HandsOn - Iaas on a Box

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Overview

For this HandsOn Openstack is used for the IaaS Implementation.
Openstack is a cloud operating system, which makes it easy to control different compute, storage and network nodes throughout a datacenter. It is all managed through a web interface.

For testing Openstack on a single machine, the Devstack opensource project will be used.
All nodes will be simulated on a single VM or single machine. You can download Devstack from the Github repository.

The host operating system for Openstack will be Ubuntu 14.04.1 Desktop.
The Desktop image will be sufficient for testing. The GUI will be easier to use for none command line users.
For the latest Ubuntu Desktop image, visit Download page.

Installation

Devstack is used for single machine implementation of Openstack.
The Installation guide helps you with the setup.
After installation of devstack and before executing **stack.sh**, it is recommended to edit the local.conf file in the root folder of devstack. This file will be used for configuration purpose. An example on how the file should look like can be found in **<devstack_root_folder>/samples/local.conf**. The easiest way, is to copy the **local.conf** file into the root folder of devstack.
After some try and error, the only thing you have to add or uncomment in the **local.conf** file is the following line:

#HOST_IP=w.x.y.z

Replace the w,x,y and z with your IP address on your host system and remove the **#** in front of the code snipped. Otherwise **HOST_IP** will not be recognized from the shell script.

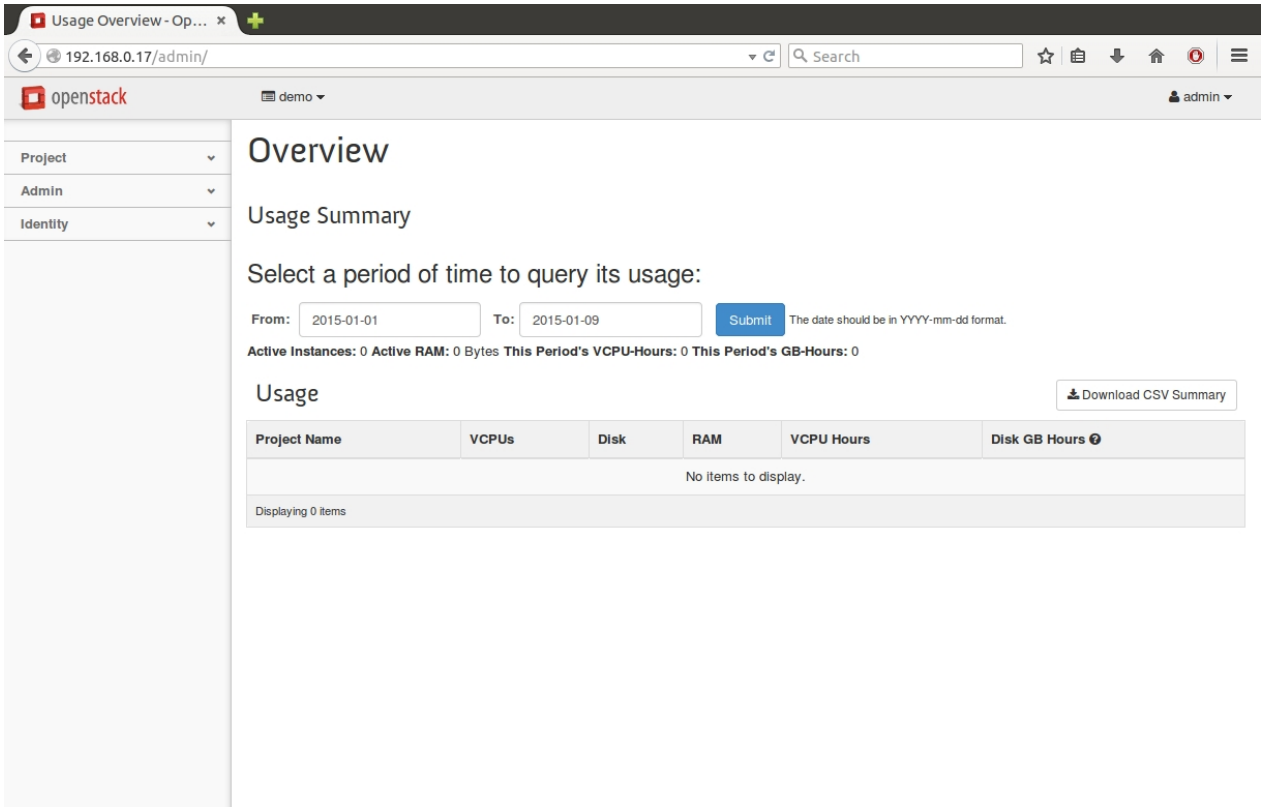
Now you can execute the **stack.sh** shell script, and devstack will be installed and executed.

If you want to launch the dashboard, you only have to open your internet browser and enter the **HOST_IP** with a **http://** prefix.

GUI

Overview

Here you can see the Dashboard of Openstack.

