

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](#).

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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 snippet. 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.

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GUI

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Overview

Here you can see the Dashboard of Openstack.

Usage Overview - Op... x

192.168.0.17/admin/

openstack demo admin

Overview

Usage Summary

Select a period of time to query its usage:

From: 2015-01-01 To: 2015-01-09 Submit The date should be in YYYY-mm-dd format.

Active Instances: 0 Active RAM: 0 Bytes This Period's VCPU-Hours: 0 This Period's GB-Hours: 0

Usage

Download CSV Summary

Project Name	VCPUs	Disk	RAM	VCPU Hours	Disk GB Hours
No items to display.					
Displaying 0 items					

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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.

Images - OpenStack ... x

192.168.0.17/project/images/

openstack demo admin

Project

Compute

Overview

Instances

Volumes

Images

Access & Security

Orchestration

Admin

Identity

Images

Project (0) Shared with Me (0) Public (4) + Create Image x Delete Images

<input type="checkbox"/>	Image Name	Type	Status	Public	Protected	Format	Size	Actions
<input type="checkbox"/>	Fedora-x86_64-20-20140618-sda	Image	Active	Yes	No	QCOW2	199.9 MB	Launch <input type="button" value="Launch"/>
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec	Image	Active	Yes	No	AMI	24.0 MB	Launch <input type="button" value="Launch"/>
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec-ramdisk	Image	Active	Yes	No	ARI	3.6 MB	
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec-kernel	Image	Active	Yes	No	AKI	4.7 MB	

Displaying 4 items

Orchestration:

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

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Admin

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

Images

<input type="checkbox"/>	Image Name	Type	Status	Public	Protected	Format	Size	Actions
<input type="checkbox"/>	Fedora-x86_64-20-20140618-sda	Image	Active	Yes	No	QCOW2	199.9 MB	Edit ▼
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec	Image	Active	Yes	No	AMI	24.0 MB	Edit ▼
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec-ramdisk	Image	Active	Yes	No	ARI	3.6 MB	Edit ▼
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec-kernel	Image	Active	Yes	No	AKI	4.7 MB	Edit ▼

Displaying 4 items

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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.

Users

<input type="checkbox"/>	User Name	Email	User ID	Enabled	Actions
<input type="checkbox"/>	admin		0a85f954eb644a0c8c0e8e757f43db4f	True	Edit ▼
<input type="checkbox"/>	demo	demo@example.com	0e22683841614d2e8a17031847783b3c	True	Edit ▼
<input type="checkbox"/>	alt_demo	alt_demo@example.com	1286827ce8bb4a94877e72a99fb18899	True	Edit ▼
<input type="checkbox"/>	heat		2fd974fbef264d559b7a8017fb70b24d	True	Edit ▼
<input type="checkbox"/>	glance		63500203681a43e1a15ce468f7fff1147	True	Edit ▼
<input type="checkbox"/>	nova		b2b69f2d75be4b6d8b32334161147003	True	Edit ▼
<input type="checkbox"/>	cinder		d088d306476042d087941bae2ada2d6f	True	Edit ▼

Displaying 7 items

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.

The screenshot shows a web browser window with the URL `192.168.0.17/identity/users/`. The page title is "Users - OpenStack D..." and the browser tabs show "Create and manage ...". The OpenStack logo is visible in the top left. The user is logged in as "admin". The "Users" tab is selected in the left sidebar. The "Edit User" modal form is open, displaying the following fields:

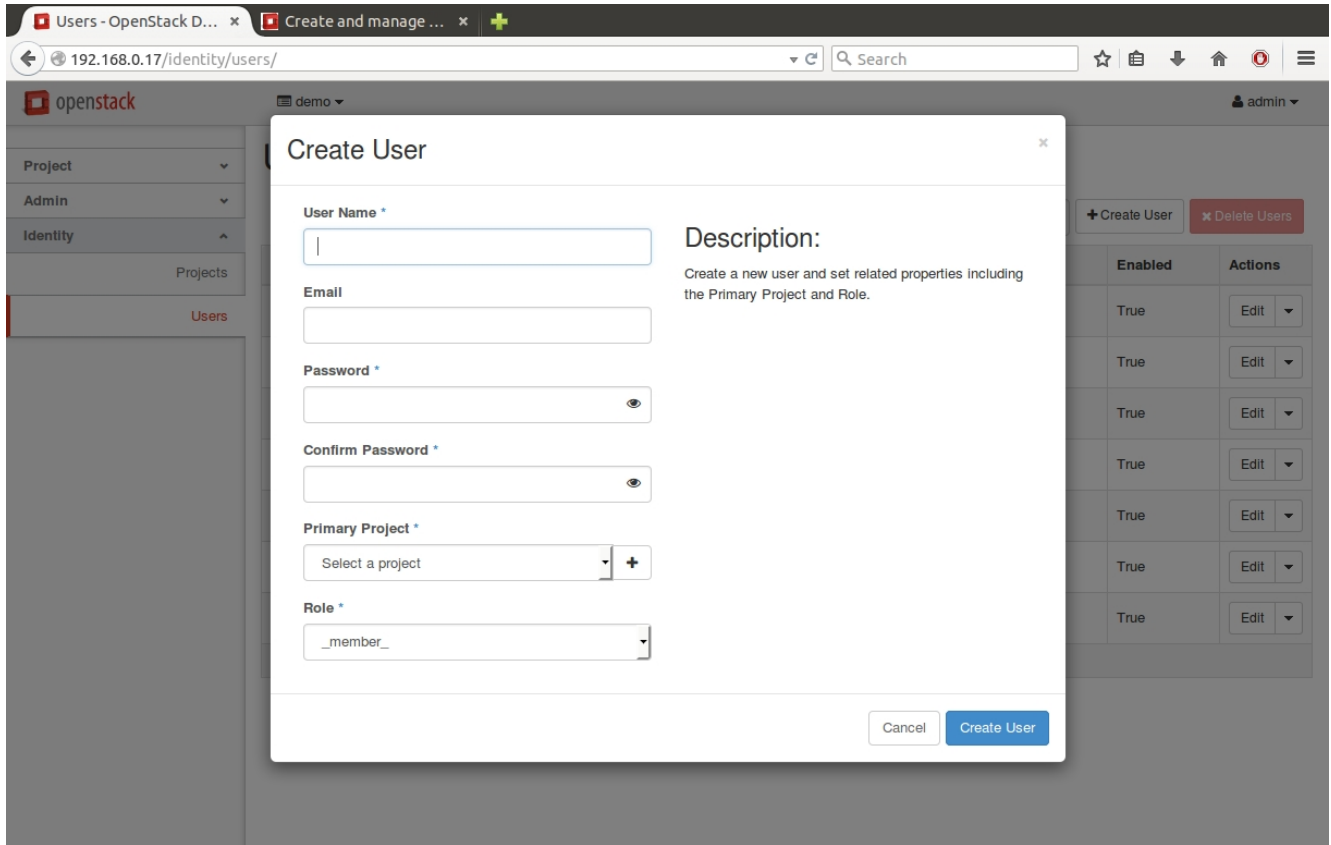
- User Name ***:
- Email**:
- Password**:
- Confirm Password**:
- Primary Project ***:

The modal also includes a "Description:" section with the text "Edit the user's details, including the Primary Project." and "Cancel" and "Save" buttons at the bottom right.

Enabled	Actions
True	Edit
True	Edit
True	Edit
True	Edit
True	Edit
True	Edit
True	Edit

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.

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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.

Create An Image

Name *

Description

Image Source

Image Location

Image Location ?

http://example.com/image.iso

Format *

Select format

Architecture

Minimum Disk (GB) ?

Minimum RAM (MB) ?

☐ Public

☐ Protected

Description:

Specify an image to upload to the Image Service.

Currently only images available via an HTTP URL are supported. The image location must be accessible to the Image Service. Compressed image binaries are supported (.zip and .tar.gz.)

Please note: The Image Location field MUST be a valid and direct URL to the image binary. URLs that redirect or serve error pages will result in unusable images.

	Size	Actions
2	199.9 MB	Edit
	24.0 MB	Edit
	3.6 MB	Edit
	4.7 MB	Edit

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.

