
OpenNebula.org

OpenNebula 4.10 Quickstart Create Your First VDC

Release 4.10

OpenNebula Project

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This guide will provide a quick example of how to partition your cloud for a VDC. In short, a VDC is a group of users with part of the physical resources assigned to them. The *Understanding OpenNebula* guide explains the OpenNebula provisioning model in detail.

STEP 1. CREATE A CLUSTER

We will first create a *cluster*, 'web-dev', where we can group *hosts*, *datastores* and *virtual networks* for the new VDC.

```
$ onehost list
```

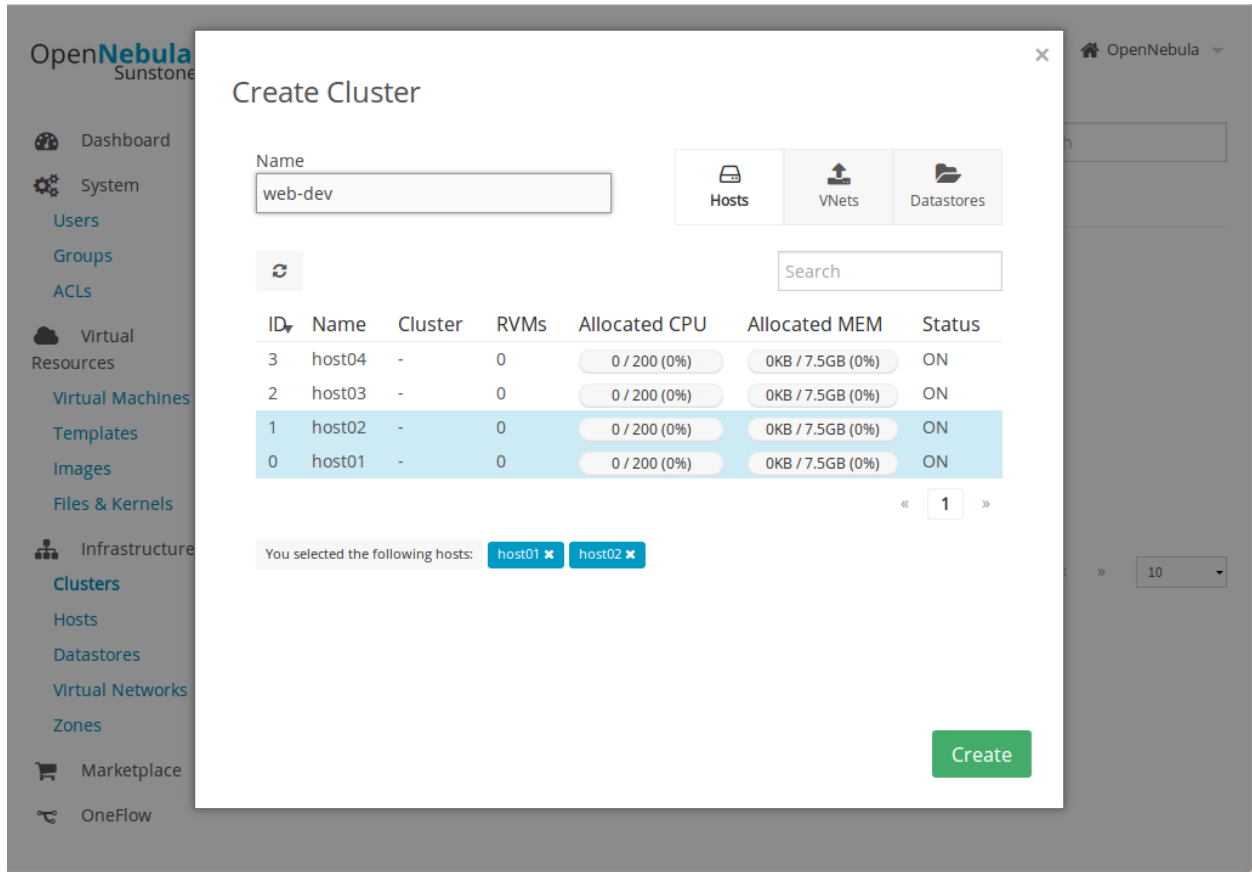
| ID | NAME | CLUSTER | RVM | ALLOCATED_CPU | ALLOCATED_MEM | STAT |
|----|--------|---------|-----|---------------|----------------|------|
| 0 | host01 | web-dev | 0 | 0 / 200 (0%) | 0K / 7.5G (0%) | on |
| 1 | host02 | web-dev | 0 | 0 / 200 (0%) | 0K / 7.5G (0%) | on |
| 2 | host03 | - | 0 | 0 / 200 (0%) | 0K / 7.5G (0%) | on |
| 3 | host04 | - | 0 | 0 / 200 (0%) | 0K / 7.5G (0%) | on |

```
$ onedatastore list
```