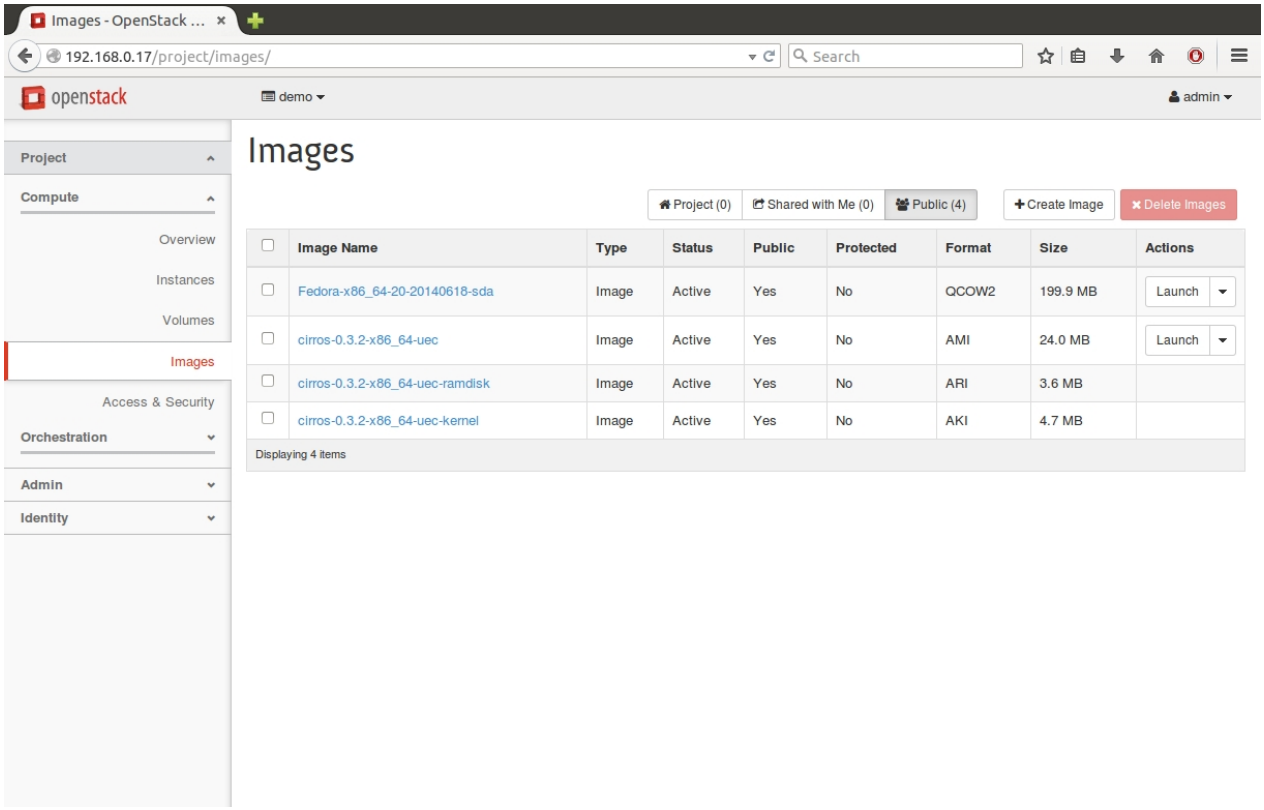


Project

Under the Project Tab you will see two new tabs, Compute and Orchestration.

Compute:

Compute gives an overview over your VM images, Volumes and Instances. The Access & Security tab is important for the remote access over the API. In this tab you can see the tentant IDs, which identifies a user and the API Endpoints for the modules.