The screenshot shows the OpenStack Images dashboard. The left sidebar contains navigation links: Project, Compute, Overview, Instances, Volumes, Images (highlighted), Access & Security, Orchestration, Admin, and Identity. The main content area is titled 'Images' and displays a table of images. Above the table are filters for Project (0), Shared with Me (0), and Public (4), along with buttons for '+ Create Image' and 'x Delete Images'. The table lists four images, all of type 'Image' and status 'Active'. The first image is 'Fedora-x86_64-20-20140618-sda' (199.9 MB, QCOW2 format). The other three are 'cirros-0.3.2-x86_64-uec' (24.0 MB, AMI format), 'cirros-0.3.2-x86_64-uec-ramdisk' (3.6 MB, ARI format), and 'cirros-0.3.2-x86_64-uec-kernel' (4.7 MB, AKI format). Each image has a 'Launch' button in the Actions column. At the bottom of the table, it says 'Displaying 4 items'.

	Image Name	Type	Status	Public	Protected	Format	Size	Actions
<input type="checkbox"/>	Fedora-x86_64-20-20140618-sda	Image	Active	Yes	No	QCOW2	199.9 MB	Launch
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec	Image	Active	Yes	No	AMI	24.0 MB	Launch
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec-ramdisk	Image	Active	Yes	No	ARI	3.6 MB	
<input type="checkbox"/>	cirros-0.3.2-x86_64-uec-kernel	Image	Active	Yes	No	AKI	4.7 MB	

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.

The screenshot shows the 'Launch Instance' configuration window in OpenStack. The window has tabs for Details, Access & Security, Post-Creation, and Advanced Options. The 'Details' tab is active. It contains the following fields: Availability Zone (nova), Instance Name (empty), Flavor (m1.nano), Instance Count (1), Instance Boot Source (Boot from image), and Image Name (cirros-0.3.2-x86_64-uec (24.0 MB)). To the right, there is a 'Specify the details for launching an instance' section with a note: 'The chart below shows the resources used by this project in relation to the project's quotas.' Below this is a 'Flavor Details' table:

Name	m1.nano
VCPUs	1
Root Disk	0 GB
Ephemeral Disk	0 GB
Total Disk	0 GB
RAM	64 MB

Below the flavor details is a 'Project Limits' section with three progress bars: Number of Instances (0 of 10 Used), Number of VCPUs (0 of 20 Used), and Total RAM (0 of 51,200 MB Used). At the bottom right are 'Cancel' and 'Launch' buttons. On the far right, a sidebar shows the 'Images' list with 'Launch' buttons for the first three images.

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.

The screenshot shows the OpenStack dashboard interface. The left sidebar contains navigation links: Project, Compute, Overview, Instances (highlighted), Volumes, Images, Access & Security, Orchestration, Admin, and Identity. The main content area is titled 'Instances' and displays a table with one instance named 'Cirros'. The table columns are: Instance Name, Image Name, IP Address, Size, Key Pair, Status, Availability Zone, Task, Power State, Time since created, and Actions. The 'Actions' column for 'Cirros' has a dropdown menu open, showing various actions: Associate Floating IP, Disassociate Floating IP, Edit Instance, Edit Security Groups, Console, View Log, Pause Instance, Suspend Instance, Resize Instance, Lock Instance, Unlock Instance, Soft Reboot Instance, Hard Reboot Instance, Shut Off Instance, Rebuild Instance, and Terminate Instance.

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
Cirros	cirros-0.3.2-x86_64-uec	10.0.0.2	m1.micro	-	Active	nova	None	Running	0 minutes	Create Snapshot Associate Floating IP Disassociate Floating IP Edit Instance Edit Security Groups Console View Log Pause Instance Suspend Instance Resize Instance Lock Instance Unlock Instance Soft Reboot Instance Hard Reboot Instance Shut Off Instance Rebuild Instance Terminate Instance

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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.

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Debian:

At first, Debian was the operating system of choice. However, only a multi node [installation guide](#) was found

After some researching we found Devstack. It will support Openstack on a single machine, however it is not recommended to use with Debian. On the [github page](#) only Fedora and Ubuntu will be supported. Therefore a

The [Devstack installation guide](#) for single machine usage was misleading. It recommends to define the

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