

Compute resources are based on KVM virtualization and run on bare metal with CentOS Linux as the management operating system or VMware ESXi servers. Compute resources are used to
provide hardware resources for virtual servers, ensuring highly-efficient use of available hardware and complete isolation of virtual server processes. Compute resources can be organized into compute zones, which make it easy to offer tiered service levels and create private clouds for specific users. Each virtual server in the cloud is hosted on a specific physical compute resource server, from which it receives CPU, RAM, and storage capacity from the data stores attached to that compute resource. In this document, you can find information on how to manage compute resources.

For more information on how to manage a specific compute resource, refer to the Compute Resources section.

4.4.4.1 View Compute Resource Settings
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. On the screen that appears, you will see the list of all compute resources in the cloud along with their details:
   - **Status** - whether the compute resource is online, offline, in maintenance mode, or locked (means that some of the services are yet to be started; this status appears during hot migration or when starting a compute resource)
   - **Label** - the name of the compute resource
   - **IP Address** - the IP address of the compute resource
   - **Enabled** - whether the compute resource is enabled or disabled. If disabled, you cannot create the virtual servers on it, or migrate the VSs to this compute resource.
   - **Compute Zone** - the compute zone to which the compute resource is assigned
   - **Operating System** - the operating system type of the virtual servers that can live on this compute resource
   - **CPU Cores** - number of CPU cores
   - **RAM** - total/free RAM (based on the compute resource type)
   - **VS** - the number of VSs associated with the compute resource
   - **Features** -

   ![icons](image)

   . where the first icon shows the compute resource's failover status, the second one - statistics collection, the third one - CloudBoot status, and the fourth one - backup status (for CloudBoot compute resources only; it shows whether CloudBoot compute resource is used as a backup server)

4.4.4.2 View Compute Resources
The Control Panel provides a quick way to see a summary of compute resources available in your cloud. On the Admin tab, click All Compute Resources to see a list of all compute resources and the following details:
   - **Status**
   - **Label**
   - **IP Address**
• Type
• Zone
• Location Group
• Operating System
• Failover
• VS (the number of deployed virtual servers)
• CPU
  o Cores
  o Used
  o Available
  o MHZ
• RAM (based on the compute resource type)
  o Total
  o Free

If you are viewing the compute resources list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, select the columns you want to see and click Apply. The narrower your screen is, the more deselected columns will be hidden from the table. If your screen is too narrow to fit all the columns you have selected, a scrollbar will appear at the bottom of the compute resources list. You can always change the selection of columns. Note that by default the VS, Used and MHZ columns are not visible in the table on narrow screens.

The selection of columns is currently set for one browser. If you select some columns in one browser and open this page in another browser, the column selection will be the default one for that other browser.

To sort information by column in ascending or descending order, mouse over the particular column header and click a triangle icon.

To view a particular compute resource details, click the label of a required compute resource. On the screen that appears, you'll see compute resource details (RAM usage/RAM available, IP Address, CPU MHZ/CPU cores, etc.) and Activity log of this compute resource. In the Target column, you can see an identification number and the name of a compute resource, to which the appropriate action was applied. To view details of a transaction from the activity log, click its Ref number.

To edit or delete a compute resource, click the Actions button next to the compute resource, then select the required action.

4.4.4.3 View Compute Resource Details
To view compute resource hardware info:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. On the screen that appears, you will see the list of all compute resources in the cloud.
4. Click the Actions button next to the compute resource and then select Hardware Info. Also, you can click the label of a specific compute resource, then click the Actions button, point to Resource Options, and select Hardware Info.
You can also view the compute resource details after clicking in the Admin tab > a label of a compute zone where a target compute resource runs > a label of a compute resource.

5. You will see the following details:
   - **Summary Info** This section contains basic information about the compute resource:
     - *Current Uptime* - the time the compute resource has been working and available, the number of its users, and the average load
     - *Total CPU* - the total amount of CPU (number of cores/frequency in MHz) allocated to the compute resource
     - *Memory* - the total amount of memory (GB) allocated to a compute resource
     - *Type* - the type of the compute resource, for example, KVM
     - *OS* - the operating system of the compute resource
     - *Manufacturer/Model* - the manufacturer and model of the motherboard
     - *BIOS/Serial Number* - the system BIOS, its serial number, and release date

   - **CPU** This section shows CPU manufacturer logo and information about CPU slots. Click the **CPU Details** button to get detailed information about CPU from the Intel ARK database if available.

   - **RAM** This section includes information about memory slots (double data rate, memory clock in MHz, size).

   - **HD** This section shows information about the manufacturer and model of a hard disk drive and the hard disk drive capacity in GB.

   - **Network** This section contains information about network cards. Click the **Info** button next to the specific network to get detailed information from the Intel ARK Database if available.

6. If hardware information is empty or incomplete, click the **Update Hardware Info** button in the right upper corner.

7. Click the **Edit Custom Fields** button to add/edit/delete custom fields for the hardware info. For more information on how to manage custom fields, refer to the Hardware Info page.

The list of available actions for the virtual server depends on the VS power status. For more information, refer to the Virtual Server Power Options guide.

4.4.4.4 Edit Compute Resource Details
You can edit compute resource details at the compute resource details page or through your Control Panel > Admin > Settings > Compute Resources.

OR
On the **Admin** tab, you can click a label of a compute zone where a target compute resource runs.

1. Click the label of the compute resource.
2. Click the **Actions** button, point to **Resource Options**, and select **Edit Compute Resource**.

The editing functionality is the same whichever method you choose.

On the screen that follows, change details as required:

- **Label** - the name of the compute resource
- **Operating System Type** - choose an operating system type (*Any OS*, *Windows only*, or *Non-Windows*)

Note that the compute resource won't be edited if the VSs with the inappropriate operating system is present on it. Thus, it won't be possible to set *Windows only* type for a compute resource if there are any Linux or FreeBSD VSs living on it. Likewise, it won't be possible to set the *Non-Windows* type for a compute resource, if there are Windows-based VSs living on it.

1.  
   - **Backup IP address** - the provisioning network IP address
2.  

   The provisioning network IP address is not obligatory but recommended as an additional network connection for intensive data transfer by migrations and backups. If not specified, the management network connection will be loaded by that data.

   - **CPU Units** - shows the speed of the CPU. Please note that it is just a number that is relative to another number. For example, if one compute resource is two times more powerful than another, the CPU units could be 1000 and 500, respectively. The number of CPU Units is an abstract figure that you set by yourself to compare the compute resource's capacity as the more capacity the compute resource has, the more CPU units should be assigned to this compute resource.

   Mind that setting a different amount of CPU units will affect your cloud configuration. It will not be possible to create *Instance Package* VSs in the compute zone to which you assign this compute resource.

   Note that the compute resource won't be edited if the VSs with the inappropriate operating system is present on it. Thus, it won't be possible to set *Windows only* type for a compute resource if there are any Linux or FreeBSD VSs living on it. Likewise, it won't be possible to set the *Non-Windows* type for a compute resource, if there are Windows-based VSs living on it.

   - **Enabled** - enable or disable the ability to install/boot virtual servers on this compute resource
   - **Collect stats** - enable or disable the ability to collect statistics for this compute resource
When you assign the compute resource to the new compute zone without any compute resources, the disable failover zone’s parameter automatically takes the value of the compute resource.

When all compute resources within the zone have the same value, the compute zone’s disable failover status will be the same; otherwise, the compute resources zone’s failover status will be set to disabled.

When you change the compute zone’s disable failover value, this change will be applied to all compute resources within this zone.

**Disable Failover** - enable or disable the VS migration to another compute resource if this compute resource is marked as offline by the Control Panel server

- If you want to enable/disable failover for all compute resources within the compute zone, refer to **Manage Failover** section of this guide.
- If you use automatic failover with write-back caching you may lose some data in the event of a failover.

**Failover recipe** - select a recipe to run on compute resource before the failover process

**Power Cycle Command** - arbitrary command string to be executed by IPMI from the CP server. If the command is entered, a new **Power Cycle compute resource** option, which will execute the entered command, will appear at **Admin > Settings > Compute Resources > label of a compute resource > Actions > Resource Options**

Currently, a command or commands should be written in one line separated by a semicolon. If the command is written in two lines you will receive a “fail” response, although the transaction will be performed. The power cycle command is executed on Control Panel under the `onapp` user and it can be any bash script.

Click the **Save** button to save your changes.

### 4.4.4.5 Power On/Off Virtual Servers

At the compute resource details page, you can power on and power off virtual servers that are run on this compute resource. To power on/off virtual servers, follow the next steps:

1. On the **Admin** tab, click a label of a compute zone where a target compute resource runs.
2. Click a label of a compute resource. On the screen that appears, you will see a list of all virtual servers hosted on the compute resource.
3. Choose virtual servers that you want to power on or power off by selecting the required checkboxes in the first column of the table.

- To select all virtual servers residing on the compute resource, click the first checkbox. To cancel the selection of all virtual servers, click this checkbox again.
- If you select all virtual servers, only the powered-off VSs will be powered on, while the already powered-on VSs will be skipped and vice versa.

Depending on the current power status of the selected VSs, one of the following options become available.
Power On
To power on the selected VSs:

- Click the **Power On** button.
- In the pop-up box, click the **YES** button to confirm your action.

Power Off

We show usage for any compute resource cores that are being managed within the cloud. To ensure you are not charged for cores if you are taking a compute resource offline, please ensure to **delete it**.

To power off the selected VSs:

- Click the **Power Off** button.
- In the pop-up box, select one of the following methods:
  - *Gracefully shutdown* - to run a graceful shutdown of VSs
  - *Power Off* - to run a forceful shutdown of VSs
- Click the **Submit** button to confirm your action.

- The bulk power on/off actions are available only to virtual servers that are run on KVM and Xen compute resources.
- For more information on the **VS Power Options**, refer to the linked guide.

4.4.4.6 Migrate Virtual Servers

You can migrate multiple virtual servers at once from one compute resource to another compute resource of the same type (KVM to KVM or Xen to Xen). The mass migration is available within compute resources that belong to the same compute zone. To migrate virtual servers, follow the next steps:

1. On the **Admin** tab, click a label of a compute zone where a target compute resource runs.
2. Click a label of a compute resource. On the screen that appears, you will see a list of all virtual servers hosted on the compute resource.
3. Select checkboxes next to the virtual servers that you want to migrate and click the **Migrate** button.

   To select all virtual servers residing on the compute resource, click the first checkbox. To cancel the selection of all virtual servers, click this checkbox again.

4. In the pop-up box, select the following options:
   - *Target compute resource* - select a destination compute resource to migrate the virtual servers to
   - *Cold-migrate when hot-migration fails* - select the checkbox if you want to apply cold migration in case of the hot migration failure

   If some of the selected virtual servers have disks that run as a local storage on this compute resource, these virtual servers could not be migrated. After the migration, these virtual servers remain on the previous compute resource, while other VSs are migrated to the destination compute resource.

5. When you are finished, click the **Submit** button.
After the migration, the power status of your virtual servers remains the same as before the migration. If you migrate virtual servers that are running, the whole process is almost unnoticeable.

To check if your Windows template supports hot migration, see the Windows templates list.

Note that migration of virtual servers to a compute resource without a specific Operating System Type has the following implications:

- You won't be able to set the Windows only type for a compute resource if there are any Linux or FreeBSD virtual servers on it.
- You won't be able to set the non-Windows type for a compute resource if there are Windows-based virtual servers on it.

### 4.4.4.7 Edit Integrated Storage Settings

1. Go to your Control Panel > Admin > Settings menu and click the Compute Resources icon.
2. On the page that appears, you will see the list of compute resources available in your cloud. Click the Actions button next to the label of a compute resource and select the Integrated Storage Settings option.
3. Click the Edit button.
4. On the screen that loads, edit the following parameters:
   - **Number of cache mirrors** - specify the number of cache mirrors for the compute resource
   - **Number of cache stripes** - specify the number of cache stripes for the compute resource
   - **Controller RAM** - specify the controller RAM value. You may calculate the amount of memory needed for a storage controller as DB size (128 MB by default) + 10 MB x vDisk parts at the controller.
   - **Drives per controller** - specify the number of disks per controller virtual server. You can specify from 1 to 4 disks. By default, the controller virtual server is created per 4 disk drives.
   - **Controller DB size** - select the controller DB size value (minimum 128 MB, maximum 256 MB)
   - **SAN bonding mode** - choose bonding mode type from the drop-down menu
   - **MTU** - specify the maximum transportation unit size. You can set the frame size from 1500 to 9000 bytes
   - **VLAN id** - specify the ID of a VLAN number
   - Cache settings:
   - Controller settings:
   - Click the Save button to save changes.

### 4.4.4.8 Reboot Compute Resource

You can reboot a compute resource and set a logic to apply to virtual servers during the reboot. To reboot a compute resource:
1. Go to your Control Panel > Admin > Compute Resources menu.
2. Click a label of the compute resource that you want to reboot.
3. On the compute resource details page, click the Actions button, point to Resource Options, and select Reboot Compute Resource.
4. In the pop-up box, you can select the following options:
   - **Do not migrate powered off VSs** Select this checkbox to prevent the migration of powered off virtual servers to another compute resource while the source compute resource is being rebooted.
   - **Start running virtual servers after reboot?** Select this checkbox to initiate the failover process to start running virtual servers after the reboot. The failover process will be initiated despite the Disable Failover configuration for compute resource or compute zone.
   - **Stop all virtual servers that cannot be migrated to another compute resource?** Select this checkbox to power off virtual servers that cannot be migrated. When a compute resource is scheduled for the reboot, OnApp first attempts to hot migrate all virtual servers on a compute resource. If hot migration is not possible for a VS, OnApp attempts to cold migrate the VS. If you select this checkbox and cold migration fails, the VS is stopped so that the reboot may continue. If you don’t select this checkbox, OnApp first attempts to hot and then cold migrate all VSs hosted on the compute resource but stops the reboot process if any VS cannot be migrated.
   - **Are you sure you want to reboot this compute resource?** Select this checkbox to confirm that you want to reboot the compute resource.
5. When you are certain that you want to proceed with the reboot, click the Reboot button.

The reboot option is not available for VMware compute resources.

If your backups disappear after rebooting the CloudBoot compute resource with LVM storage which is used as a backup server, add mount command to CloudBoot backup server custom config after the reboot. This is a known issue which will be fixed in the future release.
To fix your custom config settings, use one of the following options provided in the examples below (you will have to specify your own device names):

1. If you have a separate partition for backups and templates (/dev/sda1 and /dev/sda2)
   
   ```
   mkdir -p /onapp/backups
   mkdir -p /onapp/template
   mount /dev/sda1 /onapp/backups
   mount /dev/sda2 /onapp/templates
   ```

2. If your current array is detected as /dev/sda1 and currently everything is located in /onapp within templates and backup directories within:

   ```
   mkdir -p /onapp
   mount /dev/sda1 /onapp
   ```

### 4.4.4.9 Delete Compute Resource

Compute resources can be removed from your cloud if required. A Compute resource cannot be removed until all of the virtual servers assigned to it are migrated to another compute resource.

To remove a 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 compute resource you want to delete, then click Delete.

See also:

- Zone Types
- Add Compute Resource to Compute Zone
- Cloudboot Compute Resources
- Hardware Info

https://onappcloud.typeform.com/to/A64Eu#source=Manage%20Compute%20Resources

Leave feedback

### 4.4.5 CloudBoot Compute Resources

CloudBoot functionality is a method of compute resource installation without the presence of a local disk or other local storage, utilizing the PXE and DHCP servers. In other words, Cloudboot refers to a type of compute resource that is booted from an image generally hosted on the Control Panel server.

This allows users to both lower their hardware requirements on the compute resources (no local storage is required to boot a compute resource) as well as make the process of adding new compute resources to the cloud more efficient:

- No manual admin work required to boot compute resources
- No local storage needed to boot compute resources
- Self-discovery of new compute resources added to the cloud
- Ability to move compute resources quickly between zones

Cloudboot compute resources are required for the use of OnApp Integrated Storage.

To start using CloudBoot, you must enable CloudBoot and Storage in the system configuration first (Admin > Settings > Configuration > CloudBoot). Visit the Configuration Settings chapter for more details.
It's recommended that you create a separate network for compute resources when using the CloudBoot system to prevent errors of other servers (not compute resources) on the cloud to boot into the CloudBoot network. All Compute resources must reside on the same VLAN (this concerns compute resources only, not the VS's themselves).

Since CloudBoot compute resources are booted from an image, some configurations will not be saved after reboots. You can use the Custom Config option to effectively save configurations. The custom config executes as a script on the compute resource any time it is booted.

The following CloudBoot features are not currently available (they will be introduced in future releases):

- Bonded NICs for the management/boot interface

For details on how to create a CloudBoot compute resource, refer to the Create CloudBoot Compute Resource section.

https://onappcloud.typeform.com/to/A64Euy#source=CloudBoot%20Compute%20Resources

Leave feedback

4.4.5.1 Manage CloudBoot Compute Resources

Compute resources are a critical part of the cloud. Compute resources have types which they inherit from the zone to which they belong. This section provides information on how to edit CloudBoot compute resources for different types of servers and how to delete them.

4.4.5.1.1 Edit CloudBoot Compute Resource

To edit a CloudBoot 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 CloudBoot compute resource you want to edit and then click Edit.
4. On the screen that follows, change details as required:

Properties

- Label - the compute resource's name
- MAC - the MAC address of the compute resource
- Backup IP address - provisioning network IP address
- CPU Units - set the amount of CPU units assigned to this compute resource
- Enabled - enable or disable the ability to install/boot virtual servers on this compute resource
- Collect Stats - enable or disable the ability to collect statistics for this compute resource. If you edit a Backup CloudBoot resource type, the Disable Failover parameter is not available
- Disable Failover - enable or disable the VS migration to another compute resource, if this compute resource is marked as offline by the Control Panel server

- If you edit a Backup CloudBoot resource type, the Disable Failover and Failover Recipe parameters are not available.
- The Failover option is not available for baremetal servers.
- If you use automatic failover with write-back caching, you may lose some data in the event of a failover.
- **Failover recipe** - select a recipe to run before the failover process
- **Pxe IP address** - select a new IP address for this compute resource from the address pool

  - When you change the Pxe IP address, you should reboot the CloudBoot compute resource immediately after saving the new settings. If you do not reboot the resource immediately, the Control Panel will fail to connect to the new IP address, causing failover transactions. You can reboot the compute resource manually from the console or use the Power Cycle command (if configured).

  You cannot use the **Reboot** option on the CP UI to reboot the resource after changing the IP address.

  You can also change the IP address of a CloudBoot compute resource that is offline and once the resource is booted, it will be available on the new IP Address.

  - If InfiniBand is enabled for CloudBoot, you should change a value of the `cloud_boot` pxe config after changing the Pxe IP address.

**Advanced**

Move the Advanced slider to the right to edit advanced compute resource settings:

1. **MTU** - specify the maximum transportation unit size. You can set the frame size from 1500 to 9000 bytes

   The maximum transportation unit (MTU) is the maximum size of a unit that can be transmitted transferred via ethernet traffic. Any data that exceed the specified MTU value will be divided into smaller units before being transferred. Utilization of jumbo frames allows you to reduce increase throughput and increase CPU utilization during large size file transfers.

2. **SAN bonding mode** - choose bonding mode type from the drop-down menu

   After editing the SAN bonding mode option, it is required to reboot your compute resource to apply the settings.

   Please note that using more than one NIC for SAN subnet requires switch support. Please ensure that your network infrastructure supports the utilized NIC bonding and is configured correctly. By default, the utilized NICs bonding mode is IEEE 802.3ad Dynamic link aggregation which requires grouping appropriate ports together according to the section *5 Switch Configuration* of Linux Ethernet Bonding Driver guide.

   - **Storage Controller RAM** - specify the storage controller RAM value. You may calculate the amount of memory needed for a storage controller as DB size (128 MB by default) + 10 MB x vDisk parts at the controller.

   - **Storage Controller DB size** - select the storage controller DB size value (minimum 128 MB, maximum 256 MB)

   - **Drives per Controller** - specify the number of disks per controller virtual server. You can specify from 1 to 4 disks. By default, the controller virtual server is created per 4 disk drives

   - **Dom0 RAM** - allocate the amount of memory in MB for Dom0 on Xen compute resources. You need to allocate at least 3072 MB of Dom0 RAM

   - **Storage VLAN** - select VLAN for Integrated Storage Network
2.

The *Dom0 RAM* parameter is applicable only to Xen compute resources. Starting from OnApp 6.5, Xen virtualization type is not supported.

After editing the Storage VLAN, it is required to reboot your compute resource to apply settings. By default, Storage VLAN is set to 0 that is equal to no VLAN. If you already use a VLAN parameter in onappstore.conf that was added manually, please change the Storage VLAN parameter for each compute resource and save the CP configuration after editing to regenerate boot configuration. These requirements do not apply to VLAN used by means of a custom config script.

1.

- **Apply Compute Zone Custom Config** - move this slider to the right to apply a *compute zone* custom config

  If this check box is selected, a compute zone custom config is applied before a CloudBoot compute resource custom config.

- **Custom Config** - specify any custom commands you want to run when a compute resource is booted

- **Power Cycle Command** - arbitrary command string to be executed by IPMI from the CP server. If the command is entered, a new *Power Cycle compute resource* option, which will execute the entered command will appear at Admin > Settings > Compute Resources > label of a compute resource > Actions > Resource Options

  Currently, a command or commands should be written in one line separated by a semicolon. If the command(s) is written in two lines you will receive a "fail" response, although the transaction will be performed. The power cycle command is executed on Control Panel under user *onapp*, this may be any script created in bash.

5. Click the **Save** button to save your changes.

You can manage CloudBoot compute resource devices (disks, network interfaces, and PCI devices) on the Devices page. For more information, refer to Manage CloudBoot Compute Resource Devices.

4.4.5.1.2 Edit Baremetal CloudBoot Compute Resource

To edit a Baremetal CloudBoot 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 CloudBoot compute resource you want to edit and then click **Edit**.
4. On the screen that follows, change details as required:

- **Label** - the compute resource's name
CPU units - the amount of CPU units assigned to this compute resource

Enabled - enable or disable the ability to install/boot virtual servers on this compute resource

Pxe IP address - select a new IP address for this compute resource from the address pool

- When you change the Pxe IP address, you should reboot the CloudBoot compute resource immediately after saving the new settings. If you do not reboot the resource immediately, the Control Panel will fail to connect to the new IP address. You can reboot the compute resource manually from the console or use the Power Cycle command (if configured).

You cannot use the Reboot option on the CP UI to reboot the resource after changing the IP address.

You can also change the IP address of a CloudBoot compute resource that is offline and once the resource is rebooted, it will be available on the new IP Address.

- If InfiniBand is enabled for CloudBoot, you should change a value of the cloud_boot pxe config after changing the Pxe IP address.

Apply Compute Zone Custom Config - move this slider to the right to apply a compute zone custom config

If this check box is selected, a compute zone custom config is applied before a CloudBoot compute Resource custom config.

Custom Config - specify any custom commands you want to run when a compute resource is booted

Power Cycle command - arbitrary command string to be executed by IPMI from the CP server. If the command is entered, a new Power Cycle compute resource option which will execute the entered command, will appear at Admin > Settings > Compute Resources > label of a compute resource > Actions > Resource Options

Currently, a command or commands should be written in one line separated by semicolon. If the command(s) is written in two lines you will receive a “fail” response, although the transaction will be performed. The power cycle command is executed on Control Panel under user onapp, this may be any script created in bash.

5. Click the Save button to save your changes.

4.4.5.1.3 Edit Smart CloudBoot Compute Resource

To edit a Smart CloudBoot 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 CloudBoot compute resource you want to edit and then click Edit.

4. On the screen that follows, change details as required:

Properties

- Label - the compute resource's name
- Backup IP address - provisioning network IP address
- CPU units - the amount of CPU units assigned to this compute resource
- **Enabled** - enable or disable the ability to install/boot virtual servers on this compute resource
- **Collect stats** - enable or disable the ability to collect statistics for this compute resource
- **Disable failover** - enable or disable the VS migration to another compute resource, if this compute resource is marked as offline by the Control Panel server

If you use automatic failover with write-back caching you may lose some data in the event of a failover.

- **Pxe IP address** - select a new IP address for this compute resource from the address pool

  - If you change the Pxe IP address, you should perform a manual reboot of a Smart CloudBoot compute resource after saving new settings.
  - If InfiniBand is enabled for CloudBoot, you should change a value of the `cloud_boot` pxe config after changing the Pxe IP address.

### Storage disks
- Move the slider next to the available disk to the right to select it for this compute resource.

### Storage NICs
For each compute resource NIC, you can use one of the following options:

- **Unassigned** - leave the NIC unused
- **SAN subnet** - select this option to use this interface for the storage network. In this case, the NIC interface will be bonded with the virtual network interface of the Storage Controller Server
- **Passthrough to storage** - this option is available for Xen CloudBoot compute resources. The network interface will be added to the Storage Controller Server without the bond and the Storage Controller Server will have the complete control over this interface
- **Passthrough to Guest** - this option is available for smart CloudBoot compute resources. The network interface will be added to the smart server

1. The **Passthrough to storage** option is applicable only to Xen compute resources. Starting from OnApp 6.5, Xen virtualization type is not supported.

### Advanced
Move the Advanced slider to the right to edit advanced compute resource settings:

- **MTU** - specify the maximum transportation unit size. You can set the frame size from 1500 to 9000 bytes

The maximum transportation unit (MTU) is the maximum size of a unit that can be transmitted transferred via ethernet traffic. Any data that exceed the specified MTU value will be divided into smaller units before being transferred. Utilization of jumbo frames allows you to reduce increase throughput and increase CPU utilization during large size file transfers.
4.4.5.1.4 Delete Compute Resource
Compute resources can be removed from your cloud if required. A compute resource cannot be removed until all of the virtual servers assigned to it are migrated to another compute resource.

To remove a 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 compute resource you want to delete, then click Delete.

See also:
4.4.5.2 Manage CloudBoot Compute Resource Devices

You can manage CloudBoot compute resource devices (disks, network interfaces, and PCI devices), which are configured during Create CloudBoot Compute Resource.

To edit CloudBoot compute resource devices configuration:

1. Go to your Control Panel > Admin > Settings > Compute Resources > label of compute resource > Actions > Resource Options > Hardware Devices.

2. The page that loads displays the Storage and CloudBoot versions details and the list of devices together with their details. The Storage version displays the onappstore rpm version and may have the UNKNOWN VERSION value if the compute resource was booted from an older ramdisk image.
   - For disks - name, status, and SCSI identifier
   - For network interfaces - name, status, and MAC

3. Click the Edit Device Configuration button.

4. Configure disks:
   - move the Passthrough all disks slider to the right to pass through all disks to Storage Controller Server without the bond and the Storage Controller Server will have the complete control over disks.
   - assign each disk to Storage or to Cache, or leave it unassigned
   - for disks assigned to Cache, specify the number of mirrors and stripes

5. Configure cache settings:
   - Number of cache mirrors - specify the number of cache mirrors for the compute resource
   - Number of cache stripes - specify the number of cache stripes for the compute resource

6. Configure network interfaces. For each compute resource NIC, you can use one of the following options:
   - Unassigned - leave the NIC unused.
   - SAN subnet - select this option to use this interface for the storage network. In this case, NIC interface will be bonded with the virtual network interface of the Storage Controller Server.
   - Passthrough to storage - this option is available for Xen CloudBoot compute resources. The network interface will be added to the Storage Controller Server without the bond and the Storage Controller Server will have the complete control over this interface.
   - Passthrough to Guest - this option is available for smart CloudBoot compute resources. The network interface will be added to the smart server.

The Passthrough to storage option is applicable only to Xen compute resources. Starting from OnApp 6.5, Xen virtualization type is not supported.
7. Click **Next**.
8. After the devices are successfully reconfigured, click **Finish**.

Note that Storage drives cannot be formatted as integrated storage in case they were previously used in LVM. Therefore, you need to run the following commands to clean the device:

```bash
pvremove /dev/<device>
dd if=/dev/zero of=/dev/<disk> bs=1024 count=1000
```

See also:
- Compute Resources
- Manage Compute Resources
- Compute Resource Matrix
- CloudBoot Compute Resources

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20CloudBoot%20Compute%20
Resource%20Devices

### 4.4.6 Manage Static Compute Resource Hardware Devices

You can manage static compute resource hardware devices (disks and network interfaces), which are configured during **Static compute resource creation**.

To edit static compute resource hardware devices configuration:

1. Go to your Control Panel > **Admin** > **Settings** > **Compute Resources** > label of compute resource > **Actions** > **Resource Options** > **Hardware Devices**.
2. The page that loads displays the Storage versions details and the list of devices together with their details. The Storage version displays the `onappstore rpm` version and may have the UNKNOWN VERSION value if the compute resource was booted from an older ramdisk image.
   - For disks - name, status, and SCSI identifier
   - For network interfaces - name, status, and MAC
3. Click the **Edit Hardware Device Configuration** button.
4. Assign each disk to Storage or to Cache, or leave it unassigned
5. Configure disks:
   - **Unassigned** - leave the disk unused
   - **Assigned to Storage** - select this option to use this disk into storage datastore
   - **Assigned to Cache** - select this option to use this disk for DM-Cache
6. Configure network interfaces. For each Compute resource NIC, you can use one of the following options:
   - **Unassigned** - leave the NIC unused.
   - **Assigned to SAN** - select this option to use this interface for storage network. In this case, NIC interface will be bonded with virtual network interface of the Storage Controller Server.
7. Click **Next**.
8. After devices are successfully reconfigured, click **Finish**.

4.4.7 Manage Compute Resource Data Store

Data stores can easily be attached and removed from 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.
2. Click the Compute Resources icon.
3. Click the label of the compute resource you want to manage data stores for.
4. On the page that appears, click the Actions button, point to Management Options, and select Manage Data Stores.
5. On the following page, you'll see a list of all data stores currently associated with this compute resource.

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

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

4.4.8 Manage Compute Resource Backup Servers

The association between a compute resource and a backup server is called a backup server join. It enables the use of a backup server for storing the backups of virtual servers hosted on the compute resource.

If a compute resource lacks such a backup server join, the backups will be created on the compute resource hosting the virtual server. To prevent creating both manual and auto-backups on compute resources, set the Max limit in the Miscellaneous section to 0.

Ensure that the **Update any compute resource** permission is on before managing compute resource backup servers. For more information about permissions, refer to the Permissions section of this guide.

View Compute Resource Backup Servers

1. Go to your Control Panel > Admin > Settings menu.
2. Click the **Compute Resources** icon.

3. Click the label of a compute resource.

4. On the page that appears, click the **Actions** button, point to **Management Options**, and select **Manage Backup Servers**.

5. On the following page, you'll see a list of all backup servers associated with this compute resource and their details:
   - **Label** - the name of the backup server
   - **IP Address** - the IP Address of the backup server
   - **Enabled** - whether backup server is enabled or not

### 4.4.8.1 Add Backup Server Join

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

1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Compute Resources** icon.
3. Click the label of the compute resource you want to manage backup servers for.
4. On the page that appears, click the **Actions** button, point to **Management Options** and select **Manage Backup Servers**.
5. On the following page, in the **Add Backup Servers** section, fill in the following field:
   - **Backup Server** – select the required backup server from the drop-down list
6. Click **Add Backup Server**.

### 4.4.8.2 Remove Backup Server Join

1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **Compute Resources** icon.
3. Click the label of the compute resource you want to manage backup servers for.
4. On the page that appears, click the **Actions** button, point to **Management Options** and select **Manage Backup Servers**.
5. On the following page, click the next to the backup server join you want to remove.
6. You will be asked for confirmation before the backup server is removed.

See also:

- [Manage Compute Zone Backup Servers](#)
- [Manage Compute Resource Data Store](#)
- [Manage Compute Resource Networks](#)

### 4.4.9 Manage Compute Resource Networks

Networks can easily be attached and removed from compute resources. This association between a compute resource and a network is called a network join.

- You can add networks to a compute resource only if they are assigned to zones of the same type. For more information, refer to **Zone Types**.
• Note that starting from OnApp 5.4, it is allowed to attach only one network to a NIC, and different networks can be assigned to the same NICs if their VLANs are different. If you attach more than one network to the same NIC, all of them will be displayed in the interface, but only one will work.

To add/remove network joins:
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Click the label of the compute resource you want to manage networks for.
4. On the screen that appears, click the Actions button, point to Management Options, and select Manage Networks.
5. On the screen that follows, you'll see a list of all networks currently associated with this compute resource.

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

To attach a new network join, fill in the following fields:
• Interface - enter the interface name of the network join (eth0, eth1)
• Network - select a network from the drop-down list

Then click Add Network.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Compute%20Resource%20Networks

4.4.10 Maintenance Mode for KVM Compute Resources

Compute resources provide hardware for virtual servers, ensuring highly efficient use of available hardware. Below you can find the solutions regarding compute resource maintenance.

If you need to take a compute resource out of service, fix or upgrade it, use the maintenance mode feature. The VSs will be migrated to another compute resource and you can easily maintain your hardware. Be aware that after maintenance, VSs will not be migrated back to your compute resource automatically. You should manually bring VSs back to this compute resource.

If a compute resource is overloaded, but you do not want to take it out of service, you can enable or disable the ability to install/boot virtual servers on the compute resource by means of the Enabled slider while editing compute resource. Virtual servers that are already created on this compute resource will not be migrated and will be running.

• Maintenance mode is applicable only to KVM compute resources.
• Ensure that the Set maintenance mode for any compute resource permission is on before managing maintenance mode. For more information, refer to the OnApp Permissions section of this guide.
• Starting with OnApp 5.4, maintenance mode is also available for CloudBoot compute resources. Also, you can disable Integrated Storage for CloudBoot compute resources with Integrated Storage.

4.4.10.1 Enable Maintenance Mode
1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Click the label of the compute resource you are interested in.

4. Click the Actions button, point to Resource Options, and select Enable Maintenance Mode.

5. On the screen that follows:
   - Move the first slider to the right if you want to stop all virtual servers that cannot
     be migrated to another compute resource. This might happen because there are not
     enough resources on other compute resources in this zone for all VSs, or there is only
     one compute resource in a zone. All VSs, which have the hot migration option enabled,
     are attempted to be migrated to another compute resource. Note that smart servers can
     be migrated using only the cold migration option.
   - Move the second slider to the right if you are sure you want to enable
     maintenance mode for this compute resource.

6. Click the Confirm button. The action will be confirmed only if both options are enabled.

VSs will be sequentially migrated to other compute resources within the compute zone to which
your compute resource is assigned. The compute resource will be marked as in maintenance
mode and you will be able to fix or upgrade it.

Be aware that KVM-based VSs are migrated to KVM compute resources within one
compute zone.

4.4.10.2 Disable Maintenance Mode

To bring a compute resource back online, switch maintenance mode off:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Click the label of the compute resource you are interested in.
4. Click the Actions button, point to Resource Options, and select Disable Maintenance Mode.

If you want to return VSs to the compute resource, from which they were migrated, you should
manually bring VSs back to this compute resource.

Disabling maintenance mode initiates automatic reboot of a compute resource.

4.4.10.3 Maintenance Mode and Extended CPU Configuration

If the compute zone has extended CPU configuration (CPU model/flags) and one of the
compute resources from this compute zone goes to maintenance mode, there are several
scenarios that can take effect when the resource goes back online:
• If the compute resource after maintenance has the same CPU performance characteristics as other compute resources in a compute zone, the CPU model remains the same for this compute zone.

• If the compute resource after maintenance has better CPU performance characteristics than other compute resources in a compute zone, the CPU model remains the same for this compute zone.

• If the compute resource after maintenance has worse CPU performance characteristics than other compute resources in a compute zone, the CPU model is downgraded for this compute zone.

Consider assigning a compute resource with worse or better CPU performance characteristics to another compute zone, where a CPU model would correspond to the actual CPU performance.

See also:
• Compute Resources
• Manage Compute Resources
• Compute Resource Matrix
• Add KVM Compute Resource (API)
• OnApp Permissions
• Manage Virtual Servers

https://onappcloud.typeform.com/to/A64Euy#source=Maintenance%20Mode%20for%20Xen/KVM%20Compute%20Resources

4.4.11 Enable Kernel Crash Dumping

Kdump is a kernel crash dumping mechanism designed for saving the system's memory contents for later analysis. It is especially helpful for the purposes of debugging when you want to discover the cause of a crash. At OnApp, Kdump feature allows you to create and collect kernel crash dumps on the CloudBoot compute resources. This feature is implemented for CentOS 6 KVM and CentOS 7 KVM compute resources only.

To enable kernel crash dumping:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute Resources icon.
3. Click the label of the Compute resource you want to enable Kdump on.
4. On the screen that appears, click the Actions button, point to Resource Options, and select Enable Kernel Crash Dumping.
5. Move the Kernel Crash Dumping slider to the right to enable Kernel Crash Dumping.
6. Click Save to proceed.

After you have enabled kernel crash dumping, reboot your compute resources at a convenient time to apply the changes.

The core dumps should be stored on NFS resource(s) because CloudBoot doesn't have any local storage. The resource will be $NFS_IP:/data. By default, the NFS share is located on the Control Panel server.

For additional information on kernel crash dumping, refer to the Kernel Crash Dumping Mechanism on KVM Compute Resources section.
4.4.12 Compute Resource Extended CPU Configuration

OnApp provides a possibility to use extended CPU configuration to group compute resources with similar CPU performance characteristics into compute zones. The extended CPU configuration is implemented on a per-compute-zone basis. The compute zone with the extended CPU configuration is automatically assigned to a CPU model with a set of default and additional CPU flags. On the compute resource level, you can view the CPU model and the list of default, additional and unmatching CPU flags.

The extended CPU configuration is applicable only to KVM compute resources.

For more information on the extended CPU configuration of the compute resource, refer to the following sections.

4.4.12.1 Prerequisites

The extended CPU configuration is managed per compute zone and each compute resource assigned to the zone inherits CPU model and CPU flags from the compute zone.

To use the extended CPU configuration:

1. Move the *Extended CPU Flags* switcher to the right while creating or editing a compute zone. After this functionality is enabled for the compute zone, all compute resources in this zone are automatically attached to a CPU model with a set of default and additional CPU flags. The CPU model is selected based on the CPU characteristics common for each compute resource assigned to this zone.

   When you add a new compute resource to a compute zone with extended CPU configuration, wait for CPU flags to be updated after all the related transactions are finished.

2. Manage the extended CPU configuration for a compute zone. For more information, refer to the *Compute Zone Extended CPU Configuration* section of this guide.

4.4.12.2 Compute Resource CPU Flags

To view the list of extended CPU flags of a compute resource:

1. Go to your Control Panel > Admin > Settings menu.
2. On the following page, click the *Compute Resources* icon.
3. Click the label of the compute resource you are interested in.
4. On the page that appears, click the **Actions** button, point to **Resource Options**, and select **Extended CPU Configuration**.

5. On the page that follows, you will see the following information on the extended CPU configuration:

   - **CPU Model Configuration** - provides a label of a CPU model set for this compute resource, as well as the list of default CPU flags. You cannot edit the list of default CPU flags.
   - **CPU Blacklisted Flags** - lists CPU flags which a virtual server should skip when starting. You can add a CPU flag to the **CPU Blacklisted Flags** table using the `info_hub.xml` file. CPU blacklisted flags are set up at the cloud level.
   - **Additional CPU Flags** - includes the list of additional CPU flags available for each compute resource in this zone. The enabled CPU flags are displayed in green boxes and the disabled CPU flags are dimmed. You can edit the list of additional CPU flags at **Settings > Compute Zones > compute zone label > Actions > Resource Options > Extended CPU Configuration**.
   - **Unmatching CPU Flags** - lists CPU flags that are available for the current compute resource but cannot be enabled for the entire compute zone as they are not available for each of the compute resources in this zone.

   If there are some unmatching CPU flags, consider assigning a compute resource to another compute zone, where a CPU model would correspond to the actual CPU performance of the compute resource.

   To keep your blacklisted CPU flag list after your Control Panel is updated, you need to create an `info_hub.local.yml` file and add the `cpu_blacklisted_flags` section to this file.

See also:

- Manage Compute Zones
- Compute Zone Extended CPU Configuration
- Maintenance Mode for KVM Compute Resources

https://onappcloud.typeform.com/to/A64Euy#source=Compute%20Resource%20Extended%20CPU%20Configuration

**4.4.13 Set Default CPU Quota**

CPU quota is a percentage value limiting maximum VS CPU load on a compute resource. CPU quota functionality allows limiting CPU usage for the particular virtual server in order to avoid abuse usage, which is affecting all virtual servers on the KVM compute resource.

- This option is available for the users under administrator's role. Make sure you have enabled **Manage CPU quota** permission first.
- This feature is available only for KVM compute resources.
- Before you enable CPU quota, its value is set to unlimited for all the VSs on this compute resource.

You can set the default value of CPU quota on the compute resource level and edit the custom value on the virtual server level.
4.4.13.1 Set CPU Quota for Compute Resource

1. Go to your Control Panel > Admin > Settings menu.
2. and click the Compute Resources icon.
3. Click the label of the compute resource you are interested in.
4. On the screen that appears, click the Actions button, point to Resource Options, and select Set default CPU Quota.
5. Move the CPU Quota enabled slider to the right to enable CPU quota and set the default value.
6. Set CPU quota. The maximum value is 99%. Also, you can select the ∞ unlimited checkbox to set an unlimited amount of CPU quota.
7. Click the Save button.

- If default CPU quota value is changed or CPU quota is enabled, it does not affect running virtual servers until they are restarted.
- If default CPU quota is disabled, it is set unlimited for all running virtual servers.

See also:
- Compute Resource Extended CPU Configuration
- Manage Compute Resources
- Manage Compute Resource Networks

https://onapcloud.typeform.com/to/A64Euy#source=Set%20Default%20CPU%20Quota Leave feedback

4.4.14 Compute Resource Matrix

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<th>Feature / Virtualization Software</th>
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<th>KVM 6</th>
<th>KVM 7</th>
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<td>Y**</td>
<td>Y**</td>
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<td>Y</td>
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<td>Segregate</td>
<td>VIP Status</td>
<td>Change Owner</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
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<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
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<td>N</td>
<td>N</td>
<td>N</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Set SSH Keys</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<tr>
<td>Edit VS Resources</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
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<td></td>
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<tr>
<td>HTML 5 Console</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>VMRC Console</td>
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<td>N</td>
<td>N</td>
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<td>Y</td>
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<td>Y</td>
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<td>Container servers</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>
**It is not possible to exceed the server’s max_memory when increasing RAM on KVM compute resources. Detailed info about RAM resize without reboot and hot-migrate abilities per template is available at:

- [http://templates.repo.onapp.com/Linux_templates.html](http://templates.repo.onapp.com/Linux_templates.html)
- [http://templates.repo.onapp.com/FreeBSD_templates.html](http://templates.repo.onapp.com/FreeBSD_templates.html)

*** At least one IPv4 address must be allocated to a virtual server’s primary network interface, as some applications do not support IPv6.

https://onappcloud.typeform.com/to/A64Euy#source=Compute%20Resource%20Matrix Leave feedback

### 4.4.15 OpenStack

<table>
<thead>
<tr>
<th>Feature / Virtualization Software</th>
<th>OpenStack</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provisioning</strong></td>
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<tr>
<td>Self Service via UI</td>
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<tr>
<td>Cloudboot</td>
<td>Y</td>
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<td>Static</td>
<td>N</td>
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<td>Recipes</td>
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<tr>
<td>Host CDN Edge</td>
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<td>SAN</td>
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<td><strong>Availability</strong></td>
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<td>Firewall rules</td>
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<td>Autoscaling</td>
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<td>Virtual server management</td>
<td>Hot RAM resize without reboot**</td>
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<td>-------------------------------</td>
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<td>Hot CPU cores resize without reboot</td>
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<td>Hot migration**</td>
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<td></td>
<td>Cold migration</td>
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<tr>
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<td>Disk hot attachment / detachment</td>
</tr>
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<td></td>
<td>Disk resize (increase/decrease)</td>
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<td>Change owner</td>
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<td>CPU Topology</td>
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<td>Power on/off/reboot vApp</td>
</tr>
<tr>
<td></td>
<td>Power on/off/reboot VS</td>
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<td></td>
<td>Build vApp from template</td>
</tr>
<tr>
<td></td>
<td>Build VS from template</td>
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<td></td>
<td>Set SSH Keys</td>
</tr>
<tr>
<td></td>
<td>Edit VS Resources</td>
</tr>
</tbody>
</table>

| Statistics | CPU Stats | Y |
|            | Disk IOPS Stats | Y |
|            | Network Interface Stats | Y |

<p>| Console | HTML 5 Console | Y |
|         | VMRC Console | N |</p>
<table>
<thead>
<tr>
<th>Smart Servers</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge servers</td>
<td>Y</td>
</tr>
<tr>
<td>Baremetal servers</td>
<td>Y</td>
</tr>
<tr>
<td>Application servers</td>
<td>Y</td>
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<tr>
<td>Container servers</td>
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<td>Load Balancers</td>
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<td>Ballooning release resource type for Compute zones</td>
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<tr>
<td>CPU Units</td>
<td>Y</td>
</tr>
</tbody>
</table>

**It is not possible to exceed the server’s max_memory when increasing RAM on KVM compute resources. Detailed info about RAM resize without reboot and hot-migrate abilities per template is available at:**

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https://onappcloud.typeform.com/to/A64Euy#source=OpenStack

4.4.16 Assets

Assets are the compute resources that are connected to the Control Panel server, but are either not configured or not assigned to a compute zone.

Compute resources that are not configured yet are accessed via the Admin > Settings > Assets menu.

Compute resources that are already created but not assigned to a compute resource group are managed via the Control Panel > Admin > Assets menu. They are managed exactly the same as compute resources.

Click your Control Panel’s main Assets menu to see the list of all unassigned compute resources in your cloud, and a quick overview of their details:

- Label
- IP address
- Type (KVM, etc.)
- Zone
- Location Group
- Failover status
- VSs
- CPU cores
- CPU resources used
- CPU resources available
- CPU speed
• Total RAM
• Free RAM

You can drill into a specific asset to add virtual servers to that compute resource, edit resources, or reboot an asset. To do so:

1. Go to your Control Panel's Assets menu. On the screen that appears you'll see the list of assets.
2. Click an asset's name (label) to see its details screen.
3. On the screen that appears:
   - click the "+" sign to add a VS to this compute resource. You'll be prompted to a VS creation wizard.
   - click Actions > Resource Options > Edit Compute Resource to change its details and resources.
   - click Actions > Resource Options > Reboot Compute Resource to reboot an asset.

https://onappcloud.typeform.com/to/A64Euy#source=Assets

4.5 Transaction Server

Transaction server is an element of the location group (compute resource or a backup server) where the particular transaction is performed.

These are non-backup transactions, related to Appliances (apart from VMware virtual servers), such as:

• destroy disk
• configuration of the operating system
• build disk
• format disk
• provisioning
• rebuild network (offline)
• Set Ssh Key (offline)
• Configure Load Balancer (offline)

The system selects the element of your location group to be a transaction server according to the following principle:

1. If the appliance is associated with a compute resource with only a local data store, this compute resource will be selected.

2. If there are backup servers (server) available to the user who sets the transaction, any such backup server will be selected based on the lowest CPU load (highest cpu_idle parameter)

3. If the above user does not have access to the backup servers, but there are such in his location group, any of the available backup serves will be selected based on the lowest CPU load (highest cpu_idle parameter)

4. If there are no backup servers in the location group, the compute resource associated with this virtual server will be selected as the transaction server.

See also:
4.6 Failover Configuration

OnApp allows configuring the compute resource failover behavior. The failover settings are specified per compute zone. Below you can find instructions on how to manage failover processes for compute resources.

4.6.1 How Failover Works

Requests before marked as failed (default value = 12) specifies how many times we cannot get a reply from a compute resource after which the compute resource is marked as offline. If the compute resource is marked as offline and the failover is enabled, the failover process starts. This parameter is configurable at Control Panel > Admin > Settings > Configuration, see the following Failover Settings section for details.

The compute resource will be rebooted in case it's completely unreachable for OnApp when failover is enabled.

Also, the Ping hosted virtual servers before initiating failover slider should be enabled to contact VSs before initiating failover.

First iteration tries to migrate all VSs according to the failover algorithm set for the compute zone. If some VSs weren’t migrated, next iteration will start, until all VSs are migrated (iterations run once a minute).

Failover can be globally turned off/on for the whole cloud in the /onapp/interface/config/on_app.yml file. Please check if disable_hypervisor_failover is set to 'false' to have Failover enabled.

Note that you should also check the Operating System Type option of a target compute resource before the VS migration. A Windows-based VS can be only migrated to a compute resource with Any option or Windows only option enabled. The Linux-based or FreeBSD-based VS can be only migrated to a compute resource with Any option or Non-Windows option enabled.

Additional Considerations for Integrated Storage

In Integrated Storage backend nodes are marked as inactive approximately three minutes after a backend node has stopped reporting its status. IS is a distributed system and it takes some time to sync/converge metadata across nodes. If IS is used in the cloud it is strongly recommended to set the “Requests before marked as failed” parameter in Settings > Configuration menu to at least 18-20.

4.6.2 Failover Settings

To configure compute zone failover settings:
1. Go to your Control Panel > Admin > Settings menu, and click the Compute resource Zones icon. The screen that appears will show all zones currently set up in the cloud.

2. Click the Actions button next to the required compute zone, and then click Edit and specify the following parameters:

   Placement type - specify the compute resource selection algorithm, that will be used on virtual server provisioning and recovery, per compute zone:
   - Take Compute resource with maximum free RAM (Round Robin) - set this type to select the compute resource with maximum free RAM during the VS recovery. This option allows performing faster migration of virtual servers with the lesser number of iterations during the failover.

   This option behaves in different ways, depending on the event:
   1. On provisioning, the round-robin algorithm will be used on compute resource selection.
   2. On recovery, the compute resource with maximum free RAM will be selected.

   Take Compute resource with minimum required free RAM - with this type the system selects the compute resource with minimum required free RAM. This option allows filling compute resource as tightly as possible before starting to use next compute resource in the zone.

   Failover timeout - set how many minutes the system should try to find the appropriate hypervisor to migrate the VSs from the compute resource that failed. The count will start after the first time the system will find no compute resources to which to migrate VSs.

You can disable failover for each particular compute resource in compute resource settings:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Compute resources icon.
3. Click the Actions button next to the compute resource you want to edit, then click Edit.
4. On the screen that follows, change the failover settings:

   Disable failover - enable or disable the VS migration to another compute resource if this compute resource is marked as offline by the Control Panel server.

To configure the Requests before marked as failed parameter:

1. Go to your Control Panel > Admin > Settings menu, and click the Configuration icon.
2. Click the System tab to change the settings:

   Requests before marked as failed - determines how many times the Control Panel server will attempt to contact a compute resource before failover is initiated. For the Integrated Storage, we recommend increasing this parameter to 30, so that the storage platform has enough time to mark the compute resources accordingly, and allow the VSs to start up after a failed compute resource.

   The time before the CP initiates failover may differ depending on the number of compute resources and their load.

   Ping hosted virtual servers before initiating failover - move the slider to the right to enable contacting VSs before initiating failover for a particular compute resource. By default this slider is enabled.

Note that if you are using Floating IPs in your environment or if you have VS with primary IPs which could respond to your Control Panel server from elsewhere on your network we would recommend to disable this setting to avoid the possibility of a false-positive ICMP result.
Control Panel daemon checks compute resource accessibility via the management network (using SNMP) each 10 seconds.

If after a certain number of attempts (indicated in settings as Requests before marked as failed) compute resource's SNMP service is down, system should ensure that compute resource is offline.

4.6.3 Failover Algorithm
Control Panel takes the following steps:

A option
Control Panel sends `snmpget` request. If it is successful, then SSH is added into compute resource `virsh list` and failure account (amount of requests before compute resource is marked as failed) is reset.

B option
In case of `snmpget` request failure SSH is checked. If command is successful, then SSH is added into compute resource, services (`snmpd&snmptrapd`, `restart` etc.) are checked and one more `snmpget` request is sent. If it is successful, then A option is applied.

C option
If option B is unsuccessful, then one more `snmpget` request is sent. If it is successful, then A option is applied. In case of failure you get an alert (with information that SNMP has unusual configuration) and failure account (amount of requests before compute resource is marked as failed) is reset.

D option
If SSH checking request is unsuccessful, all booted VSs of the compute resource are pinged. This step is optional and depends if the `Ping hosted virtual servers before initiating failover` slider is enabled (by default this slider is enabled, see Failover settings section below).

E option
If ping of VSs is successful, you get an alert and failure account (amount of requests before compute resource is marked as failed) is reset.

F option
If ping of VSs is unsuccessful, failover is activated and compute resource is marked as offline.

The meanings of commands:
`virsh list` - get virtualization system status (KVM) to ensure that it works properly
`snmpget` - take uptime from compute resource

4.6.4 Failover Logs
Failover processes show the list of failover logs that take place on the compute zones in the cloud.

To view the list of failover processes:
1. Go to Control Panel > Admin > Logs menu.
2. Click the Failover Processes button. On the page that appears, you can see the following information for each failover log:
   - Failover number
   - Indication of the time when it started
   - Compute zone on which the failover happened
   - Time of the last iteration
   - Failover action status: active or completed

To view the failover transaction details, click its reference number.

See also:
4.7 Advanced Configuration Settings

Although you can edit most of the OnApp settings via the Control Panel user interface, there are some options that can be edited only in the on_app.yml file. You can use the Advanced Configuration Settings section to modify the OnApp configuration settings. This section contains the list of parameters you can edit in the on_app.yml file with their default values.

We recommend making a copy of the configuration file before making any changes.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
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<td>custom.css file</td>
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<td>background_process_pid_path</td>
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<td>Parameter</td>
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<td>Parameter</td>
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<td>cluster_monitor_delay</td>
<td>15</td>
</tr>
<tr>
<td>hypervisor_monitor_delay</td>
<td>5</td>
</tr>
<tr>
<td>schedule_runner_delay</td>
<td>60*</td>
</tr>
<tr>
<td>transaction_runner_delay</td>
<td>300*</td>
</tr>
<tr>
<td>zombie_transaction_time</td>
<td>20</td>
</tr>
<tr>
<td>kms_server_host</td>
<td></td>
</tr>
<tr>
<td>kms_server_port</td>
<td>1</td>
</tr>
<tr>
<td>ip_range_limit</td>
<td>1000</td>
</tr>
<tr>
<td>same_autoscaleout_nodes_virtualization_system</td>
<td>true</td>
</tr>
<tr>
<td>dns_enabled</td>
<td>false</td>
</tr>
<tr>
<td>enabled_libvirt_anti_spoofing</td>
<td>false</td>
</tr>
<tr>
<td>allow_start_vms_with_one_ip</td>
<td>true</td>
</tr>
<tr>
<td>allow_initial_root_password_encryption</td>
<td>false</td>
</tr>
<tr>
<td>wipe_out_disk_on_destroy</td>
<td>false</td>
</tr>
<tr>
<td>password_enforce_complexity</td>
<td>true</td>
</tr>
<tr>
<td>password_minimum_length</td>
<td>12</td>
</tr>
<tr>
<td>password_upper_lowercase</td>
<td>true</td>
</tr>
<tr>
<td>password_letters_numbers</td>
<td>true</td>
</tr>
<tr>
<td>password_symbols</td>
<td>true</td>
</tr>
<tr>
<td>password_force_unique</td>
<td>true</td>
</tr>
<tr>
<td>password_lockout_attempts</td>
<td>3</td>
</tr>
<tr>
<td>password_expiry</td>
<td>1</td>
</tr>
</tbody>
</table>
### Parameter Default value

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>password_history_length</td>
<td>12</td>
</tr>
<tr>
<td>cloud_boot_enabled</td>
<td>false</td>
</tr>
<tr>
<td>nfs_root_ip</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>cloud_boot_target</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>storage_enabled</td>
<td>false</td>
</tr>
<tr>
<td>prefer_local_reads</td>
<td>false</td>
</tr>
<tr>
<td>vmware_cluster_name</td>
<td>OnApp</td>
</tr>
<tr>
<td>service_account_name</td>
<td>onapp</td>
</tr>
<tr>
<td>system_alert_reminder_period</td>
<td>60</td>
</tr>
<tr>
<td>archive_stats_period</td>
<td>3</td>
</tr>
<tr>
<td>is_archive_stats_enabled</td>
<td>false</td>
</tr>
<tr>
<td>wrong激活ed_logical_volume_minutes</td>
<td>60</td>
</tr>
<tr>
<td>use_html5_vnc_console</td>
<td>false</td>
</tr>
<tr>
<td>use_rrd_for_statistic_tables</td>
<td>true</td>
</tr>
<tr>
<td>partition_align_offset</td>
<td>2048</td>
</tr>
<tr>
<td>migration_rate_limit</td>
<td>10</td>
</tr>
<tr>
<td>iscsi_port_availability_check_timeout</td>
<td>5</td>
</tr>
</tbody>
</table>

* - these values are recommended for the specified parameters in order to provide more stable daemon workflow.

### 4.7.1 Daemon Workflow

To provide more stable daemon workflow for deployments with a high load we recommend increasing values for the following parameters in the `/onapp/interface/config/on_app.yml` file:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>backup_taker_delay</td>
<td>300</td>
</tr>
<tr>
<td>schedule_runner_delay</td>
<td>60</td>
</tr>
<tr>
<td>transaction_runner_delay</td>
<td>300</td>
</tr>
</tbody>
</table>

### 4.7.2 SNMP Statistics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>server_community</td>
<td>onapp</td>
</tr>
<tr>
<td>Parameter</td>
<td>Default value</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>snmp_timeout</td>
<td>2</td>
</tr>
<tr>
<td>snmp_connect_retries</td>
<td>3</td>
</tr>
<tr>
<td>snmp_stats_level1_period</td>
<td>10</td>
</tr>
<tr>
<td>snmp_stats_level2_period</td>
<td>60</td>
</tr>
<tr>
<td>snmp_stats_level3_period</td>
<td>120</td>
</tr>
<tr>
<td>snmp_max_recv_bytes</td>
<td>100000</td>
</tr>
<tr>
<td>snmp_stats_protocol</td>
<td>udp</td>
</tr>
</tbody>
</table>

Both TCP and UDP protocols are enabled on compute resources by default. You can select the preferred protocol by changing the `snmp_stats_protocol` parameter value.