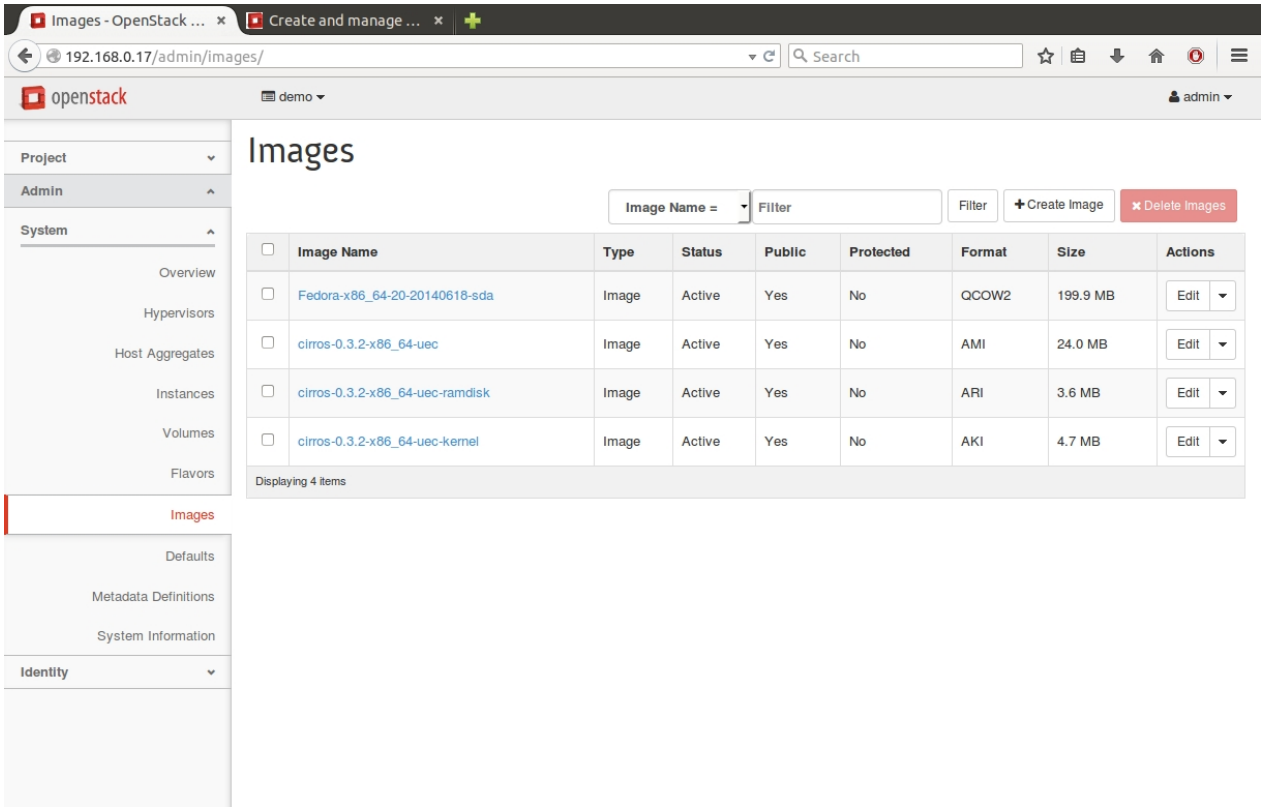


Orchestration:

Orchestration shows the applied stacks. Stacks lets you auto generate a few instances at once.

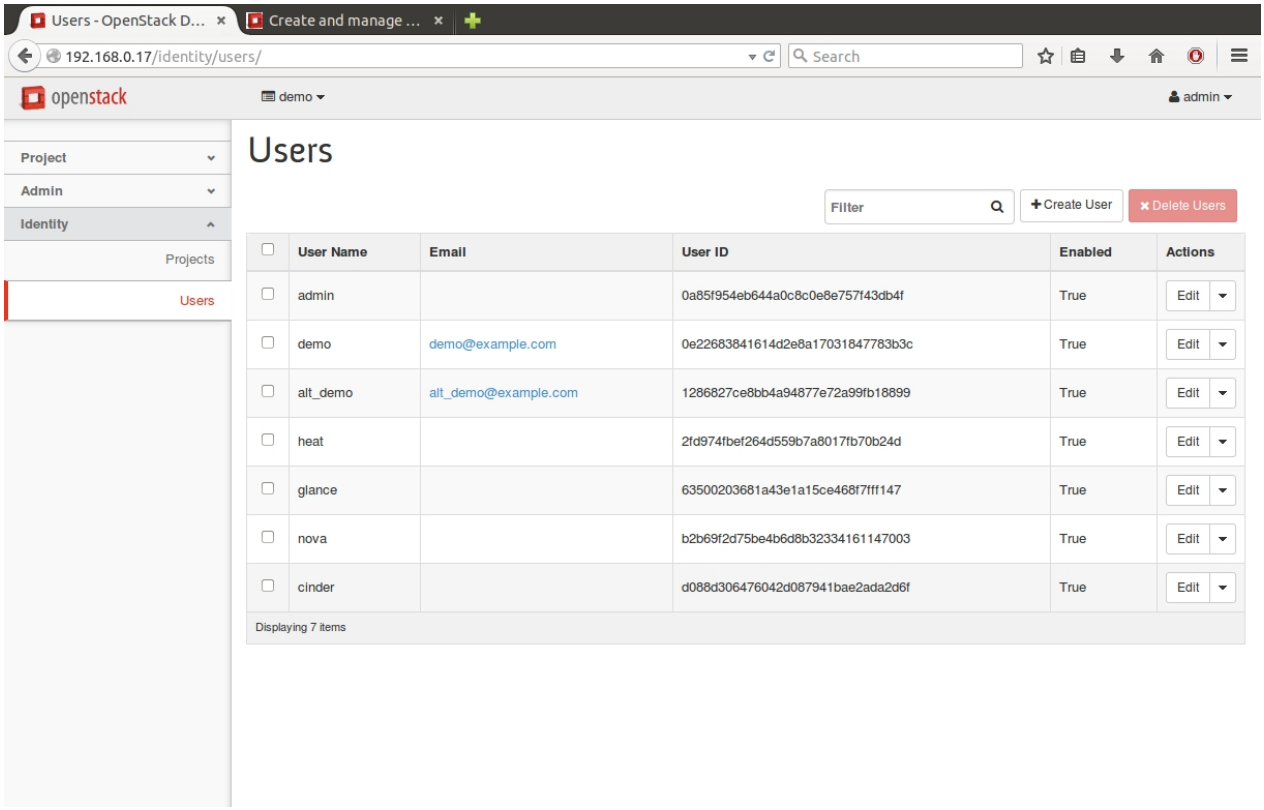
Admin

The Admin section will be visible if you are logged in as admin. Here you can configure the system and add new VMs.



Identity

In the identity section you can administer the users and projects. Users will be only visible for the admin account. If you are a user on the cloud service, only your Projects will be displayed.

