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# vOneCloud

## **vOneCloud Documentation**

*Release 2.2.0*

**OpenNebula Systems**

**Jan 24, 2017**



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## RELEASE NOTES VONECLOUD 2.2.0

### 1.1 What's New vOneCloud 2.2

vOneCloud 2.2 is powered by OpenNebula 5.2.1 'Excession', and, as such, includes functionality present in [OpenNebula 5.2 'Excession'](#) relevant to vOneCloud:

- **Support for clustered Datastores**, SDRS clustered *datastores* are now visible in vCenter.
- **Better Sunstone support**, with host dropdown option in DS creation and image import.
- **Network monitoring**, now vCenter VMs network traffic is accounted for in OpenNebula.
- **Limit VM Network consumption**, with *specific values* available in each of the NICs of a Virtual Machine.
- **More useful vCenter networks import**, *importing networks* with the same name in different clusters is now possible.
- **More useful vCenter datracenter import**, *importing datastores* skips those not associated with any cluster.

Multiple bugfixes and documentation improvements have been included in this version. For instance, attaching and detaching network cards properly rollback if an error is found, uploading VMDKs is less error prone, fixed errors in CDROM attach/detach, better support for CDROMs, and a long list of other bugfixes and enhancements that can be consulted in the [development portal](#).

vOneCloud 2.2 has been certified with *support for vSphere 5.5 and 6.0*.

The *Automated Upgrade process* implemented by the *Control Panel* will only be available to users with an active support subscription. With this functionality users will be notified when a new vOneCloud release is available for download and they will be able to upgrade the vOneCloud platform with a single click.

### 1.2 Upgrade

Upgrading to a newer version of vOneCloud is only supported for users with an [active support subscription](#). The upgrade process is carried out in the *Control Panel web interface*.

When a new vOneCloud release is available for download, users with an active support subscription will be notified in the Sunstone interface (in particular, in the Control Panel link), as well as in the main Dashboard area of the Control Panel, and will be able to upgrade with a single click. The Control Panel component will, behind the scenes:

- download the new vOneCloud packages
- install the new vOneCloud packages, keeping the existing configuration
- restart the OpenNebula service, with no downtime whatsoever to the currently running virtual machines.

The Control Panel will display a message after the upgrade is performed, at this moment vOneCloud services would be up and running and updated to the latest version.

## 1.3 System Requirements

**Warning:** It is advised to manage one vCenter by only one vOneCloud (ie, do not manage the same vCenter from two different vOneClouds). Otherwise VMs from both server will clash and produce errors.

The following components are needed to be present in the infrastructure to implement a cloud infrastructure run by vOneCloud:

Component	Observations
vCenter 5.5 and 6.0	<ul style="list-style-type: none"><li>• ESX hosts, VM Templates and Running VMs expected to be managed by vOneCloud needs to be grouped into clusters</li><li>• The IP or DNS needs to be known, as well as the credentials (username and password) of an <a href="#">admin user</a>.</li><li>• DRS is not required but it is recommended. vOneCloud does not schedule to the granularity of ESX hosts, and you would need DRS to select the actual ESX host within the cluster. Otherwise the VM will be started in the ESX host associated to the VM Template</li><li>• Ideally, all ESX belonging to the same vCenter cluster to be exposed to vOneCloud need to share at least one datastore among them, although this is not a hard requirement.</li><li>• VMs that will be instantiated through vOneCloud need to be saved as VMs Templates in vCenter. vOneCloud only creates new VMs by instantiating VM Templates.</li></ul>
ESX 5.5 and 6.0	<ul style="list-style-type: none"><li>• With at least 2 GB of free RAM and 1 free CPU</li><li>• To enable VNC functionality from vOneCloud there are two requirements: 1) the ESX hosts need to be reachable from vOneCloud and 2) the ESX firewall should allow for VNC connections (see the note below)</li></ul>
Guest OS	<ul style="list-style-type: none"><li>• VMware tools are needed in the guestOS to enable several features (contextualization and networking feedback). Please install <a href="#">VMware Tools (for Windows)</a> or <a href="#">Open Virtual Machine Tools (for *nix)</a> in the guestOS.</li></ul>

**Note:** To enable VNC functionality for vOneCloud, repeat the following procedure for each ESX:

- In the vSphere client proceed to Home -> Inventory -> Hosts and Clusters

- Select the ESX host, Configuration tab and select Security Profile in the Software category.
- In the Firewall section, select Edit. Enable GDB Server, then click OK.

Make sure that the ESX hosts are reachable from vOneCloud.

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vOneCloud ships with a default of 2 CPUs and 2 GB of RAM, and as such it has been certified for infrastructures of the following dimensions:

- Up to 4 vCenters
- Up to 40 ESXs managed by each vCenter
- Up to 1.000 VMs in total, each vCenter managing up to 250 VMs
- Up to 100 users, being the concurrent limit 10 users accessing the system simultaneously

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**Note:** For infrastructures exceeding the aforementioned limits, we recommend an installation of OpenNebula from scratch on a bare metal server, using the [vCenter drivers](#)

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## 1.4 Known Issues and Limitations

### 1.4.1 Known Issues

These known issues will be addressed in future versions of vOneCloud:

- [Delete operation leaves a poweroff instance registered in vCenter.](#)
- [Vcenter does not honor vmm\\_exec\\_vcenter.conf.](#)

#### Found more?

If you find any new issue, please let us know in the [Community Questions](#) section of the [vOneCloud Support Portal](#).

### 1.4.2 Limitations

These limitations will be addressed in future versions of vOneCloud:

Limitation	Description
<b>VM Unsupported Operations</b>	The following operations are only supported from vCenter: - Migrate VM to different ESX clusters
<b>No spaces in Clusters</b>	VMware Clusters with space in their names are not supported
<b>No spaces in VMDKs</b>	VMDKs with spaces in their names or paths (ie, folders that contain them) are not supported for importing, attaching or uploading
<b>No spaces in Datastores</b>	Datastore names cannot contain spaces to be managed from vOneCloud
<b>No CDROM drive creation</b>	Attaching a new CDROM ISO will add a new (or change the existing) ISO to an already existing CDROM drive that needs to be present in the VM
<b>No FILES support in context</b>	Contextualization in vOneCloud does not support passing files to Virtual Machines
<b>Cannot import “one-” VMs</b>	VMs deployed by another instance of vOneCloud, or machines named with a leading “one-” cannot be imported again
<b>vCenter password length</b>	Cannot be more than 22 characters
<b>Browser support</b>	Internet Explorer ( $\geq 9$ ), Firefox ( $> 3.5$ ) and Chrome browsers are supported. Other browsers, including Safari, are <b>not</b> supported and may not work well.
<b>Browser Adblock plug ins</b>	Features like VNC and VM log viewer may be affected by Adblock plug ins. Please disable these plug ins if you are experiencing issues
<b>Cloning imported VMs</b>	Cloning in vCenter an imported VM will result in a VM that cannot be imported again. Please instantiate from templates and import the resulting VMs, instead of cloning already imported VMs.
<b>VLAN ID not reported</b>	Only networks of type DistributedVirtualPortgroup actually import the VLAN ID
<b>vCenter Password Length</b>	The vCenter password can only be 22 characters long.

If you find any new limitation, feel free to add a feature request in [Community - Feature Request](#) section of the [vOneCloud Support Portal](#).



## OVERVIEW

### 2.1 Introduction

vOneCloud extends vCenter with cloud features such as provisioning, elasticity, multi-tenancy and multi-vm capabilities. vOneCloud is designed for companies that want to create a self-service cloud environment on top of their VMware infrastructure without having to abandon their investment in VMware and retool the entire stack. vOneCloud leverages advanced features such as vMotion, HA or DRS scheduling provided by the VMware vSphere product family.

This section describes the vOneCloud platform as a whole, and its components, features and roles.

### 2.2 What Is?

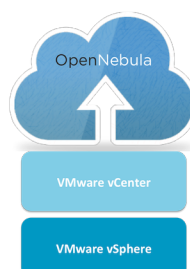
# vOneCloud

#### The Open Replacement for vCloud

vOneCloud is an [OpenNebula](#) distribution optimized to work on existing VMware vCenter deployments. It deploys an enterprise-ready OpenNebula cloud just in a few minutes where the infrastructure is managed by already familiar VMware tools, such as vSphere and vCenter Operations Manager, and the provisioning, elasticity, multi-tenancy, elasticity and multi-vm cloud features are offered by OpenNebula. It inherits all the [benefits](#) from the open source cloud management platform, adding an easy to deploy, easy to use aspect due to pre configuration of the OpenNebula install contained within the appliance.

vOneCloud is distributed as a virtual appliance in OVA format for vSphere. It contains all required OpenNebula services within a single CentOS Linux appliance. All components are fully open-source and have been certified to work in enterprise environments, vOneCloud 2.2 includes:

CentOS	7.3
OpenNebula	5.2.1



The following table summarizes the benefits of vOneCloud:

<b>Powerful</b>	Virtual data centers, self-service, Virtual Routers on VMware environments
<b>Cost Effective</b>	Free, there are no license costs, all components are fully open-source software
<b>Flexible</b>	Completely open, customizable and modular, so it can be adapted to your needs
<b>No Lock-in</b>	Platform independent, gradually migrate to other virtualization platforms
<b>Simple</b>	Very easy to install, upgrade, and maintain, with easy-to-use graphical interfaces
<b>Enterprise-ready</b>	Certified, production-ready with commercial support subscriptions and professional services

## 2.3 vOneCloud Features

vOneCloud leverages the [functionality of OpenNebula](#). The following features come pre-configured and can be used out-of-the-box with vOneCloud:

- **Cloud User Interfaces**
  - Simple, clean, intuitive portals for cloud consumers and Virtual Datacenter (VDC) administrators.
- **Cloud Admin Interfaces**
  - Sunstone Portal for administrators and advanced users
  - Powerful CLI that resembles typical UNIX commands applications
- **Import Existing Resources**
  - Import existing vCenter VM Templates
  - Import existing vCenter Networks and Distributed vSwitches
  - Import existing running and powered off Virtual Machines
  - Import existing Datastores and VMDK images

- Import existing Storage Pods

- **On-demand Provision of Virtual Data Centers**

- Dynamic creation of Virtual Data Centers (VDCs) as fully-isolated virtual infrastructure environments where a group of users, under the control of the group administrator, can create and manage compute capacity
- Placement of VDCs to multiple vCenters
- Resource Pool Confinement, restrict vOneCloud users/groups to a subset of hardware specified by a Resource Pool

- **Fast Provisioning and Virtualization Management**

- Automatic provision of Virtual Machines and Services (Multi-VM applications) from a Template catalog
- VM Template cloning and editing capabilities to maintain Template catalog
- Automatic execution and scaling of multi-tiered applications
- Snapshotting
- Contextualization capabilities, including the ability to run any script at VM boot time
- VM capacity resizing (CPU and Memory)
- vCenter Network and Distributed vSwitch support
- Connect Virtual Networks using a Virtual Router
- Attach/detach network interfaces functionality
- VNC connection to VMs, including the ability to set keymap
- Attach/detach disk functionality
- Chose datastore and Resource Pool where VMs will be deployed to
- Instantiate to persistent to easily crate a VM Template catalog
- Limit and monitor VM network consumption

- **Security and Resource Consumption Control**

- Resource Quota Management to track and limit computing resource utilization
- Fine-grained accounting and monitoring
- Complete isolated VDCs and organizations
- Fine-grained ACLs and user quotas
- Powerful user, group and role management
- Showback functionality to report resource usage cost

- **Enterprise Datacenter Component Integration Capabilities**

- Integration with user management services like Active Directory and LDAP.
- HTTP Proxy support

- **Reliability, Efficiency and Massive Scalability**

- Profit from years of testing and production use
- Be sure that your Cloud Management Platform will be up to the task

vOneCloud additionally brings new configuration and upgrade tools:

- **Appliance and Services Configuration**

- Control Console for vOneCloud appliance configuration
- Control Panel (Web UI) for vOneCloud services configuration and debugging

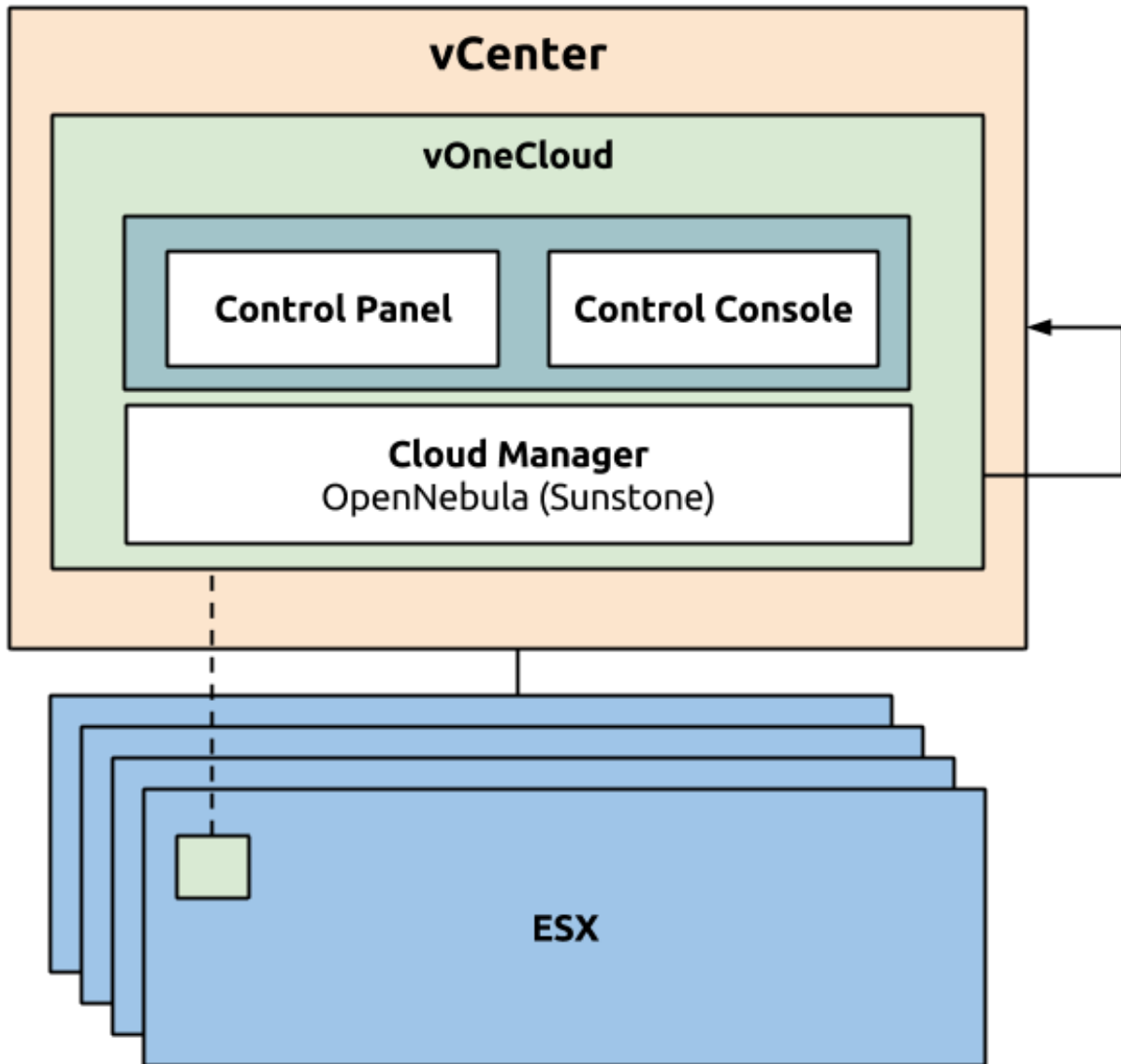
- **Smooth Upgrade Process**

- Automatic upgrade process and notifications through the Control Panel available for users with an active support subscription

If you feel that there is a particular feature interesting for the general public, feel free to add a feature request in [Community - Feature Request section of the vOneCloud Support Portal](#). If you are building a large-scale cloud, are interested in the federation of multiple controller instances, or want to integrate with third party components, customize the product or manage open source hypervisors, we recommend an installation of [OpenNebula](#).

## 2.4 Components

This diagram reflects the relationship between the components that compose the vOneCloud platform.



### 2.4.1 vCenter infrastructure

- vOneCloud is an appliance that is executed on vCenter. vOneCloud then leverages this previously set up infrastructure composed of vCenter and ESX nodes.

### 2.4.2 OpenNebula (Cloud Manager)

- **OpenNebula** acts as the Cloud Manager of vOneCloud, responsible for managing your virtual vCenter resources and adding a Cloud layer on top of it.
- **Sunstone** is the web-based graphical interface of OpenNebula. It is available at [http://<appliance\\_ip>](http://<appliance_ip>). This interface is at the same time the main administration interface for you cloud infrastructure, and consumer interface for the final users of the cloud.

### 2.4.3 Control Console and Control Panel

Control Console and Control Panel are two components which have the goal of configuring different aspects of the vOneCloud appliance: network, appliance user accounts, OpenNebula (Sunstone) configuration and services.

- The *Control Console* is a text based wizard accessible through the vCenter console to the vOneCloud appliance and has relevance in the bootstrap process and the configuration of the appliance
- The *Control Panel* is a slick web interface and is oriented to the configuration of the vOneCloud services as well as used to update to a newer version of vOneCloud.

## 2.5 Accounts

The vOneCloud platform ships with several pre-created user accounts which will be described in this section:

Account	Interface	Role	Description
root	linux	Appliance administrator	This user can log into the appliance (local login, no SSH).
oneadmin	vOneCloud Control Panel	vOneCloud Appliance administrator	Used to configure several aspects of the vOneCloud Appliance infrastructure: OpenNebula services, automatic upgrades, and drivers configuration (Active Directory integration).
CloudAdmin	OpenNebula (Sunstone)	Cloud Administrator	Cloud Administrator. Run any task in OpenNebula, including creating other users.

Different *cloud roles* can be used in order to offer and consume cloud provisioning services in Sunstone (vOneCloud Web UI). These roles can be defined through Sunstone, and in particular CloudAdmin comes preconfigured as the Cloud Administrator.

### 2.5.1 root linux account

vOneCloud runs on top of Linux (in particular CentOS 7 <<http://www.centos.org/>>), therefore the administrators of the vOneCloud appliance should be able to have console access to the appliance. The appliance comes with a *root* account with an undefined password. This password **must** be set during the first boot of the appliance. The *vOneCloud Control Console* will prompt the administrator for a new root password.

Please note that ssh access is disabled by default in the appliance. You can log in either opening an alternate TTY on a Virtual Machine Console in vSphere's client or enabling SSH using vOneCloud's Control Panel.

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**Note:** Console access to the appliance is not required by vOneCloud. Use it only under special circumstances. If you are a user with an active support subscription, make sure any changes applied in the appliance are supported by the vOneCloud support.

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### 2.5.2 oneadmin account

The main use of this account is to access the vOneCloud Control Panel ([http://<appliance\\_ip>:8000](http://<appliance_ip>:8000)). Only this account will have access to the Control Panel, no other user will be allowed to log in.

However, the *oneadmin* account is also a valid Sunstone account, but we **strongly recommend not to use this account to access the Sunstone Web UI**, relying instead in the pre-existing *CloudAdmin* account (see below).

The *oneadmin* account password is set by the admin user during the initial configuration of the vOneCloud Control Console. The **password can only be changed in the vOneCloud Control Console**. After changing it the user **must** restart the OpenNebula service in the *vOneCloud Control Panel*.

### 2.5.3 CloudAdmin OpenNebula (Sunstone) account

This account is used to log into Sunstone. It is a Cloud Administrator account, capable of running any task within OpenNebula, however, since this account cannot log into the vOneCloud Control Panel, it cannot control Appliance infrastructure, only the virtual resources.

This account should also be used to create other accounts within Sunstone, either with the same level of privileges (by placing a new account in the *oneadmin* group) or final user without admin privileges. These final users can either be *VDCadmins* or *cloud consumers*.

The default password for this account is *CloudAdmin* (just like the username). Make sure you change the password within Sunstone once you log in.





## **SIMPLE CLOUD DEPLOYMENT**

### **3.1 All About Simplicity**

vOneCloud is pre configured to be plugged into your existing vCenter infrastructure and quickly start using its cloud features. vOneCloud is the perfect choice for companies that want to create a self-service cloud environment on top of their VMware infrastructure without having to abandon their investment in VMware and retool the entire stack.

Simple to Use	Simple graphical interfaces for cloud consumers, and VDC and cloud administrators.
Simple to Update	New versions can be easily installed with no downtime of the virtual workload.
Simple to Adopt	Add cloud features, do not interfere in existing VMware procedures and workflows.
Simple to Install	CentOS appliance deployable through vSphere, able to import your system

This guide will guide through all the needed steps to deploy vOneCloud and prepare your new cloud to provision your end users.

### **3.2 Download and Deploy**

Download links:

- [Download](#)

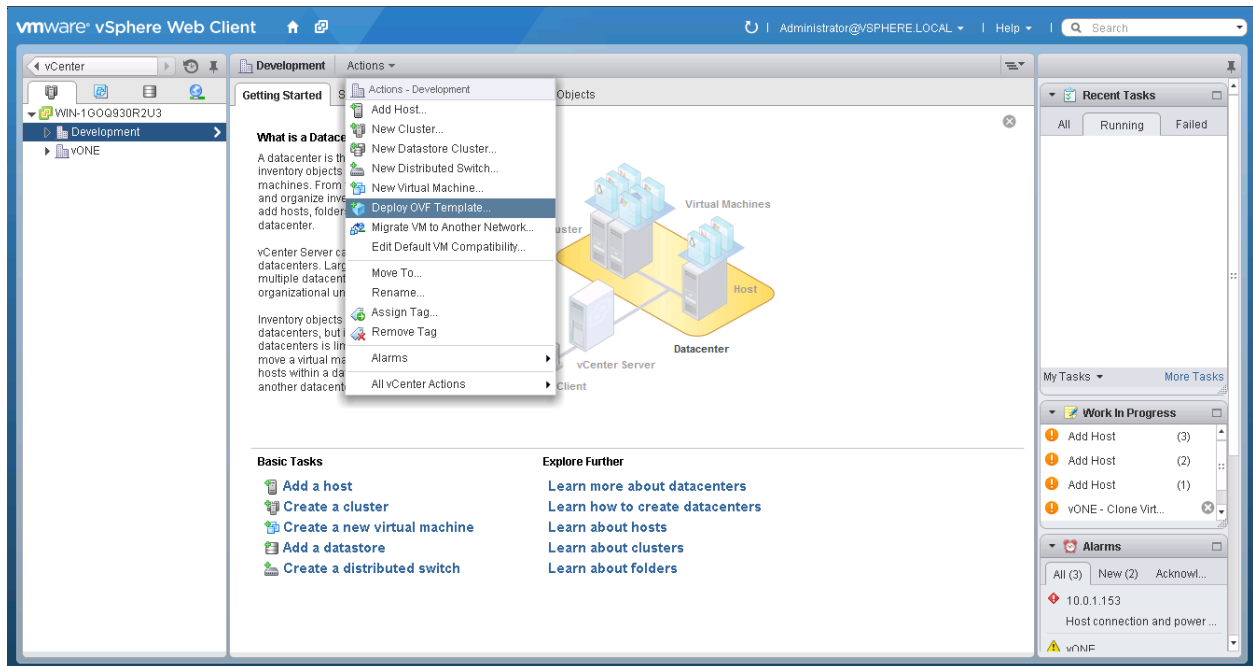
You can import this OVA appliance to your vCenter infrastructure. It is based on [CentOS 7](#) and has the VMware tools enabled.

The appliance requirements are kept to a strict minimum so it can be executed in any vCenter installation. However, before deploying it, please read the [system requirements](#).

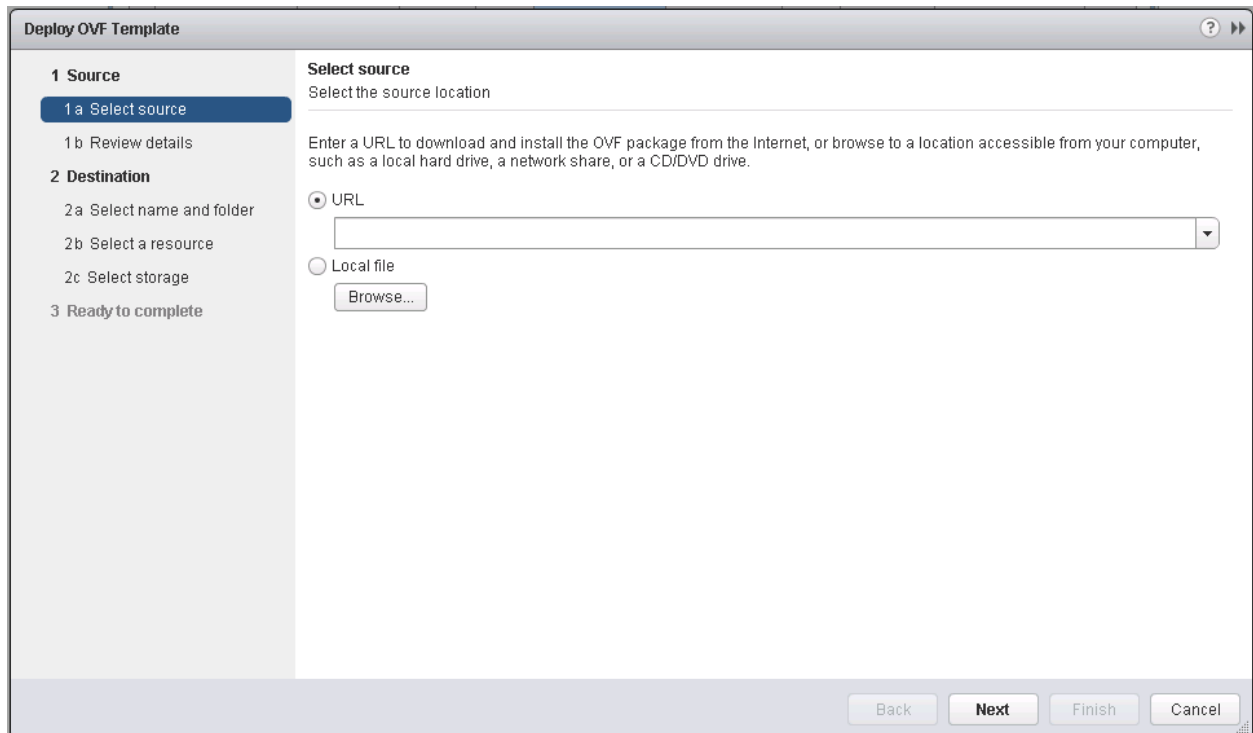
Follow the next steps to deploy a fully functional vOneCloud:

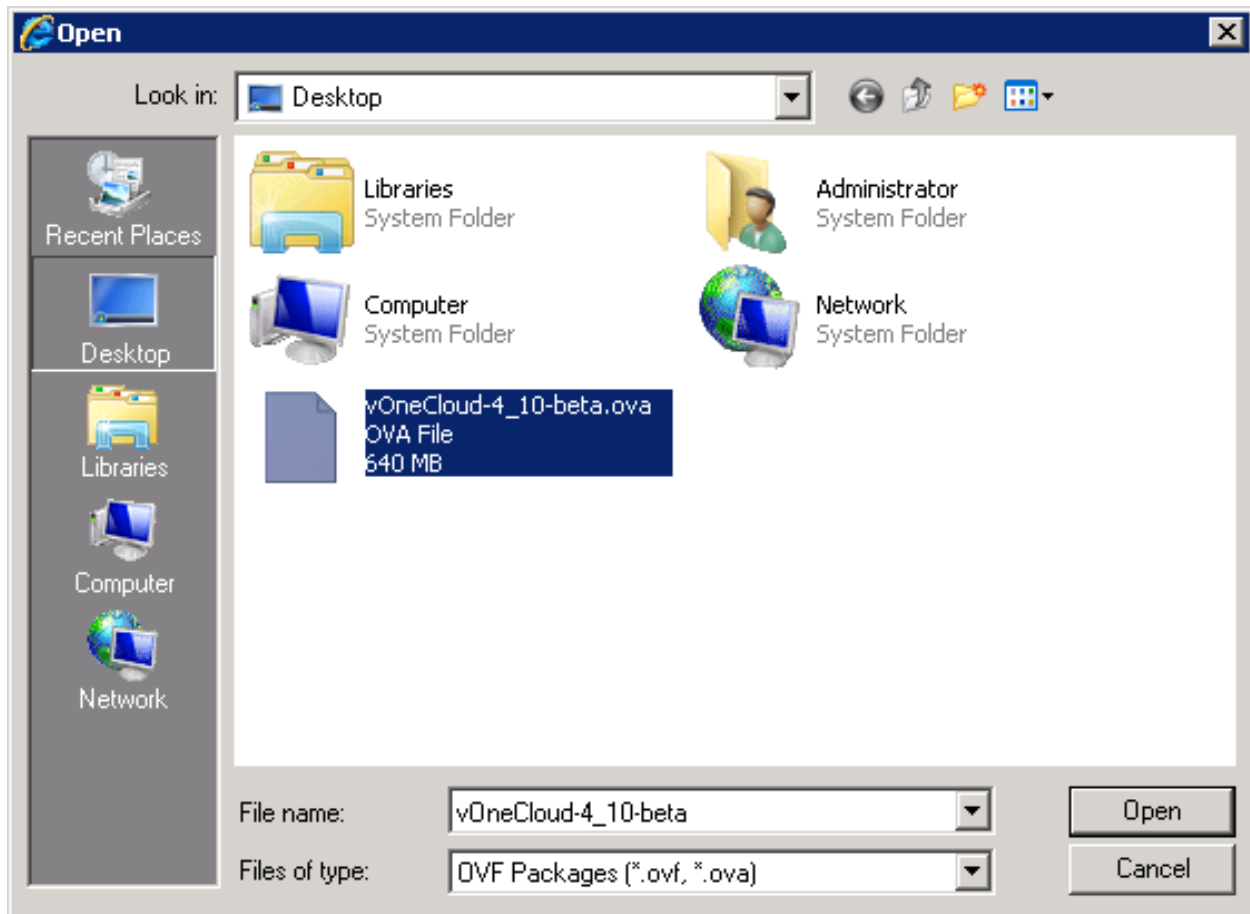
#### **3.2.1 Step 1. Deploying the OVA**

Login to your vCenter installation and select the appropriate datacenter and cluster, where you want to deploy the appliance. Select the `Deploy OVF Template`.