### 4.7.3 VMware Statistics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>vmware_stats_level1_period</td>
<td>60</td>
</tr>
<tr>
<td>vmware_stats_level2_period</td>
<td>180</td>
</tr>
<tr>
<td>vmware_stats_usage_interval</td>
<td>20</td>
</tr>
</tbody>
</table>

### 4.7.4 SolidFire Statistics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>solidfire_stats_usage_interval</td>
<td>120</td>
</tr>
</tbody>
</table>

### 4.7.5 Global Whitelist

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>global_white_list_ips</td>
<td>-</td>
</tr>
</tbody>
</table>

See [Global Whitelist](#) for more details.

**See also:**
- [Reset Control Panel Administrator Password](#)
- [Failover Configuration](#)
- [Transaction Server](#)
- [Virtual Server Provisioning](#)
4.8 Track Daemon Process Activity

To get the details on daemon process's activity, run the activity tracker:

```
./script/tools/process-logger.sh -p <PID> -l|--log-folder <log folder> -d|--pid-folder <pid folder>
```

Example:

```
./script/tools/process-logger.sh -p 4242 -l /tmp/logs -d /tmp/pids
```

Usage:

```
track -p <PID> -l|--log-folder <log folder> -d|--pid-folder <pid folder>
```

Logs folder structure: `<LOG-FOLDER>/<PID>`.  
Example:  
LOG-FOLDER = /tmp/logs  
PID = 4242  
Result: /tmp/logs/4242/  

Options:  
Required:  
-p|--pid  
PID of target process  
-l|--log-folder  
Folder, where logs are stored  
-d|--pid-folder  
Folder, where pid files are stored  

Optional:  
-t|--time-interval  
Refresh time in seconds. Works only for main log and lsof command  
Default: 1 second  
-m|--memory-alert-step  
Memory alert size. In megabytes.  
Default: 100m  
-r|--log-max-size  
Max log size, before it rotates. In megabytes.  
Default: 100m

Example:  
```
track.sh -p 4242 -l /tmp/logs -d /tmp/pids
```

See also:  
- [Virtual Server Provisioning](#)  
- [Calculate Billing Statistics for the Missing Period](#)  
- [Transaction Server](#)
https://onappcloud.typeform.com/to/A64Euy#source=Track%20Daemon%20Process%20Activity
Leave feedback
5 Identity Management

OnApp provides very fine control over cloud users and what they're allowed to do. You can set up as many different types of user as you need, and customize their access to cloud resources and Control Panel functions as required.

For example, standard, VIP and reseller users can have different capabilities and resource limits. You might provide basic cloud management functionality to L1 support staff (e.g. reboot virtual servers but not destroy them) while your L3 admins have full rights. Your development teams will probably need to deploy test VSs in the cloud just as a customer would, only without being charged for them. Meanwhile, your billing staff need a "billing only" view with no access to customer resources.

This fine control is enabled by a combination of user accounts, roles, permissions, and buckets.

You can also monitor resource usage of your users. Refer to the sections below for more details.

5.1 Resources

https://docs.onapp.com/display/TEST2/.Dashboard+v6.4Dashboard
https://docs.onapp.com/display/TEST2/.Metrics+v6.4Metrics
https://docs.onapp.com/display/TEST2/.Logs+v6.7Logs
https://docs.onapp.com/display/TEST2/.Alerts+v6.6Alerts
https://docs.onapp.com/display/TEST2/.Sysadmin+v6.6Sysadmin
https://docs.onapp.com/display/TEST2/.Notifications+v6.4Notifications

5.2 Users

https://docs.onapp.com/display/TEST2/.User+Accounts+v6.7User Accounts
https://docs.onapp.com/display/TEST2/.User+Groups+v6.7User Groups
https://docs.onapp.com/display/TEST2/.Roles+v6.6Roles
https://docs.onapp.com/display/TEST2/.OnApp+Permissions+v6.7Permissions
https://docs.onapp.com/display/TEST2/.Drop+Sessions+v6.7Sessions

https://onappcloud.typeform.com/to/A64Euy#source=Identity%20Management Leave feedback

5.3 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, 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.

### 5.3.1 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><strong>CPU</strong></td>
<td>Total virtual cores assigned to running VSSs (may be higher than active cores if overselling)</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 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 used currently.</td>
<td>Sum total of RAM allocated to VSSs + RAM allocated to orphaned VSSs</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 currently used.</td>
<td>Sum total of all VS disks unused capacities + orphaned 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><strong>IOPS /h usage</strong></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>Baremetal servers</strong></td>
<td>The amount of running baremetal servers in the cloud</td>
<td>The amount of baremetal servers created in the cloud</td>
<td>The points on the graph show daily peaks of amount of created baremetal servers. Hover over a particular point, to view the peak of amount of created baremetal servers that will appear below the chart.</td>
</tr>
</tbody>
</table>
### 5.3.2 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.

### 5.3.3 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.

### 5.3.4 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 Accounts section.

See also:

- API Key
- Login Screen
- Cloud Search Tool
5.3.5 API Key

The API key is used as a secret token for API operations authentication. On this page, you can find information on how to manage the API keys.

5.3.5.1 Create API Key

We do not store the API keys for security reasons.

To generate a key for a user, go to the user’s profile page at Control Panel > Admin > Users > Full Name and click the Add API Key button in the API Info section. On the dialog box that loads you will see the generated key and can add it a description. Please note that the is the only time you can see and copy an API key. After you click Create, a key will be added into the API Info section, but you can not see the entire key or recover it.

There is a limit of 100 API keys per user. To increase the limit:

1. Open file /onapp/interface/config/info_hub.yml
2. Add parameter api.max_keys and set an appropriate value for API keys limit.

5.3.5.2 Manage API Key

To see a whole list of API keys assigned to a user together with their details:

Go to the user’s profile page at Control Panel > Admin > Users > Full Name and click Manage API Keys in the API Info section. On the page that loads, you will see the list of API keys together with their details:

Key - first 5 symbols of a key
Description - description of a key added during creation
Created Date - date and time when a key was created
Last Access Date - date and time when the key was last used
Delete - click to delete a key

5.3.6 Cloud Search Tool

The search tool in the upper right corner allows you to search your cloud for:

- IP addresses
- Usernames
- Users full names (first or last name, in any order)
- VS labels
- VS identifiers
- Disk identifiers
- Log IDs
- Backups
- Template labels
- Permission labels/identifiers
5.3.7 Login Screen

To access your Control Panel, you must first provide a username and password. Optionally, you can set up two factor authentication for your cloud using a YubiKey. Authentication means identifying a user and verifying that this user is allowed to access the OnApp Control Panel.

You can also implement SAML authentication for your cloud so that your users can input their credentials from third-party systems to access OnApp services, without the need to be previously registered in OnApp Cloud. For more information refer to SAML Authentication.

Check the Remember me box to have the CP remember your login details for one month. You will have to enter your login credentials again after you log out or clear your browser cookies.

After two failed attempts at logging into the OnApp account the system will show the number of login attempts that the user has left. After the login attempts limit is exhausted the account will be locked and unlock instructions will be sent to the user's email. You can set the number of login attempts at Control Panel > Admin > Settings > Configuration > Defaults by configuring the Lockout attempts parameter.

If you have forgotten your password, press the Forgot your password? link and specify the email to which your reset password instructions will be sent.

You may face issues with logging in to your Control Panel in the following scenarios:

- If you enter invalid credentials that are your login and/or password.
- If an IP address from which you try to access your CP is not added to a White List.

To successfully log in to CP, make sure that you enter valid credentials and your IP is in the White List.

5.3.7.1 Two Factor Authentication

To set up two factor authentication for your cloud you need to perform the following steps:

1. Enable the Use Yubico login option at Dashboard > Admin > Settings > Configuration > System tab. For more information on OnApp configuration, refer to the Control Panel Configuration chapter.

2. Enable the Use Yubikey option for your user and set your Yubikey at Dashboard > Admin > Users > User name.

Then you will be prompted to provide your OnApp login and password, and afterwards you will be forwarded to a page where you need to enter your YubiKey:

1. Insert the YubiKey into your computer's USB port. If the YubiKey is connected correctly, its status light will turn green.

2. Click in the Enter your Yubikey field.

3. Press your finger to the gold YubiKey button. A long line of characters will appear in the field. You will be automatically forwarded to your Dashboard page.

If a user has TOTP Authentication enabled, after entering login and password, one-time password must be entered too to log in successfully.
The CP requires outbound connection to the Yubico API server, api.yubico.com, over HTTPS port 443 (TCP).

See also:
- Configuration Settings
- Authentication
- Tools
- Localization and Customization
- User Accounts
- Appliances

https://onappcloud.typeform.com/to/A64Euy#source=Login%20Screen

5.4 User Accounts

There are two types of accounts in OnApp: administrators and users. An administrator account is created automatically when OnApp is installed. Administrators have full access to the system, including managing virtual servers and compute resources, performing actions on templates and backups, and configuring data stores and networks. There can be several administrators in OnApp. User accounts are created by administrators, and only have access to those actions which are specified by an administrator.

5.4.1 Create User

To add a new user:

1. Go to your Control Panel > Admin > Users menu. You’ll see a list of all user accounts in your cloud.
2. Click the Create User button at the bottom of the list.
3. Fill in the user creation form:1
   - Move the Use Gravatar slider to the right to use the gravator image.
   - Login name - provide user login name. It can consist of 2-40 characters, letters [A-Za-z], digits [0-9], dash [-], lower dash [ _ ], [@]. You can use both lower- and uppercase letters.
     - The dash [-] and [@] symbols are not allowed as first characters of the login name.
   - First name - specify user first name. It can consist of any 1-20 characters.
   - Last name - specify user last name. It can consist of any 1-20 characters.
   - Email address - specify user email.
   - Time zone - select the required time zone from the drop-down box.
   - Locale - specify user locale settings by selecting the appropriate locale from the drop-down box (see Locales section for details).
   - Password - specify user password and confirm it. The password can consist of 6-40 characters and must meet the password complexity requirements.
   - Repeat password - repeat user password
   - Additional info - fill in a custom field, created using the Additional fields functionality, with corresponding information
2  
  o  **Display infoboxes** - move the slider to the right to display guidance infoboxes for the user.
  o  Click **Next**.

3  
  o  **User role** - select the user role for this user.
  o  **User group** - assign a user to the user group by selecting the required user group from the drop-down box.
  o  Click **Next**.

4  
  Specify Auto-suspending options if any. You can configure the system to suspend a user at a definite time or in several hours after creation.
  
  4.  Click the **Save** button to finish.

### 5.4.2 User Additional Fields

User Additional Fields allow administrators to create custom fields and use them with the API or a third party system. The custom fields are stored and edited in the user profile.

As an administrator, you can create additional field via **Users** menu. Then when going to a particular user profile, you can use the additional fields as a complementary information. For more info, refer to the Create user section of this guide.

- The **User additional fields** permissions control the ability to create/edit/delete user additional fields.
- The **Update any user** permission controls the ability to assign an additional field for a particular user when creating a new user.

For more information about permissions refer to the List of all OnApp Permissions section of this guide.

To add a new additional field:

1. Go to your Control Panel > **Admin** > **Users** menu.
2. On the page that appears, click the **User Additional Fields** button at the bottom of the list.
3. On the following page, click the **Create Additional Field** button lower right or .
4. Fill in the form that appears. You can choose the string/integer data type, and set the Default Value that will be displayed if a user hasn't specified data for this field, or if they have entered information that doesn't match the data type.
5. Click the **Create New Field** button to finish.

To edit or delete an additional field:

1. Click next to an additional field to change its details.
2. Click next to an additional field to delete it.

5.4.3 View Users

For a quick view of user account details, go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud, along with their details:

- **Full Name** – user's name and surname
- **Username** – user's screen name
- **User Role** – the role set for the user
- **User Group** – the group to which the user is assigned
- **Status** – user's status (active or deleted)

If you are viewing the users list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, check the columns you want to be displayed and click **Apply**. The narrower your screen is, the more unchecked columns will be hidden from the table. If your screen is too narrow to fit all the columns you have checked, a scrollbar will appear at the bottom of the users list. You can always alter your column selection later.

Column selection is currently set for one browser. If you have checked some columns in one browser and open the list in some other browser, the column selection will be the default one for that other browser.

You can scroll through the list of users with the **Previous/Next** buttons at the bottom of the screen, as well as use search tool to search for a specific user. Click the **Actions** button next to the required user to edit, suspend or delete them, view the list of whitelist IPs or login as a user. Click **Drop All Sessions** button to terminate all sessions.

Every user including you will be logged out.

To get the list of additional fields, click the **User Additional Fields** button. To view detailed information about a user's account, click user's full name.

5.4.4 View User Account Details

To view account details of a particular user:

1. Go to your Control Panel > Admin > Users menu.
2. On the screen that appears, click the full name of the user to view their account details.

The user details screen that appears shows the following information:

**User details** These are the settings which are specified at user creation process.

- **User's avatar** (this feature is available if the **Use gravatar** option is enabled).
- **User's name and surname**.
- **User's email**.
- **Last Access Log** - click to see information on the IP addresses that logged in to your account directly from the OnApp login page using your login and password, and the time and date of access.
- **Drop Other Sessions** - click this button to drop other sessions except the active one, will be dropped
- **Login** - user's screen name.
• **User Roles** – the role set for the user.
• **User Group** – the group to which the user is assigned.
• **Time Zone** - timezone set for this user.
• **Locale** - locales set for this user.
• **System theme** - system theme set for this user.
• **Display infoboxes** - whether infoboxes are displayed or not for this user.
• **Restore Infoboxes** - click this button to display infoboxes for the user (this option may be disabled depending on the user's permissions).
• **Send Password Reminder** - click this button to send the password reminder to the user. The user will receive an email with a link for change password action.

Ensure that Allow user to send password reminder permission is on before sending password reminder. For more information about permissions refer to the List of all OnApp Permissions section of this guide.

**Amazon Web Services**

Shows the status of the Amazon Web Services: disconnected or connected. For more information, see Enable/Disable AWS.

Here you can also connect Amazon Web Services:

1. Click the (Connect) icon.
2. On the following page provide your AWS credentials: AWS access key ID and AWS secret access key.
3. Click Submit to connect AWS to your account.

**API Info**

Shows a short list of API keys assigned to a user.

We do not store the API key for security reasons. You can see only the first 5 symbols of a key to identify it.

• **Add API Key** - click to generate a new API key.
• **Manage API Keys** - click to see a list of all API keys assigned to a user together with their description, creation and last access dates. You can also delete an API key on the page that loads.

**2-factor Authentication**

This section appears in the profile if you have either the Update Yubikey or the Update own Yubikey permission enabled or TOTP authentication is enabled for the cloud.

You can use only one two-factor authentication option per user profile (Yubikey or TOTP). Once the TOTP authentication is enabled successfully, the Yubikey switch becomes disabled.

Here you can enable/disable logging into OnApp using a YubiKey, add/delete YubiKeys, and enable/disable TOTP authentication. It is required to add at least one YubiKey to the user profile at Manage YubiKeys before you can enable the Use YubiKey option.

• **TOTP Authentication** - move the slider to the right to enable logging in using time-based two-factor authentication. In the pop-up window that appears, scan the QR code with
your mobile application (Google Authenticator or any other TOTP authentication app that complies with the RFC). Enter the generated one-time password to validate that the application works properly. If the password is correct, the TOTP Authentication becomes enabled. This slider is displayed only if TOTP authentication is enabled for the cloud.

- **Use Yubikey** - move the slider to the right to enable logging in using a YubiKey for this user. You can enable this option only if you have added at least one YubiKey to your profile. If you delete all your Yubikeys, this option will be disabled automatically.

- **Manage YubiKeys** - click this button to add or delete YubiKey to your profile. The window that pops up shows the list of your YubiKeys and when each of them was last used. You can add up to five YubiKeys.
  - To add a new YubiKey:
    1. Enter a label for your YubiKey in the *Enter label* field.
    2. Click on the *Touch your yubikey* field.
    3. Press your finger to the gold Yubikey button. A long line of characters will appear in the field and the new Yubikey will be added to your profile.

  - To delete a YubiKey click the button next to the YubiKey you want to delete.

Be careful when deleting a YubiKey as it will no longer be possible to log in using that Yubikey unless you add it again to your profile. The *Yubico info* section appears in the user profile only if the *Use Yubico login* option is enabled for your cloud at Control Panel > Settings > Configuration.

**Billing Details**

- **Price per last hour** - shows the price for VSs, Load Balancers, and other resources charged for the previous hour.

- **Price per last hour (including discount)** - shows the price for VSs, Load Balancers, and other resources charged for the previous hour with the discount included (if any).

- **Bucket** - the bucket this user is assigned to. Click the bucket label to see its details.

- **Outstanding amount** - the total amount of money owned by this user since it has been created, for all resources, minus the amount of Payments. The sum is displayed for the period since a user has been created until the last 24hrs.

- **Monthly fee** - a set monthly price for a bucket.

- **Total cost** - the sum of all used resources cost and virtual servers cost. This sum does not take into consideration the free limits for resources set in the bucket. The cost that takes into account the bucket's free limits is displayed in the *Total cost with discount* field.

- **Payments** - the total amount of payments made.

- **Discount due to free** - the price of the resources that were created within the bucket's free limits. This sum will be subtracted from the *Total cost.*

- **Total cost with discount** - the price of used resources that excludes the cost of the resources that were created within the bucket's free limits.

- **Virtual Server Hourly Statistic** - clicking this link will generate billing statistics for all virtual servers owned by this user. For more information, see Virtual Server Billing Statistics.
• **User Statistic** - clicking this link will generate user’s resource usage statistics. For more information, see [User Accounts](#).

• **Monthly Bills** - clicking this link will generate the bills list that shows the total due per each month of the year. To view billing statistics, select a year from the drop-down list and click **Apply**. The list that appears displays a particular month of the selected year and the cost of used resources for that month. At the bottom of the list there is the total amount of money which was to be paid for the selected period.

• **System Service Add-ons Report** - report for the system service add-ons usage.

• **SPLA Report** - report for Windows system service add-ons.

**Prices**

The list of all used resources and their price per hour for two states: server powered ON and server powered OFF. The prices in this section do not take into consideration the free limits for resources set in the bucket.

**Servers**

Shows the list of all virtual servers, load balancers, edge servers, smart servers, application servers in the cloud with their prices for server on and off. The prices in this section do not take into consideration the free limits for resources set in the bucket.

**Backups**

The prices in this section do not take into consideration the free limits for resources set in the bucket.

• **Backups Count** - the price per hour for the quantity of the user's backups
• **Templates Count** - the price per hour for the quantity of the user's templates
• **ISOs Count** - the price per hour for the quantity of the user's ISOs
• **OVAs Count** - the price per hour for the quantity of the user's OVAs
• **Templates, ISOs & Backups Disk Size** - the price per hour for the disk space user's /ISOs/OVAs/backups/templates occupy
• **Recovery Points Count** - the price per hour for recovery points created on the backup resource
• **Backup Resource Usage** - the price per hour for using backup resources
• **Autoscaling Monitor Fee** - the price per hour for autoscaling monitors
• **Backup Server Groups** - the price per hour for the resources consumed by backup server groups
• **Acceleration** - the price per hour for using acceleration for virtual servers and smart servers

### 5.4.5 Manage User Payments

To view, add, and edit payments for a user:

1. Go to your Control Panel > **Admin** > **Users** menu.
2. Click the name of the required user.
3. On the screen that appears, click **Payments** tab.
4. Click the **Edit** icon to change details of a specific payment.
5. Click the **Create Payment** button at the end of the list to add a new payment.

Also, you can add payments at Control Panel > **Payments** menu. For more information refer to the **Payments** section of this guide.
5.4.6 View User Statistics

The system has a record of all the billing statistics on a user account for the last three months. If the account was created less than three months ago, statistics are generated for the actual period. You can also define a shorter period by setting Start and End time.

To view billing statistics for an account:

1. Go to your Control Panel > Admin > Users menu.
2. You'll see a list of all user accounts in your cloud. Click a name of the appropriate user.
3. Go to Billing Details and click the User Statistic button.
4. You can filter the statistics by date and time - select the time period from the drop-down menu and click the Apply button. By default the statistics is generated for the last day. The statistics for each resource is divided into the Costs and Free amount. The Costs of resources do not take into consideration the free limits for resources set in the bucket. The Free amount displays the cost of components within the bucket's free limits for each resource. The Free amount is subtracted from the total cost of a resource. You can see the statistics for the following resources:

- **Backups** - the price for the number of backups taken by the user during the chosen period on the compute resource.
- **Templates** - the price for the templates made by the user during the chosen period.
- **ISOs** - the price for the number of ISO images uploaded by the user during the chosen period.
- **Templates, ISOs & Backups Storage** - the price for the disk space taken by the templates, ISOs, and backups on the compute resource. For backups and templates, applies if you use compute resources for disk-related actions. If there is a backup server in the cloud, Backup Zones Backup Disk Size Cost and Template Disk Size Cost will apply.
- **Backup Zones Backups** - the price for the number of backups of the backup zones taken during the selected period. Applies if backup servers are used for disk-related actions. Otherwise Backup cost record will apply.
- **Backup Zones Backup Disk Size** - the price for the disk size taken by backups on the backup servers during the predefined period. Applies if backup servers are used for disk-related actions, otherwise, Templates, ISOs & Backups Storage Costs record will apply.
- **Backup Zones Templates Count** - the price for the number of templates of the backup zones made during the chosen period.
- **Backup Zones Template Disk** - the price for the disk size taken by templates stored on the backup zones during the predefined period.
- **Recovery Points** - the price for the number of recovery points created by means of a backup plugin.
- **Recovery Points Size** - the price for the size in Gb occupied by recovery points.
- **Autoscaling monitor** - the price for using the autoscaling monitor during the selected period.
- **Acceleration** - the price for the number of accelerated VSs for the selected period.
- **OVAs count** - the price for the number of OVAAs uploaded by the user during the selected period.
- **OVAs size** - the price for the disk size taken by OVA files stored on the backup server during the predefined period.
- **Virtual Servers** - the total due for all the VSs minus Backups/Templates Cost (if any) for the predefined period.
• **Total User Resources Costs**
  
  o **User Resources Cost** - the price for all the resources, except for virtual servers, consumed by the user during the selected period. This price can include costs of the following resources:
    - Disk size
    - Data read/written
    - Input/Output requests
    - Port speed
    - Data received
    - Data sent
  
  o **User Resources Free Amount** - the price of free limits that will be subtracted from the **User Resources Cost**.
  
  o **Monthly Free Amount** - the price of all free limits per month for the selected period.

  If the selected period contains several calendar months, for example 10th of February - 10th of March, the **Monthly Free Amount** will be displayed for both months and the **Total Cost** will be reduced by the monthly free amount.

• **Total Cost** - the total price for the selected period of time that includes the **User Resources Cost and Virtual Servers Cost**.
  
  o **Total Free Amount** - the total price of free limits both per hour and per month that will be subtracted from the **Total Cost**.
  
  o **Total Cost with Discount** - the total price of used resources that excludes the cost of the resources that were created within the bucket's free limits.

**User Statistics**

  o **Virtual Server** - the list of virtual servers owned by the user
  
  o **Total** - the total due for a virtual server, including the price for the virtual server itself and all **User Resources Cost**. The prices in this section do not take into consideration the free limits for resources set in the bucket.

### 5.4.7 User Whitelist IPs

Whitelist IP addresses are IPs from which a particular user can access the OnApp control panel. If whitelisted IP addresses are specified for a particular user, the user can only access CP from that defined IP addresses.

To add a whitelisted IP address:

1. Go to your Control Panel > **Admin > Users** menu.
2. Click the name of the required user. You will see the **User Profile** page.
3. Click the **Create White List** tab.
4. On the page that appears, click the **Create White List IP** button.
5. Fill in the form that appears:
   - **IP** - an IP you wish to enter to the white list
6. Click **Save IP**.
7. Repeat steps 4-6 if you need to add more IPs to the white list.

To edit/delete a whitelisted IP address, click the **Actions** button next to the required IP address, and then choose the required action.

**Click here to see how to add IP to a whitelist manually**

If there is already an IP(s) in place in the whitelist, and you aren't logging in from one of those, then you'll effectively be locked out from logging in as that user.

From the database, you'll need to run the following insert command (For example, for a user with the id 5 add the IP of 192.168.1.1):

```sql
INSERT INTO user_white_lists
(user_id, ip, description, created_at, updated_at)
VALUES
(5, '192.168.1.1', 'description of ip', NOW(), NOW());
```

You can also add a whole subnet range by adding the /CIDR on the end of the IP like (please keep in mind that unfortunately you can't add a range by using something like 192.168.1.1-5):

```sql
INSERT INTO user_white_lists
(user_id, ip, description, created_at, updated_at)
VALUES
(5, '192.168.1.1/24', 'description of ip', NOW(), NOW());
```

**Additional Info**

You can effectively disable Whitelist IPs for a user by adding the range 0.0.0.0/0 as a Whitelist IP. This can be useful if you would like to disable the Whitelist IP prompt for the admin users, or to enable temporary access for maintenance or testing:

```sql
INSERT INTO user_white_lists
(user_id, ip, description, created_at, updated_at)
VALUES
(5, '0.0.0.0/0', 'Disables WhiteList for this User - delete to re-enable', NOW(), NOW());
```

### 5.4.8 View User Backups

Backups in OnApp clouds are associated with a user account. To view backups of a particular user:

1. Go to your Control Panel > **Admin** > **Users** menu.
2. You'll see a list of all user accounts in your cloud. Click the name of a required user.
3. On the **User Details** screen, click **Backups** tab.
4. On the screen that appears, you'll see the list of backups that belong to this user along with their details:

   - date when the backup was taken
   - target
   - status
   - backup size
   - initiated
• backup server
• note
• virtual server
• customer

To move to the VS backups page, delete a backup or convert it to a template, click the Actions button next to the template and then select the required action.

## 5.4.9 Manage SSH Keys

### 5.4.9.1 View SSH Keys Assigned to User
1. Go to your Control Panel > Admin > Users menu.
2. On the following page, click the name of the required user.
3. On the page that appears, click the SSH-Keys tab to view the list of SSH keys assigned to the user, with the following parameters:

   • Name - the label of the SSH key
   • Key - the SSH key in the following format: ssh-[type] [ascii-symbols allowed for base64 string] [user’s email address]
   • Creation Date - the date when the SSH key was created

### 5.4.9.2 Add SSH Key to User
1. Go to your Control Panel > Admin > Users menu.
2. On the following page, click the user’s name to whom you want to assign an SSH key.
3. Click the SSH-Keys tab.
4. On the page that appears, in the upper-right corner of the SSH-Keys table, click to add an SSH key, then fill in the following:

   • Name - enter the label of the SSH key
     
     If the Name field is left empty, it inherits the user’s email address specified in the Key field.

   • Key - enter the SSH key in the following format: ssh-[type] [ascii-symbols allowed for base64 string] [user’s email address]

5. Click Save SSH Key.

   An SSH key created by a user is automatically assigned to all the VSSs the user creates. To assign SSH keys to existing VSSs, refer to the Manage Virtual Server Administrative Options page.

### 5.4.9.3 Edit SSH Key
Go to your Control Panel > Admin > Users menu.
On the following page, click the user’s name whose SSH key you want to edit.
Click the SSH Keys tab.

On the page that appears, click next to the required SSH key and edit the following:
Name - the label of the SSH key

Key - the SSH key in the following format: ssh- [type] [ascii-symbols allowed for base64 string] [user’s email address]

5. Click **Save SSH Key**.

### 5.4.9.4 Delete SSH Keys

Go to your Control Panel > **Admin > Users** menu.

On the following page, click the user’s name for whom you want to delete an SSH key.

Click the **SSH Keys** tab.

On the page that appears, click the icon next to the SSH key you want to delete.

In the dialog, click **OK** to confirm the deletion.

---

### 5.4.10 View IP Addresses Assigned to User

Go to your Control Panel > **Admin > Users** menu.

On the following page, click the name of the required user.

On the page that appears, click the **Assigned IPs** tab and select **User IPs** to view the list of IP addresses assigned to the user with the following information:

**IP** – the IP address assigned to the user

**Assigned at** – the date and time when the IP address was assigned to the user

---

### 5.4.11 View IP Addresses Assigned to User’s Virtual Servers

Go to your Control Panel > **Admin > Users** menu.

On the following page, click the name of the required user.

On the page that appears, click the **Assigned IPs** tab and select **Virtual Server IPs** to view the list of IP addresses assigned to the user’s virtual servers with the following information:

**IP** – the IP address assigned to the virtual server

**Virtual Server** – the name of the virtual server to which the IP address is assigned
5.4.12 Log in as User
Administrators can log in as a user to see their view of the cloud. To do so:

Go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud.

Click Actions next to the user you'd like to log in as and click Login as.

Your screen will be updated and you will be logged in as the selected user.

You cannot log in as a user whose account is locked. First, unlock the account and then login as the user.

To return to your original view of the cloud, click the Back to Admin Area link at the top of the screen.

5.4.13 Edit User
To edit a user account:

Go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud.

Click the Edit icon next to the user you want to edit.

Change their details as required on the screen that appears:

Move the Use Gravatar slider to the right to use the gravatar image.

Login - provide user login name. It can consist of 2-40 characters, letters [A-Za-z], digits [0-9], dash [-], lower dash [ _ ], [@]. You can use both lower- and uppercase letters.

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

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

Email - specify user email

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

Locale - specify user locale settings by selecting the appropriate locale from the drop-down box (see Locales section for details)
System theme - specify the desired theme for the user CP look and feel. By default, global cloud settings are applied.

Password - specify user password and confirm it. The password can consist of 6-40 characters and must meet the password complexity requirements.

Repeat Password - repeat user password

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

Bucket - select the required bucket from the drop-down box

User roles - select the user role for this user

User Group - assign the user to the user group by selecting the required user group from the drop-down box

Auto Suspending - edit the auto-suspending options

Click the Save button to finish.

5.4.14 Delete User

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

5.4.14.1 Deleting users and their resources

To delete a user:

Go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud.

Click the Actions icon next to the user you want to remove, then choose Delete. A confirmation window with the warning that all resources associated with the user will be removed as well will appear. Click the Confirm button.

To enable confirmation of user deletion by means of password, go to your Control Panel > Admin > Settings menu > Configuration > Defaults tab and move the Enable password protection on user deleting slider to the right. In this case, after the deletion confirmation, the additional window will pop up with the requirement to enter the admin password. Enter the password and click Confirm. Otherwise, the password protection will be disabled by default.
After this process all user’s resources will be deleted, however, the user and their statistics will remain in the cloud. Recipes that run on other user's resources are not deleted after their owners are removed. These recipes can be accessed via Recipes > Unowned recipes menu. User with global permissions can become an owner of any of the unowned recipes by choosing Actions > Become an owner.

5.4.14.2 Erasing the user
The deleted user will appear in the users list with the deleted status. The cloud administrator can completely erase the user from the cloud by performing the following procedure:

Go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud. Click the Show Deleted button to see the list of deleted users.

Click the Actions icon next to the user you want to delete, then choose Erase. You'll be asked for confirmation before the user is scheduled for destruction.

5.4.15 Suspend and Activate Users

Please note that suspending a user results in powering off all one's active virtual servers.

SUSpending a user account makes it inactive, but still present on the system. A suspended user will not be able to log into the Control Panel. To suspend an account:

Go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud.

Click the Suspend icon next to the user you want to suspend. You'll be asked for confirmation before the user is suspended.

To activate a suspended user, click the Activate user button next to their entry in the Users menu.

You can also set a user to auto-suspend at a certain time/date on the user's Edit Profile screen (Users > [user name] > Edit Profile tab).

5.4.16 Unlock User
To unlock the user:

Go to your Control Panel > Admin > Users menu. You'll see a list of all user accounts in your cloud.

Click the Actions button next to the locked user.

Click the Unlock Account button.

5.4.17 Users with Config Problems
With OnApp, you can manage users who have some configuration problems and resolve those issues through the Users with config problems menu.

For this:
Go to your Control Panel > **Admin** > **Users** menu.

Click the **Users with Config Problems** tab, and then select one of the following:

* **Users without Roles** - shows the list of those users who do not have the roles assigned.
* **Users without Time Zones** - shows the list of users who do not have the time zones set.
* **Users without User Groups** - shows the list of users who are not assigned to any user group.

On the page that appears, click the **Actions** button next to a required user and select one of the required actions:

- Log in as User
- Edit User
- Delete User
- Suspend and Activate Users
- Whitelist IPs

To see the details of each action, click the corresponding link.

https://onappcloud.typeform.com/to/A64Euy#source=User%20Accounts

### 5.5 User Groups

You can assign users to different user groups. So you can tie some users together and offer similar cloud experiences. At present, you can configure the following for user groups:

- Assign a UI theme to specific user groups (**Admin** > **Settings** > **Look&Feel**)
- Set the default roles
- Specify buckets

The following actions are available in OnApp for user groups:

#### 5.5.1 View User Group Details

Go to your Control Panel > **Admin** > **Groups** menu.

On the following page, click the label of the required user group to view the following parameters:

- **Roles** - roles available to the users within this user group
- **Organizations** - vCloud organizations (applicable to vCloud Director only)
- **Assigned User IPs** - click the number next to it to view the list of IP addresses assigned to users within this user group with the following details:
  - **IP** - the IP address
  - **User** - the name of the user
  - **Assigned at** - the date and time when the IP address was assigned to the user
- **Virtual Server IPs** - click the number next to it to view the list of IP addresses assigned to all the virtual servers of users within this user group with the following details:
  - **IP** - the IP address
  - **Virtual server** - the IP address assigned to the virtual server
  - **User** - the name of the virtual server's owner
Assigned at - the date and time when the IP address was assigned to the virtual server
Bucket - the bucket used by the users within this user group
User Buckets - buckets available for assignment to the users within this user group. This parameter relates to restriction sets only.

5.5.2 Create User Group

Go to your Control Panel > Admin > Groups menu.

On the page that follows, click + or the Create Group button.

On the next page, fill in the user group details:

- Label - choose a name for the user group
- Buckets - select a bucket in the drop-down list that the users within this user group will use
- Assign vCloud Roles - move the slider to the right to assign vCloud roles
- Roles - assign roles to the users within this user group
- User Buckets - specify the list of buckets available for assignment to the users within this user group. This parameter relates to restriction sets only.

4. Click Save.

5.5.3 Edit User Group

Go to your Control Panel > Admin > Groups menu.

Click the Actions button next to the user group you want to change, then select Edit.

Alternatively, you can click the user group's label, and on the screen that appears, click .

Edit the user group details:

- Label - edit the name of the user group
- Buckets - select a bucket in the drop-down list that the users within this user group will use
- Assign vCloud Roles - move the slider to the right to assign vCloud roles
- Roles - assign roles to the users within this user group
- User Buckets - specify the list of buckets available for assignment to the users within this user group. This parameter relates to restriction sets only.

4. Click Save.

5.5.4 Assign New User to Group

You can do this on the Add a New User page as part of the user creation process:

Go to your Control Panel > Admin > Users menu.

Click + or the Create User button.

In the Roles & Groups section, select the needed user group from the drop-down list.
Complete the other user detail fields, and click Save.
5.5.5 Change User Group for User
You can change the group a user is assigned to on the Edit User screen:
Go to your Control Panel > Admin > Users menu.
Click the Actions button next to the user, then select Edit.
Select a user group for the user from the user group drop-down list.
Click the Save button.

5.5.6 Delete User Group
Go to your Control Panel > Admin > Groups menu.
Click the Actions button next to the user group/organization you want to delete and select Delete.
https://onappcloud.typeform.com/to/A64Euy#source=User%20Groups

5.6 Roles
OnApp allows you to assign roles to users. Each role has a set of permissions associated with it. By assigning users to different roles you can control what those users are allowed to do.
To view the roles list, go to the Control Panel's Roles menu. You will get the list of roles together with their labels, amount of assigned users and actions, which you can perform with the role (Edit, Delete, Clone).
Roles are assigned to users during the user creation process. OnApp provides the following pre-configured user roles:
Administrator
User
https://onappcloud.typeform.com/to/A64Euy#source=Roles

5.6.1 Create and Manage Roles
OnApp allows you to assign roles to users. Each role has a set of permissions associated with it. By assigning users to different roles you can control what those users are allowed to do. This section contains information on actions you can perform with the role which are Create, Edit, Delete, and Clone.

5.6.1.1 Create New Role
To add a new role:
Go to Control Panel > Roles.
Press the "+" button or click the Create Role button at the bottom of the screen.
On the screen that follows, give the role a name (label) and use the radio buttons to set its permissions.
Based on default role - move the slider to the right to create the role based on one of the default roles.
Role based on - select the Administrator or User option from the dropdown.
Click the Save button to finish.
On the Add New Role screen, there are also buttons to give full access to the role (this automatically checks all relevant boxes to allow that role to perform any action) and to deselect all permissions, if you want to start from scratch.

Make sure to enable either the Select resources manually on virtual server creation or the Select instance package on virtual server creation permission, or both if required. If the user does not have any of these permissions enabled, they will not be able to create virtual servers.

5.6.1.2 Edit Role

To edit a role:

Go to Control Panel > Roles.

You'll see a list of all roles on your system and a number of users assigned to each role.

Click the Actions button next to the role you want to change, then click Edit.

On the screen that appears, change the role's description and permissions, then click the Save button.

5.6.1.3 Clone Role

You can copy the role with all its permissions in OnApp. To clone a role:

Go to Control Panel > Roles.

You'll see a list of all roles in your system and a number of users assigned to each role.

Click the Actions button next to the role you want to change, then click Clone.

Now the role is copied with the name of the original role proceeded with the date and time suffix.

To change the role's name or the set of permissions, edit its details:

Go to Control Panel > Roles.

You'll see a list of all roles in your system and a number of users assigned to each role.

On the screen that appears, click the Actions button next to the role you want to change and select the Edit option from the dropbox.

Change the permissions and role's label if required.

Click Save to apply the changes.

To clone a default role to a new user, go to Control Panel > Roles > Templates Role tab. Clicking on the label of a role, you will see the template role details and the assigned permissions.

5.6.1.4 Delete Role

To delete a role:

Go to Control Panel > Roles.

You'll see a list of all roles in your system.

Click the Actions button next to the role you want to delete, then click Delete. You'll be asked for confirmation before the role is removed.
5.6.2 Transaction Approvals

Make sure that the required Approvals permissions are enabled to be able to use this functionality.

Transaction Approvals feature lets you set up certain users (approvers) so that they can approve or decline actions performed by other users (requesters). This feature is tied to roles. You can enable the ability to approve transactions for a user role and you can configure that certain transactions performed by a user role will require approval. Note that any approver can approve or decline any transaction that requires approval in the cloud.

After a transaction that requires approval is initiated, it is paused with the 'Pending' status and a notification is sent to the approver users. After an approver has made a decision, a notification is sent to the requester. Note that if an action initiates several transactions, all its transactions will be approved in case the main transaction is approved. For example, the schedule build virtual server transaction includes the transactions that create the VS resources and which will be approved automatically if the schedule build virtual server transaction is approved.

5.6.2.1 Enable Transaction Approvals for Your Cloud

Firstly, you need to enable transaction approvals for your cloud. You can do this at the Configuration section.

To enable transaction approvals for your cloud:

Go to Control Panel > Settings > Configuration > System tab.

Move the Transaction approvals slider in the Miscellaneous section to enable approvals.

Click the Save Configuration button.

Next, you can proceed to setting up approver user roles.

5.6.2.2 Set up Approver User Role(s)

Approvers have the ability to approve or decline transactions in the cloud, they receive notifications about the transactions that are pending approval. By default, only the admin user role has the permissions to approve/decline transactions. To add this permission to other user roles go to Control Panel > Roles > Label > Edit and enable the Approvals permissions.

After you configure the approval user roles you need to set up the list of transactions that require approval for that or other user role.

5.6.2.3 Configure the List of Actions that Require Approval

Once you enable the permissions for the approver user role(s), you can configure which transactions require approval for each of the user roles.

To set the list of transaction that will require approval for a user role:

Go to Control Panel > Roles > Actions icon next the required user role and select Set approvals.

On the page that loads set Yes for the action(s) which should require approval:

attach disk - adding a disk to a server with the Hot attach option selected
build disk - adding a disk to a server without the Hot attach option selected or adding a disk during virtual server creation
compose vApp - composing a new vApp
create data store - adding a new data store
create resource pool - adding a new resource pool from the Control Panel > Resource Pools page
destroy data store - deleting an existing data store
destroy disk - deleting an existing disk that was created without the Hot attach option selected
delete vApp - deleting an existing vApp
destroy resource pool - deleting an existing resource pool
destroy virtual server - deleting an existing server. This option refers to the destruction of any type of server in OnApp: virtual server, application server, storage server, VS in Federation, etc.
detach disk - removing a disk that was created with the Hot attach option selected
recompose vApp - recomposing a vApp
resize disk - resizing an existing disk
resize virtual server - resizing an existing server with a reboot. This option refers to the resize of any type of server in OnApp: virtual server, application server, storage server, VS in Federation, etc.
resize VS without reboot - resizing an existing server without a reboot. This option refers to the resize of any type of server in OnApp: virtual server, application server, storage server, VS in Federation, etc.
schedule build vDC - adding a new resource pool after an orchestration model deployment
schedule build virtual server - creating a new VS. This option refers to the creation of any type of server in OnApp: virtual server, application server, storage server, VS in Federation, etc.
schedule rebuild virtual server - rebuilding virtual server. This option refers to the creation of any type of server in OnApp: virtual server, application server, storage server, VS in Federation, etc.
update data store - changing the properties of a data store
update resource pool - changing the properties of a resource pool
When you have finished, click Save.

If you set approvals for a user role that has permissions to approve transactions, the transactions performed by the representatives of this user role will be approved automatically.

After the above configuration the selected transactions performed by a representative of the user role will be paused until they are approved or declined by an approver. Next you can set up notifications so that approvers are notified in case there are transactions that are pending approval and the requesters will be notified after their transaction has been approved/declined.

5.6.2.4 Configure Approval Notifications
You can configure the system to send notifications to the approver users when there is a transaction pending approval. Requester users can also be sent emails after there has been a decision regarding the transaction they have initiated.

To set up notifications for the approver users:

Enable notifications for your cloud at Control Panel > Notifications > Configuration.

Configure gateways at Control Panel > Notifications > Gateways. You can configure to send either internal notifications in OnApp or emails.

Add notification templates at Control Panel > Notifications > Notification Templates. These templates are the messages that are sent to the approvers. You can add any text to the messages. Add the %message% text to the template for the messages to automatically include the link to the transaction that is pending approval.

Create the approver recipients list at Control Panel > Notifications > Recipients Lists and add the approver users to it.

Set up subscriptions at Control Panel > Notifications > Subscriptions. Add the gateway (step 2), the notification template (step 3), the recipients list (step 4) and select the Pending approval event for the new subscription.
After the above configuration, the approver users will receive notifications when there is a transaction pending approval in the cloud.

To set up notifications for the requester users:

Go to **Control Panel > Notifications > Gateways**

Click the **New gateway** button

On the page that loads select the SENDMAIL delivery method for the gateway

Click **Select** to proceed to the next gateway creation step

Depending on the selected delivery method fill in the following details:

For the SENDMAIL delivery method:

- **Name** - the name for your new gateway.

  For successful notification configuration for requesters, the name of the gateway should be *System SENDMAIL Gateway*.

- **From** - the email address from which emails will be sent

- **Host** - the server IP or URL

  For the SMTP delivery method:

  - **Name** - the name for your new gateway.

    For successful notification configuration for requesters, the name of the gateway should be *System SMTP Gateway*.

- **From** - the email address from which emails will be sent

- **Host** - the server IP or URL

  - **Smtp address** - address of the SMTP server
  - **Smtp port** - port of the SMTP server
  - **Smtp domain** - associated domain
  - **Smtp user name** - user name to login into SMTP server
  - **Smtp password** - password to login into SMTP server
  - **Smtp authentication** - select an authentication mechanism from the drop-down list: plain, login, or cram_md5
  - **Smtp enable starttls auto** - enable the StartTLS extension

Click **Save** to finish the creation process

After the above configuration, the requester users will automatically be sent an email after their transaction has been approved or declined.

For detailed information on notifications refer to *Notifications Setup*.

### 5.6.2.5 Approve or Decline Transactions

The **Control Panel > Approvals** menu contains the list of all the transactions that require or required approval with their details:

- **ref** - the reference number of the transaction. Click the number to view the details of the transaction.

- **status** - the status of the transaction: approved, declined or pending

- **date** - the date when the transaction was initiated
**action** - the action performed by the transaction

**target** - the entity to which the transaction is related: vApp, VS, resource pool, data store or disk

**requester** - the user who initiated the transaction. Click the name of the user to view their profile.

**approver** - the user who has approved or declined the transaction. Click the name of the user to view their profile. The link to the approver appears only after the transaction has been declined or approved.

To approve or decline a transaction click its reference number and select the Approve or the Decline button at the bottom of the page. The page will also display the output and details of the transaction. The resource difference tables contain the changes in resource distribution before and after the transaction.

For detailed information on logs refer to Logs. 
https://onappcloud.typeform.com/to/A64Euy#source=Transaction%20Approvals

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### 5.6.3 Create and Manage Super Admin Role

When a user enables the Enable Super Admin permissions option via Settings, the option activates the permission, but the corresponding role does not appear in the list of roles at Control Panel > Roles and is not assigned to any user.

#### 5.6.3.1 Create Super Admin Role

To create a super admin role:

At the command prompt, run the following rake task:

```
rake role:generate_super_admin
```

Assign this role to a specific user:

```
rake 'role:assign_super_admin_to_user[login]'`
```

---

#### 5.6.3.2 Delete Super Admin Role

To delete a super admin role, run the following rake task:

```
rake role:destroy_super_admin
```

---

Refer to the Edit System Configuration page for more information about activating the permission via the Settings menu.

---

### 5.7 Restrictions Sets

The restrictions set is a customizable group of limitations. Configure restrictions sets to create a sub-admin role, with control over a limited amount of cloud resources. This tool gives cloud administrators more flexibility in limiting resources and operations available to sub-admin role(s). Creating a new restrictions set associates a role or number of roles with certain resources' limitations. The sub-admins can only view and control the part of cloud assigned to them by the cloud administrator. Within that part they have admin permissions. However, they cannot view or use the resources of the whole cloud.

Previously, the exact list of resources and actions that the users were able to handle in their cloud was defined by the following parameters:

- **Bucket** - configures which resources are available to users (e.g. data store zones, recipes, network zones, and so on). If none are added, the user will have unlimited resources.
Roles/permissions - specifies which actions the user can perform with those resources configured by the bucket (e.g. See all data store zones in the cloud, edit own recipes only, etc.).

The restrictions sets add the possibility to tie the user limitations with the user groups. With this new option, you can choose if the particular resources are restricted by the following:

Bucket resources - if restricted by buckets, the sub-admins will be able to manage only those resources which are added to a bucket. If nothing is added, no resources will be available.

User groups - if the resource is restricted by user group, the sub-admin will be able to handle only the resources owned by the users of their group.

Sub-admins cannot create any new zones or resources.
Sub-admin cannot create roles, therefore, the roles that sub-admin requires have to be created by the cloud administrator. Further corrections to user roles can only be performed by the cloud administrator.
Sub-admin’s users have the same permissions as regular OnApp users.
We recommend that the cloud administrator grants the sub-admin full access to all resources excluding the following permissions:
- Restrictions Resources group
- Restrictions Sets group
- Create/update/destroy role
- Create new zones or resources

See also:
- Create and Manage Restriction Sets
- User Groups
- Buckets

https://onappcloud.typeform.com/to/A64Euy#source=Restrictions%20Sets

5.7.1 List of Restrictions Resources

Restrictions sets can limit the following resources:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Restriction Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity logs</td>
<td>By user group</td>
<td>The sub-admin can see the activity log of those users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Autoscaling configuration</td>
<td>By user group</td>
<td>The sub-admin can manage only those autoscaling configurations, which are created for VSs created by users who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage autoscaling configurations for VSs which are created on compute resources in compute zones added to sub-admin bucket.</td>
</tr>
<tr>
<td>Backups server zones</td>
<td>By bucket resources</td>
<td>The sub-admins can manage backup server zones within the limits set in their bucket.</td>
</tr>
</tbody>
</table>

Some resources can be limited both by bucket and user group. If two restrictions are selected for one parameter, the sub-admin’s access to this resource will be defined by both these limitations at the same time.
<table>
<thead>
<tr>
<th>Resource</th>
<th>Restriction Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup servers</td>
<td>By bucket resources</td>
<td>The sub-admin can see and use only those backup servers, which are set in their bucket.</td>
</tr>
<tr>
<td>Backups</td>
<td>By user group</td>
<td>The sub-admin can configure only those backups, which are created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage backups created on backup server zones added to the sub-admin bucket.</td>
</tr>
<tr>
<td>Base resources</td>
<td>By user group</td>
<td>The sub-admin can manage only those base resources of buckets (Miscellaneous section) which are assigned to users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Buckets</td>
<td>By user group</td>
<td>The sub-admin can manage only those buckets, which are assigned to users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Blueprints</td>
<td>By bucket resources</td>
<td>The sub-admin can manage blueprints stored on data store zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td></td>
<td>By user group</td>
<td>The sub-admin can see and use only those blueprints, which were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Data store zones</td>
<td>By bucket resources</td>
<td>The sub-admin can manage data store zones within the limits set in their bucket.</td>
</tr>
<tr>
<td>Data stores</td>
<td>By bucket resources</td>
<td>The sub-admin can manage data stores added to data store zones specified in their bucket. Without this restriction, the sub-admin will be able to see all the data stores in the cloud (if permissions allow).</td>
</tr>
<tr>
<td>Disks</td>
<td>By user group</td>
<td>The sub-admin can manage only those disks, which are used by customers, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage disks located on data store zones which are assigned to their bucket.</td>
</tr>
<tr>
<td>DNS zones</td>
<td>By user group</td>
<td>The sub-admin can manage only those DNS zones, which are created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Edge groups</td>
<td>By bucket resources</td>
<td>The sub-admin can manage edge groups within the limits set in their bucket.</td>
</tr>
<tr>
<td>Edge servers</td>
<td>By user group</td>
<td>The sub-admin can manage only those edge servers, which are created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage edge servers within the limits set in their bucket.</td>
</tr>
<tr>
<td>Firewall rules</td>
<td>By user group</td>
<td>The sub-admin can manage only those firewall rules, which are set by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Resource</td>
<td>Restriction Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>By bucket resources</strong></td>
<td></td>
<td><strong>Resource</strong></td>
</tr>
<tr>
<td><strong>Compute zones</strong></td>
<td>By bucket resources</td>
<td>The sub-admin can manage firewall rules for VSs created in network zones which are added to the sub-admin bucket.</td>
</tr>
<tr>
<td><strong>Compute resources</strong></td>
<td>By bucket resources</td>
<td>The sub-admin can manage compute resources assigned to compute zones which are added to their bucket.</td>
</tr>
<tr>
<td><strong>iFrames</strong></td>
<td>By user group</td>
<td>The sub-admin can manage only those iFrames, which are created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td><strong>Template groups</strong></td>
<td>By bucket resources</td>
<td>The sub-admin can manage template groups within the limits set in their bucket.</td>
</tr>
<tr>
<td><strong>Templates</strong></td>
<td>By bucket resources</td>
<td>The sub-admin can manage templates assigned to template stores which are added to the sub-admin bucket.</td>
</tr>
<tr>
<td><strong>IO statistics</strong></td>
<td>By user group</td>
<td>The sub-admin can monitor only IO statistics of those users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage IO statistics stored on data store zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td><strong>Virtual server's IP addresses</strong></td>
<td>By user group</td>
<td>The sub-admin can manage IP addresses for VSs, which are owned by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage IP addresses for VSs running on compute resources assigned to compute zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td><strong>IP addresses</strong></td>
<td>By bucket resources</td>
<td>The sub-admin can manage IP addresses in the network zones added to sub-admin buckets.</td>
</tr>
<tr>
<td><strong>Last access log</strong></td>
<td>By user group</td>
<td>The sub-admin can view only the last access log of those users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td><strong>Load balancers</strong></td>
<td>By user group</td>
<td>The sub-admin can manage only those load balancers that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage load balancers running on compute resources attached to compute zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td><strong>Load balancing clusters</strong></td>
<td>By user group</td>
<td>The sub-admin can see and manage only those load-balancing clusters that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can see and manage load balancing clusters running on compute resources attached to compute zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td>Resource</td>
<td>Restriction Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Log items</td>
<td>By user group</td>
<td>The sub-admin can view only the log items of users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Nameservers</td>
<td>By bucket resources</td>
<td>The sub-admin can configure resolvers on network zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td>Network zones</td>
<td>By bucket resources</td>
<td>The sub-admin can see and manage network zones within the limits set in their bucket.</td>
</tr>
<tr>
<td>Networks</td>
<td>By bucket resources</td>
<td>The sub-admin can see and manage only networks attached to network zones which are added to sub-admin bucket.</td>
</tr>
<tr>
<td>OAuth providers</td>
<td>By user group</td>
<td>The sub-admin can configure only those OAuth identity providers that are used by customers, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Payments</td>
<td>By user group</td>
<td>The sub-admin can view only the payments made by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Recipe groups</td>
<td>By bucket resources</td>
<td>The sub-admin can see and manage recipe groups within the limits set in their bucket.</td>
</tr>
<tr>
<td>Recipes</td>
<td>By user group</td>
<td>The sub-admin can manage only those recipes, that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage recipes assigned to recipe groups which are added to the sub-admin bucket.</td>
</tr>
<tr>
<td>Roles</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those roles that are assigned to their user group.</td>
</tr>
<tr>
<td>SAML identity providers</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those SAML identity providers that were configured by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Schedule logs</td>
<td>By user group</td>
<td>The sub-admin can view only the schedule logs of the users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can view schedule logs depending on where the backup schedules have been taken:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for normal backups, the schedule logs for data store zones added to sub-admin bucket are available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for incremental backups, the schedule logs for compute zones added to sub-admin bucket are available</td>
</tr>
<tr>
<td>Schedules</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those schedules, that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can view schedules depending on where they have been taken:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for normal backups, the schedules for data store zones added to sub-admin bucket are available</td>
</tr>
<tr>
<td>Resource</td>
<td>Restriction Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for incremental backups, the schedules for compute zones added to sub-admin bucket are available</td>
</tr>
<tr>
<td>Storage servers</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those storage servers, that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can manage storage servers that are based on compute resources from compute zones added to sub-admin bucket.</td>
</tr>
<tr>
<td>Transactions</td>
<td>By user group</td>
<td>The sub-admin can view only the transactions of those users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>User groups</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those user groups, that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If there is a restriction set by user group, then the counter for Users under the Roles menu will specify only the amount of users within the user group.</td>
</tr>
<tr>
<td>White IPs</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those white IPs that were added by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Users</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those users who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td>Virtual server snapshots</td>
<td>By user group</td>
<td>The sub-admin can see and manage only those virtual server snapshots, that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can see and manage snapshots of virtual servers running on the compute resources from the compute zones added to sub-admin bucket.</td>
</tr>
<tr>
<td>Virtual servers</td>
<td>By user group</td>
<td>The sub-admin can manage only those virtual servers, that were created by users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can see and create virtual servers within the limits set in their bucket.</td>
</tr>
<tr>
<td>Virtual machine statistics</td>
<td>By user group</td>
<td>The sub-admin can view only the virtual server statistics of those users, who are members of the user group to which this sub-admin is assigned.</td>
</tr>
<tr>
<td></td>
<td>By bucket resources</td>
<td>The sub-admin can view the statistics for virtual servers running on the compute resources from the compute zones added to sub-admin bucket.</td>
</tr>
</tbody>
</table>

[https://onappcloud.typeform.com/to/A64Euy#source=List%20of%20Restrictions%20Resources](https://onappcloud.typeform.com/to/A64Euy#source=List%20of%20Restrictions%20Resources)

Leave feedback
5.7.2 Create and Manage Restriction Sets

The restrictions set is a customizable group of limitations. You can configure restrictions sets to create a sub-admin role, with control over a limited amount of cloud resources. Comparing to administrator's role, sub-admins have admin permissions within specific part of the cloud. This section contains information on how you can create, edit and delete restrictions sets.

5.7.2.1 Create Restrictions Sets

Go to your Control Panel > Admin > Sets menu.

Click upper right or the Create Set button lower right.

On the screen that follows, fill in the restrictions set details:

*Label* - choose a name for the restrictions set

*Roles* - select the roles that will be limited under the restrictions set

*Resources* - choose the resources you want to limit for the sub-admins assigned to the role specified above. You can restrict users by bucket or user group or both:

- By bucket resources - if restricted by buckets, the sub-admins will be able to access only those resources which are added to a bucket. If nothing is added to a bucket, no resources will be available.

- By user group - if the resource is restricted by the user group, the sub-admin will be able to access only the resources available to the users of the sub-admin's group.

- By bucket resources and user group - if the resource is restricted both by user group and bucket, the sub-admin's access to this resource will be defined by both these limitations at the same time. For the list of resources that can be limited under a restrictions set, see [List of Restrictions Resources](https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Restriction%20Sets).

Click the Submit button to finish.

5.7.2.2 Edit Restrictions Sets

Go to your Control Panel > Admin > Sets menu.

On the following page, click the Actions button next to the restrictions set you want to change, then select Edit.

On the screen that appears, you can change the following parameters:

*Label*

*Roles*

*Resources*

Click the Submit button.

5.7.2.3 Delete Restrictions Sets

Go to your Control Panel > Admin > Sets menu.

On the following page, click the Actions button next to the restrictions set you want to remove, then click Delete.

In the dialog, click OK to confirm the deletion.

See also:

- Configure Resource Allocation and Prices
- Create New Role
- [List of Restrictions Resources](https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Restriction%20Sets)

Leave feedback
5.8 OnApp Permissions

The permissions are used to determine what the OnApp users are authorized to do within the cloud. OnApp uses role-based access to specify what users can view, edit, create or remove in OnApp. Each role is a set of permissions defined for the OnApp cloud that you can assign to specific users to control user access to the cloud settings.

To view the list of VMware Cloud Director permissions, refer to the VMware Cloud Director Permissions page of the OnApp and VMware Cloud Director Configuration Guide.

To view the list of vCenter permissions, refer to the vCenter Permissions page of the vCenter Implementation Guide (5.4 and up).

To set the permissions:

Go to your Control Panel > Admin > Roles and Sets menu.

On the screen that follows, you'll see a list of all roles on your system on the following screen.

Click the Actions button next to the relevant role, then click Edit.

Change the role's permissions for users as required, then click the Save button.