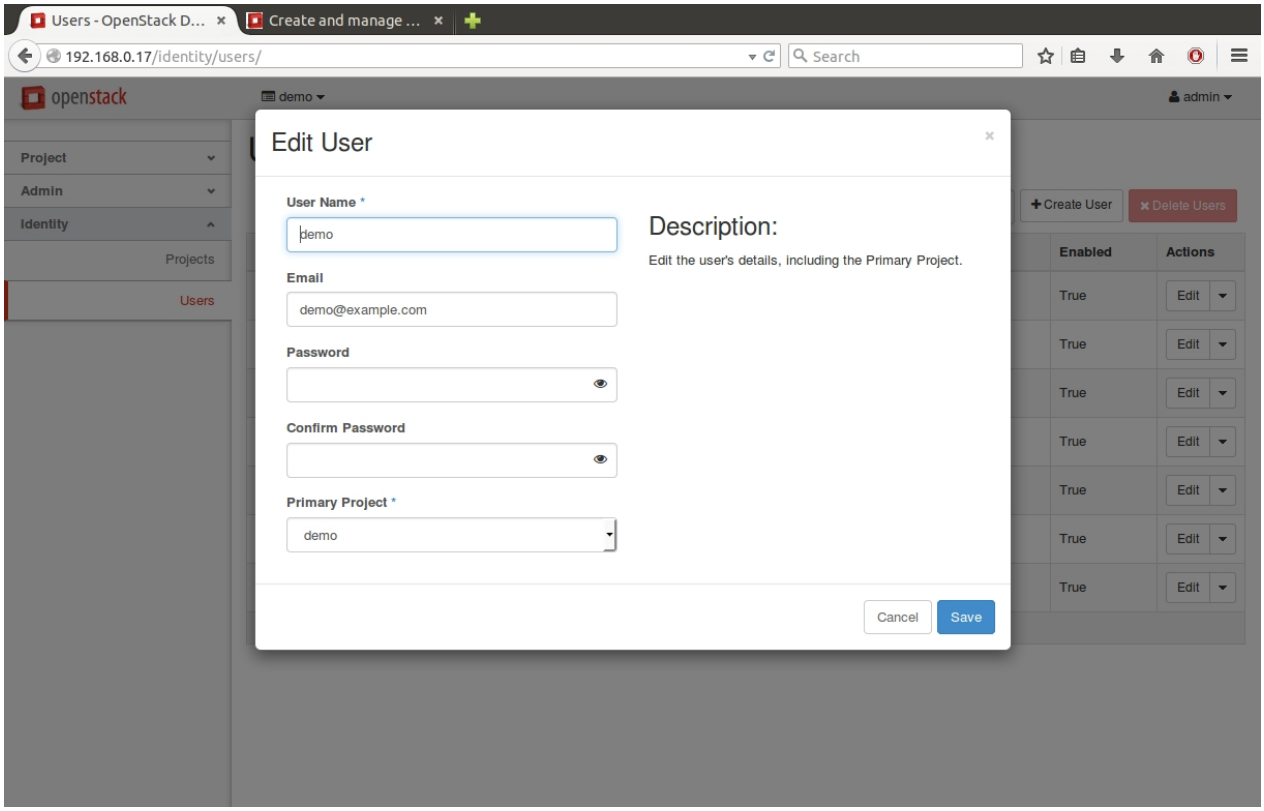


Manage Users

You have to be logged in as admin to add or update a user.

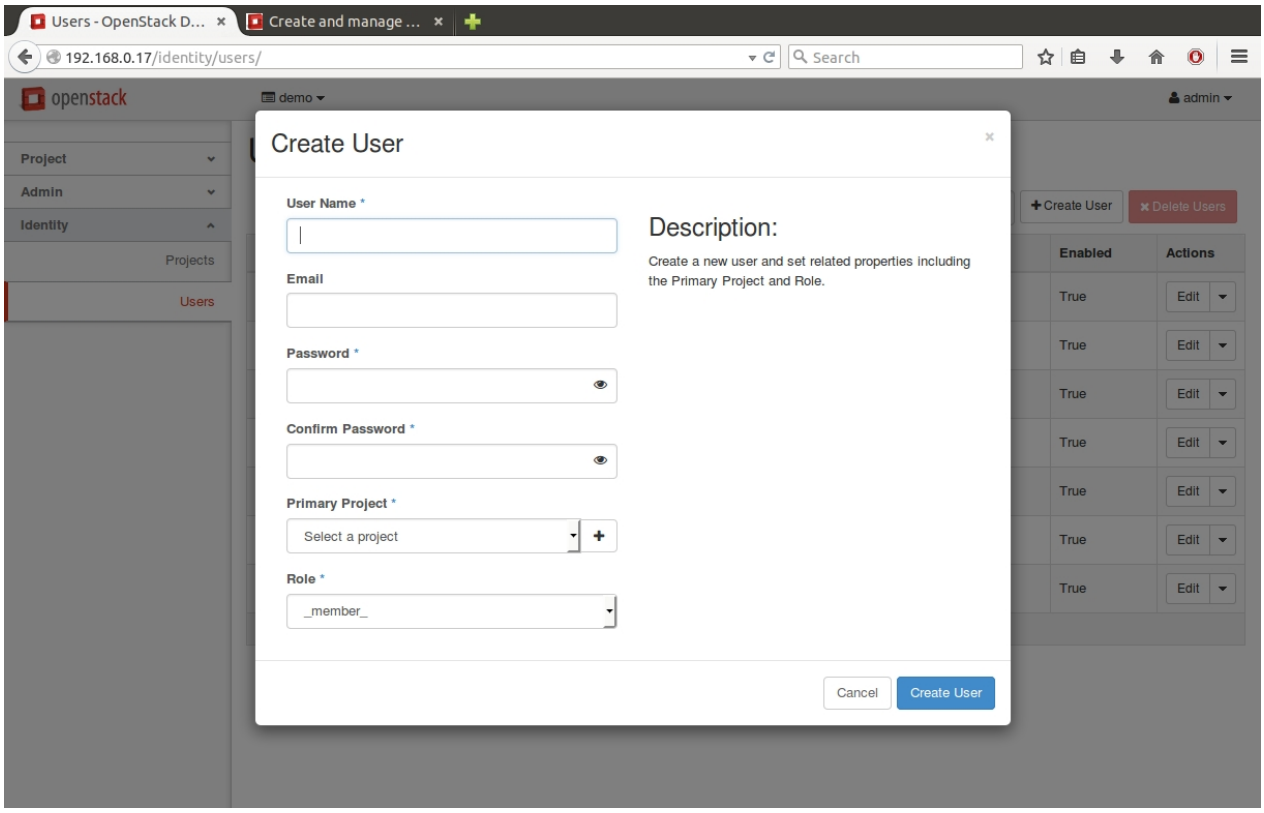
Edit User:

For updating a user you have to click on the Edit button. Here you can change the name, password, email address and his primary project.



Create User:

Here you can create a user and define his role on the cloud system.



Delete User:

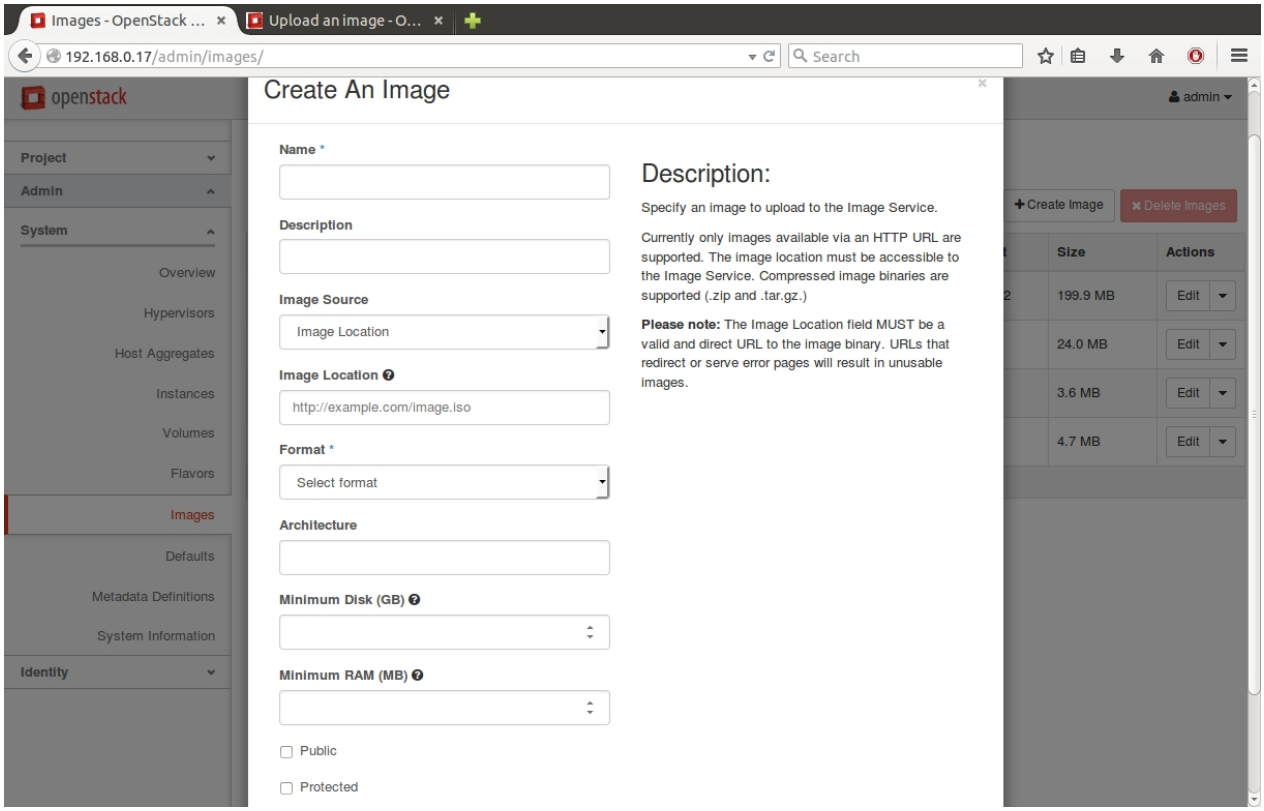
You can select a user and press the delete button to delete a user.