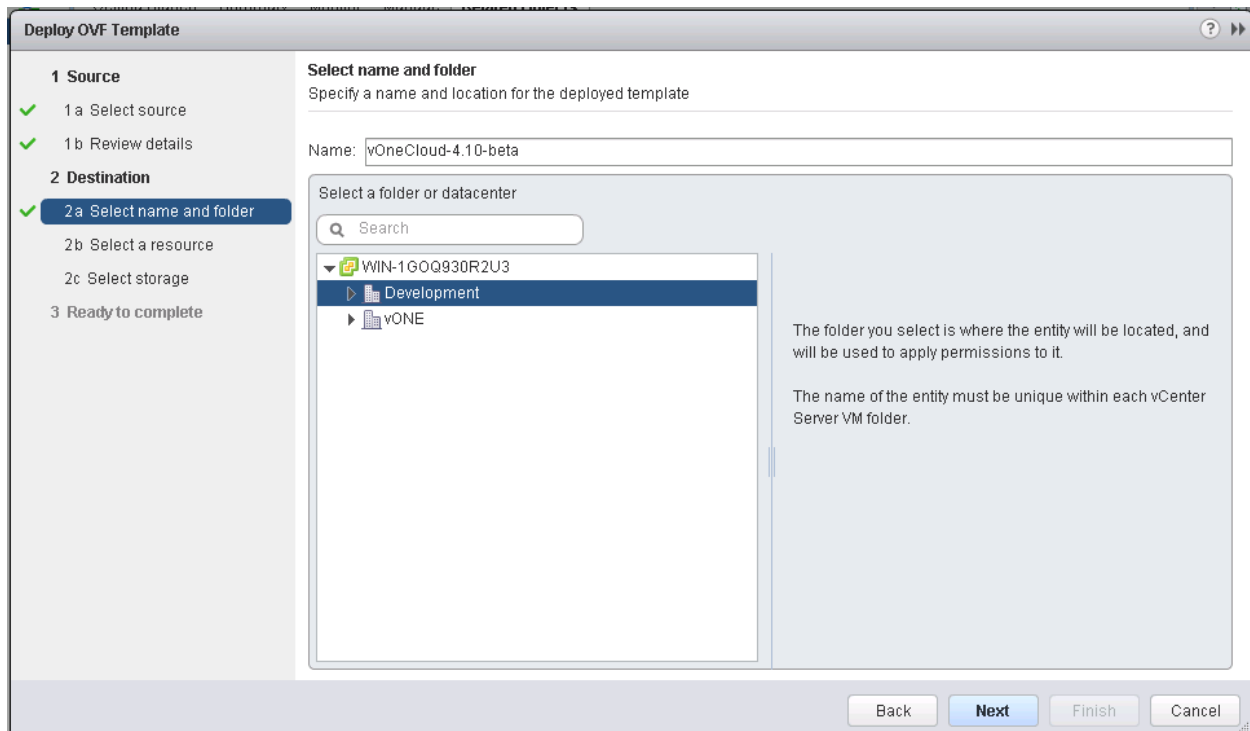


You have the option now to input the URL of the appliance (you can find it at the top of this page), or if you have previously downloaded it, you can simply browse to the download path as such:

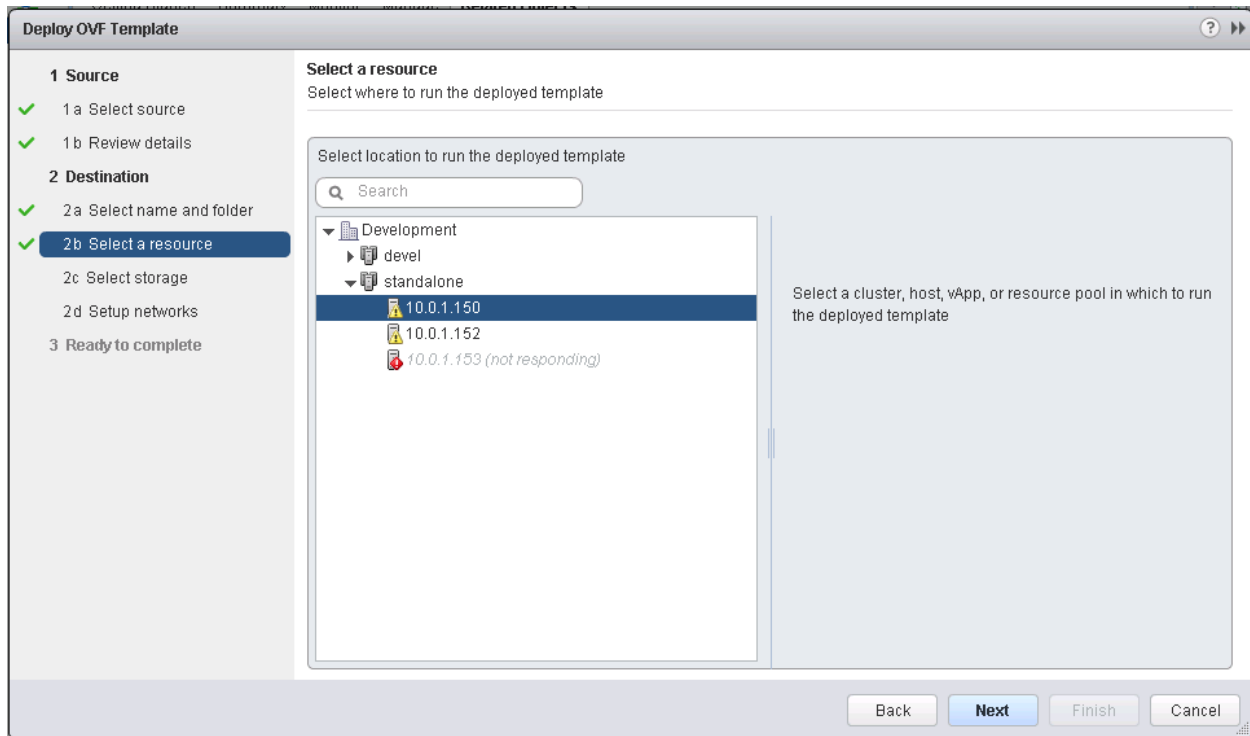




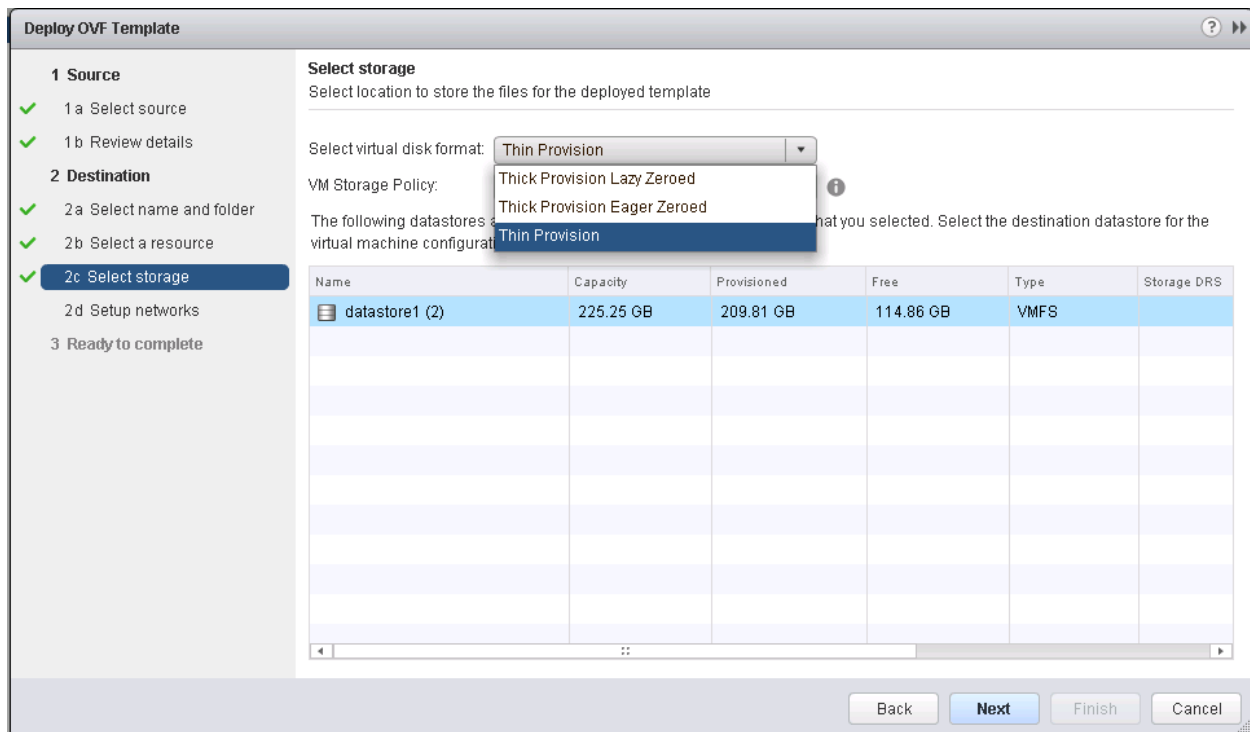
Select the name and folder:



Select a resource to run the appliance:



Select the datastore:



Select the Network. You will need to choose a network that has access to the ESX hosts.

**Deploy OVF Template**

**1 Source**

- 1 a Select source
- 1 b Review details

**2 Destination**

- 2 a Select name and folder
- 2 b Select a resource
- 2 c Select storage
- 2 d Setup networks**

**3 Ready to complete**

**Setup networks**  
Configure the networks the deployed template should use

Source	Destination	Configuration
internal	internal	<input checked="" type="checkbox"/>
	VM Network	
	internal	

IP protocol: IPv4 IP allocation: Static - Manual ⓘ

**Source: internal - Description**  
The internal network

**Destination: internal - Protocol settings**  
No configuration needed for this network

Back Next Finish Cancel

Review the settings selection and click finish. Wait for the Virtual Machine to appear in the cluster.

**Deploy OVF Template**

**1 Source**

- 1 a Select source
- 1 b Review details

**2 Destination**

- 2 a Select name and folder
- 2 b Select a resource
- 2 c Select storage
- 2 d Setup networks
- 3 Ready to complete**

**Ready to complete**  
Review your settings selections before finishing the wizard.

OVF file	C:\Users\Administrator\Desktop\wOneCloud-4_10-beta.ova
Download size	640.3 MB
Size on disk	1.3 GB
Name	vOneCloud-4.10-beta
Datastore	datastore1 (2)
Target	10.0.1.150
Folder	Development
Disk storage	Thin Provision
Network mapping	internal to internal
IP allocation	Static - Manual, IPv4

☐ Power on after deployment

Back Next Finish Cancel

After importing the vOneCloud OVA, and before powering it on, the vOneCloud Virtual Machine can be edited to, for instance, add a new network interface, increase the amount of RAM, the available CPUs for performance, etc.

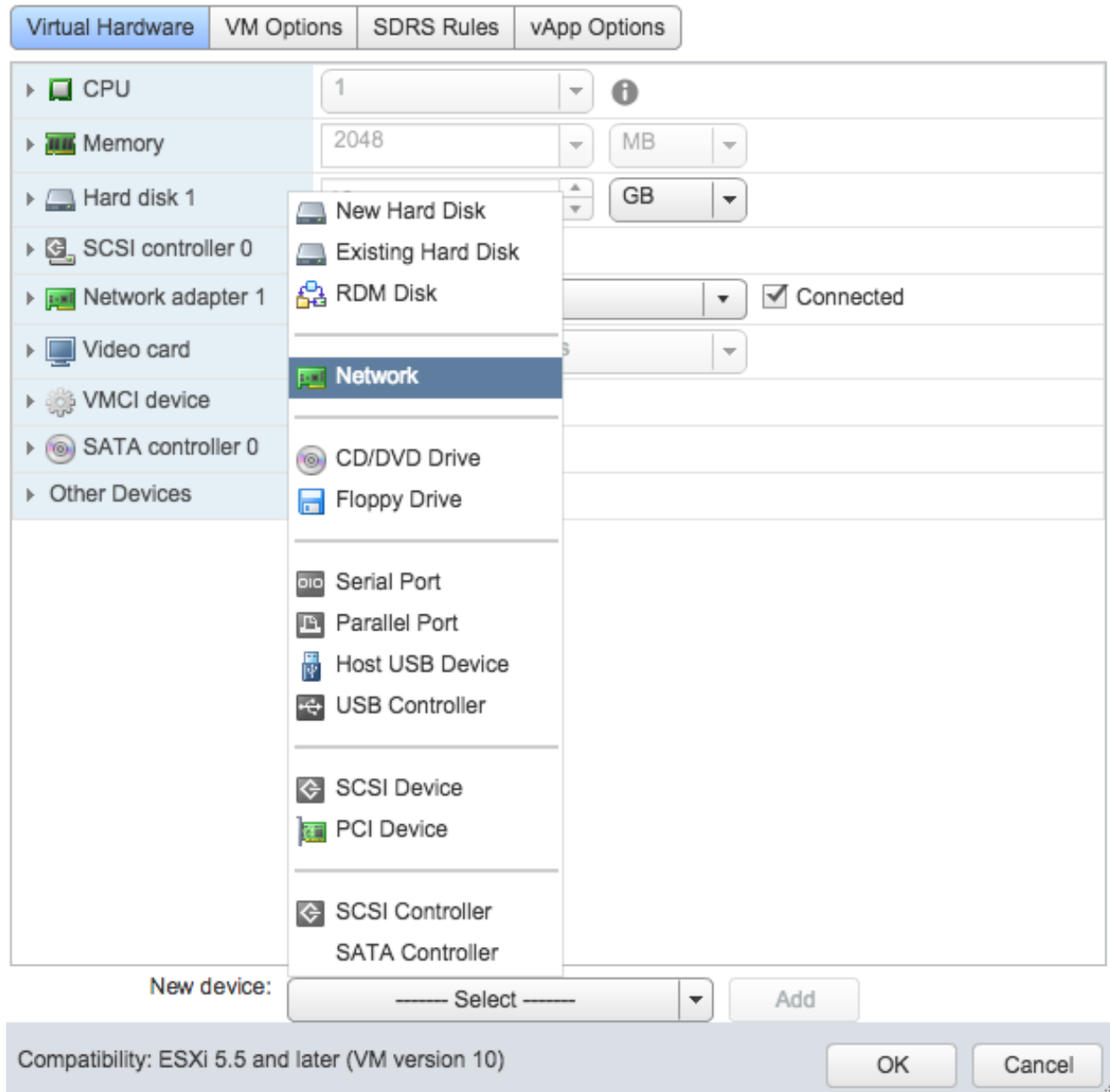
In order to achieve this, please right click on the vOneCloud VM, and select Edit Settings. The next dialog should pop up:

Virtual Hardware	VM Options	SDRS Rules	vApp Options
▶  CPU	1		
▶  Memory	2048		MB
▶  Hard disk 1	10		GB
▶  SCSI controller 0	VMware Paravirtual		
▶  Network adapter 1	VM Network		<input checked="" type="checkbox"/> Connected
▶  Video card	Specify custom settings		
▶  VMCI device			
▶  SATA controller 0			
▶ Other Devices			

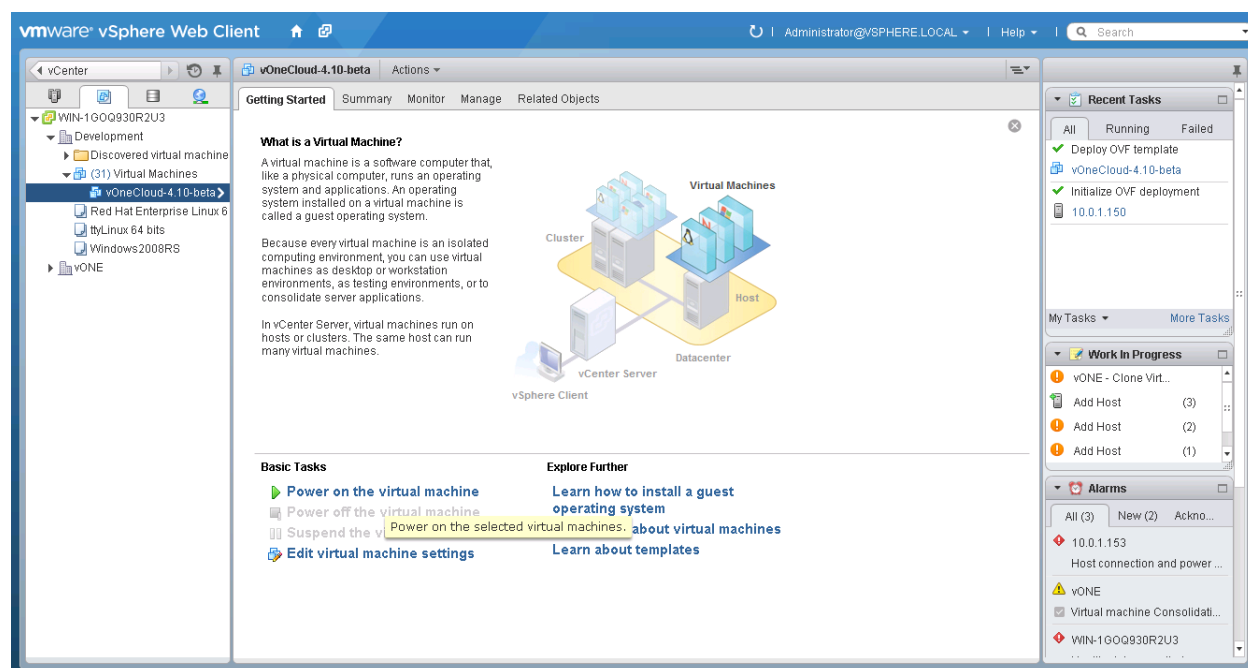
New device: —— Select —— Add

Compatibility: ESXi 5.5 and later (VM version 10) OK Cancel

If you want for instance to add a new network interface, select Network from the dropdown in New device (at the bottom of the dialog):



Now you can power on the Virtual Machine (to edit settings before, *read this section*):



### 3.2.2 Step 2. vOneCloud Control Console - Initial Configuration

When the VM boots up you will see in the VM console in vCenter the *vOneCloud Control Console*, showing this wizard:



If you are presented instead with the following:



You are being presented with the wrong tty. You will need to press CTRL+ALT+F1 to access the Control Console.



In this wizard you need to **configure the network**. If you are using DHCP you can simply skip to the next item.

If you are using a static network configuration, answer yes and you will need to use a ncurses interface to:

- “Edit a connection”
- Select “Wired connection 1”
- Change IPv4 CONFIGURATION from <Automatic> to <Manual> and select “Show”
- Input the desired IP address/24 in Addresses
- Input Gateway and DNS Servers
- Select OK and then quit the dialog.

An example of static network configuration on the available network interface (see *Editing the vOneCloud Appliance* for information on how to add new interfaces to vOneCloud) on the 10.0.1.x class C network, with a gateway in 10.0.1.1 and using 8.8.8.8 as the DNS server:

```
Iqoooooooooooooooooooooooooooo Edit connection tqqooooooooooooooooooooooooo
X
X Profile name Wired connection 1 X
X Device 00:50:56:95:DC:BD (ens192) X
X
X ETHERNET <Show> X
X
X IPv4 CONFIGURATION <Manual> <Hide> X
X Addresses 10.0.1.249/24 <Remove> X
X <Add...> X
X Gateway 10.0.1.1 X
X DNS servers 8.8.8.8 <Remove> X
X <Add...> X
X Search domains <Add...> X
X
X Routing (No custom routes) <Edit...> X
X [ ] Never use this network for default route X
X
X [X] Require IPv4 addressing for this connection X
X
X IPv6 CONFIGURATION <Automatic> <Show> X
X
X [X] Automatically connect X
X [X] Available to all users X
X
X <Cancel> <OK>
```

Next, you can **configure the proxy** if your network topology requires a proxy to access the internet. However please note that it's absolutely fine to use vOneCloud without any Internet access at all, as you will be able to do most of the things, except for automatic upgrades.

Afterwards you need to define a **root password**. You won't be using this very often, so write it down somewhere safe. It's your master password to the appliance.

The next item is the **oneadmin account password**. You will only need this to login to the vOneCloud Control Panel, a web-based configuration interface we will see very shortly. Check the *Accounts section* to learn more about vOneCloud roles and users.

We have now finished the vOneCloud Control Console initial configuration wizard.

### 3.2.3 Step 3. vOneCloud Control Panel - Manage Services

The wizard points out that you can open the vOneCloud Control Panel by visiting `http://<appliance_ip>:8000` in your browser and using the *oneadmin* account and password just chosen.

The *vOneCloud Control Panel* will allow the administrator to:

- Check for new vOneCloud versions and manage automatic upgrades.
- Configure Active Directory / LDAP integration
- Configure SSL (https) access
- Enable/Disable ssh
- Start the OpenNebula services

Click on the configuration icon if you need to configure one of the supported options. Keep in mind that you can run this configuration at any moment. We recommend to start inspecting vOneCloud's functionality before delving into advanced configuration options like the aforementioned ones.

After clicking on the Start button, proceed to log in to Sunstone (OpenNebula's frontend) by opening: `http://<appliance_ip>` and using the default login *CloudAdmin* / *CloudAdmin* user and password.

---

**Note:** There is a guide available that documents the configuration interfaces of the appliance [here](#).

---

### 3.2.4 Step 4. Enjoy the Out-of-the-Box Features

After opening the Sunstone interface (`http://<appliance_ip>` with *CloudAdmin* / *CloudAdmin* user and password) you are now ready to enjoy the *out-of-the-box features* of vOneCloud!

Move on to the [next section](#) to start using your cloud by importing your vCenter infrastructure.

### 3.2.5 Login to the Appliance

**Warning:** If you make **any** changes to OpenNebula configuration files under `/etc/one` please note that they **will** be either discarded in the next upgrade, or overwritten by vOneCloud Control Center. Keep in mind that only those features configurable in Sunstone or in vOneCloud Control Console and Control Panel are officially supported. Any other customizations are not supported by [vOneCloud Support](#).

All the functionality you need to run your vOneCloud can be accessed via Sunstone, and all the support configuration parameters are available either in the *vOneCloud Control Console* or in the *vOneCloud Control Panel*.

To access the *vOneCloud command line interface*, first *enable SSH* and ssh to the host using the *root* account and password. In OS X and Linux environments, simply use *ssh* to log into the root account of vOneCloud's IP. For Windows environments you can use software like [PuTTY](#) or even SFTP clients like [WinSCP](#) if you are simply uploading or downloading-modifying-uploading files in order to make customization as documented by the [Advanced Customizations](#) section.

Alternatively, open the vCenter console of the vOneCloud Virtual Machine appliance and change the tty (Ctrl + Alt + F2). Afterwards, log in with the *root* account and the password you used in the *initial configuration*, and switch to the *oneadmin* user.

### 3.3 Import Existing vCenter

Importing a vCenter infrastructure into vOneCloud can be carried out easily through the Sunstone Web UI. Follow the next steps to import an existing vCenter cluster as well as any already defined VM Template and Networks.

You will need the IP or hostname of the vCenter server, as well as a user declared as Administrator in vCenter.

Alternatively, in some enterprise environments declaring the user as Administrator is not allowed, in that case, you will need to grant the following permissions to a user depending on what OpenNebula's functionality you want to enable:

vCenter Operation	Privileges required by OpenNebula	OpenNebula's functionality
CloneVM_Task	VirtualMachine.Provisioning.DeployTemplate	Creates a clone of a particular VM
ReconfigVM_Task	VirtualMachine.Interact.DeviceConnection VirtualMachine.Interact.SetCDMedia VirtualMachine.Interact.SetFloppyMedia VirtualMachine.Config.Rename VirtualMachine.Config.Annotation VirtualMachine.Config.AddExistingDisk VirtualMachine.Config.AddNewDisk VirtualMachine.Config.RemoveDisk VirtualMachine.Config.CPUCount VirtualMachine.Config.Memory VirtualMachine.Config.RawDevice VirtualMachine.Config.AddRemoveDevice VirtualMachine.Config.Settings VirtualMachine.Config.AdvancedConfig VirtualMachine.Config.SwapPlacement VirtualMachine.Config.HostUSBDevice VirtualMachine.Config.DiskExtend VirtualMachine.Config.ChangeTracking VirtualMachine.Provisioning.ReadCustSpecs VirtualMachine.Inventory.CreateFromExisting VirtualMachine.Inventory.CreateNew VirtualMachine.Inventory.Move VirtualMachine.Inventory.Register VirtualMachine.Inventory.Remove VirtualMachine.Inventory.Unregister DVSwitch.CanUse DVPortgroup.CanUse Datastore.AllocateSpace Datastore.BrowseDatastore Datastore.LowLevelFileOperations Datastore.RemoveFile Network.Assign Resource.AssignVirtualMachineToResourcePool	Reconfigures a particular virtual machine.
PowerOnVM_Task	VirtualMachine.Interact.PowerOn	Powers on a virtual machine
PowerOffVM_Task	VirtualMachine.Interact.PowerOff	Powers off a virtual machine
Destroy_Task	VirtualMachine.Inventory.Delete	Deletes a VM (including disks)
SuspendVM_Task	VirtualMachine.Interact.Suspend	Suspends a VM
RebootGuest	VirtualMachine.Interact.Reset	Reboots VM's guest Operating System
ResetVM_Task	VirtualMachine.Interact.Reset	Resets power on a virtual machine
ShutdownGuest	VirtualMachine.Interact.PowerOff	Shutdown guest Operating System
CreateSnapshot_Task	VirtualMachine.State.CreateSnapshot	Creates a new snapshot of a virtual machine.
RemoveSnapshot_Task	VirtualMachine.State.RemoveSnapshot	Removes a snapshot from a virtual machine
RevertToSnapshot_Task	VirtualMachine.State.RevertToSnapshot	Revert a virtual machine to a particular snapshot
CreateVirtualDisk_Task	Datastore.FileManagement	On all VMFS datastores represented by OpenNebula
CopyVirtualDisk_Task	Datastore.FileManagement	On all VMFS datastores represented by OpenNebula
DeleteVirtualDisk_Task	Datastore.FileManagement	On all VMFS datastores represented by OpenNebula

---

**Note:** For security reasons, you may define different users to access different ESX Clusters. A different user can be defined in OpenNebula per ESX cluster, which is encapsulated in OpenNebula as an OpenNebula host.