Now, you have a user with the customized set of Permissions. For OnApp administrators, this set includes access to a wider range of OnApp functionality. OnApp administrators can control users’ ability to manage different components through the Control Panel's Roles menu.

Some of the listed permissions (or permission sets) are default for the Admin and User roles in OnApp.

⚠ sign marks the default permissions for the predefined Administrator role in OnApp.

⚠ sign marks the default permissions for the predefined User role in OnApp.

5.8.1 Accelerators

OnApp administrators can control users’ ability to manage accelerators. You can set the following accelerator permissions for user roles:

* **Any action on Accelerators** - the user can take all actions listed below

* **Change an owner of any Accelerator** - the user can replace the owner of any accelerator in the cloud

* **Create a new Accelerator** - the user can add new accelerators to the cloud

* **Destroy any Accelerator** - the user can delete any of the existing accelerators

* **Destroy own Accelerators** - the user can delete only those accelerators that are in their bucket

* **Migrate any Accelerator** - the user can migrate any of the existing accelerators

* **Migrate own Accelerators** - the user can migrate only those accelerators that are in their bucket

* **Any power action on Accelerators** - the user can take any power-related action on accelerator

* **Any power action on own Accelerators** - the user can take any power-related action only on their own accelerators

* **See all Accelerators** - the user can view all accelerators currently present in the cloud

* **See own Accelerators** - the user can see only those accelerators that are in their bucket

* **Rebuild Network on any Accelerator** - the user can rebuild network on any of the existing accelerators
Rebuild Network on own Accelerators - the user can only rebuild network on own accelerators

Change Suspended status for any Accelerator - the user can change Suspended status for any accelerator in the cloud

Unlock any Accelerator - the user can unlock any of the accelerators in the cloud

Update any Accelerator - the user can edit any of the existing accelerators

Update own Accelerators - the user can edit only those accelerators that are in their bucket

For details, refer to the Accelerators section.

Activity Logs

OnApp administrators can control users' ability to manage activity logs configuration. The following activity logs for user roles can be set:

- Any action on Activity Logs - the user can view and destroy all activity logs
- Destroy any Activity Logs - the user can delete activity logs
- Destroy own Activity Logs - the user can only delete their own activity logs
- See list of all Activity Logs - the user can see list of all activity logs
- See list own Activity Logs - the user can only see list of their own activity logs
- See all Activity Logs - the user can see all activity logs
- See all own Activity Logs - the user can only see the details of their own activity log

5.8.1.1 Application Servers

OnApp administrators can control users' ability to manage application servers. You can set the following application servers permissions for user roles:

- Any action on application servers – the user can take all actions listed below
- Change an owner of any application server – the user can replace the owner of any of the application servers in the cloud
- Create a new application server – the user can create a new application server
- Destroy any application server – the user can delete any application server. To delete any application server together with its backups, the user needs to have the Destroy any backup permission enabled. Otherwise, the backups of the application server deleted by the user will remain in the system.
- Destroy own application servers – the user can only delete their own application servers. To delete an application server together with its backups, the user needs to have the Destroy own backup permission enabled. Otherwise, the backups of the application server deleted by the user will remain in the system.
- Migrate any application server – the user can migrate any application server in the cloud
- Migrate own application servers – the user can only migrate only those application servers that are in their bucket
- Any power action on application servers – the user can take any power-related action on all application servers in the cloud
- Any power action on own application servers – the user can only take power-related actions on their own application servers
- See all application servers – the user can view any application server. If this permission is enabled, the user can manage applications deployed on any application server.
- See own application servers – the user can only view their own application servers. If this permission is enabled, the user can manage applications deployed on their application servers.
Read VIP status - the user can read VIP status of application servers and know which of them will have higher priority in the migration queue.

Rebuild Network on any application server – the user can rebuild the network of any application server located in the cloud.

Rebuild Network on own application servers – the user can only rebuild network of their own application servers

Set VIP status - the user can set/delete VIP status for application servers

Change Suspended status for application server – the user can edit Suspended status for an application server and disable or enable all the major actions on VS

Unlock any application server – the user can unlock any application server and edit its XML file

Update any application server – the user can edit any application server present in the cloud

Update own application servers – the user can only edit those application servers that are in their bucket

Allow user to set CPU topology - the user can set CPU topology options for application server

For details, refer to the Application Servers section.

5.8.1.2 Approvals
OnApp administrators can control users’ ability to approve and decline transactions. The following permissions for transaction approvals can be set:

⚠️ Any Actions on Approvals - the user can approve, decline and see pending status of all transactions
See all Approvals - the user can see if any of the transactions is pending for approval
Update any Approval - the user can approve or decline transactions

For details, refer to the Transaction Approvals section.

5.8.1.3 Autoscaling Configuration
OnApp administrators can control users’ ability to manage VS autoscaling configuration. The following autoscaling permissions for user roles can be set:

⚠️ Any Actions with Autoscaling Configuration - the user can take all actions on autoscaling configuration listed below
Create Autoscaling Configuration - the user can create autoscaling configuration for virtual servers
Destroy any Autoscaling Configuration - the user can delete autoscaling configuration created by other users
Destroy own Autoscaling Configuration - the user can only delete autoscaling configuration for appliances that are added to their bucket
Read all Autoscaling Configuration - the user can read autoscaling configuration on all VSs in the cloud
Read own Autoscaling Configuration - the user can only read autoscaling configurations of appliances that are in their bucket
Update all Autoscaling Configuration - the user can edit autoscaling configuration on all VSs in the cloud
Update own Autoscaling Configuration - the user can only edit autoscaling configuration for appliances in their bucket

For details, refer to the Autoscale Virtual Server section.
Autoscaling Monitors

OnApp administrators can control users’ access to monitis monitors. You can set the following monitis monitors permissions for user roles:

- **Any Actions on relation autoscaling monitors** - the user can perform any actions on relation monitis monitors
- **View autoscaling monitor information** - the user can view monitis monitor information

For details, refer to the View Load Balancer Autoscaling Monitors section.

5.8.1.4 Auto-Backup Presets

OnApp administrators can control users’ ability to manage auto-backup presets configuration. The following auto-backup presets permissions for user roles can be set:

- **Any action on auto-backup presets** - the user can see and update auto-backup presets that have been backed up automatically
- **See all auto-backup presets** - the user can see all auto-backup presets that have been backed up automatically
- **Update any auto-backup presets** - the user can edit any auto-backup presets that have been backed up automatically

For details, refer to the Auto-Backup Presets Settings section.

5.8.1.5 Availability

OnApp administrators can control users’ ability to access and manage the High Availability system via Settings > HA Clusters. The following permission for user roles can be set:

- **Any action on Availability settings** - a user can take any actions on High Availability general settings, hosts, clusters, communication rings, etc

For details, refer to the High Availability section.

5.8.2 B

5.8.2.1 Backups

OnApp administrators can control users’ ability to manage backups. You can set the following backup permissions for user roles:

- **Any action on backups** - the user can take all actions listed below on any backup
- **Convert any backup to template** - the user can take any backup of any virtual server, and convert it to a template
- **Convert own backup to template** - the users can only convert their own backups to templates
- **Create backup for own VS** - the users can only create backups of their own virtual servers
- **Destroy own backup** - the users can only delete their own backups. To delete own virtual server together with its backups, the user needs to have this permission enabled. Otherwise, the backups of the VS deleted by the user will remain in the system.
- **See own backups** - the users can only see their own backups
Update own backup - the users can only edit their own backups
For details, refer to the Virtual Server Backups section.

5.8.2.2 Backup Resources
OnApp administrators can control users' ability to manage backup resources. You can set the following backup resources permissions for user roles:

- **Any action on backup resources** - the user can create, view, edit, and delete backup resources
- **Create backup resource** - the user can add a new backup resource
- **Delete any backup resource** - the user can delete any backup resource
- **See any backup resource** - the user can view the list of all backup resources
- **Update any backup resource** - the user can edit any backup resource
For details, refer to the Create and Manage Backup Resources section.

5.8.2.3 Backup Resource Zones
OnApp administrators can control users' ability to manage backup resource zones. You can set the following backup resource zones permissions for user roles:

- **Any action on backup resource zones** - the user can create, view, edit, and delete backup resource zones
- **Create backup resource zone** - the user can add a new backup resource zone
- **Delete any backup resource zone** - the user can delete any backup resource zone
- **See any backup resource zone** - the user can view the list of all backup resource zone
- **Update any backup resource zone** - the user can edit any backup resource zone
For details, refer to the Create and Manage Backup Resource Zones section.

5.8.2.4 Backup Servers
OnApp administrators can control users' ability to manage backup servers. You can set the following backup server permissions for user roles:

- **Any action on Backup servers** - the user can create, view, edit, and delete backup servers
Add a new Backup server - the user can add a new backup server
Delete any Backup server - the user can delete any backup server
See all Backup servers - the user can view the list of all backup servers
Update any Backup server - the user can edit any backup server
For details, refer to the Backup Servers Settings section.

5.8.2.5 Backup Server Zones
OnApp administrators can control users’ ability to manage backup server zones. The following backup server zone permissions for user roles can be set:

- Any action on backup server zones - the user can create, view, edit, and delete backup server zones
- Create a new backup server zone - the user can add a new backup server zone
- Delete any backup server zone - the user can delete any backup server zone
- See list of all backup server zones - the user can see list of all backup server zones
- See details of any backup server zone - the user can view the details of any backup server zone
- Update any backup server zone - the user can edit any backup server zone

For details, refer to the Backup Server Zones Settings section.

5.8.2.6 Blueprints
- Deploy own blueprint - the user can deploy their own blueprint

Buckets
OnApp administrators can control users’ ability to manage buckets. You can set the following bucket permissions for user roles:

- Any action on buckets - the user can create, view, edit, and delete buckets
- Create a new bucket - the user can add a new bucket
- Delete any bucket - the user can delete any bucket
- See list of all buckets - the user can see list of all buckets
- See details of any bucket - the user can see details (limits and prices) of any bucket
- See own bucket - the user can only see a bucket assigned to this user
- Show empty values - the user can see empty values in the access control and rate card of any bucket

For details, refer to the Buckets section.

5.8.3 C

5.8.3.1 CloudBoot
OnApp administrators can control users’ ability to manage CloudBoot settings. You can set the following permission:

- Manage CloudBoot configurations - the user can manage CloudBoot settings

For details, refer to the CloudBoot Compute Resources section.
5.8.3.2 Compute Resources
OnApp administrators can control users’ ability to manage compute resources. You can set the following compute resource permissions for user roles:

- Any action on compute resources - the user can take all actions listed below on compute resources
- Manage auto import rules - the user can manage auto import rules for any compute resource
- Create a new compute resource - the user can add a new compute resource
- Destroy any compute resource - the user can delete any compute resource
- Set maintenance mode for any compute resource - the user can set maintenance mode for any compute resource
- See all compute resources - the user can see all compute resources
- Show compute resources on virtual server creation - display compute resources and their joined networks on the Add New Virtual Server screen
- Reboot any compute resource - the user can reboot any compute resource
- Enable/Disable Storage-related services - the user can enable and disable storage-related services for any compute resource
- Update any compute resource - the user can edit any compute resource

For details, refer to the Compute Resource Settings section.

5.8.3.3 Compute Resource Devices
OnApp administrators can control users’ ability to manage compute resource devices. You can set the following compute resource devices permissions for user roles:

- Any action on Compute Resource Devices - the user can view and edit compute resource devices
- See all Compute Resource Devices - the user can view the list of all compute resource devices
- Update any Compute Resource Device - the user can edit any compute resource device

For details, refer to the Manage Compute Resource Static Hardware Devices section.

5.8.3.4 Compute Zones
OnApp administrators can control users’ ability to manage compute zones. You can set the following compute zone permissions for user roles:

- Any action on Compute zones - the user can take all actions listed below on compute zones
- Create a new Compute zone - the user can create a new compute zone
- Delete any Compute zone - the user can delete any compute zone
- See list of all Compute zones - the user can see list of all compute zones
- See details of any Compute zone - the user can see details of any compute zone
- Show Compute Zones on Virtual server creation - display compute zones on Add New Virtual Server screen. Note: the See Details of any Compute Zone permission must be enabled for this permission to work properly.
- Manage recipes for Compute zone - the user can manage recipes for any compute zone
- Update any Compute zone - the user can edit any compute zone

For details, refer to the Compute Zones Settings section.
5.8.3.5 Container Servers

- **Build/rebuild user's own container server** - the user can build/rebuild their own container server
- **Console to own container server** - the user can only access their own container server via console
- **Create a new container server** - the user can create a new container server
- **Destroy own container servers** - the user can destroy their own container servers
- **Edit own container server's cloud config** - the user can only edit their own container server's cloud config
- **Migrate own container servers** - the user can migrate their own container servers
- **Any power action on own container servers** - the user can take any power-related action on their own container servers
- **See own container servers** - the user can see their own container servers
- **Read own container server's root password** - the user can read their own container server's root password
- **Rebuild network of own container server** - the user can only rebuild network of their own container server
- **Manage recipes joins for own container servers** - the user can manage recipes joins for their own container servers
- **Reset root password to own container server** - the user can only reset the root password for their own container servers
- **Update own container servers** - the user can update their own container servers

5.8.3.6 Control Panel

OnApp administrators can control users' ability to manage recipes for Control Panel. You can set the following permission:

- **Manage recipes for Control Panel** - the user can manage recipes for any Control Panel

This permission will not be granted by pressing Full access button while editing the list of Permissions in the Roles section and can only be selected manually.

5.8.3.7 CPU Quota

OnApp administrators can control users' ability to manage CPU quota. You can set the following CPU quota permissions for user roles:

- **Manage CPU Quota** - the user can enable/disable/edit CPU quota. Editing includes setting the default value of CPU quota on the compute resource level and editing the custom value on the virtual server level.

For details, refer to the Set Default CPU Quota section.

**Currencies**

OnApp administrators can control users' ability to manage currency. You can set the following currency permissions for user roles:

- **Any action on Currencies** - the user can create, edit, view, and delete currencies
- **Create new Currency** - the user can add a new currency
- **Delete any Currency** - the user can delete any currency
See list of all Currencies - the user can view the list of all currencies

Update all Currencies - the user can edit any currency

For details, refer to the Currencies section.

5.8.3.8 Custom Fields

OnApp administrators can control users' ability to manage the Hardware Info custom fields. You can set the following custom fields permissions for user roles:

Any actions on Custom Fields - the user can add or edit any custom commands you want to run when a compute zone is booted

For details, refer to the Hardware Info section.

5.8.4 D

5.8.4.1 Dashboard

OnApp administrators can control users' access to the dashboard. You can set the following dashboard permissions for user roles:

All actions on Dashboard - the user can see all available dashboard actions

See Alerts - the user can see alerts on the dashboard, including zombie VSs and transactions, and background processes

See Global Statistic - the user can see Global Dashboard statistics

See License Details - the user can see Dashboard Cloud Licenses' details

Show cloud dashboard - the user can see the cloud details on the dashboard

For details, refer to the Dashboard section.

Data Stores

OnApp administrators can control user access to datastore management. You can set the following data store permissions for user roles:

Any action on data_stores - the user can take all action listed below on data stores

Create a new data_store - the user can add a new data store

Destroy any data_store - the user can delete any data store

See all data_stores - the user can view the list of all data stores

For details, refer to the Data Stores Settings section.

Data Store Joins

OnApp administrators can control users' ability to manage data store joins. You can set the following data store joins permissions for user roles:

All actions on datastores on Compute resource - the user can attach and remove datastores from Compute resources and zones

Add Data Store to any Compute resource - the user can add a data store to any compute resource

Remove Data Store from any Compute resource - the user can detach a data store from any compute resource

For details, refer to Manage Compute Zone Data Stores section.
Data Store Zones

OnApp administrators can control user access to data store zones management. You can set the following data store zone permissions for user roles:

- **Any action on data store zones** - the user can take all actions listed below on data store zones
- **Create a new data store zone** - the user can add a new data store zone
- **Delete any data store zone** - the user can delete any data store zone
- **See list of all data store zones** - the user can view the list of all data store zones
- **See details of any data store zone** - the user can see details of any data store zone
- **Update any data store zone** - the user can edit any data store zone

For details, refer to the [Data Store Zones Settings](#) section.

5.8.4.2 Disks

OnApp administrators can control user access to disks management. You can set the following disks permissions for user roles:

- **Any action on disks** - the user can take all actions listed below on disks
- **Assign any disk to VS** - the user can assign the disks of any users to another VS of that user
- **Assign own disk to VS** - the user can assign their own disks to another VS of their own user
- **Auto-backup for any disk** - the user can schedule automatic backups on the disks of any users' virtual servers
- **Auto-backup for own disk** - the user can only schedule automatic backups on the disks of their own virtual servers
- **Create a new disk** - the user can create a new disk
- **Destroy any disk** - the user can delete any disks
- **Destroy own disk** - the user can only delete the disks of their own virtual servers
- **Manage virtio bus for disks** - the user can enable virtio mode for the disks of Windows-based virtual servers of any users
- **Migrate any disk** - the user can migrate the disks of any users' virtual servers
- **Migrate own disks** - the user can only migrate the disks of their own virtual servers
- **Resize the disk below minimum set by Template** - the user can resize the disks below the minimum set by template
- **See all disks** - the user can see all the disks of any users' virtual servers
- **See own disks** - the user can only see the disks of their own virtual servers
- **Unlock any disk** - the user can unlock any disk
- **Update any disk** - the user can edit the disks of any users' virtual servers
- **Update own disk** - the user can only edit the disks of their own virtual servers
For details, refer to the Virtual Server Disks section.

5.8.4.3 DRaaS
OnApp administrators can control users’ ability to manage DRaaS. You can set the following DRaaS permissions for user roles:

- **Any action related to DRaaS** - the user can take any action related to DRaaS such as enable DRaaS on the cloud and enable DRaaS for virtual servers

5.8.5 E

5.8.5.1 Edge Groups

- **See all edge groups** - the user can see all edge groups

5.8.6 F

5.8.6.1 Firewall Rules
OnApp administrators can control users’ ability to manage firewall rules. You can set the following firewall rules permissions for user roles:

- **Any Action on Firewall Rules** - the user can create, view, edit, and delete all firewall rules

- **Create Firewall Rules for anyone** - the user can add firewall rules for anyone

- **Create own Firewall Rules** - the user can only create firewall rules for appliances in their own bucket

- **Destroy own Firewall Rules** - the user can only delete firewall rules for appliances in their own bucket

- **Read own Firewall Rules** - the user can only view firewall rules for appliances in their own bucket

- **Update own Firewall Rules** - the user can only edit firewall rules for appliances in their own bucket

Be aware that additionally the following permissions should be enabled before setting firewall rules for your virtual server:

- **Update own virtual server** – the user can only edit their own virtual servers
- **Read own virtual servers** – the user can only read their own virtual servers

For details, refer to the Set Virtual Server Firewall Rules section.

5.8.6.2 Federation failed action

- **Clean own federation failed actions** - the user can clean their own federation failed actions

- **Read own federation failed actions** - the user can read their own federation failed actions

5.8.7 G

5.8.7.1 Global Search
OnApp administrators can control user access to global search. You can set the following global search for user roles:

- **Global search** - global search through the whole database

For details, refer to the Cloud Search Tool section.
5.8.7.2 Groups
This set of permissions is reserved for future use and currently is not used. Enabling or disabling those permissions will not affect the system in any way.

5.8.8 H

5.8.8.1 Hardware Info
OnApp administrators can control user access to hardware information that is available for all compute resources and backup servers in the Settings menu. The access to the Hardware Info page for a particular compute resource or backup server is controlled under the See all compute resources/See all backup servers and Update any compute resource/Update any backup server permissions.

You can set the following hardware info permissions for user roles:
See all Hardware Info - the user can see all hardware information in the Settings menu
For details, refer to the Hardware Info section.

5.8.8.2 Help
OnApp administrators can control user access to help section. You can set the following permissions for user roles:

All actions on Help - the user can take any action under the Help menu
Send Support requests - the user can send support requests from the Help menu
For details, refer to Help chapter.

5.8.9 I

5.8.9.1 Instance Packages
OnApp administrators can control user access to instance packages. You can set the following permissions for user roles:

Any action on instance packages - the user can create, view, edit, and delete instance packages
Create instance package - the user can add a new instance package
Delete any instance package - the user can delete any instance package
See all instance packages - the user can see all instance packages
Update any instance package - the user can edit any instance package
For details, refer to the Instance Packages section.

5.8.9.2 Internationalization
OnApp administrators can control user access to internationalization locales. You can set the following permission:

Edit Internationalization Locales - the user can view and edit all non-English language phrases
For details, refer to the Localization and Customization section.
5.8.9.3 IO Limiting
OnApp administrators can control user access to IO limiting. You can set the following permissions:

- **Any actions on IO limits** - the user can update all IO limits for disks and data stores
- **Update any IO limits** - the user can update IO limits for any disks and data stores
- **Update own IO limits** - the user can update IO limits for own disks

For details on IO limiting, refer to the Edit Data Store IO Limits section.

5.8.9.4 IO Statistics
OnApp administrators can control user access to IOPS statistics. You can set the following permissions:

- **Full access to IO Statistics** - the user has full access to Input/Output Operations VS disk statistics
- **See all IO Statistics** - the user can view all charts with IO Statistics
- **See own IO Statistics** - the user can see IO Statistics only for those VS disks that belong to them

For details on IO Statistics, refer to the View Disk IOPS section.

5.8.9.5 IP Addresses
OnApp administrators can control users' ability to manage IP addresses. You can set the following IP address permissions for user roles:

- **Any action on IP addresses** - the user can take all actions listed below on IP addresses
- **Assign IP address to user** - the user can assign IP address to user
- **Create a new IP address** - the user can add a new IP address
- **Destroy any IP address** - the user can delete any IP address
- **See all IP addresses** - the user can see all IP addresses

For details, refer to the Assign/Unassign IP Address to User section.

5.8.9.6 IP Nets
OnApp administrators can control users' ability to manage IP nets. You can set the following IP nets permissions for user roles:

- **All actions on IP Nets** - the user can take all action listed below on IP net
- **Add IP Nets to any network** - the user can add an IP net to any network
- **Add IP net to own networks** - the user can only add IP net to their own networks
- **Remove IP Nets from any network** - the user can remove an IP net from any network
- **Remove IP nets from own networks** - the user can only remove IP net from their own networks
- **View IP Nets assigned to any network** - the user can see IP nets assigned to any network

For details, refer to the IP Nets section.
5.8.9.7 IP Ranges
OnApp administrators can control users’ ability to manage IP ranges. You can set the following IP ranges permissions for user roles:

- **All actions on IP Ranges** - the user can take all actions listed below on IP ranges
- **Add IP Ranges to any IP Net** - the user can add an IP range to any IP net
- **Add IP Ranges to own IP Nets** - the user can only add IP range to their own IP nets
- **Remove IP Ranges from any IP Net** - the user can remove an IP range from any IP net
- **Remove IP Ranges from own IP Nets** - the user can only remove IP range from their own IP nets
- **View IP Ranges assigned to any IP Net** - the user can see IP ranges assigned to any IP net

For details, refer to the IP Ranges section.

5.8.9.8 ISOs
OnApp administrators can control users’ ability to manage ISOs. You can set the following ISO permissions for user roles:

- **Any action on ISOs** - the user can take any action on ISOs
- **Create a new ISO** - the user can create a new ISO
- **Destroy any ISO** - the user can delete any ISO (own, user, and public)
- **Destroy own ISO** - the user can only delete own ISO
- **Destroy user ISO** - the user can delete ISOs created by any user, but not public ISOs
- **Make any ISO public** - the user can make public any ISO available to all users
- **Make own ISO public** - the user can make public own ISOs only
- **Make user ISO public** - the user can make public ISOs created by any user
- **Create and manage own ISOs** - the user can create and edit/delete/view own ISOs
- **Manage all ISOs** - the user can manage own/user/public ISOs
- **Create and manage user ISOs** - the user can view/create/edit/delete ISOs created by any user
- **See all ISOs** - the user can view all ISOs in the cloud
- **See own ISOs** - the user can only view the ISOs created by themselves

- **Read all public ISOs** - the user can view all public ISOs

For details, refer to the Manage ISOs section.

5.8.10 J

5.8.11 K

5.8.12 L

5.8.12.1 Last Access Log
OnApp administrators can control users access to logs. You can set the following last access log permissions for user roles:
Any action on last access log - the user can view information on all the IP addresses that logged in to his account together with the time and date of last access

See the last access log of any user - the user can see the last access log of other users

See own last access log - the user can only see their own last access log

5.8.12.2 Load Balancers
OnApp administrators can control users' ability to manage load balancers. You can set the following load balancer permissions for user roles:

Any action on load balancer - the user can create and manage load balancers

Migrate any load balancer - the user can migrate any load balancer

Migrate own load balancer - the user can only migrate their own load balancer

For details, refer to the Load Balancers section.

5.8.12.3 Load Balancing Clusters
OnApp administrators can control users' ability to manage load balancing clusters. You can set the following load balancing cluster permissions for user roles:

Any action on load balancing cluster - the user can take all actions listed below on load balancing clusters

Configure autoscale out parameter of load balancing cluster - the user can configure Autoscale Out when creating/updating a load balancing cluster

Create a new load balancing cluster - the user can create a new load balancing cluster

Delete own load balancing cluster - the user can only delete own load balancing clusters

See details of own load balancing cluster - the user can only see details of own load balancing cluster

Change own load balancing cluster - the user can only change own load balancing cluster

For details, refer to the Load Balancers section.

5.8.12.4 Location Groups
OnApp administrators can control users' ability to manage location groups. You can set the following location groups permissions for user roles:

Any action on location groups - the user can create, view, refresh, and delete location groups

Create a new location group - the user can add a new location group

Delete any location group - the user can attempt to delete location group

See all location groups - the user can see details of any location group

Refresh location groups - the user can refresh location groups

For details, refer to the Location Groups section.
5.8.12.5 Log Items
OnApp administrators can control users’ ability to manage log items. You can set the following log items permissions for user roles:

- **Any action on log items** - the user can view and delete any log items
- **Delete any log item** - the user can delete any log item
- **Delete own log item** - the user can only delete their own log items
- **See details of own log item** - the user can only see details of their own log items

For details, refer to the **Logs** section.

5.8.13 M

5.8.13.1 Media
OnApp administrators can control users’ ability to manage Media files. You can set the following media permissions for user roles:

- **Any action on Media** - the user can delete, view, and edit media files
- **Delete any Media** - the user can delete any media files
- **See any Media** - the user can view any media files
- **Update any Media** - the user can edit any media files

5.8.13.2 Messaging: Deliveries
OnApp administrators can control users’ access to messaging deliveries. You can set the following messaging deliveries permissions for user roles:

- **Any action on deliveries** - the user can view and delete notifications deliveries
- **See all deliveries** - the user can see all deliveries

For details, refer to the **Deliveries** section.

5.8.13.3 Messaging: Events
OnApp administrators can control users’ access to messaging events. You can set the following messaging events permissions for user roles:

- **Any action on events** - the user can view and add messaging events
- **Add a new event** - the user can add new messaging events
- **See all events** - the user can see all messaging events

For details, refer to the **Events** section.

5.8.13.4 Messaging: External Recipients
OnApp administrators can control users’ access to external recipients. You can set the following external recipients permissions for user roles:

- **Any action on external recipients** - the user can perform any action on external recipients
- **Add a new external recipient** - the user add new external recipients
- **Delete external recipient** - the user can delete any external recipients
- **See all external recipients** - the user can see all external recipients
- **Update external recipients** - the user can edit any external recipients
For details, refer to the Recipients section.

5.8.13.5 Messaging: Gateways
OnApp administrators can control users’ access to messaging gateways. You can set the following messaging gateways permissions for user roles:

- **Any action on gateways** - the user can view, edit, create and delete gateways
- **Add a new gateway** - the user can add new messaging gateways
- **Delete gateway** - the user can delete any messaging gateways
- **See all gateways** - the user can see all messaging gateways
- **Update gateway** - the user can edit any messaging gateways

For details, refer to the Gateways section.

5.8.13.6 Messaging: Notifications
OnApp administrators can control users’ access to messaging notifications. You can set the following messaging notifications permissions for user roles:

- **Any action on notifications** - the user can view, enable, and disable messaging notifications

For details, refer to the Notifications section.

5.8.13.7 Messaging: Notification Templates
OnApp administrators can control users’ access to messaging notification templates. You can set the following messaging notification templates permissions for user roles:

- **Any action on notification templates** - the user can perform any action on notification templates
- **Add a new notification template** - the user can add new notification templates
- **Delete notification template** - the user can delete any notification templates
- **See all notification templates** - the user can view all notification templates
- **Update notification template** - the user can edit any notification templates

For details, refer to the Notification Templates section.

5.8.13.8 Messaging: Recipients Lists
OnApp administrators can control users’ access to recipients lists. You can set the following recipients lists permissions for user roles:

- **Any action on recipients lists** - the user can view, edit, create and delete recipients lists
- **Add a new recipients list** - the user can add new recipients lists
- **Delete recipients lists** - the user can delete any recipients lists
- **See all recipients lists** - the user can see all recipients lists
- **Update recipients lists** - the user can edit any recipients lists

For details, refer to the Recipients section.

5.8.13.9 Messaging: Subscriptions
OnApp administrators can control users’ access to messaging subscriptions. You can set the following subscriptions permissions for user roles:
Any action on recipients subscriptions - the user can view, create and delete messaging subscriptions

Add a new subscription - the user can add new messaging subscriptions

Delete subscription - the user can delete any subscriptions

See all subscriptions - the user can view all subscriptions

For details, refer to Subscriptions section.

5.8.13.10 Monthly User Billing Statistics
OnApp administrators can control users’ access to monthly user billing statistics. You can set the following user monthly bills permissions for user roles:

Full access to user Monthly Bills Statistics - the user has full access to monthly bills statistics of all users

See all Monthly user Bills Statistics - the user can see all user monthly bills statistics

See only own user Monthly Bills Statistics - the user can only see own user monthly bills statistics

5.8.13.11 Monthly User Group Billing Statistics
OnApp administrators can control users’ access to monthly user group billing statistics. You can set the following user group monthly bills permissions for user roles:

Full access to user group Monthly Bills Statistics - the user has full access to user group monthly bills statistics

See all Monthly user group Bills Statistics - the user can see all user group monthly bills statistics

See only own user group Monthly Bills Statistics - the user can only see own user group monthly bills statistics

5.8.14 Nameservers

5.8.14.1 Nameservers
OnApp administrators can control users’ ability to manage name servers. You can set the following nameservers permissions for user roles:

Any action on nameservers - the user can view, edit, create and delete nameservers

Create a new nameserver - the user can create a new nameserver

Destroy any nameserver - the user can delete any nameserver

See all nameservers - the user can see all nameservers

5.8.14.2 Networks
OnApp administrators control how users can manage networks. You can set the following network permissions for user roles:

Any action on networks - the user can take all actions listed below on networks

Add new network - the user can create a new network. This permission also controls the user’s ability to create IP nets and IP ranges.

Add new own network - the user can create a new own network

Delete network - the user can delete a network

Delete own network - the user can delete own network
**See all networks** - the user can see all networks

**Network Joins**

OnApp administrators can control users’ ability to manage network joins. You can set the following network joins permissions for user roles:

- **All actions on network joins** - the user can attach or detach all/own networks to a compute resource or a compute zone
- **Attach network to any compute resource or a compute zone** - the user can attach all/own networks to any compute resource or a compute zone
- **Detach network from any compute resource or a compute zone** - the user can detach all/own networks from any compute resource or a compute zone

For details, refer to the [Manage Compute Zone Networks](#) section.

**5.8.14.3 Network Zones**

OnApp administrators control a user’s ability to manage network zones. You can set the following network zone management permissions for user roles:

- **Any action on network zones** - the user can take all actions listed below on network zones
  - **Create a new network zone** - the user can create a new network zone
  - **Delete any network zone** - the user can delete any network zone
  - **See list of all network zones** - the user can see list of all network zones
  - **See details of any network zone** - the user can see details of any network zone
  - **Update any network zone** - the user can update any network zone

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

**5.8.15 OnApp Storage**

OnApp administrators can control users’ ability to manage OnApp Storage. You can set the following OnApp Storage management permission for user roles:

- **Manage OnApp storage** - the user can access and manage the OnApp storage settings
  - **Override Integrated Storage cache settings** - the user can override Integrated Storage cache settings

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

**5.8.15.2 OAuth Providers**

OnApp administrators can control users’ ability to manage OAuth providers. You can set the following OAuth providers permissions for user roles:

- **Any action on OAuth providers** - the user can view, configure, and edit all OAuth providers
  - **See all OAuth providers** - the user can see all configured OAuth providers
  - **Update any OAuth provider** - the user can edit any OAuth provider

For details, refer to the [OAuth](#) section.
Onboarding Billing Wizard

The onboarding wizard allows an admin to without deep product knowledge to configure initial users and buckets. OnApp administrators can control users' ability to use the wizard. You can set the following permissions for user roles:

- **Manage Onboarding Billing Wizard** - the user can use the Billing Wizard

Onboarding Infrastructure Wizard

The infrastructure wizard allows a user without deep product knowledge to configure initial compute, storage, and networking resources on the cloud by just filling the forms and providing access credentials for connection to their servers. OnApp administrators can control users' ability to use the wizard. You can set the following permissions for user roles:

- **Manage Onboarding Infrastructure Wizard** - the user can use the Infrastructure Wizard

5.8.15.3 OVAs

OnApp administrators can control users' ability to manage OVAs. You can set the following OVA permissions for user roles:

- **Any action on OVAs** - the user can take all actions listed below on OVAs:
  - *Create a new OVA* - the user can add a new OVA to the cloud
  - *Destroy any OVA* - the user can delete any OVA (own, user, and public)
  - *Destroy own OVA* - the user can only delete own OVA
  - *Destroy user OVA* - the user can delete OVAs created by any user, but not public OVAs
  - *Make any OVA public* - the user can make any OVA available to all users in the cloud
  - *Make own OVA public* - the user can make available to all users only own OVAs
  - *Create and manage OVAs* - the user can create and edit/delete/view OVAs
  - *Manage public OVAs* - the user can manage public OVAs
  - *Create and manage user OVAs* - the user can view/create/edit/delete OVAs created by any user
  - *See all OVAs* - the user can see the list of all OVAs in the cloud
  - *See own OVAs* - the user can only view the OVAs created by themselves
  - *Read all public OVAs* - the user can see the list of all public OVAs
  - *See user OVAs* - the user can see the list of the OVAs created by any user in the cloud
  - *Unlock any OVA* - the user can unlock any OVA locked for the time period while it is being converted to make editing and deleting instantly available
  - *Update any OVA* - the user can edit any OVA in the cloud (change label, version, and other details, depending on the virtualization type)
  - *Update own OVA* - the user can only edit own OVA (change label, version, and other details, depending on the virtualization type)
  - *Update user OVA* - the user can edit the OVAs created by any user in the cloud (change label, version, and other details, depending on the virtualization type)
  - *Manage System Service Add-ons* - the user can assign to an OVA all the system service add-ons in the cloud
  - *Manage own System Service Add-ons* - the user can assign to an OVA only own system service add-ons

For details, refer to the OVAs section.
5.8.16 P

5.8.16.1 Payments
OnApp administrators control how users can manage payments. You can set the following payments permissions for user roles:

- **Any action on payments** - the user can take any action on payments
- **Create a new payment** - the user can create a new payment
- **Destroy any payment** - the user can delete any payment
- **See all payments** - the user can see all payments
- **See own user payments** - the user can only see their own user payments

Please note that if a user has **See own company/group payments** permission enabled but does not have a VMware integration, they will see all the payments in the cloud.

- **See own company/group payments** - the user can only see all the payments of their user group
- **Update any payment** - the user can edit any payment

For details, refer to the [User Payments] section.

5.8.16.2 Permissions
OnApp administrators control a user's ability to manage permissions. You can set the following permissions for user roles:

- **Any action on permissions** - the user can create, edit, view and delete permissions
- **Create a new permission** - the user can add new permissions
- **Destroy any permission** - the user can delete any permission within the cloud
- **See all permissions** - the user can see the list of all permissions in the cloud
- **Update any permission** - the user can edit any permission within the cloud

For details, refer to the [OnApp Permissions] section.

5.8.17 Q

5.8.18 R

5.8.18.1 Recipes
OnApp administrators control a user's ability to manage recipes. You can set the following permissions:

- **Any actions on Recipes** - the user can create, edit, view and delete all recipes
- **Create new Recipes** - the user can add a new recipes
- **Delete own Recipes** - the user can delete own recipes
- **Edit own Recipes** - the user can edit own recipes
- **Read own Recipes** - the user can read own recipes

For details, refer to the [Recipes] section.
5.8.18.2 Recipe Groups
OnApp administrators control a user’s ability to manage recipe groups. You can set the following recipe groups permissions for user roles:

- Any action on recipe groups - the user can create, edit, view and delete recipe groups
- Create a new recipe group – the user can create a new recipe group
- Destroy any recipe group - the user can delete any recipe group
- See all recipe groups – the user can view the list of recipe groups

For details, refer to the Recipe Groups section.

5.8.18.3 Recipe Group Relations
OnApp administrators control how users can manage recipe group relations. You can set the following recipe group relations permissions for user roles:

- Any action on recipe group relations - the user can add recipes to a group or child group and manage the structure in the groups
- Create a new recipe group relation - the user can add recipes to groups and create child groups
- Destroy any recipe group relation - the user can remove any recipe from a group
- See all recipe group relations - the user can view the list of recipe groups and their structure

For details, refer to the Recipe Groups section.

5.8.18.4 Recovery Points
OnApp administrators control how users can manage recovery points for virtual servers with the assigned backup resources. You can set the following permissions for user roles:

- Any action on recovery points - the user can take all actions listed below on recovery point
- Create any recovery point - the user can create a recovery point for any VS
- Create own recovery point - the user can create a recovery point for the VSs that are in their bucket
- See any recovery point - the user can see a recovery point for any VS
- See own recovery point - the user can see a recovery point for the VSs that are in their bucket
- See any recovery point size - the user can see a recovery point size for any VS
- See own recovery point size - the user can see a recovery point size for the VSs that are in their bucket
- Restore any recovery point - the user can restore any VS from a recovery point
- Restore own recovery point - the user can restore the VSs that are in their bucket from a recovery point

For details, refer to the Recovery Points section.

5.8.18.5 Relation Group Templates
OnApp administrators control how users can manage relation group templates. You can set the following relation group templates permissions for user roles:
Any action on relation group templates - the user can add templates to a group or child group and manage the structure in the groups

Create a new relation group template - the user can add all templates in the cloud to groups and create child groups

Create own relation group template - the user can add only their own templates to groups

Destroy any relation group template - the user can remove any template in the cloud from a group or child group

Destroy own relation group templates - the user can remove only their own template from a group or child group

See all relation group templates - the user can see all template groups and child groups

See own relation group templates - the user can see only their own template groups and child groups

Update price for relation group template - the user can update price for template groups

To establish full control over templates and template groups, refer to the corresponding sections on this page. For details, refer to the Template Store and My Template Groups sections.

5.8.18.6 Resource Diff
OnApp administrators control how users can manage resource differences. You can set the following resource differences permissions for user roles:

Any actions on resource diff - the user can view the changes which a resource has undergone (e.g. disk resize), both the old and the new value of the resource.

See any Resource Diff - the user can view the list of all resource differences in the cloud

See own Resource Diff - the user can view the changes to resources of only their objects

For details, refer to Sysadmin section.

5.8.18.7 Resource Limits
OnApp administrators control how users can manage resource limits. You can set the following resource limits permissions for user roles:

Any action on resource limit - the user can create, edit, view and delete resource limits

Create a new resource limit - the user can add new resource limits

Destroy any resource limit - the user can delete any resource limit

See all resource limits - the user can see the list of all resource limits in the cloud

See own resource limits - the user can only see their own resource limits

Update any resource limit - the user can edit resource limits for any user account in the cloud

For details, refer to Configure Resource Allocation and Prices section.

5.8.18.8 Restrictions Resources
OnApp administrators can control users’ ability to manage restrictions resources. You can set the following restrictions resources permissions for user roles:

Any actions on restrictions resources - the user can set restriction on any resource while configuring restriction sets

See all restrictions resources - the user can see the list of all restrictions resources while configuring restriction sets

For details, refer to the List of Restrictions Resources section.
5.8.18.9 Restrictions Sets
OnApp administrators can control users' ability to manage restrictions sets. You can set the following restrictions sets permissions for user roles:

- **Any action on restrictions sets** - the user can take any action on restrictions sets
- **Create a new restrictions set** - the user can create a new restrictions set
- **Delete restrictions set** - the user can delete any restrictions set
- **See all restrictions sets** - the user can see all restrictions sets
- **See own restrictions sets** - the user can see restrictions sets assigned to his role(s)
- **Update restrictions set** - the user can update any restrictions set

For details, refer to the Restrictions Sets section.

5.8.18.10 Roles
OnApp administrators control a user's ability to manage roles. You can set the following permissions:

- **Any action on Roles** - the user can create, edit, view and delete roles
- **Create a new Role** - the user can create a new role
- **Destroy any Role** - the user can delete any role
- **See all Roles** - the user can see all roles
- **See user's own roles** - the user can see only roles assigned to them

For details, refer to the Roles section.

5.8.19 S

5.8.19.1 SAML Identity Providers
OnApp administrators control a user's ability to manage identity providers. You can set the following SAML identity providers' management permissions for user roles:

- **Any action on SAML identity providers** - the user can perform any action on SAML Identity Providers
- **Create a SAML identity provider** - the user can add new Identity Provider
- **Destroy any SAML identity provider** - the user can delete any Identity Provider
- **See all SAML identity providers** - the user can see the list of all Identity Providers
- **Update any SAML identity provider** - the user can edit any SAML Identity Provider

For details, refer to the Manage Identity Providers section.

5.8.19.2 Schedule Logs
OnApp administrators control a user's ability to manage schedule logs. You can set the following permissions:

- **Any action on schedule logs** - the user can create, edit, view and delete schedule logs
- **Create a new schedule log** - the user can add new schedule logs
- **Destroy any schedule log** - the user can destroy any schedule log
- **See all schedule logs** - the user can see all schedule logs in the cloud
See own schedule logs - the user can only see their own schedule logs
Update any schedule log - the user can edit any schedule log in the cloud
For details, refer to the Schedules Settings section.

5.8.19.3 Schedules
OnApp administrators control users' ability to manage schedules. You can set the following schedule management permissions for user roles:

- Any action on schedules - the user can create, edit, view and delete schedules
- Create a new schedule - the user can add new schedules
- Destroy any schedule - the user can delete any schedule in the cloud
- Destroy own schedule - the user can only delete their own schedules
- See all schedules - the user can see all schedules
- See own schedules - the user can only see their own schedules
- Update any schedule - the user can edit any schedule
- Update own schedule - the user can only edit their own schedules
For details, refer to the Schedules Settings section.

5.8.19.4 SDN Managers
OnApp administrators control how users can manage SDN managers. You can set the following permission:

- Any action on SDN Managers - the user can create and manage SDN managers
For details, refer to the SDN Managers section.

5.8.19.5 SDN Networks
OnApp administrators control how users can manage SDN networks. You can set the following permissions:

- Any action on SDN Networks - the user can create and manage SDN networks
For details, refer to the SDN Networks section.

Service Add-ons
OnApp administrators control users' ability to manage service add-ons. You can set the following service add-on management permissions for user roles:

- Any actions on Service Add-ons - the user can view, create, edit and delete service add-ons
- Create new Service Add-ons - the user can add new service add-ons
- Delete Service Add-ons - the user can delete any service add-ons within the cloud
- Delete own Service Add-ons - the user can delete only their own service add-ons
- Edit any Service Add-on - the user can edit all service add-ons within the cloud: change label, description, icon, compatible OS, or make service add-on available in VS Creation wizard
- Edit own Service Add-ons - the user can edit only their own service add-ons
- Read all Service Add-ons - the user can view all service add-ons within the cloud
- Read own Service Add-ons - the user can view the list of only their own service add-ons
For details, refer to the Service Add-ons section.

5.8.19.6 Service Add-on Groups
OnApp administrators control users’ ability to manage service add-on groups. You can set the following service add-on group management permissions for user roles:

- **Any action on Service Add-on Groups** - the user can take all actions listed below on service add-on groups. *view, create, edit and delete* service add-on groups

Create a new Service Add-on group - the user can add new service add-on groups and add child service add-on groups

Destroy any Service Add-on group - the user can delete any service add-on group within the cloud

Destroy own Service Add-on group - the user can delete only their own service add-on groups

See all Service Add-on groups - the user can view the list of all service add-on groups within the cloud

Manage any Service Add-on group - the user can manage a Service Add-on group: edit a service add-on group, assign a particular service add-on to a service add-on group, remove service add-on from the service add-on group, edit service add-on price.

For details, refer to the Manage Service Add-on Store section.

5.8.19.7 Service Catalog
OnApp administrators control users’ ability to access the service catalog. You can set the following service catalog permission for user roles:

- **Any action related to service catalog** - user can take any action related to the service catalog

For details, refer to the Service Catalog section.

5.8.19.8 Service Insertion Groups
OnApp administrators control users’ ability to access the service insertion groups. You can set the following service insertion groups permissions for user roles:

- **Any action on Service Insertion Groups** - the user can create, edit, view and delete service insertion groups

Create new Service Insertion Group - the user can create a new service insertion group

Destroy any Service Insertion Group - the user can delete any service insertion group

For details, refer to the Service Insertion Framework Configuration section.

5.8.19.9 Service Insertion Pages
OnApp administrators control users’ ability to access the service insertion pages. You can set the following service insertion pages permissions for user roles:

- **Any action on Service Insertion Pages** - the user can create, edit, view and delete service insertion pages

Create new Service Insertion Page - the user can create a new service insertion page

Destroy any Service Insertion Page - the user can delete any service insertion page

For details, refer to the Service Insertion Framework Configuration section.
5.8.19.10 Sessions
OnApp administrators control a user's ability to drop sessions. You can set the following drop session permissions for user roles:

- **Any actions on sessions** - *the user can terminate a session because they can't get to a PC or have a bad connection*
- **Drop all the existing sessions** - *the user can drop all the existing sessions including their own*
- **Drop all the user sessions but the current** - *the user can delete all the sessions created under their account but their current*

For details, refer to the [View User Account Details](#) section.

5.8.19.11 Settings
OnApp administrators control a user's ability to manage settings. You can set the following permissions:

- **Any action on settings** - *the user can take all actions listed below on settings*
- **Manage SSL certificate** - *the user can upload and update SSL certificate located under config/ssl_certificates folder*
- **See read settings** - *the user can view general OnApp configuration*
- **Restart Dashboard Client** - *the user can Restart License Client* (necessary in such cases as changing license key)
- **Update Settings** - *the user can edit general OnApp configuration*
- **View OnApp version** - *the user can check which version of OnApp is installed*

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

5.8.19.12 Smart Servers
OnApp administrators control how users can manage smart servers. You can set the following smart servers permissions for user roles:

- **Add recipe to any Smart Server** - *the user can add recipes to any smart server within the cloud*
- **Add recipe to own Smart Server** - *the user can add recipes to their own smart servers only*
- **Remove recipe from any Smart Server** - *the user can remove a recipe from any smart server within the cloud*
- **Remove recipe from own Smart Server** - *the user can remove recipe from their own smart server*

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

5.8.19.13 SSH Keys
OnApp administrators control how users can manage SSH keys. You can set the following SSH keys permissions for user roles:

- **Add ssh keys for all the virtual servers** - *the user can add ssh keys for all the virtual servers. Enabling this permission means that the keys are configured in Settings > SSH keys and are added to all VSs in the cloud every time a user creates a new VS or runs Set SSH keys for his VS. Therefore, we recommend enabling this permission only for those users that might really need it, namely, administrators.*
**Add ssh keys for own virtual servers** - the user can only add ssh keys for own virtual servers. Enabling this permission means that the keys won't be added to Settings > SSH keys and will be added to the VSs that belong to this particular user only.

For details, refer to the Create and Manage User Accounts section.

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### 5.8.19.14 Sysadmin Tools

OnApp administrators control how users can manage sysadmin tools. You can set the following sysadmin tools permissions for user roles:

- **Any action Sysadmin Tools** - the user can take any action on the items in the Sysadmin Tools menu, including operating Background Task Daemon, running Availability Check, and see the list of Running Processes.

For details, refer to the Sysadmin section.

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### 5.8.20 Templates

OnApp administrators control how users can manage templates. You can set the following template sets permissions for user roles:

- **Any action on templates** - the user can take all actions listed below on all templates

See the list of available for installation templates - the user can see all templates available for the installation from the template server

Install template upgrades - the user can install upgrades to the system templates

See the list of template upgrades - the user can see the upgrades for the installed system templates

Create a new template - the user can add new templates

Destroy any template - the user can delete any template within the cloud

Destroy own template - the user can only delete their own templates

Destroy user template - the user can delete any user templates (created by backing up an existing virtual server, and converting that backup to a template)

See the list of inactive templates - the user can view the list of inactive templates

See list of active installations - the user can view the list of active template installations

Make any template public - the user can make any template public

Make own template public - the user can only make their own templates public

Make user template public - the user can make any user templates public (created by backing up an existing virtual server, and converting that backup to a template)

See user templates - the user can see all user templates (those created by backing up an existing virtual server, and converting that backup to a template)

Manage recipe for any template - the user can manage recipes for any template: assign recipes to a template and unassign it

Manage recipe for own templates - the user can manage recipes for own templates only: assign recipes to a template and unassign it

Restart failed installation - if template installation failed, the user can restart the installation

Update any template - the user can edit any template: change label, version, min disk size, etc
**Update own template** - the user can only edit their own templates: change label, version, min disk size, etc

**Update user template** - the user can edit user templates: change label, version, min disk size, etc

**Manage System Service Add-ons** - the user can assign to template any system service add-on in the cloud

**Manage own System Service Add-ons** - the user can assign to templates only own system service add-ons

- **Manage own templates** - the user can create and manage their own templates
- **See all public templates** - the user can see all public templates

For details, refer to the Templates section.

### 5.8.20.2 Template Groups

OnApp administrators can control users' ability to manage image template groups. You can set the following image template groups permissions for user roles:

- **Any action on template group** - the user can create, edit, view and delete all template groups.
- **Create a new template group** - the user can add a new template group to the Template Store
- **Create own template group** - the user can create his own template group in the My Template Groups menu
- **Delete any template group** - the user can delete a template group
- **Delete own template group** - the user can delete his own template group
- **See details of any template group** (image_template_groups.read) - the user can view template group details

For details, refer to the Template Store and My Template Groups sections.

### 5.8.20.3 Themes

OnApp administrators control a user's ability to manage themes. You can set the following themes permissions for user roles:

- **Any action on Themes** - the user can create, edit, view and delete themes.
- **Create Theme** - the user can add new themes
- **Destroy Theme** - the user can delete themes
- **Read Theme** - the user can view the list of all themes in the cloud
- **Update Theme** - the user can edit all themes in the cloud

For details, refer to the Look & Feel section.

### 5.8.20.4 Transactions

OnApp administrators control a user's ability to manage transactions. You can set the following transactions permissions for user roles:

- **Any action on transactions** - the user can take all actions listed below on transactions:
Cancel zombie transactions - the user can cancel transactions which run too long and are most likely failed

Cancel own zombie transactions - the user can cancel transactions which run too long and are most likely failed and were initiated by this user

Delete all transactions from log - the user can delete any transaction from log

Delete own transactions from logs - the user can only delete their own transactions from log

See details of own transaction - the user can only see details of their own transactions

See log output of all transactions - the user can see the Output section at the Logs Item Details page

For details, refer to the Virtual Server Transactions and Logs and Smart Server Transactions and Logs sections.

5.8.21 U

5.8.21.1 Users

OnApp administrators can control users’ ability to manage configuration. You can set the following users permissions for user roles:

Any action on users - the user can take all actions listed below on user accounts in the cloud:

Upload avatar - the user can upload an avatar for a User Profile

Change user password - the user can change the password for their user account and passwords of all users within the cloud

Change own password - the user can only change password

Create any user - the user can create a new user account

Destroy any user - the user can delete any user account

Destroy own user - the user can only delete their own user account

Allow user to send password reminder - the user can send password reminder for other users at user profile page

User can login as any user - the user can log in as any user

See all users - the user can see all user accounts

See all users prices - the user can see all users prices. By disabling this permission together with the See user outstanding amount and See user summary payments permissions, you can hide the payment screen on the dashboard.

See user backups/templates prices – the user can see the price for the number of backups taken and templates uploaded by the user during the chosen period on the compute resource

See user bucket – the user can see the details of their buckets

See user hourly prices – the user can see the price for VSSs, Load Balancers, and other resources charged for the previous hour

See user monthly prices – the user can see the price for VSSs, Load Balancers, and other resources charged for the previous month

See user outstanding amount – the user can see the total amount of money owned by this user since it has been created, for all resources, minus the amount of Payments.
See user summary payments – the user can see user’s summary payments.

See user total cost – the user can see users’ total cost

See user virtual server prices – the user can see the total due for all the VSs minus Backups/Templates Cost (if any) for the predefined period

See own users – the user can only see their own user account

Suspend and unsuspend users – the user can suspend/unsuspend any users

Unlock any user - the user can unlock any user within the cloud

Update any user – the user can edit any user account

Update own user – the user can only edit the user accounts they created: change name, bucket, role, etc.

Manage API key – the user can manage API keys for all users

Manage own API key – the user can only manage API keys for their own user account

Create API key via API - the user can generate an API key via API request

Update own Yubikey - the user can modify only their own Yubikey. If a user does not have this or the Update Yubikey permission enabled, they will not be able to manage YubiKeys in the user profile.

Update Yubikey - the user can modify all user Yubikeys. If a user does not have this or the Update own Yubikey permission enabled, they will not be able to manage YubiKeys in the user profile.

Disable TOTP authentication - the user can disable TOTP-based authentication for two factor authentication (2FA)

For details, refer to the Users Accounts page.

5.8.21.2 User Additional Fields

OnApp administrators control a user's ability to create user additional fields. You should edit user profile to add necessary info to this additional field. It is regulated by Update any user permission. You can set the following user additional fields permissions for user roles:

Any action on user additional fields - the user can create, edit, view and delete user additional fields,

Create user additional fields - the user can add new custom additional fields

Destroy any user additional fields - the user can delete any user additional fields

Read all user additional fields - the user can view all user additional fields in the user profile

Update all user additional fields - the user can edit all user additional fields

For details, refer to the Create and Manage User Accounts section.

5.8.21.3 User Groups

OnApp administrators control a user’s ability to manage user groups. You can set the following user groups permissions for user roles:

Any action on user groups - the user can create, edit, view and delete user groups

Create a new user group - the user can add a new user group
Destroy user group - the user can delete any user group within the cloud

See list of all user groups - the user can view only the list of all user groups created within the cloud, without the details

See details of any user group - the user can see details of any user group

Update any user group - the user can edit any user group within the cloud

For details, refer to the User Groups section.

5.8.22 V

Virtual Routers

OnApp administrators can control users' ability to manage virtual routers. You can set the following virtual routers permissions for user roles:

Any actions on Virtual Routers - the user can take all actions listed below on virtual routers:

Change an owner of any Virtual Router - the user can grant ownership of any virtual router in the cloud to another user

Convert any Virtual Server to Virtual Router - the user can convert any virtual server to virtual router

Convert own Virtual Server to Virtual Router - the user can convert own virtual server to virtual router

Delete any Virtual Router - the user can remove any virtual router from the cloud

Delete own Virtual Router - the user can remove only own virtual routers

Migrate any Virtual Router - the user can migrate any virtual router in the cloud

Migrate own Virtual Router - the user can migrate only their own virtual router

Any power action on Virtual Router - the user can take any power-related action on virtual router (e.g. reboot, suspend, shut down, start up, boot from ISO)

Any power action on own Virtual Router - the user can take any power-related action on own virtual router (e.g. reboot, suspend, shut down, start up, boot from ISO)

See any Virtual Router - the user can view the list of all virtual routers in the cloud

See own Virtual Routers - the user can view the list only of own virtual routers

Rebuild network on any Virtual Router - the user can rebuild network and assign IP nets on any virtual router

Rebuild network on own Virtual Routers - the user can rebuild network and assign IP nets only on own virtual routers

Change Suspended status for any Virtual Router - the user can change suspend and unsuspend any virtual router

Unlock any Virtual Router - the user can unlock XML config for any virtual router

For details, refer to the Virtual Routers section.

5.8.22.1 Virtual Servers

OnApp administrators can control users' ability to manage virtual servers. You can set the following virtual servers permissions for user roles:

Any action on virtual servers - the user can take all actions listed below on virtual servers:

Accelerate any Virtual Server - the user can accelerate any virtual server in the cloud

Accelerate own Virtual Servers - the user can accelerate only own virtual servers
Any action with admin note - the user can take any action with admin note

Edit advanced XML configuration for any VS - the user can manage advanced XML configuration for any virtual server in the cloud

Edit advanced XML configuration for own VS - the user can manage advanced XML configuration for their own virtual servers

Schedule autobackups on any virtual server - the user can schedule autobackups on any virtual server in the cloud

Schedule autobackups on own virtual servers - the user can schedule autobackups on their own virtual servers

Allow all virtual servers to boot from ISO - the user can boot from ISO any virtual server in the cloud

Allow own virtual servers to boot from ISO - the user can boot from ISO their own virtual servers only

Build/rebuild any virtual server - the user can build or rebuild any virtual server in the cloud

Build/rebuild user's own virtual server - the user can build or rebuild their own virtual servers only

Change an owner of any virtual server - the user can change the owner of any virtual server

Clone any Virtual Server - the user can clone any virtual server

Clone own Virtual Servers - the user can clone only their own virtual server

Console to any virtual server - the user can access any virtual server via console

Console to own virtual server - the user can only access their own virtual server via console

Allow user to set CPU topology - the user can set CPU typology options with virtual server

Create a new virtual server - the user can add new virtual servers

Destroy own virtual server - the user can only delete their own virtual servers. To delete a virtual server together with its backups, the user needs to have the Destroy own backup permission enabled. Otherwise, the backups of the VS deleted by the user will remain in the system.