Manage Images

For editing images you have to be logged in as admin. Only starting a new instance, which is defined in the users project, is allowed by normal users.
Under the Admin tab you will find the System tab, where you can find the Images.

Create Image:

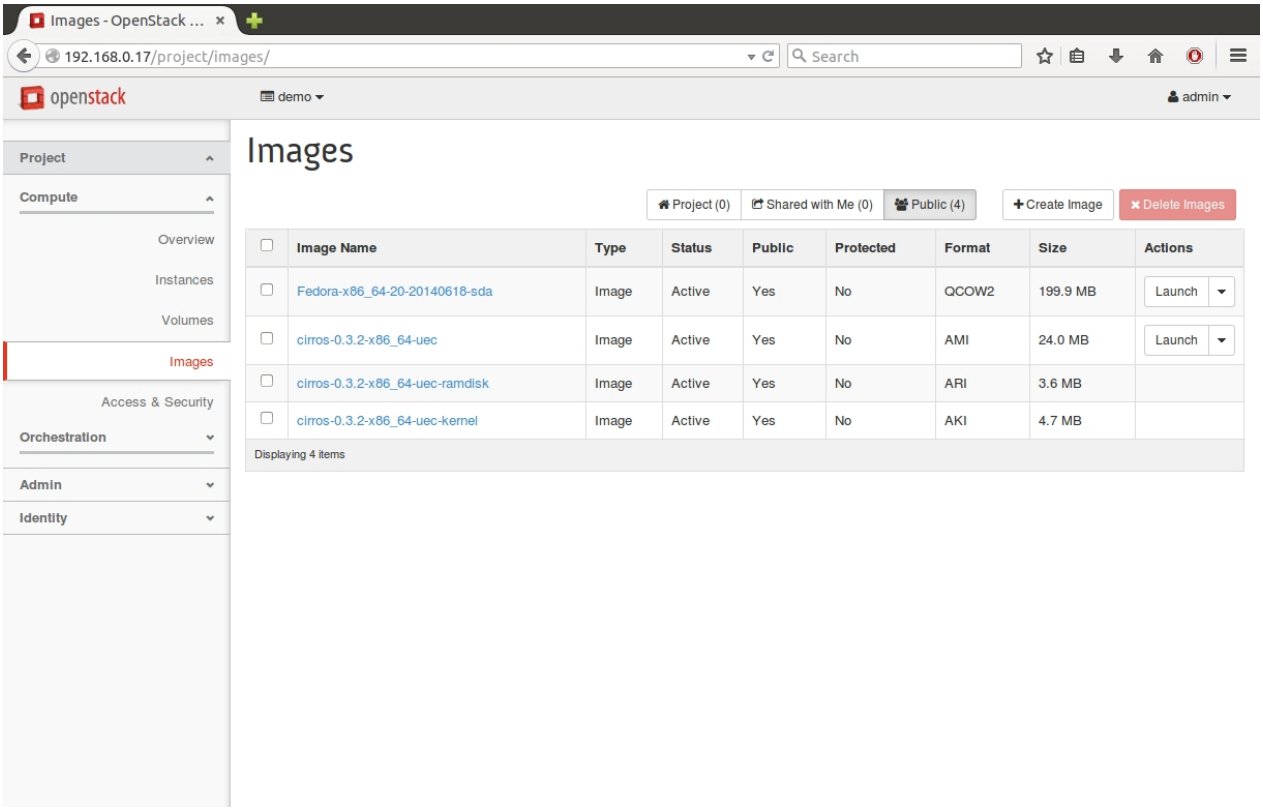
You can create an Image by clicking the create image button.