---

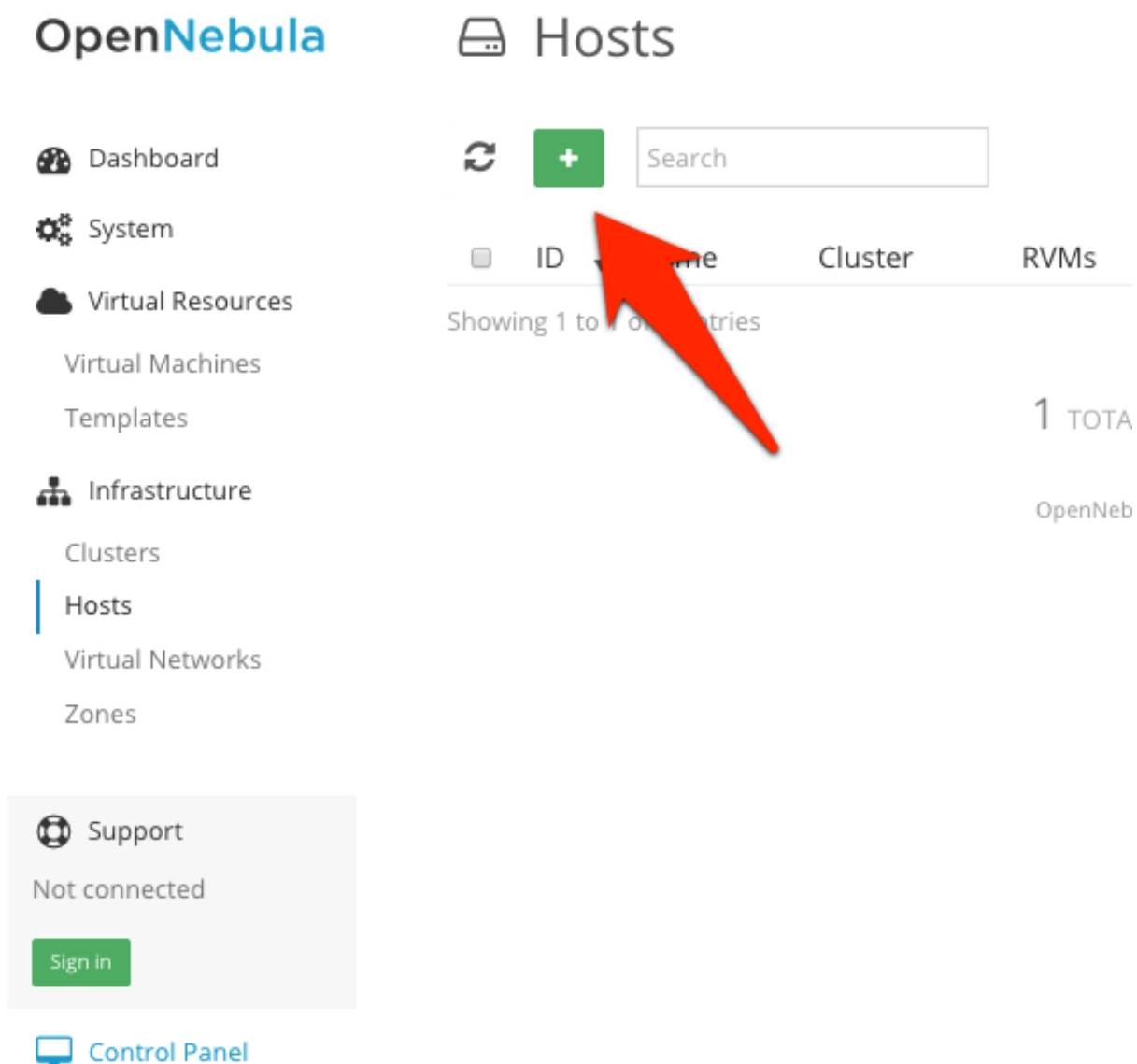
### 3.3.1 Step 1. Sunstone login

Log in into Sunstone as **CloudAdmin**, as explained in *the previous section*.

The *CloudAdmin* user comes pre configured and is the **Cloud Administrator**, in full control of all the physical and virtual resources and using the vCenter view. Views will be explained later in its own section.

### 3.3.2 Step 2. Acquire vCenter Resources

To import new vCenter clusters to be managed in voneCloud, proceed in Sunstone to the Infrastructure --> Hosts tab and click on the “+” green icon.



**Warning:** vOneCloud does not support spaces in vCenter cluster names.

In the dialog that pops up, select vCenter as Type in the drop-down. You now need to fill in the data according to the following table:

<b>Hostname</b>	vCenter hostname (FQDN) or IP address
<b>User</b>	Username of a vCenter user with administrator rights
<b>Password</b>	Password for the above user

**Create Host** CloudAdmin OpenNebula

Type: VMWare vCenter Cluster: 0: default

**vCenter**

Hostname: vcenter.vcenter3
 User: administrator@vsphere.local
 Password: .....

**Datacenter DataCenter**

☐ MyvCenterCluster

Now it's time to check that the vCenter import has been successful. In **Infrastructure** --> **Hosts** check if vCenter cluster has been imported, and if all the ESX hosts are available in the ESX tab.

**Note:** Take into account that one vCenter cluster (with all its ESX hosts) will be represented as one vOneCloud host.

**OpenNebula** Host devel oneadmin OpenNebula

Hostname	Status	Real CPU	Real Memory
10.0.1.3	on	31 / 800 (4%)	14.2GB / 16GB (89%)

Showing 1 to 1 of 1 entries

Previous 1 Next 10

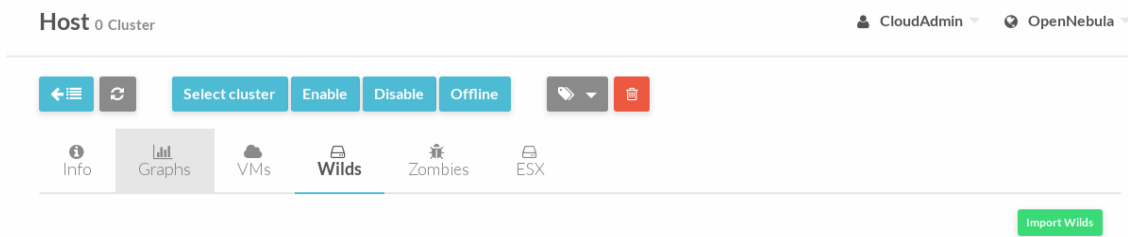
OpenNebula 4.10.2 by OpenNebula Systems.

Dashboard  
 System  
 Virtual Resources  
 Virtual Machines  
 Templates  
**Infrastructure**  
 Clusters  
**Hosts**  
 Virtual Networks  
 Zones  
 Support  
 Not connected

### 3.3.3 Step 3. Import / Reacquire vCenter Resources

#### Existing VMs

If the vCenter infrastructure has running or powered off **Virtual Machines**, vOneCloud can import and subsequently manage them. To import vCenter VMs, proceed to the WILDS tab in the Host info tab representing the vCenter cluster where the VMs are running in, select the VMs to be imported and click on the import button.



After the VMs are in the Running state, you can operate on their life-cycle, assign them to particular users, attach or detach network interfaces, create snapshots, do capacity resizing (change CPU and MEMORY after powering the VMs off), etc.

All the functionality that vOneCloud supports for regular VMs is present for imported VMs with some exceptions. The following operations *cannot* be performed on an imported VM:

- Recover –recreate
- Undeploy (and Undeploy –hard)
- Migrate (and Migrate –live)
- Stop

Running VMs with open VNC ports are imported with the ability to establish VNC connection to them via vOneCloud. To activate the VNC ports, you need to right click on the VM while it is shut down and click on “Edit Settings”, and set the `remotedisplay.*` settings shown in the following images.

---

**Note:** Every VM needs it’s own VNC port, so use different values for `remotedisplay.vnc.port` when importing existing VMs.

---



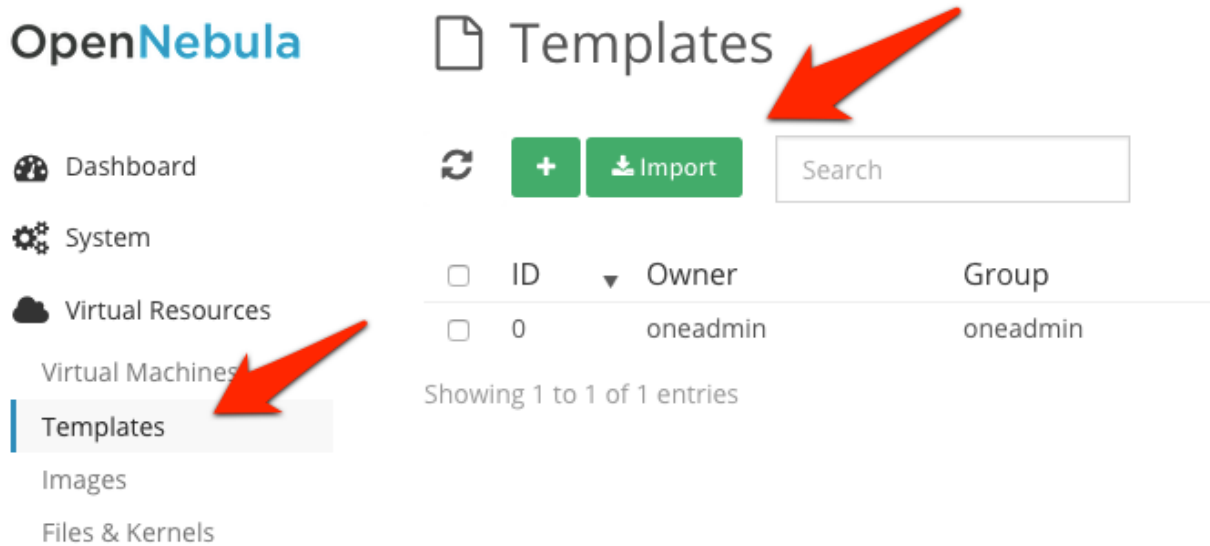
Virtual Hardware	VM Options	SDRS Rules	vApp Options
▶ VMware Tools	<i>Expand for VMware Tools settings</i>		
▶ Power management	<i>Expand for power management settings</i>		
▶ Boot Options	<i>Expand for boot options</i>		
▼ Advanced			
Settings	<input type="checkbox"/> Disable acceleration <input checked="" type="checkbox"/> Enable logging		
Debugging and statistics	Run normally ▾		
Swap file location	<input checked="" type="radio"/> Default Use the settings of the cluster or host containing the virtual machine.		
	<input type="radio"/> Virtual machine directory Store the swap files in the same directory as the virtual machine.		
	<input type="radio"/> Datastore specified by host Store the swap files in the datastore specified by the host to be used for swap files. If not possible, store the swap files in the same directory as the virtual machine. Using a datastore that is not visible to both hosts during vMotion might affect the vMotion performance for the affected virtual machines.		
Configuration Parameters	Edit Configuration...		
Latency Sensitivity	Normal ▾ ⓘ		
▶ Fibre Channel NPIV	<i>Expand for Fibre Channel NPIV settings</i>		

Name	Value
migrate.hostLog	one-7-1be8be7b.hlog
remotedisplay.vnc.enabled	TRUE
remotedisplay.vnc.ip	0.0.0.0
remotedisplay.vnc.port	5907
ethernet0.pciSlotNumber	192

### VM Templates

vCenter **VM Templates** can be imported and reacquired using the **Import** button in **Virtual Resources --> Templates**. Fill in the credentials and the IP or hostname of vCenter and click on the “Get Templates” button.



These vOneCloud VM templates can be modified selecting the VM Template in Virtual Resources --> Templates and clicking on the Update button, so the resulting VMs are adjusted to user needs. Among other options available through the Sunstone web interface:

- Information can be passed into the instantiated VM, through either *Contextualization or Customization*.
- Network interface cards can be added to give VMs access to different networks
- Capacity (MEMORY and CPU) can be modified
- VNC capabilities can be disabled

**Note:** VMs instantiated through vOneCloud will be named in vCenter as 'one-<vid>-<VM Name>', where <vid> is the id of the VM and VM Name is the name given to the VM in vOneCloud. This value can be changed using a special attribute set in the vCenter cluster representation in vOneCloud, ie, the vOneCloud host. This attribute is called "VM\_PREFIX", and will evaluate one variable, \$i, to the id of the VM. A value of "one-\$i-" in that parameter would have the same behaviour as the default. This attribute can be set in the "Attributes" section of the vOneCloud host, in the info panel that shows after clicking on the desire host.

Regarding the vCenter VM Templates and Networks, is important to take into account:

- vCenter **VM Templates with already defined NICs** that reference Networks in vCenter will be imported without this information in vOneCloud. These NICs will be invisible for vOneCloud, and therefore cannot be detached from the Virtual Machines. The imported Templates in vOneCloud can be updated to add NICs from Virtual Networks imported from vCenter (being Networks or Distributed vSwitches).
- We recommend therefore to use **VM Templates in vCenter without defined NICs**, to add them later on in the vOneCloud VM Templates

### Networks

Similarly, **Networks** and Distributed vSwitches can also be imported / reacquired from using a similar `Import` button in Infrastructure --> Virtual Networks.

Virtual Networks can be further refined with the inclusion of different [Address Ranges](#). This refinement can be done at import time, defining the size of the network one of the following supported Address Ranges:

- IPv4: Need to define at least starting IP address. MAC address can be defined as well
- IPv6: Can optionally define starting MAC address, GLOBAL PREFIX and ULA PREFIX

- Ethernet: Does not manage IP addresses but rather MAC addresses. If a starting MAC is not provided, vOneCloud will generate one.

The networking information will also be passed onto the VM in the *Contextualization* process.

It is possible to limit the bandwidth of any VM NIC associated to a particular virtual network by using the Inbound/Outbound Traffic QoS values as seen in the next image.

The image shows a web interface for configuring network QoS. It is divided into two sections: 'Override Network Inbound Traffic QoS' and 'Override Network Outbound Traffic QoS'. Each section contains three input fields: 'Average bandwidth (KBytes/s)', 'Peak bandwidth (KBytes/s)', and 'Peak burst (KBytes)'. The fields are currently empty.

### Datastores and Images

Datastores and VMDK images can be imported / reacquired from the Storage --> Datastores and Storage --> Images respectively.

Datastore will be monitored for free space and availability. Images can be used for:

- disk attach/detach on VMs
- enrich VM Templates to add additional disks or CDROMs

---

**Note:** vOneCloud does not support spaces in VMDK and datastores names.

---



---

**Note:** Resources imported from vCenter will have their names appended with a the name of the cluster where this resources belong in vCenter, to ease their identification within vOneCloud.

---



---

**Note:** vCenter VM Templates, Networks, Distributed vSwitches, Datastores, VMDKs and Virtual Machines can be imported regardless of their position inside VM Folders, since vOneCloud will search recursively for them.

---

### 3.3.4 Step 4. Instantiate a VM Template

Everything is ready! Now vOneCloud is prepared to manage Virtual Machines. In Sunstone, go to Virtual Resources --> Templates, select one of the templates imported in **Step 3** and click on Instantiate. Now you will be able to control the life cycle of the VM.

More information on available operations over VMs [here](#).

## 3.4 Create a Virtual Datacenter

A Virtual Datacenter (VDC) defines an assignment of a pool of physical resources to one or several groups of users. This pool consists of logical groups of hosts, virtual networks and datastores from one or several clusters, which can be shared between VDCs. VDCs are a great way to partition your cloud into smaller clouds, and assign them to groups with their administrators and users, completely isolated from other groups.

A **Group Admin** manages her partition of the cloud, including user management, but only within the VDCs assigned to the Group.

Let's create a Group (under System) named *Production* with an administrator called **prodadmin**:

OpenNebula

Dashboard  
System  
Users  
Groups  
VDCs  
ACLs  
Virtual Resources  
Virtual Machines  
Templates  
Infrastructure  
OneFlow  
Support  
Not connected  
Sign in

### Create Group

Name:

☒ Create an administrator user

Username:

Password:

Authentication:

Views Admin Permissions

Reset Create

⚠ New Groups are automatically added to the default VDC

Let's create a VDCs (under System) named *ProductionVDC*, and assign the *Production* group to use it:

OpenNebula Create Virtual Data Center

oneadmin OpenNebula

Dashboard System Users Groups **VDCs** ACLs Virtual Resources Virtual Machines Templates Infrastructure OneFlow Support

General Groups Resources

Search

ID	Name	Users	VMs	Memory	CPU
101	Production	1	0 / -	0KB / -	0 / -
100	BlueGroup	0	0 / -	0KB / -	0 / -
1	users	0	0 / -	0KB / -	0 / -
0	oneadmin	3	-	-	-

Previous 1 Next

You selected the following groups: Production

Let's add resources to the VDC under the "Resources" tab, for instance a vCenter instance and a Virtual Network:

OpenNebula Create Virtual Data Center

oneadmin OpenNebula

Dashboard System Users Groups VDCs ACLs Virtual Resources Virtual Machines Templates Infrastructure OneFlow Support

General Groups Resources

Clusters Hosts VNETs Datastores

Zone OpenNebula

Search

ID	Owner	Group	Name	Reservation	Cluster	Leases
2	oneadmin	oneadmin	VM Network	No	-	1 / 1
1	oneadmin	oneadmin	DPortGroup	No	-	1 / 255
0	oneadmin	oneadmin	DSwitch6.0-DVUplinks-17	No	-	0 / 255

Previous 1 Next

Now login again using the newly created **prodadmin**. The Group Admin view will kick in (views will be explained later in its own section.). Try it out creating the first *produser* and assign them quotas on resource usage:

**Create User**

produser

.....

.....

**Define Quotas**

Default Manual

Running VMs

Manual 25

CPU

Manual 25

As the *CloudAdmin* user, in the vCenter View, you will be able to see all the VM Templates that have been automatically created when importing the vCenter infrastructure. You can assign any of these VM Templates to the VDC by assigned them to the Group associated to the VDC:

OpenNebula Sunstone

Dashboard

System

Users

Groups

ACLs

Virtual Resources

Virtual Machines

Templates

Infrastructure

Clusters

Hosts

Zones

Marketplace

OneFlow

Template 0

Info Template

Information

ID	0
Name	ttyLinux 64 bits
Register time	16:30:37 22/10/2014

Permissions:

	Use	Manage	Admin
Owner	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ownership

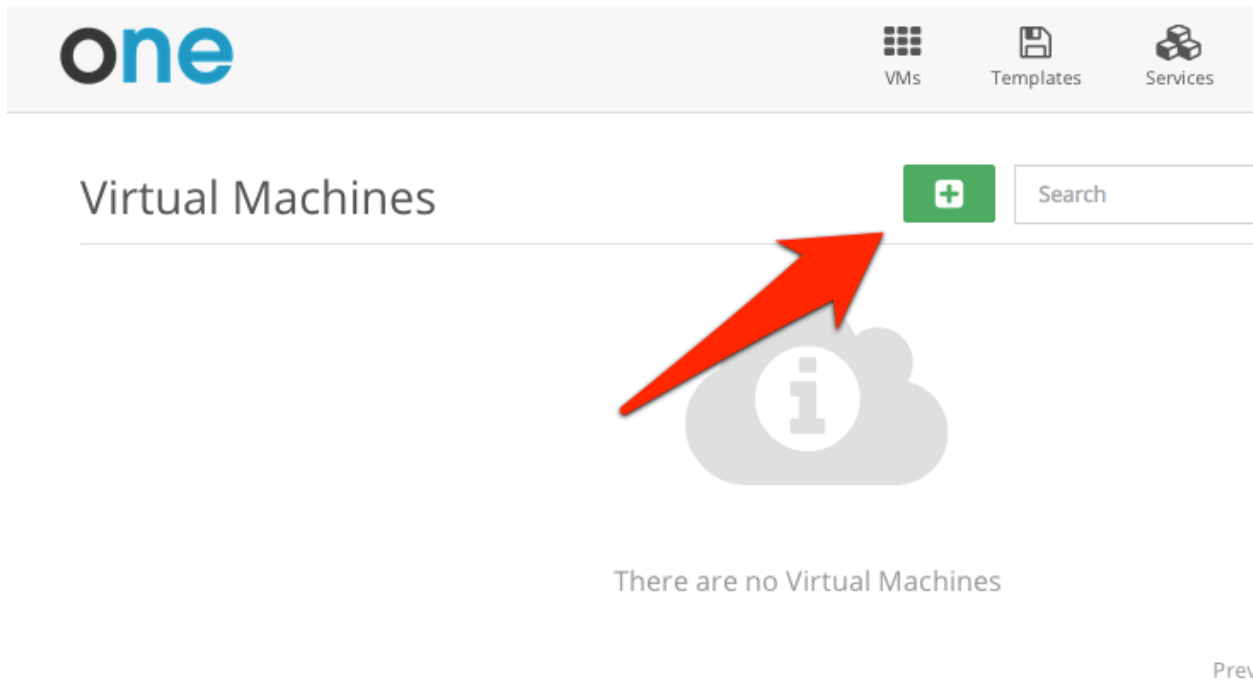
Owner	vOneCloud
Group	<div> <input checked="" type="checkbox"/> 0: oneadmin  <input type="checkbox"/> 1: users  <input type="checkbox"/> 101: ProductionVDC </div>

OpenNebula 4.9.80 by OpenNebula Systems

The same applies for Virtual Networks these VM Templates may use.

If you log with *produser*, the view will change to the vCenter Cloud View, where you can start consuming VMs based

on the VM Template shared by the **Cloud Administrator** and allowed by the **prodadmin**:

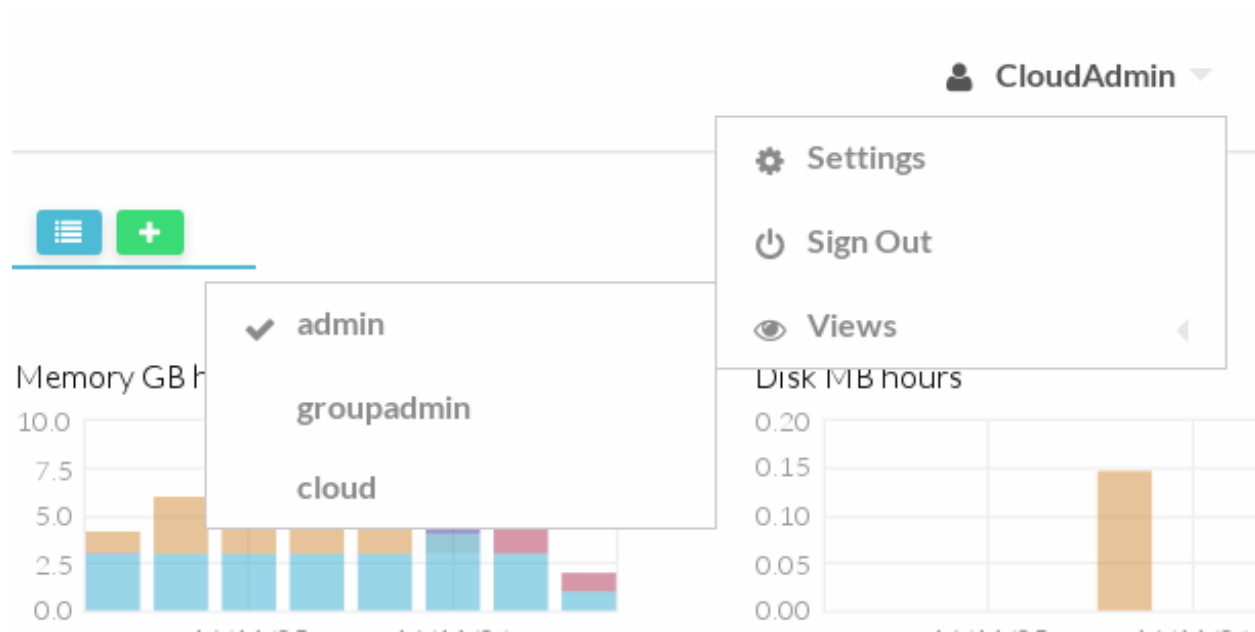


Read more about [Group](#) and [VDC](#) managing.

## 3.5 vOneCloud Interfaces

vOneCloud offers a rich set of interfaces to interact with your cloud infrastructure, tailored for specific needs of cloud administrators and cloud users alike.

You can select one of the available views clicking in the username at the top right of the screen and selecting the Views entry.

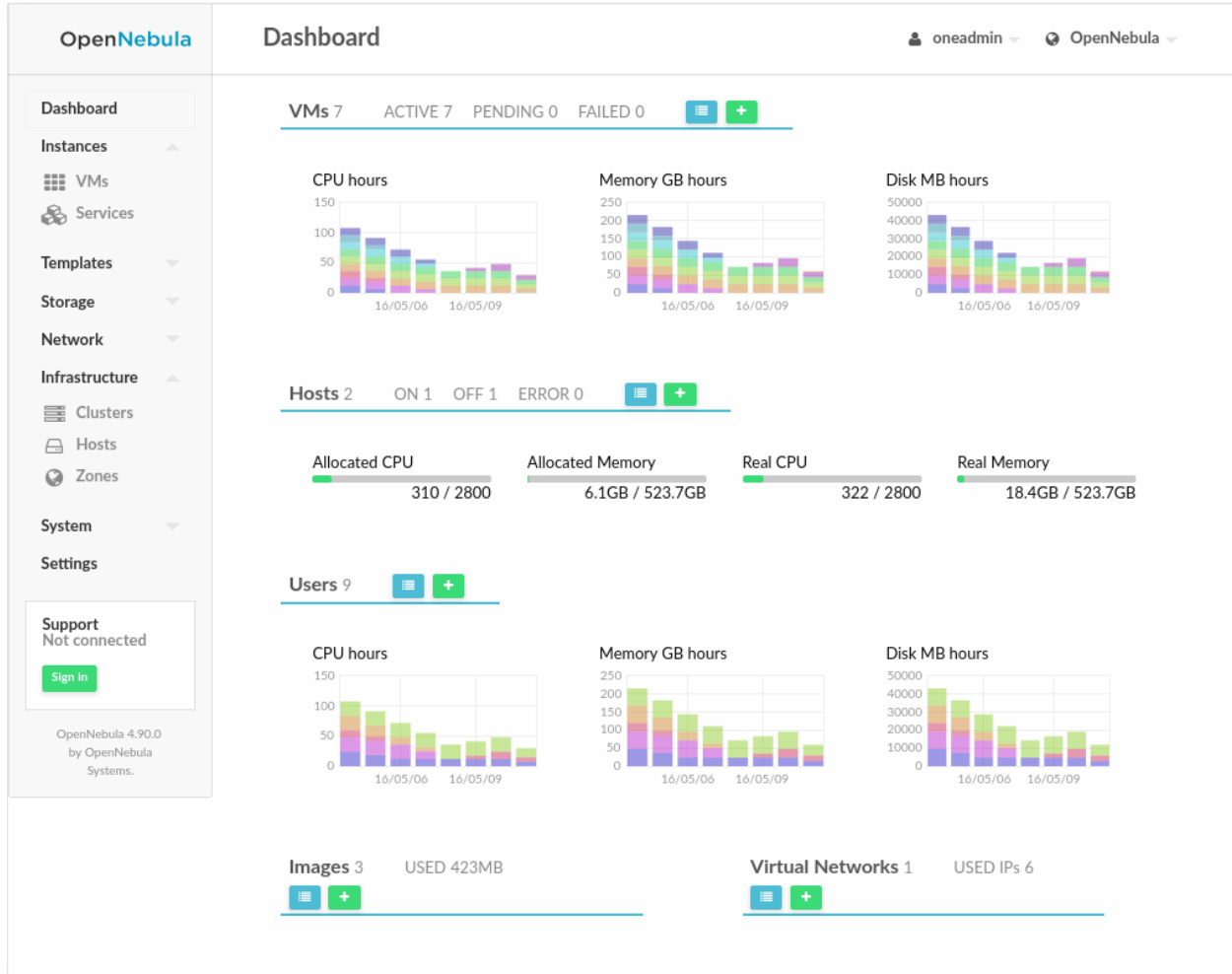


### 3.5.1 Web Interface (Sunstone)

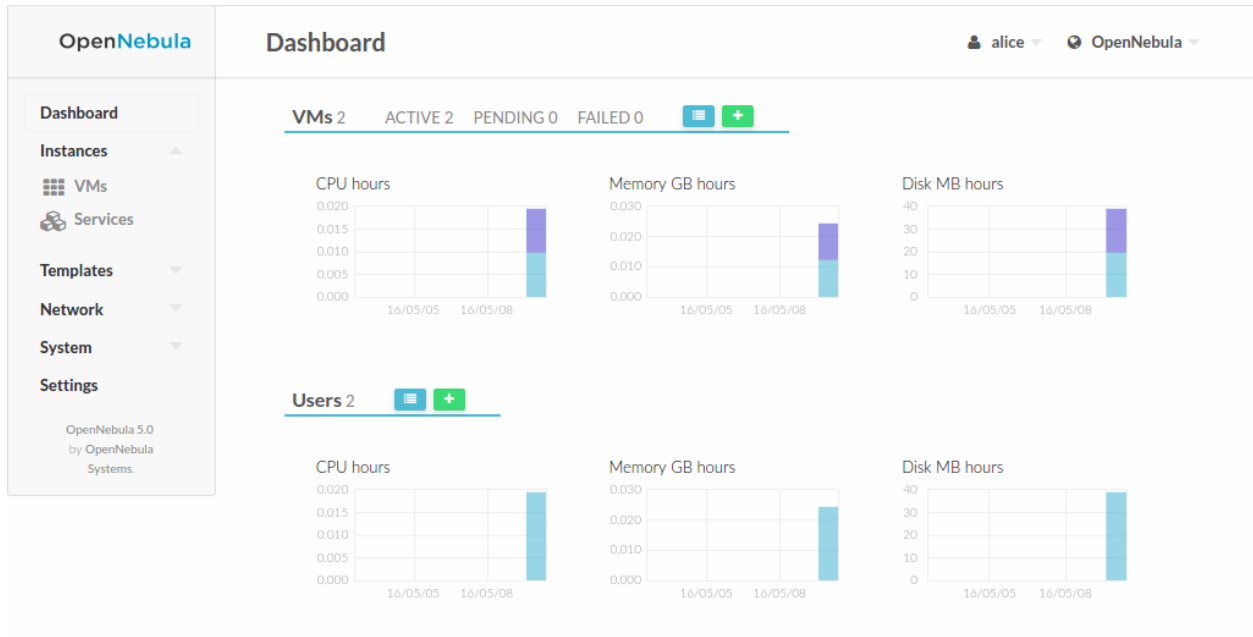
vOneCloud web interface, called Sunstone, offers three main views:

- **Sunstone Admin view:** Aimed at cloud administrators, this view is tailored to present all the available options to manage the physical and virtual aspects of your vCenter infrastructure.