Manage publications for all virtual servers - the user can manage publications for all virtual servers

Manage publications for own virtual servers - the user can manage publications only for their own virtual servers

See own virtual servers - the user can only view the details of their own virtual servers

Read Virtual Server's root password - the user can read virtual server's root password

Read own virtual server's root password - the user can read their own virtual server's root password

Rebuild network of any virtual server - the user can rebuild network on any virtual server

Rebuild network of own virtual server - the user can only rebuild network of own virtual server

Reset root password of own virtual server - the user can only reset the root password of their own virtual servers

Select resources manually on virtual server creation - the user can select resources manually on virtual server creation
Update own virtual server - the user can edit only their own virtual servers

Allow own virtual servers to boot from ISO - the user can boot from ISO their own virtual servers only

Schedule autoubacks on own virtual server - the user can schedule autoubacks on their own virtual server

Destroy any virtual server - the user can delete any virtual server

Destroy own virtual server - the user can delete only their own virtual server

Edit any network appliance config - the user can edit any network appliance config

Edit own network appliance config - the user can edit only their own appliance config

Edit any network appliance license - the user can edit any network appliance license

Edit own network appliance license - the user can edit only their own network appliance license

Infrastructure Mode - the user can use virtual server in Infrastructure Mode

Manage Virsh Console - the user can set manage Virsh Console

Migrate any virtual server - the user can migrate any virtual server

Migrate own virtual server - the user can only migrate their own virtual servers

Move any virtual server to another federated location - the user can move any virtual server to another federated location

Move own virtual server to another federated location - the user can move their own virtual server to another federated location

Any power action on virtual servers - the user can take any power-related action on virtual servers

Any power action on own virtual servers - the user can only take power-related actions on their own virtual servers

Allow to purge content of all Virtual Servers - the user can purge content of any virtual server

Allow to purge content of Own Virtual Servers - the user can purge content of their own virtual server

Read any virtual server - the user can read any virtual server

Read own virtual servers - the user can read their own virtual server

Read VIP status - the user can read VIP status of virtual server

Manage recipes joins for all virtual servers - the user can manage recipes joins for all virtual servers

Manage recipes joins for own virtual servers - the user can manage recipe joins for own virtual servers

Report a federation problem on any virtual server - the user can report a federation problem on any virtual server

Report a federation problem on user's own virtual server - the user can report a federation problem on their own virtual server

Reset root password to any virtual server - the user can reset root password for any virtual server

Reset root password to own virtual server - the user can reset root password for their own virtual server
Select instance package on virtual server creation - the user can select instance package on virtual server creation

Manage Service Add-ons for all virtual servers - the user can manage Service Add-ons for all virtual servers

Manage Service Add-ons for own virtual servers - the user can manage Service Add-ons for their own virtual servers

Set Max Memory - the user can set Max Memory

Set SSH keys - the user can set their own SSH key after virtual server is created

Set VIP status - the user can set/delete VIP status for virtual servers

Change suspended status for Virtual Server - the user can change suspended status for a virtual server

Allow insert/eject media for all virtual server - the user can insert/eject media for all virtual server

Allow insert/eject media for own virtual server - the user can insert/eject media for their own virtual server

Unlock any virtual server - the user can unlock any virtual server

Update all virtual server - the user can update all virtual servers

Update own virtual server - the user can update only their own virtual servers

Allow use virtual server as gateway - the user can use virtual server as a gateway for another virtual server

For details, refer to the Appliances section.

Virtual server snapshots

Create or restore own virtual server snapshot - the user can create/restore own snapshots

Destroy own virtual server snapshot - the user can delete own snapshots

See own virtual server snapshots - the user can see the list of own snapshots

5.8.22.2 Virtual Machine Statistics
OnApp administrators control user’s access to virtual server statistics. You can set the following statistics permissions for user roles:

See Virtual Machine Statistics – the user has full access to view CPU utilization, billing, network interface usage, disk IOPS and accelerated virtual servers

See all Virtual Machines Statistics – the user can see statistics of all virtual servers in the cloud

See own Virtual Machines Statistics – the user can only see statistics of their own virtual servers

For details, refer to the Virtual Server Statistics section.

5.8.22.3 Virtual Server's IP Addresses
OnApp administrators can control users’ ability to manage IP address joins. You can set the following IP address joins permissions for user roles:

All actions on virtual server's IP addresses - the user can take all the actions listed below on VS IP addresses:

Add IP address to any virtual server - the user can add an IP address to any virtual server
Add IP address to own virtual server - the user can only add IP addresses to their own virtual servers

Remove IP address from any virtual server - the user can remove IP addresses from any virtual servers

Remove IP address from own virtual server - the user can only remove IP addresses from their own virtual servers

See IP addresses assigned to any virtual server - the user can see IP addresses assigned to any virtual server

See IP addresses assigned to own virtual server - the user can see IP addresses assigned to their own virtual server

For details, refer to the Virtual Server IP Addresses section.

5.8.23 W

5.8.23.1 White IPs

OnApp administrators control a user's ability to manage white IPs. You can set the following white IPs permissions for user roles:

Manage all White IPs for users - the user can take all actions listed below on White IPs for users:
  Create white IP for all users - the user can add white IP address for any user within the cloud
  Create own white IP - the user can add a white IP address only for their own User Account
  Destroy white IP for all users - the user can destroy any white IP of any user in the cloud
  Destroy own white IPs - the user can only delete white IPs from their own User Account
  Read all white user IPs - the user can view the list of all white IPs in the cloud
  Read own white IPs - the user can view the list of white IPs added to their User Account
  Update white IP for all users - the user can edit all white IPs in the cloud
  Update own white IPs - the user can edit only white IPs in their User Account

For details, refer to the User Whitelist IPs section.

5.8.24 X

5.8.25 Y

5.8.26 Z

5.8.26.1 Zabbix Server

OnApp administrators can control users' ability to manage the Zabbix server. You can set the following Zabbix server permission for user roles:

Any action related to zabbix server - user can set up and manage Zabbix server

https://onappcloud.typeform.com/to/A64Euy#source=OnApp%20Permissions Leave feedback
5.9 Metrics

This section covers all items that can be managed via the Metrics tab of the Control Panel sidebar menu. Hover over a button to view a short explanation of a term. Click the button to get to the necessary page.

https://docs.onapp.com/adminguide/latest/identity-management/metrics/cloud-usage

Cloud Usage


Operator Dashboard


Usage Trends

https://onappcloud.typeform.com/to/A64Euy#source=Metrics

Leave feedback

5.9.1 Cloud Usage

To view the usage statistics of your cloud, go to your Control Panel > Metrics > Cloud Usage.

5.9.1.1 Usage statistics details

The Usage Statistics page lists each virtual server in your cloud, along with the following details:

Virtual Server - the label the virtual server

Owner - the username of the VS owner

CPU Used - the average CPU percentage that the VS has been using during the last 48 hours or during the period you specified

Disk r/w Completed

Disk reads completed - the number of read operations completed on the disk

Disk writes completed - the number of write operations completed on the disk

Disk r/w Data

Disk data read - the amount of data read from the disk

Disk data written - the amount of data written to the disk

Bandwidth

Bandwidth sent - the number of Kilobytes (KB) sent by the VS

Bandwidth received - the number of Kilobytes (KB) received by the VS

5.9.1.2 Sort statistics

To sort the statistics in the table, hover over the required column and click the label. The arrow that appears while hovering over the label shows the order (ascending/descending) in which the data is sorted. Click the label again to sort the data in a different order. You can also view details of a specific VS or its owner by clicking the corresponding links in the table.

5.9.1.3 Statistics period

By default, statistics are generated for the last 48 hours. To specify another period, set the Start and End time and click the Apply button.

When you specify hours for statistics generation, pay attention that statistics will be generated as follows:

For a period of time where hours are specified without minutes, e.g. 15.00-17.00, the statistics will be generated for the specified period of time and the preceding hour, that is from 14.00 up to 17.00.
For a period of time where hours are specified with minutes, e.g. 15.30-17.00, the statistics will be generated for the specified period of time, which is from 15.00 up to 17.00.

To generate the statistics for one month, select a period without the following month, for example from 01.04.2019 00:00 to 30.04.2019 23:59 but not to 01.05.2019 00:00.

5.9.1.4 Download statistics

To download a CSV file with statistics for a selected period of time, click the Save as CSV button. The download will start automatically after you click the button. In the downloaded file, the data in the data_sent, data_received, data_read, and data_written columns are displayed in GB.

See also:

Usage Trends
Virtual Servers
https://onappcloud.typeform.com/to/A64Euy#source=Cloud%20Usage

5.9.2 Edge Accelerator Operator Dashboard

If you want to track the amount of bandwidth used by accelerated websites, you can view bandwidth statistics in the Operator Dashboard menu. By default, statistics are generated for the last 24 hours. To specify another period, use the period filter at the top right corner of the page.

To see bandwidth statistics:

Go to your Control Panel > Metrics > Operator Dashboard menu.

Set the Start and End time and click the Apply button.

The Operator Dashboard page lists each accelerated website in your cloud, along with the following details:

Highest CDN Bandwidth - the highest total cached bandwidth (traffic served from CDN) served per day within the selected period

Highest Origin Bandwidth - the highest total uncached bandwidth (traffic served from the origin) served per day within the selected period

Total Website Count - the total number of active websites that are currently accelerated by the accelerator

See also:

Edge Accelerator Statistics
Usage Trends
Cloud Usage
Top IOPS disks
https://onappcloud.typeform.com/to/A64Euy#source=Edge%20Accelerator%20Operator%20Dashboard

5.9.3 Usage Trends

The charts at the User Trends page show the quick overview of your cloud infrastructure. Depending on the date range that you select, the charts will show hourly or daily statistics. For the 24 hours or less time period, the hourly statistics will be displayed. Otherwise, the charts will represent daily statistics.
Ensure that the See Global Statistic permission is on before viewing usage trends statistics. For more information about permissions refer to the OnApp Permissions section of this guide.

Below you can find how the details on usage trends statistics and its measurement.

5.9.3.1 View Usage Trends
To view Usage Trends of your cloud:

Go to your Control Panel > Metrics > User Trends.

Click the tab you are interested in (CPU usage, Memory usage, Disk usage, IOPS, Bandwidth, Virtual/baremetal/smart servers).

The chart with the statistics appears.

Period filter
By default, statistics are generated for the last three days. To specify another period, set the Start and End time and click the Apply button. Tick the Show in my Timezone box to show statistics according to your profile's time zone settings. You can zoom in a chart to view more detailed graphs.

Filtering by compute zone
It is possible to see the infrastructure statistics per compute zone as well as combination of the different zones. Statistics are shown in a form of area charts with highlighted color per each compute zone. On the side where the amount for each zone is shown, you can remove compute zones you do not wish to see by clicking on it. Selected compute zone will be grayed out and excluded from the graph. Also, the top 20 VSs are shown according to compute zone selection.

Top 20 VSs
Under the graphs you can find the list of top 20 VSs, which are shown for the compute zones selected in the filter, or for the whole cloud if nothing is filtered. Each VS is marked by color in accordance with compute zone color on the chart. Top 20 servers ordered by resource usage for the selected period are displayed together with their details:

<table>
<thead>
<tr>
<th>Details</th>
<th>CPU (cores)</th>
<th>Memory (MB)</th>
<th>Disk (GB)</th>
<th>IOPS (items)</th>
<th>Bandwidth (KB)</th>
<th>Virtual Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>VS operating system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label</td>
<td>the name of the server</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disk Size</td>
<td>disk size allocated to VS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAM</td>
<td>the RAM size available to VS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compute resource</td>
<td>compute resource on which VS is built</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User</td>
<td>username of the VS owner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Usage</td>
<td>the used amount of CPU cores for the last hour</td>
<td>the used amount of Memory for the last hour</td>
<td>the used amount of Disk for the last hour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td>average for the selected period is displayed. If the VS has not been existing for the whole period, the average for the actual (existing) period is displayed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

543
<table>
<thead>
<tr>
<th>Details</th>
<th>CPU (cores)</th>
<th>Memory (MB)</th>
<th>Disk (GB)</th>
<th>IOPS (items)</th>
<th>Bandwidth (KB)</th>
<th>Virtual Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Data</strong></td>
<td></td>
<td></td>
<td></td>
<td>the latest instant usage data that we have</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td></td>
<td></td>
<td></td>
<td>the total for the whole period is displayed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Created at</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>server creation time</td>
</tr>
</tbody>
</table>

5.9.3.2 Usage Trends Statistics Measurement
Below you can find what statistics is shown depending on the chosen time period.

<table>
<thead>
<tr>
<th>Chart</th>
<th>Hourly</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>shows the total amount of cores per hour (virtual)</td>
<td>shows the maximum amount of cores per day for the set time period (virtual)</td>
</tr>
<tr>
<td>Memory</td>
<td>shows the total amount of RAM per hour for all VSs in the cloud</td>
<td>shows the max amount of RAM per day for the set time period for all VSs in the cloud</td>
</tr>
<tr>
<td>Storage</td>
<td>shows the total of all disks’ capacities per hour for all VSs in the cloud</td>
<td>shows the maximum of all disks’ capacities per day for the set time period for all VSs in the cloud</td>
</tr>
<tr>
<td>IOPS</td>
<td>shows the total of data read/written for the entire cloud per hour</td>
<td>shows the total of data read/written for each day for the entire cloud for the time period set</td>
</tr>
</tbody>
</table>

IOPS is measured in amount, indicated by metric prefix. For example, 8M=8 millions, 2G=2 billions etc.

| Baremetal servers | shows the total amount of baremetal servers per hour | shows the amount of baremetal servers in the cloud for each day for the time period set |
| Smart Servers | shows the total amount of smart servers in the cloud per hour | shows the amount of smart servers in the cloud for each day for the time period set |
| VSs | shows the amount of VSs per hour | shows the amount of VSs per day for the time period set |
| Bandwidth | shows the total bytes sent/received for the entire cloud per hour | shows the total bytes sent/received for each day for the entire cloud for the time period set |

See also:
Cloud Usage
Operator Dashboard
https://onappcloud.typeform.com/to/A64Euy#source=Usage%20Trends Leave feedback

5.10 Drop Sessions
The Drop Session panel is used to terminate a session from an OSA-ICC. You can use this functionality if you need to terminate a session because you can't get to a PC or you have a bad
connection. If the auto-reconnect option was selected during the customization of your session, the option will automatically reconnect your session after you drop it.

To be able to use drop session functionality, you should have the following permissions enabled for your user role:

* Drop all the existing sessions
* Drop all the user sessions but the current

For details on permissions, refer to the Permissions section.

### 5.10.1 Drop All Sessions

To drop sessions:

Go to your [Control Panel](#) > [Admin](#) > [Users](#) menu.

On the [Users](#) tab, click the [Drop all sessions](#) button in the bottom left corner of your screen.

All sessions, including the active one, will be dropped.

### 5.10.2 Drop Own Sessions

To terminate own sessions:

Go to your [Control Panel](#) and click your name at the top right corner of the screen to get to your [User Profile](#).

On the screen that appears, click the [Drop Other Sessions](#) button.

All sessions, except the active one, will be dropped.

https://onappcloud.typeform.com/to/A64Euy#source=Drop%20Sessions

### 5.11 Notifications

The Control Panel's Notification menu lets you configure the notifications for your CP. You can select the events about which to notify your users. To configure notifications for your cloud you need to:

- **Enable notifications** for your cloud - the configured subscriptions will send notifications only if you enable this option.
- **Configure gateways** - select what type of notifications you want to send: SMTP/SENDMAIL emails or internal notifications in CP.
- **Add notification templates** - notification templates determine the text of the messages your users will receive.
- **Add custom events** - you can add custom events to send notifications when you require.
- **Create recipients lists** - recipients lists include users whom you want to address certain notifications.
- **Set up subscriptions** - a subscription ties all your configurations together. After you set up subscriptions your users will start receiving notifications.

After these configurations, you can:

- Check whether your [notification have been delivered](#) - you can check whether the sent notifications have been delivered successfully.
- View [internal notifications](#) in CP - you can view internal notification in your Control Panel.
You need to have messaging permissions enabled to configure notification for the cloud. For more information, refer to List of all OnApp Permissions.

You can manage the following elements of the notifications system:

- **Gateways** define what type of notifications will be send: SMTP/SENDMAIL emails or internal notifications in CP.
- **Notification templates** determine the text of the messages your users will receive.
- **External recipients** are the contacts not registered in OnApp whom notification can be sent.
- **Recipients lists** include users whom certain notifications will be addressed.
- **Subscriptions** tie all your configurations together. After you set up subscriptions your users will start receiving notifications.

You can also disable notifications for your cloud and delete for a period of time.

You need to have messaging permissions enabled to manage notifications. For more information, refer to OnApp Permissions.

### 5.11.1 Enable Notifications for Your Cloud

Firstly, you need to enable notifications for your cloud. You can do this in the **Configuration** section. All notification sections will be available in the Control Panel if notifications are disabled for the cloud, but no notifications will be sent.

To enable notifications for your cloud:

1. Go to your Control Panel > **Admin** > **Configuration** menu.
2. Move the **Enable notifications** slider to enable notifications. By default, this option is disabled.
3. Specify the number of unread notifications to show. It is set to 5 by default.
4. Specify the notification subject prefix. By default, this value is 'OnApp.'
5. Click the **Save Configuration** button. The transaction will be scheduled to enable notifications for your cloud.

### 5.11.2 View Internal Notifications in CP

Your **Notifications** are displayed as a bell near your Profile icon and contain the internal notifications received by your Control Panel. These notifications are configured at your Control Panel > **Admin** > **Notifications**. The notification count includes only unread notifications. You
can configure the amount of unread notifications at your Control Panel > Admin > Configuration menu. Each of the notifications is displayed with the following details:

**Topic** - the event about which the notification is sent

**Message** - the message of the notification. The message of an unread notification is displayed in bold. Click the message to view its full text. The notification will include the text generated by the alert and the text from the notification template.

**Date** - the time when the notification was delivered

### 5.11.3 Disable Notifications

If required, you can switch off notifications for your cloud. In this case all your configurations will be preserved, but notifications will not be sent to users. You can switch notifications back on at any time.

To enable/disable notifications for your cloud:

Go to your Control Panel > Admin > Configuration menu.

Move the Enable notifications slider to enable/disable notifications. By default, this option is disabled.

Click the Save Configuration button. The transaction will be scheduled to disable notifications for your cloud.

### 5.11.4 Delete Notification Data

You can delete notification data, including events, deliveries and notifications for a particular period of time. To delete all notification data, you need to run the following command from the onapp user:

```bash
cd /onapp/interface
RAILS_ENV=production rake messaging:clean_notification_elements[2016-09-20,2016-09-23]
```

Change the dates in the example above to the ones you require and separate them by comma. The notification data is deleted for the period from the first date up to and including the second date you specify.

If the deletion of notification data fails, you can run the following command:
cd /onapp/interface
RAILS_ENV=production rake messaging:fix_events_data

After running this command, you can repeat the previous step to delete notification data.

5.11.5 Troubleshooting

If you see the following warning: "Replace the default system notification settings with actual data," this means that the notification settings have not been configured for your cloud and are still default.

To change these settings:

Go to your Control Panel > Admin > Settings menu.

Click the **Configuration** icon.

On the page that appears, click the **Systems** tab and under **Miscellaneous**, change the following parameters:

* **Support help email** - the email to which requests are sent from the Help form at Control Panel
* **System host** - enter a server IP or URL. Email alerts link to transaction logs for alert events, and those logs are opened from the server configured here.

See also:
- OnApp Configuration
- Logs
- Sysadmin
- Alerts
- https://onappcloud.typeform.com/to/A64Euy

5.11.6 Events

The **Events** page shows the events which occurred in the cloud and which users were notified. To view the list of events go to your Control Panel > Admin > Events menu. The page that loads shows the list of events which have occurred in the system with their details:

* **Date** - the time and date when the event occurred
* **Event Type** - the type of the event
* **Data** - the text of the notification that was sent about the event

OnApp currently offers two event types: system and custom. To view the list of system event types, that cannot be edited or deleted, go to your Control Panel > Admin > Event Types > System Event Types tab. The page that loads shows the list of system event types registered in system with their details:

* **ID** - the ID of the event
* **Event type** - the type of the event

If required you can add a custom event type which can later be selected when setting up a subscription.

5.11.6.1 Add Custom Event Type

To add a custom event type:

Go to your Control Panel > Admin > Event Types > Custom Event types tab.
Click the Create New Event Type button.

On the page that loads, enter the name and description of your custom event type.

Click Submit to save the new event type.

5.11.6.1.1 Trigger Custom Events

If required, you can trigger the event from the list of custom events manually. When you trigger a custom event type, a new popup window appears where you can enter the text of the message to be passed into the notification template. Triggered custom events are displayed in the Events section together with the system events that have occurred in the cloud.

To trigger a custom event:

Go to your Control Panel > Admin > Event Types > Custom Event types tab.

Click the Actions button next to the event type you want to trigger and select Trigger.

Enter a text which will be included into your notification.

Click Trigger to send the notifications.

To edit or delete a custom event type, click the Actions button next to the necessary event and select the corresponding option from the drop-down list.

https://onappcloud.typeform.com/to/A64Euy#source=Events

5.11.7 Recipients

Recipients lists determine to whom of your users notifications will be sent. If required, you can add different recipients lists for different events. One recipients list can be used in multiple subscriptions and you can create multiple recipients lists, as well. If you want to send notifications to emails that are not registered in your OnApp cloud, you need to add such contacts as external recipients. Recipients lists can include both OnApp users and external recipients.

5.11.7.1 Create Recipients

5.11.7.1.1 External Recipients

If you want to send notifications to emails that are not registered in your OnApp cloud you can add them to your External Recipients. Later these contacts can be added to recipients lists of users who will receive notifications about certain events.

To view the list of external recipients go to your Control Panel > Admin > External Recipients menu. The page that loads shows the added external contacts with their name and email.

To add a new external recipient:

Go to your Control Panel > Admin > External Recipients menu.

Click the New External Recipient button or .

On the page that loads, enter a name for recipient and their email address. The name of the recipient should not contain any special characters.

Click Submit to save the recipient.

5.11.7.1.2 Recipients Lists

The Recipients Lists section lets you create lists of users whom you want to notify about certain events. Recipients lists are used when setting up a subscription to select whom of the users to notify about which events in the cloud.
To view your recipients lists go to your Control Panel > Admin > Recipients Lists menu. The page that loads shows all your recipients lists.

Click the label of the recipient list to view its list of users with their emails.

To add a new recipients list:
Go to your Control Panel > Admin > Recipients Lists menu.

Click the **New Recipients List** button or +.

On the page that loads fill in the name and select the recipients from the drop-down list (external recipients will also appear on the list).

The name of the list should not contain any special characters.

Click **Create** to save the new recipients list.

---

### 5.11.7.2 Manage External Recipients

If you want to send notifications to emails that are not registered in your OnApp cloud you can add them to your External Recipients. Later these contacts can be added to recipients lists of users who will receive notifications about certain events.

To view the list of external recipients go to your Control Panel > Admin > External Recipients menu. The page that loads shows the added external contacts with their name and email.

#### 5.11.7.2.1 Edit External Recipients

To edit an external recipient:

Go to your Control Panel > Admin > External Recipients menu.

Click the **Actions** button next to the recipient you want to edit and select **Edit**.

On the page that loads, edit the recipient's name and email. The name of the recipient should not contain any special characters.

Click **Submit** to save changes.

#### 5.11.7.2.2 Delete External Recipients

To delete an external recipient:

Go to your Control Panel > Admin > External Recipients menu.

Click the **Actions** button next to the recipient you want to edit and select **Delete**. If you are attempting to delete an external recipient who is included into a recipients list, a confirmation window will appear.

---

### 5.11.7.3 Manage Recipients Lists

Recipients lists include the users whom you want to notify about certain events. To view your recipients lists go to your Control Panel > Admin > Recipients Lists menu. The page that loads shows all your recipients lists.

Click the name of the recipient list to view its list of users with their emails.

#### 5.11.7.3.1 Edit Recipients List

To edit a recipients list:

Go to your Control Panel > Admin > Recipients Lists menu.

Click the **Actions** button next to the list you want to edit and select **Edit**. Or just click the name of the required list.

On the page that loads, you can change the name of the list and add new recipients. The name of the list should not contain any special characters. External recipients will also appear in the
drop-down list. The page also shows the recipients that are already in the list at the top of the screen. You can delete recipients from the list by clicking next to the required recipient.

Click Update to save the changes.

5.11.7.3.2 Delete Recipients List

To delete a recipients list:

Go to your Control Panel > Admin > Recipients Lists menu.

Click the Actions button next to the list you want to edit and select Delete.

A recipients list that is associated with at least one subscription cannot be deleted.

https://onappcloud.typeform.com/to/A64Euy#source=Recipients

Leave feedback

5.11.8 Notification Templates

The Notification Templates section lets you create message texts that will be sent to your users via email or internal notifications in CP. Notification templates are used when setting up a subscription for your users. There are two types of notification templates: system templates that come pre-installed with OnApp and cannot be deleted but only edited, and custom templates which you add to your cloud.

To view your notification templates go to your Control Panel > Admin > Notification Templates menu. The page that loads shows your notification templates with their labels, indicators whether this is a system or a custom template and the template's text. If a template contains a long message, only the beginning of the text will be displayed.

5.11.8.1 Add Notification Templates

To add a new notification template:

Go to your Control Panel > Admin > Notification Templates menu.

Click the New notification template button lower right or upper right.

On the page that loads, fill in the label and the text of the template. The label of the template should not contain any special characters. The text of the template is the message which your users will receive.

Click the Submit button to add the notification template.

If you add a '%{message}' text to the template, the notification will contain the full text of the event that is written into logs. If you add a '%{name}' text to the template, the notification will contain the name of the user who will receive the notification. You can set %{message} and %{name} placeholders for almost any type of event, however, the following events will have the different placeholders available:

- **federation new announcement** - {label} and {period_for_federation_announcement} placeholders.
- **federation templates changed** - {label} placeholder.

For custom events you can only set the %{message} and %{name} placeholders.

5.11.8.2 Manage Notification Templates

Notification templates include message texts that will be sent to your users via email or internal notifications in CP. There are two types of notification templates: system templates that come pre-installed with OnApp and cannot be deleted but only edited, and custom templates which you add to your cloud. To view your notification templates go to your Control Panel > Admin
> Notification Templates menu. The page that loads shows your notification templates with their names, indicators whether this is a system or a custom template and the template’s text. If a template contains a long message, only the beginning of the text will be displayed.

5.11.8.2.1 Edit Notification Template
To edit a notification template:

Go to your Control Panel > Admin > Notification Templates menu.

Click the Actions button next to the required template and select Edit.

On the page that loads, you can edit the name and the text of the template. The name of the template should not contain any special characters. After editing the text you can save the changes or restore it to the default.

When editing a system template, you can configure if HTTP or HTTPS should used in the links sent in the notifications.

Click Submit for the changes to take effect.

To edit system notification templates you need to have the the Update notification template permission enabled. You can also restore the message of a system template to default at your Control Panel > Admin > Notification Templates > Actions button > Restore to default.

If you add a '%{message}' text to the template, the notification will contain the full text of the event that is written into logs. If you add a '%{name}' text to the template, the notification will contain the name of the user who will receive the notification. You can set the %{message} and %{name} placeholders for almost any type of event, however, the following events will have the different placeholders available:

federation new announcement - {label} and {period_for_federation_announcement} placeholders.

federation templates changed - {label} placeholder.

For custom events you can only set the %{message} and %{name} placeholders.

5.11.8.2.2 Delete Notification Template
To delete a notification template:

Go to your Control Panel > Admin > Notification Templates menu.

Click the Actions button next to the required template and select Delete.

A notification template that is associated with at least one subscription cannot be deleted. System notification templates for the reset password, account lock and transaction approval cannot be deleted.

https://onappcloud.typeform.com/to/A64Euy#source=Notification%20Templates Leave feedback

5.11.9 Subscriptions

Using the Subscriptions section you determine who of your users are notified about which events. A subscription is the final step of a notifications configuration which ties together a recipients list, a gateway and a notification template.

To view the list of subscriptions go to your Control Panel > Admin > Subscriptions menu. The page that loads shows your subscriptions with the following details:

Name - the label of the subscription.

Event Type - the event type with which the subscription is associated.

Template - the subscription's notification template. Click the template to view its details.
Gateways - the name of the gateway and the means by which the notifications will be sent. Click the gateway to view its details.

Recipients Lists - the subscription's recipients list. Click the label of the recipients list to view the list of users in it and their emails.

5.11.9.1 Set up Subscriptions

5.11.9.1.1 Create New Subscription

To add a new subscription:

Go to your Control Panel > Admin > Subscriptions menu.

Click the New Subscription button or .

On the page that loads, fill in the following details:

Name - the label for the subscription

Recipients list - select from the drop-down menu the list of recipients to whom the notifications will be sent. You can use one recipients list for several subscriptions

Gateways - select from the drop-down list the gateway for the subscription. The gateway determines whether notifications will be send via email or internal notifications in CP. You can use one gateway for several subscriptions.

Click to add an event.

In the new popup windows that appears fill in the following details:

Event - select from the drop-down list the event about which the notifications will be sent. Every time the event takes place a notification will be sent to users from the recipients list you select

Notification template - select from the drop-down list the event and the notifications template for the subscription. You can use one notification template for several subscriptions

You can create multiple events for the custom events which are non-deletable but open to editing. These custom events include reset password instructions, unlock instructions, set password instructions, and confirmation instructions.

Click the Add button.

Click Submit to add the subscription.

You can set up notifications for the following events:
All compute resources status - all compute resources in a compute zone have changed their statuses to Online/Offline/Inactive

Auto healing failed diagnostics - the disk automatic repair failed due to some errors detected

Auto healing processing disk repair - the disk automatic repair has been initiated

Can't schedule transaction - a transaction could not be scheduled in the cloud

Auto backup failed - the backup creation limit has been reached

Daemon notification - the status of the OnApp engine has changed to Active/Up/Inactive

Daily storage health report - the daily storage health report will be sent in the notification

Failed task - a task failed in the cloud

Failover compute resource - deprecated option, it will be removed in the next version

Failover process - failover process has been initiated

Federation new announcement - a new notification that will be sent to all the buyers who are subscribed to the selected zone

Federation templates changed - the templates have undergone some changes. These changes may include adding a new template, changing the limits of the existing template or deleting one

Generate hourly stats failed - hourly statistics failed to be generated

Hourly storage health report - the hourly storage health report will be sent in the notification

Compute resource missing CPU flags - a compute resource without CPU flags has been detected in the cloud

Compute resource status - one of the compute resources in the cloud has changed its status to Online/Offline/Inactive

Compute resource group responsive - an unresponsive compute zone has been detected in the cloud

Maintenance mode - the Control Panel has been switched to maintenance mode

Reclaim baremetal compute resource - a baremetal server has been deleted. It has been removed from the DB, but it may remain working. To fully remove the baremetal server it might be required to reboot the compute resource on which it was running.

Service addon event - an event with custom message, which is used during creation of service add-on ‘Raise event’ action

System resources - a hardware resource of the CP server is exhausted

Processes status - deprecated option, it will be removed in the next version

Wrong activated logical volumes - the system has detected VSs’ disks that are either activated on the wrong compute resource or on two compute resources simultaneously

Custom event - this is your custom event configured at your Control Panel -> Event Types > Custom Event types tab

Internal server error - an internal server error occurred in the system

Pending approval - a transaction that requires approval has been requested

Approved - a transaction that requires approval has been approved

Declined - a transaction that requires approval has been declined

5.11.9.2 Manage Subscriptions
Using the Subscriptions section you determine who of your users are notified about which events. A subscription is the final step of a notifications configuration which ties together a recipients list, a gateway and a notification template. To view the list of subscriptions go to your Control Panel > Admin > Subscriptions menu.
Click the name of the subscription to view the gateways, recipients lists, events and templates associated with it.

5.11.9.2.1 Edit Subscriptions
To edit a subscription:
Go to your Control Panel > Admin > Subscriptions menu.
Click the name of the subscription you want to edit.
Click the Edit Subscription button.
On the page that loads, you can change the name of the subscription and add new recipients lists, events and gateways. You can add events by clicking the + button and delete events from the list by clicking the – icon next to the required event.
Click Update to save changes.

5.11.9.2.2 Delete Subscriptions
Subscriptions determine who of your users are notified about which events and the type of the notification: email or internal notification in CP.
To delete a subscription:
Go to your Control Panel > Admin > Subscriptions menu.
Click the Actions icon next to the required subscription and select Delete.

https://onappcloud.typeform.com/to/A64Euy#source=Subscriptions Leave feedback

5.11.10 Gateways
The Gateways section lets you create gateways for your notification system. Gateways are used when setting up a subscription and determine in what way users will be contacted: via email or internal notifications in CP. You can create multiple gateways to verify without any limitation.
To view your gateways:
Go to your Control Panel > Admin > Gateways menu.
The following page shows your gateways with their names and the types:
SMTP
SENDMAIL
INTERNAL

5.11.10.1 Configure Gateways
To add a new gateway:
Go to your Control Panel > Admin > Gateways menu.
Click the New gateway or + button.
On the page that appears, select the delivery method for the gateway:
SMTP or SENDMAIL for email notifications
INTERNAL for internal notifications in the CP
Click Select to proceed to the next gateway creation step.
Depending on the selected delivery method, fill in the following details:

For the Transaction Approvals functionality, you need to add a SENDMAIL gateway with the System SENDMAIL Gateway label or/and an SMTP gateway with the System SMTP Gateway label.
For the SENDMAIL delivery method:

Name - the name for your new gateway. The name of the gateway should not contain any special characters

Primary - move the slider to the right to mark current gateway as primary to be used to receive the notifications on set/reset/forgot password/unlock a user. The previous primary gateway will be unmarked

From - the email address from which emails will be sent

Host - the server IP or hostname

For the INTERNAL delivery method:

Name - the name for your new gateway. The name of the gateway should not contain any special characters

For the SMTP delivery method:

Name - the name for your new gateway. The name of the gateway should not contain any special characters

Primary - move the slider to the right to mark current gateway as primary to be used to receive the notifications on set/reset/forgot password/unlock a user. The previous primary gateway will be unmarked

**SMTP authentication mechanism**

<table>
<thead>
<tr>
<th>SMTP authentication mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>After the client has sent the <em>plain</em> command to the server, the server responds with a reply code. Then the username and password are sent from the client to the server. The username and password are combined to one string and encoded.</td>
</tr>
<tr>
<td>After that the <em>login</em> command has been sent to the server, the server asks for username and password by sending encoded text to the client.</td>
</tr>
<tr>
<td><em>(cram_md5)</em> combines a challenge-response authentication mechanism to exchange information and a cryptographic Message Digest 5 algorithm to encrypt important information.</td>
</tr>
</tbody>
</table>

SMTP password - password to login into SMTP server

From - the email address from which emails will be sent

Host - the OnApp Control Panel server IP or hostname

SMTP address - hostname or IP of the SMTP server

SMTP port - port of the SMTP server

SMTP domain - the SMTP server associated domain

SMTP enable starttls auto - enable the StartTLS extension

Verify certificate (if tls enabled) - select the checkbox to verify the certificate

Click Save to finish the creation process.
5.11.10.2 Manage Gateways
Gateways are used when setting up a subscription and determine in what way users will be contacted: via email or internal notifications in CP.

To view your gateways:

Go to your Control Panel > Admin > Gateways menu.

The following page shows your gateways with their names and the types:

SMTP
SENDMAIL
INTERNAL

5.11.10.2.1 Edit Gateway
To edit a gateway:

Go to your Control Panel > Admin > Gateways menu.

Click the Actions button next to the required gateway and select Edit.

Depending on the gateway’s delivery method, edit the following details:

For the SENDMAIL delivery method:

Name - the name for your new gateway. The name of the gateway should not contain any special characters

From - the email address from which emails will be sent

Host - the server IP or hostname

For the INTERNAL delivery method:

Name - the name for your new gateway. The name of the gateway should not contain any special characters

For the SMTP delivery method:

Name - the name for your new gateway. The name of the gateway should not contain any special characters
Primary - move the slider to the right to mark current gateway as primary to be used to receive the notifications on set/reset/forgot password/unlock a user. The previous primary gateway will be unmarked
Enable SMTP identification - move the slider to enable SMTP identification
SMTP password - password to login into SMTP server
From - the email address from which emails will be sent
Host - the OnApp Control Panel server IP or hostname
SMTP address - hostname or IP of the SMTP server
SMTP port - port of the SMTP server
SMTP domain - the SMTP server associated domain
SMTP enable starttls auto - enable the STARTTLS extension
Verify certificate (if tls enabled) - select the checkbox to verify the certificate
Click Save to apply the changes.

5.11.10.2.2 Delete Gateway
To delete a gateway:
Go to your Control Panel > Admin > Gateways menu.
Click the Actions button next to the gateway you want to delete and select Delete.
A gateway that is associated with at least one subscription cannot be deleted.

https://onappcloud.typeform.com/to/A64Euy#source=Gateways Leave feedback

5.11.11 Deliveries
The Deliveries section shows all the notification deliveries in your cloud. If a subscription has a recipient list which contains multiple users, a separate delivery will be displayed for each of the recipients of the notification.

5.11.11.1 Check Notifications Delivery
At your Control Panel > Admin > Deliveries menu, you can see the deliveries in your system with the following details:
Status - whether the notification was delivered. This status can indicate that the delivery is Complete, Running or Failed.
ID - the ID of the delivery
Subscription Name - the subscription within which this delivery was initiated. Click the label of the subscription to view its details.
Recipient - the user to whom the notification is to be delivered
Destination - the destination to which the notification was delivered: SMTP or SENDMAIL for email notifications and INTERNAL for notifications in CP
Date - the time when the notification was sent

5.11.11.2 Delete Notification Data
You can delete notification data, including events, deliveries and notifications for a particular period of time. To delete all notification data, you need to run the following command from the onapp user:
OnApp Cloud 6.7 Admin Guide

cd /onapp/interface
RAILS_ENV=production rake messaging:clean_notification_elements[2016-09-20,2016-09-23]

Change the dates in the example above to the ones you require and separate them by comma. The notification data is deleted for the period from the first date up to and including the second date you specify.

If the deletion of notification data fails, you can run the following command:

```
cd /onapp/interface
RAILS_ENV=production rake messaging:fix_events_data
```

After running this command, you can repeat the previous step to delete notification data.

https://onappcloud.typeform.com/to/A64Euy#source=Deliveries

5.12 Tools

OnApp provides a number of tools to help you monitor and manage your OnApp system: Logs, Cloud Usage Statistics, and Alerts. To access them, click the corresponding links under the main Tools menu item in the Control Panel > Admin.

```
<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>LAST 24 HOURS</th>
<th>LAST 7 DAYS</th>
<th>LAST 30 DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>105.106 GB</td>
<td>393.035 GB</td>
<td>6.145 GB</td>
</tr>
<tr>
<td>Memory</td>
<td>96.105 GB</td>
<td>363.035 GB</td>
<td>6.145 GB</td>
</tr>
<tr>
<td>Storage</td>
<td>96 GB</td>
<td>16.541 TB</td>
<td>1.2 TB</td>
</tr>
</tbody>
</table>
```

https://onappcloud.typeform.com/to/A64Euy#source=Tools

5.12.1 Logs

OnApp logs all cloud management actions that take place on cloud resources, including virtual servers, disks, data stores, compute resources, templates, networks.

5.12.1.1 View and Manage Logs

To access and manage logs, go to your Control Panel > Admin > Logs menu, where you can view the log of all transactions in the cloud. The Activity Log table provides the following details:

- **Icon** - indicates the status of an action
- **Ref** - number that you can click to view details of a specific transaction
- **Date** - time when the action was performed
- **Action** - name of the transaction
**Target** - cloud resource with an identification number that you can click to view its details

You can view details on target cloud resources that are displayed in bold, indicating that they are available in the cloud. You cannot view details on resources that are unavailable, for example, resources that failed to be created.

**Dependent** - action's ref number that you can click to view its details

At the Logs page, you can click:

- **Hide Successful Market Notifications** to remove from the list actions that were performed successfully. Click this button again to show the full list.
- **Complete, Running, Failed or Cancelled** to filter logs by their status
- **Failover Processes** to view the list of failover logs. See [Failover Processes](#) section for details.
- **Clean Logs** to clear the logs completely
- **Cancel All Pending Tasks** to cancel all tasks scheduled for completion
- **Cancel All Pending Backups** to remove all pending backups

To search for a specific transaction, you can use the search box at the top.

You can cancel a *TakeBackup* transaction, which is running longer and exceeding the time set for a zombie transaction, for *virtual servers*, *application servers*, and *smart servers*.

You can also relegate "pending" transactions to the failed status. To do so, hover over the pending status icon of a transaction > click the cross sign that pops up. This option becomes available if the transaction has been pending for the period of time specified in the *Settings > Admin > Configuration > Zombie* transaction time parameter.

You can see transaction logs updated in real time. This is achieved by means of tail -f Unix command, which causes tail to not stop when the end of file is reached but rather to wait for additional data to be appended to the output.

To enhance readability, the following log items are pointed out with color and font size:
- Remote Server
- Fatal
- Executing Rollback

### 5.12.1.2 Change Tracking

To view changes that have been made during a transaction, you need to have the appropriate *Resource Diff permissions* enabled.
If the size of certain resources is changed, the logs will contain the information about both current and previous size of the resource. Change tracking is available for the following transactions:

*Resize Disk* - changes of the disk size
*ResizeVirtualServer* - changes to a VS's number of CPU cores, priority value and RAM size
*ResizeApplicationServer* - changes to an application server's number of CPU cores, priority value and RAM size
*ResizeVirtualServerwithoutreboot* - changes to a VS's number of CPU cores, priority value and RAM size performed without a reboot
*ResizeApplicationServerwithoutreboot* - changes to an application server's number of CPU cores, priority value and RAM size performed without a reboot
*UpdateResourcePool* - changes to the resource pool's resources
*EditFirewallRule* - changes to the firewalls
*EditNATRule* - changes to the NAT rules
*EditIPSECVPNRule* - changes to the IPSECVPN rules
*HotMigrate* - changes to the ID, label, and IP address of the source/destination compute resource when the VS is online
*ColdMigrate* - changes to the ID, label, and IP address of the source/destination compute resource when the VS is offline

To view resource changes in these transactions:

- for all resources in the cloud: go to the Activity Log section of the Control Panel page or go to your Control Panel > Admin > Logs > Ref number
- for a virtual server's resources: go to your Control Panel > Cloud > Virtual Servers > Label > Activity Log > Ref number

At the beginning of the page that loads you will see a table with the list of resources with their values before and after the transaction. If you have the Approvals permissions enabled, you will see the Approve and Decline buttons at the bottom of the screen in case the transaction is pending for approval. For more information refer to Transaction Approvals.

5.12.1.3 Failover Processes
Failover processes show the list of failover logs that take place on the Compute zones in the cloud.

To view the list of failover processes:

- Go to your Control Panel > Admin > Logs menu.
- Click the Failover Processes button. On the page that appears, you can see the following information for each failover log:

  - Failover number
  - Indication of the time when it started
  - Compute zone on which the failover happened
  - Time of the last iteration
  - Failover action status: active or completed
To view the failover transaction details, click its reference number. For more information on failover, refer to Failover Configuration section of this guide.

See Also:
List of all OnApp Permissions
Virtual Servers
Tools
https://onappcloud.typeform.com/to/A64Euy#source=Logs

5.12.2 Sysadmin

The Sysadmin page provides statistics and tools for a number of system administration tasks. These tools are divided into the following tabs:

Sysadmin Tools
Services
Application Errors
Activity Logs
Zabbix Setup
Control Panel Maintenance
IP Usage Report
Resource Diffs

5.12.2.1 Sysadmin Tools
Background Task Daemon

Daemon is responsible for executing all background tasks such as:
Transactions
Backup takers
Billing stats updater
Cluster monitor
Compute resource monitor
Schedule runner

To operate the daemon, use the following buttons:

Reload daemon – restarts the tasks, and completes all running tasks if their PIDs still exist
Stop daemon - completes any backups in progress, but prevents any more backups from starting; stops all tasks in progress
Start daemon - starts up all the tasks
Check status – shows PID of the task and its status
To get details on daemon processes activity, run the Track Daemon Process Activity tool.

**Availability Check**

Availability check enables to see the status of OnApp Services Monitoring Tool and perform the following functions:
- Reload the OnApp Services Monitoring Tool
- Disable the OnApp Services Monitoring Tool
- Enable the OnApp Services Monitoring Tool
- Check status the OnApp Services Monitoring Tool

**CDN API**

CDN API checks API for accessibility and an allocated CdnCloudRef.

**CDN Sync Runner**

CDN Sync Runner checks CDN for accessibility, as well as for errors and warnings.

**Running Processes**

This section displays the list of the running system processes:
- **Generate hourly stats** - last time hourly statistics was aggregated.
- **Clean Redundant Instant Stat** - last time redundant statistics was deleted.
- **CDN Sync Runner** - last time synchronization between CDN and OnApp was performed.
- **SNMP stats runner** - last time SNMP statistics was gathered from the compute resources and virtual servers running in the cloud.

There are three levels of an SNMP statistics gathering:
- **Level 1** - every 10 seconds. CP gets info about Compute resources uptime/virtual servers’ statuses.
- **Level 2** - every 60 seconds. CP gets info about the disk usage, network usage, CPU usage statistics and the list of virtual servers.
- **Level 3** every 120 seconds. CP gets list of volume groups and logical volumes.

The level values can be changed in the onapp.yml file. For details, see Advanced Configuration Settings section.

- **VMware stats** - last time VMware statistics was gathered from the vCenter.

There are two levels of VMware statistics gathering:
- **Level 1** - every 60 seconds.
- **Level 2** - every 180 seconds.

For details, see Advanced Configuration Settings section.

- **Delete old stats** - last time when the old SNMP has been deleted.
- **Last time started** - the last time when the transaction started.
- **Last time finished** - the last time when the transaction finished successfully. When the transaction has failed, the last time finished field will display the time of the last successful transaction, thus indicating the failure.
Running processes time is always displayed in UTC format.

Solidfire Stats Level 1 - last time the statistics on disks situated on SolidFire data stores was gathered. This statistic is gathered every 2 minutes.

5.12.2.2 Services
This tab shows the statuses of all the services for High Availability clusters. Click the Services Status button to load the page with the list of services, their PID number, and the online/offline status.

5.12.2.3 Application Errors
This tab provides the list of errors registered in your Control Panel. The OnApp error collector records the errors within a CP and aggregates an error list. After that, your Control Panel may send crash reports to OnApp in a form of an encrypted API call. You can enable sending of the error list using your Control Panel > Admin > Settings > Configuration > System tab.

Errors are displayed with the following details:

- **id** - the ID of the error
- **Class** - the class of the error
- **Last detected** - the last time the error was detected
- **Quantity** - how many times the error has occurred
- **Reported** - whether the error has been reported or not

Click the class of the error to view its details. This information will be sent to OnApp if you allow your CP to send crash reports:

- **Class** - the class of the error
- **Last detected** - the last time the error was detected
- **Quantity** - how many times the error has occurred
- **Message** - the message that will be sent with this error
- **Backtrace** - the backtrace of the error

5.12.2.4 Activity Log
OnApp provides a possibility to trace back any user's behavior in the cloud to prevent possible misconduct or damage from staying unrevealed.

This Activity Log covers the following actions:

- DestroyVM
- DestroyUser
- DestroyBackup
- DestroyDisk
- Change Password
- LoginAs
- StopVirtualServer
- BuildVM
- Delete CDN Resource
- Delete DNS Zone

Activity Log registers actions with the following information:

- **ID** - the ID of the user in the DB
Username - name of the user
Created at - when the user was created
Action - what action was performed
Dependent - the ID of the action on which the current one was depending
Dependent Type - type of the dependent
IP Address - the IP address from which the action was launched
User Agent - description of the agent through which the cloud was accessed

To download a CSV file with the Activity Log, click the Download Activity Log as CSV button. The download will start automatically after you click the button.

5.12.2.5 Zabbix Setup
OnApp uses Zabbix for autoscaling. OnApp provides the automatic UI-based installation and configuration procedure for Zabbix on a server that you indicate. It can be either a physical server or a virtual server.

OnApp supports 2.4.x Zabbix version.

We recommend the following configuration for the Zabbix server:

**Server**: a separate physical server or a virtual server

**Operating system**: CentOS 6.x or 7.x

**Network requirements**: make sure that IP address of the Zabbix server is available to the Control Panel server and all virtual servers.

**Memory**: 128 MB of physical memory and 256 MB of free disk space are minimum requirements. However, the amount of required disk memory depends on the number of hosts that are being monitored.

The examples of recommended configuration:

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Platform</th>
<th>CPU/Memory</th>
<th>Database</th>
<th>Monitored VSs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>CentOS 6.x or 7.x</td>
<td>2 CPU cores/2GB</td>
<td>MySQL InnoDB</td>
<td>500</td>
</tr>
<tr>
<td>Large</td>
<td>CentOS 6.x or 7.x</td>
<td>4 CPU cores/8GB</td>
<td>RAID10 MySQL InnoDB or PostgreSQL</td>
<td>&gt;1000</td>
</tr>
</tbody>
</table>

Zabbix will be used for autoscaling of newly created VSs.

We strongly do not recommend installing Zabbix on the Control Panel server. You can use a separate server or a VS (if your network allows it) as the Zabbix server. For successful configuration, the Control Panel should have access to the Zabbix server without a password. Therefore, SSH keys should be added to the Zabbix server. To add SSH keys, run the following command on the Control Panel.

```
bash#> ssh-copy-id -i /home/onapp/.ssh/id_rsa.pub root@ZABBIX_SERVER_HOST_IP
```

You need to indicate the IP of your Zabbix server in the command above. You will also be prompted to enter the password for the root user on the Zabbix server. After you enter the password the SSH keys will be added to /root/.ssh/authorized_keys.

5.12.2.5.1 Set Up New Zabbix Server
Go to your Control Panel > **Admin** > **Sysadmin** menu.
Click the **Zabbix Setup** tab.

On the page that appears, fill in the following fields:
- **Server IP Address** - the IP address of the server
- **Server OS** - select the operating system of the server from the drop-down list

Click the **Deploy Zabbix Server** button.

Please be aware that default administrator credentials "Admin"/"zabbix" are used during Zabbix server deployment. It is recommended to change the credentials due to security reasons.

OnApp will install and configure Zabbix on the server with that IP. Make sure you meet the hardware and software requirements before deploying a Zabbix server.

### 5.12.2.5.2 Add Existing Zabbix Server to Cloud

If you already have a Zabbix server, you can connect it to your cloud by using the following procedure:

Fill in the following fields at Control Panel > **Admin** > **Settings** > **Configuration** > **Infrastructure** tab.
- **Zabbix host** - the IP address of your Zabbix server
- **Zabbix url** - the path to the Zabbix web-interface
- **Zabbix user** - your Zabbix user
- **Zabbix password** - your Zabbix password

For more information, see **Edit System Configuration**.

Configure the existing Zabbix server by clicking the **Reconfigure Existing Zabbix Server** button at Control Panel > **Admin** > **Sysadmin** > **Zabbix Setup** tab. OnApp will take credentials data provided in step 1, and schedule a transaction to reconfigure server.

### Uninstall Zabbix Server

Refer to a separate doc to **uninstall a Zabbix server** if required. Pay attention that when you uninstall a Zabbix server, autoscaling will stop working.

### 5.12.2.6 Control Panel Maintenance

From this tab you can click **Enable** to switch on the maintenance for the CP. Control Panel maintenance is a tool which enables administrators to block the CP. Administrators having **permissions on managing Sysadmin Tools** will have access to the Control Panel as usual. However, the CP will be blocked for all other users. Servers and services will remain running.

The screenshot illustrates what users who do not have the necessary permissions will see when they try to access the CP.
5.12.2.7 IP Usage Report

This tab contains the history of the IP address usage and provides information about:

- IP address assign/unassign to the VS
- IP address assign/unassign to the User

To view the IP usage report:

Go to your Control Panel > Admin > Sysadmin menu.

Click the IP Usage Report tab.

On the page that appears, fill in the following fields:
- **IP Address** - specify the IP address
- **Filter** - filter the statistics by selecting the time period from the dialog box.

Click **Apply**.

You will get the statistics divided into several sections:

- **From** - time and date from which IP address was assigned
- **To** - time and date from to which IP address was assigned
- **Full name** - user's first and last name
- **Username** - the user to whom the IP address is assigned
- **Email** - user email
- **VS hostname** - the name of your host
- **VS identifier** - the VS identifier
- **NIC identifier** - the identifier of the network interface
- **NIC MAC** - MAC address of the network interface
By default, the statistics is stored for no less than six months and is kept on file for easy access by law enforcement and/or other authorities who request this information.

To export the statistics in csv format, click the Download CSV button.

5.12.2.8 Resource Diffs

To view changes that have been made during a transaction, you need to have the appropriate Resource Diff permissions enabled.

This tab contains the transactions that caused a change in the distribution of resources. The list contains the transactions that change the amount of resources allocated to an existing entity, e.g. disk resize, as well as the transactions that add or delete entities, e.g. virtual server destruction. Below is the example of some transactions that you may find on the page.

- **Resize Disk** - changes of the disk size
- **ResizeVirtualServer** - changes to a VS's number of CPU cores, priority value and RAM size
- **ResizeContainerServer** - changes to a container server's number of CPU cores, priority value and RAM size
- **ResizeApplicationServer** - changes to an application server's number of CPU cores, priority value and RAM size
- **ResizeVirtualServerwithoutreboot** - changes to a VS's number of CPU cores, priority value and RAM size performed without a reboot
- **ResizeApplicationServerwithoutreboot** - changes to an application server's number of CPU cores, priority value and RAM size performed without a reboot
- **ResizeContainerServerwithoutreboot** - changes to a container server's number of CPU cores, priority value and RAM size performed without a reboot
- **HotMigrate** - changes to a source/destination compute resource ID, label, and IP address
- **ColdMigrate** - changes to a source/destination compute resource ID, label, and IP address
- **UpdateResourcePool** - changes to the resource pool's resources
- **EditFirewallRule** - changes to the firewalls
- **EditNATRule** - changes to the NAT rules
- **EditIPSECVPNRule** - changes to the IPSECVPN rules

Any other transactions that create or delete entities

Click the transaction to view its details. You will see the Before and After columns with the changed resources highlighted in red and green. The Before column will be empty if a transaction creates a new entity. Correspondingly, the After column will be empty if the transaction removes an entity. If you have Approvals permissions enabled, you will see
the Approve and Decline buttons at the bottom of the screen in case the transaction is pending for approval. For more information refer to Transaction Approvals.

You can also view resource differences in the Control Panel's logs.

https://onappcloud.typeform.com/to/A64Euy#source=Sysadmin

5.12.3 Alerts

Alerts are created when zombies appear on the system. These are listed in the Control Panel's Alerts screen. There are different kinds of zombies:

Zombie Virtual Servers - VSs which are detected by the OnApp controller as currently running on a Compute resource, but which are not in OnApp's database. Also, VSs running on a Compute resource the CP is not expecting it to be running on.

Zombie Disks - disks that are detected by the OnApp controller as existing on a data store, but which are not in OnApp's database.

Zombie Data stores - data stores that are detected by the OnApp controller as existing in the cloud, but which are not in OnApp's database.

Wrong Activated Logical Volumes - the virtual servers' disks that are either activated on two compute resources simultaneously or activated on the wrong compute resource.

Zombie Transactions - transactions that have running status but their PIDs do not exist on the system or transactions that have exceeded the zombie transaction time.

Zombie Networks - networks used by VS that have a network interface without assigned IP addresses. Click \[\Box\] to delete the zombie network.

The Alerts menu also lists the background processes running on your system. Max Amount values show the maximum number of background processes that can run simultaneously. Running shows the number of processes running at the moment.

In most cases, you can remove the zombie elements from the system by clicking \[\Box\] next to a zombie. For further help, contact support.

In previous versions, OnApp used LVM commands to detect zombie disks. Since version 4.2, the Control Panel gathers text files from the disks in the system via SNMP and makes the decision to mark certain disks as ‘zombie’ based on these files. This solution reduces the load on LVM. The system can gather data from a maximum of approximately 4400 disks at a time per one compute resource or backup server.

See also:

Logs
Sysadmin

https://onappcloud.typeform.com/to/A64Euy#source=Alerts

5.12.4 Help

The help menu enables you and your users to submit support requests to the OnApp team. All OnApp customers with a full license are entitled to 24/7 support.

To submit a support request, go to your Control Panel > Admin > Help, and complete the form on the screen that follows.

Alternatively, you can call +1 (888) 876-8666 or use the OnApp support portal.
Be aware that Help enables your users to submit requests to OnApp on behalf of the cloud owner. All the requests received via Help are considered to be sent from a trusted source. You can prohibit certain users or user groups to access Help, using Permissions.

https://onappcloud.typeform.com/to/A64Euy#source=Help

5.13 Reset Control Panel Administrator Password

To generate a new password for an administrator user:

Log in to your OnApp Cloud Control Panel using SSH:

```
ssh root@your.hostname
```

Go to the directory where your Control Panel is installed:

```
cd /onapp/interface
```

To set a predefined password, run:

```
RAILS_ENV=production rake onapp:password[admin,new_password]
```

To set a predefined password, run:

```
RAILS_ENV=production rake onapp:password[admin_login,new_password]
```

Make sure there are no spaces in brackets.

If the operation was successful you will see a *Password successfully changed to 'new_password'* message. If the operation could not be completed, you will see an error report.

See also:

Failover Configuration
Advanced Configuration Settings
Track Daemon Process Activity
Virtual Server Provisioning

https://onappcloud.typeform.com/to/A64Euy#source=Reset%20Control%20Panel%20Administrator%20Password
6 Billing

You may configure billing and limits for your end-users, change currencies, and create payments. Buckets enable you to give access to the resources and set prices for the used resources separately. Instance packages allow you to select preconfigured CPU/RAM/Disk/Bandwidth during the VS creation process or change it later to another instance package with appropriate resources while editing the VS. Refer to the sections below for more information.

https://docs.onapp.com/display/TEST2/.Buckets+v6.5 Buckets
https://docs.onapp.com/display/TEST2/.Currencies+v6.4 Currencies
https://docs.onapp.com/display/TEST2/.Instance+Packages+v6.7 Instance Packages
https://docs.onapp.com/display/TEST2/.Payments+v6.6 Payments
https://onappcloud.typeform.com/to/A64Euy#source=Billing Leave feedback

6.1 Buckets

Before users can create virtual servers in your cloud, it is important to give access to the resources and set prices for the resources they use. This is a three-step process:

1. Create a bucket.
2. Set prices and resources limits for the bucket.
3. Assign users to the bucket.

Buckets enable you to set up resources allocation and pricing separately. If you only want to configure the resources to which a user has access, you can easily do that using Access Control, and the pricing parameters will not appear in the process. If you want to set up both access to the resources and pricing, you only need to proceed from Access Control to Rate Card, where the prices and the number of free resources are set.