| ID | NAME | SIZE | AVAIL | CLUSTER | IMAGES | TYPE | DS | TM |
|----|---------|--------|-------|---------|--------|------|----|--------|
| 0 | system | 113.3G | 25% | web-dev | 0 | sys | - | shared |
| 1 | default | 113.3G | 25% | web-dev | 1 | img | fs | shared |
| 2 | files | 113.3G | 25% | - | 0 | fil | fs | ssh |

```
$ onevnet list
```

| ID | USER | GROUP | NAME | CLUSTER | TYPE | BRIDGE | LEASES |
|----|----------|----------|---------|---------|------|--------|--------|
| 0 | oneadmin | oneadmin | private | web-dev | R | virbr0 | 0 |



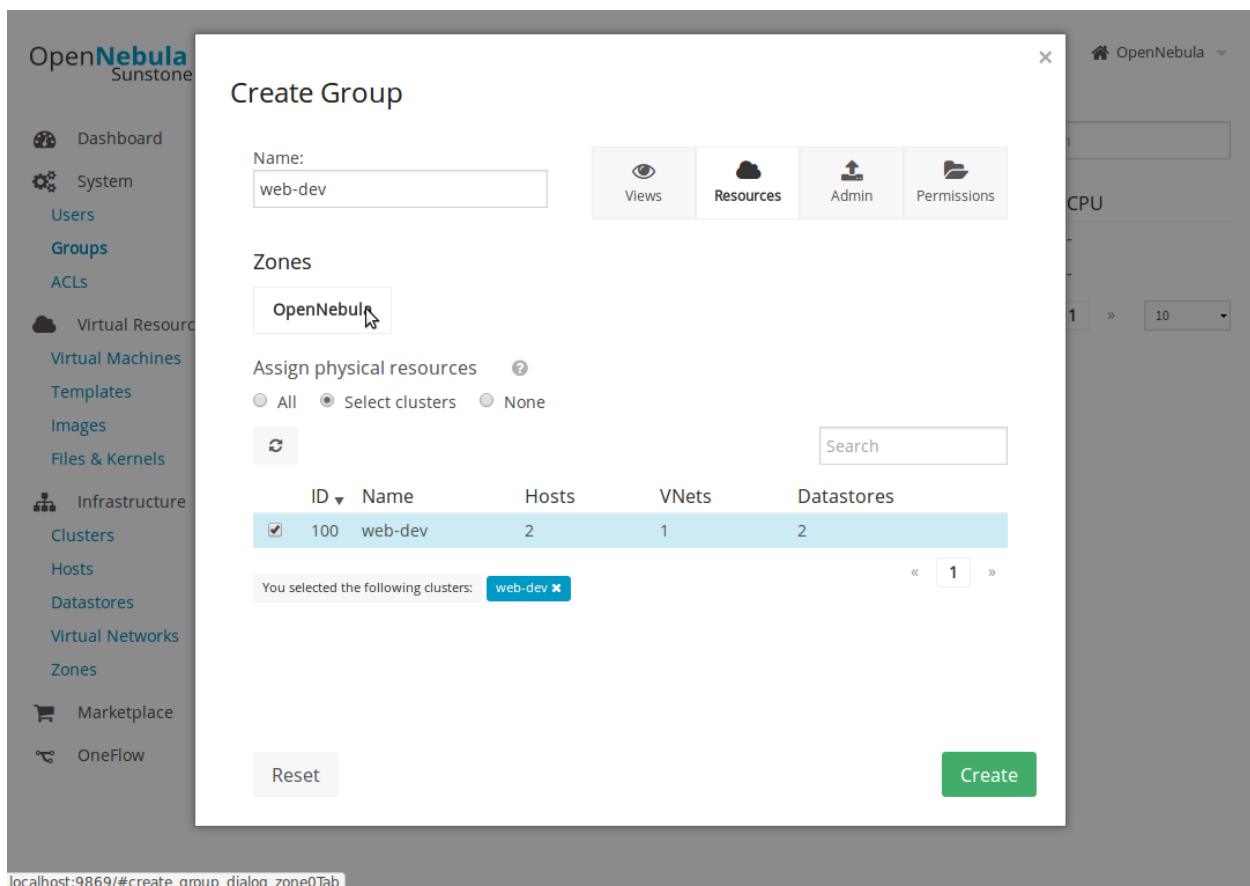
STEP 2. CREATE A VDC GROUP

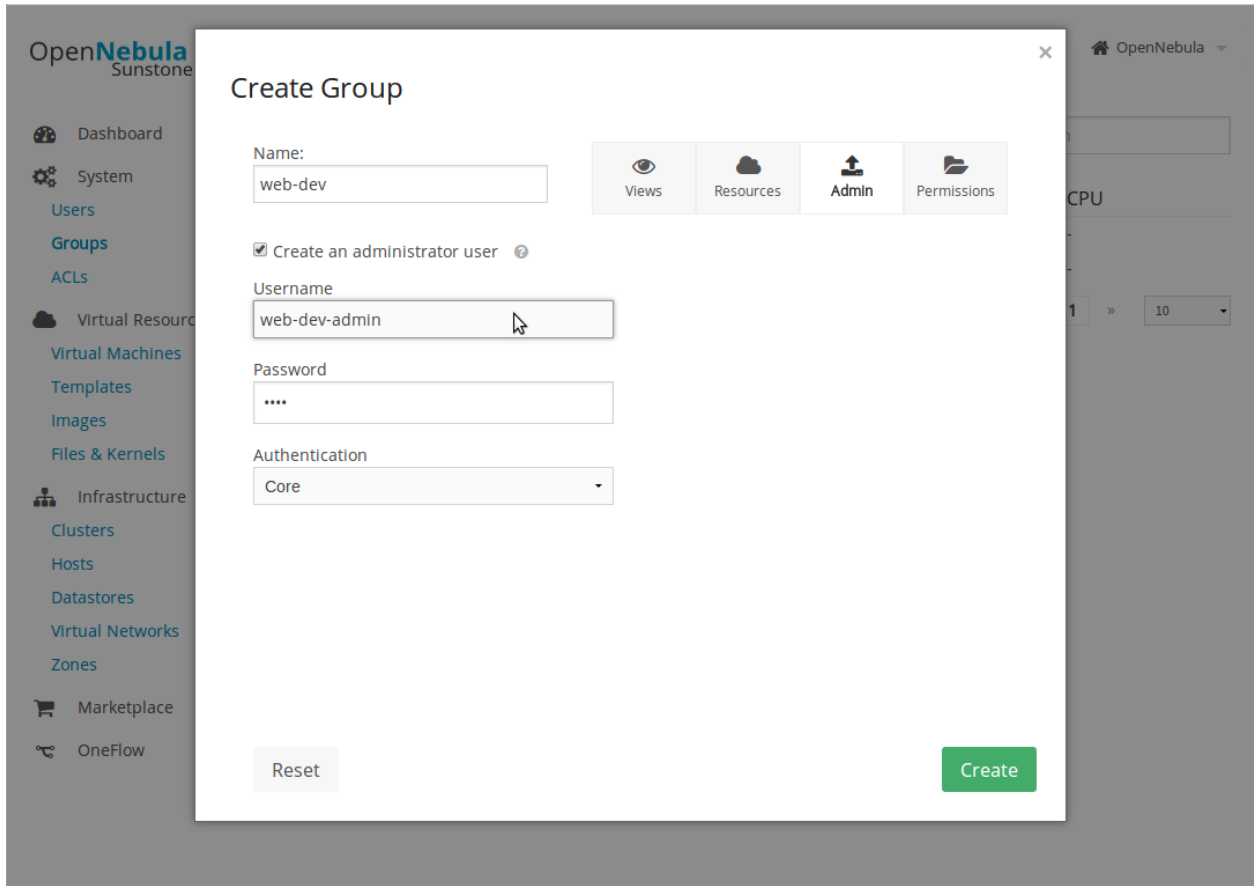
We can now create the new *group*, named also ‘web-dev’. This group, or VDC, will have a special admin user, ‘web-dev-admin’. This admin user will be able to create new users inside the VDC.