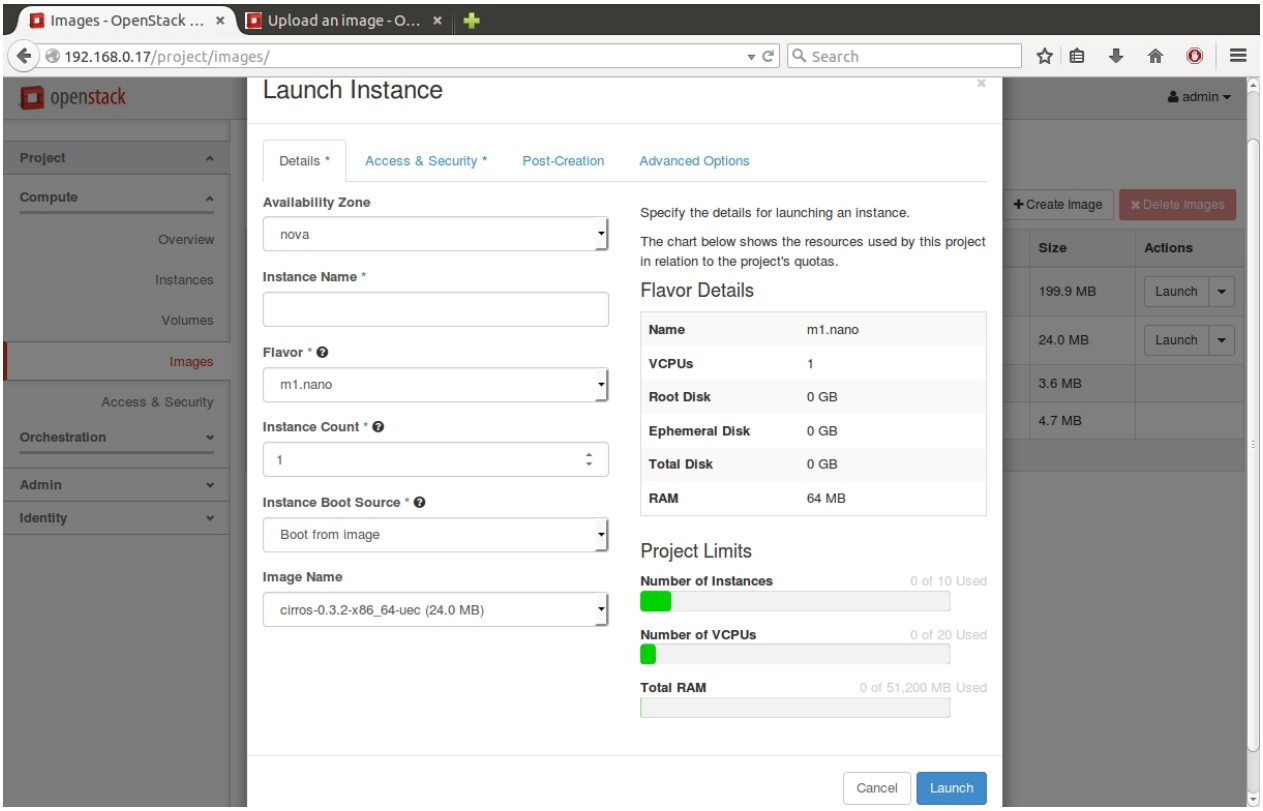
Here you can define the name of an image, and the location, where the cloud service will upload the image file. You have to select a proper Format for the image. On the bottom of the configuration menu, you will see checkboxes. Public means that everybody can see your image and use it. Protected means that only users with permission can delete the image.

Start/stop image:

For starting an image you have to choose the Project tab. In the Project tab select the Compute tab. In here you will see your images.

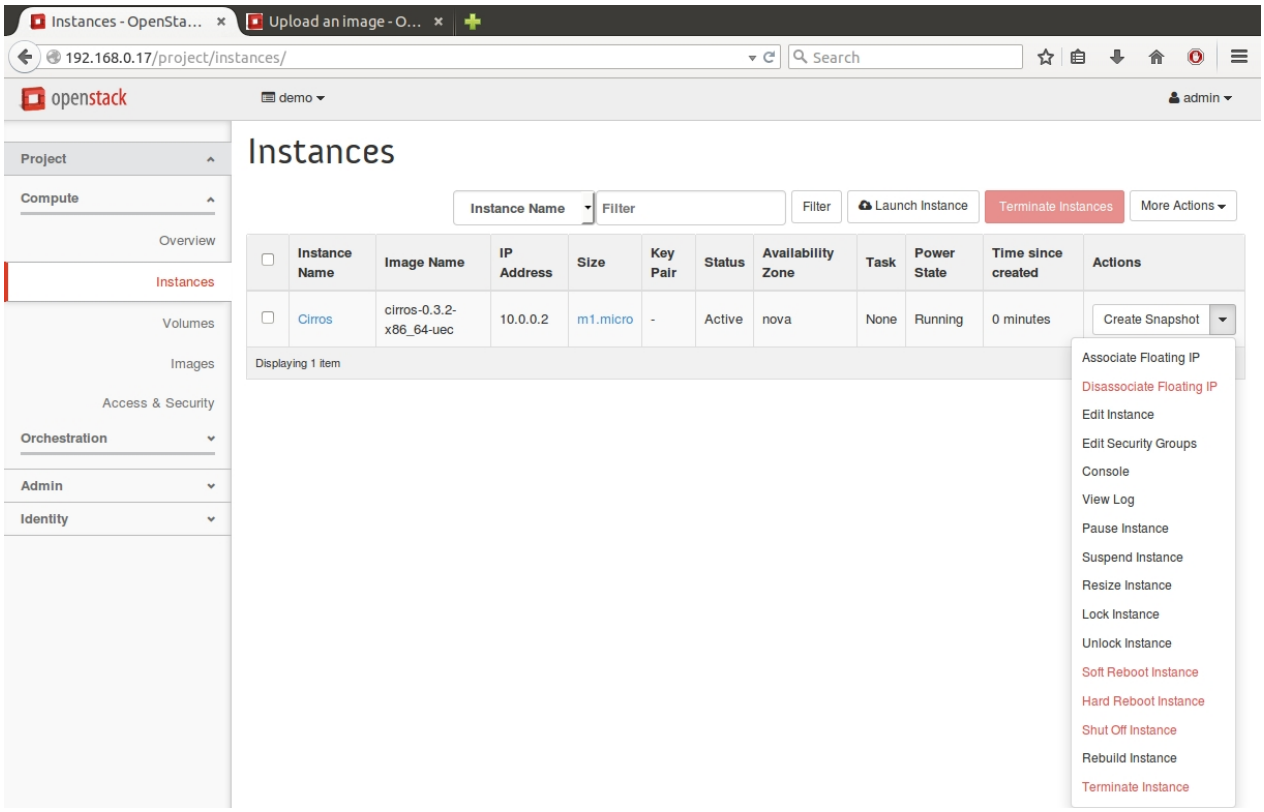


To launch an image you have to click on the Launch button on the right side of the image. If you start an Image, an Instance will be generated from this Image. A configuration menu will appear, where you can define the Instance name and your Flavor. Flavor defines the size of the instance and how many resources from the host system should be used. You can define a boot source, from which the Instance should be booted.