The bucket representation depends on the resources available in the cloud:

If there are no resources of a certain server type in the system, the section corresponding to that server type will not appear in the bucket.

If there are no resources of a certain type that do not have a server type, (e.g. service add-on groups) the selection of that resource will not be available in the Other section of the Access Control/Rate Card.

Buckets are arranged into two tabs:

Access Control - in this section you configure the resources allocation for the users under this bucket. If you assign a bucket to a user, that user will have access only to those resources which you have added to the bucket. If no resources are added to a section of the Access Control, e.g. compute zones, the user under the bucket will not have access to any of the compute zones in the cloud.

Rate Card - in this section you set up prices for the resources and the amount of resources users can request for free. Users under the bucket will be billed according to the prices you configure in the Rate Card.
In case you remove from Access Control a resource on which users under the bucket have running servers, the users' existing servers will remain as they are, but users will not be able to use these resources to create new servers. If you leave such a resource in the Rate Card, the users' existing servers will continue to be billed according to the prices you have configured.

The Access Control and Rate Card tabs are further subdivided into sections that depend on the server types of resources you have in the cloud:

**Virtual** - the server type under which KVM or CloudBoot compute, data store, network, and backup server zones of the virtual server type can be added

**Smart** - the server type under which KVM compute, data store, network, and backup server zones of the smart type can be added

**Baremetal** - the server type under which KVM compute and network zones of the baremetal type can be added

**Other** - the resources that relate to the system and do not have a server type. This section includes backup resource zones, template store, edge groups, recipe groups, and service add-on groups.

Note that the user under the bucket has access only to the resources added to the Access Control. If you add a resource to the Rate Card but do not add it to the Access Control, the user under this bucket will not have access to that resource.

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

If you have VMware Cloud Director resources in the cloud, the bucket will also contain the VPC server type section. For information on setting up VCD resources in the bucket, refer to the [VMware Cloud Director Buckets](https://onappcloud.typeform.com/to/A64Euy#source=Buckets) section of the OnApp and VMware Cloud Director Configuration Guide.

### 6.1.1 Billing Calculation

Below you will find the description of the billing logic and how the billing is calculated for the following bucket resources:

- Free limits
- Free and free per month limit types
- Calculation for the missing period
- IP addresses
If you remove from the bucket a resource that has a virtual server(s) running on it, the pricing for that resource will be removed for such VSs. This behavior refers to user VS limits, template stores, edge groups, recipe groups, backup server zones, and guaranteed minIOPS.

6.1.1.1 Free Limits
To calculate the free limits, the system first adds up all resources as if there were no free limits configured and then, at the end of the hour, subtracts the cost of free resources from the total amount of used resources.

For example, a user's bucket has the free limit for acceleration set to '2' (VS/hr) and the price for acceleration set to '5 VSs'. If this user creates four VSs with acceleration enabled, at first, the system will calculate the price of all the servers excluding the free limit: 4*5=20. At the end of the billing period (hour), the system will subtract the price of the free resources, in this case, 2*5=10, from the total amount for the used resource: 20-10=10.

6.1.1.2 Free and Free per Month Resource Limit Types
It is possible to choose hourly or monthly free limits when adding a data store or network zone resources to the OnApp bucket.

When setting the 'free' resource type, the limit for resources is set per hour, and the statistics are gathered hourly and then is compared to the free resource limit. Then, the resource limits which exceed the free amount allowed are billed.

When setting the "free per month' resource type, the limit for resources is set per month, and the statistics are gathered hourly and then are compared to the free resource limit set per month. When the free limit set per month is exceeded, the exceeding amount is billed based on the overusage price per resource per hour.

Click to see the example
For example, a user adds a data store zone with 'free per month' limits to the bucket and sets free data read limit per month to 50 GB:

During the first hour, 50 GB are used (all the free limit).

During the second hour, 2 GB are used. As there’s no free limit left, the user is charged for 2 GB per hour.

During the third hour, 5 GB are used. Since there’s no free limit left, the user is charged for 5 GB per hour (previous 2 GB over limit are not taken into account, since they are already billed).

If a user adds a data store zone with 'free' limits to the billing plan and sets free data read limit per hour to 50 GB:

During the first hour, 5 GB are used. As the free limit is 50GB the user is not charged (all the free limit).

During the second hour, 52 GB are used. The user is charged for 2 GB over free limit per hour.
During the third hour, 55 GB are used. The user is charged for 5 GB per hour overusage (the previous 2 GB over the limit are not taken into account since they are already billed).

6.1.1.3 Calculation for Missing Period
Under certain circumstances, statistics might be missing for a period of time. This might happen due to daemon issues, cron jobs failures, or some other unexpected errors with the statistics collection mechanism. In such cases, the instant (raw) statistics is aggregated for the whole missing period, and the calculated amount is added into the hourly statistics for the first hour when the services are up again. This behavior is relevant only to the resources which are calculated dynamically on the hourly basis, in particular:

| Data store zones       | Data read |
|                       | Data written |
|                       | Input requests |
|                       | Output requests |
| Network zones          | Data received |
|                       | Data sent |

Click to see the example
The following scheme demonstrates this behavior for Data Received for network zones as an example:

The last value for data received (Hour1) reported as hourly statistics for the network zone in question was 10GB. Then the OnApp daemon stopped working, and no hourly statistics were generated for Hour2, Hour3, Hour4, and Hour5. On Hour6 the problem was fixed, and daemon was up again. The hourly statistics for Hour6 will aggregate all the statistics for the whole missing period into that hour. Most probably you will get a huge value for the Hour6 as it will be the summary for the whole period when no stats have been reported. Pay attention that the Outstanding amount and Total amount for users will be calculated as per one hour: the whole aggregated statistics will be regarded as statistics per one hour, and compared to the free limits and charged for overusage.

As a workaround, to fix the overcharging for the aggregated stats, you can use the payments functionality. Add the appropriate value as a payment for a user, and it will be subtracted from the Total amount.

Each virtual server has two IP types: regular and outside. Public IP addresses are used for servers’ Internet access. Private IP addresses are used for private networks.

6.1.1.4 IP addresses
When calculating IP address billing for a particular resource, each virtual server’s IP address is compared to the free IP limit in a linear queue (starting with the first added IP address). Regular IPs are calculated first.

Click to see the example
Example

Free IP address limit is 3.

**VS 1**

The first virtual server has two regular and two outside IP addresses, but the second regular IP address is the same as the second outside IP address, so the number of unique IPs assigned to this virtual server is 3.

**VS 2**

The second virtual server has two regular and two outside IP addresses.

According to the billing algorithm, the first regular IP address checks if there are some IPs added before it and then gets compared to the free IP address limit. 1 < 3, so it is not charged (2 IPs of free limit left).

Then, the second IP address is compared to the remaining free IP address number. 1 < 2, so the second IP also is not charged (1 IP of free limit left).

After that, the outside IPs are calculated:

The first outside IP address checks if there are some outside IPs added before it and then gets compared to the free IP address limit.

1 ≥1, so this IP address is not charged (0 IP of free limit left).

Then, the second outside IP is compared to the remaining free IP address number. There are no free IPs left, but since the second regular IP address equals the second outside IP address, the second IP also is not billed.

Consequently, all IP addresses of the second virtual server are billed, as the free IP address limit is already used up.

One IP address can be added as a regular and an outside IP at the same time. In this case, it will be only charged as a regular one. That is why outside IPs are calculated second.

### 6.1.1.5 Port Speed

Port speed is calculated by subtracting the free port speed value from the free port speed limit and summing up the remainders. If the port speed is less than the free port speed limit, it is not billed.

If the NIC port speed is set as Unlimited in the bucket, it means that the maximum port speed value is the value specified in the Control Panel **Admin > Settings > Configuration > Max network interface port speed** field.
Formula for port speed billing calculation

(NIC 1 port speed - free port speed value) + (NIC 2 port speed - free port speed value) + ... etc

Click to see the example

In this example, the free port speed limit is 20 MB/second.

**VS 1**
The first virtual server has two NICs.
NIC 1 = 10 MB/second
NIC 2 = 25 MB/second

**VS 2**
Second virtual server has two NICs.
NIC 3 = 10 MB/second
NIC 4 = 30 MB/second

Then, (10 - 20) + (25 - 20) + (10 - 20) + (30 - 20) = 15 MB will be charged.

Since the first and the third NICs are less than the free amount, they are not charged.

6.1.1.6 Guaranteed minIOPS
Guaranteed minIOPS is calculated by subtracting the free IOPS value from each disk’s IOPS and summing up the remainders. If the disk’s IOPS is less than the free IOPS value, it is not billed.
(Disk 1 IOPS - free IOPS value) + (Disk 2 IOPS - free IOPS value)...etc

Click to see the example

In this example, free IOPS = 45

Disk 1 has 50 IOPS
Disk 2 has 45 IOPS
Disk 2 has 60 IOPS
Disk 4 has 20 IOPS

Then: (50-45) + (45-45) + (60-45) + (20-45) = 20 IOPS which is billed.

Since the second and the fourth disks’ IOPS values are less than the free amount, these disks are not billed.

6.1.1.7 Disk size
When calculating disk size billing for a particular resource, each virtual server’s disk size is compared to the free disk size limit in a linear queue (starting with the first added disk), then each next disk is compared to the free disk size limit remainders.

Click to see the example
Free disk size is 50 GB.

We have two virtual servers assigned to the same data store.

**VS 1**
The first virtual server has two disks.
Disk 1 = 15 GB
Disk 2 = 20 GB

**VS 2**
The second virtual server has two disks.
Disk 1 = 20 GB
Disk 2 = 15 GB

According to the billing algorithm, the first disk checks if there are disks added before it and then gets compared to the free disk size limit:
15 < 50, so it is not charged (35 GB of free disk size limit left).

Then, the second disk is compared to the remaining free disk size limit:
20 < 35 (15 GB of free disk size limit left).
So, the second disk is also not charged.

After that, the second virtual server’s disks are processed. The third disk is compared to the remaining free disk size limit:
20 > 15 (20 - 15 = 5, so 5 GB of the disk’s size will be charged).
Finally, the fourth disk is charged for the whole disk size, as the free disk size limit is already reached.

---

6.1.1.8 CPU
CPU, CPU shares, and memory limits are set for the compute zone.
When calculating CPU billing for a particular resource, the sum of all virtual server’s CPU over the free limit is billed.
**Formula for the CPU billing calculation**

\[(\text{VS1 CPUs}) + (\text{V2 CPUs}) + (\text{VS# CPUs}) - \text{free CPU limit}\]

**Click to see the example**

<table>
<thead>
<tr>
<th>VS 1</th>
<th>2 CPUs, 50% CPU priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS 2</td>
<td>3 CPUs, 40% CPU priority</td>
</tr>
</tbody>
</table>

**Example**

Free CPU limit is 3.

If we have two virtual servers:

**VS 1**
The first VS has 2 CPUs

**VS 2**
The second VS has 3 CPUs

The number of CPUs charged: \((2+3) - 3 = 2\)

6.1.1.9 CPU Shares

To calculate the CPU shares price for the virtual server, multiply the number of server’s cores by the CPU priority percentage given.

Then, each virtual server’s CPU priority value is compared to the free CPU shares limit in a linear queue (starting with the first added virtual server), then each next virtual server is compared to the free CPU shares limit remainders.

**Click to see the example**

In this example, free CPU shares limit is 140.

**VS 1**
The first virtual server has 2 CPUs and 50% CPU priority (100% in total).

**VS 2**
The second virtual server has 3 CPUs and 40% CPU priority (120% in total).

According to the billing algorithm, the first virtual server checks if there are servers added before it and then gets compared to the free CPU shares limit:
100 < 140, so it is not charged (40 of free CPU shares limit left).
Then, the second virtual server is compared to the remaining CPU shares limit:
120 > 40 (120 – 40 = 80), so 80 percent of this server’s CPU shares will be charged.

6.1.1.10 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 burst over it by manually adding up to 100% multiplied by the number of cores. You may do it by modifying the CPU priority value at the Adjust Resource Allocation page (Cloud > Virtual Servers > label of the necessary VS > Actions > Options > Edit Virtual Server). 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, the CPU priority settings will be disabled and the CPU priority value will be 100 by default.

Click here to explore more
Depending on the settings of your cloud (CPU Guarantee), OnApp may allow overselling of cloud resources. For example, OnApp will allow you to create 5 virtual servers 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 virtual server.

If resource overselling is disabled for your cloud, OnApp will not create virtual servers requiring more CPU resource than it is available on the hypervisor.

You can set the CPU priority to virtual server depending on the virtualization type of the compute resource the server is located on:
on KVM compute resource under CentOS 6, you can set the 1-100 CPU priority value.
on KVM hypervisors under CentOS 5, the CPU priority is 100 by default.

6.1.1.11 CPU Units
The CPU unit is an abstract figure that replaces CPU priority. It is an arbitrary relative value that the host can enter to mark the capacity of the compute resources in a zone. It is the host’s responsibility to enter the values per compute resources correctly and logically. You can set the amount of units per compute zone and per each particular compute resource in a zone. If you set the CPU Units per compute zone, then each compute resource in this zone will be assigned the number of units set. To set different capacity to a particular compute resource, specify the CPU units amount to a required compute resource not a zone. To bill for CPU Units, enable CPU units for a bucket and set the price per unit.

Each compute resource core within a zone is given a 1000 CPU Units default value when CPU units are enabled per zone (this is made in the bucket). The Host can then change that number for each compute resource to any other number between 1-100,000 to fit its capacity. The faster the compute resource, the higher the value should be set.

CPU Units show the speed of the CPU - this can be done in any way that the host wants to as it’s just a number that is relative to another number. OnApp will simply process the numbers. For example, if one compute resource is two times more powerful than another, then the CPU units could be 1000 and 500.

To evaluate compute resource’s physical performance, you can take the following values:
CPU Mhz
Passmark Score (http://www.cpubenchmark.net/)
BogoMips (http://en.wikipedia.org/wiki/BogoMips)

When creating a VS, you will specify the desired amount of CPU Units that this VS will take out of total CPU Units set for compute resource.

Please note that OnApp cannot guarantee identical performance over different Compute resources and workload types when migrating VSs.

Click to see the example
Example: If you have a compute zone (Compute resourceZ) with 5 compute resources attached to it, and you set 1000 CPU Units to Compute resourceZ zone, then each of five compute resources in this zone will have 1000 CPU Units. In case you would like to increase the capacity of specific Compute resource1 compute resource to 2000 in this Compute resourceZ zone, set the CPU Units option of this Compute resource1 to 2000. For example, giving Compute resource 1 a score of 1000 and Compute resource 2 the score of 500 is the same as giving Compute resource 1 a score of 2 and Compute resource 2 a score of 1. However, the first case gives you more flexibility in spreading the resources between VSs.

When setting CPU units, the main thing is that the correlation between the CPU Units for each compute resource should correspond to the correlation of their actual performance. Example of setting CPU units based on CPU speed:

<table>
<thead>
<tr>
<th>Compute Resource</th>
<th>Compute Resource CPU Mhz</th>
<th>Compute Resource Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4000</td>
<td>1000</td>
</tr>
<tr>
<td>B</td>
<td>2000</td>
<td>500</td>
</tr>
<tr>
<td>C</td>
<td>1000</td>
<td>250</td>
</tr>
<tr>
<td>D</td>
<td>500</td>
<td>125</td>
</tr>
</tbody>
</table>

Limitations
CPU Units are available for KVM compute resources only.
Do not apply CPU Units for KVM compute resources running on VMware, baremetal servers, and load balancers.
So far only billing calculation can be performed based on CPU units. At this time we do not guarantee the same performance for VSs when migrating to another compute resource with different capacity.

6.1.1.12 Instance Packages
To set up billing for the instance packages, at first configure the number of available resources in the package at the Admin > Instance Packages > Create Instance Package menu.

Second, add the instance package(s) to the bucket. There you set the price that will be charged per VS powered on/off for each appropriate instance package.

There are also a number of VS resources that are not set up during instance package creation but are configured automatically:

- **CPU Priority** - CPU priority is automatically set to 100
- **Swap disk size** - swap disk size can have the size of 1/2/3 GB. Its size is calculated by multiplying the RAM by two.
- **IP address** - the first available IP address is selected. One IP address is assigned to the VS created using an instance package for free.
Port speed - depends on the bucket limit. If the port speed Max limit in the bucket is set to unlimited, the port speed in the instance package will also be set to unlimited. If the port speed Max limit in the bucket is set to a certain value, the port speed in the instance package will be set to that same value.

When you build a VS using an instance package, certain bucket limits will not apply to that VS:

Data read/written and input/output requests are not billed for disks of the VS built using an instance package. The VSs disk size will be defined by the disk size indicated in the selected instance package.

The Limits & Prices for Network Zones will only apply to the VSs that overuse the bandwidth limit set in the selected instance package. A free IP address is assigned to the VS. The VSs port speed, data sent and data received are not billed until the VS overuses the instance package's bandwidth limit. After that, the data the VS sends and receives will be billed according to the Price over free units cost.

For more information, refer to the Billing for Instance Packages section.

6.1.1.13 DRaaS

In a bucket, DRaaS resources are a part of User VS limits. You can set the following additional fees for a VS with DRaaS enabled:

- for disk size per GB per hour
- for RAM per GB per hour
- for CPU core per core per hour
- for CPU per percent per hour or CPU per unit per hour
- for node per unit per hour

These prices are additional to regular prices per indicated resources.

Click to see the example

Regular price for disk size, set in your bucket, is 10$ per GB per hour. Additionally, you set price for disk size for a VS using DRaaS, as 5$ per GB per hour. So the total price for the VS disk size will be 15$ per GB per hour when DRaaS enabled.

In the case of billing per node, it is calculated how many nodes each VS with DRaaS enabled has. The number of nodes corresponds to the highest resource requirement, e.g. a VS with 1 Core, 1GB RAM, and 20GB Storage is equivalent to two nodes and is charged accordingly.

https://onappcloud.typeform.com/to/A64Euy#source=Billing%20Calculation

6.1.2 Configure Resource Allocation and Prices

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

Access Control - in this section you configure the resources allocation for the users under this bucket. If you assign a bucket to a user, that user will have access only to those resources which you have added to the bucket. If no resources are added to a section of the Access Control, e.g. compute zones, the user under the bucket will not have access to any of the compute zones in the cloud.

Rate Card - in this section you set up prices for the resources and the amount of resources users can request for free. Users under the bucket will be billed according to the prices you configure in the Rate Card.

These tabs are further subdivided into sections that depend on the server types of resources you have in the cloud:
Virtual - the server type under which KVM or CloudBoot compute, data store, network and backup server zones of the virtual server type can be created

Smart - the server type under which KVM compute, data store, network, and backup server zones of the smart type can be created

Baremetal - the server type under which KVM compute and network zones of the baremetal type can be created

Other - the resources that relate to the system and do not have a server type. This section includes backup resource zones, template store, edge groups, recipe groups, and service add-on groups.

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

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

6.1.2.1 Configure Access Control

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

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

To manage the resources allocation:

Go to your Control Panel > Admin > Buckets menu.

Click a label of a bucket. You will be redirected to the Access Control tab of the bucket.

Click an icon to select the required server type and add resources as follows:

- Click + button in the appropriate box.
- When the new windows pops up, set limits for resources (see the table below for reference).
- Select as many compute zones as you need to set the same limits for all resources of the following types:

  - Compute zone resource
  - Data store zone resource
  - Network zone resource
  - Backup server zone resource
After you submit changes, you can edit limits for any zone resource in the bucket.

Select the **Duplicate to rate card** checkbox if you want to set free limits and prices for the resources.

### Virtual Server Type

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>Virtual Servers</td>
<td>Max</td>
<td>The maximum number of virtual servers users can create in the cloud. This parameter affects the number of virtual servers, VSs in Federation, and load balancers users can create. Leave the ‘-’ value to set an unlimited amount of VSs available to users under this bucket.</td>
</tr>
<tr>
<td>Templates, ISO's &amp; Backups Storage</td>
<td>Max</td>
<td>The total amount of disk space (GB) users can request for storing their backups, ISOs, and templates under this bucket. The <strong>Templates, ISO's &amp; Backup Storage</strong> limit will apply only if you use compute resources for disk-related actions in your cloud. Leave the ‘-’ value to provide an unlimited amount of disk space for storing backups, ISOs, and OVAs under this bucket.</td>
<td></td>
</tr>
<tr>
<td>Templates</td>
<td>Max</td>
<td>The maximum number of templates that users can create in the cloud. The disk space available for templates is defined by the <strong>Templates, ISO's &amp; Backup Storage</strong> limit. You can set prices per template per hour in the bucket's Rate Card. Leave the ‘-’ value to let a user create an unlimited amount of templates under this bucket.</td>
<td></td>
</tr>
<tr>
<td>Autoscaling</td>
<td>Max</td>
<td>The maximum number of VSs for which the user can enable autoscaling under this bucket. After this number runs out, the user will not be able to switch on autoscaling for the next VSs. Leave the ‘-’ value to let a user apply autoscaling to an unlimited amount of VSs under this bucket.</td>
<td></td>
</tr>
<tr>
<td>Backups</td>
<td>Max</td>
<td>The maximum number of backups (both manual and auto-backups) users can create under this bucket. Make sure that <strong>Backups max limit</strong> is no less than the rotation period or it will prevent auto-backups from creating. If the <strong>Backups max limit</strong> equals the rotation period, then one more auto-backup will be created to replace the existing one. The disk space available for backups is defined by the <strong>Templates, ISO's &amp; Backup Storage</strong> limit. The <strong>Backups</strong> limit will apply only if you use compute resources for disk-related actions in your cloud.</td>
<td></td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>ISO templates</td>
<td>Max</td>
<td></td>
<td>The maximum number of ISO templates users can create under this bucket. Leave the '-' value to let a user create an unlimited amount of ISO templates under this bucket.</td>
</tr>
<tr>
<td>Container Server</td>
<td>Max</td>
<td></td>
<td>The maximum number of container servers in the cloud that the users can create under this bucket. Leave the '-' value to let a user create an unlimited amount of container servers under this bucket.</td>
</tr>
<tr>
<td>Application Servers</td>
<td>Max</td>
<td></td>
<td>The maximum number of application servers in the cloud that the users can create under this bucket. Leave the '-' value to let a user create an unlimited amount of application servers under this bucket.</td>
</tr>
<tr>
<td>Limits for compute zones</td>
<td>CPU Priority</td>
<td>Min</td>
<td>The minimum amount of CPU priority which can be set in the VS creation wizard when the user adds a VS under this bucket in the compute zone. If you enable the Use CPU Units then adding/editing a compute zone in the Access Control, this parameter will not apply to the users under this bucket. Instead, the Max CPU Units parameter will be used.</td>
</tr>
<tr>
<td></td>
<td>CPU Shares</td>
<td>Max</td>
<td>The maximum amount of CPU shares users can request for all their servers in this compute zone under this bucket. Leave the '-' value to provide an unlimited amount of CPU Shares within the compute zone to a user under this bucket. The default amount of CPU shares that will be set in the VS creation wizard when the user adds a VS in this compute zone under this bucket. This parameter will apply to users under this bucket only if you enable the Use default CPU share option when adding/editing a compute zone in the Access Control.</td>
</tr>
<tr>
<td>RAM</td>
<td>Min Max</td>
<td></td>
<td>The minimum amount of RAM that can be set in the VS creation wizard when the user adds a VS under this bucket in the compute zone.</td>
</tr>
</tbody>
</table>

If there are backup servers in your cloud: set the **Backup server zone limits** in the bucket as required. set the **Backups max limit** in the Miscellaneous section of the Access Control to 0 to prevent creating both manual and auto-backups on compute resources.
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>The maximum amount of RAM that users can request for all their VSs within this compute zone under the bucket. Leave the '-' value to provide an unlimited amount of RAM within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>CPU</td>
<td>Min/Default</td>
<td></td>
<td>The minimum amount of virtualized CPU cores that can be set in the VS creation wizard when the user adds a VS under this bucket in the compute zone. The default amount of virtualized CPU cores that will be set in the VS creation wizard when the user adds a VS in this compute zone under this bucket. This parameter will apply to users under this bucket only if you enable the <em>Use default CPU</em> option when adding/editing a compute zone in the Access Control.</td>
</tr>
<tr>
<td>CPU Cores</td>
<td>Max</td>
<td></td>
<td>The maximum amount of CPU cores that users can request for all their VSs within this compute zone under the bucket. Leave the '-' value to provide an unlimited amount of CPU cores within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>CPU Units</td>
<td>Max</td>
<td></td>
<td>The maximum amount of CPU units that users can request for all their VSs within this compute zone under the bucket. This parameter will apply to users under this bucket only if you enable the <em>Use CPU Units</em> option when adding/editing a compute zone in the Access Control. Leave the '-' value to provide an unlimited amount of CPU units within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>Use default CPU</td>
<td>Yes/No</td>
<td></td>
<td>Select whether you wish a default amount of CPU cores to be set in the VS creation wizard when the user adds a VS in this compute zone under this bucket. You can set the default amount of CPU cores using the <em>Default CPU</em> limit. It is only possible to enable the <em>Use default CPU</em> option when resource prices and max limit are not set.</td>
</tr>
<tr>
<td>Use default CPU shares</td>
<td>Yes/No</td>
<td></td>
<td>Select whether you wish a default amount of CPU shares to be set in the VS creation wizard when the user adds a VS in this compute zone under this bucket. You can set the default amount of CPU shares using the <em>Default CPU shares</em> limit. It is only possible to enable the <em>Use default CPU shares</em> option when resource prices and max limit are not set.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Use CPU Units</td>
<td>Yes/No</td>
<td></td>
<td>Select whether you wish to use CPU shares instead of CPU priority. You can set the number of CPU units available to users under this bucket using the <strong>Max CPU Units</strong> limit.</td>
</tr>
<tr>
<td>Limits for data store zones</td>
<td>Disk Size</td>
<td>Max</td>
<td>The maximum amount of disk space (GB) users can request in the data store zone under the bucket. Leave the ‘-’ value to provide an unlimited amount of disk space within the data store zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for network zones</td>
<td>IP Addresses</td>
<td>Max</td>
<td>The maximum amount of IP addresses users can request in this network zone under the bucket. Leave the ‘-’ value to provide an unlimited amount of IP addresses within the network zone to a user under this bucket.</td>
</tr>
<tr>
<td>Port Speed</td>
<td>Max</td>
<td></td>
<td>The maximum port speed (Mbps) users can request in this network zone under the bucket. Leave the ‘-’ value to provide an unlimited port speed within the network zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for backup server zones</td>
<td>Backup</td>
<td>Max</td>
<td>The maximum number of backups (both manual and auto-backups) users can create under this bucket. Make sure that <strong>Backups</strong> max limit is no less than the rotation period or it will prevent auto-backups from creation. If the <strong>Backups</strong> max limit equals the rotation period, then one more auto-backup will be created to replace the existing one. Leave the ‘-’ value to provide an ability to create an unlimited number of backups within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>Backup disk size</td>
<td>Max</td>
<td></td>
<td>The maximum amount of disk space (GB) users get for storing their backups in this backup server zone under the bucket. When the backup space is exceeded, users can take backups, but they cannot restore from them unless the size is freed up. Leave the ‘-’ value to provide an unlimited amount of disk space for storing backups within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>Template</td>
<td>Max</td>
<td></td>
<td>The maximum amount of templates users can create in this backup server zone under the bucket. Leave the ‘-’ value to provide an ability to create an unlimited number of templates within the backup server zone to a user under this bucket.</td>
</tr>
</tbody>
</table>

Please also set the **Backups** max limit to 0 in the Miscellaneous section of the bucket to prevent creating backups on compute resources.
### Resource Type

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Template</td>
<td>disk size</td>
<td>Max</td>
<td>The maximum amount of disk space (GB) users get for storing their templates in this backup server zone under the bucket. Leave the '-' value to provide an unlimited amount of disk space for storing templates within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>OVA</td>
<td></td>
<td>Max</td>
<td>The maximum amount of OVAs users can create in this backup server zone under the bucket. Leave the '-' value to provide an ability to create an unlimited number of OVAs within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>OVA disk size</td>
<td></td>
<td>Max</td>
<td>The maximum amount of disk space (GB) users get for storing their OVAs in this backup server zone under the bucket. Leave the '-' value to provide an unlimited amount of disk space for storing OVAs within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for guaranteed minIOPS</td>
<td>Requests</td>
<td>Max</td>
<td>The maximum number of IOPS requests users can request in this data store zone under the bucket. Leave the '-' value to provide an unlimited amount of IOPS requests within the data store zone to a user under this bucket. This parameter is SolidFire related.</td>
</tr>
<tr>
<td>Limits for instance packages</td>
<td>Instance Package</td>
<td>Compute zones</td>
<td>Select an instance package and the compute, data store, and/or network zone(s) in which this package will be available to users under this bucket. If no zones are selected for the instance package that you added to the Access Control, the instance package will be available in all zones added to this bucket. Here you can also edit the list of zones in which the package will be available to users under this bucket.</td>
</tr>
</tbody>
</table>

### Baremetal Server Type

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limits for compute zones</td>
<td>Select a zone from the dropdown menu.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limits for network zones</td>
<td>IP Addresses</td>
<td>Max</td>
<td>The maximum amount of IP addresses users can request in this network zone under the bucket.</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Baremetal server</td>
<td>Max</td>
<td>The total amount of baremetal servers users can create under this bucket.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Smart Servers</td>
<td>Max</td>
<td>The maximum number of smart servers users can create in the cloud. Leave the '-' value to let a user create an unlimited amount of smart servers under this bucket.</td>
</tr>
<tr>
<td>Templates, ISO's &amp; Backups Storage</td>
<td>Max</td>
<td>The total amount of disk space (GB) users can request for storing their backups, ISOs, and templates under this bucket. The Templates, ISO's &amp; Backup Storage limit will apply only if you use compute resources for disk-related actions in your cloud. Leave the '-' value to provide an unlimited amount of disk space for storing backups, ISOs, and OVAs under this bucket.</td>
<td></td>
</tr>
<tr>
<td>Backups</td>
<td>Max</td>
<td>The maximum number of backups users can create under this bucket. The disk space available for backups is defined by the Templates, ISO's &amp; Backups Storage limit. The Backups limit will apply only if you use compute resources for disk-related actions in your cloud. Leave the '-' value to let a user create an unlimited amount of backups under this bucket.</td>
<td></td>
</tr>
<tr>
<td>Limits for compute zones</td>
<td>CPU Cores</td>
<td>Max</td>
<td>The maximum amount of CPU cores that users can request for all their smart servers within this compute zone under the bucket. Leave the '-' value to provide an unlimited amount of CPU cores within the compute zone to a user under this bucket.</td>
</tr>
<tr>
<td>CPU Shares</td>
<td>Max</td>
<td>The maximum amount of CPU shares (%) users can request for all their servers in this compute zone under this bucket. Leave the '-' value to provide an unlimited amount of CPU shares within the compute zone to a user under this bucket. If you enable the Use CPU Units option while adding/editing a compute zone in the Access Control, the CPU Shares parameter will not apply to the users.</td>
<td></td>
</tr>
</tbody>
</table>

If there are backup servers in your cloud: set the Backup server zone limits in the bucket as required. set the Backups and Templates, ISO's & Backups Storage max limit in the Miscellaneous section of the Access Control to 0 to prevent creating backups on compute resources.
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Units</td>
<td>Max</td>
<td>The maximum amount of CPU units that users can request for all their smart servers within this compute zone under the bucket. This parameter will apply to users under this bucket only if you enable the Use CPU Units option when adding/editing a compute zone in the Access Control. Leave the '-' value to provide an unlimited amount of CPU units within the compute zone to a user under this bucket.</td>
<td></td>
</tr>
<tr>
<td>RAM</td>
<td>Max</td>
<td>The maximum amount of RAM (GB) that users can request for all their smart servers within this compute zone under the bucket. Leave the '-' value to provide an unlimited amount of RAM within the compute zone to a user under this bucket.</td>
<td></td>
</tr>
<tr>
<td>Use CPU Units</td>
<td>Yes/No</td>
<td>Select whether you want to use CPU units instead of CPU shares. You can set the number of CPU units available to users under this bucket using the Max CPU Units limit.</td>
<td></td>
</tr>
<tr>
<td>Limits for data store zones</td>
<td>Disk Size</td>
<td>Max</td>
<td>The maximum amount of disk space (GB) users can request in the data store zone under the bucket. Leave the '-' value to provide an unlimited amount of disk space within the data store zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for network zones</td>
<td>IP Addresses</td>
<td>Max</td>
<td>The maximum amount of IP addresses users can request in this network zone under the bucket. Leave the '-' value to provide an unlimited amount of IP addresses within the network zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for backup server zones</td>
<td>Port Speed</td>
<td>Max</td>
<td>The maximum port speed (Mbps) users can request in this network zone under the bucket. Leave the '-' value to provide an unlimited port speed within the network zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for backup server zones</td>
<td>Backup</td>
<td>Max</td>
<td>The maximum amount of backups users can create in this backup server zone under the bucket. Leave the '-' value to provide an ability to create an unlimited number of backups within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>Limits for backup server zones</td>
<td>Backup disk size</td>
<td>Max</td>
<td>The maximum amount of disk space (GB) users get for storing their backups in this backup server zone under the bucket. When the backup space is exceeded, users can take backups, but they cannot restore from them unless the size is freed up.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leave the ‘-’ value to provide an unlimited amount of disk space for storing backups within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>Template</td>
<td>Max</td>
<td></td>
<td>The maximum amount of templates users can create in this backup server zone under the bucket. Leave the ‘-’ value to provide an ability to create an unlimited number of templates within the backup server zone to a user under this bucket.</td>
</tr>
<tr>
<td>Template disk size</td>
<td>Max</td>
<td></td>
<td>The maximum amount of disk space (GB) users get for storing their templates in this backup server zone under the bucket. Leave the ‘-’ value to provide an unlimited amount of disk space for storing templates within the backup server zone to a user under this bucket.</td>
</tr>
</tbody>
</table>

**Other Resources**

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limits for backup resource zones</td>
<td>Select which backup resource zones will be available to users under this bucket.</td>
</tr>
<tr>
<td>Limits for edge groups</td>
<td>Select which edge groups will be available to users under this bucket.</td>
</tr>
<tr>
<td>Limits for CDN bandwidth</td>
<td>Specify the maximum CDN bandwidth limit in Gb per month available for each user under this bucket.</td>
</tr>
<tr>
<td>Limits for template store</td>
<td>Select which template stores from which templates will be available for users to select during a virtual server creation.</td>
</tr>
<tr>
<td>Limits for recipe groups</td>
<td>Select which groups of recipes will be available to users under this bucket.</td>
</tr>
<tr>
<td>Limits for service add-on groups</td>
<td>Select which service add-on groups will be available for users to assign to virtual servers.</td>
</tr>
</tbody>
</table>

6.1.2.2 **Configure Rate Card**

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

If you add a resource to the Rate Card but do not add it to the Access Control, the user under this bucket will not have access to that resource.
In case you remove from Access Control a resource on which users under the bucket have running servers, the users’ existing servers will remain as they are, but users will not be able to access these resources to create new servers. If you leave such a resource in the Rate Card, the users’ existing servers will continue to be billed according to the prices you have configured.

If you remove a template store or compute/data store/network/backup server zone from the Rate Card, the prices for the removed resource will be set to zero for the servers using this zone(s).

Note that if you set price equal number with precision 10 or more (e.g.:0.008789062511) the price is saved equal number with precision 8 (e.g.:0.00878906).

If you want to disable prices completely you can do so by enabling the Disable billing slider at the Edit System Configuration page. When the billing is disabled, the Rate Cards are removed from existing buckets. Note that if billing is enabled again, the prices won’t be recalculated again. Instead, the price calculation will start with the next hour.

To manage pricing for the resources:

Go to your Control Panel > Admin > Buckets menu.

Click a label of a bucket. You will be redirected to the Access Control tab of the bucket.

Click the Rate Card tab.

Click an icon to select the required server type and add resources as follows:

- Click + button in the appropriate section.
- When the new windows pop up, set the value for the free limit and the price (see the table below for reference).
- Select as many compute zones as you need to set the same limits for all resources of the following types:
  - Compute zone resource
  - Data store zone resource
  - Network zone resource
  - Backup server zone resource

After you submit changes, you can edit free limits and prices for any zone resource in the bucket.

Select the Duplicate to access control checkbox if you want to add the resource not only to Rate Card but also to Access Control.

### Virtual Server Type

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>Autoscaling</td>
<td>Free</td>
<td>the number of virtual servers for which the user can enable autoscaling for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price</td>
<td>free under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>the price per VS per hour for VSs for which the user enables autoscaling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This price applies to servers that exceed the free Autoscaling limit set in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>the bucket's Rate Card.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Templates, ISO's &amp; Backups Storage</td>
<td>Free Price</td>
<td>Free Price</td>
<td>the amount of free disk space (in GB) users can allocate to storing backups, ISOs, and templates together. The price per GB per hour of disk space the user allocates to storing backups, ISOs, and templates. This price applies once the user exceeds the free Templates, ISO's &amp; Backups Storage limit set in the bucket's Rate Card.</td>
</tr>
<tr>
<td>Backups</td>
<td>Free Price</td>
<td>Free Price</td>
<td>the number of backups users can create for free under this bucket. The price per backup created by the user under this bucket per hour. This price applies once the user exceeds the number of free backups available in the bucket's Rate Card.</td>
</tr>
<tr>
<td>Templates</td>
<td>Free Price</td>
<td>Free Price</td>
<td>the number of templates a user under this bucket can create for free. The price per template created by the user under this bucket per hour. This price applies once the user exceeds the number of free templates available in the bucket's Rate Card.</td>
</tr>
<tr>
<td>ISO Templates</td>
<td>Free Price</td>
<td>Free Price</td>
<td>the number of ISOs a user under this bucket can create for free. The price per ISO created by the user under this bucket per hour. This price applies once the user exceeds the number of free ISOs available in the bucket's Rate Card.</td>
</tr>
<tr>
<td>Acceleration</td>
<td>Free Price</td>
<td>Free Price</td>
<td>the number of virtual servers for which the user can enable acceleration for free under this bucket. The price per VS per hour for VSs for which the user enables acceleration. This price applies to servers that exceed the free Acceleration limit set in the bucket's Rate Card.</td>
</tr>
<tr>
<td>DRaaS</td>
<td>Price Disk Size</td>
<td>Price Disk Size</td>
<td>The additional price for disk size (GB/hr) that applies to a virtual server with enabled DRaaS.</td>
</tr>
</tbody>
</table>

Note that when establishing replication DRaaS dashboard an additional 1GB disk is created on the shadow VS to be used to store replication metadata. The price for this additional disk corresponds to the value of the Price Disk Size set in the bucket.

<p>| DRaaS         | Price RAM                           | Price RAM    | The additional price for RAM (GB/hr) that applies to a virtual server with enabled DRaaS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |</p>
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing for compute zones</td>
<td>Price CPU Cores</td>
<td>The additional price for CPU (core/hr) that applies to a virtual server with enabled DRaaS.</td>
<td></td>
</tr>
<tr>
<td>Pricing for compute zones</td>
<td>Price CPU Shares</td>
<td>The additional price for CPU shares (%/hr) that applies to a virtual server with enabled DRaaS.</td>
<td></td>
</tr>
<tr>
<td>Pricing for compute zones</td>
<td>Price CPU Units</td>
<td>The additional price for CPU units (unit/hr) that applies to a virtual server with enabled DRaaS.</td>
<td></td>
</tr>
<tr>
<td>Pricing for compute zones</td>
<td>Price Nodes</td>
<td>The additional price for nodes (node/hr) that applies to a virtual server with enabled DRaaS.</td>
<td></td>
</tr>
</tbody>
</table>

**CPU**

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price on</td>
<td>Price per CPU core per hour, charged for powered on VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Price off</td>
<td>Price per CPU core per hour, charged for powered off VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
</tbody>
</table>

**RAM**

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price on</td>
<td>Price for RAM GB/hr, charged for powered on VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Price off</td>
<td>Price for RAM GB/hr, charged for powered off VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>The amount of RAM (GB/hr) users can request for free for the total number of their VSs built in this compute zone under this bucket</td>
<td></td>
</tr>
</tbody>
</table>

**CPU Shares**

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price on</td>
<td>Price for CPU shares %/hr, charged for powered on VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Price off</td>
<td>Price for CPU shares %/hr, charged for powered off VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>The amount of CPU shares users can request for free for the total number of their VSs built in this compute zone under this bucket</td>
<td></td>
</tr>
</tbody>
</table>

**CPU Units**

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price on</td>
<td>Price per CPU unit per hour, charged for powered on VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Price off</td>
<td>Price per CPU unit per hour, charged for powered off VSs which are built in this compute zone under this bucket</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>The number of CPU units users can request for free for the total number of their VSs built in this compute zone under this bucket</td>
<td></td>
</tr>
</tbody>
</table>

These parameters will apply to users under this bucket only if you enable the *Use CPU Units* option when adding/editing a compute zone in the Access Control.
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Cores</td>
<td>Free</td>
<td></td>
<td>The number of CPU cores users can request for free for the total number of VSs built in this compute zone under this bucket</td>
</tr>
<tr>
<td>Pricing for data</td>
<td>Disk Size</td>
<td>Price on</td>
<td>the price per GB of disk space per hour, charged for powered on VSs which are built in this data store zone under this bucket</td>
</tr>
<tr>
<td>store zones</td>
<td></td>
<td>Price off</td>
<td>the price per GB of disk space per hour, charged for powered off VSs which are built in this data store zone under this bucket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>set the amount of disk space (GB/hr) users can request for free either per hour or per month:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free per month</td>
<td>When setting <em>hourly</em> free amount using the <em>Free Disk Size</em> parameter, the user will be billed only for the disk size that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources. When setting <em>monthly</em> free amount using the <em>Free Disk Size per month</em> parameter, the free limits for resources are set per month rather than per hour. After the free limit is exceeded, all the units overused during the month will be billed hourly according to the set price.</td>
</tr>
<tr>
<td>Data Read</td>
<td>Price</td>
<td></td>
<td>the price per GB of read data per hour, charged for VSs which are built in this data store zone under this bucket</td>
</tr>
<tr>
<td></td>
<td>Free</td>
<td></td>
<td>set the amount of read data (GB/hr) users can request for free either per hour or per month:</td>
</tr>
<tr>
<td></td>
<td>Free per month</td>
<td></td>
<td>When setting <em>hourly</em> free amount using the <em>Free Data Read</em> parameter, the user will be billed only for the amount of data read that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources. When setting <em>monthly</em> free amount using the <em>Free Data Read per month</em> parameter, the free limits for resources are set per month rather than per hour. After the free limit is exceeded, all the units overused during the month will be billed hourly according to the set price.</td>
</tr>
<tr>
<td>Data Written</td>
<td>Price</td>
<td></td>
<td>the price per GB of written data per hour, charged for VSs which are built in this data store zone under this bucket</td>
</tr>
<tr>
<td></td>
<td>Free</td>
<td></td>
<td>set the amount of written data (GB/hr) users can request for free either per hour or per month:</td>
</tr>
<tr>
<td></td>
<td>Free per month</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Resource Type

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input Requests</strong></td>
<td><strong>Price</strong> Free Free per month</td>
<td>When setting <em>hourly</em> free amount using the <em>Free Data Written</em> parameter, the user will be billed only for the amount of data written that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources. When setting <em>monthly</em> free amount using the <em>Free Data Written per month</em> parameter, the free limits for resources are set per month rather than per hour. After the free limit is exceeded, all the units overused during the month will be billed hourly according to the set price.</td>
</tr>
<tr>
<td><strong>Output Requests</strong></td>
<td><strong>Price</strong> Free Free per month</td>
<td>When setting <em>hourly</em> free amount using the <em>Free Input Requests</em> parameter, the user will be billed only for the number of input requests that exceed the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources. When setting <em>monthly</em> free amount using the <em>Free Input Requests per month</em> parameter, the free limits for resources are set per month rather than per hour. After the free limit is exceeded, all the units overused during the month will be billed hourly according to the set price.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
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<td>---------------------------------------</td>
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<td>-----------------------------</td>
</tr>
<tr>
<td>Pricing for network zones</td>
<td>Port Speed</td>
<td>Price on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
</tr>
<tr>
<td>IP Addresses</td>
<td></td>
<td>Price on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free per zone</td>
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<td></td>
<td></td>
<td>Free per month</td>
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<tr>
<td></td>
<td></td>
<td>Free per Virtual Server</td>
</tr>
<tr>
<td>Data Sent</td>
<td></td>
<td>Price</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free per</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Data Received</td>
<td>Price</td>
<td>Free, Free per month</td>
</tr>
<tr>
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</tr>
<tr>
<td>Pricing for backup server zones</td>
<td>Backup</td>
<td>Price</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>Backup Disk Size</td>
<td>Price</td>
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<td></td>
<td>Template</td>
<td>Price</td>
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<tr>
<td></td>
<td>Template Disk Size</td>
<td>Price</td>
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</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
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<tr>
<td>---------------</td>
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</tr>
<tr>
<td>OVA</td>
<td>Price</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVA Disk Size</td>
<td>Price</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pricing for instance packages</td>
<td>Instance Package</td>
<td>Price on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price Overused Bandwidth</td>
</tr>
</tbody>
</table>

**Baremetal Server Type**

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing for network zones</td>
<td>IP Addresses</td>
<td>Free</td>
<td>the amount of IP address (IP/hr) users can request for free under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price</td>
<td>the price per IP per hour, charged for baremetal servers which are built in this network zone under this bucket.</td>
</tr>
</tbody>
</table>

**Smart Server Type**

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>Backups</td>
<td>Free</td>
<td>the number of backups users can create for free under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price</td>
<td>the price per backup created by the user under this bucket per hour. This price applies once the user exceeds the number of free backups available in the bucket's Rate Card.</td>
</tr>
<tr>
<td></td>
<td>Templates, ISO's &amp; Backups Storage</td>
<td>Free</td>
<td>the amount of free disk space (in GB) users can allocate to storing backups, ISOs, and templates together.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price</td>
<td></td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td>--------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pricing for compute zones</td>
<td>CPU</td>
<td>Price on</td>
<td>the price per CPU core per hour, charged for powered on smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
<td>the price per CPU core per hour, charged for powered off smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td>CPU Shares</td>
<td>Price on</td>
<td>the price for CPU shares %/hr, charged for powered on smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
<td>the price for CPU shares %/hr, charged for powered off smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>the amount of CPU shares users can request for free for the total number of their smart servers built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td>CPU Units</td>
<td>Price on</td>
<td>the price per CPU unit per hour, charged for powered on smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
<td>the price per CPU unit per hour, charged for powered off smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>the amount of CPU units users can request for free for the total number of their smart servers built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td>RAM</td>
<td>Price on</td>
<td>the price for RAM GB/hr, charged for powered on smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price off</td>
<td>the price for RAM GB/hr, charged for powered off smart servers which are built in this compute zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free</td>
<td>the amount of RAM (GB/hr) users can request for free for the total number of their smart servers built in this compute zone under this bucket.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>CPU Cores</td>
<td>Free</td>
<td>The number of CPU cores users can request for free for the total number of smart servers built in this compute zone under this bucket.</td>
</tr>
</tbody>
</table>

**Pricing for data store zones**

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource name</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing</td>
<td>Disk Size</td>
<td>Price on, Price off, Free</td>
<td>the price per GB of disk space per hour, charged for powered on smart servers which are built in this data store zone under this bucket. The price per GB of disk space per hour, charged for powered off smart servers which are built in this data store zone under this bucket. Set the amount of disk space (GB/hr) users can request for free per hour. When setting free amount using the <strong>Free Disk Size</strong> parameter, the user will be billed only for the disk size that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td>Pricing</td>
<td>Data Read</td>
<td>Price on, Price off, Free</td>
<td>the price per GB of read data per hour, charged for smart servers which are built in this data store zone under this bucket. Set the amount of read data (GB/hr) users can request for free per hour. When setting free amount using the <strong>Free Data Read</strong> parameter, the user will be billed only for the amount of data read that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td>Pricing</td>
<td>Data Written</td>
<td>Price on, Price off, Free</td>
<td>the price per GB of written data per hour, charged for smart servers which are built in this data store zone under this bucket. Set the amount of written data (GB/hr) users can request for free per hour. When setting the free amount using the <strong>Free Data Written</strong> parameter, the user will be billed only for the amount of data written that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td>Pricing</td>
<td>Input Requests</td>
<td>Price on, Price off, Free</td>
<td>the price per 1M input requests per hour, charged for smart servers which are built in this data store zone under this bucket. Set the number of input requests (1M requests/hr) users can request for free per hour. When setting free amount using the <strong>Free Input Requests</strong> parameter, the user will be billed only for the number of input requests that exceed the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------</td>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Output Requests</td>
<td>Price</td>
<td>Free</td>
<td>the price per 1M output requests per hour, charged for smart servers which are built in this data store zone under this bucket. Set the number of output requests (1M requests/hr) users can request for free per hour. When setting free amount using the <em>Free Output Requests</em> parameter, the user will be billed only for the number of output requests that exceed the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td>Pricing for network zones</td>
<td>Port Speed</td>
<td>Price on</td>
<td>the price per Mbps of port speed per hour, charged for powered on smart servers which are built in this network zone under this bucket. The price per Mbps of port speed per hour, charged for powered off smart servers which are built in this network zone under this bucket. The amount of port speed (Mbps/hr) users can request for free for the total number of their smart servers built in this network zone under this bucket.</td>
</tr>
<tr>
<td></td>
<td>Price off</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Price</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP Addresses</td>
<td>Price on</td>
<td></td>
<td>the price per IP address per hour, charged for powered on smart servers which are built in this network zone under this bucket. Set the amount of IP address (IP/hr) users can request for free per hour. When setting free amount using the <em>Free IP Addresses</em> parameter, the user will be billed only for the number of IP addresses that exceed the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td></td>
<td>Price off</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Price</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>on</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sent</td>
<td>Price</td>
<td>Free</td>
<td>the price per GB of data sent per hour, charged for smart servers which are built in this network zone under this bucket. Set the amount of data sent (GB/hr) users can request for free per hour. When setting free amount using the <em>Free Data Sent</em> parameter, the user will be billed only for the amount of data sent that exceeds the hourly free limit. The next hour, the user will again have the free hourly limit available and will pay only for the overused resources.</td>
</tr>
<tr>
<td></td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource Type</td>
<td>Resource Name</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------</td>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Data Received</td>
<td></td>
<td>Price</td>
<td>the price per GB of data received per hour, charged for smart servers which are built in this network zone under this bucket\n                                \n</td>
</tr>
<tr>
<td>Pricing for backup server zones</td>
<td>Backups</td>
<td>Price</td>
<td>the price per backup per hour, charged for the backups stored in this backup server zone under this bucket \n                                \n</td>
</tr>
</tbody>
</table>

**Other Resources**

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

OnApp buckets manage access to cloud infrastructure as well as allow you to set prices for the resources allocated to a user. In this document, you can find information on how to create and manage buckets.

6.1.3.1 Create Bucket

To create a bucket:

Go to your Control Panel > Admin > Buckets menu.

On the screen that appears, click the + button or click New Bucket at the bottom of the screen.

Complete the form on the screen that appears:

- **Label** – enter a name for the bucket
- **Monthly price** – set a monthly price for the bucket. This price will be applied regardless of the actual prices for used resources.

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

- **Currency** - set a currency to charge in

4. Specify Windows licensing support settings:

   - Tick the **Allows mak** box to enable MAK licensing for a user signed up for this bucket
   - Tick the **Allows kms** box to allow using KMS service
   - Choose **Allows own** to permit inserting custom licenses

5. Click **Save** to finish.

When the bucket is created, its Access control and Rate card are empty. That means that no resources are available under that bucket, and the prices are not configured. Click the bucket label to configure resource allocation and pricing.

6.1.3.2 Assign Users to Bucket

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

To assign a bucket to a new user:

Go to the Control Panel > Admin > Users menu. The page that loads shows all the users in your cloud.
Click the + icon or the Create User button. You will be forwarded to the first step of the user creation wizard.

Fill in the login, first and last name, email and password for the new user and click Next.

At the second step of the user creation process select the user group and one or several roles for the user from the drop-down lists. Click Next to proceed.

Select the bucket under which the user will be billed. Click Next to proceed to the final step of the user creation process.

Set the auto suspending options if required and click Save to create the user. The new user will be able to log into OnApp with the credentials you have specified during creation and will be billed according to the bucket you have selected.

To assign a bucket to an existing user:

Go to the Control Panel > Admin > Users menu. The page that loads shows all the users in your cloud.

Click the Actions icon next to the user to which you want to assign a bucket.

To assign a certain bucket to a user, select the required bucket from the drop-down list in the Buckets field. On this page, you can also change other details of the user account, e.g., login, email, password, etc.

Click Save to change the details of the user profile. After this process, the user will be billed according to the bucket you have selected.

When a user is reassigned to a new bucket all statistics as well as the user's VS prices are recalculated depending on whether CPU units are enabled in the new bucket.

6.1.3.3 Assign User Groups to Bucket
You can assign a bucket to a user group while creating or editing a group.

The total number of Virtual Servers created by all users in the group cannot exceed the Virtual Servers limit set in the bucket for that user group.

The exact number of VSs that can be allocated to each user in the group is not predefined in the group's bucket. Therefore, when one group member uses, for example, half of the group's bucket VS limit, the remaining amount of VSs is left for the rest of users in the group. To provide the exact number of VSs to specific users, you need to specify the VS limit in the individual buckets. If the VS bucket limit is reached, users will not be able to create new virtual servers. Currently, such behavior is implemented only for the virtual servers functionality.

To assign a bucket to a new user group:

Go to the Control Panel > Admin > User Groups menu. The page that loads shows all the user groups in your cloud.
Click the + icon or the **Create Group** button.

At the **Add a New User Group** page, fill in the user group details:

- **Label** - type a name for the user group
- **Buckets** - select a bucket for the user group
- **Roles** - assign role(s) that come with the appropriate **Permissions** set
- **User Buckets** - specify the list of buckets that will be available for assignment to users within this user group. This parameter relates to **restriction sets** only.

Click **Save** to create the user group. Users assigned to this group will be charged according to the bucket you have selected.

To assign a bucket to an existing user group:

Go to the **Control Panel > Admin > User Groups** menu. The page that loads shows all the user groups in your cloud.

Click the **Actions** icon next to the target user group and click the **Edit** button.

To assign a certain bucket to a user group, select the required bucket from the drop-down list in the **Buckets** field. On this page, you can also change other details of the user group, e.g., label, roles, etc.

Click **Save** to change the details of the user group. As a result, users assigned to this user group will be charged according to the bucket you have selected.

### 6.1.3.4 View List of Users Assigned to Bucket

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

To view the list of users assigned to a bucket:

Go to **Control Panel > Admin > Buckets**. The page that loads lists all the buckets in your cloud.

In the **Associated with users** column click the number next to the bucket you are interested in. This number indicates how many active users are associated with this bucket. You will be forwarded to the list of users to whom the bucket is assigned. The users which have been deleted or deactivated are not shown at this list.

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

### 6.1.3.5 Edit Bucket

To edit a bucket:

Go to your **Control Panel > Admin > Buckets** menu.

Click the **Actions** button next to the required bucket and then click **Edit**.
Change the required settings and click the **Save** button.

**EDIT BUCKET DETAILS**

![Bucket Details](image)

Editing a bucket that is associated with more than one user will affect all users attached to it. If you want to affect only a particular user, copy the bucket, assign it to this user and then edit the bucket.

6.1.3.6 **Copy Bucket**

To copy a bucket:

Go to your Control Panel > **Admin > Buckets** menu. The screen that appears will show all the buckets currently set up on the cloud.

Click the **Actions** icon next to a required bucket, then click **Copy**.

You will be forwarded to the **Access Control** section of the copied version of the original bucket. The copy will be displayed in the bucket's list at **Control Panel > Admin > Buckets** with a label consisting of ‘Bucket clone of’ and the name of the original bucket, e.g. ‘Bucket Clone of Test.Bucket’.

6.1.3.7 **Delete Bucket**

To delete a bucket:

Go to your Control Panel > **Admin > Buckets** menu. The screen that appears will show all the buckets currently set up in the cloud.

Click the **Actions** button next to a bucket and select the **Delete** option. You'll be asked for confirmation before the bucket is removed.

Deleting a bucket that is associated with more than one user will affect all users attached to it. If you want to delete or change the bucket for a particular user, go to the **Admin > Users** menu and edit the bucket in the user profile.

[https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Buckets](https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Buckets)
6.2 Calculate Billing Statistics for the Missing Period

Sometimes customers are experiencing the problem of missing billing statistics because of daemon, delayed jobs, cron, and raw statistics temporary failures. After the mentioned services get started, raw statistics data gets inserted into the DB and afterward aggregated into raw hourly statistics (in most of the cases). Having raw hourly stats in DB allows generating billing statistics based on it. That doesn't happen automatically because of peculiarities of billing statistics generation. However, it can be done manually running the rake task specifying the period (billing:calculate_hourly_stats_for_missed_period [:start_time, :end_time]).

Usage example:

```
RAILS_ENV=production rake
    billing:calculate_hourly_stats_for_missed_period
    ['2014-06-01 01:00:00','2014-06-05 23:00:00']
```

See also:

Reset Control Panel Administrator Password
Advanced Configuration Settings
Track Daemon Process Activity
Virtual Server Provisioning
https://onappcloud.typeform.com/to/A64Euy#source=Calculate%20Billing%20Statistics%20for%20the%20Missing%20Period
Leave feedback

6.3 Currencies

By default, the system includes three currencies: USD, EUR and GBP. You can add more currencies at any time. In this document you can find information on how to add, edit, and delete currencies.

6.3.1 Add Currency

Go to your Control Panel > Admin > Settings menu.
Click the Currencies icon.
On the page that follows, click the Create New button.
Fill in the form that appears:

- **name** - give the label to your currency
- **unit** - insert a currency symbol
- **code** - fill in a three-character currency code that is generally used to represent the currency you wish to add (e.g. USD, EUR)
- **separator** - specify a character used to format decimal numbers, e.g 100.99.
- **delimiter** - set a grouping character used to separate thousands, e.g: 100,000,000.

Be aware that it is prohibited to set the delimiter and separator which are identical.