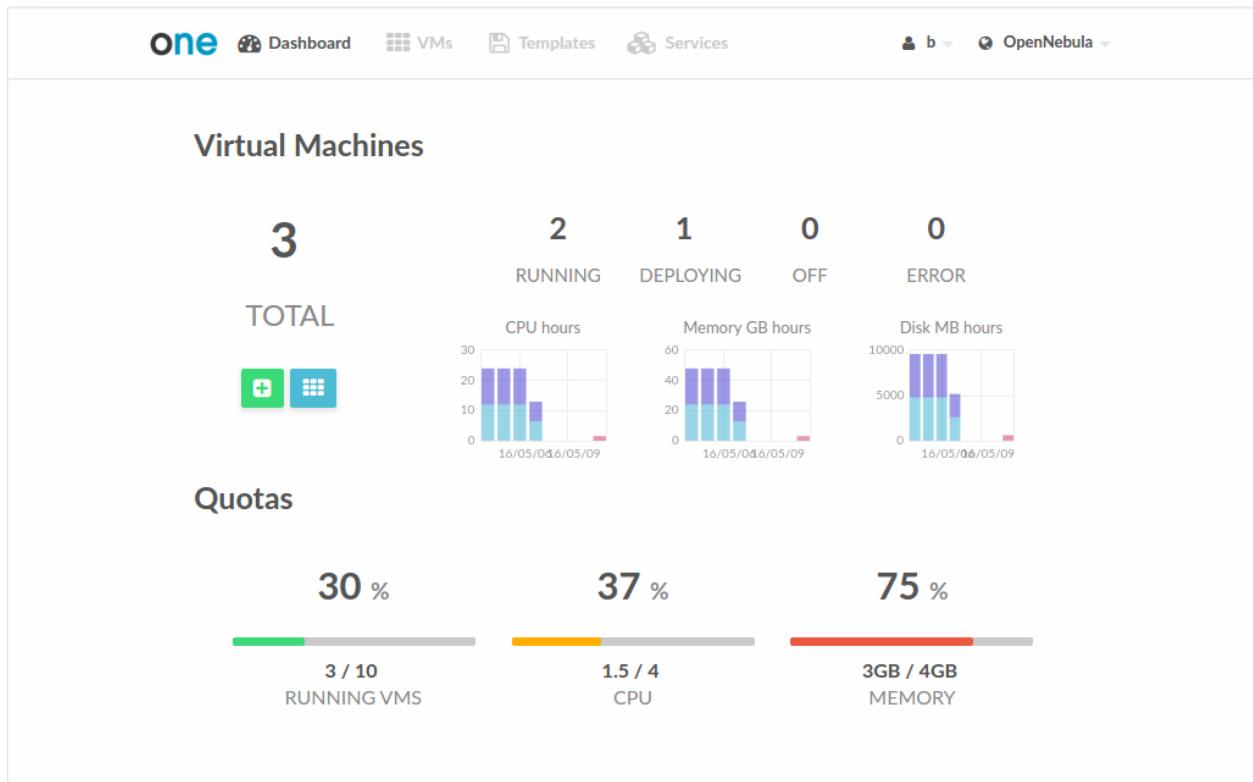




- **Sunstone Group Admin View:** Aimed at Group administrators, this interface is designed to manage all the virtual resources accessible by a group of users, including the creation of new users.



- **Sunstone Cloud View:** Aimed at end users, this interface eases virtual resource provisioning and hides all the complexity of the cloud that is going on behind the scenes. It is a tailored version of the Sunstone [Cloud View](#), with adjusted functionality relevant to vOneCloud and vCenter.



### 3.5.2 Command Line Interface (CLI)

If you are a SysAdmin, you will probably appreciate vOneCloud's **CLI**, which uses the same design philosophy behind \*nix commands (one command for each task).

Moreover, vOneCloud ships with a powerful tool (`onevcenter`) to import vCenter clusters, VM Templates and Networks. The tool is self-explanatory, just set the credentials and IP to access the vCenter host and follow on screen instructions.

To access the vOneCloud command line interface you need to *login into the vOneCloud appliance*, and switch to the *oneadmin* user.

### 3.5.3 Application Programming Interfaces (API)

If you are a DevOp, you are probably used to build scripts to automate tasks for you. vOneCloud offers a rich set of APIs to build scripts to perform these tasks in different programming languages:

- **xmlrpc API** Talk directly to the OpenNebula core
- **Ruby OpenNebula Cloud API (OCA)** Build tasks in Ruby
- **Java OpenNebula Cloud API (OCA)** Build tasks in Java



## **SECURITY AND RESOURCE CONSUMPTION CONTROL**

### **4.1 Introduction**

vOneCloud ships with several authentication plugins that can be configured to pull user data from existing authentication backends.

vOneCloud also implements a powerful permissions, quotas and ACLs mechanisms to control which users and groups are allowed to use which physical and virtual resources, keeping a record of the consumption of these resources as well as monitoring their state periodically.

Take control of your cloud infrastructure!

### **4.2 Users, Groups and ACLs**

vOneCloud offers a powerful mechanism for managing, grouping and assigning roles to users. Permissions and Access Control List mechanisms ensures the ability to allow or forbid access to any resource controlled by vOneCloud, being physical or virtual.

#### **4.2.1 User & Roles**

vOneCloud can manage different types of users, attending to the permissions they have over infrastructure and logical resources.

<b>User Type</b>	<b>Permissions</b>	<b>View</b>
Cloud Administrators	enough privileges to perform any operation on any object	vcenter
Group Administrators	manage a limited set and users within VDCs	groupadmin
End Users	access a simplified view with limited actions to create new VMs	cloud

---

**Note:** VDC is the acronym for Virtual Datacenter

---

OpenNebula Sunstone

Users

oneadmin OpenNebula

Dashboard System Users Groups ACLs Virtual Resources Infrastructure Marketplace OneFlow Support

Showing 1 to 5 of 5 entries

ID	Name	Group	Auth driver	VMs	Memory	CPU
4	Doe	BlueVDC	core	1 / 5	1GB / 10GB	1 / 5
3	John	BlueVDC	core	10 / 10	10GB / 60GB	10 / 20
2	BlueVDC-admin	BlueVDC	core	4 / -	3.5GB / -	5 / -
1	serveradmin	oneadmin	server_cipher	0 / 0	0KB / 0KB	0 / 0
0	oneadmin	oneadmin	core	0 / 0	0KB / 0KB	0 / 0

6 TOTAL

Learn more about user management [here](#).

## 4.2.2 Group & VDC Management

A **group** of users makes it possible to isolate users and resources. A user can see and use the shared resources from other users. The **group** is an authorization boundary for the users, but you can also partition your cloud infrastructure and define what resources are available to each group using Virtual Data Centers (VDC).

A VDC defines an assignment of one or several groups to a pool of physical resources. This pool of physical resources consists of resources from one or several clusters, which are logical groups of hosts and virtual networks. VDCs are a great way to partition your cloud into smaller clouds, and assign them to groups with their administrators and users, completely isolated from other groups.

OpenNebula

Groups

oneadmin OpenNebula

Dashboard System Users Groups VDCs ACLs Virtual Resources Infrastructure Marketplace OneFlow Support

Showing 1 to 3 of 3 entries

ID	Name	Users	VMs	Memory	CPU
100	BlueGroup	0	0 / -	0KB / -	0 / -
1	users	0	0 / -	0KB / -	0 / -
0	oneadmin	3	-	-	-

3 TOTAL

OpenNebula 4.12.1 by OpenNebula Systems.

Read more about groups and VDCs.

### 4.2.3 Access Control Lists

vOneCloud implements a very useful ACL mechanism that enables fine-tuning of allowed operations for any user, or group of users. Each operation generates an authorization request that is checked against the registered set of ACL rules. There are predefined ACLs that implements default behaviors (like VDC isolation), but they can be altered by the cloud administrator.

ID	Applies to	Affected resources	Resource ID / Owned by	Allowed operations	Zone
9	User BlueVDC-admin	Virtual Machines, Images, VM Templates, Documents	Group BlueVDC	use, manage, create	All
8	User BlueVDC-admin	Users	Group BlueVDC	use, manage, admin, create	All
7	Group BlueVDC	Virtual Machines, Documents	Group BlueVDC	use	All
6	Group BlueVDC	Virtual Machines, Images, VM Templates, Documents	All	create	All
5	Group BlueVDC	Virtual Networks, Datastores	All	use	OpenNebula
4	Group BlueVDC	Hosts	All	manage	OpenNebula
3	Group users	Virtual Networks, Datastores	All	use	OpenNebula
2	Group users	Hosts	All	manage	OpenNebula
1	All	Zones	All	use	All
0	Group users	Virtual Machines, Virtual Networks, Images, VM Templates, Documents	All	create	OpenNebula

Writing (or even reading) ACL rules is not trivial, more information about [ACLs](#) [here](#).

## 4.3 Resource Quotas

vOneCloud quota system tracks user and group usage of system resources, allowing the cloud administrator to set limits on the usage of these resources.

Quota limits can be set for:

- **users**, to individually limit the usage made by a given user.
- **groups**, to limit the overall usage made by all the users in a given group.

Tracking the usage on:

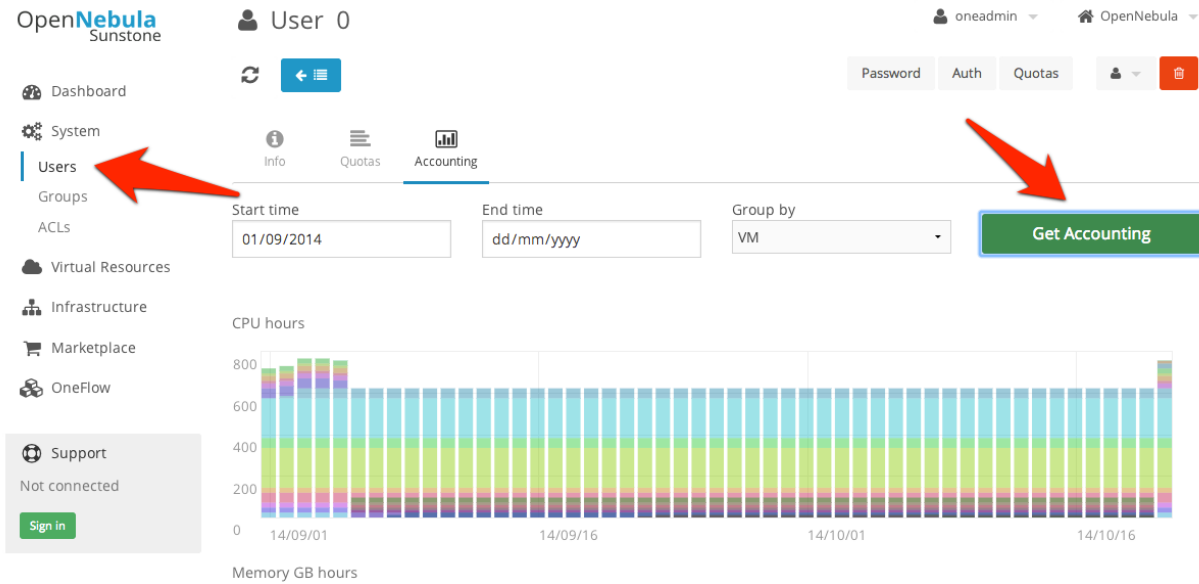
- **Compute**: Limit the overall memory, cpu or VM instances

**Warning:** OpenNebula supports additional quotas for **Datastores** (control amount of storage capacity), **Network** (limit number of IPs), **Images** (limit VM instances per image). However these quotas are not available for the vCenter drivers.

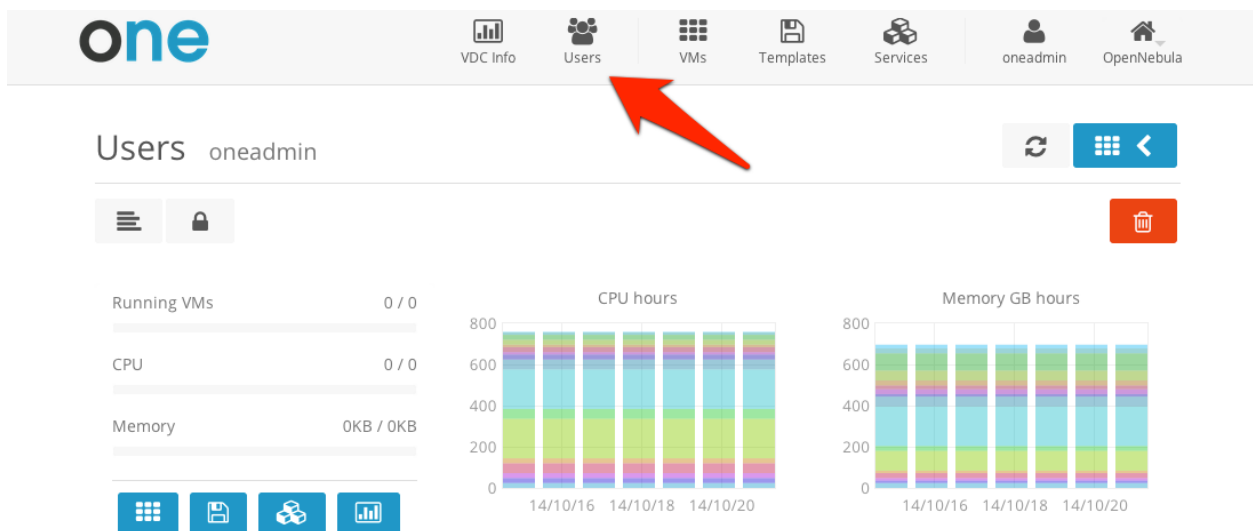
Quotas can be updated either from the vCenter View or from the Group Admin View.



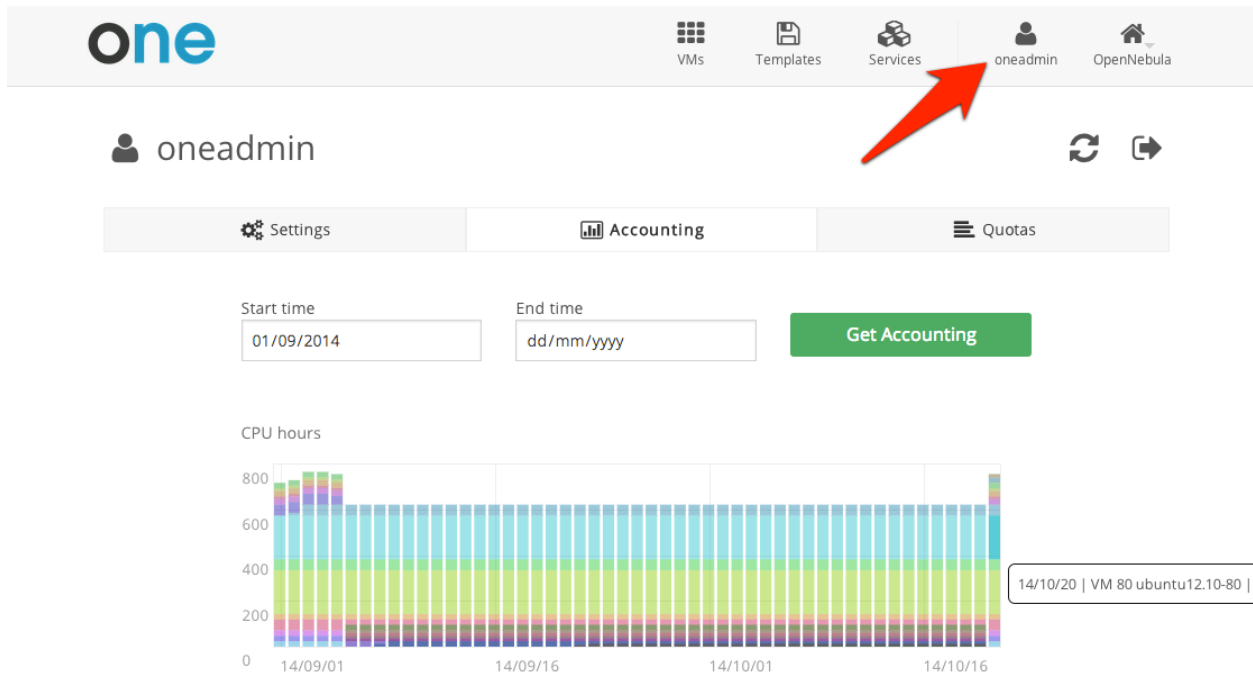




From the Group Admin View:



And from the vCenter Cloud View:



Learn more on the [monitoring](#) and [accounting](#) subsystems

## 4.5 Showback

vOneCloud ships with functionality to report resource usage cost. Showback reports are generated daily (at mid-night) using the information retrieved from OpenNebula.

### Set the VM Cost

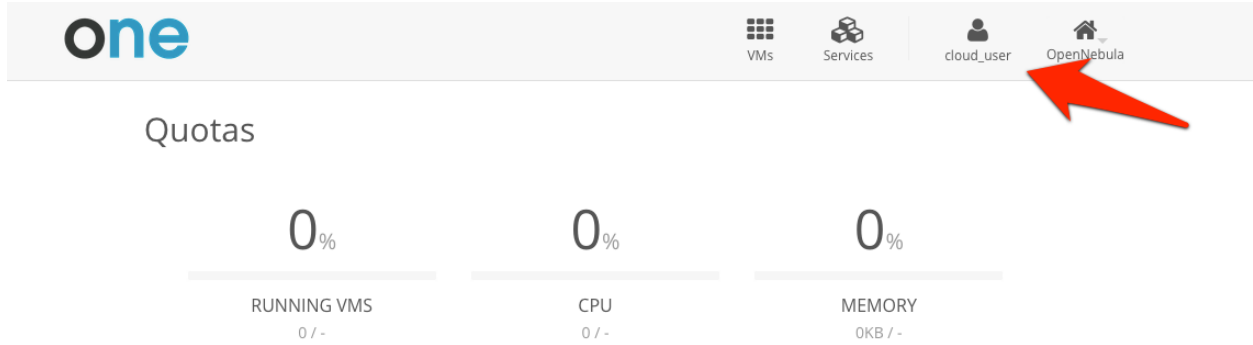
Each VM Template can optionally define a cost. The cost is defined as cost per cpu per hour, and cost per memory MB per hour. The cost units are abstract and their equivalent to monetary or other cost metrics have to be defined in each deployment.

This cost is defined per VM Template by the Cloud Administrator at the time of creating or updating a VM Template, applying a cost to the total Memory and CPU of the VMs that will be spawn from this VM Template.

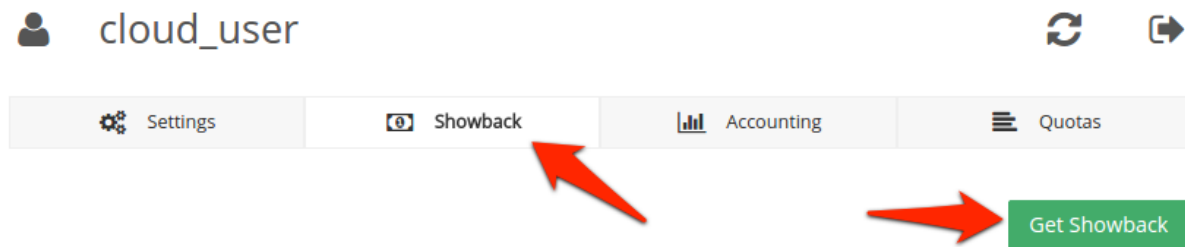
The screenshot shows the VM Template configuration interface. It has two main sections: 'Memory' and 'CPU'. Each section has a slider, a numerical input field, a unit dropdown, and a 'Cost' field. In the 'Memory' section, the slider is at 1024, the unit is 'MB', and the 'Cost' is 1. In the 'CPU' section, the slider is at 0.5, the unit is '0.5', and the 'Cost' is 30. Red arrows point to the 'Cost' input fields.

### Retrieve Monthly Reports

Any user or administrator can see their monthly showback reports clicking on their user icon to access Settings.



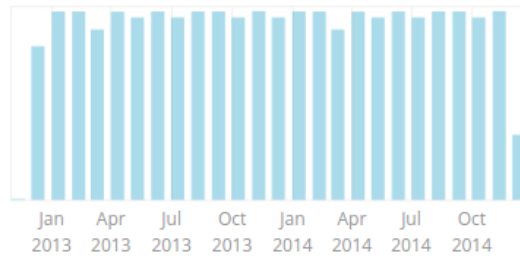
And clicking on the Showback tab, obtain the cost consumed by clicking on the “Get Showback”



## Showback

Date	Cost
December 2014	169875317.75
November 2014	494281637.5
October 2014	477695002.5
September 2014	493618170
August 2014	493618170
July 2014	477695002.5

Previous 1 2 3 4 5 Next



## December 2014 VMs

ID	Name	Owner	Hours	Cost
4258	vm_4258	cloud_user	256.04	12179303
4265	vm_4265	cloud_user	256.04	10128939
4270	vm_4270	cloud_user	256.04	11572200
4271	vm_4271	cloud_user	256.04	3153522
4283	vm_4283	cloud_user	256.04	1930355.75
4286	vm_4286	cloud_user	256.04	7202296.50
4289	vm_4289	cloud_user	256.04	6325310
4290	vm_4290	cloud_user	256.04	2843006.75
4291	vm_4291	cloud_user	256.04	7578269.50
4297	vm_4297	cloud_user	256.04	7443770

Showing 1 to 10 of 14 entries

Previous 1 2 Next 10

Learn more on the [Showback functionality](#).



## GUEST CONFIGURATION

### 5.1 Introduction

vOneCloud will use pre configured vCenter VM Templates, which leverages the functionality provided by vCenter to build such templates. Additionally, vOneCloud provides functionality to tailor the VM guest Operating System to adjust it for the end user needs. OpenNebula provides two mechanisms to configure the newly created VMs.

- **OpenNebula Contextualization:** It allows configuration and information sharing between the vOneCloud interface and the Virtual Machine. This methods needs to build a a template for contextualization and to prepare the guest OS.
- *vCenter Customization Specifications:* It ties the template with a vCenter Customization Specification so it is configured on VM creation

<p><b>Warning:</b> These options can not be used together. A template can use either OpenNebula Contextualization or vCenter customization.</p>
---

This section will instruct on the needed actions to be taken into account to build vOneCloud Templates to deliver cloud users with personalized and perfectly adjusted Virtual Machines.

### 5.2 Building a Template for Contextualization

In order to pass information to the instantiated VM template, the Context section of the vOneCloud VM Template can be used. These templates can be updated in the Virtual Resources -> Templates tab of the vOneCloud GUI, and they can be updated regardless if they are *directly imported from vCenter* or *created through the vOneCloud Templates tab*.

**Note:** Installing the Contextualization packages in the Virtual Machine image is required to pass this information to the instantiated VM template. Make sure you follow the *Guest Contextualization* guide to properly prepare your VM templates.

Update VM Template 41 centos7 oneadmin OpenNebula

[←](#) [Update](#) Wizard Advanced

General Storage Network Input/Output **Context** Scheduling Hybrid ...

Contextualization type  
☐ vCenter ☒ OpenNebula

**Configuration**  
 Files  
 Custom vars

☒ Add SSH contextualization ⓘ  
 SSH public key  

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDAxGG
ZB+1KHJXpztH4J81wh8kysHbMVm07LVCwBE0DT
u6OIg2Q9lgt4xbrNC/86M5B2XiZ1SUUzNwnRWIH
93SbXapC59qqWoIN7HXXatZo3CzdA9bqWcusjEQ
IQ+ZZNdZL9FraSHZE5XmclPBySBc5G7kdQlc7Yx9
44/kaDfz+yPjAzmg81di2Ya+7jx56XLWI1U8uKfVGg
hFo3oMWT+TtWHoXfaekellE1atb8acYnRXaEWwtj
cUaTk6661/xzg1YVhW2xbtqaz4pFuzAwFH804WIJI
TM+ZltoVugiqCpSAo+DzikTfW5I2CvpsZwu77CxGr
FbKQ22PjRYq7nN4v tinova@makito.esi.ucm.es
```

☒ Add Network contextualization ⓘ  
☒ Add OneGate token ⓘ  
☒ Report Ready to OneGate ⓘ

Start script ⓘ  

```
yum upgrade
```

☐ Encode script in Base64

**User Inputs** ⓘ

Name	Type	Description
DB_PASS	password	Password for the DB

**Warning:** Passing files to VMs through contextualization is not supported

Different kinds of context information can be passed onto the VMs:

### 5.2.1 OneGate Token

vOneCloud has a centralized service to share data between Virtual Machines and the main daemon, useful to set monitoring information that can be gathered inside the VM and configuration data. It also lets you send scaling actions when the Virtual Machine belongs to a Service.

To do so the client installed with the contextualization packages (`onegate`) needs some information:

- **Token:** it's the key specific to each VM used to authenticate with the service
- **OneGate endpoint:** the address where the OneGate daemon is reachable

To fill this information you have to click the “Add OneGate token” check box.

### 5.2.2 Network Configuration

vOneCloud does not rely on a DHCP server to configure networking in the Virtual Machines. To do this configuration it injects the network information in the contextualization section. This is done checking the “Add Network configuration” check box. When vOneCloud finds this option it adds the IP information for each of the network interfaces configured plus extra information that resides in the Virtual Network template, like DNS, gateway and network mask.

The parameters used from the Virtual Network template are explained in the OpenNebula documentation, [Managing Virtual Networks](#) section.

### 5.2.3 User Credentials

One of the other very important things you have to configure is user credentials to connect to the newly created Virtual Machine.

For Linux base images we recommend to use SSH public key authentication and using it with vOneCloud is very convenient. The first thing the users should do its to add their SSH public key (or keys) to its vOneCloud user configuration, this can be done in the Settings section of the web interface. The Context section of the VM Template needs to have the “Add SSH contextualization” check box selected. Using this system the new Virtual Machines will be configured with the SSH public key of the user that instantiated it.

For Windows machines SSH is not available but you can use the options `USERNAME` and `PASSWORD` to create and set the password of an initial administrator, they can be set as *Custom Vars*.

### 5.2.4 Execute Scripts on Boot

To be able to execute commands on boot, for example, to install some software, you can use the option `Start script` text area. When this option is used a new file that contains the value of the option will be created and executed.

For Windows machines this is a PowerShell script. For Linux machines this can be any scripting language as long as it is installed in the base image and the proper shebang line is set (shell scripts don't need shebang).

In this example some commands will be executed using `bash` shell that will install the package `ntpd` and set the time.