When a new group is created, you will also have the opportunity to configure different options, like the available *Sunstone views*. Another thing that can be configured is if the virtual resources will be shared for all the users of the VDC, or private.

```
$ onegroup create --name web-dev --admin_user web-dev-admin --admin_password abcd  
ID: 100
```

```
$ onegroup add_provider 100 0 web-dev
```





STEP 3. OPTIONALLY, SET QUOTAS

The cloud administrator can set *usage quotas* for the VDC. In this case, we will put a limit of 10 VMs.

```
$ onegroup show web-dev
GROUP 100 INFORMATION
ID           : 100
NAME        : web-dev

GROUP TEMPLATE
GROUP_ADMINS="web-dev-admin"
GROUP_ADMIN_VIEWS="vdcadmin"
SUNSTONE_VIEWS="cloud"

USERS
ID
2

RESOURCE PROVIDERS
ZONE CLUSTER
0      100

RESOURCE USAGE & QUOTAS

NUMBER OF VMS      MEMORY      CPU      VOLATILE_SIZE
0 / 10             0M / 0M    0.00 / 0.00    0M / 0M
```

Dashboard

System

Users

Groups

ACLs

Virtual Resources

Infrastructure

Marketplace

OneFlow

Support



Update Quotas

Info Quotas Providers Accounting

VMs 0 / 10

CPU 0 / Default (∞)

Memory 0 / Default (∞) MB

Volatile disks 0 / Default (∞) MB

Image

| ID | Running VMs |
|----|-------------|
| | |

Network

| ID | Leases |
|----|--------|
| | |

Datastore

| ID | Images | Size |
|----|--------|------|
| | | |

STEP 4. PREPARE VIRTUAL RESOURCES FOR THE USERS

The cloud administrator has to create the *Virtual Machine Templates* and *Images* that the VDC users will instantiate. If you don't have any working Image yet, import the `ttlinux` testing appliance from the *marketplace*.

The screenshot shows the OpenNebula Sunstone interface. A modal dialog titled "Import Appliance" is open. The dialog contains the following text: "The following images will be created in OpenNebula. If you want to edit parameters of the image you can do it later in the Images tab". Below this, there is a dropdown menu labeled "Select the datastore for the Images" with "1: default" selected. A table lists the image details:

| 0 - Image Name | 40MB |
|---------------------|------|
| ttlinux - kvm_file0 | |

An "Import" button is located at the bottom right of the dialog. In the background, a table shows metadata for the image:

| | |
|------------|---------------|
| Tags | linux ttlinux |
| Catalog | community |
| OS | ttlinux null |
| Arch | x86_64 |
| Size | 40MB |
| Hypervisor | KVM |
| Format | raw |

Additional text in the background includes: "The login information for this image is: **login**: root, **password**: password. **NOTE:** The contextualization of this image is really simple. You can not set the network mask or the gateway. It's always a C class and gateway is x.y.z.1."

Now you need to create a VM Template that uses the new Image. Make sure you set the features mentioned in the *Cloud View guide*, specifically the logo, description, ssh key, and user inputs.

The new Template will be owned by `oneadmin`. To make it available to all users (including the ones of the new VDC), check the `OTHER USE` permission **for both the Template and the Image**. Read more about assigning virtual resources to a VDC in the *Managing Groups & VDC guide*.

The screenshot shows the OpenNebula Sunstone interface for a template named '3'. The left sidebar contains navigation links for Dashboard, System (Users, Groups, ACLs), Virtual Resources (Virtual Machines, Templates, Images, Files & Kernels), Infrastructure, Marketplace, OneFlow, and Support. The main area has a top bar with 'Template 3', user 'oneadmin', and 'OpenNebula' dropdown. Below this are action buttons: Update, Instantiate, Clone, a user dropdown, and a red delete button. A secondary bar contains 'Info' and 'Template' tabs. The 'Info' tab is active, showing the following information:

| Information | |
|---------------|--------------------------------------|
| ID | 3 |
| Name | Ubuntu 14.04 - KVM ✎ |
| Register time | 18:01:52 05/08/2014 |

Below the information is a permissions table:

| 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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Below the permissions table is an ownership section:

| Ownership | |
|-----------|----------------------------|
| Owner | oneadmin ✎ |
| Group | oneadmin ✎ |

At the bottom of the main area, it says 'OpenNebula 4.8.0 by C12G Labs.'

You can also prepare a *Service Template*. A Service is a group of interconnected Virtual Machines with deployment dependencies between them.