**precision** - specify the number of digits after the separator. The precision parameter is used to display the costs total for a certain period, e.g. Outstanding amount, Total Cost, Payments.
**precision per unit** - the number of digits after the separator. The precision per unit parameter is used to display the prices for the resources, e.g. for CPU, Disk size, RAM, IP, Data stores, Edge servers, Disks, Backups, Templates, etc.

The precision cannot exceed 8 symbols.

**format** - set how the currency will be displayed in the Control Panel. Use the following parameters:

- `%n` - for the digits
- `%u` - for the currency symbol

Click **Save**.

Now you have the currency configured in the system. To use it further, you have to associate it with a **bucket**: create a new bucket or edit the existing one.

**6.3.2 Edit Currency**

Go to your **Control Panel > Admin > Settings** menu.

Click the **Currencies** icon.

Click the **Actions** icon next to the necessary currency on the list and select the **Edit** option. On the screen that appears, you may edit the following currency details:

- **name** - the label of your currency
- **unit** - a currency symbol
- **code** - a three-character currency code that is generally used to represent the currency you wish to add
- **separator** - a character used to format decimal numbers, e.g. 100.99.
- **delimiter** - a grouping character used to separate thousands, e.g. 100,000,000.

Be aware that it is prohibited to set the delimiter and separator which are identical.
**precision** - the number of digits after the separator. The precision parameter is used to display the costs total for a certain period, e.g. Outstanding amount, Total Cost, Payments.

**precision per unit** - the number of digits after the separator. The precision per unit parameter is used to display the prices for the resources, e.g. for CPU, Disk size, RAM, IP, Data stores, Edge servers, Disks, Backups, Templates, etc.

The precision cannot exceed 8 symbols.

**format** - how the currency will be displayed in the control panel. Use the following parameters:

%\(n\) - for the digits

%\(u\) - for the currency symbol

Click **Save**.

### 6.3.3 Delete Currency

Go to your **Control Panel** > **Admin** > **Settings** menu.

Click the **Currencies** icon.

Click the **Actions** icon next to the currency you want to remove and select the **Delete** option. You will be asked for confirmation before the currency is deleted.

You cannot delete a currency that is associated with a bucket.

See also:
- Localization and Customization Search
- Look & Feel
- Control Panel Configuration
- https://onappcloud.typeform.com/to/A64Euy#source=Currencies

### 6.4 Instance Packages

Instance packages are preconfigured CPU/RAM/Disk/Bandwidth packages that can be selected during the VS creation process. You can add multiple instance packages specifying different values for the parameters to suit your customer's needs. Resources that are not set when creating an instance package (for example, swap disk size) are calculated automatically.

Instance packages make it easier for users to create virtual servers. The users simply need to select one of the instance packages available to them in the wizard. However, it is still possible to set the VS resources manually if required. Instance packages apply only to virtual servers created on KVM compute resources.

To provide your users with the ability to choose VS resources from the predefined instance package(s), add the necessary packages to the users' bucket(s). After that, instance packages will appear in the server creation wizard, on the Resources step.

### 6.4.1 Set Up Instance Packages for Cloud

To enable your users to create virtual servers using instance packages, you need to perform the following configurations:

- Enable the instance packages permission
- Add instance package(s) to your cloud
- Add the instance package(s) to the users' bucket
Interface configuration

Build virtual server using instance packages

6.4.1.1 Enable the instance packages permission

In OnApp, there are two permissions that control how resources are selected during virtual server creation: Select resources manually on virtual server creation and Select instance package on virtual server creation. You can enable one or both of these permissions for your users. By default, users with the role User have the Select resources manually on virtual server creation enabled. If you want your users to be able to select instance packages during virtual server creation, you need to enable the Select instance package on virtual server creation permission. Depending on the permissions, the Resources step of the virtual server creation wizard can be different:

If both the Select resources manually on virtual server creation and Select instance package on virtual server creation permissions are enabled, the user will be able to choose whether to create a VS using an instance package or by setting resources manually.

If you disable the Select resources manually on virtual server permission and enable the Select instance package on virtual server creation permission, the user will be able to select VS resources only from the instance package(s) available to that user.

If you disable the Select instance package on virtual server creation permission and enable the Select resources manually on virtual server permission, the user will only be able to select resources manually.

If you are adding a custom role, make sure to enable either the Select resources manually on virtual server creation or the Select instance package on virtual server creation permission or both if required. If the user does not have any of these permissions enabled, they will not be able to create virtual servers.

For the list of OnApp permissions, refer to the Permissions List section.

6.4.1.2 Add instance packages to your cloud

After you enable the necessary permissions for your user(s), you need to add instance packages to your cloud. When you add a new instance package, you set CPU/RAM/Disk/Bandwidth. You can add multiple instance packages to provide your customers with a number of predefined packages to choose from. Resources that are not set when creating an instance package are calculated automatically.

To create an instance package:

Go to your Control Panel > Admin > Instance packages menu.

The screen that appears shows the list of all instance packages. Click + button at the top of the screen.
Complete the form on the screen that follows:

**Label** - fill in the name of the instance package.

**CPUs** - move the slider to set the number of CPU cores available in the instance package. The maximum CPUs value is 8.

**Memory** - move the slider to set the RAM size available in the instance package. The maximum value is 16384 MB by default.

**Disk Size** - move the slider to set the Disk size available in the instance package. The maximum value is 100 GB by default. The maximum disk size cannot be larger than the largest data store size in your cloud.

**Bandwidth** - move the slider to set the bandwidth available in the instance package, the maximum value is 1000 GB by default. Otherwise, tick the check box to set bandwidth to unlimited.

If the user exhausts the bandwidth limit, the resources they overuse will be calculated according to the bucket’s Overused Bandwidth price in the **Limits for Instance packages** section.

You can change the default minimum and/or maximum values for memory, disk size and bandwidth by adding the following parameters to the config/on_app.yml file and restarting OnApp services together with httpd service:

- `instance_package_min_disk_size` (GB)
- `instance_package_max_disk_size` (GB)
- `instance_package_max_memory` (MB)
- `instance_package_min_bandwidth` (GB)
- `instance_package_max_bandwidth` (GB)

You can change the default maximum value for CPU by making updates to the **info_hub.yml** file.

**Click here to change the default maximum CPU value:**

1. Open the **info_hub.yml** file which can be found at `/onapp/interface/config`:
   ```bash
   vi /onapp/interface/config/info_hub.yml
   ```

2. Navigate to the **virtual_machine** section:
virtual_machine:
  min_cpus: 1
  max_cpus: 8
  min_memory: 128
  min_swap_size: 1
  max_swap_size: 3
  cpu_sockets_min: 1
  cpu_sockets_max: 16
  cpu_threads_min: 1
  cpu_threads_max: 16
  cores_per_socket_min: 1
  cores_per_socket_max: 32

vcloud:
  min_memory: 4
  max_memory: 1048576
  max_cpus: 32

3. These changes will be overwritten by any OnApp update. Thus, the permanent file with the changes should be created and named

info_hub.local:

Virtual_machine:
  max_cpus: 8

4. Edit the following values to the required ones and restart OnApp services:

service monit stop
service crond stop
service onapp stop
service httpd stop
service httpd start
service onapp start
service crond start
service monit start

Click Save to finish. Now you have a configured instance package. In order for it to be available to a user in VS Creation wizard, you have to add it to the user's bucket.

How are other VS resources calculated?
The following resources are set automatically for instance packages:

CPU Priority - CPU priority is automatically set to 100

Swap disk size - swap disk size can have the size of 1/2/3 GB. Its size is calculated by multiplying the RAM by two. If the calculated value is larger than three, the swap disk size is set to 3. If the calculated value is smaller than three, it is rounded to the closest value from the 1/2/3 range that is larger than the calculated size. If the calculated value is larger than the disk size set for the instance package, the swap disk is not added to the VS.

IP address - the first available IP address is selected

Port speed - depends on the bucket limit. If the port speed Max limit in the bucket is set to unlimited, the port speed in the instance package will also be set to unlimited. If the port speed Max limit in the bucket is set to a certain value, the port speed in the instance package will be set to that same value.

6.4.1.3 Add the instance package(s) to the users’ bucket
Once you created the instance packages, they can be added to bucket(s). This step is required to bundle the instance packages with the specific compute/data store/network zones. To add limits for instance packages:
Go to the Admin > Buckets list and click the label of the bucket to which you want to add instance or create a new bucket.

Click + button in the upper right corner of the Limits for Instance packages box.

In the window that pops up, select the target instance package and the compute zone(s), data store zone(s) and network zone(s) to which the instance package will apply. Click Add Resource.

Set the price that will be charged per VS powered on/off for each appropriate instance package. You can also set the pricing for overused bandwidth per GB/hr.

Instance packages apply only to KVM compute zones. If you select a vCloud Director or VMware compute zone, the instance package will not be displayed in the virtual server creation wizard.

If you do not select any compute/data store/network zones, the instance package will apply to all compute/data store/network zones available for the user.

It is advisable that you limit the user's bucket by the compute zones that have enough resources to support the instance package(s) you add to the user's bucket. If the user selects a compute zone that does not have enough resources during virtual server creation, they will see all instance packages available to them, but those that have resources incompatible with the chosen compute zone will be greyed out. Greyed out instance packages cannot be selected.

Note that Instance package VSs can only be created on compute resources within compute zones where all compute resources are assigned the same amount of CPU units. If there are compute resources with different amount of CPU units set in a zone, it will not be possible to create Instance package VSs in such zones. The reason is that CPU priority for Instance package VSs in this configuration cannot be set to 100%, which is the default value for such virtual servers.

If required, you can edit the zones to which the instance package applies:

Go to the Admin > Buckets list and click the label of the bucket you are interested in.

Click the Actions button next to the instance package you are interested in and select Edit.

In the window that pops up, edit the compute resource/data store/network zone(s) and click Update.

If there is a VS created on a compute/data store/network zone which you remove while editing the bucket, the VS will still be billed according to the instance package.

Also, you can delete instance packages from the bucket:

Go to the Buckets list and click the label of the bucket you are interested in.

Click the Actions button next to the instance package you want to remove and select Delete. You will be asked for confirmation before the instance package is removed from the bucket.

You cannot delete the Instance packages that are used for existing VSs.

After you add instance packages to the user's bucket, they will be available in the virtual server creation wizard at the Resources step.
6.4.1.4 Interface configuration

After you add instance packages to the user's bucket, you can configure how instance packages will be displayed in the virtual server creation wizard. This step is optional.

Instance packages can be displayed either in card or list view. Displaying instance packages in card view is convenient if there is one or several instance packages available to the user.

Instance packages can be displayed in card or list view. Displaying instance packages in card view is convenient if there is one or several instance packages available to the user.

To change the layout of instance packages in the virtual server creation wizard:

- Go to your Control Panel Admin > Settings menu, and click the Configuration icon.
- The page that loads is the System tab. At the bottom of this page, set the Instance packages number parameter. The default value is 3.
- Click Save Configuration.

6.4.1.5 Build Virtual Server Using Instance packages

Once you have performed the above configurations, the instance packages can be selected during a virtual server creation.

Depending on the permissions, users will be able to select an instance package, set resources manually or choose one of these options on the Resources step.

<table>
<thead>
<tr>
<th>Instance Packages</th>
<th>Create Your Own</th>
</tr>
</thead>
</table>

### DataBase Server

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPUs</td>
<td>2 Core(s)</td>
</tr>
<tr>
<td>Memory</td>
<td>3.26 GB</td>
</tr>
<tr>
<td>Disk Size</td>
<td>25 GB</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>116 GB</td>
</tr>
</tbody>
</table>

### mid

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPUs</td>
<td>2 Core(s)</td>
</tr>
<tr>
<td>Memory</td>
<td>1 GB</td>
</tr>
<tr>
<td>Disk Size</td>
<td>20 GB</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>-</td>
</tr>
</tbody>
</table>

### example

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPUs</td>
<td>1 Core(s)</td>
</tr>
<tr>
<td>Memory</td>
<td>1 GB</td>
</tr>
<tr>
<td>Disk Size</td>
<td>10 GB</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>160 GB</td>
</tr>
</tbody>
</table>

However, if the user can choose among a large number of instance packages, it is more convenient to view instance packages in list view.

To change the layout of instance packages in the virtual server creation wizard:

- Go to your Control Panel Admin > Settings menu, and click the Configuration icon.
- The page that loads is the System tab. At the bottom of this page, set the Instance packages number parameter. The default value is 3.
- Click Save Configuration.

### If the user selects a compute zone that does not have enough resources during VS creation, the instance packages that have resources incompatible with the chosen compute zone will be grayed out and unavailable.

### If there are no available IP addresses during VS creation, all instance packages will be grayed out in the wizard.

Check production_allocation.log to see why some resources are not suitable for a particular virtual server while adding/editing this VS using an instance package.

From this tab, you can choose one of the predefined instance packages for your virtual server. For each of the instance packages the following details are displayed:

- **Memory** - the RAM size (GB) available in the instance package
- **CPUs** - the number of CPU cores available in this instance package
- **Disk Size** - the disk size available in this instance package
- **Bandwidth** - the bandwidth available in this instance package
- **Price per Hour**:
  - **Mode ON** - hourly instance package price for the VS powered on
  - **Mode OFF** - hourly instance package price for the VS powered off
- **Price per Month**: 

```plaintext
Memory - the RAM size (GB) available in the instance package
CPUs - the number of CPU cores available in this instance package
Disk Size - the disk size available in this instance package
Bandwidth - the bandwidth available in this instance package
Price per Hour:
Mode ON - hourly instance package price for the VS powered on
Mode OFF - hourly instance package price for the VS powered off
Price per Month:
```
Mode ON - monthly instance package price for the VS powered on

Mode OFF - monthly instance package price for the VS powered on

Click the instance package to select it. After that, the instance package you have chosen will be highlighted in green.

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

You are forwarded to the next step from the tab you are currently on. If you select an instance package and then click the *Create Your Own* tab (where you set the resources manually) and proceed to the next step, the system will set the resources from the *Create Your Own* tab even if you did not configure any resources there.

Virtual servers created using instance packages do not support autoscaling.

The virtual servers you create using the *Instance packages* tab will be billed according to one of your preconfigured instance packages.

### 6.4.2 Billing for Instance Packages

Virtual servers that are built using instance packages are billed differently than VSs built by configuring resources manually. To set up billing for instance packages, you need to perform two steps:  

1. Add an instance package to your cloud and configure resources available to VS that will be built on the basis of this instance package.
2. Add the instance package to the bucket's Access Control and set prices charged for the instance package VS in the Rate Card.

#### 6.4.2.1 Add instance packages to your cloud

To set up billing for instance packages, at first configure the number of resources available in the package at the **Admin > Instance packages > Create Instance package** menu. The users who build a VS applying that instance package will be limited to:

- **CPUs** - the number of CPU cores available in the instance package. The maximum CPUs value is 8.
- **Memory** - the RAM size (GB) available in the instance package. The maximum value is 16384 MB by default.
- **Disk Size** - the disk size available in the instance package. The maximum value is 100 GB by default. The maximum disk size cannot be larger than the largest data store size in your cloud.
- **Bandwidth** - the bandwidth available in the instance package. The maximum value is 1000 GB by default. Otherwise, tick the checkbox to set bandwidth to unlimited.

You can change the default minimum and/or maximum values for memory, disk size and bandwidth by adding the following parameters to the `config/on_app.yml` file and restarting OnApp services:

- `instance_package_min_disk_size` (GB)
- `instance_package_max_disk_size` (GB)
- `instance_package_max_memory` (MB)
- `instance_package_min_bandwidth` (GB)
- `instance_package_max_bandwidth` (GB)

You can change the default maximum value for CPU by making updates to the `info_hub.yml` file.

**Click here to change the default maximum CPU value:**

1. Open the `info_hub.yml` file which can be found at `/onapp/interface/config/`.

---

617
2. Navigate to the virtual machine section:

```
vi /onapp/interface/config/info_hub.yml
```

```yaml
virtual_machine:
  min_cpus: 1
  max_cpus: 8
  min_memory: 128
  min_swap_size: 1
  max_swap_size: 3
  cpu_sockets_min: 1
  cpu_sockets_max: 16
  cpu_threads_min: 1
  cpu_threads_max: 16
  cores_per_socket_min: 1
  cores_per_socket_max: 32
  vcloud:
    min_memory: 4
    max_memory: 1048576
    max_cpus: 32
```

3. These changes will be overwritten by any OnApp update. Thus, the permanent file with the changes should be created and named info_hub.local:

```
Virtual_machine:
  max_cpus: 8
```

4. Edit the following values to the required ones and restart OnApp services:

```
  service monit stop
  service crond stop
  service onapp stop
  service httpd stop
  service httpd start
  service onapp start
  service crond start
  service monit start
```

Add instance packages to the bucket

After you create instance packages in your cloud, you need to add them to the bucket. You give users under the bucket access to the instance package(s) in the Access Control and set a price for each instance package per powered on/off VSS and per overused bandwidth in the Rate Card. In the Access Control, you can select the instance package and zone(s) in which this package will be available for users. If no zones are selected for the instance package that you added to the Access Control, the instance package will be available in all compute, network, and data store zones.

There is also a number of VS resources that are not configured during the instance package creation but are set automatically or differ from the standard procedure.

Click here to see the list of those.

<table>
<thead>
<tr>
<th>Resource type</th>
<th>Resource</th>
<th>Default Value</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Priority</td>
<td>100</td>
<td>CPU priority is automatically set to 100.</td>
<td></td>
</tr>
</tbody>
</table>
### Resource type

<table>
<thead>
<tr>
<th>Limits for Compute Zones</th>
<th>Resource</th>
<th>Default Value</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Free bucket limits for compute zones</td>
<td>N/A</td>
<td>The Free bucket limits for compute zones do not apply to Instance package VSs.</td>
</tr>
<tr>
<td></td>
<td>The Max bucket limits for compute zones</td>
<td>configurable</td>
<td>Max limits for compute zone resources apply to Instance package VSs. The CPUs and Memory limits set in the instance package cannot exceed the corresponding limits in the bucket. If you create an instance package that exceeds the bucket limits, you will be able to add this instance package to a bucket and it will appear as available in the VS creation wizard. However, if this instance package is selected in the wizard, an error will occur after you try to proceed to the next step of the wizard.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limits for Data Store Zones</th>
<th>Resource</th>
<th>Default Value</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Free bucket limits for data store zones</td>
<td>N/A</td>
<td>The Free bucket limits for data store zones do not apply to Instance package VSs.</td>
</tr>
<tr>
<td></td>
<td>The Max bucket limits for data store zones</td>
<td>configurable</td>
<td>Max limits for data store resources apply to Instance package VSs. The Disk Size limit set in the instance package cannot exceed the corresponding limit in the bucket. If you create an instance package that exceeds the bucket limit, you will be able to add this instance package to a bucket and it will appear as available in the VS creation wizard. However, if this instance package is selected in the wizard, an error will occur after you try to proceed to the next step of the wizard.</td>
</tr>
</tbody>
</table>

| Data Read/written | N/A | The VSs disk size will be defined by the disk size indicated in the selected instance package. |
| Input/output Requests | N/A | The VSs disk size will be defined by the disk size indicated in the selected instance package. |
| Swap Disk Size | 1/2/3 GB | The size is calculated by multiplying the RAM by two. If the calculated value is larger than three, the swap disk size is set to 3. If the calculated value is smaller than three, it is rounded to the closest value from the 1/2/3 range that is larger than the calculated size. If the calculated value is larger than the disk size set for the instance package, the swap disk is not added to the VS. |

<table>
<thead>
<tr>
<th>Limits for Network Zones</th>
<th>Resource</th>
<th>Default Value</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address</td>
<td>the first available IP address is assigned</td>
<td>One IP address is assigned to the Instance package VS for free. If a user wants to assign an additional IP address to such a VS: In case there are available units according to the Free IP address limit in the bucket, the additional IP address will be assigned for free.</td>
<td></td>
</tr>
</tbody>
</table>
### 6.4.3 Edit Instance Package

You can edit all the resources set for an instance package.

To edit an instance package:

Go to your Control Panel > Admin > Instance packages menu.

The screen that appears, shows the list of all instance packages. Click the Actions button next the instance package you are interested in and select Edit.

Only those instance packages that are not used in a bucket and during VS creation can be edited. If you try to edit an instance package that is used an error message will appear.

On the page that loads, you can edit the following details:

- **Label** - edit the name of the instance package.
- **CPUs** - move the slider to set the number of CPU cores available in the instance package. The maximum CPUs value is 8.
- **Memory** - move the slider to set the RAM size (MB) available in the instance package. The maximum value is 16384 MB by default.
- **Disk Size** - move the slider to set the Disk size (GB) available in the instance package. The maximum value is 100 GB by default.
- **Bandwidth** - move the slider to set the bandwidth (GB) available in the instance package. The maximum value is 1000 GB by default. Otherwise, tick the check box to set bandwidth to unlimited.

Click Save to finish.
You can change the default maximum value for CPU by making updates to the info_hub.yml file.

**Click here to change the default maximum CPU value:**

1. Open the info_hub.yml file which can be found at /onapp/interface/config/:

```
vi /onapp/interface/config/info_hub.yml
```

2. Navigate to the virtual_machine section:

```
virtual_machine:
  min_cpus: 1
  max_cpus: 8
  min_memory: 128
  max_memory: 3
  cpusockets_min: 1
  cpusockets_max: 16
  cpthreads_min: 1
  cpthreads_max: 16
  cores_per_socket_min: 1
  cores_per_socket_max: 32
  vcloud:
    min_memory: 4
    max_memory: 1048576
    max_cpus: 32
```

3. These changes will be overwritten by any OnApp update. Thus, the permanent file with the changes should be created and named info_hub.local:

```
Virtual_machine:
  max_cpus: 8
```

4. Edit the following values to the required ones and restart OnApp services:

```
service monit stop
service crond stop
service onapp stop
service httpd stop
service httpd start
service onapp start
service crond start
service monit start
```

### 6.4.4 Delete Instance Package

Go to your Control Panel > **Admin** > **Instance packages** menu.

The screen that appears, show the list of all instance packages. Click the **Actions** button next the instance package you are interested in and select **Delete**. You will be asked for confirmation before the instance package is removed.

Only those instance packages that are not used in a bucket and during VS creation can be deleted. If you try to delete an instance package that is used an error message will appear.

**See also:**

- Create Virtual Server
- Configure Resource Allocation and Prices
6.5 Payments

OnApp provides a possibility to add information about payments to OnApp Control Panel. Payments are already paid invoices for used resources. User payments are those which you charge for the resources created on KVM compute resources.

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

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

6.5.1 Create payment

To create a payment:

Go to your Control Panel > Admin > Payments menu.

On the screen that appears, you will see the list of all user payments. Click the New Payment button or the + button.

Complete the form on the screen that follows:

User – the name of a user, who makes the payment. This parameter appears only for user payments.

Invoice Number – the serial number of a paid invoice

Amount – the money amount which was paid

Click Save.

You can also create and manage payments for a particular user at Control Panel > Admin > Users and Groups menu > User's name > Payments tab.

6.5.2 Edit payment

To edit a payment:

Go to your Control Panel > Admin > Payments menu.

On the screen that appears, you will see the list of all user payments. Click the Actions button next to the payment you want to edit, then click Edit.

Make changes on the screen that follows:

User – write the name of a user, who conducted the payment. This parameter appears only for user payments.
Invoice Number – put the serial number of a paid invoice
Amount – change the money amount which was paid

Click Save.

### 6.5.3 Delete payment

To delete a payment:

Go to your Control Panel > Admin > Payments menu.

On the screen that appears, you will see the list of all user payments. Click the Actions button next to the payment you want to delete, then click Delete.

Confirm the deletion.

https://onappcloud.typeform.com/to/A64Euy#source=Payments Leave feedback
7 Networking

The Control Panel's Network Settings menu is where you get detailed control over low-level cloud settings for networks, network zones, firewalls, resolvers. Refer to the sections below for more information.

https://docs.onapp.com/display/TEST2/Create+and+Manage+Networks+v6.7 Networks
https://docs.onapp.com/display/TEST2/Network+Zones+v6.7 Network Zones

https://docs.onapp.com/display/TEST2/SDN+Management+v6.4 SDN
https://docs.onapp.com/display/TEST2/Resolvers+Settings+v6.4 Payments

To be able to provide IP addresses to the virtual servers you need to:
1. Create a network zone of the virtual type.
2. Create a network and specify the network zone you wish to assign it to.
3. Add an IP net to the new network.
4. Add IP ranges to the new IP net.

7.1 Create and Manage Networks

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. IPs that are not assigned to a user or a VS are not displayed on the network details page but they are available for selection during virtual server creation or when assigning IPs to users.

7.1.1 Create Network

To add a new network:
Go to your Control Panel > Admin > Settings menu.
Click the Networks icon. The page that loads shows the shared networks in your cloud. For information on how to add other types of networks, refer to Organization Networks and Create and Manage vApp Networks.

Click the upper right or the Add New Network button lower right.

On the screen that follows, specify the following network details:

Label - choose a name for the network

Vlan - fill in a VLAN number. The VLAN field only needs to be given a value if you are tagging the IP addresses you will add to this network with a VLAN ID (IEEE 802.1Q). If you plan to tag
IP addresses in this way, you need to make sure the link to the public interface on the compute resources is a trunk network port. If you are not VLAN tagging addresses, this field can be left blank and the public port on the compute resource can be an access port. You can also enter a VXLAN segment ID which will in turn create the VXLAN wire across the compute resources.

**Network group** - assign the network to a network zone. When you add a network to a network zone, the network inherits the zone's type. It will be possible to move such a network only to a network zone of the same type. For more information, refer to [Zone Types](#).

**Type** - the type of the network, select *Shared Network* - the default type of network in OnApp where users receive an IP address on the network they have access to.

Click the **Submit** button to finish.

---

### 7.1.2 Edit Network

To change the name, VLAN or network zone of an existing network:

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **Networks** icon. The page that loads shows the shared networks in your cloud.

Click the **Actions** button next to the network you want to change, then click **Edit**.

On the screen that follows, change the details of the network:

**Label** - the name of the network

**VLAN** - a VLAN number. The VLAN field only needs to be given a value if you are tagging the IP addresses you will add to this network with a VLAN ID (IEEE 802.1Q). If you plan to tag IP addresses in this way, you need to make sure the link to the public interface on the compute resources is a trunked network port. If you are not VLAN tagging addresses, this field can be left blank and the public port on the compute resource can be an access port. You cannot edit this parameter for Org networks.

**Network group** - you can reassign the network to another network zone. It is possible to move networks only between network zones of the same type. For more information, refer to [Zone Types](#). You cannot edit this parameter for Org networks.

**Shared** - whether this network is shared or not. This parameter is applicable only for vCloud Org networks.

Click the **Update** button to save the changes.

---

### 7.1.3 Delete Network

Before deleting a network, please, ensure that it is detached from compute zone and compute resources.

You cannot delete a vCenter network.

To delete an existing network, so it is no longer available as a cloud resource:

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **Networks** icon. The page that loads shows the shared networks in your cloud.

Click the **Actions** button next to the network you want to remove, then click **Delete**.
Confirm the deletion.

### 7.1.4 Add Additional Network

To set up an additional network:

Ensure you are using a trunk port from the switch to your compute resource for VS networking, this is required to add more than one network to a single compute resource network interface. **Create a new network** with a label for the new network and the VLAN number. **Add an IP ranges** to the new network (can be public or private IPs). Assign this network either to a **compute resource** or a **compute zone**. Specify the same network interface as you currently use for your primary network.

**See also:**
- Networking
- IP Nets
- IP Ranges
- Virtual Servers
- Control Panel Configuration
- [https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Networks](https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Networks)

### 7.1.5 Assign/Unassign IP Address to User

You can assign and and unassign IP addresses to users from the network overview page.

**You can assign and unassign IP addresses from shared networks only.**

#### 7.1.5.1 Assign IP Address to User

You can assign an IP address or several IP addresses to a particular user, so that they could create a VS based on it:

Go to your **Control Panel > Admin > Settings** menu.

Click the **Networks** icon. The page that loads shows the shared networks in your cloud.

Click the name (label) of the network from which you wish to assign an IP address to a user.

Click the **Assign IP addresses** button.

On the window that pops up, select the following parameters:

- **IP net** - select from the drop-down list the IP net from which the IP address should be assigned
- **IP range** - select from the drop-down list the IP range from which the IP address should be assigned
- **User** - select from the drop-down list the user to whom you wish to assign IP addresses
- **Selection** - type in the IP address you wish to assign and click **Add**. You can assign multiple IPs from the same form by filling in an address in the **Selection** field, clicking **Add** and repeating the process for all the required IPs.

You can assign a range of IPs by typing them in one of the following formats: 192.168.128.11-20, 192.168.128.11-192.168.128.20 or 192.168.128.11/30. If one or several IPs from the range are assigned to a different user or to VSs that do not belong to the required user, the IP range will not be assigned.

The IP addresses and ranges that are to be assigned appear in the **IP Addresses** field. If you
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7.1.5.2 Unassign IP Address from User
You can unassign an IP Address from a particular user at any time:

Go to your **Control Panel** > **Admin** > **Settings** menu.

Click the **Networks** icon.

Click the name (label) of the network from which you wish unassign an IP address.

Click the **Unassign IP addresses** button.

On the window that pops up, select the following parameters:

- **User** - select from the drop-down list the user/s from which you wish to unassign the IP address
- **IP addresses** - select from the drop-down list one or more IP addresses you wish to unassign from a user

Click the **Unassign** button.

See also:

- Network Settings
- IP Nets
- IP Ranges

https://onappcloud.typeform.com/to/A64Euy#source=Assign/Unassign%20IP%20Address%20to%20User

7.1.6 IP Nets

IP nets contain the IP address ranges of the network. You can add new IP nets to the network, edit and delete the existing nets and add and edit IP ranges in the IP nets. For information on how to add IP ranges to IP nets, refer to **IP Ranges**.

You can add IP nets only to shared networks.

7.1.6.1 Create IP Net

To add an IP net to a network:

Go to your **Control Panel** > **Admin** > **Settings** > **Networks** icon. The page that loads shows the shared networks in your cloud.

Click the label of the network to which you want to add an IP net.

On the page that loads, click the **New IP Net** button.

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

Currently, assigning multiple IPs to a user works only with IPv4.
Allow gateway to be outside from Ip Net - select the checkbox to allow the gateway to be outside from the IP net

Add default IP range - select the 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.

Click Submit to finish.

7.1.6.2 Edit IP Net
To edit an IP net:

Go to your Control Panel > Admin > Settings > Networks icon. The page that loads shows the shared networks in your cloud.

Click the label of the network which contains the IP net you wish to edit.

Click the Actions button next to the IP net you want to modify and select Edit.

Edit the details of the IP net:

Label - the name of the IP net
If the IP net does not contain any IP ranges, you can also edit the following parameters:

network address - the network address of the IP net

network mask - the network mask

Click Submit to save changes.

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

To delete an IP net:

Go to your Control Panel > Admin > Settings > Networks icon. The page that loads shows the shared networks in your cloud.

Click the label of the network to which you want to add an IP net.

Click the Actions button next to the required IP net and select Delete.

See also:
Network Settings
IP Nets
IP Ranges
Virtual Servers
OnApp Configuration
https://onappcloud.typeform.com/to/A64Euy#source=IP%20Nets

7.1.7 IP Ranges

IP ranges reside inside IP nets and include the IP addresses within your cloud that are either assigned to a user or/and used by a VS. The IPs that are neither assigned to a user nor a VS, are not shown in the IP range list, but are available during VS creation. You can add new IP ranges and edit and delete the existing ones. To add IP ranges you first need to create a network and then add an IP net to that network.

You can manage IP ranges only for shared networks.

7.1.7.1 Add IP Range to IP Net
To add an IP range to an IP net:
Go to your Control Panel > Admin > Settings > Networks icon. The page that loads shows the shared networks in your cloud.

Click the label of the network to which you want to add an IP net.

Click the Actions button next to the required IP net and select Add New IP Range.

Fill in the the start and end address and the default gateway of the new IP range.

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.

7.1.7.2    Edit IP Range
To edit an IP range in an IP net:

Go to your Control Panel > Admin > Settings > Networks icon. The page that loads shows the shared networks in your cloud.

Click the label of the required network.

Click the IP net in which you want to edit an IP range.

Click the Actions button next to the required IP range and select Edit.

Fill in the the start and end address and the default gateway of the IP range.

If you edit an IP range that includes used IPs, the edited range should include these IPs after the changes.

Click Submit to save the changes.

7.1.7.3    Delete IP Range
Go to your Control Panel > Admin > Settings > Networks icon. The page that loads shows the shared networks in your cloud.

Click the label of the required network.

Click the IP net in which you want to edit an IP range.

Click the Actions button next to the required IP range and select Delete.

See also:
Network Settings
IP Nets
IP Ranges
Virtual Servers
OnApp Configuration
https://onappcloud.typeform.com/to/A64Euy#source=IP%20Ranges

7.2    Network Zones

Network zones can be used to create different tiers of service – for example, by setting up different zones for different network resources in the cloud. Zones can also be used to create private clouds for specific users.

Network zones have types which are inherited by the networks in the zone. Later networks can be attached to a compute resource/compute zone of the same type. Networks can be moved from one network zone to another, but the zones should be of the same type. For more
information, refer to Zone Types. The table below demonstrates the available network zone types for different networks:

<table>
<thead>
<tr>
<th>Network Type</th>
<th>Network Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCloud Director</td>
<td>VPC</td>
</tr>
<tr>
<td>Other</td>
<td>Virtual/Smart/Baremetal</td>
</tr>
</tbody>
</table>

Network zones represent segments of your network connected to the firewall and controlled by it. Network zoning improves security and privacy for users, servers, etc. Network zones usually have types which are inherited by the networks in the zone. Later networks can be attached to a compute resource/compute zone of the same type. For more information, refer to Zone Types.

You can create new network zones, view existing network zones and its details, edit network zones as well as add and remove networks from network zone. For more information on network settings, refer to Networking.

### 7.2.1 Create Network Zone

Go to your Control Panel > Admin > Settings menu.

On the page that appears, click the Network Zones icon.

On the following page, click upper right or the Create Network Zone button lower right.

On the screen that appears, fill in the following:

- **Label** - give your network zone a name
- **Server type** - choose the server type from the drop-down box:
  - virtual - for Xen, KVM, or CloudBoot zone
  - smart - for a smart zone
  - baremetal - for a baremetal server zone
  - Virtual Private Cloud - for a vCloud Director zone
- **Infrastructure** - type reserved for future functionality and should not be selected

The zone's type cannot be changed after the zone is created.

- **Location group** - select from the drop-down list the location group you wish to assign this network zone to
- **Instance Package VSs** - move the slider to the right if you want the zone to be used when creating Instance Package VSs only. If you enable this option, the zone will not be available in the virtual server creation wizard's Resources step for custom VSs (VSs built by setting resources manually).

5. Click the Save button.

### 7.2.2 Edit Network Zone

Go to your Control Panel > Admin > Settings menu.

On the following page, click the Network Zones icon.
The screen that appears will show all network zones currently set up in the cloud. Click a zone’s label (name) to see the details of the zone and to access the functions for adding/removing networks to/from the zone.

To change the network zone's label and location group, click the **Actions** button next to **required zone**, then click **Edit**.

- **Label** - the name of the zone
- **Location group** - the location group with which the zone is associated. You can change the already assigned location only if there are no network joins, IP addresses or name servers within networks in this zone.
- **Instance Package VSm** - move the slider to the right if you want the zone to be used when creating Instance Package VSm only. If you enable this option, the zone will not be available in the virtual server creation wizard's **Resources** step for custom VSm (VSm built by setting resources manually).

Click **Save**.

### 7.2.3 Add Networks to Network Zone

Go to your Control Panel > **Admin > Settings** menu and click the **Network Zones** icon.

Click the label of the zone you want to add a network to. The screen that appears will show you all networks in the cloud, organized into two lists – those assigned to the zone already, and those that are unassigned.

In the unassigned list, find the network you want to add to the zone and click the **Add** icon next to it.

When you add a network to a network zone, the network inherits the zone’s type. For more information, refer to **Zone Types**.

### 7.2.4 Remove Networks from Network Zone

Go to your Control Panel > **Admin > Settings** menu and click the **Network Zones** icon.

Click the label of the zone you want to remove a network from. The screen that appears will show you all networks in the cloud, organized into two lists – those assigned to the zone already, and those that are unassigned.

In the assigned list, find the network you want to remove, and click the **Delete** icon next to it.

### 7.2.5 Delete Network Zone

Go to your Control Panel > **Admin > Settings** menu.

On the following page, click the **Network Zones** icon.

To remove a network zone from the cloud, click the **Actions** button next to the zone, then click **Delete**.

Confirm the deletion.

**See also:**

- Network Settings
- IP Nets
- IP Ranges

https://onappcloud.typeform.com/to/A64Euy#source=Network%20Zones

Leave feedback
7.3 Resolvers Settings

OnApp Resolvers are names given to computers located with institutional networks and are used to meet user's request of a domain name. Resolvers work like DNS servers – they translate a hostname to an IP address, thus, linking your computer and the Internet's DNS infrastructure.

You should specify at least 2 resolvers for each network in OnApp. When a new VS is provisioned, these resolvers are injected into the resolver configuration automatically.

7.3.1 Create Resolver

Go to your Control Panel > Admin > Settings menu.
Click the Resolvers icon.
On the screen that appears, click the Create Resolver button.
Specify resolver details:
Address - the resolver IP address
Network - the ID of the network to which this resolver should belong
Click Create Resolver.

7.3.2 Edit Resolver

Go to your Control Panel > Admin > Settings menu.
Click the Resolvers icon.
Click the Actions icon next to the resolver you want to change, then click Edit to change the resolver's address and network.
Click Save Resolvers.

7.3.3 Delete Resolver

Go to your Control Panel > Admin > Settings menu.
Click the Resolvers icon.
Click the Actions button next to the resolver you want to remove, then click Delete.
Confirm the deletion.

See also:
Networking
IP Nets
IP Ranges
Virtual Servers
https://onappcloud.typeform.com/to/A64Euy#source=Resolvers%20Settings

7.4 SDN Management

Software-defined networking (SDN) is a network technology designed to make a network agile and easy to manage. SDN implies several kinds of technology intended to build a network as flexible as the modern data center's virtualized server and storage infrastructure. The feature
provides you the ability to manage networks using VXLAN technology across OnApp cloud compute resources. Accordingly, you receive a tool to build a level-two network infrastructure with OnApp on top of the existing IP (a level-three) network.

To create an SDN network, take the following steps:

1. Install and configure the ODL controller.
2. Create an SDN manager.
3. Add SDN Manager's connection options, used to connect SDN nodes.
4. Add SDN nodes to the created SDN Manager.

A schematic of OnApp running SDN is shown below.

https://onappcloud.typeform.com/to/A64Euy#source=SDN%20Managements

7.4.1 Install OpenDaylight Controller

This document provides information on installing and configuring OpenDaylight (ODL) Controller to work with OnApp Software-defined networking. The provided procedure was tested and verified with OpenDaylight 0.14.0 Silicon version.

Please note that the stable version for OnApp is OpenDaylight 0.14.0.

7.4.1.1 Prerequisites

<table>
<thead>
<tr>
<th>Minimum System Requirements</th>
<th>Recommended System Requirements</th>
<th>OS Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU: 2 Cores</td>
<td>CPU: 8 Cores</td>
<td>CentOS 7.x</td>
</tr>
</tbody>
</table>
7.4.1.2 Install OpenDaylight Silicon

In case of the Log4j 2 vulnerability (CVE-2021-44228), please refer to the CVE Fixes page.

To install OpenDaylight Silicon, follow the next procedure:

Switch to the root home directory and download an archive with ODL:

```
# wget https://nexus.opendaylight.org/content/repositories/opendaylight.release/org/opendaylight/integration/opendaylight/0.14.0/opendaylight-0.14.0.zip
```

Unpack the archive by running the following command:

```
# unzip opendaylight-0.14.0.zip
```

Install JVM by running the following command:

```
# yum install java-11
```

Set JAVA_HOME by running the next command:

```
# export JAVA_HOME=/usr/lib/jvm/jre-11
```

Start controller and install the required tools with the following command:

```
# cd /root/opendaylight-0.14.0
# ./bin/karaf
```

After the ODL console is opened, perform the refresh of repositories with the next command:

```
opendaylight-user@root> feature:repo-refresh
```

Install feature needed by OpenDaylight:

```
opendaylight-user@root> feature:install odl-ovsdb-library odl-restconf-all odl-ovsdb-southbound-api odl-ovsdb-southbound-impl odl-ovsdb-southbound-impl-rest
```

After the features are installed, log out from the karaf:

```
opendaylight-user@root> logout
```

Ensure that ODL listens to OnApp on 8181 and 6640 ports:
OnApp Cloud 6.7 Admin Guide

7.4.1.3 Create a Service to Be Run at Startup
To create a service to be run at startup, use the following command:

```
# ln -s /root/opendaylight-0.14.0 /etc/sdn
# touch /etc/systemd/system/opendaylight.service
# vi /etc/systemd/system/opendaylight.service
[Unit]
Description=OpenDayLight Controller
After=network.target
[Service]
Environment=LOG4J_FORMAT_MSG_NO_LOOKUPS=true
Type=forking
User=root
ExecStart=/etc/sdn/bin/start
Restart=on-abort
[Install]
WantedBy=multi-user.target
```

Don’t forget to set correct credentials and port (8181) at https://onapp--cp--ip/settings/sdn/managers/1/edit

7.4.1.4 Password Change
The password for the admin account can be changed according to this example:
Create a file with a password as a parameter:
```json
cat user.json
{
  "name": "admin",
  "description": "admin account",
  "enabled": "1",
  "email": "",
  "password": "newpass"
}
```

Run API call by the command:

```bash
# curl -u admin:admin -X PUT -H "Content-Type: application/json" --data-binary @./user.json http://localhost:8181/auth/v1/users/admin@sdn
{
  "userid": "admin@sdn",
  "name": "admin",
  "description": "admin account",
  "enabled": "1",
  "email": "",
  "password": "**********, "salt": "***
  "domainid": "sdn"
}
```

7.4.1.5 Tweaks
To prevent intensive logging, you need to decrease log level. It can be done in config `/etc/sdn/etc/org.ops4j.pax.logging.cfg`, by changing the value `log4j2.rootLogger.level` from `INFO` to `ERROR`.

```bash
# grep log4j2.rootLogger.level /etc/sdn/etc/org.ops4j.pax.logging.cfg
log4j2.rootLogger.level = INFO
```

`ovsdb-rpc-task-timeout` and `json-rpc-decoder-max-frame-length` parameters can be changed in `/etc/sdn/etc/org.opendaylight.ovsdb.library.cfg`.

Default values are as follows:

```bash
# grep -E "ovsdb-rpc-task-timeout|json-rpc-decoder-max-frame-length" /etc/sdn/etc/org.opendaylight.ovsdb.library.cfg
ovsdb-rpc-task-timeout = 1000
json-rpc-decoder-max-frame-length = 100000
```

See also:
- Manage SDN Manager
- Manage SDN Nodes
- Upgrade ODL Controller

https://onappcloud.typeform.com/to/A64Euy#source=Install%20OpenDayLight%20ControllerLeave feedback

7.4.2 SDN Manager
SDN manager is an OnApp Control Panel entity, used to manage the SDN infrastructure using API calls for the ODL controller. SDN manager connection options define the way SDN Nodes will be connected to the ODL controller. You can create, edit, and delete SDN manager.

Before you start working with SDN manager, make sure your ODL controller is installed and properly configured:
- OnApp is compatible with OpenDaylight 14.0.0 Silicon version
- ODL controller should be accessible from the Control Panel with SDN manager `host:port` and from compute resources with selected connection options (tcp://ip_address:port)
7.4.2.1 View SDN Manager
To view SDN manager on your system:

Go to your Control Panel > Admin > Settings menu.

Click the SDN Management icon.

Currently, only one SDN manager per cloud is available.

3. Click the label of an SDN manager to view its details:

   - **Label** - the name of the SDN manager
   - **Host** - the hostname or IP address of the ODL controller
   - **Type** - the type of the manager. Currently, manual type is available.
   - **Nodes Connection Options** - how OpenVSwitch will be connected to SDN manager using the format: protocol:IP:port. Currently, the TCP protocol is available as a connection option.

7.4.2.2 Create SDN Manager
To add SDN manager:

Go to your Control Panel > Admin > Settings menu.

Click SDN Management and go to the Opendaylight (KVM) tab.

Click the Add Manual Manager button.

On the screen that follows, fill in the following details:

   - **Label** - the name of the SDN manager
   - **Host** - the hostname or IP address of the ODL controller
   - **Port** - specify the port to connect to the ODL controller (e.g. 9090, 8080)
   - **Login** - provide user login name to login into ODL controller
   - **Password** - specify user password and confirm it

Click the Submit button to save the changes.

7.4.2.3 Edit SDN Manager
Before editing an SDN manager, make sure the connection with ODL controller can be established. For that, click Check connection at the right bottom corner of the screen.

To edit an SDN manager:

Go to your Control Panel > Admin > Settings menu.

Click SDN Management and go to the Opendaylight (KVM) tab.

Click the Actions button next to the SDN manager and then click Edit.

On the screen that follows, change details as required:

   - **Label** - the name of the SDN manager
   - **Host** - the hostname or IP address of the ODL controller
   - **Port** - specify the port to connect to the ODL controller (e.g. 9090, 8080)
   - **Login** - provide user login name to log in to ODL controller
Password - specify user password and confirm it
Click the Submit button to save your changes.

7.4.2.4 Delete SDN Manager
To delete an SDN manager:
Go to your Control Panel > Admin > Settings menu.
Click SDN Management and go to the Opendaylight (KVM) tab.
Click the Actions button next to the SDN manager you want to delete and then click Delete.

Note that you cannot delete SDN manager if it has any nodes assigned.

7.4.2.4.1 Connection Options
At OnApp, OpenSwitch instances installed on compute resources are connected to ODL controller using different connection options. SDN manager contains a list of accepted TCP connection options that you can use.

7.4.2.4.1.1 Add Connection Options
To add a new connection option:
Go to your Control Panel > Admin > Settings > SDN Management > Opendaylight (KVM) tab.
Click the Actions button next to the necessary SDN manager and select Connection Options.
Insert the new connection option using one of the formats:
tcp:ipv4_address:port
OR
tcp:[ipv6_address]:port
6640 is the default port for OVSDB
Click the "+" button.

OpenDayLight has a current limitation of 50 ports. If you plan to use more, please contact support or your account manager.

7.4.2.4.1.2 Delete Connection Options
To delete a connection option:
Go to your Control Panel > Admin > Settings > SDN Management > Opendaylight (KVM) tab.
Click the Actions button next to the SDN manager and select Connection Options.
Click Delete next to the connection option you want to remove.

See also:
SDN Nodes
SDN Networks
Networks Settings
https://onappcloud.typeform.com/to/A64Euy#source=SDN%20Manager
Leave feedback
### 7.4.3 SDN Nodes

A node is an OpenVSwitch instance installed by OnApp's installation script on compute resources. You can assign and unassign nodes that have OpenVSwitch installed to be managed by the SDN manager (currently, only the KVM type of compute resources is supported). It will allow you to select the compute resource from compute resource zones. Adding nodes is the first step of the SDN network creation.

#### 7.4.3.1 View SDN Nodes

You can view both nodes assigned to your managers and the compute resources without nodes.

To view SDN nodes:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the SDN Management icon.
3. Click the label of the SDN manager.
4. Click the Nodes tab.
5. Click the label of a compute zone to view the details:
   - **Compute Zone** - compute zone's name
   - **Connection Option** - how OpenVSwitch will be connected to SDN manager using the format: protocol:IP:port. Currently, only TCP protocol is available as a connection option
   - **Transit IP** - the IP address of a transit network
   - **System Id** - the ID of the compute resource
   - **Connected** - whether an SDN node is successfully connected to an SDN manager or not

#### 7.4.3.2 Add SDN Nodes

You can add and remove SDN nodes to an SDN manager.

To add SDN nodes:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the SDN Management icon.
3. Click the label of an SDN manager.
4. Click the Nodes tab.
5. In the Compute Resources Without Node table, click the label of a compute zone to which you want to add a node, select the connection option, enter the transit IP and then click .

#### 7.4.3.3 Edit SDN Node

To edit an SDN node:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the SDN Management icon.
3. Click the label of an SDN manager.
4. Click the Nodes tab.
5. In the SDN Manager Nodes table, click the Actions button next to the compute zone with the transit IP which you want to edit and then select Change transit IP.

On the page that appears, you can edit the following:
- **Transit IP** - specify a new transit IP

Click Submit.
7.4.3.3.1 Reattach SDN Node
Sometimes, adding SDN nodes to SDN manager may fail. In this case, you can detach SDN node from SDN manager and then, attach it again. This action is available only if the node and the network are not connected to each other.

To reattach an SDN node:
Go to your Control Panel > Admin > Settings menu.
Click the SDN Management icon.
Click the label of the SDN manager.
Click the Nodes tab.
Click the label of a compute zone from which you want to reattach a node.
Click the Actions button next to the node you want to reattach, then click Reattach.

7.4.3.3.2 Delete SDN Nodes
To delete your SDN nodes:
Go to your Control Panel > Admin > Settings menu.
Click the SDN Management icon.
Click the label of an SDN manager.
Click the Nodes tab.
Click the label of a compute zone from which you want to delete a node and then click the Delete button.

Note that you cannot delete an SDN node if it has any compute resources.

See also:
Manage SDN Manager
Create and Manage SDN Networks
Network Settings
https://onappcloud.typeform.com/to/A64Euy#source=SDN%20Nodes

7.4.4 SDN Networks
An SDN network consists of Open vSwitch (OVS) bridges interconnected using VXLAN Tunnel End Points. These bridges are created on compute resources selected during the SDN network creation process. Such a network is created quickly, just in a few clicks. Like other networks, using SDN network requires adding IP nets and IP ranges.

You can view SDN networks at Control Panel > Admin > Settings > Networks, although without the possibility of editing or deleting them.

7.4.4.1 Create SDN Network
Go to your Control Panel > Admin > Settings menu.
Click the SDN Management icon.
Click the label of the manager.
Click the Network Management tab.
Click the Add SDN Network button.
On the page that loads fill in the following details:

**Label** - the name of the SDN network

**VNI** - VXLAN Network Identifier (or VXLAN Segment ID)

**Network zone** - select from the drop-down menu the label of the zone to which a network will be assigned

Click + to add an SDN node.

In the dialog, identify the following parameters:

**Node** - select the node from the drop-down list

**IP** - IP address that will be used for the connection (transmit/receive VXLAN traffic) with other nodes

Click **Add** to save the parameters.

Click **Apply** to save the network.

---

**After you created the network, you have to add IP nets and IP ranges for the virtual server to use the network.**

For information on how to add IP nets to networks, refer to [Create and Manage IP Nets](#).

For information on how to add IP ranges to IP nets, refer to [Create and Manage IP Ranges](#).

---

### 7.4.4.2 Connect SDN Network to SDN Node

If you want to extend your SDN network, you can increase the set of SDN nodes to which the network is attached.

To connect SDN network to SDN node:

Go to your Control Panel > Admin > Settings menu.

Click the **SDN Management** icon.

Click the label of the manager.

Click the **Network Management** tab.

Click the **Actions** button next to the SDN network to which you want to attach a node and then click **Connect node**.

On the page that loads, fill in the following details:

**Connecting Node** - select the SDN network node from the drop-down menu

**Node** - the node to which SDN network is connected

**Local IP** - IP address of the node

**Remote IP** - IP address of the connecting node

Click the **Submit** button.

---

### 7.4.4.3 Assign/Unassign SDN Network to/from User

You can assign and unassign networks to/from users on the networks overview page. A user assigned to a specific SDN network can then assign this network’s IP nets to his/her virtual routers, and this network will be available only for this user for the VS creation/managing.

To assign a network to a particular user:

Go to your Control Panel > Admin > Settings menu.

Click the **Networks** icon. The page that loads shows the shared networks in your cloud.
Click the **Actions** button next to the SDN network you want to assign and then click **Assign to user**.

In the pop-up box, select the user from the dropdown menu.

Click the **Assign** button.

To unassign a network from a particular user:

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **Networks** icon. The page that loads shows the shared networks in your cloud.

Click the **Actions** button next to the assigned SDN network you want to unassign and then, click **Unassign**.

In the pop-up box, click the **Unassign** button.

---

### 7.4.4.4 Edit SDN Network

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **SDN Management** icon.

Click the label of the SDN manager to which the network you want to edit is assigned.

On the following page, click the **Network Management** tab.

Click the **Actions** button next to the SDN network you want to edit and then select **Edit**.

On the page that appears, you can edit the following:

- **Label** - the name of the SDN network

Click **Submit**.

---

### 7.4.4.5 Delete SDN Network

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **Networks** icon.

Click the **Actions** button next to the SDN network you want to delete and then click **Delete**.

---

### 7.4.4.6 Manage Bridges

SDN network consists of the required OVS bridges and tunnels between bridges. The bridge is created on the SDN node and is deleted when you detach network from a node.

In case bridge creation transaction fails, you can try to recreate the bridge.

To recreate bridges:

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **SDN Management** icon.

Click the label of the manager.

Click the **Network Management** tab.

Click the label of the SDN network you want to edit.

Click the **Tools** button and then, click **Manage Bridges**.

Click the **Actions** button next to the SDN bridge you want to recreate and then, click **Recreate**.

To delete a bridge (detach network from a node):

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **SDN Management** icon.

Click the label of the manager.

Click the **Network Management** tab.

Click the label of the SDN network you want to edit.
Click the **Tools** button and then, click **Manage Bridges**.

Click the **Actions** button next to the SDN bridge you want to recreate and then click **Destroy**.

### 7.4.4.7 Cleanup Zombie Tunnels

Destroying an OVS bridge schedules automatic zombie tunnels cleanup transaction. If bridge deleting process is interrupted or cancelled, the transaction may fail. In this case, we recommend to cleanup the zombie tunnels manually.

To cleanup zombie tunnels:

1. Go to your Control Panel > **Admin** > **Settings** menu.
2. Click the **SDN Management** icon.
3. Click the label of the manager.
4. Click the **Network Management** tab.
5. Click the label of the SDN network you want to edit.
6. Click the **Tools** button and select **Cleanup zombie tunnels**.

#### See also:

- SDN Manager
- SDN Nodes
- Create and Manage IP Nets
- Create and Manage IP Ranges
- [https://onappcloud.typeform.com/to/A64Euy#source=SDN%20Networks](https://onappcloud.typeform.com/to/A64Euy#source=SDN%20Networks)

### 7.4.5 Upgrade OpenDaylight Controller

This document provides information on upgrading OpenDaylight (ODL) Controller to work with OnApp Software-defined networking.

Please note that the stable version for OnApp is OpenDaylight 0.14.0.

#### 7.4.5.1 Backup of the Datastore in Old ODL Controller

To backup the datastore in an old ODL controller, follow the next procedure:

1. Create a file with backup file name as a parameter:

   ```bash
   # cat ./backup.json
   {
       "input": {
           "file-path": "/tmp/datastore_backup"
       }
   }
   ```

2. Run API call, with proper admin and pass parameters:
7.4.5.2 Stop Old ODL Controller

Stop an old ODL Controller by running the following command:

```bash
# systemctl stop.opendaylight
```

7.4.5.3 Install OpenDaylight Silicon

In case of the Log4j 2 vulnerability (CVE-2021-44228), please refer to the CVE Fixes page.

To install OpenDaylight Silicon, follow the next procedure:

Switch to the root home directory and download an archive with ODL by running the next command:

```bash
https://nexus.opendaylight.org/content/repositories/opendaylight.release/org/opendaylight/integration/opendaylight/0.14.0/opendaylight-0.14.0.zip
```

Unpack the archive by running the following command:

```bash
# unzip opendaylight-0.14.0.zip
```

Install JVM by running the following command:

```bash
yum install java-11
```

Set `JAVA_HOME` by running the next command:

```
export JAVA_HOME=/usr/lib/jvm/jre-11
```

Start controller and install the required tools with the following command:

```bash
cd /root/opendaylight-0.14.0
./bin/karaf
```

After the ODL console is opened, perform the refresh of repositories with the next command:

```bash
opendaylight-user@root> feature:repo-refresh
```

7. Install feature needed by OpenDaylight:

```bash
opendaylight-user@root> feature:install odl-ovsdb-library odl-restconf-all odl-ovsdb-southbound-api odl-ovsdb-southbound-impl odl-ovsdb-southbound-impl-rest
```

8. After the features are installed, log out from the `karaf` by the following command:
9. Update link:

```bash
unlink /etc/sdn
ln -s /root/opendaylight-0.14.0 /etc/sdn
```

### 7.4.5.4 Restore From Backup

To restore the backup on the target node, the backup file needs to be placed into the `$KARAF_HOME/clustered-datastore-restore` directory and then, the node restarted. If the directory does not exist (which is quite likely if this is a first-time restore), it needs to be created. On startup, ODL checks if the journal and snapshots directories in `$KARAF_HOME` are empty and, only then, tries to read the contents of the `clustered-datastore-restore` directory if it exists. Thus, for a successful restore, these two directories should be empty. The backup file name itself does not matter; the startup process will delete it after a successful restore.

Restore the backup by running the following command:

```bash
# rm -rf /root/opendaylight-0.14.0/journal/*
# rm -rf /root/opendaylight-0.14.0/snapshots/*
# mkdir /root/opendaylight-0.14.0/clustered-datastore-restore
# cp /tmp/datastore_backup /root/opendaylight-0.14.0/clustered-datastore-restore/
```

### 7.4.5.5 Start OpenDaylight Service

To start OpenDaylight Service, use the following command:

```bash
# systemctl start opendaylight
```

Similar record should be displayed in the log file at `/root/opendaylight-0.12.1/data/log/karaf.log`

```
2020-07-01T13:55:12,889 | INFO | Blueprint Extender: 3 | DatastoreSnapshotRestore 227 - org.opendaylight.controller.sal-distributed-datastore-1.11.1 | Clustered datastore will be restored from file ./clustered-datastore-restore/datastore_backup
```

Don’t forget to set correct credentials and port (8181) at [https://onapp--cp--ip/settings/sdn/managers/1/edit](https://onapp--cp--ip/settings/sdn/managers/1/edit)

### 7.4.5.6 Password Change

The password can be changed according to this example:

Create a file with password as a parameter:
# cat user.json
{
  "name": "admin",
  "description": "admin account",
  "enabled": "1",
  "email": "",
  "password": "newpass"
}

2. Run API call:

```bash
# curl -u admin:adminpass -X PUT -H "Content-Type: application/json" --data-binary @./user.json http://localhost:8181/auth/v1/users/admin@sdn
{
  "userid": "admin@sdn", "name": "admin", "description": "admin account", "enabled": "1", "email": "", "password": "**********", "salt": "**********",
  "domainid": "sdn"
}
```

7.4.5.7 Tweaks

To prevent intensive logging, you need to decrease log level. It can be done in config `/etc/sdn/etc/org.ops4j.pax.logging.cfg`, by changing the value `log4j2.rootLogger.level` from `INFO` to `ERROR`.

```bash
# grep log4j2.rootLogger.level /etc/sdn/etc/org.ops4j.pax.logging.cfg
log4j2.rootLogger.level = INFO
```

In that case, `ovsdb-rpc-task-timeout` and `json-rpc-decoder-max-frame-length` parameters can be changed in `/etc/sdn/etc/org.opendaylight.ovsdb.library.cfg`.