```
#!/bin/bash
yum update
yum install -y ntpdate
ntpdate 0.pool.ntp.org"
```

If you are using complex scripts, it is a good idea to use the “encode script in Base64” option.

There are more options that can be set in the contextualization section. You can read about them in the [Virtual Machine Definition File reference section](#)

## 5.2.5 User Inputs

These inputs are a special kind of contextualization that built into the templates. At instantiation time, the end user will be asked to fill in information for the defined inputs, and the answers will be packed and passed onto the VM.

For instance, vOneCloud administrator can build a VM Template that will ask for the MySQL password (the MySQL software will be configured at VM boot time and this password will be set) and for instance whether or not to enable WordPress:

### Create Template

← Reset Create

Wizard Advanced

General Input/Output Context Scheduling Hybrid Other

Network & SSH  
Files  
User Inputs  
Custom vars

#### User Inputs ?

Name	Type	Description
MySQLPassword	password	Password for the MySQL Database
EnableWordpress	text	Yes or No

+ Add another attribute

OpenNebula 4.10.1 by OpenNebula Systems.

The end user will then be presented with the following form when instantiating the previously defined VM Template



## ⚙️ Custom Attributes

\* Password for the MySQL Database

\* Enable WordPress: Yes or No

Create

### 5.2.6 Custom vars

These are personalized information to pass directly to the VM, in the form of Key - Value.

---

**Note:** There are more options that can be set in the contextualization section. You can read about them in the [Virtual Machine Definition File reference section](#)

---

## 5.3 Guest Contextualization

The information defined at the *VM Template building* time is presented to the VM using the VMware VMCI channel. This information comes encoded in base64 and can be gathered using the VMware Tools.

---

**Note:** VMware tools are needed in the guestOS to enable several features (contextualization and networking feedback). Please install [VMware Tools \(for Windows\)](#) or [Open Virtual Machine Tools \(for \\*nix\)](#) in the guestOS.

---

In order to make your VMs aware of OpenNebula, you **must** install the *official packages*. Packages for both Linux and Windows exist that can collect this data and configure the supported parameters.

In Linux guests, the information can be consumed using the following command:

```
$ vmtoolsd --cmd 'info-get guestinfo.opennebula.context' | base64 -d
MYSQLPASSWORD = 'MyPassword'
ENABLEWORDPRESS = 'YES'
```

The Linux packages can be downloaded from its [project page](#) and the Windows one from its [project page](#). The steps to prepare a contextualized VM Template are:

### 5.3.1 Step 1. Start a VM with the OS you want to Customize

Supported contextualization packages are available for the following OS's:

- **CentOS/RHEL** >= 6
- **Debian** >= 6
- **Ubuntu** >= 11.10
- **Windows** >= 7
- **Windows Server** >= 2008

If you already happen to have a VM or Template in vCenter with the installed OS you can start it and prepare it to be used with vOneCloud. Alternatively you can start an installation process with the OS media.

### 5.3.2 Step 2. Download Contextualization Packages to the VM

#### CentOS/RHEL

```
# wget https://github.com/OpenNebula/addon-context-linux/releases/download/v5.0.3/one-  
↪ context_5.0.3.rpm
```

#### Debian/Ubuntu

```
# wget https://github.com/OpenNebula/addon-context-linux/releases/download/v5.0.3/one-  
↪ context_5.0.3.deb
```

#### Windows

Download and install the MSI package (preferred way) into C:\: <https://github.com/OpenNebula/addon-context-windows/releases/download/v5.2.0/one-context-5.2.0.msi>

Or download particular contextualization scripts to C:\:

- <https://raw.githubusercontent.com/OpenNebula/addon-context-windows/v5.2.0/context.ps1>
- <https://raw.githubusercontent.com/OpenNebula/addon-context-windows/v5.2.0/startup.vbs>

### 5.3.3 Step 3. Install Contextualization Packages and Dependencies

#### CentOS/RHEL 6

```
# rpm -Uvh one-context*rpm  
# yum install -y epel-release  
# yum install ruby # only needed for onegate command  
# yum install -i dracut-modules-growroot  
# dracut -f
```

## CentOS/RHEL 7

```
# rpm -Uvh one-context*rpm
# yum install -y epel-release
# yum install ruby # only needed for onegate command
# yum install -y cloud-utils-growpart
```

## Debian/Ubuntu

```
# dpkg -i one-context*deb
# apt-get install ruby # only needed for onegate command
# apt-get install -y cloud-utils
```

## Windows

- Open the Local Group Policy Dialog by running `gpedit.msc`.
- Go to *Computer Configuration -> Windows Settings -> Scripts -> startup* (right click).
- Browse to the `startup.vbs` file and enable it as a startup script.

## 5.3.4 Step 4. Install VMware Tools

### CentOS