Create a basic Service with two roles: master (x1) and slave (x2). Check 'master' as the parent role of 'slave'. For testing purposes, both can use the `ttylinux` VM Template. This Service Template also needs to be shared with other users, changing the `OTHER USE` permission.

Create Service Template

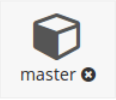

Name [?]
test

Description [?]

▼ Network Configuration

▼ Advanced Service Parameters

Roles

  [+ Add another role](#)

Role Name [?]
slave

VM template [?]
4: ttylinux

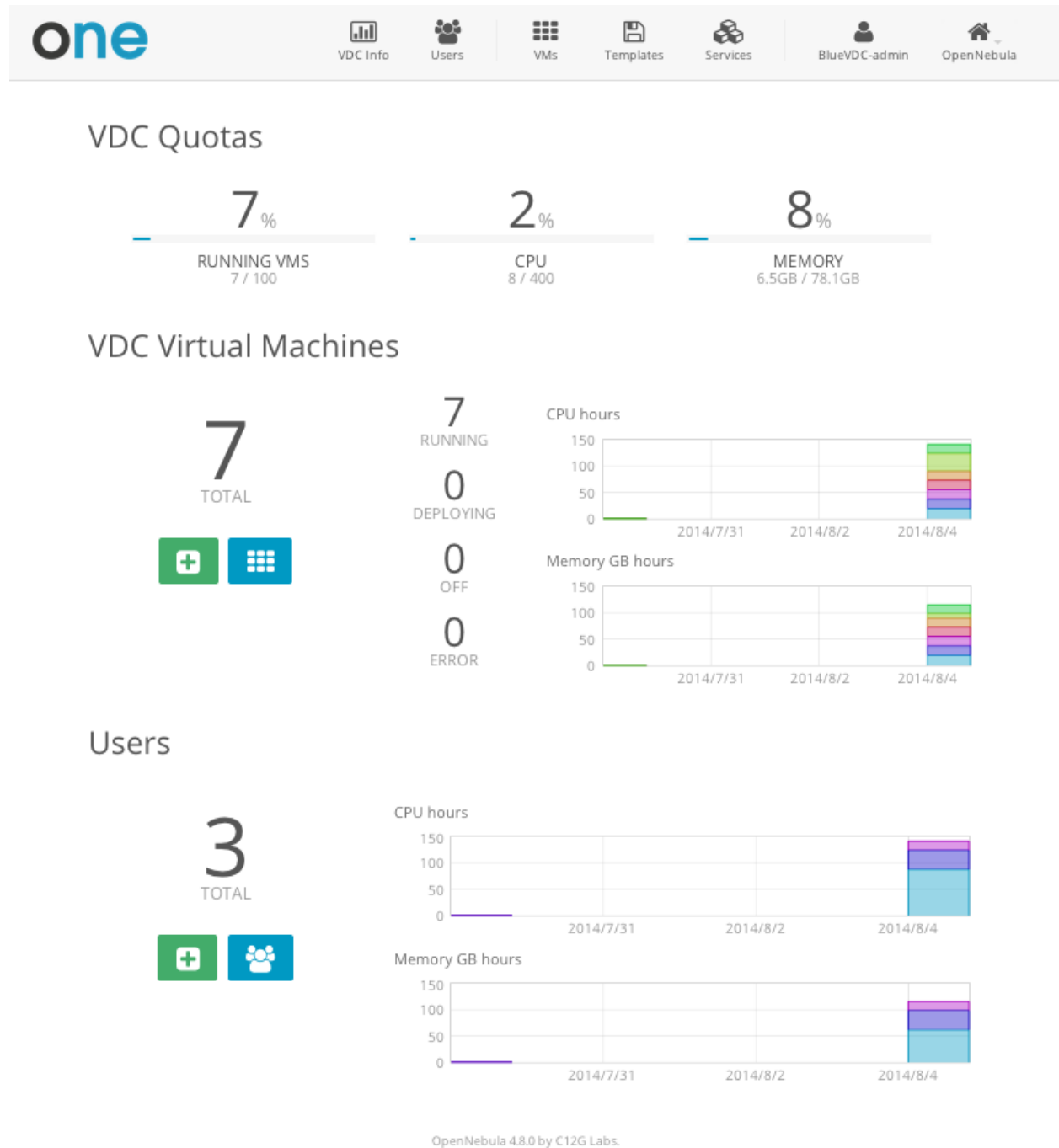
VMs [?]
3

Parent roles

master

STEP 5. USING THE CLOUD AS A VDC ADMIN

If you login as the 'web-dev-admin', you will see a simplified interface, the *VDC admin view*. This view hides the physical infrastructure, but allows some administration tasks to be performed.