Default values are as follows:

```bash
# grep -E 'ovsdb-rpc-task-timeout|json-rpc-decoder-max-frame-length' /etc/sdn/etc/org.opendaylight.ovsdb.library.cfg
json-rpc-decoder-max-frame-length = 100000
ovsdb-rpc-task-timeout = 1000
```

See also:

Install OpenDaylight Controller

https://onappcloud.typeform.com/to/A64Euy#source=Upgrade%20OpenDayLight%20Controller

Leave feedback

7.5 Edge Accelerator

You can accelerate all types of networks to speed up the traffic flow running on the corresponding virtual server. After you enable acceleration for a network, the Edge Accelerator instance is created automatically. Edge accelerator is a type of VS built from specific template and aimed to serve as a router for traffic between CDN core and CDN-enabled VSs. Edge Accelerator gives your customers all the benefits of a global CDN without configuring and maintaining a CDN platform. Edge Accelerator requires no modifications to the web applications running on virtual servers. All optimization is entirely automatic so that using minification & lossless compression of pages, scripts, and images, will not modify or reduce the quality of the source content.

This functionality is applicable only to virtual servers and smart servers running on KVM compute resources.
For details on how to install Edge Accelerator functionality, refer to Edge Accelerator Deployment sections at Install Compute Resources.

Enable Acceleration for Networks

Enabling acceleration for networks brings the following results:

Remote accelerator is created. Two networks cannot be used for one Accelerator simultaneously. Only one Accelerator is created per network.

All VSs, which exist in this particular network and have acceleration allowed, become accelerated.

Accelerator creation usually takes 20 minutes to synchronize between CDN and OnApp. To configure the delay in seconds between executing background tasks, do the following:

Go to your Control Panel > Admin > Settings menu and click the Configuration icon.
Click the Infrastructure tab and edit the CDN sync application setting.

To enable acceleration for networks, do the following:

Go to your Control Panel > Admin > Settings menu.
Click the Edge Accelerator Dashboard icon.
On the screen that loads, click the button next to the network you want to accelerate.

View Accelerated Networks

To view accelerated networks, do the following:

Go to your Control Panel > Admin > Settings menu.
Click the Edge Accelerator Dashboard icon.
The screen that appears shows the networks in your cloud with the following details:

Network - the label of the network
Edge accelerator - the ID of the edge accelerator used to accelerate the network
Remote Edge Accelerator Status - edge accelerator status, active or inactive
Acceleration status - network acceleration status, enabled or disabled.
Click a network's label to view its details.

View Accelerated Network Details

To view details of a network:

Go to your Control Panel > Admin > Settings menu.
Click the Networks icon. The page that loads shows the shared networks in your cloud.
Click the label of the network you are interested in. The screen that loads shows the network's label, identifier, VLAN, and network zone.
This page also includes the IP nets in the selected network.

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/VSs and are available during server creation. For information on manual IP nets, refer to Manual IP Nets.

Click an IP net to view the list of IPs in it with the user and/or VS they are assigned to. To find a particular IP net, type your query in the search box and click the Search button.
Disable Acceleration for Networks

To disable acceleration for networks, do the following:

Go to your Control Panel > Admin > Settings menu.

Click the Edge Accelerator Dashboard icon.

On the screen that loads, click the button next to the network you want to disable acceleration for.

After the network acceleration has been disabled, you can re-enable it again.

See also:

Create Accelerator Networking Networks Settings

https://onappcloud.typeform.com/to/A64Euy#source=Edge%20Accelerator
8 Storage and Backups

The Control Panel's Storage Settings menu is where you get detailed control over low-level cloud settings for data stores, data store zones, and disks. With OnApp, you can also create backups and manage low-level cloud settings for backup servers and backup server zones.

https://docs.onapp.com/display/TEST2/Backup+Settings+v6.7 Backup Settings
https://docs.onapp.com/display/TEST2/Backup+Plugin+System+v6.7 Backup Plugin System

https://docs.onapp.com/display/TEST2/Data+Stores+Settings+v6.6 Data Stores Settings
https://docs.onapp.com/display/TEST2/Data+Store+Zones+Settings+v6.5 Data Store Zone Settings
https://docs.onapp.com/display/TEST2/Disks+Settings+v6.7 Disks Settings
https://onappcloud.typeform.com/to/A64Euy#source=Storage%20and%20backups Leave feedback

8.1 Backup Plugin System

The Backup Plugin System enables you to integrate OnApp with a third-party backup service. The plugin allows to back up and restore your virtual servers by means of a service that you use for backup management. OnApp provides the plugins for R1Soft Server Backup Manager and Veeam Backup & Replication that you can install to your Control Panel. You can also create your own plugin to integrate OnApp with a backup service of your choice.

Starting with OnApp 6.3, the R1Soft backup plugin that we support is 6.12.0. If your R1Soft version is more recent than 6.12.0, we suggest downgrading to this version if possible.

Sorry, the widget is not supported in this export. But you can reach it using the following URL:
https://vimeo.com/530821222

To use the Backup Plugin System in your cloud, you need to apply the workflow that includes the next steps.

Create Backup Plugin

To start with, you need to create a plugin to integrate your backup service with OnApp. You can also use the plugins for R1Soft 6.4 and Veeam 9.5 that were developed by OnApp.
**Install Backup Plugin**
Install your custom or default plugin for it to be available on your Control Panel.

**Create Backup Resource**
Create a backup resource that will use your plugin to manage the backup process on the OnApp side.

**Create Backup Resource Zone**
Create a backup resource zone where your backup resource will reside.

**Attach Backup Resource to Backup Resource Zone**
Attach your backup resource to the backup resource zone that you created in the preceding step.

**Attach Backup Resource Zone to Compute Zone**
Attach the backup resource zone to a compute zone to back up virtual servers that run on compute resources in this compute zone by means of your plugin.

**Add Backup Resource Zone to Bucket**
Add the backup resource zone to a bucket for this zone to be available for users in your cloud.
Create Auto Backup Preset

Create auto backup presets to schedule when backups are automatically run on your third-party service to back up virtual servers hosted in OnApp.

Attach Backup Resource to Virtual Server

Attach your backup resource to virtual servers that run on compute resources from the compute zone to which you assigned the backup resource zone.

You can use the Veeam plugin only for VMware resources such as **vCloud Director** and **vCenter**.

8.1.1 What’s Next?

Creating Backup Plugins
Installing Backup Plugins
Backup Resources
Resource Zones
Auto Backup Presets
Recovery Points
https://onappcloud.typeform.com/to/A64Euy#source=Backup%20Plugin%20System

8.1.2 Billing for Backup Resource Zones

The backup resource zone is available to users when it is present in the Access Control section of the users’ bucket. In this document, you can find information on how to manage pricing and access to backup resource zones available in your cloud.

You can use the Veeam plugin only for VMware resources such as **vCloud Director** and **vCenter**.

8.1.2.1 Configure Access Control

The access to backup resource zones is configured in the Access Control section of the bucket. To give access to a backup resource zone for users to whom the bucket is assigned:

Go to your **Control Panel > Admin > Buckets** menu.

Click a label of a destination bucket and open the **Other** tab from the **Access Control** section.
Click the **Add New Backup Resource Zone** (++) button in the **Limits for Backup Resource Zones** box.

Select a backup resource zone that you want to add to the bucket and click the **Submit** button.

Select the **Duplicate to rate card** checkbox before clicking **Submit** to add a backup resource zone to Rate Card of the bucket with the default price and free limit of 0.

When the backup resource zone is added to the Access Control section, users to whom the bucket is assigned will be able to use this zone. Go to the **Rate Card** tab to set a price for using backups available to users assigned to this bucket.

If no backup resource zones are added to Access Control, users under the bucket have access to none of the backup resource zones available on the system.

### 8.1.2.2 Configure Rate Card

The prices and free limits for backup resource zones are configured in the Rate Card section of the bucket. To set a price and free limit for a backup resource zone:

1. Go to your Control Panel > **Admin** > **Buckets** menu.
2. Click a label of a destination bucket and open the **Other** tab from the **Rate Card** section.
3. Click the **Add New Backup Resource Zone** (++) button in the **Pricing for Backup Resource Zones** box.
4. Select a backup resource zone that you want to add to the bucket and enter the following settings:
   - **Price**
     - **Price** - set the price for a recovery point per hour charged for recovery points stored in the backup resource zone under this bucket
     - **Price Recovery Point Size** - set the price for a recovery point size (Gb/hour) charged for recovery points stored in the backup resource zone under this bucket
     - **Price Space Used** - set the price for a total disk size (Gb/hour) charged for all backups of a particular virtual server in the backup resource zone under this bucket
   - **Free**
     - **Free Limit** - set the number of recovery points (recovery point/hour) that users can store in the backup resource zone for free under this bucket
     - **Free Recovery Point Size** - set the free size (Gb/hour) that users can consume to store their recovery points in the backup resource zone under this bucket
Free Space Used - set the free size (Gb/hour) that users can consume to store all backups of a particular virtual server in the backup resource zone under this bucket. When you are finished, click the Submit button.

If you only add the prices and free limits for a backup resource zone in Rate Card but don't add the backup resource zone to Access Control, users under the bucket have no access to the backup resource zone. To give users under the bucket access to the backup resource zone, you need to add this zone to Access Control.

8.1.2.3 What's Next?
Attach Backup Resource Zone to Compute Zone
Attach Backup Resource to Virtual Server

See also:
Install Plugins
Buckets
Resource Allocation and Prices
Backup Resource Zones
https://onappcloud.typeform.com/to/A64Euy#source=Billing%20for%20Backup%20Resource%20Zones
Leave feedback

8.1.3 Create and Manage Auto Backup Presets
After installing your plugin, creating backup resource and backup resource zone you can configure auto backup presets. Auto backup presets enable you to schedule when backups are automatically run on your third-party service to back up virtual servers hosted in OnApp. You can schedule backups to be run hourly, daily, weekly, monthly and yearly. In this document, you can find information on how to manage auto backup presets for your backup resource.

You can use the Veeam plugin only for VMware resources such as vCloud Director and vCenter.
Starting with OnApp 6.3, the R1Soft backup plugin that we support is 6.12.0. If your R1Soft version is more recent than 6.12.0, we suggest downgrading to this version if possible.

To create, edit, and delete auto backup presets, refer to the following sections.

8.1.3.1 Create Auto Backup Preset

For the R1Soft backup plugin, only an hourly auto backup preset is available. After the backup resource is created, one hourly preset is automatically added on this resource. You cannot create more hourly auto backup presets. To edit the default hourly preset, refer to Edit Auto Backup Preset.

For the Veeam backup plugin, all types of auto backup presets are available. You can create an unlimited number of auto backup presets for Veeam-based backup resources.

To create an auto backup preset, follow the next steps:

1. Go to your Control Panel > Admin > Settings menu.
2. Click the Backup Resources icon.
3. Click the Actions button next to the required backup resource and then click Auto backup presets.
4. Click + or the New Auto Backup Preset button.

On the page that appears, select the Period and enter details, depending on the selected period:

**Hourly**

*Enabled* - turn the slider to the right to enable the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

The recovery point represents a point-in-time full backup from which you can restore a virtual server. The Max recovery points option is used to set a total amount of recovery points that can be created for a destination VS. When the maximum limit is reached, new recovery points overwrite the existing ones.

For the Veeam backup plugin, you can skip the Max recovery points option because you control the limit of recovery points via Retention Policy in Veeam Backup & Replication UI.
Daily

*Enabled* - turn the slider to the right to enable the auto backup preset

*Start time* - select the start time for running the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

*Frequency* - specify the frequency of how often to run the auto backup preset

For example, set 1 to run the auto backup preset every day, 2 - every second day, 3 - every third day, etc.

Weekly

*Enabled* - turn the slider to the right to enable the auto backup preset

*Start time* - select the start time for running the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

*Days to run on* - select the day or days of the week when to run the auto backup preset
For the Veeam backup plugin, to see the *Week to run on* option in UI, change the `/onapp/interface/vendor/backups/plugins/veeam/config.xml` file by setting the `week_of_the_month_to_run` parameter to `true`:

```xml
<monthly>
  <day_of_the_week_to_run>true</day_of_the_week_to_run>
  <week_of_the_month_to_run>true</week_of_the_month_to_run>
</monthly>
```

**Enabled** - turn the slider to the right to enable the auto backup preset

**Start time** - select the start time for running the auto backup preset

**Max recovery points** - set the maximum number of recovery points to be created for a virtual server

**Week to run on** - specify the week when to run the auto backup preset
For example, set 0 to run the auto backup preset on the first week of the month, 1 - the second week, 2 - the third week, 3 - the fourth week, or 4 - the fifth week.

**Day to run on** - type the day or days of the week when to run the auto backup preset
For example, set 0 to run the auto backup preset on Sunday, 1 - Monday, 2 - Tuesday, 3 - Wednesday, 4 - Thursday, 5 - Friday, or 6 - Saturday.
Yearly

*Enabled* - turn the slider to the right to enable the auto backup preset

*Start time* - select the start time for running the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

*Day to run on* - type the day or days of the week when to run the auto backup preset
For example, set 0 to run the auto backup preset on Sunday, 1 - Monday, 2 - Tuesday, 3 - Wednesday, 4 - Thursday, 5 - Friday, or 6 - Saturday.

*Month to run on* - type the month or months of the year when to run the auto backup preset
For example, set 0 to run the auto backup preset in January, 1 - February, 2 - March, 3 - April, 4 - May, 5 - June, 6 - July, 7 - August, 8 - September, 9 - October, 10 - November, or 11 - December.

6. Click the **Create** button.
You can also configure the re-run period for auto-backup in case of auto-backup transaction failure. By default, it is set to 3 hours, but you may change the time value in the info_hub.yaml configuration file.

8.1.3.2 Edit Auto Backup Preset

When you edit an auto backup preset of a resource that is already attached to a virtual server, changes you make will not affect the existing backup schedule. For changes to be applied, detach the backup resource from the virtual server, edit the auto backup preset, and attach the resource again. When detaching the backup resource from the virtual server, all recovery points are deleted.

To edit an auto backup preset, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resources icon.

Click the Actions button next to the required backup resource and then click Auto backup presets.

On the page that appears, click the Actions button next to the required auto backup preset and then click Edit. You can change the following properties of the auto backup preset, depending on the selected period:

**Hourly**

*Enabled* - turn the slider to the right to enable the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

**Daily**

*Enabled* - turn the slider to the right to enable the auto backup preset

*Start time* - select the start time for running the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

*Frequency* - specify the frequency of how often to run the auto backup preset

For example, set 1 to run the auto backup preset every day, 2 - every second day, 3 - every third day, etc.
**Weekly**

*Enabled* - turn the slider to the right to enable the auto backup preset

*Start time* - select the start time for running the auto backup preset

*Max recovery points* - type the maximum number of recovery points to be created for a virtual server

*Days to run on* - select the day or days of the week when to run the auto backup preset

---

**Monthly**

For the Veeam backup plugin, to see the *Week to run on* option in UI, change the `/onapp/interface/vendor/backups/plugins/veeam/config.xml` file by setting the `week_of_the_month_to_run` parameter to `true`:

```xml
<monthly>
  <day_of_the_week_to_run>true</day_of_the_week_to_run>
  <week_of_the_month_to_run>true</week_of_the_month_to_run>
</monthly>
```

*Enabled* - turn the slider to the right to enable the auto backup preset
**Start time** - select the start time for running the auto backup preset

**Max recovery points** - set the maximum number of recovery points to be created for a virtual server

**Week to run on** - specify the week when to run the auto backup preset
For example, set 0 to run the auto backup preset on the first week of the month, 1 - the second week, 2 - the third week, 3 - the fourth week, or 4 - the fifth week.

**Day to run on** - type the day or days of the week when to run the auto backup preset
For example, set 0 to run the auto backup preset on Sunday, 1 - Monday, 2 - Tuesday, 3 - Wednesday, 4 - Thursday, 5 - Friday, or 6 - Saturday.

**Yearly**

**Enabled** - turn the slider to the right to enable the auto backup preset

**Start time** - select the start time for running the auto backup preset

**Max recovery points** - type the maximum number of recovery points to be created for a virtual server

**Day to run on** - type the day or days of the week when to run the auto backup preset
For example, set 0 to run the auto backup preset on Sunday, 1 - Monday, 2 - Tuesday, 3 - Wednesday, 4 - Thursday, 5 - Friday, or 6 - Saturday.

**Month to run on** - type the month or months of the year when to run the auto backup preset
For example, set 0 to run the auto backup preset in January, 1 - February, 2 - March, 3 - April, 4 - May, 5 - June, 6 - July, 7 - August, 8 - September, 9 - October, 10 - November, or 11 - December.
5. Click the **Save** button.

You can also configure the re-run period for auto-backup in the case of auto-backup transaction failure. By default, it is set to 3 hours, but you may change the time value in the info_hub.yaml configuration file.

---

**8.1.3.3 Delete Auto Backup Preset**

To delete an auto backup preset, follow the next steps:

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **Backup Resources** icon.

Click the **Actions** button next to the required backup resource and then click **Auto backup presets**.

On the page that appears, click the **Actions** button next to the required auto backup preset and then click **Delete**.

Click the **OK** button to confirm your action.

---

**8.1.3.4 What's Next?**

| Attach Backup Resource Zone to Compute Zone |
| Add Backup Resource Zone to Bucket |
| Attach Backup Resource to Virtual Server |

See also:

- **Install Plugins**
- **Create and Manage Backup Resources**
- **Manage Compute Zones**
- **Manage Virtual Server Backup Resources**
- **Recovery Points**

https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Auto-backup%20Presets

Leave feedback
8.1.4 Create and Manage Backup Resources

Backup resources are based on plugins that enable running backups on third-party systems. Creating a backup resource is the first step to take after installing a backup plugin. You can install your custom plugin or default plugins that are provided for R1Soft and Veeam. In this section, you can find information on how to view, create, edit and delete backup resources.

You can use the Veeam plugin only for VMware resources such as VMware Cloud Director and vCenter. If you want to use a plugin for Veeam Backup & Replication, make sure that you complete the steps from Prerequisites for Veeam.

8.1.4.1 Prerequisites for Veeam

Before you install a plugin for Veeam and create a backup resource, complete the following steps via Veeam Backup & Replication UI:

Add your VMware vCenter Servers or VMware vCloud Director to the Veeam backup infrastructure.

Note that this step works only if the number of Veeam Backup & Replication instances connected to the Veeam Enterprise Manager does not exceed 1; otherwise, it will fail.

Add a Backup Repository to the Veeam backup infrastructure.

Create a vSphere backup job and specify the Retention Policy settings.

After you complete the preceding steps, you can create a backup resource and add advanced options that are required for Veeam.

8.1.4.2 Prerequisites for R1Soft

Before you install a plugin for R1Soft and create a backup resource, make sure your firewall configuration is correct. If you are using a network firewall or host-based firewall (e.g. iptables), you may need to change your firewall configuration to open ports that Server Backup Manager uses for network communication.

Starting with OnApp 6.3, the R1Soft backup plugin that we support is 6.12.0. If your R1Soft version is more recent than 6.12.0, we suggest downgrading to this version if possible.

API Server Network Ports

8.1.4.2.1 Input:
allow TCP packets from any port to the Backup Manager port 9080
allow TCP packets from any port to the Backup Manager port 9443

8.1.4.2.2 Output:
allow TCP packets from the Backup Manager port 9080 to any port range 1024-65535
allow TCP packets from the Backup Manager port 9443 to any port range 1024-65535

To access the API server, you will need to allow network traffic to the Backup Managers IP address, TCP port 9080 for HTTP traffic, and TCP port 9443 for HTTPS traffic.

HTTP and HTTPS ports are configurable. "9080" and "9443" are the default values. If you change the ports, do not forget to change your firewall configuration to reflect the changes.
8.1.4.3 Create Backup Resource

Backup resources that are built on the R1Soft plugin are not currently supported for Windows-based virtual servers.

To create a new backup resource, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resources icon.

On the page that appears, click the ‘+’ or New Backup Resource button and provide the following details:

**Label** - type the name of the backup resource

**Enabled** - turn the slider to the right/left to enable/disable the backup resource

The disabled backup resource cannot be attached to a virtual server. Make sure that the Enabled slider is turned on before attaching the backup resource to virtual servers.

**Backup resource zone** - select the backup resource zone to assign the backup resource to

If you have no backup resource zone at this point, you can assign the backup resource to the zone when it is created.

**Plugin** - select the plugin for the backup resource

**Primary host** - enter the primary address (either hostname or IP address) used to connect to the third-party backup system. Specify a protocol and port type of the primary host, that is http://{address}:{port} or https://{address}:{port}.

**Secondary host** - enter the secondary address (either hostname or IP address) used to connect to the third-party backup system. Specify a protocol and port type of the secondary host, that is http://{address}:{port} or https://{address}:{port}.

**Username** - type the username used to connect to the third-party backup system

**Password** - type the password used to connect to the third-party backup system

Click the Create button to add a new backup resource.

8.1.4.4 Edit Backup Resource

To edit a backup resource, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resources icon.

On the page that appears, click the Actions button next to the required backup resource and then click Edit. You can change the following properties of the backup resource:

**Label** - type the name of the backup resource

**Enabled** - turn the slider to the right/left to enable/disable the backup resource

The disabled backup resource cannot be attached to a virtual server. Make sure that the Enabled slider is turned on before attaching the backup resource to virtual servers.

**Primary host** - enter the primary address (either hostname or IP address) used to connect to the third-party backup system. Specify a protocol and port type of the primary host, that is http://{address}:{port} or https://{address}:{port}.
Secondary host - enter the secondary address (either hostname or IP address) used to connect to the third-party backup system. Specify a protocol and port type of the secondary host, that is http://{address}:{port} or https://{address}:{port}.

Username - type the username used to connect to the third-party backup system

Password - type the password used to connect to the third-party backup system

Click the Save button to apply new settings for the backup resource.

8.1.4.5 Manage Advanced Options

The advanced options for a backup resource are automatically fetched from the config.xml file of a backup plugin. You can edit the advanced options for the backup resource as follows:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resources icon.

Click the Actions button next to the required backup resource and then click Advanced options.

You can manage the following advanced options, depending on a backup plugin:

**Veeam**

- vSphere template job name - enter a name of a vSphere backup job that is added to the Veeam backup infrastructure
- Backup repository name - enter a name of a backup repository that is added to the Veeam backup infrastructure
- Power on after restore - select this checkbox to power on virtual servers after restoring them from recovery points
- Quick rollback - select this checkbox to perform an incremental restore of virtual servers from recovery points

For more information on the incremental restore, see Quick Rollback.

**R1Soft**

There are no options that require an advanced management for the R1Soft backup plugin.

**Custom Plugin**

You can manage advanced options that you provide for your custom plugin in the config.xml file. For more information, please refer to the Create Backup Plugin guidance.

5. Click the Save button to apply changes.

8.1.4.6 Delete Backup Resource

To delete a backup resource, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resources icon.

On the page that appears, click the Actions button next to the required backup resource and then click Delete.

In the pop-up box, click the Ok button to confirm your action.

If you delete a backup resource that is attached to a virtual server, the backups for this VS will be no longer run by means of the plugin.

8.1.4.7 What's Next?

Create Backup Resource Zone
8.1.5 Create and Manage Backup Resource Zones

When you have installed your backup plugin and have a backup resource up and running, you can create a backup resource zone and assign the backup resource to this zone. Afterwards, you need to assign the backup resource zone to a compute zone. In this document, you can find information on how to manage backup resource zones in OnApp CP.

Starting with OnApp 6.3, the R1Soft backup plugin that we support is 6.12.0. If your R1Soft version is more recent than 6.12.0, we suggest downgrading to this version if possible.

8.1.5.1 Create Backup Resource Zone

To create a new backup resource zone, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resource Zones icon.

Click the ‘+’ or New Backup Resource Zone button.

On the page that appears, enter the following information:

**Label** - type a name for your backup resource zone

**Location group** - select a location group for your backup resource zone

You can attach backup resource zones to compute zones from the same location groups.

When you are finished, click the Create button.

After you created a backup resource zone, you can add and remove backup resources to and from this zone. Also, you can add the backup resource zone to the compute zone.

8.1.5.2 Edit Backup Resource Zone

To edit a backup resource zone, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resource Zones icon.

Click the Actions button next to the required backup resource zone and then click Edit.

On the page that appears, you can edit the following information:

**Label** - type a name for your backup resource zone

**Location group** - select a location group for your backup resource zone

You can attach backup resource zones to compute zones from the same location groups.

When you are finished, click the Save button.
8.1.5.3 Attach Backup Resource to Backup Resource Zone
To attach a backup resource to a backup resource zone, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resource Zones icon.

Click a label of a backup resource zone you want to add a backup resource to. The page that appears, contains the list of assigned and unassigned backup resources.

In the Unassigned Backup Resources box, click the ‘+’ button next to the backup resource that you want to add to this zone.

8.1.5.4 Remove Backup Resource from Backup Resource Zone
To remove a backup resource from a backup resource zone, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resource Zones icon.

Click a label of a backup resource zone you want to remove a backup resource from. The page that appears, contains the list of assigned and unassigned backup resources.

In the Assigned Backup Resources box, click the ‘-’ button next to the backup resource that you want to remove from this zone.

You cannot remove a backup resource from a backup resource zone, if there are recovery points available on the backup resource.

8.1.5.5 Delete Backup Resource Zone
To delete a backup resource zone, follow the next steps:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Resource Zones icon.

On the page that appears, click the Actions button next to the required backup resource zone and then click Delete.

In the pop-up box, click the Ok button to confirm your action.

You cannot delete a backup resource zone if there are backup resources assigned to this zone.

8.1.5.6 What's Next?
Attach Backup Resource Zone to Compute Zone
Create Auto Backup Preset
Add Backup Resource Zone to Bucket
Attach Backup Resource to Virtual Server

See also:
Install Plugins
Create and Manage Backup Resources
Manage Virtual Server Backup Resources
Manage Compute Zones
Create and Manage Auto Backup Presets
8.2 Backup Settings

The Control Panel's Backup Settings menu is where you get detailed control over low-level cloud settings for backup servers and backup server zones.

For general information on how backups work, where they are stored, the types of backups, refer to Virtual Server Backups section of this guide.

https://onappcloud.typeform.com/to/A64Euy#source=Backup%20Settings

8.2.1 Auto-Backup Presets Settings

Auto-backup presets are a simple way to set up an automatic backup schedule when virtual servers are created. Once configured, they can be applied to a VS automatically when the Automatic Backups Required box is checked during VS creation. A number of preset backup time periods are available (daily, weekly, monthly and annual backups) which are configured further by specifying how often each backup is taken. So, for example, you can set up automatic backups every 2 days, every 1 month, or even every 12 months (the same as every 1 year). Each type of backup can be enabled or disabled.

To view and edit auto-backup presets:

Go to your Control Panel > Admin > Settings menu.

Click the Auto-backup Presets icon. You'll see a list of the presets available on the following screen, and whether they are enabled or not.

To change a preset, click to change the following auto-backup preset details:

- **Period** - the frequency of how often the backups are taken per period type
- **Period type** - the period for which the auto backup preset is set that can be Days, Weeks, Months, and Years
- **Rotation frequency** - the number of backups to keep before deleting the initial backup
- **Enabled** - the status that indicates whether the auto-backup preset is enabled or not

Click the Save button to finish.

To add more schedules, click Back.

The combination of Auto-backup Presets and Scheduled VS backups provides a great deal of flexibility in the way backups are handled for the cloud, and for individual VSSs. Auto-backup Presets can be applied to all new VSSs added to the cloud. Scheduled VS backups enable specific backups to be scheduled for individual VSSs, outside of the auto-backup pattern.

You can also configure the re-run period for auto-backup in case of auto-backup transaction failure. By default, it is set to 3 hours, but you may change the time value in the info_hub.yaml configuration file.
8.2.2 Backup Servers Settings

Backup servers are servers responsible for storing backups and templates of virtual servers running in the cloud to prevent data loss in the event of failure.

There are now three ways to handle backup and template storage in your cloud:

- **Basic backup scheme**
- **Advanced backup scheme**
- **CloudBoot backup scheme**

Only one Backup Scheme can be used per cloud.

8.2.2.1 Basic Backup Scheme

**Running disk-related actions on Compute resources**

This was the default backup method prior to OnApp Cloud 2.3.2. In this scenario, template/backup storage works as follows:

- Backups and templates are stored on a single backup/template server.
- Backup transactions are performed on Compute resources.
- After the backup is taken on a Compute resource, it is put on the backup/template server. This server can be accessed via SSH or NFS.
- In order to make this server accessible via SSH, you should configure SSH file transfer server options.
- In order to make this server accessible via NFS, you should mount the appropriate directory from this server to each Compute resource.

Centos now defaults to NFSv4. This is known to cause compatibility issues so we strongly recommend that you use NFSv3 for all mounts. This can be done by passing `-t nfs -o vers=3` in any mount commands.

Backups created are stored at the path defined in **Admin > Settings > Configuration > Backups/templates**

OnApp SANity can only use the Basic Backup Scheme.

8.2.2.2 Advanced Backup Scheme

**Running disk-related actions on one or more dedicated backup servers**

This backup scheme can be used in OnApp Cloud 2.3.2 and above. This option does not use Compute resources to take backups. Instead, you deploy one or more dedicated backup servers, which handle transactions and store all backups & templates.

- If you have added one or more backup servers, all backups will be stored on these servers.
- If there is more than one backup server, backups are performed on the server with the most available disk space.

A network is used to connect Compute resource with the backup server. (An IP address is assigned to Compute resource and a backup server to build an iSCSI connection. If no IP is assigned to the Compute resource, an IP from the management network will be used.

Using this method, templates are also stored on the dedicated backup server(s). When converting a backup to a template, the new template will be stored on the same server as the backup.
Dedicated backup servers handle the following activities:

**Backup and template related actions**
Take a backup
Restore a backup
Convert backup to template
Destroy backup
Destroy template

**Disk related actions**
Configure OS on virtual server
Provision virtual server
Create disk
Format disk
Resize disk
Migrate disk
Destroy disk

**VS related actions**
Set SSH keys
Network Configuration
Rebuild network
Attach/detach Network Interface

If there are no dedicated backup servers in the cloud, all these actions will be performed by Compute resources, and backups/templates stored according to the settings defined in **Admin > Settings > Configuration > Backups/templates.**

---

**PLEASE NOTE:**
The use of dedicated backup servers is available for non-local data stores only. Volume groups of each data store based on SAN must be shared with the backup server.
If your cloud uses a combination of local storage and SANs, you will only be able to use the new backup method for virtual servers that have been allocated SAN-based storage.
If only local storage is used, you shouldn't define any dedicated backup servers – instead, configure your SSH or NFS settings in the **Admin > Settings > Configuration > Backups/templates** menu.

---

**8.2.2.3 CloudBoot Backup Scheme**
You can use dedicated CloudBoot backup servers in your cloud. Please refer to the [Create CloudBoot Backup Server](#) section for more details.

---

**Disabling backup servers**
Be aware, that if you switch off a backup server, transactions "restore backups" (those backups which are located on this server) will be failed. Also if OS template is located only on this backup server, provisioning disk transaction will be failed.

---

**See also:**
[Backup Server Zone Settings](#)
Schedules Settings
Auto-backup Presets Settings
Create and Manage Backup Servers
https://onappcloud.typeform.com/to/A64Euy#source=Backup%20Servers%20Settings

8.2.2.4 Backup Server Backups
The choice of a specific backup server on which a backup will be performed is called backup server balancing.

Previously when you sent a command to take a backup, the system would schedule a corresponding transaction at a specific backup server. This transaction would be pending until its queue came up. However, if the backup server was very loaded, offline, or somehow not available, this transaction would take very long, or even should be restarted manually.

Now, with Backup Server Balancing, when the transaction is launched, the system will reassign it to the most appropriate backup server.

OnApp supports two backup types: normal and incremental, each of them having its own procedure of selecting the most appropriate server to take a backup.

8.2.2.4.1 Normal Backups
For Normal Backups the system will follow the sequence below to take a backup:

Check which backup servers are assigned to this location group
Which of them are available to the user
Which of those have enough space
From those remaining, the most appropriate backup server will be the one with the smallest count of "take backup" transactions at the moment of the check
If for several backup servers this quantity is equal (0, 1, 2, ...n), the backup server with the lowest load (highest cpu_idle parameter) will be selected as the most appropriate

8.2.2.4.2 Incremental Backups
In case of Incremental Backups, the first backup (which is similar to normal backups) the server will be selected the same as for normal backups:

Check which backup servers are assigned to this location group
Which of them are available to the user
Which of those have enough space
From those remaining, the most appropriate backup server will be the one with the smallest count of "take backup" transactions at the moment of the check
If for several backup servers this quantity is equal (0, 1, 2, ...n), the backup server with the lowest load (highest cpu_idle parameter) will be selected as the most appropriate
All consequent backups will be performed at the same backup server as long as it is available and has enough storage space. If not - the alternative backup server will be selected following the principle described above.

8.2.2.4.3 Manage Backups for Backup Server
To manage backups for a backup server:

Go to your Control Panel > Admin > Settings menu and click the Backup Servers icon.
On the screen that appears, you’ll see the list of all backup servers currently set up in the cloud. Click the label of the specific backup server. You will get the list of backups on this backup server together with their details:

Date - the date of the backup creation
8.2.2.5 Create and Manage Backup Servers

Backup servers are servers responsible for storing backups and templates of virtual servers running in the cloud, in order to prevent data loss in the event of failure. Backup servers enable recovery of files, applications, and databases and so guarantee security of an IT environment. Besides, backup servers are used for scheduling backup jobs and committing associated backup details to the database. At OnApp, you can create, edit, enable, disable and delete backup servers.

8.2.2.5.1 Create Backup Server

To create a backup server:

Go to your Control Panel > Admin > Settings menu, then click Backup Servers icon.

Click the Create Backup Server button.

Fill in the form that appears:

- **Label** - give your backup server a label
- **IP address** - enter the backup server IP address (IPv4)
- **Backup IP address** - add a provisioning network IP address
- **Capacity** - set the backup server capacity (in GB)

4. Move the **Enabled** slider to the right to enable the backup server.
5. Move the **Enable Integrated Storage on Static Backup Server** slider to the right to enable Integrated Storage on static compute resources.
6. Click the **Add Backup server** button.

To use the backup server, you have to add it to a backup server zone and assign it either to a compute resource or a compute zone.
Once you've added a backup server to your cloud and wish to limit the backup resources, make sure to set the limits in bucket for backup server zone resources. When you add a backup server to a backup server zone, the backup server inherits the zone's type. It will be possible to move such a backup server only to a backup server zone of the same type. For more information refer to Zone Types.

8.2.2.5.2 Edit Backup Server

To edit a backup server:

Go to your Control Panel > Admin > Settings menu and click the Backup Servers icon.

On the screen that appears, you'll see the list of all backup servers currently set up in the cloud. Click the Actions button next to the backup server you want to edit, then click Edit to change the backup server's properties:

- **Label** - the name of the backup server
- **IP address** - the backup server IP address (IPv4)
- **Backup IP address** - provisioning network IP address
- **Capacity (in GB)** - the backup server capacity
- **Backup server zone** - the backup server zone to which this backup server is assigned

It is possible to move backup servers only between backup server zones of the same type. For more information refer to Zone Types.

**Enabled** – move this slider to the right to enable the backup server or to the left to disable the backup server

Note that disabling a backup server affects backups and virtual server provisioning as follows:

- **Backups**
  - You cannot create new backups on this backup server anymore.
  - Backups that were created before disabling the backup server remain on this BS.
  - You can restore virtual servers from backups available on this backup server.
  - You can convert virtual server backups to templates.

- **Provisioning**
  - The virtual server provisioning is not available on this backup server except for the following case.
  - If a template is located only on this backup server, provisioning of virtual servers based on this template is still performed on this backup server.

**Enable Integrated Storage on Static Backup Server** - move the slider to the right to enable Integrated Storage on static backup server.

Click the Save Backup server button to save changes.

8.2.2.5.2.1 Backup Server Maintenance

If you want to take your backup server offline for maintenance and prevent backups and other transactions from failing during the maintenance window, you may use the Daemon tool.

To use Daemon for background tasks:

Go to Admin > Sysadmin menu.

Click Stop Daemon button. This will allow any currently running backups and tasks to complete but no new ones will start. At that stage, you can proceed with your maintenance.

Once completed, go back to Admin > Sysadmin menu and click Start Daemon button.
8.2.2.5.3  Edit Integrated Storage Settings

Please note that manual server reboot is required for changes to take place.

To edit integrated storage settings:

Go to your Control Panel > Admin > Settings menu and click the Backup Servers icon.

On the page that appears, you will see the list of backup servers available in your cloud. Click the Actions button next to the label of a backup server and select the Integrated Storage Settings option.

Click the Edit button.

On the screen that loads, edit the following parameters:

SAN bonding mode - choose bonding mode type from the drop-down menu

MTU - specify the maximum transportation unit size. You can set the frame size from 1500 to 9000 bytes

VLAN id - the ID of a VLAN number

Click the Save button to save changes.

8.2.2.5.4  View Backup Server Hardware Info

OnApp provides an overview of hardware that is used by backup servers available in your cloud. On the Hardware Info page, you can view information on CPU, RAM, hard disk drives, networks and other hardware components.

To view the hardware information:

Go to the Control Panel > Admin > Settings menu and click the Backup Servers icon.

On the page that appears, you will see the list of backup servers available in your cloud. Click the Actions button next to the label of a backup server and select the Hardware Info option.

You will get the following details:

Summary Info  This section contains the basic information about the backup server:

Current Uptime - the time the backup server has been working and available, the number of its users, and the average load.

Total CPU - the total amount of CPU (number of cores/frequency in MHz) allocated to the backup server

Memory - the total amount of memory (GB) allocated to the backup server

Type - the type of a resource (Backup server)

OS - the operating system of the backup server

Manufacturer/Model - the manufacturer and model of the motherboard

BIOS/Serial Number - the system BIOS, its serial number and release date
CPU
This section shows CPU manufacturer logo and information about CPU slots. Click the CPU Details button to get detailed information about CPU from the Intel ARK database if available.

RAM
This section includes information about memory slots (double data rate, memory clock in MHz, size).

HD
This section shows information about the manufacturer and model of a hard disk drive and the hard disk drive capacity in GB.

Network
This section contains information about network cards. Click the Info button next to the specific network to get detailed information from the Intel ARK Database if available.

If hardware information is empty or incomplete, click the Update Hardware Info button in the right upper corner.

Click the Edit Custom Fields button to add/edit/delete custom fields for the hardware info. For more information on how to manage custom fields, refer to the Hardware Info page.

8.2.2.5.5 Replace Dedicated Backup Server
There are two ways of switching to a new backup server and keeping existing backups and templates.

Method 1
Create a new backup server.
Disable the old backup server, so that new backups are not created on it.

Quick manual backup data migration should be performed by using the rsync utility, which offers the ability to preserve hard links by enabling the -H option. This option should be enabled if you are copying incremental backups.

Before starting the data transfer, go to your Control Panel > Admin > Settings > Configuration > Backups/Templates and set the Total number allowed parameter to 0 to prevent the processing of a new backup task during the data transfer.

Wait for all the running backup tasks to finish. Otherwise, cancel them.

Check if the direct SSH logging from the old backup server to the new one is possible. SSH Key-Based authentication is recommended. Depending on the link speed, the transfer can take up to 40 hours for 1 TB of data. Therefore, it is recommended to start the copying procedure in the screen session.

Log in to the old backup server as root and start backups data transfer by issuing the following command:

```bash
rsync -a -z -H -v --numeric-ids /backupstorage/* NewBackupServerIP:/backupstorage
```

As soon as all the data have been copied, update the backup server ID for the templates and backups using MySQL:

```sql
mysql onapp
select id, label from backup_servers;
```

The command above displays the IDs of the existing backup servers.
Change all backups and templates assignments to the new backup server by issuing the following command:

```
update templates set backup_server_id=2 where backup_server_id=1;
update backups set backup_server_id=2 where backup_server_id=1;
```

The IDs above are only the examples. Enter the correct `backup_server_id` in your command line.

To start the processing of new backup tasks, go to your Control Panel > Admin > Settings > Configuration > Backups/Templates and set the Total number allowed parameter to a value greater than 0. Check whether the new backup tasks have started on the new backup server.

**Method 2**

You can try an automatic backup migration. When using this method, there is no need to stop backup tasks processing and remove/update backup entries in OnApp DB.

Copy template files to the new backup server by issuing the following command:

```
rsync -a -v /backupstorage/templates NewBackupServerIP:/backupstorage
```

To avoid using the old backup server, disable it and set the capacity to 1 GB for the old Backup Server to emulate the No space left on device error for new backups. All newly created backups should migrate to the new backup server. The old backups will be removed automatically after the new ones are created. After the period of backup rotation, the old backup server can be removed from the cloud.

---

### 8.2.2.5.6 Delete Backup Server

To delete a backup server:

Go to your Control Panel > Admin > Settings menu and click the Backup Servers icon.

Click the backup server's label.

On the screen that appears, you'll see the list of all backup servers currently set up in the cloud.

Click the Actions button next to the backup server you want to remove from the cloud, then click Delete. You'll be asked to confirm deletion.

All the backups stored on that backup server will be deleted!

---

See also:

- Backup Server Zone Settings
- Schedules Settings
- Auto-backup Presets Settings
- Hardware Info
- [https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Backup%20Servers](https://onappcloud.typeform.com/to/A64Euy#source=Create%20and%20Manage%20Backup%20Servers) Leave feedback

### 8.2.2.6 Manage Backup Servers Hardware Devices

You can manage Integrated Storage Static Backup Server network interfaces at any time after the Backup server creation.

To edit IS Static Backup Server Hardware Devices configuration:
Go to Control Panel > Admin > Settings menu > Backup Servers > label of a backup server > Tools > Hardware Devices.

The page that loads displays Network Interfaces details:

- **Name**
- **Status**
- **MAC address**

Click the **Edit Hardware Device Configuration** button.

Configure network interfaces. For each backup server NIC, you can use one of the following options:

- **Unassigned** - leave the NIC unused.
- **Assigned to SAN** - select this option to use this interface for storage network. In this case, NIC interface will be bonded with virtual network interface of the Storage Controller Server.

Click **Next**.

After devices are successfully reconfigured, click **Finish**.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Backups%20Servers%20Hardware%20Devices

Leave feedback
8.2.2.7 Recover Files from Backup Server
This instruction presumes the availability of off-server/site backups of the following directories so that the files of those directories could be copied back to the server being recovered:

/onapp/backups
/onapp/templates
/root
/etc/iscsi/initiatoname.iscsi

8.2.2.7.1 Recover Backup Server
Prepare the following:

Install a clean installation of CentOS 64bit
Configure networking to match the previous configuration
Ensure you can ping compute resources and Control Panel over the management and backup networks
Update CentOS components to the latest yum update.

Download and install the OnApp YUM repository file:

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

Install OnApp Backup Server installer package. Please, reboot if requested by the installer due to SELINUX, and then continue:

```bash
> yum install -y onapp-bk-install
```

Run the Backup Server installer to install the latest OnApp release:

```bash
/onapp/onapp-bk-install/onapp-bk-install.sh
```

If required, indicate the build number of the release version you want to install:

```bash
/onapp/onapp-bk-install/onapp-bk-install.sh -v <ONAPP_VERSION>
```

Run the Backup Server configuration script to register it with the controller:

Where:

*CP_HOST_IP* - is the IP address of the Control Panel server

*BK_HOST_IP* - is the IP address of the Backup Server

*FILE_TRANSFER_SERVER_IP* - is the IP address of the server that will hold your backups and templates

To ensure the SSH keys are correct, import the following from the backup:

```
root/.ssh/authorized_keys
root/.ssh/id_rsa
root/.ssh/id_rsa.pub
```

Make sure you can access the backup server via SSH from the controller and the hypervisors. You should be able to connect through SSH as an OnApp user if the keys are working correctly.

```
ssh root@<BK_IP_ADDRESS>
```

Restore backup and template files to the new installation:

```
onapp/backups
onapp/templates
```

Basing on server configurations it’s possible that a separate block device is being used for backups. If so, this block device needs to be mounted under /onapp and all files transferred over to the block. If the /onapp/backups directory does not exist it can be created at this time.

Restore primary storage targets on the server.

The primary storage targets need to be mounted on the backup server.

If the environment is using iSCSI this can be done using the following commands:

```
> iscsiadmin -m discovery -t sendtargets -p [SAN IP]
> iscsiadmin -m node -l
```

If the environment has FC/FCoE directly attached, you will need to ensure the block devices are visible and multipath is enabled:

```
> service multipathd start
> multipath -ll
```

Once this is complete you can run the pvs command. You should see the primary storage targets, their identifiers will be in the following format: onapp- xxxxxxxxxx.

Ensure root access is available via SSH:

If the PermitRootLogin in the /etc/ssh/sshd_config is set to no, change it to yes to allow access to the backup server from the controller.

Restart services for changes to take effect:
8.2.3 Backup Server Zones Settings

The Backup server zones feature can be used to create different tiers of service – for example, by organizing backup servers in the cloud into different backup server zones. You can also specify limits and prices individually for each Backup Server Zone assigned to the Bucket. For general information on how backups work, where they are stored, the types of backups, refer to Virtual Server Backups section of this guide.

Backup server zones have types which are inherited by the backup servers in the zone. Later backup servers can be attached to a compute resource/compute zone of the same type. Backup servers can be moved from one backup server zone to another, but the zones should be of the same type. For more information refer to Zone Types. Backup servers zones can have either the Virtual or the Smart type.

A backup server zone consists of several backup servers that share the same user permissions. Backup server zones can be used for organizing and managing backup servers and creating different tiers of servers for customers. You can also specify limits and prices individually for each backup server zone assigned to the bucket. Backup server zones have types which are inherited by the backup servers in the zone. You may select the type during backup server zone creation process. To learn more about backup servers refer to Backup Servers section of this guide.

8.2.3.1 Create Backup Server Zone

To create a new backup server zone:

Go to your Control Panel > Admin > Settings menu and click the Backup Server Zones icon.

On the screen that appears, click the Create New Backup Zone button at the bottom of the list.

On the screen that follows:

Label - give your backup server zone a name.

Server type - select the server type for the zone, it can be either Virtual or Smart. The zone's type cannot be changed after the zone is created.

Location group - select the location group you wish to assign this backup server zone to from the drop-down list.

Click the Save button.

8.2.3.2 Edit Backup Server Zone

To edit a backup server zone:

Go to your Control Panel > Admin > Settings menu.

Click the Backup Server Zones icon.

Click the Actions button next to the backup server zone, then click Edit to change the zone's label and location group. You can change the already assigned location only if there are no backups or templates stores on backup servers of the current zone.

Click Save.

8.2.3.3 Add Backup Server to Backup Server Zone

To attach a backup server to the backup server zone:

Go to your Control Panel > Admin > Settings menu and click the Backup Server Zones icon.
Click the label of the zone you want to attach a backup server to. On the screen that appears you will see the list of all backup servers in the cloud organized into two groups – those already assigned to this backup server zone and those that are unassigned.

Choose an unassigned backup server and click the Add icon next to it.

When you add a backup server to a backup server zone, the backup server inherits the zone’s type. For more information refer to Zone Types.

8.2.3.4 Remove Backup Server From Backup Server Zone
To remove a backup server to the backup server zone:

Go to your Control Panel > Admin > Settings menu and click the Backup Server Zones icon.

Click the label of the zone you want to remove a backup server from. On the screen that appears you will see the list of all backup servers in the cloud organized into two groups – those already assigned to this backup server zone and those that are unassigned.

In the assigned list, find the backup server you want to remove, and click the Delete icon next to it.

8.2.3.5 Delete Backup Server Zone
To delete a backup server zone:

Go to your Control Panel > Admin > Settings menu
Click the Backup Server Zones icon.

Click the Actions button next to the zone you want to remove, then click Delete. You will be asked to confirm deletion.

See also:
Virtual Server Backups
Backup Server Settings
Schedules Settings

https://onappcloud.typeform.com/to/A64Euy#source=Backup%20Server%20Zones%20Settings
Leave feedback

8.2.4 Schedules Settings
The schedules settings screen provides an overview of all virtual servers' backup schedules in the cloud. This section provides the information on how you can create, view, edit, and delete backup schedules.

8.2.4.1 Create Schedules
Depending on the backup type set in your cloud settings, schedules are created either per virtual server or per disk:

If you are using normal backups, the schedules are created per disk.

If you are using incremental backups, the schedules are created per virtual server.

When you create a schedule, you can set the time when the backup will be taken. Each backup erases the previous backup and a new backup is not scheduled if another auto-backup from the same schedule is pending or running. When a schedule is no longer needed, we recommend deleting it so that the task will no longer run.

8.2.4.2 View Schedules
To view the list of all schedules:

Go to your Control Panel > Admin > Settings menu.
Click the **Schedules** icon to see a list of all schedules on the system along with their details:

- **Date** - the time when the schedule was created
- **Target** - the server or disk for which the schedule was created (depending on the backup type)
- **Action** - the scheduled action
- **Period** - how frequently the backup will occur according to a period type set in the next step.

For example, if you set “2” as a period and “days” as a period type, the backup will take place at the same time every two days. By default, in this field is set 1.

- **Period type** - the backup period: days, weeks, months, or years
- **Rotation period** - the number of backups, after which the first backup will be deleted.

By default, in this field is set 1, so it means that the old one backup is deleted after a new backup occurs. If you set 2 in this field, it means that the first backup will be deleted next but one. If you set 4, three most recent backups and the new one will be stored, while the initial one will be deleted.

- **Next Start** - the date and the hour of the next backup
- **User** - the user who created the backup schedule
- **Status** - schedule status

To view schedules of a particular server, see:

- View Virtual Server Backup Schedules
- Smart Server Backup Schedules
- Application Server Backup Schedules
- ISO Virtual Server Backup Schedules
- OVA Virtual Server Backup Schedules

### 8.2.4.3 Edit Schedules

To edit a schedule:

Go to your **Control Panel > Admin > Settings** menu.

Click the **Schedules** icon to see a list of all schedules on the system.

Click the **Edit** icon next to a schedule to change its details:

- **Period** - how frequently the backup will take place according to a period type. For example, the period of 2 and the period type of days will take a backup every two days.
- **Period type** - the backup period: days, weeks, months, or years
- **Rotation period** - the number of backups after which the first backup will be deleted. This parameter is for incremental backup schedules only.
- **Start Time** - the time when the backup will be taken
- **Enabled** - move the slider to enable or disable the schedule

For a schedule with the **Failed** status, you can move the **Enabled** slider to the right to run the schedule once again.

Click the **Save** button to save your changes.
You can also configure the re-run period for auto-backup in case of auto-backup transaction failure. By default, it is set to 3 hours, but you may change the time value in the info_hub.yaml configuration file.

8.2.4.4 Delete Schedules
To delete a schedule:
Go to your Control Panel > Admin > Settings menu.
Click the Schedules icon to see a list of all schedules on the system.
Click the Actions icon next to the schedule you want to remove, then choose Delete.

See also:
Backup Server Zones Settings
Backup Server Settings
Virtual Server Backup Schedules
Smart Server Backup Schedules
https://onappcloud.typeform.com/to/A64Euy#source=Schedules%20Settings

8.2.5 OnApp Database Backup
OnApp provides the ready-to-use tool for database backing up - /onapp/onapp-cp-install/onapp-database-dump.sh. This tool is a part of onapp-cp-install package, so it is mandatory for every Control Panel. It is configured as a cron job to dump the OnApp database regularly. Also, this tool is used by the CP installer (onapp-cp-install.sh) to dump the OnApp database before any upgrade.

To set dumping properties, the tool reads the following configuration files:

<table>
<thead>
<tr>
<th>File</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>/onapp/interface</td>
<td>specifies MySQL/MariaDB connection properties, like: database, host, password, port, username.</td>
</tr>
<tr>
<td>/config/database.yml</td>
<td>specifies whether SSH File Transfer Server is used: use_ssh_file_transfer, ssh_file_transfer_server, ssh_file_transfer_user, ssh_file_transfer_options, backups_path.</td>
</tr>
<tr>
<td>/onapp/onapp-cp.conf</td>
<td>specifies: extra configuration ( e.g. custom dump server) and connection option to it ( e.g. DB_DUMP_SERVER, DB_DUMP_USER, DB_DUMP_SERVER_ROT, DB_DUMP_SERVER_SSH_OPT)</td>
</tr>
<tr>
<td></td>
<td>files rotating option (KEEP_DUMPS)</td>
</tr>
<tr>
<td></td>
<td>crontab configuration (DB_DUMP_CRON)</td>
</tr>
</tbody>
</table>
8.2.5.1 When to run?
The tool is configured as cron job to run hourly. This could be customized in `DB_DUMP_CRON` variable (/onapp/onapp-conf):

The default value is "`40 * * * *`"

Set any other crontab-styled value or leave it blank to disable the job.

Pass the "-D" option to the CP installer (onapp-cp-install-sh). This will:
disable database dumping during CP install/upgrade;
make sure that dumping is disabled in the cron;
make sure no cron job is running during install/upgrade.

8.2.5.2 How many copies to store?
The number of stored dumps is configured by `KEEP_DUMPS` variable. The default value is "`168`" (store 24 dumps per day, and keep for a week).

The variable value should be set before CP installer runs.

8.2.5.3 Where to store dumps?
The dumps are temporarily stored on the Control Panel server in
the `/onapp/interface/$ONAPP_DB_DUMP_ROOT` directory. The directory
/onapp/interface/db/dump is set by default. The `ONAPP_DB_DUMP_ROOT` variable value could be changed in the /onapp/onapp-conf file.

It is possible to move dumps into remote box automatically and to rotate there. The remote box could be:

SSH File Transfer Server if enabled in the OnApp configuration. The backups will be moved into server's `backups_path` directory and rotated there. The dumps are removed from the CP box if transfer to remote box is successful.

Any custom box. It could be configured via `DB_DUMP_SERVER` in the /onapp/onapp-cp.conf. The backups will be moved into server's `DB_DUMP_SERVER_ROOT` directory and rotated there. The dumps are removed from the CP box if transfer to a remote box is successful.

The custom box should be accessible via ssh from the CP box using onapp user without specifying the password.

To back up the entire OnApp database, use the Linux `mysqldump` command:

```
#mysqldump -p onapp > onapp.sql
```

To backup a standalone table, use the following syntax replacing `table_name` with the name of the table to be backed up:
#mysqldump -p onapp table_name > onapp.table_name.sql

To find the required MySQL password, use the following command:

```
#cat /onapp/interface/config/database.yml | grep pass
```

## 8.3 Data Stores Settings

Data stores provide disk space for your virtual servers and operating systems. Data stores are attached to Compute resources. There are several types of data stores in OnApp:

- Traditional logical volume data stores based on a centralized SAN.
- ESXi datastores used under VMware (refer to vCenter Implementation Guide for details)
- Integrated storage data stores (the core Integrated Storage functionality). See Integrated Storage chapter for details.
- SolidFire data stores.

The basic management tools are the same for all data store types, but the creation process differs.

Data stores have types that they inherit from the zone to which they belong. Later data stores can be attached to a compute resource/compute zone of the same type. Data stores can be moved from one data store zone to another, but the zones should be of the same type. For more information refer to Zone Types. The table below demonstrates the available data store zone types for different data stores:

<table>
<thead>
<tr>
<th>Data Store Type</th>
<th>Data Store Zone Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVM</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>Integrated Storage</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>SolidFire</td>
<td>Virtual/Smart</td>
</tr>
<tr>
<td>vCloud Director</td>
<td>VPC</td>
</tr>
<tr>
<td>VMware</td>
<td>Virtual</td>
</tr>
</tbody>
</table>

Use caution when changing data store settings.

OnApp is integrated with the SolidFire storage management system. It is now possible to perform the following options with the SolidFire:

- Allocate dedicated LUN from SF cluster per virtual server disk, when creating a VS (LUN is created per each VS disk, with a separate LUN per swap disk).
- Create virtual servers without the swap disk.
- Implement backups/snapshots using the SF CloneVolume method.

Logical unit number (LUN) is a unique identifier assigned to one or several virtual server disks, addressed by SCSI protocol. In the SolidFire SAN environment, a RAID controller provides multiple LUN support, presenting storage as multiple devices. In this case, a LUN is used to present a view of the disk storage to the virtual server. When a LUN is assigned to a virtual server, it acts as its physical disk drive. Regardless of the use, each logical unit is treated as a single device.
LUN allows differentiating up to eight logical units. In the LUN division, SAN is configured in such a way as to match LUNs to proper virtual servers. Use of LUN mapping allows improving security by setting storage access limitations so that only LUNs authorized to access a particular virtual server can access the specific port.

Data stores provide disk space for your virtual servers and operating systems. Data stores are attached to Compute resources. The basic management tools are the same for all data store types, but the creation process differs. This section provides information on how you can create, edit and delete data stores.

To use the data store, you have to add it to a data store zone and assign it either to a compute resource or a compute zone.

8.3.1 Create LVM Data Store

Go to your Control Panel > Admin > Settings menu.

Click the Data Stores icon.

Click the Create Data Store link at the bottom of the screen.

Follow the steps in the creation wizard:

**Step 1. Properties**

- **Label** - choose a name for the data store
- **IP address** - enter an IP address for your data store
- **Data store type** - select the lvm data store type
- **Enabled** - move the slider to the right to enable the data store. When disabled, OnApp will not allow new disks to be created automatically on that data store. This is useful to prevent an established data store from becoming too full. It also lets you prevent the automatic creation of root disks on 'special' data stores (high speed, etc).

Click Next.