```
# yum install open-vm-tools
```

### Debian/Ubuntu

```
# apt-get install open-vm-tools
```

## Windows

In vCenter open the VM menu, go to “Guest OS” section, click in “Install VMware Tools...” and follow the instructions.

## 5.3.5 Step 5. Power Off the Machine and Save it

These are the steps needed to finish the preparation and import it to OpenNebula:

- Power off the machine so it is in a consistent state the next time it boots
- Make sure that you take out any installation media used in the previous steps
- Remove the network interfaces from the VM
- Convert the VM into a Template
- Import the template in OpenNebula

Alternatively use the *instantiate as persistent* functionality for this step, that will create the new VM Template as soon as you terminate the VM.

## 5.4 vCenter Customization

vCenter offers a way to prepare the guest OS on boot. For example configuring its network, licenses, Active Directory server, etc. OpenNebula vCenter drivers offers a way to tie one OpenNebula template with one of these customizations so it is applied on VM startup. You can get more information about this system in [VMware documentation](#).

There are a couple of things to take into account:

- This system is not compatible with OpenNebula contextualization as this customization overwrites the network-  
ing changes made by context scripts.
- VM network configuration must be done externally to OpenNebula. Either with a DHCP server or manually  
setting IPs for each interface.
- This method can be used in all the [Guest OSs supported by vCenter](#).

### 5.4.1 Template Customization Using Sunstone

For vCenter templates there are two options in the context tab. To use vCenter Customization select “vCenter” in the as “Contextualization type”. This will show a drop down with all the customizations from all the hosts. There you can select from these possibilities:

- **None:** No customization will be applied
- **Custom:** You will be able to type manually the name of one customization
- The name of customizations found in vCenter

Make sure that the customization applied is available in the vCenter where the VM template reside.

#### Update VM Template

Update VM Template

← Update Wizard Advanced

General Network Input/Output **Context** Scheduling Hybrid Other

Contextualization type

☒ vCenter ☐ OpenNebula

vCenter customizations:

custom

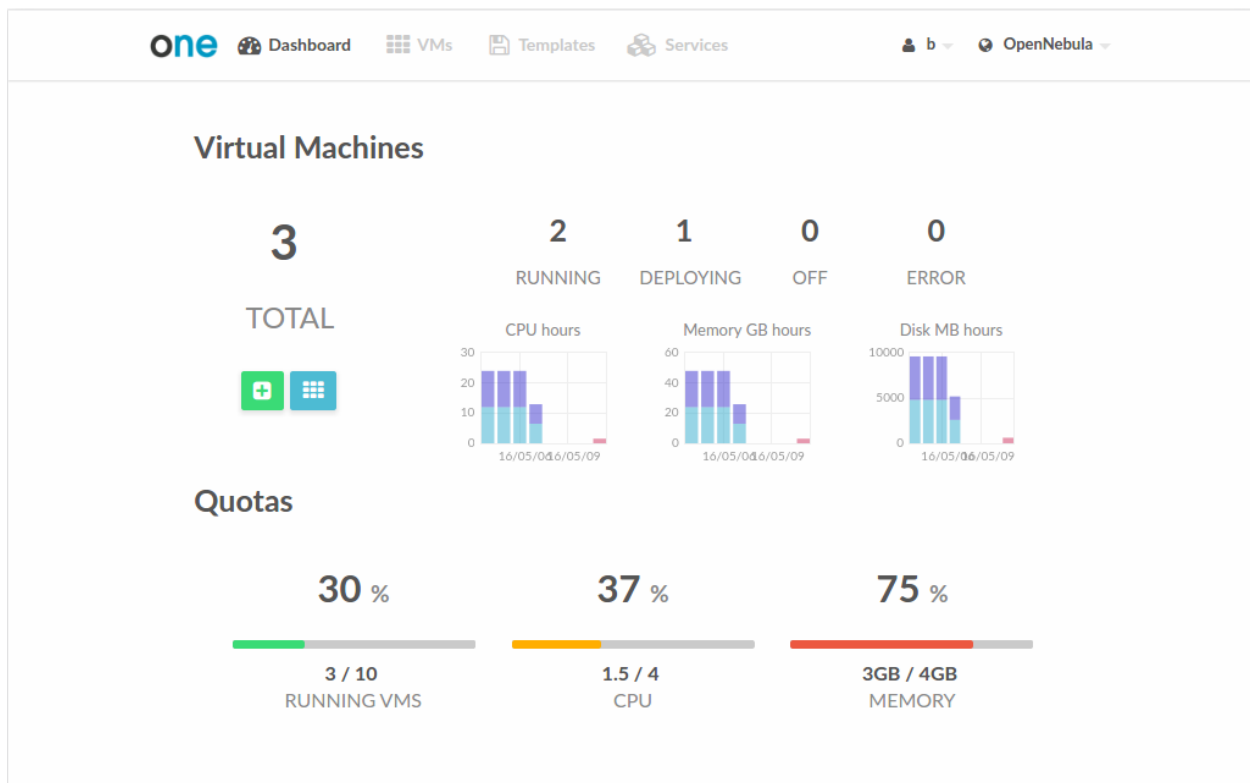
## CLOUD END USER

### 6.1 Introduction

vOneCloud offers a simple yet powerful self-service interface for end-users of the cloud, that allows them to control the life cycle of virtual resources with a slick, functional and responsive interface. Also, Group Admins have a tailored view to manage their users and assign them appropriate virtual resources.

### 6.2 Self-service Cloud View

This is a simplified view intended for cloud consumers that just require a portal where they can provision new virtual machines easily. To create new VMs and Services, they just have to select one of the available templates prepared by the administrators.



## 6.2.1 Using the Cloud

### Create VM



In this scenario the cloud administrator must prepare a set of templates and images and make them available to the cloud users. These VM Templates must be ready to be instantiated, i.e. they define all the mandatory attributes. Before using them, users can optionally customize the VM capacity, resize disks, add new network interfaces and provide values required by the template.

**one** Dashboard VMs Templates Services OpenNebula

### Create Virtual Machine

Virtual Machine Name  ☐ Persistent ? Create

**Template**

 **ubuntu-server** 


**Capacity** 205.30 COST / HOUR

Memory ?  2 GB



CPU ?  0.5

VCPU ?

**Disks** 410000.00 COST / HOUR


 **DISK 0: ubuntu-server-disk-0**  200 MB

**Network**

 Interface private-net 

### Access the VMs with SSH Keys

Any user can provide his own ssh public key to be included in the VMs created through this view. Note that the template has to be configured to include it. User can provide the ssh key clicking on its name in the top right of the screen, selecting “Settings” and then “Add SSH Key”.

A light gray rectangular button with rounded corners. It contains a dark gray key icon followed by the text "Add SSH Key" in a dark gray sans-serif font.

Add a public SSH key to your account!  
You will be able to access your Virtual Machines without  
password

A white rectangular input field with a thin gray border and rounded corners. It contains the placeholder text "SSH key" in a light gray font. A small double-slash icon is visible in the bottom right corner of the field.

SSH key

A solid blue rectangular button with rounded corners. It contains the text "Add SSH Key" in a white sans-serif font.

### Manage VMs

The status of the VMs can be monitored from the VMs tab.

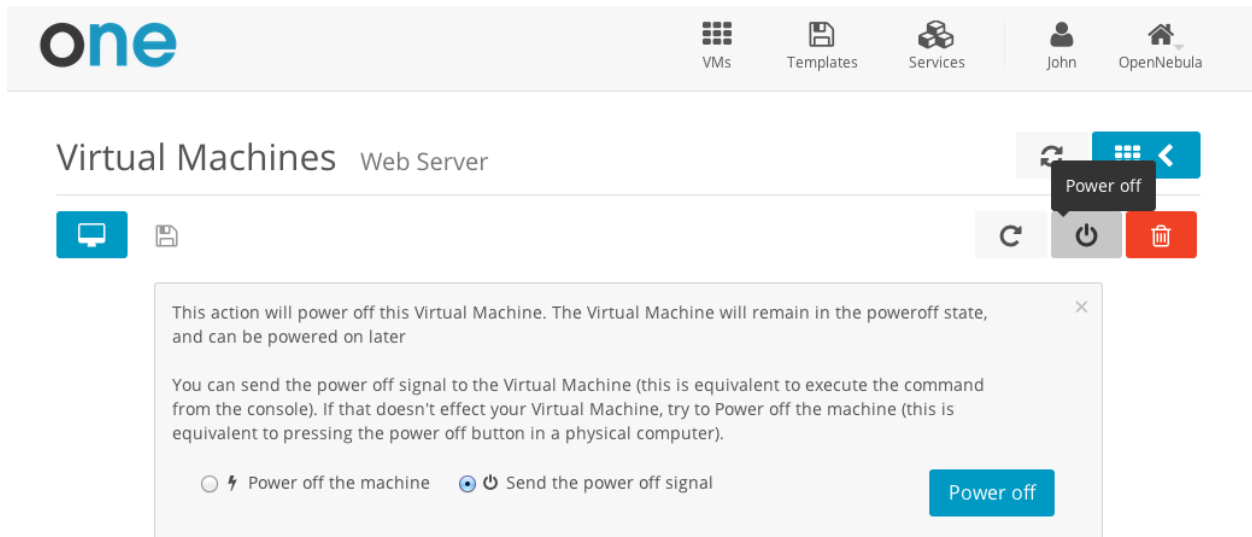
Information about the capacity, OS, IPs, creation time and monitoring graphs for a specific VM are available in the detailed view of the VM

A user can perform the following actions from this view:

- Access the VNC console, note that the Template has to be configured for this



- Reboot the VM, the user can send the reboot signal (reboot) or reboot the machine (reboot hard)
- Power off the VM, the user can send the power off signal (poweroff) or power off the machine (poweroff hard)
- Terminate the VM
- Save the VM into a new Template
- Power on the VM



### Make the VM Changes Persistent

Users can create a persistent private copy of the available templates. A persistent copy will preserve the changes made to the VM disks after the instance is terminated. This template is private, and will only be listed to the owner user.

To create a persistent copy, use the “Persistent” switch next to the create button:

The screenshot shows the 'Create Virtual Machine' page in the vOneCloud interface. The top navigation bar includes the 'one' logo, 'Dashboard', 'VMs', 'Templates', and 'Services' menus. The user 'johndoe' is logged in, and the 'OpenNebula' provider is selected. The main form is titled 'Create Virtual Machine' and contains several sections:

- Form Fields:** A text input for the VM name containing 'my-ubuntu'. A 'Persistent' checkbox is checked. A green 'Create' button is on the right.
- Template:** A section with a penguin icon and the text 'ubuntu-server'.
- Capacity:** A section with 'Memory' set to '128 MB', 'CPU' set to '0.1', and an empty 'VCPU' field.
- Disks:** A section with a single disk 'DISK 0: ttylinux-vd' set to '200 MB'.
- Network:** A section with a dropdown showing 'Interface private-net' and an 'Add another Network Interface' button.

Alternatively, a VM that was not created as persistent can be saved before it is destroyed. To do so, the user has to power off the VM first and then use the save operation.

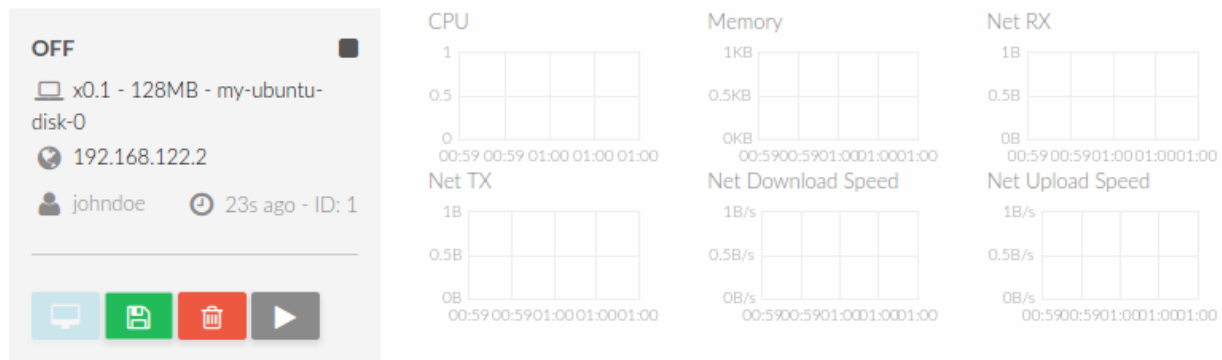
This Virtual Machine will be saved in a new Template.  
You can then create a new Virtual Machine using this Template.

Template Name

The new Virtual Machine's disks can be made persistent. In a persistent Virtual Machine the changes made survive after it is destroyed. On the other hand, you cannot create more than one simultaneous Virtual Machine from a Template with persistent disks.

☐ Persistent
 ☒ Non-persistent

Save Virtual Machine to Template



Any of these two actions will create a new Template with the VM name. This template can be used in the “new VM wizard” to restore the VM after it is terminated. This template contains a copy of each one of the original disk images. If you delete this template, all the disk contents will be also lost.

[Dashboard](#)
[VMs](#)
[Templates](#)
[Services](#)
johndoe
OpenNebula

## Templates

ALL

**my-ubuntu**

x0.1 - 128MB -

johndoe 5s ago

**ubuntu-server**

x0.1 - 128MB - ttylinux-vd

oneadmin 2m ago


Previous 1 Next


**Note:** Avoid making a persistent copy of a persistent copy! Although there are use cases where it is justified, you will end with a long list of Templates and the disk usage quota will decrease quickly.


---


## Create Service


In this scenario the cloud administrator must prepare a set of Service templates and make them available to the cloud users. These Service templates must be ready to be instantiated, i.e. they define all the mandatory attributes and the templates that are referenced are available for the user. Before using them, users can optionally customize the Service cardinality, define the network interfaces and provide values required by the template.




  
VMs

  
Templates

  
Services

  
John

  
OpenNebula



Master 1 VMs  
Slave 3 VMs



Master 1 VMs  
Worker 1 VMs



Frontend 1 VMs  
DB 1 VMs

« 1 » 6 ▾

Create

## Manage Services

The status of the Services can be monitored from the Services tab

The screenshot shows the 'Services' overview page in vOneCloud. The top navigation bar includes the 'one' logo and links for VMs, Templates, Services, John, and OpenNebula. The main section displays three service cards:

- Web App**: RUNNING. Roles: Frontend (1 / 1 VMs), DB (1 / 1 VMs). Created by John 16s ago.
- document-4**: RUNNING. Roles: Master (1 / 1 VMs), Worker (1 / 1 VMs). Created by John 31s ago.
- Hadoop**: RUNNING. Roles: Master (1 / 1 VMs), Slave (3 / 3 VMs). Created by John 56s ago.

At the bottom right, there is a pagination control showing '1' of 6 items.

Information of the creation time, cardinality and status for each Role are available in the detailed view of the Service

The screenshot shows the detailed view of the 'Hadoop' service. The top navigation bar is the same as the overview page. The main section displays the service details:

- Service Status**: RUNNING, 1m ago, John.
- Roles**:
  - Master**: RUNNING, 1 / 1 VMs. Actions: grid icon, refresh icon.
  - Slave**: RUNNING, 3 / 3 VMs. Actions: grid icon, refresh icon.

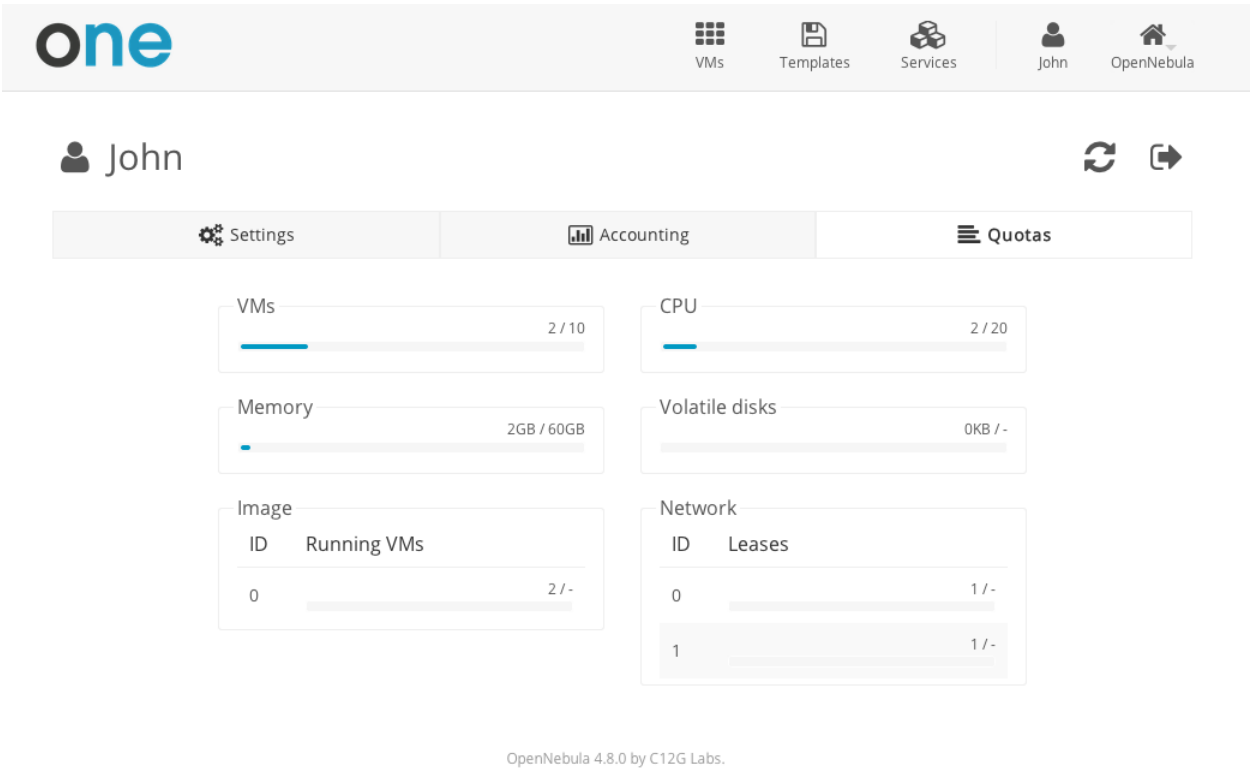
At the top right, there are buttons for 'refresh' and 'back'. At the bottom right, there are buttons for 'power' and 'delete'.

A user can perform the following actions from this view:

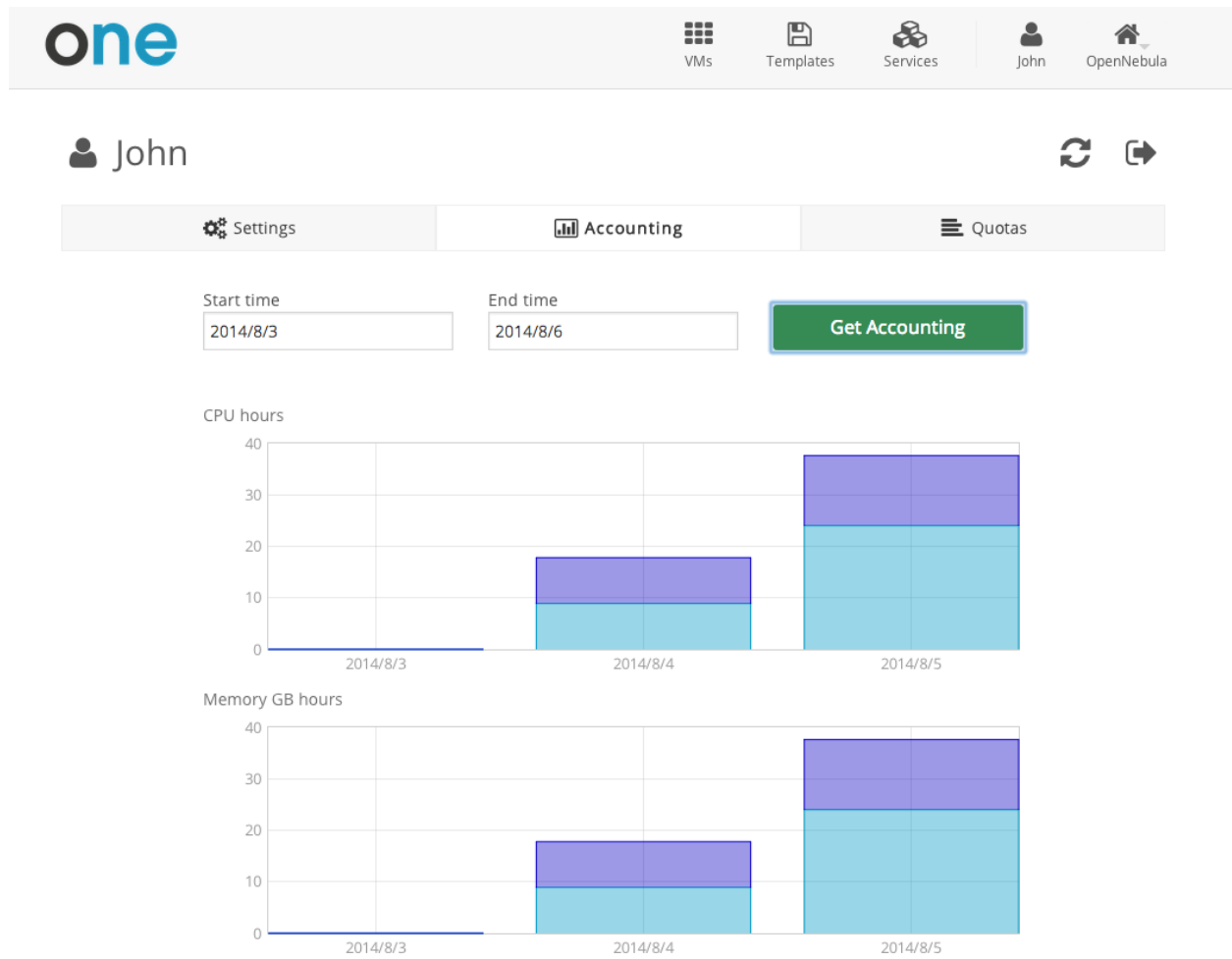
- Change the cardinality of each Role
- Retrieve the VMs of each Role
- Delete the Service
- Recover the Service from a fail status


## Usage, Accounting and Showback






The user can check his current usage and quotas










Also, the user can generate accounting reports for a given range of time





 VMs
  Templates
  Services
  john
  OpenNebula

 john
 


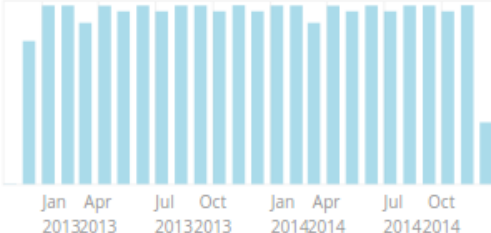
 Settings
  Showback
  Accounting
  Quotas

Get Showback

### Showback

Date	Cost
December 2014	66516541.25
November 2014	192902258
October 2014	186429022
September 2014	192643326
August 2014	192643326
July 2014	186429022

Previous 1 2 3 4 5 Next



### November 2014 VMs

ID	Name	Owner	Hours	Cost
4265	vm_4265	john	745	29471900
4271	vm_4271	john	745	9175718
4312	vm_4312	john	745	154254640

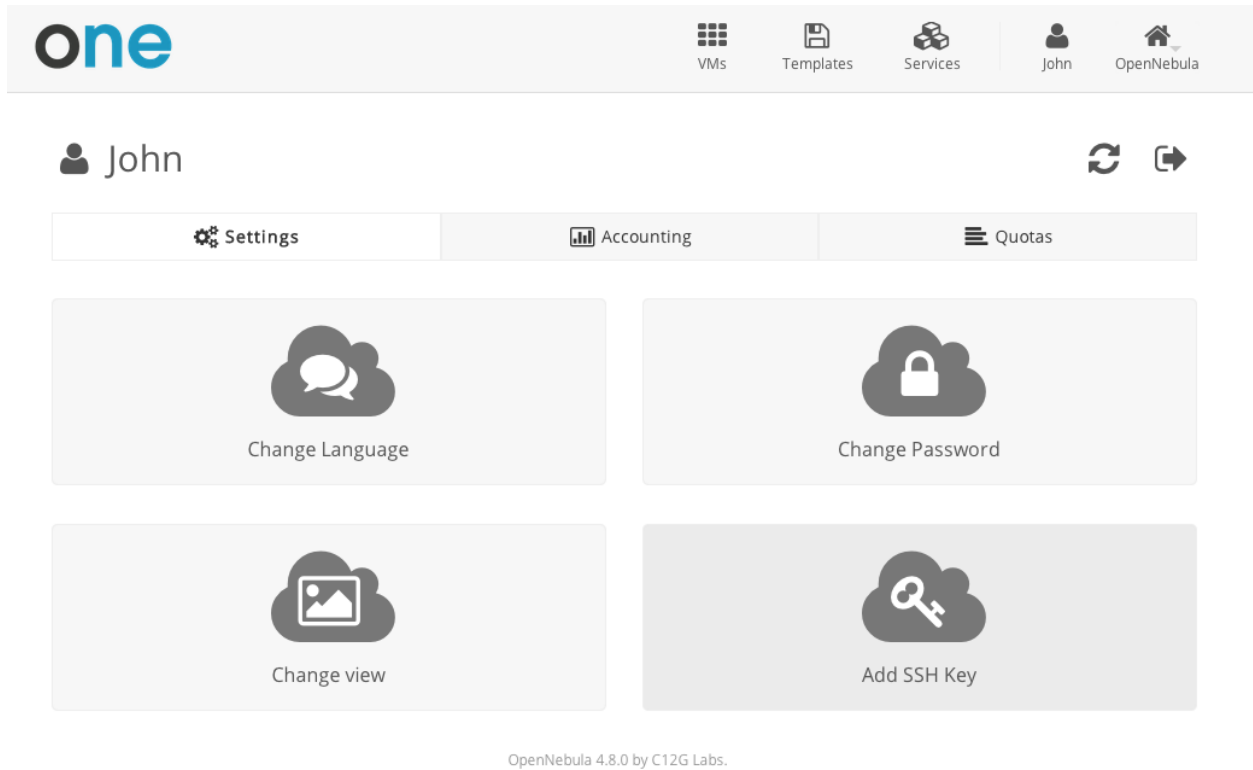
Showing 1 to 3 of 3 entries

Previous 1 Next 10

## User Settings

From the user settings tab, the user can change his password, language, ssh key and view

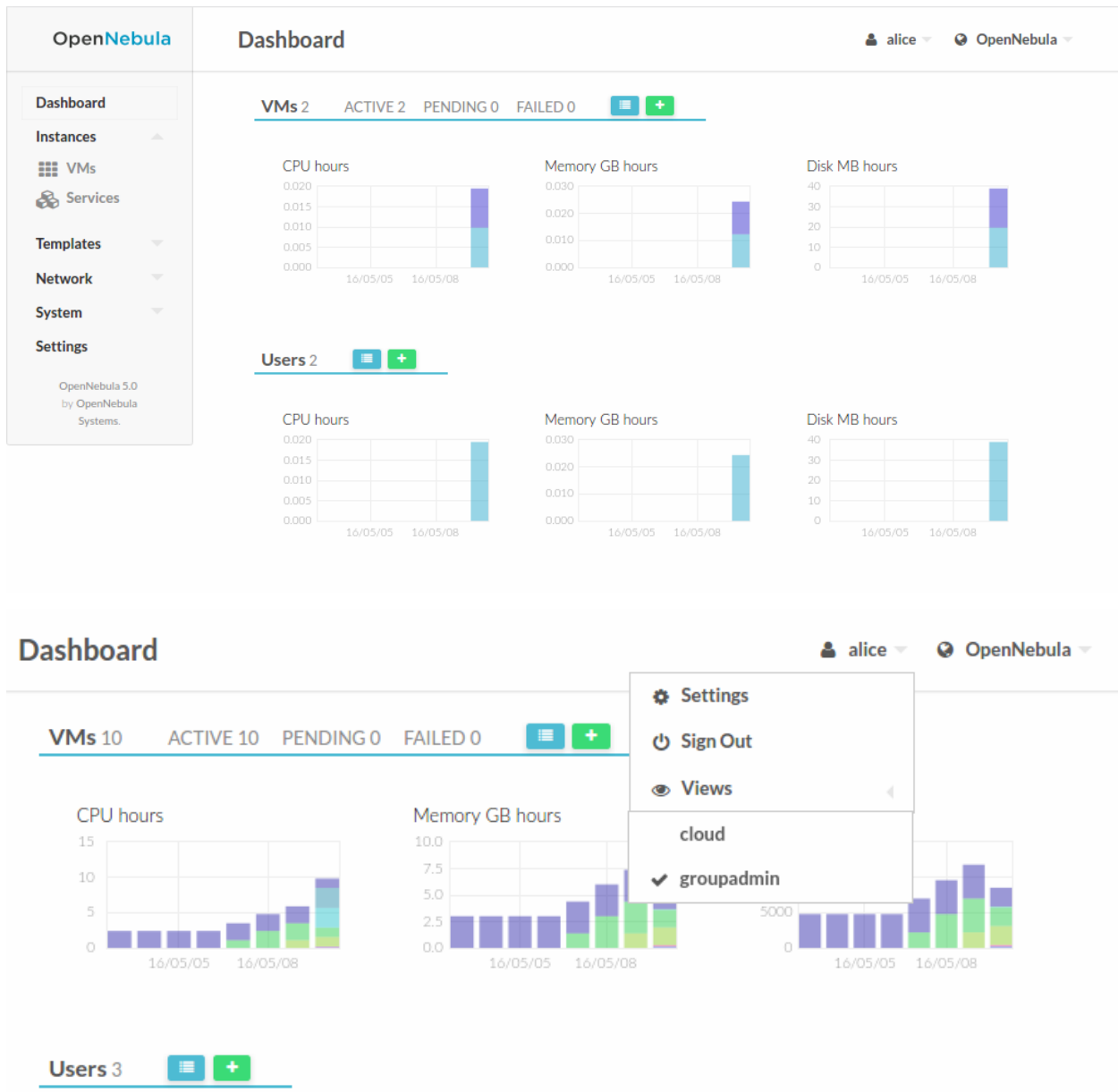




## 6.3 Group Admin View

The role of a Group Admin is to manage all the virtual resources of the Group, including the creation of new users. When one of these Group Admin users access vOnecloud, they get a limited version of the cloud administrator view. Groups can be confined to a subset of physical and virtual resources through *Virtual Data Centers*.

Group administrators can also access the *simplified Cloud View* if they prefer to.



### 6.3.1 Manage Users

The Group Admin can create new user accounts, that will belong to the same Group.

OpenNebula

Dashboard
Instances
Templates
Network
System
Users
Groups
Settings

OpenNebula 5.0  
by OpenNebula  
Systems.

## Create User

←

Reset
Create

Username

Password

Confirm Password

Authentication

core ▾

They can also see the current resource usage of all the Group users, and set quota limits for each one of them.

OpenNebula

Dashboard
Instances
Templates
Network
System
Users
Groups
Settings

OpenNebula 5.0  
by OpenNebula  
Systems.

## Users

alice ▾ OpenNebula ▾

+

↺

Password

Quotas

👤 ▾

🗑️

Search

<input type="checkbox"/>	ID	Name	VMs	Memory	CPU
<input type="checkbox"/>	4	john	<div><div></div></div> 0 / -	<div><div></div></div> 0KB / -	<div><div></div></div> 0 / -
<input type="checkbox"/>	3	alice	<div><div></div></div> 2 / -	<div><div></div></div> 256MB / -	<div><div></div></div> 0.2 / -
<input type="checkbox"/>	2	johndoe	<div><div></div></div> 1 / 5	<div><div></div></div> 128MB / 1GB	<div><div></div></div> 0.1 / 0.5

10 ▾ Showing 1 to 3 of 3 entries

Previous 1 Next

3 TOTAL

OpenNebula

User 4 john

alice

OpenNebula

Dashboard

Instances

Templates

Network

System

Users

Groups

Settings

OpenNebula 5.0  
by OpenNebula  
Systems.

←

↺

Password

Quotas

📁

📄

Info

Groups

Quotas

Accounting

Showback

Cancel

Apply

VMs

CPU

Memory

System disks

0 / 5

0 / Default (∞)

0 / 1024 MB

0 / Default (∞) MB

### 6.3.2 Manage Resources

The Group admin can manage the Services, VMs and Templates of other users in the Group.

OpenNebula

Dashboard

Instances

VMs

Services

Templates

Network

System

Settings

OpenNebula 5.0  
by OpenNebula  
Systems.

VMs

alice

OpenNebula

+

↺

📄

▶

⏸

□

↺

⋮

👤

🖱

Search

📄

	ID	Owner	Name	Status	IPs	
📄	10	john doe	ubuntu-server-10	RUNNING	192.168.122.11	🖱
📄	9	alice	customized-ubuntu	RUNNING	192.168.122.10	🖱
📄	8	alice	customized-ubuntu	RUNNING	192.168.122.9	🖱
📄	7	john doe	ubuntu-server-7	RUNNING	192.168.122.8	🖱
📄	6	john	ubuntu-server-6	RUNNING	192.168.122.7	🖱
📄	5	john doe	ubuntu-server-5	RUNNING	192.168.122.6	🖱
📄	4	alice	customized-ubuntu	RUNNING	192.168.122.5	🖱
📄	3	alice	ubuntu-server-3	RUNNING	192.168.122.4	🖱
📄	2	alice	ubuntu-server-2	RUNNING	192.168.122.3	🖱
📄	1	john doe	my-ubuntu-1	RUNNING	192.168.122.2	🖱

10

Showing 1 to 10 of 10 entries

Previous

1

Next

10 TOTAL

10 ACTIVE

0 OFF

0 PENDING

0 FAILED

### 6.3.3 Create Resources

The Group admin can create new resources in the same way as a regular user does from the *Cloud view*. The creation wizard for the Virtual Machines and Services are similar in the `groupadmin` and `cloud` views.

**OpenNebula** **Instantiate VM Template** alice OpenNebula

[←](#) [Instantiate](#)

☐ Instantiate as persistent

VM Name  Number of instances  ☐ Hold

**ubuntu-server**

[Capacity](#) [Disks](#)

Memory  MB

CPU  VCPU

☐ DISK 0: ttylinux-vd  MB

### 6.3.4 Prepare Resources for Other Users

Any user of the Cloud View or Group Admin View can save the changes made to a VM back to a new Template, and use this Template to instantiate new VMs later. See the *how to instantiate a VM to persistent* for more information.

The Group admin can also share his own Saved Templates with the rest of the group. For example the Group admin can instantiate a clean VM prepared by the cloud administrator, install software needed by other users in his Group, save it in a new Template and make it available for the rest of the group.

**OpenNebula** **VM Template 2 customized-ubuntu** alice OpenNebula


[←](#) [Refresh](#) [Instantiate](#) [Clone](#) [Change owner](#) [Share](#) [Unshare](#) [Delete](#)

**Info**

Information		Ownership	
ID	2	Owner	alice
Name	customized-ubuntu	Group	testgroup
Register time	14:54:08 10/05/2016		

These shared templates will be listed to all the group users in the VM creation wizard, marked as ‘group’. A Saved Template created by a regular user is only available for that user and is marked as ‘mine’.

---


[Dashboard](#)
[VMs](#)
[Templates](#)
[Services](#)
johnndoe ▾
OpenNebula ▾


---


## Create Virtual Machine


☐ Persistent ⓘ
 Create

Template

ALL ▾
Labels ▾

ubuntu-server  
  
 ...  
 system

my-ubuntu  
  
 ...  
 mine

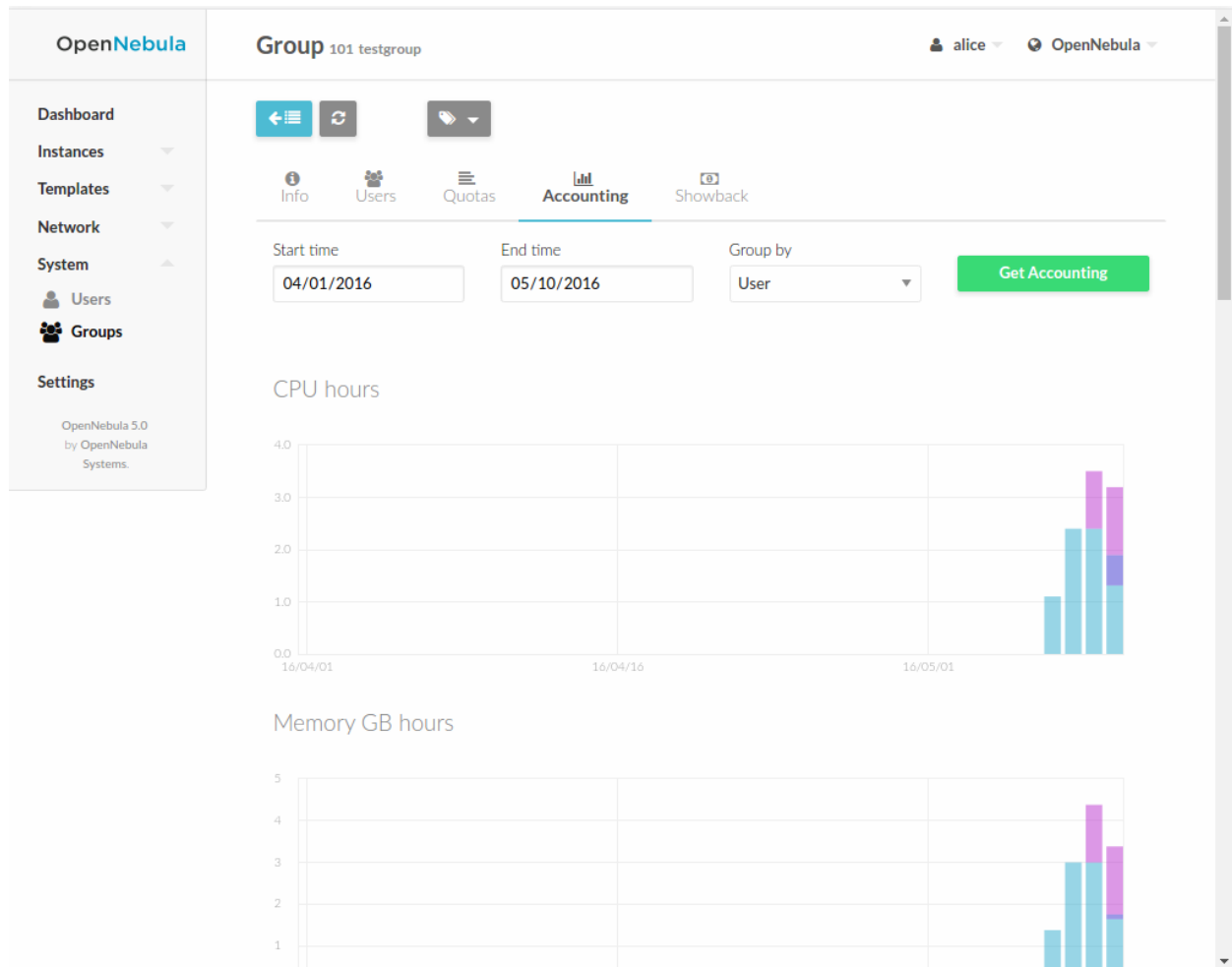
customized-ubuntu  
  
 ...  
 group

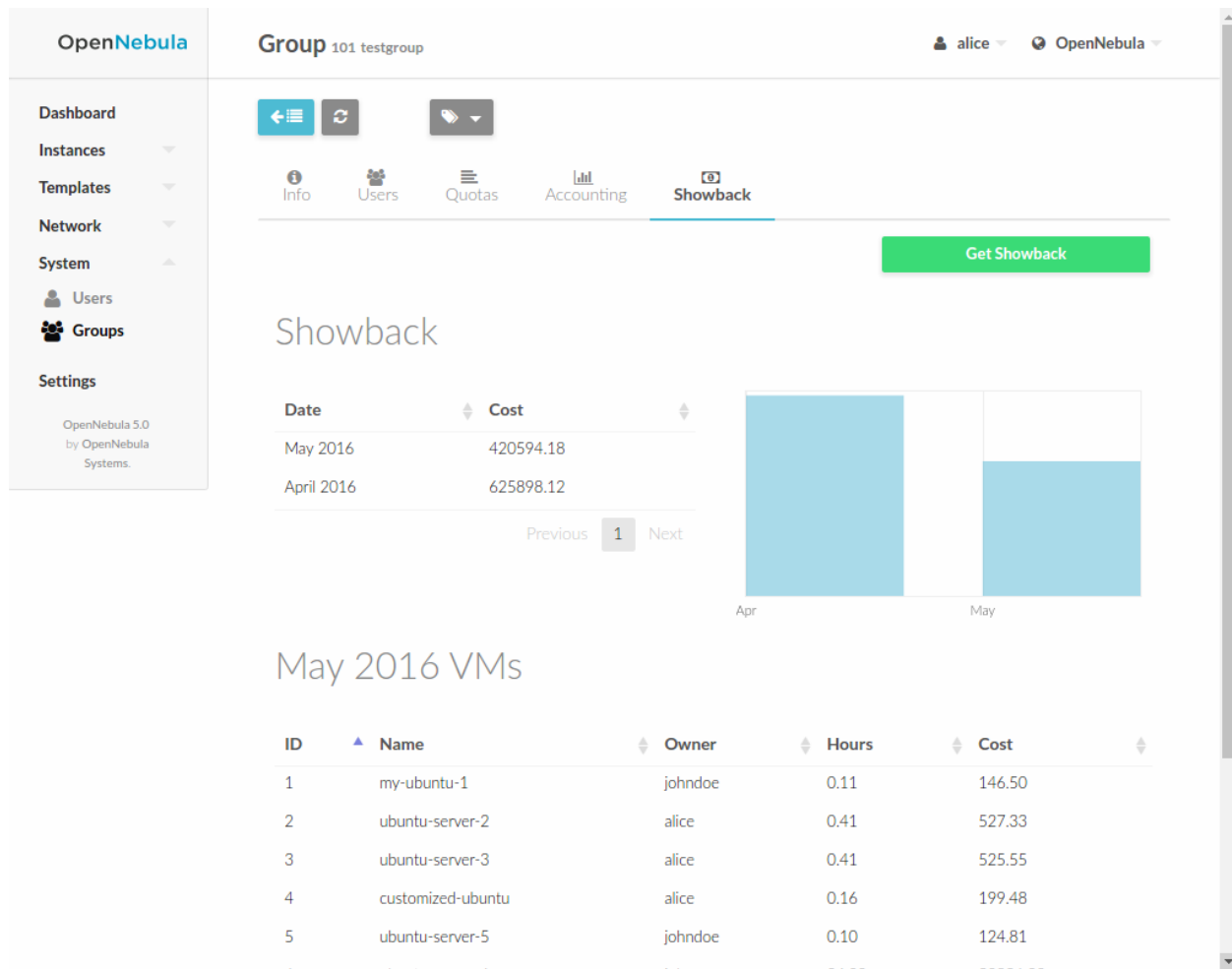
▾
 Previous
1
Next

## 6.3.5 Accounting & Showback

### Group Accounting & Showback

The Group info tab provides information of the usage of the Group and also accounting and showback reports can be generated. These reports can be configured to report the usage per VM or per user for a specific range of time.

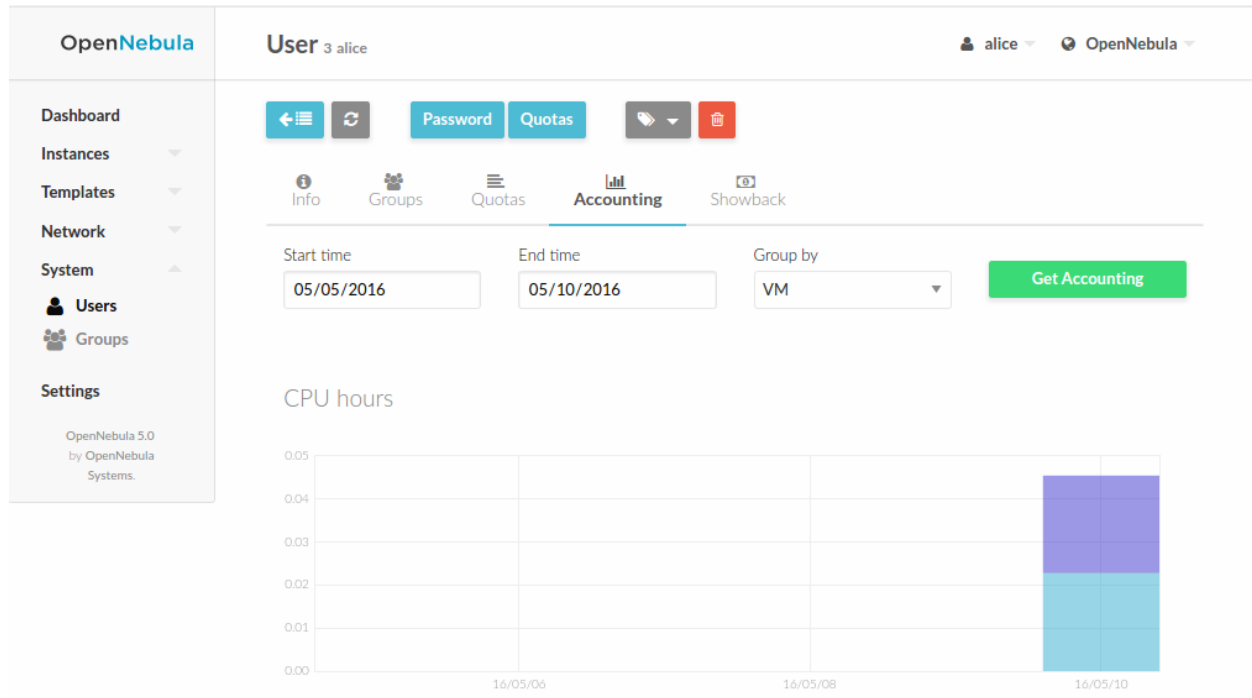




## User Accounting & Showback


The detailed view of the user provides information of the usage of the user, from this view accounting reports can be also generated for this specific user





### 6.3.6 Networking

Group administrators can create *Virtual Routers* from Templates prepared by the cloud administrator. These Virtual Routers can be used to connect two or more of the Virtual Networks assigned to the Group.

**OpenNebula**

Dashboard

Instances

VMs

Services

**Virtual Routers**

Templates

VMs

Services

Virtual Routers

Network

Virtual Networks

Network Topolog

Security Groups

System

Settings

OpenNebula 5.0.1  
by OpenNebula  
Systems.

## Create Virtual Router

alice OpenNebula

← Reset Create

Wizard Advanced

Name

my-router

Description

Keepalive service ID

Keepalive password

Network

▼ Interface net-A

⊗

▲ Interface net-B

⊗

You selected the following network: net-B

↺

Search

ID	Name
1	net-B
0	net-A

10

Showing 1 to 2 of 2 entries

Previous1Next

Force IPv4: ?

☒ Floating IP ?

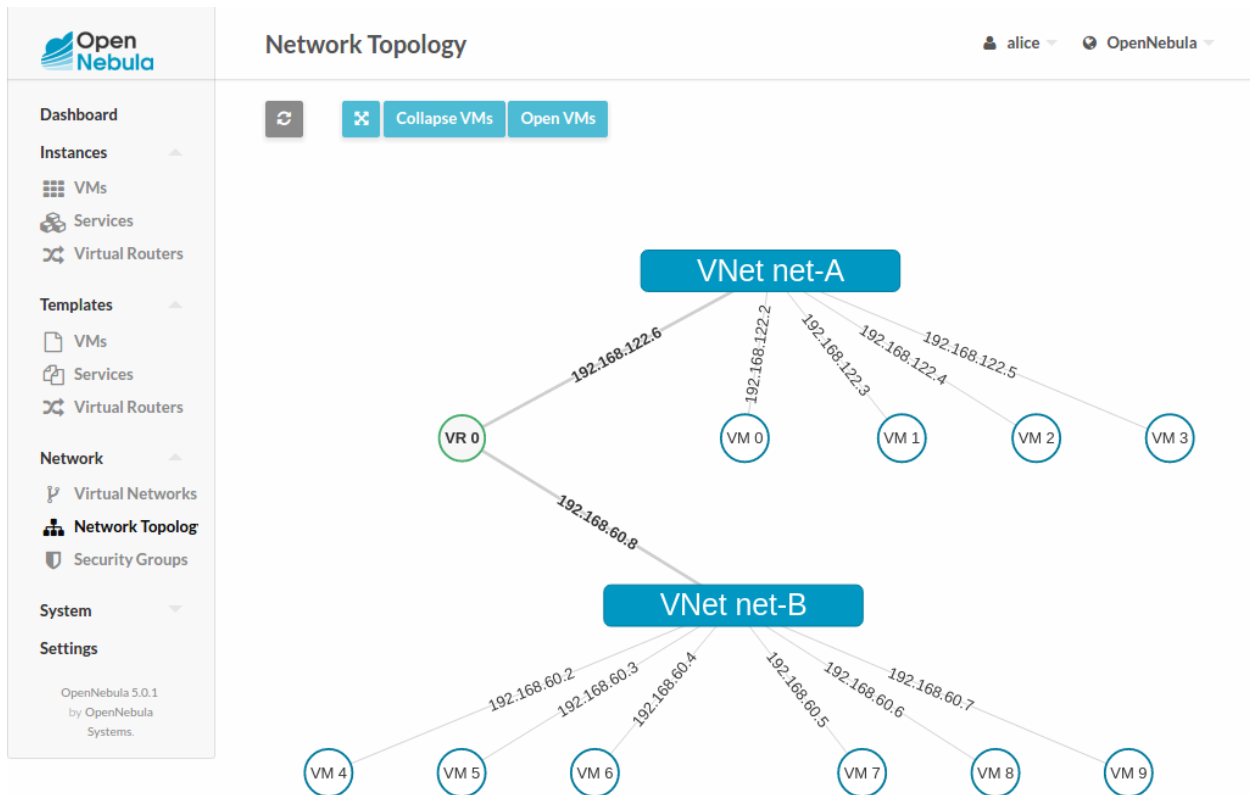
☐ Management Interface ?

Security Groups ?

Please select one or more security groups from the list

78

Chapter 6. Cloud End User





## INFRASTRUCTURE CONFIGURATION

### 7.1 Introduction

Now that you are familiar with vOneCloud concepts and operations, it is time to extend its functionality by adding new infrastructure components and reviewing advanced configurations and operations.

### 7.2 Add New vCenter Resources

vOneCloud can manage an unlimited number of vCenters. Each vCenter is going to be represented by an vOneCloud host, which in turn abstracts all the ESX hosts managed by that particular instance of vCenter.

The suggested usage is to build vOneCloud templates for each VM Template in each vCenter. The built in scheduler in vOneCloud will decide which vCenter has the VM Template needed to launch the VM.

It is important to note that there are different behavior of the vCenter resources when deleted in OpenNebula. The following resources are NOT deleted in vCenter when deleted in OpenNebula:

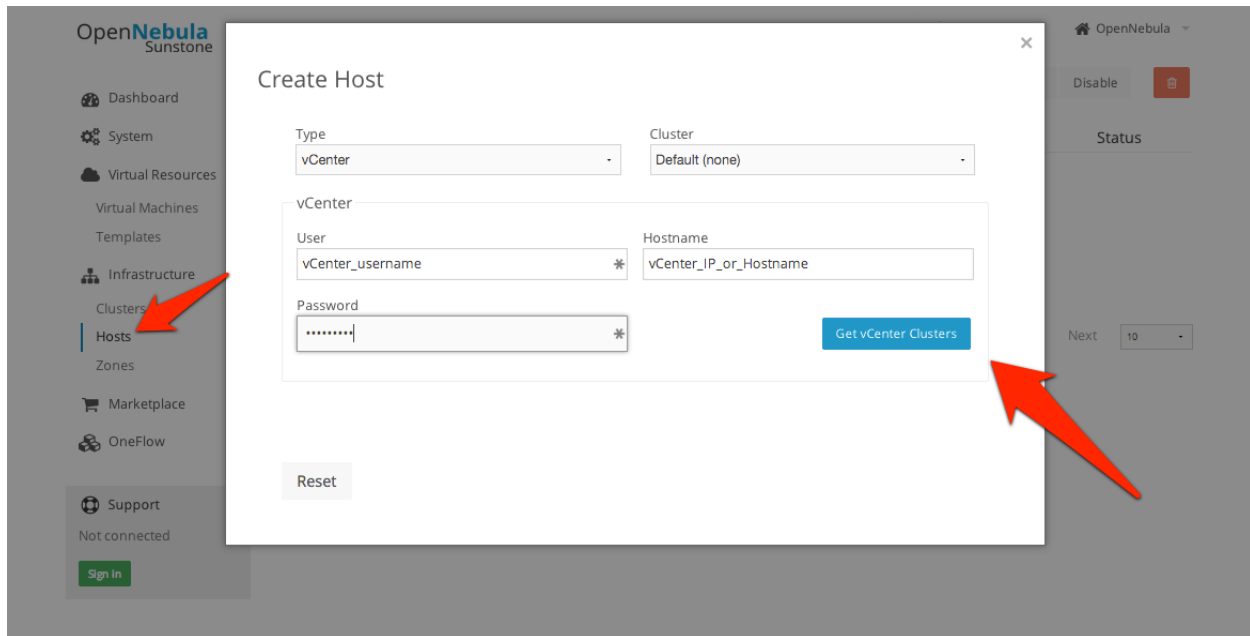
- VM Templates
- Networks
- Datastores

The following resource are deleted in vCenter when deleted in OpenNebula:

- Images
- Virtual Machines

#### 7.2.1 Add New vCenter Cluster

The mechanism to add a **new vCenter** is exactly the same as the one used to *import the first one into vOneCloud*. It can be performed graphically from the vCenter View:



**Note:** vOneCloud will create a special key at boot time and save it in `/var/lib/one/.one/one_key`. This key will be used as a private key to encrypt and decrypt all the passwords for all the vCenters that vOneCloud can access. Thus, the password shown in the vOneCloud host representing the vCenter is the original password encrypted with this special key.

## 7.2.2 Add New / Update VM Template

Let's see an example:

To avoid misunderstandings, there are two VM templates we will refer to: the vOneCloud VM Templates and the vCenter VM Templates. The formers are created in the vOneCloud web interface (Sunstone), whereas the latter are created directly through the vCenter Web Client.

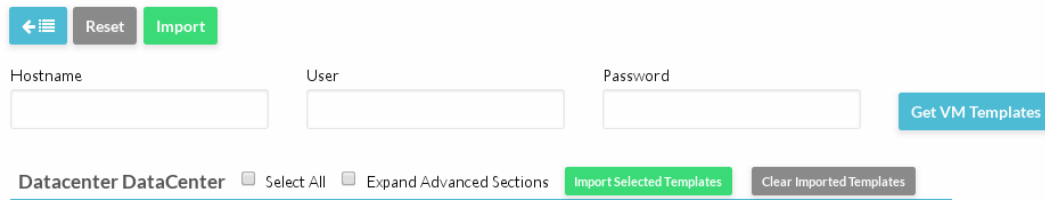
A cloud administrator builds two vOneCloud templates to represent one vCenter VM Template available in vCenterA and another available in vCenterB. As previous work, the cloud administrator creates **two vCenter VM templates**, one in each vCenter.


To create a vOneCloud VM Template representing a vCloud VM Template, you have to choices:

- Import an existing vCenter VM Template
- Create a new VM Template manually providing a reference to a vCenter VM Template

You can import a vCloud VM Template using the Import button and providing your vCenter's hostname or IP address and the credentials for a user with the required privileges. Then, select the templates you want to import and click the Import Selected Templates button.

## Import vCenter VM Templates

CloudAdmin  Ope


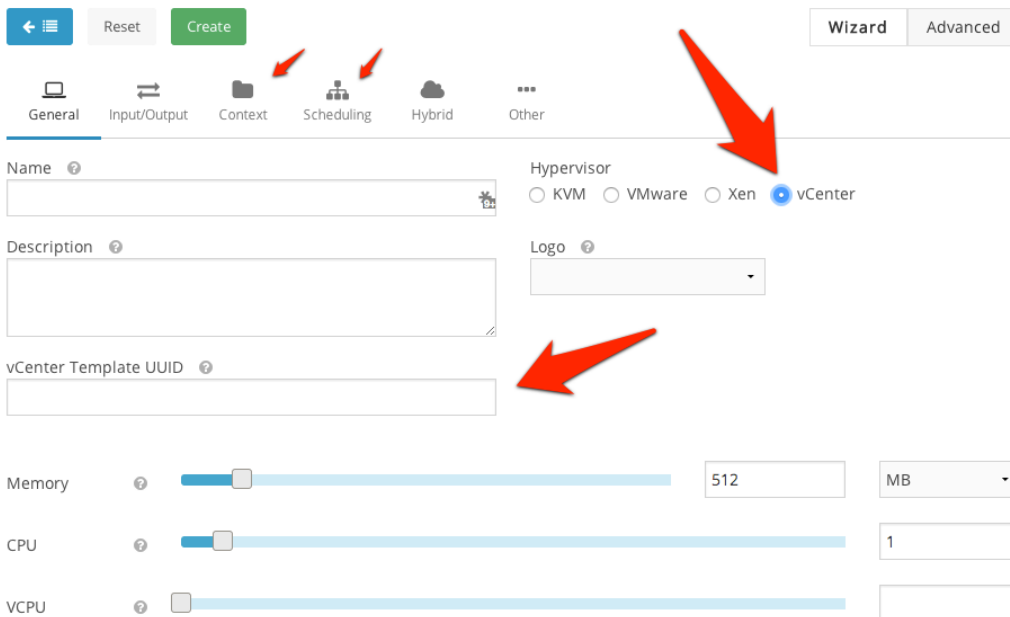
Buttons:  Reset Import


Hostname  User  Password

Datacenter **DataCenter** ☐ Select All ☐ Expand Advanced Sections



If you want to create the vOneCloud VM Template manually, log in into Sunstone as **CloudAdmin** user as in explained [here](#), proceed to the **Templates** -> **VMs**, and click on the **+** sign. Select **vCenter** as the hypervisor, and type in the **vCenter Template UUID**. You can also set a capacity (CPU and Memory) that would be honored at the time of instantiating the VM. In the **Scheduling** tab you can select the hostname of the specific vCenter. The **Context** tab allows to pass information onto the VM to tailor it for its final use (read more about it [here](#)). In **Network** tab a valid Virtual Network (see below) can added to the VM, possible values for the **MODEL** type of the network card are:


- virtuale1000
- virtuale1000e
- virtualpcnet32
- virtalsriovethernetcard
- virtualvmxnetm
- virtualvmxnet2
- virtualvmxnet3





Buttons:  Reset Create

Wizard Advanced


General Input/Output Context   Other



Name 



Description 


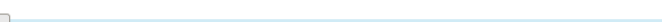
vCenter Template UUID 

Hypervisor ☐ KVM ☐ VMware ☐ Xen ☒ vCenter

Logo 

Memory   512 MB

CPU   1

VCPU  

OpenNebula 4.10.1 by OpenNebula Systems.

Fill in with UUID **uuidA** in and select host vCenterA. Repeat for vCenterB.

If a user instantiates one of these templates, the vOneCloud scheduler will pick the right vCenter in which to instantiate the VM Template.

The variable `KEEP_DISKS_ON_DONE` can be used in the VM template to instruct vOneCloud not to erase the VM disks after it enters the DONE state (either through shutdown or cancel).

vCenter

vCenter Template UUID		<div>VM disks ⓘ <input type="checkbox"/> Keep</div>
<input type="text"/>		
Default Datastore	Type	Available Datastores
<input type="text"/>	Fixed ▼	<input type="text"/>
Default Resource Pool	Type	Available Resource Pools
<input type="text"/>	Fixed ▼	<input type="text"/>

Using *the automated process for importing vCenter infrastructures*, vOneCloud will generate the above template for you at the time of importing vCenter.

Datastore and Resource Pool where a VM is going to be deployed to can be modified from the VM Template. These attributes can be set in two ways in the vOneCloud VM Template, and can be set/modified at the time of creating/updating the VM Template in vOneCloud:

- **Fixed:** Pick a certain Resource Pool / Datastore where this VM will be contained
- **Delegated to User:** Provide a comma separated list of the different Resource Pools / Datastores available for this VM Template, that the end user will be able to chose at VM launch time. A default can be selected.



**Update VM Template** 1 trusty - Cluster CloudAdmin OpenNebula


[←](#) [Update](#) Wizard Advanced

**General** Storage Network Input/Output Context Scheduling Hybrid Other

Name: trusty - Cluster


Description: vCenter Template imported by OpenNebula from Cluster Cluster

Hypervisor: ☐ KVM ☒ vCenter

Logo:  Ubuntu

**vCenter**

vCenter Template UUID: 4223a589-5bec-7dad-6b65-e94115ac30f8

VM disks  ☐ Keep

Default Datastore: datastore1 Type: Provide on instantiation

Default Resource Pool: TestResourcePool/Nested Type: Fixed

Available Datastores: nfs,datastore1,datastore2


Available Resource Pools:


### VM Instantiate to Persistent

At the time of deploying a VM Template, a flag can be used to create a new VM Template out of the VM.


**Instantiate VM Template** oneadmin OpenNebula

[←](#) [Instantiate](#)

☒ Instantiate as persistent 


VM name 


Number of instances: 1


☐ Start on hold 

**UbuntuVM**

**Capacity**

Memory : 128 MB

CPU : 0,5

VCPU :

**Network**

Whenever the VM life-cycle ends, vOneCloud will instruct vCenter to create a new vCenter VM Template out of the VM, with the settings of the VM including any new disks or network interfaces added through vOneCloud. Any new disk added to the VM will be saved as part of the template, and when a new VM is spawned from this new VM

Template the disk will be cloned by vOneCloud (ie, it will no longer be persistent).

This functionality is very useful to create new VM Templates from a original VM Template, changing the VM configuration and/or installing new software, to create a complete VM Template catalog.

**Note:** A new vOneCloud VM Template will be created pointing to this new VM Template, so it can be instantiated through vOneCloud. This new vOneCloud VM Template will be pointing to the original template until the VM is shutdown, at which point it will be converted to a vCenter VM Template and the vOneCloud VM Template updated to point to this new vCenter VM Template.

### Advanced VM Template Editing

The Advanced tab in the VM Template creation / update dialog of vOneCloud, can be used to quickly edit any aspect of the VM Template. The list of attributes that can be used to create / update vOneCloud VM Templates through the Advanced tab follows:

Attribute	Meaning
CPU	Physical CPUs to be used by the VM. This does not have to relate to the CPUs used by the vCenter VM Template, OpenNebula will change the value accordingly
MEMORY	Physical Memory in MB to be used by the VM. This does not have to relate to the CPUs used by the vCenter VM Template, OpenNebula will change the value accordingly
NIC	Valid MODELS are: virtuale1000, virtuale1000e, virtualpcnet32, virtualsriovethernetcard, virtualvmxnetm, virtualvmxnet2, virtualvmxnet3.
GRAPHICS	Multi-value - Only VNC supported.
PUBLIC_CLOUD	Multi-value. TYPE must be set to vcenter, VM_TEMPLATE must point to the uuid of the vCenter VM that is being represented and HOST must refer to the name of the vCenter Cluster (represented by a vOneCloud host) where the template is available
SCHED_REQUIREMENTS	NAME of the vCenter cluster where this VM Template can instantiated into a VM".
CONTEXT	All sections will be honored except FILES
KEEP_DISKS_ON_DONE	Prevent OpenNebula from erasing the VM disks upon reaching the done state (either via shutdown or cancel)
VCENTER_DATASTORE	By default, VM will be deployed to the datastore where the VM Template is bound to. This attribute allows to set the name of the datastore where this VM will be deployed. This can be overwritten explicitly at deployment time from the CLI or Sunstone
RESOURCE_POOL	By default, VM will be deployed to the default Resource Pool. This attribute allows to set the name of the resource pool where this VM will be deployed. This can be overwritten explicitly at deployment time from the CLI or Sunstone. More information <a href="#">here</a> <resource_pool>.

Update VM Template 1 alpine\_mcabrerizo - Cluster

CloudAdmin OpenNebula

←

Update

Wizard Advanced

Write the Virtual Machine template here