The VDC admin can create new user accounts, that will belong to the same VDC group. They can also see the current resource usage of all the VDC users, and set quota limits for each one of them.



Create User

Define Quotas

Running VMs

CPU

Memory (GBs)

Add User

OpenNebula 4.8.0 by C12G Labs.

The VDC admin can manage the Services, VMs and Templates of other users in the VDC. The resources of a specific user can be filtered in the list views for each resource type or can be listed in the detailed view of the user.

The screenshot shows the OpenNebula interface for the 'Users' section, specifically for user 'John'. The top navigation bar includes 'one', 'VDC Info', 'Users', 'VMs', 'Templates', 'Services', 'BlueVDC-admin', and 'OpenNebula'. The main content area displays user statistics: Running VMs (2 / 10), CPU (2 / 20), and Memory (2GB / 60GB). Below these are two bar charts: 'CPU hours' and 'Memory GB hours', both showing usage for 2014/7/31, 2014/8/2, and 2014/8/4. The charts show a significant increase in usage on 2014/8/4. A red trash icon is visible in the top right corner.

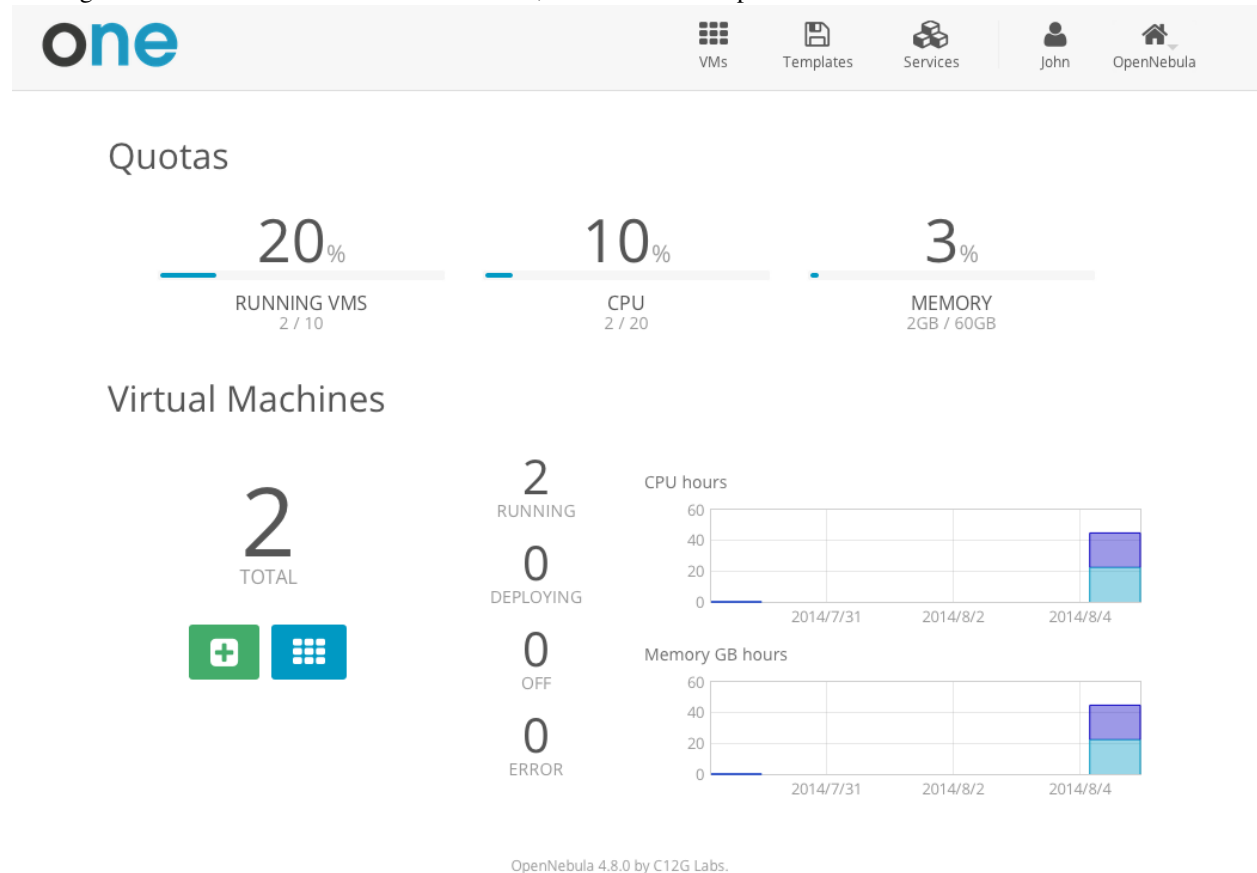
Although the cloud administrator is the only one that can create new base Images and Templates, the VDC admin can customize existing Templates, and share them with the rest of the VDC users.