**Step 2. Resources**

- **Disk Capacity** - set disk capacity in GB
- **Local Compute resource** - if required, you can also bind the data store with a local Compute resource. This is helpful if you wish that the data store and a Compute resource were located on the same physical server thus decreasing the time needed for a Compute resource-data store connection.

- **Data Store Zone** - assign the data store to a data store zone. The drop-down menu lists all data store zones set up in the cloud (to add or edit data store zones, see Data Store Zones Settings). Unless you assign a data store to a data store zone and compute resource or zone, you won’t be able to use this data store for storage. When you add a data store to a data store zone, the data store inherits the zone’s type. It will be possible to move such a data store only to a data store zone of the same type. For more information refer to Zone Types.

When you’ve finished configuring the store, click the Create Data Store button.
OnApp doesn't support the 4 K block size for local LVM data stores.

To view LVM details, use the following commands:
- `pvdisplay` - shows the current state of your physical volumes
- `vgdisplay` - shows all volume groups
- `lvdisplay` - shows all logical volumes
- `lvscan` - shows all active volumes (disks)
- `lvs` - shows the same information as `lvscan` does but with less details
- `pvscan` - scans all disks for physical volumes and shows disk space

### 8.3.2 Create SolidFire Data Store

You can create one SolidFire data store per cloud that will represent the space available at the SolidFire side.

To create a SolidFire data store:

Go to your Control Panel > Admin > Settings menu.

Click the Data Stores icon.

Click the Create Data Store link at the bottom of the screen.

Follow the steps in the creation wizard:

**Step 1 of 3. Properties**

- **Label** - enter a data store label
- **IP address** - specify an IP address to be used for managing the data store via CP (Inasmuch SolidFire data stores have two interfaces, you'll have to specify the IP address for the cluster admin later)
- **Data store type** - select a SolidFire data store type
- **Enabled** - move the slider to the right to enable a data store. When disabled, OnApp will not allow new disks to be created automatically on that data store. This is useful to prevent an established data store from becoming too full. It also lets you prevent the automatic creation of root disks on ‘special’ data stores (high speed, etc).

Click Next.

**Step 2 of 3. Resources**

- **Disk Capacity** - set disk capacity in GB.
- **Local Compute resource** - if required, you can also bind the data store with a local Compute resource. This is helpful if you wish that the data store and a Compute resource were located on the same physical server thus decreasing the time needed for a Compute resource-data store connection.
- **Data Store Zone** - assign the data store to a data store zone. The drop-down menu lists all data store zones set up in the cloud (to add or edit data store zones, see Data Store Zones Settings).
When you add a data store to a data store zone, the data store inherits the zone’s type. It will be possible to move such a data store only to a data store zone of the same type. For more information refer to Zone Types.

### Step 3. Authentication Settings

Specify the cluster Admin settings:
- **iSCSI IP** - iSCSI IP address
- **Username** - specify a username for cluster authorization
- **Password** - specify a password for cluster authorization

Specify the SolidFire Account settings:
- **Username** - specify SolidFire account username
- **Initiator secret** - specify iSCSI initiator secret (optional)
- **Target secret** - specify iSCSI target secret (optional)

*Initiator secret and target secret are optional parameters. They are created automatically for a newly created account. For the new account, they will be taken from the SolidFire database. If you specify target and initiator secrets for an existing user, they will be overwritten.*

When you’ve finished configuring the store, click the Create Data Store button.

### 8.3.3 Edit Data Store

Go to your Control Panel > **Admin** > **Settings** menu.

Click the Data Stores icon. You’ll see a list of the data stores on your system.

Click the Actions button next to the store you want to change, then click Edit.

On the following page the appropriate data store details:

- **Label** - the name of the data store.
- **IP address** - the IP address of the data store.
- **Iscsi IP** - iSCSI IP address.
- **Disk Capacity** - set disk capacity in GB.

*Enabled* - move the slider to the right to enable a data store. When disabled, OnApp will not allow new disks to be created automatically on that data store. This is useful to prevent an established data store from becoming too full. It also lets you prevent the automatic creation of root disks on ‘special’ data stores (high speed, etc).

*Local Compute resource* - if required, you can also bind the data store with a local Compute resource. This is helpful if you wish that the data store and a Compute resource were located on the same physical server thus decreasing the time needed for a Compute resource-data store connection.

*Data Store Zone* - you can re-assign the data store to another data store zone. The drop-down menu lists all data store zones set up in the cloud (to add or edit data store zones, see Data Store Zones Settings).
It is possible to move data stores only between data store zones of the same type. For more information, refer to Zone Types.

Data Store Type - edit the data store type.

Trim - select the checkbox to enable Trim on your SSD. For more information about the option, see TRIM.

If you have an integrated data store, the following parameters will be additionally available:
- Auto Healing - move the slider to the right to enable auto healing
- Epoch - move the slider to the right to enable epochs
- Integrated Storage Cache enabled - move the slider to the right to enable caching

Click the Save Data Store button to finish.

8.3.4 Edit Data Store IO Limits

IOPS limiting functionality allows you to prioritize the load on a SAN for VSs. IOPS limiting can be set for data store or for separate disks.

Ensure that the IO Limiting permissions are on before managing IO limits. For more information refer to the OnApp Permissions section of this guide. All IO limits are set to unlimited by default. The IOPS limit, set for a data store, is automatically applied to all disks within this data store.

To edit a data store IO limits:

Go to your Control Panel > Admin > Settings menu.

Click the Data Stores icon. You'll see a list of the data stores on your system.

Click the Actions button next to the store you want to change, then click Edit IO Limits.

On the following page edit the appropriate data store details:
- Read IOPS - set the read IOPS amount
- Write IOPS - set the write IOPS amount
- Read throughput - specify the read throughput (in MB/s)
- Write throughput - specify the write throughput (in MB/s)

Click the Save button to finish.

8.3.5 Disable IOPS Limiting

Go to your Control Panel > Admin > Settings menu.

Click the Data Stores icon. You'll see a list of the data stores on your system.

Click the Actions button next to the store you want to change then click Edit IO Limits.

On the following page set all parameters to Unlimited.

Click the Save button to finish.

Go to /onapp/interface/config/on_app.yml file and set the io_limiting_enabled parameter as 'false'. Disabling will only remove the feature from the UI, old vDisk limits will be used if not set to unlimited.
8.3.6 Delete Data Store

Go to your Control Panel > Admin > Settings menu.

Click the Data Store icon. You'll see a list of the data stores in your system.

Click the Actions icon next to the data store you want to delete, then click Delete. You'll be asked for confirmation before the store is deleted.

See also:

Data Store Zone Settings
Manage Compute Zone Data Stores
https://onappcloud.typeform.com/to/A64Euy#source=Data%20Stores%20Settings
Leave feedback

8.4 Data Store Zones Settings

Data store zones can be used to create different tiers of service – for example, by setting up different zones for ordinary and high-performance SANs in the cloud. Zones can also be used to create private clouds for specific users.

Data store zones have types which are inherited by the data stores in the zone. Later data stores can be attached to a compute resource/compute zone of the same type. Data stores can be moved from one data store zone to another, but the zones should be of the same type. For more information refer to Zone Types. The table below demonstrates the available data store zone types for different data stores:

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<tr>
<td>vCloud Director</td>
<td>VPC</td>
</tr>
<tr>
<td>VMware</td>
<td>Virtual</td>
</tr>
</tbody>
</table>

A data store zone consists of several data stores sharing the same permissions. Data store zones can be used to create different tiers of service. Zones can also be used to create private clouds for specific users. This section contains information on how to create data stores and manage them within the data store zone.

8.4.1 Create Data Store Zone

To create a new data store zone:

Go to your Control Panel > Admin > Settings menu and click the Data Store Zones icon.

Click the Create Data Store Zone button.

On the screen that follows:

Label - give your data store zone a name.

Server type - choose the server type from the drop-down box:

Choose the virtual server type to create a KVM or CloudBoot zone
Choose the smart server type to create a smart server zone.

Choose the Virtual Private Cloud server type to create a vCloud Director server zone.
8.4.2 Create Solidfire Data Store Zone

To create a new data store zone:

Go to your Control Panel > Admin > Settings menu and click the Data Store Zones icon.

Click the Create Data Store Zone button.

On the screen that follows:

- **Label** - give your data store zone a name.
- **Server type** - choose the server type from the drop-down box:
  - Choose the virtual server type to create a KVM or CloudBoot zone.
  - Choose the smart server type to create a smart server zone.

  The zone's type cannot be changed after the zone is created.

- **Location group** - select the location group you wish to assign this data store zone to from the drop-down list.

Click **Save**.

You will be redirected to the Data Store Zone overview page. On that page you will see Unassigned Data Stores which can be added to this Data Store Zone.

Click the + icon to assign a required SolidFire Data Store(s).

Afterwards click the **Edit** icon to proceed with SolidFire Data Store zone settings.

On the page that follows specify the following options, which will be applied while selecting this data store zone when creating a virtual server or adding a disk to an existing virtual server:

- **Default max iops** - the maximum number of Input/Output operations per second.
- **Default burst iops** - the number of burst IOPS.

  Both maximum and burst IOPS values cannot exceed 15000.

- **Min disk size** - the minimum size of a disk to be added to a virtual server.

Click **Save**.
8.4.3 Edit Data Store Zone

To edit data store zones:

Go to your Control Panel > Admin > Settings menu, and click the Data Store Zones icon. The screen that appears will show all data store zones currently set up in the cloud.

To change the zone's name and location group, click the Actions button next to the data store zone you are interested in, then click Edit.

On the page that loads you can change the following data store zone details:

- **Label** - give your data store zone a name.
- **Location group** - select the location group you wish to assign this data store zone to from the drop-down list. You can change the already assigned location group only if there are no disks or ISOs built on data stores of current zone.
- **Instance Package VSs** - move the slider to the right if you want the zone to be used when creating Instance Package VSs only. If you enable this option, the zone will not be available in the virtual server creation wizard's Resources step for custom VSs (VSs built by setting resources manually).

Click Save.

8.4.4 Attach Data Stores to Data Store Zone

To add a data store to a zone:

Go to your Control Panel > Admin > Settings menu and click the Data Store Zones icon.

Click the label of the zone you want to add a data store to.

On the screen that follows, click the + icon next to the unassigned data store you want to add.

When you add a data store to a data store zone, the data store inherits the zone's type. For more information refer to Zone Types.

8.4.5 Remove Data Stores from Data Store Zone

To remove a data store from a zone:

Go to your Control Panel > Admin > Settings menu and click the Data Store Zones icon.

Click the label of the zone you want to remove a data store from.

On the screen that appears, click the – icon next to the data store you want to remove, to delete it.

8.4.6 Delete Data Store Zone

Delete data store zones:

Go to your Control Panel > Admin > Settings menu, and click the Data Store Zones icon. The screen that appears will show all data store zones currently set up in the cloud.

Click the Actions button next to the zone you want to remove, then click Delete.

Confirm the deletion.

See also:

- Disks Settings
- Storage and Backups
8.5 Disks Settings

Virtual server storage is provided by disks. A disk is a partition of a data store that is allocated to a specific virtual server. Disks can be assigned as standard or swap disks. Managing disks for the entire cloud is handled through the Control Panel's Settings menu. This section contains information on how to view, edit, migrate and delete every disk in the cloud, and get quick access to their backup and scheduling functions.

Do not create multiple partitions on one disk for virtual servers. OnApp Control Panel supports only one partition per disk. In cases when you change disk partition, the CP might lose control of such a disk and the VS associated with it. If required, create additional disks instead.

Enable Disk Auto-Backups

Go to your Control Panel > Admin > Settings > Disks menu.

Move the Auto-backup icon to the right next to the required disk.

You can use disk auto-backups to enable/disable automatic backups for a particular disk. If the incremental backups are enabled in your cloud, you can set auto-backups per VS rather than per disk.

If disk auto-backups were turned on before enabling the incremental backups option, you will need to disable the disk auto-backups and enable incremental auto-backup per virtual server.

8.5.1 Backup Disks

The Disks screen lists all the disks in the cloud and indicates disk ID, disk label, disk size, data store they're configured on, the virtual server they're assigned to, their type, status, number of backups taken and backup status.

To back up a disk:

Go to your Control Panel > Admin > Settings > Disks menu.

Click the Actions > Backup button next to the required disk.

Click the Take a Backup button.

8.5.2 Migrate Disks

Go to your Control Panel > Admin > Settings > Disks menu.

Click the Actions button next to the disk you want to change, then click the Migrate link.

Choose the type of migration (can be hot or cold).

Choose a target data store.

Click the Start Migrate button.
8.5.3 View Disk IOPS

Go to your Control Panel > Admin > Settings > Disks menu.
Click the Actions button next to the required disk, then click the IOPS link.
There are four charts on the screen that appears:
Instant IOPS - IOPS for the last hour
Hourly IOPS - IOPS for the last 24 hours
Instant data written/read - data written/read for the last 24 hours
Hourly data written/read - data written/read for the last hour
To zoom into a time period, click and drag in a chart. Click the Reset Zoom button to zoom out again.

8.5.4 Edit Disk

Go to your Control Panel > Admin > Settings menu.
Click the Disks icon. Click the Actions button next to the required disk and select Edit.
Move the Size slider to change the size of the disk. To decrease the size of the disk below 5 GB, move the Override Minimum Size slider to the right.
Please note that decreasing disk size below 5 GB may lead to data loss.

Click Save Disk to confirm the change.

8.5.5 Edit Disk IO Limits

IOPS limiting functionality allows you to prioritize the load on a SAN for VSs. IOPS limiting can be set for data store or for separate disks.

Ensure that the IO Limiting permissions are on before managing IO limits. For more information refer to the OnApp Permissions section of this guide.

To edit disk IO limits:
Go to your Control Panel > Admin > Settings menu.
Click the Disks icon. You'll see a list of the disks on your system.
Click the Actions button next to the disk you want to change, then click Edit IO Limits.
On the following page move the Override DataStore IO Limits slider to the right to edit the appropriate details:
Read IOPS - set the read IOPS amount
Write IOPS - set the write IOPS amount
Read throughput - specify the read throughput (in MB/s)
Write throughput - specify the write throughput (in MB/s)
Click the Save button to finish.

To disable IOPS limiting:
Go to your Control Panel > Admin > Settings menu.
Click the Disks icon. You'll see a list of the disks on your system.
Click the Actions button next to the disk you want to change, then click Edit IO Limits.
On the following page set all parameters to Unlimited.
Click the **Save** button to finish.

Go to `/onapp/interface/config/on_app.yml` file and set the `io_limiting_enabled` parameter as 'false'. Disabling will only remove the feature from the UI, old vDisk limits will be used if not set to unlimited.

### 8.5.6 Schedule Disks for Backups

In addition to the system auto-backup presets, you can schedule backups of virtual servers (VS disks) as required. For example, you can set up a schedule to back up your disks once a week.

To schedule a backup:

Go to your Control Panel > **Admin** > **Settings** > **Disks** menu.

Click **Actions** > **Schedule for backups** button next to a disk to schedule a backup for.

### 8.5.7 Delete Disks

Go to your Control Panel > **Admin** > **Settings** > **Disks** menu.

Click **Actions** > **Delete** button next to a disk to delete it. You'll be asked for confirmation before the disk is removed. All backups for this disk will be removed too.

#### 8.5.7.1 Disk Wipe

OnApp Cloud provides two ways to clean VS data when deleting or migrating a VS's disk. By default, OnApp Cloud will format the physical disk space used by a virtual server when that VS's virtual disk is deleted, or when the VS disk is migrated to another data store.

You can also choose to wipe/format a VS's disk (filling it with zeroes) by changing a configuration setting on the OnApp Control Panel server. To enable this behavior:

Log in as root on your OnApp Control Panel server.

Edit the following configuration file: `/onapp/interface/config/on_app.yml` and set the `wipe_out_disk_on_destroy` parameter to true.

Restart OnApp service: `service onapp restart`.

The `wipe_out_disk_on_destroy` value is set to FALSE by default. If you wish to return disk wiping behavior to the default setting (formatting rather than zeroing disks), simply edit the config file and set the value to FALSE again.

If you are viewing the disks list on a narrow screen, you can customize the way the table is displayed by clicking the actions icon at the top of the table. In the drop-down list that appears, check the columns you want to be displayed and click **Apply**. The narrower your screen is, the more unchecked columns will be hidden from the table. If your screen is too narrow to fit all the columns you have checked, a scrollbar will appear at the bottom of the disks list. You can always alter your column selection later. Note that by default the Backups, Auto-backup? and Disk columns are not visible in the table on narrow screens.

Column selection is currently set for one browser. If you have checked some columns in one browser and open the list in some other browser, the column selection will be the default one for that other browser.

**See also:**

- Manage Virtual Server
- Data Stores Settings
- Virtual Servers
- [https://onappcloud.typeform.com/to/A64Euy#source=Disks%20Settings](https://onappcloud.typeform.com/to/A64Euy#source=Disks%20Settings) Leave feedback
9 Integrations and Additional Services

OnApp provides the ability to set up integrations and additional services on top of your standard offering. Refer to the sections below for more information.

https://docs.onapp.com/display/TEST2/.AWS+v6.4AWS
https://docs.onapp.com/display/TEST2/.High+Availability+Clusters+v6.4High Availability
https://docs.onapp.com/display/TEST2/.Disaster+Recovery+as+a+Service+%28DRaaS%29+v6.4DRaaS
https://docs.onapp.com/display/TEST2/.SolidFire+v6.4SolidFire

9.1 AWS

You can manage Amazon EC2 instances from OnApp Control Panel using the AWS API. EC2 management is represented with as much similarity to AWS as possible. The following sections provide the details on how to manage AWS and Amazon EC2 instances in CP. AWS is enabled globally for the cloud.

Amazon EC2 support is an opt-in feature that is available for a small additional fee on top of your normal OnApp license. Please discuss with your account manager if you plan to enable EC2 support for your cloud.

See also:
Enable/Disable AWS
Manage EC2 Instances
Launch New EC2

9.1.1 Enable/Disable AWS

Amazon EC2 support is an opt-in feature that is available for a small additional fee on top of your normal OnApp license. Please contact your account manager on amteam@onapp.com before enabling Amazon EC2 support.

To enable AWS for your cloud, follow the procedure below:

Go to your OnApp Control Panel > Admin > Settings > Configuration and switch on the Allow users connect to AWS toggle. This will enable AWS for the cloud.

Go to the Admin > Users menu and click the name of the appropriate user.

Find Amazon Web Services section and click Connect.

To connect, provide the following credentials:

AWS access key - go to your Amazon profile > Security credentials > Users > Manage

AWS secret access key - use the same path as above. For security reasons, AWS secret access key is stored encrypted in the OnApp DB.
In the left navigation pane of your Control Panel, a new entry **AWS > EC2 instances** will appear.

If AWS is disabled, the above option will disappear from the dashboard, but all users’ credentials will be kept in OnApp DB.

**See also:**
- OnApp License
- Manage EC2 Instances
- Launch New EC2
- [https://onappcloud.typeform.com/to/A64Euy#source=Enable/Disable%20AWS](https://onappcloud.typeform.com/to/A64Euy#source=Enable/Disable%20AWS)

### 9.1.2 Launch New EC2

Launching a new instance is a process similar to the creation of a new virtual server. In this document you can find information on how to launch a new EC2 instance.

#### 9.1.2.1 Launch EC2 Instance

Launching a new instance is a process similar to the creation of a new virtual server. In this document you can find information on how to launch a new EC2 instance.

To launch a new instance:

Go to your Control Panel > **Cloud > AWS > EC2 instances** menu.

Click the “+” icon or click **Launch EC2 Instance** at the bottom of the list.

This step initiates a wizard which will guide you through the EC2 instance launch.

**AMIs**

Select the AMI template from your list or search the marketplace. The right panel lists the main AMI’s properties.

You may search using one or more keywords, using the AMI ID. Please note, that search timeout is 30 seconds. If your request times out - try shortening the search time by making it more specific.

**Instance Type**

Select the instance type. It must be compatible with the AMI. If not - a corresponding error message will be displayed after the EC2 instance creation wizard completes.

**Instance Details**

On this step you need to fill in the following information:

Indicate the number of instances to be launched. You may launch several identical instances at the same time.

Specify network configuration. Choose network and subnet.

Select the key name.

**Review and Launch**
On this step, you can see the information on the EC2 instance you are going to create. You can either initialize the EC2 instance creation process or click the Previous button to change the required details of the instance.

Click Launch EC2 Instance button.

Some of the templates from the marketplace are not free of charge and require a subscription at AWS. Unfortunately, this information cannot be obtained via API in the process of AMI selection. So, in case a paid AMI is selected, an error message will be displayed, requesting you to accept the terms and conditions and subscribe to the selected AMI at the Amazon website.

If during the search in AWS Marketplace you get an error message about request timeout, perform the following:

- Open file /onapp/interface/config/info_hub.yml
- Increase timeout by editing parameter search_query_timeout

See also:
- Enable/Disable AWS OnApp License
- Manage EC2 Instances

9.1.3 Manage EC2 Instances

EC2 Instances menu lists your machines per selected region and lets you Launch New EC2.

OnApp does not cache, store, or change any information regarding the instances and takes it via API from AWS.

9.1.3.1 View List of EC2 Instances

To view the details of your EC2 Instances:

Go to your Control Panel > Cloud > AWS > EC2 Instances menu.

The page that loads will list your EC2 instances and the following details:

- ID
- Name
- Instance type
- Availability zone
- Status
- Public DNS name
- Public IP address

3. You can perform the following actions to your instances:

- Start/ Stop
- Terminate (only if stopped)
- Reboot
Connect - instruction how to connect to a console of the instance.

The instances are listed per region, so if you do not have instances in the selected region the list will be empty.

9.1.3.2 View EC2 Instances Details
To view the details of your EC2 Instances:

Go to your Control Panel > **Cloud** > **AWS** > **EC2 Instances** menu.
The page that loads will list your EC2 instances. Click the ID of instance you are interested in.
On the screen that appears, you will see the following EC2 instance details:
ID
Instance Type
Status
Availability zone
Key Name
Subnet
Image
Launch time
Actions buttons: Start, Stop, Reboot
Public dns name
Public IP address
Private dns name
Private IP address
Virtualization type
Ebs optimized
Root device type
Root device name

You can connect to your EC2 instance using the Connect button in the upper left corner, which will provide corresponding instructions.

9.1.3.3 Edit EC2 Instance
To edit EC2 Instance:

Go to your Control Panel > **Cloud** > **AWS** > **EC2 Instances** menu.
The page that loads will list your EC2 instances. Click the ID of instance you are interested in.
On the screen that appears, you will see the EC2 instance details.
Click the button in the upper right corner.
Choose another instance type from the drop-down menu and click Apply.

9.1.3.4 Delete EC2 Instance
To delete EC2 Instance:

Go to your Control Panel > **Cloud** > **AWS** > **EC2 Instances** menu.
The page that loads will list your EC2 instances. Click the ID of instance you are interested in.
On the screen that appears, you will see the EC2 instance details. Click the button in the upper right corner. Confirm the deletion by clicking the Terminate button.

See also:
Launch New EC2
Enable/Disable AWS
OnApp License
https://onappcloud.typeform.com/to/A64Euy#source=Manage%20EC2%20Instances

9.2 Disaster Recovery as a Service (DRaaS)

OnApp DRaaS (Disaster Recovery as a Service) is a tool which replicates all of the virtual server data to a remote cloud in real-time. If anything happens to your replicated VS, then you can quickly boot a functionally identical VS on the DRaaS provider cloud.

Requirements
You must run OnApp Integrated Storage on all compute zones you wish to replicate.

By default, you must run two cloud installations of OnApp version >=4.2 to use DRaaS. Both clouds should have the same version and the same private networks. However, if necessary, you may also use one cloud and perform replication between two compute zones within the same cloud.

Your compute resources must be publicly accessible (e.g. via NAT). Alternatively, you may use a private network, but in this case this private network must be routable between the compute zones.

You should have sufficient bandwidth for the replication (recommended > 100 Mbps).

Do not block any communication between the Control Panel and compute resources, including port 22 (default for SSH connection), and port 51820 (default for VPN).

Recommended speed for data transfer between Control Panel and compute resources is 1000+ Mbps.

DRaaS can be used for a compute zone which contains Integrated Storage data stores only (LVM and IS data stores can not be used at once).

For the instructions on how to enable and manage DRaaS for virtual servers, refer to Manage DRaaS.

9.2.1 Prerequisites

Update your Control Panel and CloudBoot to DRaaS (OnApp 4.2 version and up)

Check if DRaaS feature is enabled in your license
All the virtual servers you want to replicate must use [OnApp Storage](#). Enable DRaaS locally on your Control Panel: go to [Admin > Settings > Configuration > System > Enable DRaaS](#).

CloudBoot must be enabled ([Admin > Settings > Configuration > System > Enable CloudBoot](#)).

If you have IP whitelisting enabled on your Control Panel server, allow the DRaaS dashboard IP address (89.238.147.228) to connect.

Ensure that *Any action related to DRaaS* permission is on before managing DRaaS. For more information about permissions refer to the [List of all OnApp Permissions](#) section of this guide.

All compute resources you will use for DRaaS must be of the same virtualization type (KVM) and have the same operating system.

Make sure to [add a Location Group](#) to all CloudBoot compute zones you will use for DRaaS.

Make sure [DRaaS Dashboard](#) is properly configured (registration of compute zones for DRaaS and indication of replication sites. Be aware that DRaaS login credentials for Cloud Owner users are set up by OnApp team, regular user accounts are created automatically once DRaaS is enabled for user VS.)

Once you have all requirements and prerequisites met and [DRaaS Dashboard](#) is configured, you may [enable DRaaS](#) for virtual server.

See also:
- [Manage DRaaS](#)
- [DRaaS Dashboard Permissions](#)
- [OnApp Configuration](#)
9.2.2 DRaaS Dashboard

The DRaaS Dashboard allows you to add and configure clouds, which is required for the setup of disaster recovery as a service.

You can reset your password on the DRaaS Dashboard, if needed. Click here for more details.

1. Log out of your DRaaS Dashboard.
2. Click Forgot your password? Fill in the Password Recovery form:
   - Enter your user email.
3. Follow the link in the email to reset the user password.

The homepage displays all the recent transactions, that help you track all the disaster recovery setup, replication, failover, and failback processes, as well as cloud availability.

Prerequisites

Before adding clouds to the DRaaS Dashboard, make sure to assign at least one data store and one network to replication for each CloudBoot compute zone that you will use for DRaaS.

9.2.2.1 Add Clouds to DRaaS Dashboard

You will need to add two clouds to the DRaaS Dashboard one by one:

source cloud, where all the data will be primarily stored

provider cloud, that will be used for replication in case of disaster recovery

To register a new cloud on the DRaaS Dashboard:

Log in to the DRaaS Dashboard > Clouds tab.

Click the Register New Cloud button.

On the page that appears, fill in the following details:
Label - specify the cloud label

Subdomain - the IP address or hostname of the cloud

Go to the **Credentials** tab and click the **Edit** button.

On the page that appears, fill in the following details:

- **API Address** - IP address that responds on API calls
- **API Login** - email address of your user account
- **API Token** - you can find it at the User Profile page in API Info section or generate it on same page if you don’t have it yet.

If you get an error indicating that the API credentials are wrong, it means that you might be using an IP whitelist to control access between your CPs. In this case, **add the OnApp DRaaS Dashboard to the whitelist**.

If there are any replication issues, check if you have correct IP addresses indicated in the White List IPs.

Having the first cloud added to the DRaaS Dashboard, you may now proceed to configure it.

9.2.2.2 Configure Clouds on DRaaS Dashboard

To configure clouds on DRaaS Dashboard:

Go to the **IP Ranges** tab and click the **Add New IP Range** button to add IP range of the network assigned to the CloudBoot compute zone.

Go to the **Compute Zone** tab and click the **Register new compute zone** button to register new CloudBoot compute zone.

Select from the dropdown the compute zone the VS will be replicated to. For the provider cloud, tick the **Provider** checkbox. For the source cloud, leave the checkbox empty.

Having added and configured one of two clouds, go back to the **DRaaS Dashboard** and add the second cloud.

Having both source and provider clouds added to the DRaaS Dashboard and configured, you may now connect them.

9.2.2.3 Connect Clouds on DRaaS Dashboard

The next step is connecting source and provider compute zones. There are two possible connection methods: via selecting the provider cloud directly from the dropdown, or by adding its private key. Here is the first method:
Go to the **Compute Zones** page and select the source compute zone from the list.

Go to the **Links** tab and click the **Create new link** button.

From the **Provider** dropbox select the necessary provider compute zone.

Click **Save**.

The alternative method of connecting source and provider compute zones includes additional steps for adding the provider private key. To use the additional method:

Go to the **Compute Zones** page and select the provider compute zone from the list.

On the page that appears, find and copy the Private Key value.

Get back to the **Compute Zones** page, and select the source compute zone from the list.

On the page that appears, go to the **Links** tab and click the **Create new link** button.

Paste the private key from step two into the **Private Key** field.

Click **Save**.

Once you have the source and provider clouds connected, you may proceed to configure networks.

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### 9.2.2.4 Configure Networks on DRaaS Dashboard

In the DRaaS Dashboard, there may be three possible network types:

* **Replication** - used for the replication in all possible cases. Replication networks, which are also called **public networks**, are used for DRaaS replication traffic. IP addresses in such networks should be public or at least routable between Client and Provider clouds.

* **Internal** - may be used for replication only in case there are no replication type networks added to the compute zone. Configuration of network interfaces attached to internal networks, which are also called **private networks**, is copied to Provider side during DRaaS setup. It means that linked internal networks should have the same IP address pools.

* **Unused** - must not be used for replication even if it is the only available network in the compute zone and is disabled for DRaaS dashboard. DRaaS does not work for VSs with network interfaces attached to networks of **unused** type.

If several networks of replication and internal types are available in the compute zone, the network for replication will be randomly selected by the system.

By default, type of all networks added during clouds registration is **Replication**.
To change the network type:

Go to the **Compute Zones** page and select the necessary compute zone from the list.

On the page that appears, go to the **Networks** tab.

Select the required network and click the **Edit** button.

Select the necessary type (**replication**, **internal**, or **unused**) from the **Type** dropdown box.

Click **Save**.

Once you have both clouds and networks configured and the other prerequisites are met, you may proceed to **enable DRaaS** for your VSs in OnApp Control Panel.

### 9.2.2.4.1 Connect Networks Assigned to Different Compute Zones

This functionality applies only to networks of **internal** type.

DRaaS Dashboard also allows to connect networks of **internal** type assigned to different compute zones. To connect internal networks from different compute zones:
Go to the Compute Zones page and select the source compute zone from the list.

On the page that appears, go to the Networks tab.

Click the label of the necessary internal type network.

Go to the Links tab and click the Create New Link button.

From the Provider Network dropdown select the necessary local network.

Click Save.

9.2.2.5 DRaaS Dashboard Users

There are three types of roles in DRaaS Dashboard:

Administrator - reserved for OnApp support engineers

Cloud owner - created by support engineers; login credentials are provided by a support engineer

Cloud user - is created automatically during cloud registration and can manage only one’s own virtual server via the subdomain.draas.io dashboard (where subdomain stands for the user’s VS IP address or hostname)

9.2.2.6 Activate DRaaS

Having both the source and provider clouds configured and the DRaaS Dashboard set up, you may now activate DRaaS:

Go to your Control Panel > Virtual Servers.

Click the label of the necessary source virtual server.

On the page that appears, click Tools and select the Activate DRaaS option.

Wait for the following transactions to be finished:

Register Virtual Machine

Synchronize Virtual Machine Metadata

Replication healing
To check the list of transactions of a specific virtual server, go to the **DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Events tab.**

Once all the transactions listed above are completed, wait for the replication to finish* as well. To check this, go to the **DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab.**

*Please note that the replication process may take a lot of time to complete depending on different factors, such as data transfer speed, Internet speed, disks size, and others.

Once the replication is completed, you have one active virtual server on the source cloud and one shadow virtual server on the provider cloud.

If any unexpected issues appear on the source cloud, the virtual server on the provider cloud automatically becomes available. Consequently, the provider cloud becomes the source cloud, and the virtual server on the initial source cloud becomes the shadow virtual server.

### 9.2.2.7 Failover

The **DRaaS Dashboard** gets regular updates from Control Panel that reports on the status of all the virtual servers with enabled DRaaS. If the dashboard doesn't get an update, it checks if a VS is still running. If the VS fails, the dashboard sends you an email and a login error message appears when logging in to the **DRaaS Dashboard.** Failover is a final resort when migration and other recovery options have failed.

Failover triggers the following tasks:

- If the original VS is still active (due to a local error on the VS or if you are testing), then the VS is disabled and replication is stopped.

- The new VS is started on the provider cloud with the same data that was on the original VS. This process may take a couple of minutes.
You may also start the disaster recovery procedure manually - initiate failover. To do so:

Go to your DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab.
Click the Failover button.
Wait for the Failover transaction to finish. To check the transaction status, go to the DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Events tab.
Log in to the VS using your existing credentials but with a new IP address listed at the DRaaS Dashboard VS Details page.

Please note that during failover, your VS is not replicated.

If you have any externally accessible services, you should issue a DNS update to direct them to a new IP address.

You can keep your VS running on the failover hardware as long as you need if the following requirements are met:
- Two clouds should have the DRaaS feature enabled.
- The clouds should be correctly configured on draas.io.
It is a paid feature. For more information, contact your account manager for license cost clarification.

9.2.2.8 Failback
To revert the changes, you may also initiate failback manually. To do so:
Go to your DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab.

Click the Start Failback button.

Wait for the Synchronize Virtual Machine Metadata and Replication healing transactions to finish. To check the transaction status, go to the DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Events tab.

Wait for the replication to finish*. To check the replication status, go to the DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab.

*Please note that the replication process may take a lot of time to complete depending on different factors, such as data transfer speed, Internet speed, disks size, and others.

During the replication, the provider clouds remains available, and the source cloud is in the standby state until the replication is completed.

Once the replication is completed, go to your DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab and click the Finalize Failback button.
Wait for the Finalize Failback transaction to finish. To check the transaction status, go to the DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Events tab.

Wait for the replication to finish*. To check the replication status, go to the DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab.

*Please note that the replication process may take a lot of time to complete depending on different factors, such as data transfer speed, Internet speed, disks size, and others.

Once the replication is completed, the clouds are back to the same state as after the successful DRaaS activation.

9.2.2.9 DRaaS Dashboard API Keys

![API Keys Table]

API keys are used for running API requests to DRaaS Dashboard.

You may view the existing API keys and issue a new API key at the DRaaS Dashboard > API Keys page.

9.2.2.10 Configure VPN on DRaaS Dashboard

DRaaS Dashboard VPN is not supported on CentOS 6 KVM compute resources.

VPN is a security feature that provides data transfer between two Control Panels via secure VPN tunnels.

You may enable VPN in your DRaaS Dashboard before DRaaS activation for the source VS in your OnApp CP. Also, you may use the alternative method, if you have DRaaS already activated on the OnApp CP side or want to do it first.

If DRaaS for the source VS is not yet activated on the OnApp CP side, follow these steps to configure VPN:

Go to your DRaaS Dashboard > Clouds > click the label of the source cloud.

In the Encryption Policy field of the Details tab, click the Edit button.
On the screen that appears, specify the necessary VPN configuration option, which may be one of the following:

- **Disabled** - VPN will not be used for this cloud
- **Preferred** - VPN will be used, but will be disabled automatically in cases of poor network connection, slow Internet, etc., and replication will continue without the encryption
- **Required** - VPN will be obligatory to start and proceed the replication, but in case of network connectivity issues the replication process may be unstable.

**Restart Replication** - tick the checkbox to apply VPN to all of the already added and configured VSs in the DRaaS Dashboard through restarting replication on each of those. Otherwise, all the previously added VSs will continue working without VPN until the next replication, and all the newly added VSs will use secure VPN tunnels for data transfer after their initial replication.

Click **Save**.

Then activate DRaaS in OnApp Control Panel: go to your CP > **Virtual Servers** > label of the necessary source VS > **Tools** > **Activate DRaaS**.

To activate DRaaS first, follow this alternative method to configure VPN for the source cloud:

Activate DRaaS: go to you OnApp OnApp Control Panel > **Virtual Servers** > label of the necessary source VS > **Tools** > **Activate DRaaS**.

Wait for the replication to finish.

Go to your DRaaS Dashboard > **Clouds** > click the label of the source cloud.

In the **Encryption Policy** field of the **Details** tab, click the **Edit** button.

On the screen that appears, specify the necessary VPN configuration option, which may be one of the following:

- **Disabled** - VPN will not be used for this cloud
- **Preferred** - VPN will be used, but will be disabled automatically in cases of poor network connection, slow Internet, etc., and replication will continue without the encryption
- **Required** - VPN will be obligatory to start and proceed the replication, but in case of network connectivity issues the replication process may be unstable.

**Restart Replication** - tick the checkbox to apply VPN to all of the already added and configured VSs in the DRaaS Dashboard through restarting replication on each of those. Otherwise, all the previously added VSs will continue working without VPN until the next replication, and all the newly added VSs will use secure VPN tunnels for data transfer after their initial replication.

Click **Save**.

The Encryption Policy update will be applied to the cloud and all VSs once replication is finished.
9.2.2.10.1 Activate VPN for VS

You may also activate VPN for a specific virtual server, so that it will only apply to this VS and cloud and other VSs in the DRaaS Dashboard will not be affected.

To activate VPN for a VS:

Make sure that VPN for the corresponding cloud on the DRaaS Dashboard is disabled (check at DRaaS Dashboard > Clouds > label of the source cloud > Details tab > Encryption policy field).

Activate DRaaS for the VS: go to you OnApp OnApp Control Panel > Virtual Servers > label of the necessary source VS > Tools > Activate DRaaS.

Wait for the replication to finish. To check the replication status, go to the DRaaS Dashboard > Virtual Machines > label of the necessary virtual server > Details tab.

Go to DRaaS Dashboard > Virtual Servers > label of the necessary VS > Details tab.

In the Encryption Policy field of the Details tab, click the Edit button.

On the screen that appears, specify the necessary VPN configuration option, which may be one of the following:

- **Disabled** - VPN will not be used for this VS
- **Preferred** - VPN will be used, but will be disabled automatically in cases of poor network connection, slow Internet, etc., and replication will continue without the encryption
- **Required** - VPN will be obligatory to start and proceed the replication, but in case of network connectivity issues the replication process may be unstable.

**Restart Replication** - tick the checkbox to restart replication, so that VPN will be enabled for the VS once the replication is finished.

Click **Save**.

The Encryption Policy update will be applied to the VS once replication is finished.

See also:

- Disaster Recovery as a Service (DRaaS)
- CloudBoot Compute Resources
- Compute Zones
- https://onappcloud.typeform.com/to/A64Euy#source=DRaaS%20Dashboard

9.2.3 Manage DRaaS

Once you have enabled DRaaS on your cloud, registered on the dashboard and added your compute zones to DRaaS at the DRaaS dashboard, you can enable DRaaS on your virtual servers. DRaaS uses OnApp’s Integrated Storage, so any VS which you want to enable DRaaS on will need to use IS.

If VS is not provisioned or VS creation task is failed, Enable Disaster Recovery option will not be available.

9.2.3.1 Enable DRaaS for Virtual Server

To enable DRaaS for a virtual server:

Go to your Control Panel’s Virtual Servers menu.

Click the label of the required virtual server.

Click Tools > Enable Disaster Recovery. This triggers the following steps:
It registers the VS on the DRaaS Dashboard and creates an account for the VS owner (if it differs from the cloud owner);

It creates a shadow VS on the DRaaS provider zone that you chose;

It creates an additional 1GB disk on the shadow VS to store replication metadata that enables quick resynchronization between source and shadow VSs after connection loss;

It sets up a secure encrypted tunnel (if encryption is enabled) and begins to replicate all your data to the DRaaS provider site.

If you log in to the Dashboard and click through to the details page for the VS, you will be able to see details of the progress.

The process of enabling DRaaS can take some time and depends on your available outbound bandwidth, how much storage you are using and other factors. Once all the data has been replicated and all the disks are synchronized, then DRaaS is fully active and your VS is able to failover any time it needs to.

In case you need to resize a vdisk, the replication should be restarted manually to correctly synchronize the remote location.

9.2.3.2 Disable DRaaS
To disable DRaaS for a VS:
Log in to the DRaaS Dashboard.
Go to the Virtual Servers > label of the necessary VS > Details tab.
Click the Remove button.
Once done, the VS will be removed from the provider cloud and will remain only on the source cloud. After successful removal of a VS from the DRaaS Dashboard, you may enable DRaaS for this VS once again when necessary.

9.2.3.3 Disable DRaaS for Compute Zone
Please note that DRaaS can be disabled for a compute zone only after DRaaS has been disabled for each VS in the compute zone.

To disable DRaaS for a compute zone:
Go to the DRaaS Dashboard > Admin > Settings menu.
Click the Compute Zones icon.
Click the compute zone’s label for which you want to disable DRaaS.
On the Compute Zone Details page, click the Remove button.

9.2.3.4 Unregister Cloud
Please note that you can unregister your cloud only after DRaaS has been disabled for all your compute zones.

To unregister a cloud:
Go to the DRaaS Dashboard > Clouds tab.
Click the Actions button next to the cloud that you want to unregister and select View.
Click the Remove button.
9.2.3.5 DRaaS Billing

You can set pricing for DRaaS resources in user bucket.

In bucket DRaaS resources are a part of User VS limits. You can set the following additional fees for a VS with DRaaS enabled:

- for disk size per GB per hour
- for RAM per GB per hour
- for CPU core per core per hour
- for CPU per share per hour or CPU per unit per hour
- for node per unit per hour

In case of billing per node, it is calculated how many nodes each VS with DRaaS enabled has. The number of nodes corresponds to the highest resource requirement, e.g. a VS with 1 Core, 1GB RAM and 20GB Storage is equivalent to two nodes and is charged accordingly.

For more information on DRaaS billing, refer to the Configure Resource Allocation And Prices section of this guide.

https://onappcloud.typeform.com/to/A64Euy#source=Manage%20DRaaS

9.3 High Availability Clusters

If you want to enable or disable the High Availability Control Panel, please contact your account manager.

High availability (HA) is the capability of a system to operate continuously for a desirably long period of time despite the possible failure of one or several of its components. HA significantly decreases the extent of downtime. OnApp High Availability brings new opportunities to deploy more than one Control Panel within one cloud. This allows you to improve cloud load balancing, minimize server downtime in case of CP issues, and enhance the scalability of the whole infrastructure. High availability keeps virtual servers, daemon, and statistics live even if the physical box where they are running fails. In this case, the required component keeps working on the box which is live in the cluster. This is the optional functionality.

OnApp introduces several possible High Availability configurations depending on your infrastructure and resources. OnApp High availability is based on Pacemaker + Corosync clustering stack, using multicast as a messaging backend. At this stage OnApp introduces high availability for the following components:

- UI (HTTPd and onapp-vnc-proxy services)
- Background services (onapp-engine and onapp-ssh-agent services)
- CloudBoot (NFS, xinetd, and dhcpd services)
- Load Balancer
- Redis
- Message Queue
- Database

High availability introduces accessibility for services and communication between OnApp components:

Compute resources and backup servers are configured to accept connections from any Control Panel.

UI and CloudBoot operate in Active/Standby or Active/Active mode.
OnApp Engine, onapp-engine service (onapp daemon) operates in load balancing mode. In case when service in the active node becomes unavailable, the corresponding virtual IP address is being moved from the network interface of one active node to another active node with the highest priority. The network interface priority defines to which node the virtual IP address will be moved first if the node where it is running gets broken.

**HA Prerequisites**

Make sure to create a dedicated network for Control Panels and DB/Redis server connection.

Do not use the Control Panel server as the backup/template server. Make sure that the *Use SSH file transfer option* is disabled at **Settings > Configuration** menu.

Logs and templates are stored on the Database&Transactions server. Ensure that all the required directories are shared correctly.

It is important that you add the IPs of CP servers into the config files for compute resources and backup servers.

Compute resources accept API calls by StorageAPI from multiple IP Addresses only after reconfiguration.

SNMP Traps are being sent to Control Panels.

**See also:**

- Disaster Recovery as a Service
- Manage Hosts
- Manage Communication
- Manage Clusters
- Disable High Availability

[https://onappcloud.typeform.com/to/A64Euy#source=Highv%20Availability%20clusters](https://onappcloud.typeform.com/to/A64Euy#source=Highv%20Availability%20clusters)

**9.3.1 Disable High Availability**

When you disable High Availability, hosts marked as *Master=yes* in options at Control Panel > **Admin > Settings > HA Clusters > Hosts > Actions** next to the host(s) you want to mark.

If disabling High Availability fails in the process, rollback is not executed. Errors are displayed in the relevant transactions' logs. If faced with such situation, you need to fix any issues in your environment that prevent disabling HA and retry. If you do not set the *Master=yes* option for any host(s), disabling High Availability will fail.

To disable high availability apply the following steps:

Go to your Control Panel > **Admin > Settings** menu.

Click the **HA Clusters** icon.

On the following page, click the **General** tab.

Click **Disable**.

Click **Apply Changes**.

When you disable High Availability, all clusters are marked as disabled. If there was a configured Load Balancer, the system returns to HTTPd.

**See also:**
9.3.2 Manage Clusters

The high Availability configuration includes the following clusters: User Interface, Daemon, Cloud Boot, Load Balancer, Redis, Message Queue. You can edit or deactivate/activate these clusters and add options for them.

If you perform any changes to the cluster configuration, you need to click the **Apply Changes** button at Control Panel > Admin > Settings > HA Clusters > General for the changes to take effect.

9.3.2.1 View Clusters

Go to your Control Panel > Admin > Settings menu.

Click the **HA Clusters** icon.

On the following page, click the **Clusters** tab.

On the page that appears, you will see the clusters with their details:

- **Name** - the name of the cluster
- **Status** - the status of the cluster
- **IP Address** - the IP address of the cluster
- **Prefix** - the prefix of the network
- **Ports** - cluster ports
- **Nodes** - the number of nodes in the cluster
- **Options** - options set for the cluster
- **Modified** - whether the cluster has been altered. If it has been altered, and you want the changes to take effect, you need to click the **Apply Changes** button at Control Panel > Admin > Settings > HA Clusters > General.

**Actions** - click the **Actions** button to edit or deactivate a cluster or to add options for it.

To view the list of nodes with a cluster, click the label of the cluster you are interested in. The page that loads shows the list of nodes with their details:

- **Host** - the host to which this node belongs
- **IP Address** - the physical IP address of the node
- **Interface** - the network interface for the node
- **Priority** - the priority for the node. The node with the highest priority will take over the virtual IP address when the component of the cluster fails.
- **Options** - the options set for the node
- **Modified** - whether the node has been altered. If it has been altered, and you want the changes to take effect, you need to click the **Apply Changes** button at Control Panel > Admin > Settings > HA Clusters > General.

**Actions** - click the **Actions** button to edit or delete a node or to add options for it.

By clicking the **Actions** button you can edit or delete a node or add options for it.
You cannot delete a cluster node if the cluster to which this node is assigned has only two nodes. The minimum number of nodes in a cluster is 2.

9.3.2.2 Add Cluster
Go to your Control Panel > Admin > Settings menu.
Click the HA Clusters icon.
On the following page, click the Clusters tab.
Choose one of the optional clusters and click the appropriate button: Add Load Balancer, Add Database, Add Redis, or Add Message Queue.
Fill in the required information:
Virtual IP - the virtual IP address of the cluster. This IP address should be unique
Prefix - the prefix of the network
Ports - cluster ports
Click Submit to add the cluster.

The Load Balancer cluster must be added first, then you will be able to add Database, Redis, and Message Queue.

9.3.2.3 Add Node to Cluster
Go to your Control Panel > Admin > Settings menu.
Click the HA Clusters icon.
On the following page, click the Clusters tab.
Click the label of the cluster to which you want to add the node.
On the page that appears, you will see the list of nodes in the cluster. Click the Add Node button.
Fill in the details of the new node:
Host - select the host with which the new node is to be associated from the drop-down list
IP address - fill in the physical IP address of the node
Interface - fill in the network interface for the node
Priority - set the priority for the node. Set priority to 100 for ordinary nodes and to a larger value for the node which has an advantage in hardware. The node with the highest priority will take over the virtual IP address when the component of the cluster fails.
Click Submit.

9.3.2.4 Edit Node
Go to your Control Panel > Admin > Settings menu.
Click the HA Clusters icon.
On the following page, click the Clusters tab.
Click the label of the cluster which includes the nodes you want to edit.
On the page that appears, you will see the list of nodes in the cluster. Click the Actions button next to the node you want to edit and select Edit.
Fill in the details of the new node:
Host - select the host with which the new node is to be associated from the drop-down list
IP address - fill in the physical IP address of the node
Interface - fill in the network interface for the node

Priority - set the priority for the node. Set priority to 100 for ordinary nodes and to a larger value for the node which has an advantage in hardware. The node with the highest priority will take over the virtual IP address when the component of the cluster fails.

Click Update.

9.3.2.5 Edit Cluster

Go to your Control Panel > Admin > Settings menu.

Click the HA Clusters icon.

On the following page, click the Clusters tab.

Click the Actions button next to the cluster you want to edit, then select Edit.

On the page that appears, change the following parameters:

Virtual IP - fill in the IP address

Prefix - indicate the network prefix

Ports - indicate ports

Click Update.

9.3.2.6 Deactivate/Activate Cluster

If for a certain reason you do not wish a certain cluster to remain active, you can deactivate it. You can later activate the cluster if necessary.

To deactivate/activate a cluster:

Go to your Control Panel > Admin tab > Settings menu.

Click the HA Clusters icon > Clusters tab.

Click the Actions button next to the cluster you want to edit, then click Deactivate/Activate.

See also:

High Availability Control Panel
Manage Hosts
Manage Communication
Disable High Availability
https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Clusters

9.3.3 Manage Communication

Communication rings ensure that information is successfully transmitted between the nodes of the High Availability clusters. It is advisable to configure two multicast channels in different networks, in case if one of the networks fails.

Please note you are required to add the correct IP address when configuring multicast. Adding incorrect IP address will affect the multicast configuration.

The maximum number of communication rings corresponds to the number of available NICs on hosts. For example, if all hosts have two NICs, you can configure a maximum of two communication rings.

If you edit or delete an existing communication ring or add a new one, you need to:

Click the Apply button at Control Panel > Admin > Settings > HA Clusters > Communication.
9.3.3.1 View Communication Ring
Go to your Control Panel > Admin > Settings menu.
Click the HA Clusters icon.
On the following page, click the Communication tab.
On the page that appears, you will see you configured communication rings with their details:
Network - the multicast network used by the hosts to communicate with each other
Multicast IP Address - the multicast IP address
Multicast Port - the multicast port
TTL - time to live
Modified - whether the communication ring has been altered. If it has been altered, and you want the changes to take effect, you need to click the Apply button at Control Panel > Admin > Settings > HA Clusters > Communication.

9.3.3.2 Add Communication Ring
Go to your Control Panel > Admin > Settings menu.
Click the HA Clusters icon.
On the page that appears, click the Communication tab.
Click the Add New Ring button or click .
Fill in the following parameters:
Network - the multicast network used by the hosts to communicate with each other
Multicast IP Address - the multicast IP address
Multicast Port - the multicast port
TTL - time to live
Click Submit.

9.3.3.3 Edit Communication Ring
Go to your Control Panel > Admin > Settings menu.
Click the HA Clusters icon.
On the page that appears, click the Communication tab.
Click the Actions button next to the communication ring you want to edit and select Edit.
Fill in the following parameters:
Network - the multicast network used by the hosts to communicate with each other
Multicast IP Address - the multicast IP address
Multicast Port - the multicast port
TTL - time to live
Click Submit.

9.3.3.4 Delete Communication Ring
Go to your Control Panel > Admin > Settings menu.
Click the **HA Clusters** icon.

On the page that appears, click the **Communication** tab.

Click the **Actions** button next to the communication ring you want to remove and select **Delete**.

**See also:**
- Manage Hosts
- Manage Clusters
- Disable High Availability
- https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Communication

### 9.3.4 Manage Hosts

A High Availability cluster is comprised of a number of hosts. You can add new hosts if necessary and edit or delete the existing ones.

If you perform any changes to the hosts configuration, you need to click the **Apply Changes** button at Control Panel > **HA Clusters** > **General** for the changes to take effect.

#### 9.3.4.1 View Hosts

Go to your Control Panel > **Admin** > **Settings** menu.

Click the **HA Clusters** icon.

On the following page, click the **Hosts** tab.

On the page that appears, you will see the list of hosts in your configuration with their details:

- **Hostname** - the hostname of the host
- **Nodes** - the quantity of nodes on this host assigned to some clusters and the number of clusters in the system
- **Clusters** - the labels of cluster to which this host is assigned
- **Options** - the host options
- **Modified** - whether the host has been altered. If it has been altered, and you want the changes to take effect, you need to click the **Apply Changes** button at Control Panel > **Settings** > **HA Clusters** > **General**.
- **Actions** - click the **Actions** button to edit or delete a host or to add options for it.

To view the list of nodes within a host click the label of the host you are interested in. The page that loads shows the list of nodes with their details:

- **Cluster** - the cluster to which this node belongs
- **IP Address** - the physical IP address of the node
- **Interface** - the network interface of the node
- **Priority** - the priority for the node. The node with the highest priority will take over the virtual IP address when the component of the cluster fails.
- **Options** - the options set for the node
- **Modified** - whether the node has been altered. If it has been altered, and you want the changes to take effect, you need to click the **Apply Changes** button at Control Panel > **Settings** > **HA Clusters** > **General**.
Actions - click the **Actions** button to edit or delete a node or to add options for it.

By clicking the **Actions** button you can edit a node or add options for it.

You cannot delete a cluster node if the cluster to which this node is assigned has only two nodes. The minimum number of nodes in a cluster is 2.

9.3.4.2 Add Host

Go to your Control Panel > Admin > Settings menu. On the following page, click the **HA Clusters** icon. On the page that appears, click the **Hosts** tab.

Click the **New Host** button or click +.

On the screen that appears, fill in the following details:

- **Hostname** - the hostname of the host

Click **Submit**.

9.3.4.3 Edit Host

Go to your Control Panel > Admin > Settings menu. On the following page, click the **HA Clusters** icon. On the page that appears, click the **Hosts** tab.

Click the **Actions** button next to the host you want to edit, then select **Edit**.

On the screen that appears, change the following details:

- **Hostname** - the hostname of the host

Click **Update**.

9.3.4.4 Delete Host

You can delete a host only if it has no nodes assigned to any cluster. You can check this at Control Panel > Settings > HA Clusters > Hosts. The **Nodes** column indicates the number of nodes on the host and the quantity of clusters in the system.

To delete a host:

Go to your Control Panel > Admin > Settings menu. On the following page, click the **HA Clusters** icon. On the page that appears, click the **Hosts** tab. Click the **Actions** button next to the host you want to delete and select **Delete**.

See also:

- [Manage Communication](#)
- [Manage Clusters](#)
- [Disable High Availability](#)

[https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Hosts](https://onappcloud.typeform.com/to/A64Euy#source=Manage%20Hosts) Leave feedback
9.4 SolidFire

OnApp is integrated with the SolidFire storage management system. With the Solid Fire integration it is possible to utilize the SF SAN directly within the OnApp cloud and manage the SolidFire cluster via the SolidFire API.

You can perform the following options with SolidFire:

- Allocate dedicated LUNs from the SF cluster per virtual server disk, when creating a VS. (LUN is created per each VS disk, with a separate lun per swap disk.)
- Manage SolidFire LUNs automatically via API.
- Create virtual servers without the swap disk.
- Implement backups / snapshots using SF CloneVolume method.

To be able to utilize SolidFire in the cloud, you need to install the SolidFire storage system first.

There is a disk dependency between OnApp and SolidFire - when a new disk is created on the OnApp side, a new LUN is created automatically on the SF side, using the CreateVolume API call.

As the SolidFire data store has two interfaces (OnApp and SolidFire) you have to specify two IP addresses when creating a SolidFire Data Store Zone.

To be able to use the SF volume, you have to enable export to this device (Compute resource or a data store). To do that, you need to send an account username and initiator password to the iscsi_ip address. You will be able to use this device after the authorization.

The following options are not available under SolidFire:

- It is not possible to migrate SolidFire disks, as SF virtualizes the storage layer.
- SolidFire does not support live disk resize. To resize disk, you need to shut down the virtual server first and use the CloneVolume functionality to increase the disk size. After the disk resize operation is complete, the original volume will be replaced with the new one and deleted, after that the VS will be booted.

9.4.1 SolidFire Management

Gather statistics
Statistics gathering is performed by the OnApp Usage collection system using the GetVolumeStats API call.

Create data store
You can create one SolidFire data store per cloud that will represent the space available at the SolidFire side. Use GetLimits/GetClusterCapacity API calls to view data store size availability.

Activate/deactivate disk
All activation/deactivation operations should include automating the OpenISCSI Initiator on the Compute resource activation/deactivation for the specific Volume.

Remove disk
The Disk/LUN is removed with the DeleteVolume API call.

Backup disk
Using the CloneVolume API call, with readOnly option, a snapshot is created which you can then mount on the backup server for backup processing. The clone is then taken down after the backup using DeleteVolume API call.

Incremental backups There is a possibility to create incremental backups of VSs associated with SolidFire data store. The procedure is the same as for LVM data stores.

For more details, refer to the SolidFire API documentation.
9.4.2 SolidFire Quality of Service

SolidFire provides a substantial QoS control for the efficient performance in a cloud environment.

SolidFire data store zone has the following parameters:

Minimum IOPS (SF clusters with lower minimum IOPS will have lower priority when a system is overloaded)

Maximum IOPS

Burst IOPS

It is possible to configure the minimum IOPS resource properties as a minIOPS resource in the bucket. The maximum IOPS and burst IOPS are static values that can differ per zone, thus providing tiered functionality.

For details how to change minIOPS settings, refer to the Configure Resource Allocation and Prices section of this guide.

For more details on Solid Fire management, refer to SolidFire documentation.

SolidFire data store requires authorization for sending API requests from the CP to the SolidFire cluster (you will need to provide Cluster Admin authorization credentials when creating a SolidFire data store).

A Cluster Admin must be created on the SF side before creating a data store in the OnApp Control Panel.

See also:

Configure Resource Allocation and Prices
SolidFire Data Store Zone
Create and Manage Data Stores
https://onappcloud.typeform.com/to/A64Euy#source=SolidFire