```

CONTEXT = [
  NETWORK = "YES",
  SSH_PUBLIC_KEY = "$USER[SSH_PUBLIC_KEY]" ]
CPU = "1"
DESCRIPTION = "vCenter Template imported by OpenNebula from Cluster Cluster"
GRAPHICS = [
  LISTEN = "0.0.0.0",
  TYPE = "vnc" ]
HYPERVISOR = "vcenter"
MEMORY = "128"
PUBLIC_CLOUD = [
  HOST = "Cluster",
  TYPE = "vcenter",

```

## VM Dynamic Reconfiguration

The following operations can be performed on a running or powered off VM, and the changes will be applied dynamically to the VM:

- Change CPU
- Change Memory
- Add/Remove disks
- Add/Remove NICs
- Change contextualization values

### 7.2.3 Add New Network/Distributed vSwitch

**vCenter Networks/Distributed vSwitches** for a particular vCenter cluster can be imported in vOneCloud after the cluster is imported using the [same procedure](#) to import vCenter clusters, making use of the Import button in the Network --> Virtual Networks tab in the vCenter View.

A representation of a vCenter Network or Distributed vSwitch can be created in vOneCloud by creating a Virtual Network and setting the BRIDGE property to **exactly the same name as the vCenter Network**. Leave “Default” network model if you don’t need to define VLANs for this network, otherwise chose the “VMware” network model.

Several different Address Ranges can be added as well in the Virtual Network creation and/or Update dialog, pretty much in the same way as it can be done at the time of acquiring the resources explained in the [Import vCenter guide](#).

In order to get VM traffic shaping to work, the NIC must be controlled by vOneCloud and it needs to be connected to a Distributed vSwitch. The following requirements also needs to be met:

- Verify that vSphere Distributed Switch is version 6.0.0 and later.
- Verify that Network I/O Control on the switch is version 3.
- Verify that Network I/O Control is enabled.

- Verify that the virtual machine system traffic has a configured bandwidth reservation.

Steps to achieve the above configuration can be found [here](#)

Four values can be used in both the Virtual Network Template or the NIC to achieve traffic shaping. Take into account that only total traffic (inbound and outbound) is limited, the minimum between inbound and outbound is picked.

- Minimum between **INBOUND\_AVG\_BW** and **OUTBOUND\_AVG\_BW**. Expressed in kilobytes/second, this value is used to set the Reservation. This value cannot be set to a greater value than the **Peak\_BW**.
- Minimum between **INBOUND\_PEAK\_BW** and **OUTBOUND\_PEAK\_BW**. Expressed in kilobytes/second, this value is used to set the limit, or maximum bitrate for the interface of the VM. This value cannot be less than 1024 kilobytes/second.

## 7.2.4 Add New Datastore

**Datastores** for a particular vCenter cluster can be imported in vOneCloud after the cluster is imported using the [same procedure](#) to import vCenter clusters, making use of the Import button in the Storage --> Datastores tab in the vCenter View.

In order to create an image in vOneCloud that represents a vCenter datastore, use the following parameters:

At-tribute	Description
NAME	Arbitrary name of the image
PERSISTENCE	Must be set to 'YES'
PATH	Path of the VMDK file in the datastore. For instance, an image win10.vmdk in a Windows folder should be set to Windows/win10.vmdk
ADAPTER	Possible values (careful with the case): lsiLogic, ide, busLogic. More information <a href="#">in the VMware documentation</a>
DISK_TYPE	The type of disk has implications on performance and occupied space. Values (careful with the case): delta,eagerZeroedThick,flatMonolithic,preallocated,raw,rdm,rdmp,seSparse,sparse2Gb,sparseMonolithic,thick,thick2Gb,thin. More information <a href="#">in the VMware documentation</a>

The vCenter datastore in vOneCloud is tied to a vCenter OpenNebula host in the sense that all operations to be performed in the datastore are going to be performed through the vCenter instance associated to the vOneCloud host, which hold the needed credentials to access the vCenter instance.

## 7.2.5 Storage DRS and datastore cluster

Storage DRS allows you to manage the aggregated resources of a datastore cluster. A StoragePod data object aggregates the storage resources of associated Datastores in a datastore cluster managed by Storage DRS.

In OpenNebula, a StoragePod can be imported as a datastore using Sunstone or CLI's `onevcenter datastore` command. The StoragePod will be imported as a SYSTEM datastore so it won't be possible to use it to store images but it will be possible to deploy VMs on it.

Datastores which are member of the cluster, represented by the StoragePod, can be imported as individual IMAGE datastores where VMs can be deployed and images can be stored.

Current support has the following limitations:

- Images in StoragePods can't be imported through Sunstone or CLI's `onevcenter` command though it's possible to import them from a datastore, which is a member of a storage cluster, if it has been imported previously as an individual datastore.

- New images like VMDK files cannot be created or uploaded to the StoragePod as it's set as a SYSTEM datastore. However, it's possible to create an image and upload it to a datastore which is a member of a storage cluster it has been imported previously as an individual datastore.

**Warning:** When a VM is deployed, a cloning operation is involved. The moveAllDisksBackingsAndDisallowSharing move type is used when target datastore is a StoragePod. According to VMWare's documentation all of the virtual disk's backings should be moved to the new datastore. It is not acceptable to attach to a disk backing with the same content ID on the destination datastore. During a clone operation any delta disk backings will be consolidated. The moveChildMostDiskBacking is used for datastores which are not StoragePods in the cloning operation.

## 7.2.6 Add New Images / CDROMS

Adding a new datastore and representing existing VMDK images enables disk attach/detach functionality.

vCenter VMDK images managed by vOneCloud are always persistent, ie, vOneCloud won't copy them for new VMs, but rather the originals will be used. This means that only one VM can use one image at the same time.

There are three ways of adding VMDK representations in vOneCloud:

- Upload a new VMDK from the local filesystem
- Register an existent VMDK image already in the datastore
- Create a new empty datablock

vCenter VM Templates with already defined disks will be imported without this information in vOneCloud. These disks will be invisible for vOneCloud, and therefore cannot be detached from the VMs. The imported Templates in vOneCloud can be updated to add new disks from VMDK images imported from vCenter (please note that these will always be persistent).

The following image template attributes need to be considered for vCenter VMDK image representation in vOneCloud:

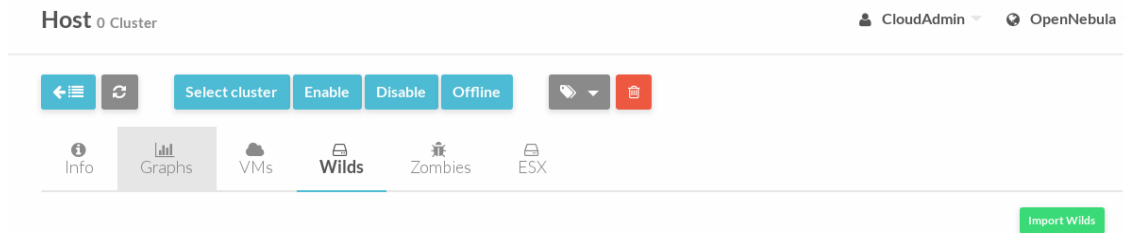
Attribute	Description
PERSISTENT	Must be set to 'YES'
PATH	This can be either: <ul style="list-style-type: none"> <li>• local filesystem path to a VMDK to be uploaded, which can be a single VMDK or a tar of vmdk descriptor and flat files which can be uncompressed or compressed with gzip or bzip2 (no OVAs supported)</li> <li>• path of an existing VMDK file in the vCenter datastore. In this case a "vcenter://" prefix must be used (for instance, an image win10.vmdk in a Windows folder should be set to vcenter://Windows/win10.vmdk)</li> </ul>
ADAPTER_TYPE	Possible values (careful with the case): lsiLogic, ide, busLogic. More information <a href="#">in the VMware documentation</a> . Known as "Bus adapter controller" in Sunstone.
DISK_TYPE	The type of disk has implications on performance and occupied space. Values (careful with the case): delta,eagerZeroedThick,flatMonolithic,preallocated,raw,rdm,rdmp,seSparse. More information <a href="#">in the VMware documentation</a>

VMDK images in vCenter datastores can be:

- Cloned
- Deleted
- Hotplugged to VMs

## 7.2.7 Import Running and Powered Off VMs

**Running** and **Powered Off VMs** can be imported through the WILDS tab in the Host info tab representing the vCenter cluster where the VMs are running in.



In the ZOMBIES tab you'll find VMs that were launched from OpenNebula but, for whatever reason, OpenNebula is not aware of this, e.g coming from a different OpenNebula installation, or being managed from a different vOneCloud. Zombie VMs are meant to be a warning of a VM that need manual clean-up.

Read more about the [vCenter drivers](#). Regarding the vCenter datastores in vOneCloud, refer to the [vCenter datastore guide](#)

## 7.3 Multi VM Applications

vOneCloud enables the management of individual VMs, but also the management of sets of VMs (services) through the OneFlow component.

vOneCloud ships with a running OneFlow, ready to manage services, allowing administrators to define multi-tiered applications using the vCenter View:

OpenNebula Sunstone

Dashboard  
System  
Virtual Resources  
Virtual Machines  
Templates  
Infrastructure  
Clusters  
Hosts  
Zones  
Marketplace  
OneFlow  
Services  
Templates  
Support  
Not connected  
Sign in

### Create Service Template

Name ?

Description ?

### Roles

Role 0 ?

Role Name ?

VM template ?

VMs ?

End users can consume services from the Cloud View:

one

### Create Service

Service Name

### Select a Template

Search

Hadoop

1 VMs  
 2 VMs

Elasticity of each service can be defined in relation with chosen Key Performance Indicators as reported by the hypervisor.

**Note:** vOneCloud does not include the `onégate` component which is mentioned at some places in the application flow guide.

More information on this component in the [OneFlow guide](#). Also, extended information on how to manage multi-tier applications is available [this guide](#).

## 7.4 Virtual Routers

Virtual Routers provide routing across Virtual Networks. Routing is implemented with a Virtual Machine appliance.

### 7.4.1 Creating Virtual Routers

An OVA containing the Virtual Router is available as an OVA which can be imported from the following URL:

<https://s3-eu-west-1.amazonaws.com/opennebula-marketplace/alpine-quagga.ova>

The OVA needs to be registered as a VM Template directly in vCenter. Afterwards the VM Template can be imported in vOneCloud, and set the template as a Virtual Router at the bottom of the General tab of the vOneCloud VM Template update wizard.



Update VM Template 1 trusty - Cluster oneadmin OpenNebula


[←](#) [Update](#) Wizard Advanced

**General** Storage Network Input/Output Context Scheduling Hybrid Other

Name:

Description:

Hypervisor: ☐ KVM ☒ vCenter

Logo:  

**vCenter**

vCenter Template UUID:

VM disks: ☐ Keep

Default Datastore:  Type:

Available Datastores:

Default Resource Pool:  Type:

Available Resource Pools:

Memory:  GB

Memory modification:

CPU:

CPU modification:

VCPU:

VCPU modification:

**Cost**

Memory:  CPU:

Disk:

☐ Do not modify network configuration

☒ Make this template available for Virtual Router machines only

Virtual Routers can be seamlessly deployed in high availability mode.

To create a new Virtual Router, proceed to `Instances --> Virtual Routers` and click on the **+** icon. Follow the wizard to select the Virtual Networks that will get logically linked to it. This connection takes effect when the Virtual Machine containing the VR Appliance is automatically deployed, with a network interface attached to each Virtual Network.

For each Virtual Network, the following options can be defined:

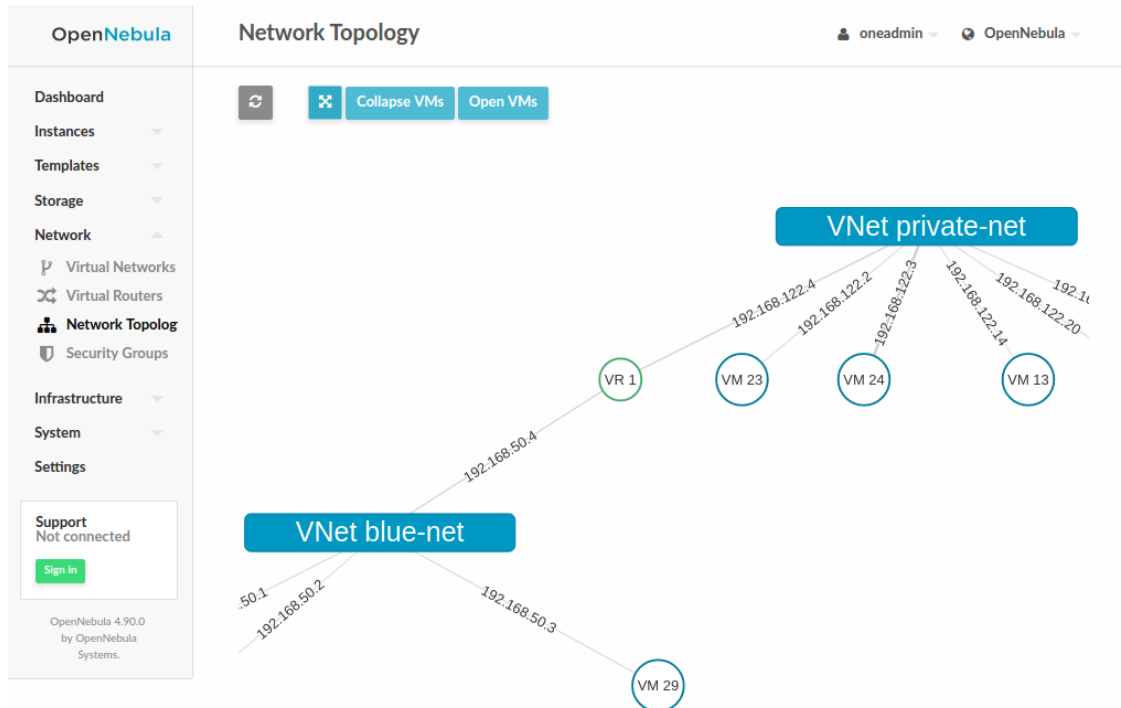
- **Floating IP.** Only used in High Availability, explained below.
- **Force IPv4.** You can force the IP assigned to the network interface. When the VR is not configured in High Availability, this will be the IP requested for the Virtual Machine appliance.

- **Management interface.** If checked, this network interface will be a Virtual Router management interface. Traffic will not be forwarded to it.

Once ready, click the “create” button to finish. vOneCloud will create the Virtual Router and the Virtual Machines automatically.

## 7.4.2 Managing Virtual Routers

Using the Virtual Routers tab you can retrieve the generic resource information such as owner and group, the list of Virtual Networks interconnected by this router, and the Virtual Machines that are actually providing the routing.



The Virtual Networks connected to the VR machines can be modified with the attach/detach actions.

Actions can be found in the Virtual Router’s main information panel, in the networks table. The options to add a new Virtual Network are the same that were explained for the creation wizard, see previous section.

After a NIC is attached or detached, the Virtual Machine appliances are automatically reconfigured to start routing to the new interface. No other action, like a reboot, is required.

Virtual Machines associated to a Virtual Router have a limited set of actions. Specifically, any action that changes the VM state cannot be executed, including terminate.

To terminate a Virtual Machine associated with a Virtual Router, you need to delete the Virtual Router.

## 7.4.3 High Availability

More than one Virtual Machines can be associated to a Virtual Router in order to implement a high availability scenario. In this case, vOneCloud will also assign a floating IP to the group of Virtual Machines, that will coordinate to manage the traffic directed to that IP.

To enable a high availability scenario, you need to choose 2 or more number of instances when the Virtual Router is created. In this scenario, the following Virtual Router options became relevant:

- **Keepalived ID:** Optional. Sets keepalived configuration parameter `virtual_router_id`.
- **Keepalived password:** Optional. Sets keepalived configuration parameter `authentication/auth_pass`.

And for each Virtual Network Interface:

- **Floating IP.** Check it to enable the floating IP.
- **Force IPv4.** Optional. With the floating IP option selected, this field requests a fixed IP for that floating IP, not the individual VM IPs.

The floating IP assignment is managed in a similar way to normal VM IPs. If you open the information of the Virtual Network, it will contain a lease assigned to the Virtual Router (not a VM). Besides the floating IP, each VM will get their own individual IP.

Other Virtual Machines in the network will use the floating IP to contact the Virtual Router VMs. At any given time, only one VM is using that floating IP address. If the active VM crashes, the other VMs will coordinate to assign the floating IP to a new Virtual Router VM.

## 7.4.4 Customization

You can provide two optional parameters in the context to configure the keepalived service started in the Virtual Router VM:

- `VROUTER_KEEPAIVED_PASSWORD`: Password used for the service to protect the service from packages of rogue machines. By default the service is configured without password.
- `VROUTER_KEEPAIVED_ID`: Number identifier of the service (0-255). This is useful when you have several virtual routers or other keepalived services in the same network. By default it is generated from the Virtual Router ID (`$vrouter_id & 255`) but you can specify it manually if needed.

These parameters can also be provided in the Virtual Router creation wizard.

## 7.5 Authentication

By default, vOneCloud authentication uses an internal user/password system with user and group information stored in an internal database.

vOneCloud can pull users from a corporate Active Directory (or LDAP), all the needed components are enabled and just an extra configuration step is needed. As requirements, you will need an Active Directory server with support for simple user/password authentication, as well as a user with read permissions in the Active Directory user's tree.

You will need to access the [Control Panel](#) in order to configure the Active Directory support in vOneCloud. After the configuration is done, users that exist in Active Directory can begin using vOneCloud.

### 7.5.1 Step 1. Configure Active Directory support

Click on the “Configure OpenNebula” button

# vOneCloud Control Panel

## vOneCloud 2.0.0

You are running **vOneCloud** for the first time.

Read the [vOneCloud Documentation](#) to understand how to operate your cloud.

If you want to configure Active Directory integration, SSH or SSL certificates, please click on the [Configure OpenNebula](#) button below.

Start to operate your Cloud by starting OpenNebula using the [Start](#) button in the right sidebar and then open Sunstone:

- <http://10.0.1.207>
- username: `cloudAdmin`
- password: `cloudAdmin`

Remember to change the password inside Sunstone after logging in.

**vOneCloud 2.0.1** is now available and ready.

[Upgrade Now](#)

UUID	da559b7c-1198-42fb-8492-8e7ef26b176b
Installation Date	2016-06-29 10:45:11 +0100
Version	2.0.0
Upgrade Date	2016-06-29 10:45:13 +0100

## Configure

This **vOneCloud** release supports the following configuration options:

- Active Directory integration
- SSL

[Configure OpenNebula](#)

## OpenNebula State

OpenNebula is **ON**

You can connect to Sunstone at <http://10.0.1.207/>

[Restart](#)

[Stop](#)

## Admin Tasks

<a href="#">Bootstrap OpenNebula</a> 2016-06-29 11:09:50 +0100	<a href="#">SUCCESS</a>
<a href="#">Start OpenNebula</a> 2016-06-29 11:09:50 +0100	<a href="#">SUCCESS</a>
<a href="#">Reconfigure OpenNebula</a> 2016-06-29 11:09:50 +0100	<a href="#">SUCCESS</a>
<a href="#">Reconfigure OpenNebula</a> 2016-06-29 10:51:03 +0100	<a href="#">SUCCESS</a>
<a href="#">Reconfigure OpenNebula</a> 2016-06-29 10:48:34 +0100	<a href="#">SUCCESS</a>

[All Tasks](#)

[Access Logs](#)

[Debug Info](#)

vOneCloud Control Center 2.0.0 by [OpenNebula Systems](#)

In the following screen, select the “Add Active Directory” category

# vOneCloud Control Panel

 Home

Add Active Directory Server



**System Options**

SSH ☒

SSL enabled ☐

SSL Certificate File\*

SSL Key Certificate File\*

SSL CA Certificate File

Apply Settings Cancel

Fill the needed fields following the criteria described in the next table

Attribute	Description
Server Name	Chosen name for the authentication backend
User	Active Directory user with read permissions in the user's tree plus the domain.
Password	Active Directory user password
Authentication method	Active Directory server authentication method (eg simple)
Encryption	simple or simple_tls
Host	hostname or IP of the Domain Controller
Port	port of the Domain Controller
Base Domain	base hierarchy where to search for users and groups
Group	group the users need to belong to. If not set any user will do
User Field	Should use <b>sAMAccountName</b> for Active Directory. Holds the user name, if not set 'cn' will be used
Group Field	field name for group membership, by default it is 'member'
User Group Field	user field that that is in in the group group_field, if not set 'dn' will be used

Click on the "Apply Settings" button when done.

## 7.5.2 Step 2. Restart vOneCloud services

For changes to take effect, you need to restart vOneCloud services and wait for OpenNebula state to be ON.

## vOneCloud Control Panel

### vOneCloud 2.0.1

vOneCloud is up to date.

No active subscription detected. Subscribe to manage upgrades.

Subscribe

### OpenNebula State

OpenNebula is **ON**  
You can connect to Sunstone at  
<http://10.0.1.178/>

Restart

Stop

You can find more information on the integration with Active Directory in [this guide](#).

## 7.6 Resource Pool Confinement

vOneCloud can be configured to place VMs in different Resource Pools. There are two approaches to achieve this, fixed per Cluster basis or flexible per VM Template basis.

### 7.6.1 Per Cluster Basis

In the fixed per Cluster basis approach, the vCenter credentials that vOneCloud use can be confined into a Resource Pool, to allow only a fraction of the vCenter infrastructure to be used by vOneCloud users. The steps to confine vOneCloud users into a Resource Pool are:

- Create a new vCenter user
- Create a Resource Pool in vCenter and assign the subset of Datacenter hardware resources wanted to be exposed through vOneCloud
- Give vCenter user Resource Pool Administration rights over the Resource Pool
- Give vCenter user Resource Pool Administration (or equivalent) over the Datastores where the VMs are going to be running on

Afterwards, these credentials can be used to add to vOneCloud the host representing the vCenter cluster. Add a new attribute called `VCENTER_RESOURCE_POOL` to the host template representing the vCenter cluster (for instance, in the info tab of the host, or in the CLI), with the name of the Resource Pool.

The screenshot shows the OpenNebula web interface. On the left is a sidebar with navigation links: Dashboard, System, Virtual Resources (Virtual Machines, Templates), Infrastructure (Clusters, Hosts, Virtual Networks, Zones), OneFlow, Services, and Templates. The 'Hosts' link under 'Infrastructure' is highlighted with a red arrow. The main content area is titled 'Host devel6' and has tabs for 'Info', 'Graphs', and 'VMs'. The 'Info' tab is selected and highlighted with a red arrow. Below the tabs are two tables: 'Information' and 'Capacity'. The 'Information' table lists attributes like id, Name, Cluster, State, IM MAD, VM MAD, and VN MAD. The 'Capacity' table lists Allocated Memory, Allocated CPU, Real Memory, and Real CPU. Below these is an 'Attributes' table with rows for IM\_MAD, PUBLIC\_CLOUD, RESERVED\_CPU, RESERVED\_MEM, TOTALHOST, TOTAL\_ZOMBIES, VCENTER\_HOST, and VCENTER\_RESOURCE\_POOL. Red arrows point to the 'VCENTER\_HOST' value '10.1.140' and the 'VCENTER\_RESOURCE\_POOL' value 'Dev6ResourcePool'.

Information		Capacity
id	5	Allocated Memory
Name	devel6	Allocated CPU
Cluster	-	Real Memory
State	MONITORED	Real CPU
IM MAD	vcenter	
VM MAD	vcenter	
VN MAD	dummy	

Attributes	
IM_MAD	vcenter
PUBLIC_CLOUD	YES
RESERVED_CPU	
RESERVED_MEM	
TOTALHOST	1
TOTAL_ZOMBIES	2
VCENTER_HOST	10.1.140
VCENTER_RESOURCE_POOL	Dev6ResourcePool

### 7.6.2 Per VM Template Basis

This second approach is more flexible in the sense that all Resource Pools defined in vCenter can be used, and the mechanism to select which one the VM is going to reside into can be defined using the attribute `RESOURCE_POOL` in the `PUBLIC_CLOUD` section of vOneCloud VM Template. This mechanism can be used to generate different vOneCloud VM Templates pointing to the same vCenter VM Template, each confined in a different Resource Pool and subject to be assigned to different groups of users.

This attribute can be set in two ways in the vOneCloud VM Template, and can be set/modified at the time of creating/updating the VM Template in vOneCloud:

- **Fixed:** Pick a certain Resource Pool where this VM will be contained
- **Delegated to User:** Provide a comma separated list of the different Resource Pools available for this VM Template, that the end user will be able to choose at VM launch time. A default can be selected.

Create VM Template

oneadmin OpenNebula

Reset Create

Wizard Advanced

General Storage Network Input/Output Context Scheduling Hybrid Other

Name: Mail Server

Description: Corporate MailServer

Hypervisor: ☐ KVM ☒ vCenter

Logo:

vCenter

vCenter Template UUID: 554c0342-c2c7-c3b7-8258-96eb00f62b0c

VM disks: ☐ Keep

Default Datastore: nfs Type: Fixed

Available Datastores:

Default Resource Pool: ProductionRP Type: Provide on instantiation

Available Resource Pools: ProductionRP, DevelopmentRP

Nested Resource Pools can be represented using '/'. For instance, a Resource Pool "RPChild" nested under "RPAncesor" can be represented both in VCENTER\_RESOURCE\_POOL and RESOURCE\_POOL attributes as "RPAncesor/RPChild".