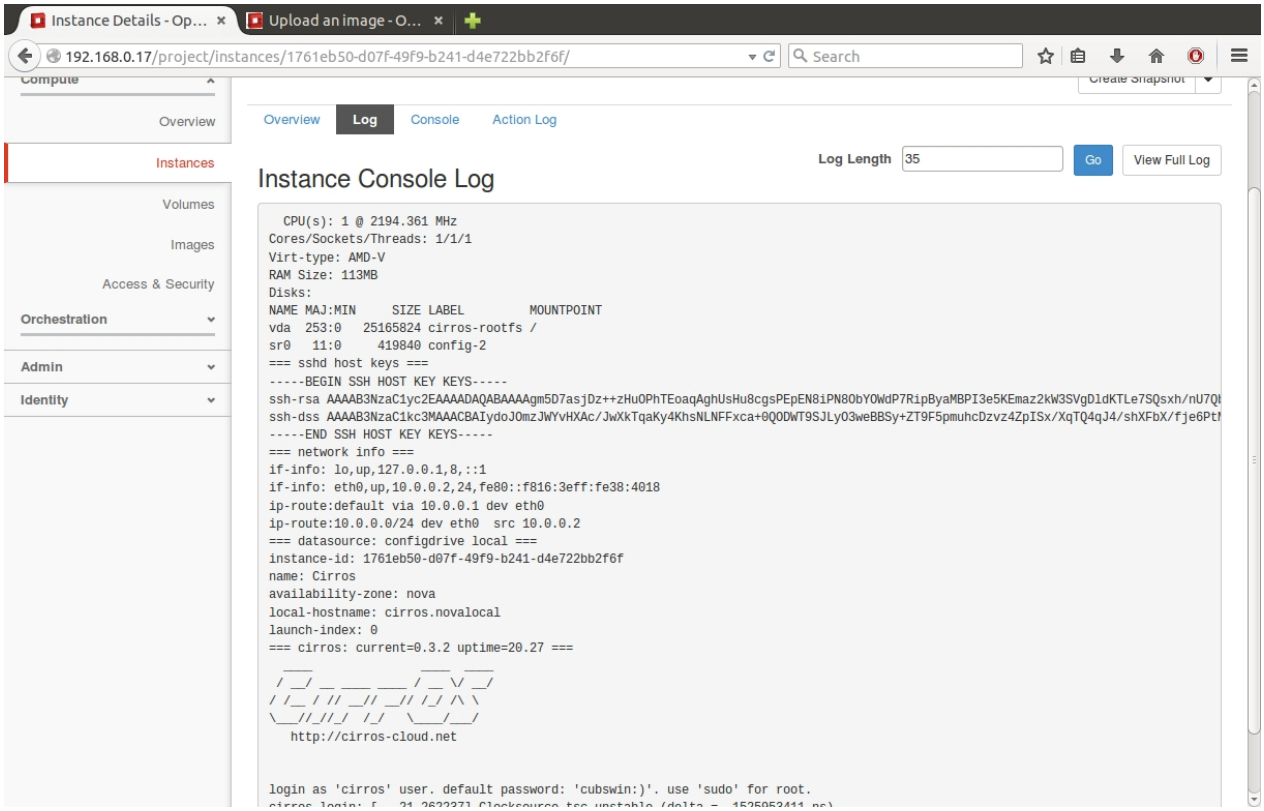
After clicking the Launch button you will be forwarded to the Instance tab, where you can see the status of

your instance. In this tab you can shut down your instance, by clicking the arrow button beside the Create Snapshot button and choosing Shut Off Instance.



SSH to VM

For establishing a secure connection to your VM, you have to now the internal IP address and the user name from your instance.
Most of the time the user name will be displayed in the Console Log of your instance.



With the ssh command **ssh <user>@<internal_IP>** you can connect to your Instance.

Problems

While setting up Openstack, some problems occurred.

Debian:

At first, Debian was the operating system of choice. However only a multi node installation guide was found, which was not capable of running on a single machine.
After some researching we found Devstack. It will support Openstack on a single machine, however it is not recommended to use with Debian. One the github page only Fedora and Ubuntu will be supported. Therefore a clean installed Ubuntu was used.

Installation guide Devstack:

The Devstack installation guide for single machine usage was misleading. It recommends to define the **FLOATING_RANGE**, **FIXED_RANGE** and **FIXED_NETWORK_SIZE**. These parameter are used to define an virtual IP range, which will be assigned to each VM node. With these IPs you can connect to the VMs.
It was not possible to start any instance on Openstack, if these three parameters were defined. The solution was to use **HOST_IP** parameter instead of these three. **HOST_IP** defines the IP address of your server, where Openstack will be installed. The IPs for the VMs will be defined automatically and an instance can be created and launched.