The screenshot shows the OpenNebula interface for the 'Virtual Machines' section, specifically for 'Mail Server'. The top navigation bar is the same as in the previous screenshot. The main content area shows a 'Mail Server' VM with a green save icon. A dialog box is open, displaying the message: 'This Virtual Machine will be saved in a new Template. Only the main disk will be preserved! You can then create a new Virtual Machine using this Template'. The dialog box contains a text input field labeled 'Template Name' and a green button labeled 'Save Virtual Machine to Template'.

Create a new user, and login again.

STEP 6. USING THE CLOUD AS A REGULAR USER

The regular users of the VDC use the *Cloud View*, an even more simplified view of their virtual resources.



The end users can provision new VMs and Services from the templates prepared by the administrators.

one

VMS Templates Services John OpenNebula

Create Virtual Machine

Virtual Machine Name

Select a Template

System VDC Saved

Search

CentOS 6.6
Vanilla CentOS Server 6.6

Ubuntu 14.04
Ubuntu 14.04.1 (Trusty Tahr)

Fedora 20
Fedora 20 Desktop Edition

« 1 » 6

Create

They can also manage their own VMs and Services: see their monitorization, shutdown them, and save the changes made.

one

VMS Templates Services John OpenNebula

Services Hadoop

Refresh Back Power Delete

■ RUNNING

1m ago
John

Master
RUNNING 1 / 1 VMs

Slave
RUNNING 3 / 3 VMs

The screenshot displays the OpenNebula web interface for monitoring a virtual machine. At the top, the 'one' logo is on the left, and navigation icons for 'VMs', 'Templates', 'Services', 'John', and 'OpenNebula' are on the right. The main heading is 'Virtual Machines Apache Server'. Below this, there are control icons for refresh, back, restart, power, and delete. The VM status is 'RUNNING'. A sidebar lists VM details: 'x1 - 1GB', 'ttylinux - kvm_file0', IP '10.0.1.0', start time '1 Aug', and owner 'John'. The central area contains six performance graphs: CPU (0-150%), MEMORY (0KB-1.4GB), NET RX (0B-39.1KB), NET TX (0B-14.6KB), NET DOWNLOAD SPEED (0B/s-15B/s), and NET UPLOAD SPEED (0B/s-4B/s). All graphs show data from 15:40 to 2017:36.

The users can perform basic administration on their account. They can check his current usage and quotas, or generate accounting reports.

The screenshot displays the OpenNebula user interface for user 'John'. The 'Accounting' tab is selected, showing a 'Get Accounting' button and two bar charts. The 'CPU hours' chart shows usage for 2014/8/3, 2014/8/4, and 2014/8/5. The 'Memory GB hours' chart shows usage for the same dates. The y-axis for both charts ranges from 0 to 40.

| Day | CPU hours | Memory GB hours |
|----------|-----------|-----------------|
| 2014/8/3 | 0 | 0 |
| 2014/8/4 | 18 | 18 |
| 2014/8/5 | 38 | 38 |

From the user settings tab, the users can also change their password, language, and ssh key.

The screenshot displays the OpenNebula web interface. At the top left is the 'one' logo. To its right is a navigation bar with icons for 'VMS', 'Templates', 'Services', 'John', and 'OpenNebula'. Below this, the user's name 'John' is shown next to refresh and share icons. A horizontal menu contains three tabs: 'Settings' (selected), 'Accounting', and 'Quotas'. Underneath the tabs are four large, light-gray buttons with cloud-themed icons: 'Change Language' (speech bubbles), 'Change Password' (lock), 'Change view' (picture), and 'Add SSH Key' (key).

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