```
RESOURCE_POOL="RPAncesor/RPChild"
PUBLIC_CLOUD=[
  HOST="Cluster",
  TYPE="vcenter",
  VM_TEMPLATE="4223067b-ed9b-8f73-82ba-b1a98c3ff96e" ]
```



## APPLIANCE CONFIGURATION

### 8.1 Introduction

The vOneCloud appliance features two components to simplify the configuration tasks needed to set-up, configure, maintain and upgrade the cloud: the vOneCloud Control Console (text-based) and the vOneCloud Control Panel (web-based).

This sections explains each of these interfaces, how to access them and the available configuration options.

### 8.2 Control Console

This is a text-based interface available used to run basic configuration tasks in the vOneCloud appliance.

A screenshot of a terminal window with a black background and white text. At the top, there is a logo for 'vOneCloud' made of small squares, followed by 'by OpenNebula Systems'. Below the logo, the text reads: 'Welcome to vOneCloud Control Console. You have started vOneCloud for the first time. Follow this short wizard to configure it:'. This is followed by a list of five tasks: '- Configure Network', '- Configure proxy', '- Set the root password', '- Change the password for oneadmin in OpenNebula', and '- Open vOneCloud Control Panel (web-based interface)'. At the bottom, it says 'Press enter to continue...'.

```
vOneCloud
by OpenNebula Systems

Welcome to vOneCloud Control Console. You have started vOneCloud for the first
time. Follow this short wizard to configure it:

- Configure Network
- Configure proxy
- Set the root password
- Change the password for oneadmin in OpenNebula
- Open vOneCloud Control Panel (web-based interface)

Press enter to continue...
```

The Control Console is available by opening the vOneCloud appliance console in vCenter. It requires no authentication since only the vCenter administrator will be able to open the vOneCloud console.

This component runs in two stages. The initial bootstrap stage, and the basic configuration stage.

### 8.2.1 Initial Bootstrap

The initial bootstrap is a configuration wizard which is part of the deployment process of vOneCloud, and it **must** be run. During this step the user will be prompted to configure the following aspects:

- Configure Network
- Set the root password
- Change the password for oneadmin in OpenNebula
- Configure http proxy

Once this wizard has been executed the user is ready to open the vOneCloud Control Panel at [http://<appliance\\_ip>:8000](http://<appliance_ip>:8000) in order to continue with the deployment configuration and to start the OpenNebula service.

Note that during this step the *oneadmin* account password will be set, which will be then used to access the vOneCloud Control Panel.

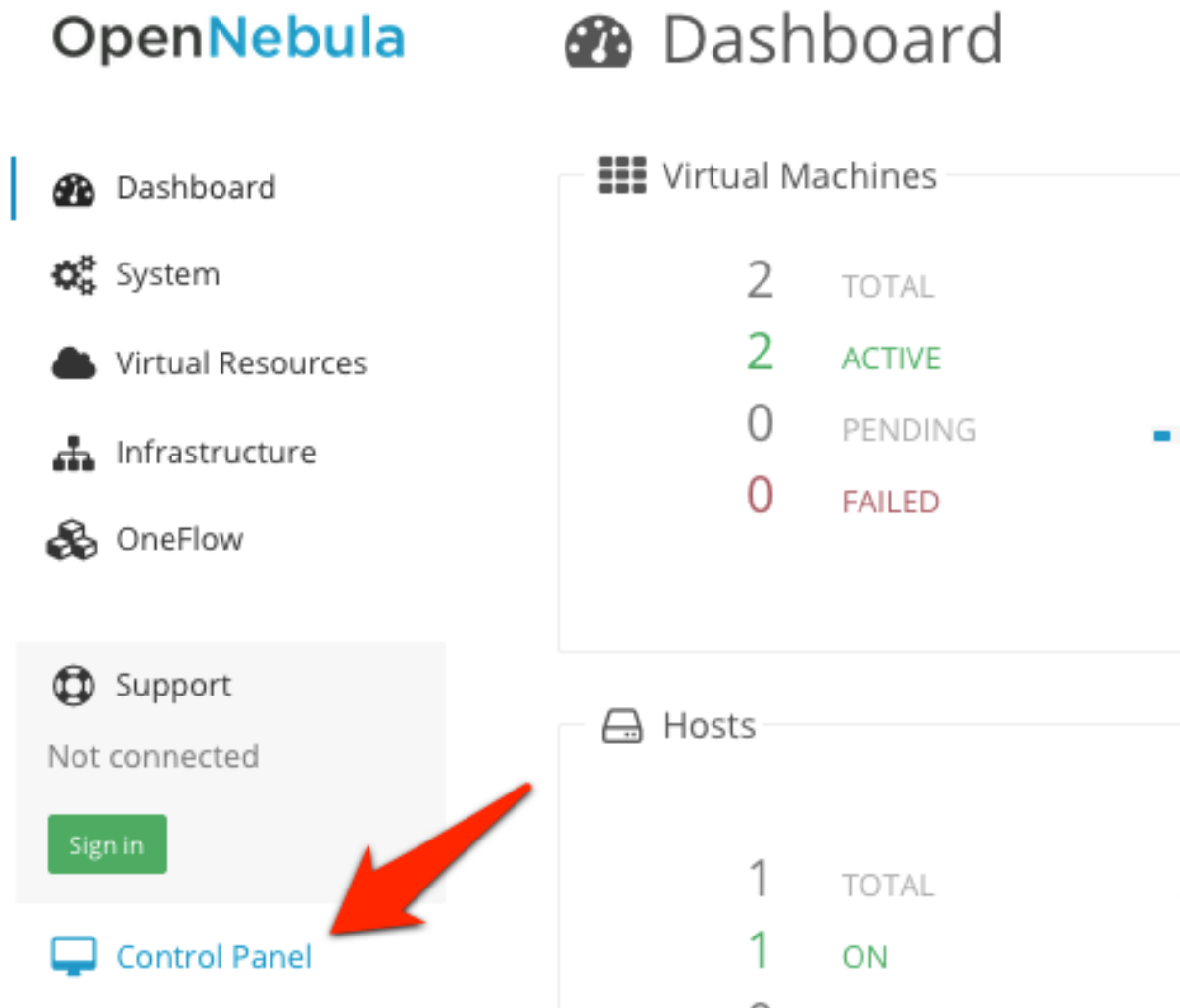
### 8.2.2 Basic Configuration

At any given moment, the vOneCloud administrator may choose to open the vOneCloud appliance console in vCenter to perform some additional configuration:

- Networking configuration, which is useful if the networking configuration changes at any given time.
- Proxy configuration.
- Change the oneadmin password. Note that this step requires that the vOneCloud administrator restarts the OpenNebula service in the *vOneCloud Control Panel*.

## 8.3 Control Panel

This is a web based interface available at [http://<appliance\\_ip>:8000](http://<appliance_ip>:8000) which handles many aspects of the vOneCloud platform configuration. The Control Panel can be reached at any time from the Sunstone GUI using the Control Panel link in the bottom of the left hand side menu.



To log in the administrator will need the *oneadmin* account, which is set in the initial configuration of the Control Console.

The next section documents the available information and actions in this interface

### 8.3.1 Appliance Management

In the dashboard of the Control Panel you will be able to see the following information:

Parameter	Description
UUID	Each vOneCloud appliance has an automatically generated UUID used to identify it. This information is required by vOneCloud Support for users with an active support subscription.
Installation Date	Records the date of the vOneCloud first deployment.
Version	Active vOneCloud version
Upgrade Date	Records the date of last vOneCloud upgrade.

# vOneCloud Control Panel

## vOneCloud 2.0.1

vOneCloud is up to date.

No active subscription detected. Subscribe to manage upgrades.

Subscribe

UUID	c9d3ba79-32c6-4bba-912f-e63bf70b88a7
Installation Date	2016-10-07 11:29:11 +0100
Version	2.0.1
Upgrade Date	2016-10-07 11:29:13 +0100

## Configure

This vOneCloud release supports the following configuration options:

- Active Directory integration
- SSL
- SSH

Configure OpenNebula

## OpenNebula State

OpenNebula is ON

You can connect to Sunstone at  
<http://10.0.1.178/>

Restart

Stop

## Admin Tasks

Restart OpenNebula 2016-11-07 14:01:30 +0000	success
Reconfigure OpenNebula 2016-11-07 14:01:30 +0000	success
Start OpenNebula 2016-10-31 07:51:23 +0000	success
Stop OpenNebula 2016-10-31 07:51:23 +0000	success
Start OpenNebula 2016-10-27 09:45:32 +0100	success
Stop OpenNebula 2016-10-27 09:45:32 +0100	success
Bootstrap OpenNebula 2016-10-07 11:30:20 +0100	success
Start OpenNebula 2016-10-07 11:30:20 +0100	success

[All Tasks](#)

[Access Logs](#)

[Debug Info](#)

Additionally vOneCloud will report the subscription status:

- No subscription detected
- Active subscription
- Expired subscription

## 8.3.2 Configuration Management

The configuration action handles the supported configuration of the vOneCloud appliance:

- *Active Directory or LDAP integration.*
- *System Options - Enable SSH.*
- *System Options - Enable SSL.*

If the configuration is changed while OpenNebula is running, it will need to be restarted. A warning will appear in the dashboard reminding the user to restart the OpenNebula service.

### 8.3.3 System options

It is possible to configure SSH and SSL:

**System Options**

**SSH** ☐

**SSL enabled** ☐

**SSL Certificate File\***

**SSL Key Certificate File\***

**SSL CA Certificate File**

#### SSH

By default SSH access is disabled. If you want to enable it, simply enable the checkbox.

#### SSL

If you want to enable SSL you will need to:

- Enable the *SSL enabled* checkbox
- Provide a Certificate (copy&paste the contents of the file)
- Provide a Key Certificate (copy&paste the contents of the file)
- Optionally, provide the CA Certificate (copy&paste the contents of the file)

---

**Note:** If you are going to use a self-signed SSL certificate, and do not have the CA certificate, you will need to have your browser trust that certificate, in both 443 and 29876 ports in the vOneCloud IP or FQDN. Otherwise VNC may not work

---

### 8.3.4 Service Management

The OpenNebula services can be managed in the main dashboard: start, stop and restart.

Any of this actions will trigger one or more tasks. If one of this tasks fails, the user will be notified, and those with an active support subscription will be able to send the error report to the vOneCloud Support.

### 8.3.5 Log Access

The Control Panel features the possibility to access the OpenNebula logs.

### 8.3.6 Automatic Upgrades

When a new vOneCloud release is available for download users will be notified both in Sunstone and in the Control Panel. Users with an active support subscription will be able to upgrade with a single click. In the main Dashboard area the user will be notified if there is a new release available. In that case the user will be able to click a button that will start the upgrade.

---

**Note:** Before running an automatic upgrade users are recommend to create a vCenter snapshot of the vOneCloud appliance in order to revert back to it in case of failure.

---

## 8.4 Advanced Customizations

This section documents further customizations that can tailor the vOneCloud environment to your needs. However, these modifications will be lost after an upgrade. So please document the process exactly so you can replay it after upgrading the appliance.

All the customizations documented in this section require logging into the vOneCloud appliance, see the [Logging into the Appliance](#) guide to access it.

These customizations are currently supported:

- [Rebrand vOneCloud](#)

**Warning:** The following changes will be lost after an upgrade.

### 8.4.1 Rebranding

It is possible to change the logos of the Sunstone interface by replacing these files:

- Logo for the login screen: `/usr/lib/one/sunstone/public/images/opennebula-sunstone-v4.0.png`. The original size is 355 x 78 px. The image will be force resized to a width of 355px.
- Logo for the admin view: `/usr/lib/one/sunstone/public/images/opennebula-sunstone-v4.0-small.png`. The original size is 413 x 60 px.
- Logo for the group and cloud view: `/usr/lib/one/sunstone/public/images/one_small_logo.png`. The original size is 563 x 194px.

The background of the login screen can be customized by replacing `/usr/lib/one/sunstone/views/login.erb`, with these contents:

```
<!DOCTYPE html>
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
    <link rel="shortcut icon" href="images/favicon.ico" />
```

```

<title>OpenNebula Sunstone Login</title>
<link rel="stylesheet" type="text/css" href="css/login.css" />
<!--[if IE]>
<script type="text/javascript" src="vendor/crypto-js/core-min.js"></script>
<script type="text/javascript" src="vendor/crypto-js/enc-base64-min.js"></script>
<![endif]-->

<% if $conf[:env] == 'dev' %>
  <script src="bower_components/requirejs/require.js" data-main="app/login"></
→script>
  <% else %>
    <script src="dist/login.js"></script>
  <% end %>
</head>

<body style="
background: url(images/%YOURIMAGE%) no-repeat center center fixed;
-webkit-background-size: cover;
-moz-background-size: cover;
-o-background-size: cover;
background-size: cover;
">

  <% if settings.config[:auth] == "x509" %>
  <%= erb :_login_x509 %>
  <% else %>
  <%= erb :_login_standard %>
  <% end %>

  <div id="footer" style="overflow:visible;">
    <a href="http://opennebula.org" target="_blank">OpenNebula 4.13.85</a>
    by
    <a href="http://opennebula.systems" target="_blank">OpenNebula Systems</a>
    .
  </div>
</body>
</html>

```

Make sure you replace %YOURIMAGE% in the above example with the name of your background. Upload your background image to /usr/lib/one/sunstone/public/images/. For example, if we have a logo called server.jpg, that line should read:

```
background: url(images/server.jpg) no-repeat center center fixed;
```

And we should upload it to /usr/lib/one/sunstone/public/images/server.jpg.

## 8.4.2 VM Template Logos

It is possible to add new logos for the VM Templates to be displayed in Sunstone:

- Create your logo in PNG format (90 x 96 pixels).
- Log in into the appliance and place it in /usr/lib/one/sunstone/public/images/logos
- chmod +644 on the uploaded file
- In Sunstone vCenter Admin view, update the desired VM Template and select any of the built in logos.
- Click on update again and switch to Advanced view.

- Change the the LOGO= line to LOGO="images/logos/<mylogo>.png

After any of these changes it's necessary to restart OpenNebula in the Control Panel.

## 8.5 Troubleshooting

This section details what actions to take if any of the vOneCloud appliance configuration functions fails.

### 8.5.1 Cannot Check for Upgrades

When the vOneCloud Repository cannot be reached this message will be displayed:

OpenNebula Systems vOneCloud Repository is unreachable. Cannot check for upgrades. Read the Troubleshooting guide for more info.

This means that the appliance cannot reach the appliance repository at [vonecloud.com](https://downloads.vonecloud.com). In the first place, check from your browser that this website is up: <https://downloads.vonecloud.com/version>, it should display a message like:

```
{“error”:”Invalid Data.”}
```

If that works, then it's probably a networking configuration error. Make sure that the network of the appliance has been properly set (see [here](#) ). It also might be a proxy problem if the appliance requires a proxy to access the internet. If you are sure these configuration parameters are correct, perform a [manual login to the appliance](#) and check the following items:

- Inspect the routes *ip route*
- If you are not using a proxy, make sure you can reach the Google DNS to test internet connection: *ping 8.8.8.8*.
- Run the following command: *curl -kv https://downloads.vonecloud.com/version*. If you are using a proxy run this instead: *HTTPS\_PROXY=http://<proxy\_user>:<proxy\_pass>@<proxy\_host>:<proxy\_port> curl -kv https://downloads.vonecloud.com/version*.

If you are sure the network is properly configured, please feel free to submit a support to [vOneCloud Support](#).

### 8.5.2 Debug Information

An Admin Task called `Debug Info` generates a gzipped tar file which can be downloaded that contains all the required information to debug the cloud if the OpenNebula user runs into a problem. This file can be then sent to [vOneCloud Support](#). Note that this sends information on all the resources of the cloud and the OpenNebula log.

---

**Note:** Please examine this information before sending it over if you have concerns about sensitive data that might be automatically bundled in the file.

---

To generate the debug information follow these steps:



## vOneCloud Control Panel

### vOneCloud

vOneCloud is up to date.

[Upgrade Now](#)

UUID	dab7bbdf-912d-4140-b52d-dccbfb688dc5
Installation Date	2015-04-20 14:29:38 +0200
Version	
Upgrade Date	2015-04-20 14:29:38 +0200

### OpenNebula State

OpenNebula is ON

You can connect to Sunstone at  
<http://localhost/>

[Restart](#)

[Stop](#)

### Admin Tasks

[Debug Info](#)

2015-04-21 12:10:23 +0200

success

[All Tasks](#)

[Access Logs](#)

[Debug Info](#)

To download the file click on the Debug Info job and download the file:

## vOneCloud Control Panel

[Home](#)

### Job — Debug Info

Start Time	2015-04-21 12:10:23 +0200
End Time	2015-04-21 12:11:00 +0200
State	finished
Exit Status	0
File	<a href="#">debug-131.tar.gz</a>

### 8.5.3 Job Failure

A job should never fail. If it fails you should submit a support ticket with the attached Job Crashed Report (link found in the Job page) to [vOneCloud Support](#).