

User Manual for Smog Cloud

Author: Salman Toor

Reviewer: Paviln Mitev

Important: Smog is currently running as a test system. UPPMAX is NOT responsible for any data loss.

Smog cloud is an UPPMAX resource based on OpenStack cloud suite. The deployed system release is OpenStack's JUNO. This guide provides basic steps to interact with the Smog cloud via web interface (Dashboard). Like other OpenStack based private clouds, Smog offers following services:

- 1 – Instance management (NOVA)
- 2 – Volume management (CINDER)
- 3 – Network access for the instances (NEUTRON)
- 4 – Object Store (Soon will be available) (SWIFT)
- 5 – Image management (GLANCE)
- 6 – Identity management (KEYSTONE)

This document only covers the dashboard (web client), for Comand-Line-Interface (CLI) or APIs please refer the latest OpenStack-User-Guide.

<http://docs.openstack.org/user-guide/content/>

For questions, issues and resource allocation requests, please send a mail to:

support@uppmx.uu.se

In order to access UPPMAX resources users need to have an UPPMAX account. If you already have an account, you can apply for access to the cloud resources at support email address. Mail should contain following information:

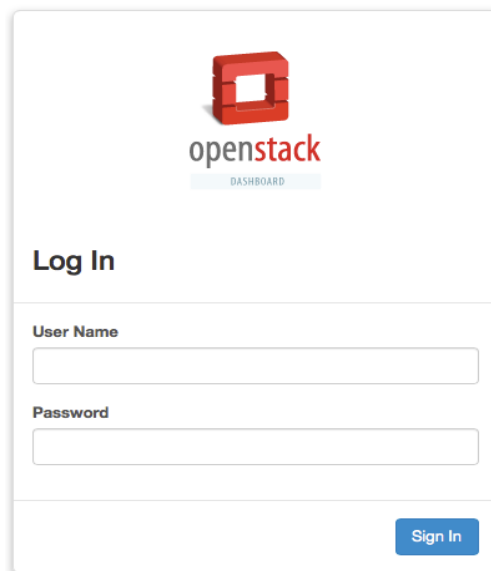
Name:
Project:
Principal Investigator (PI):
Project Description (100 words max):
Motivation for using clouds (100 words max):

Get started with Smog cloud

1 – Enter the following URL in your preferred browser:

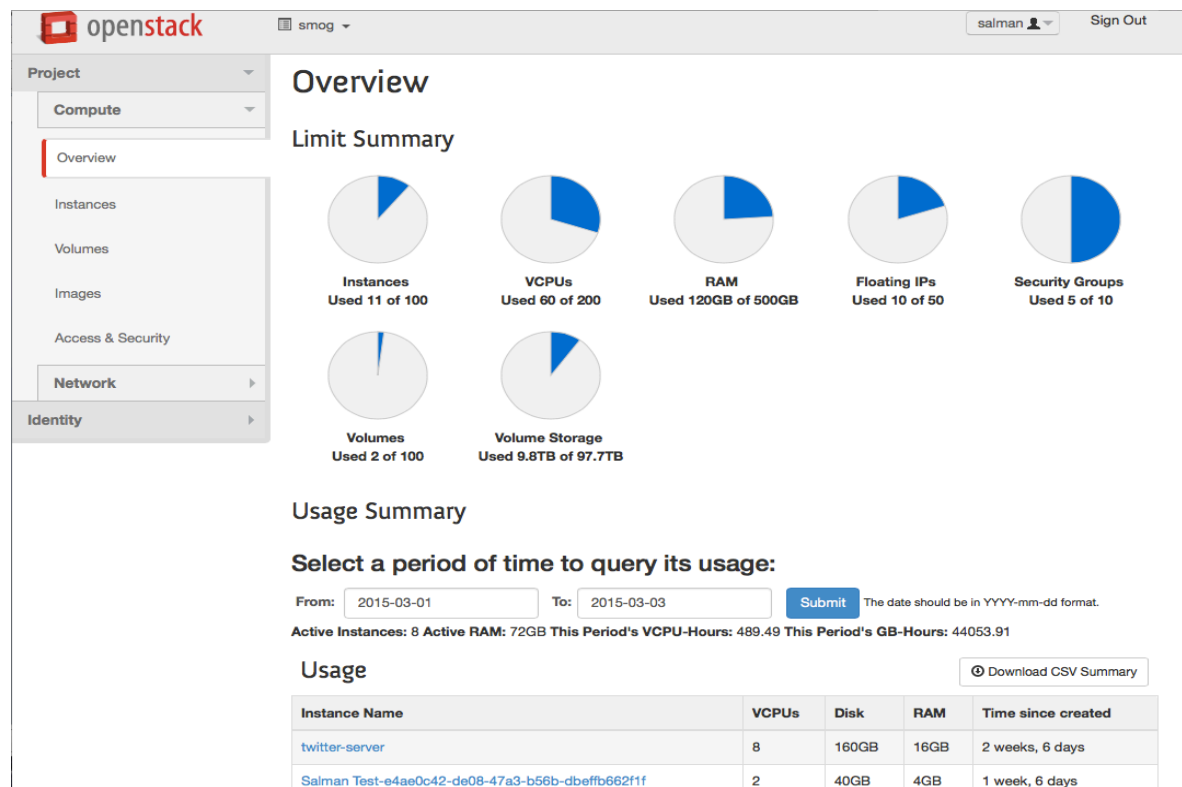
<http://smog.uppmax.uu.se/dashboard>

2 – Enter your username and password.



The image shows the OpenStack Dashboard login page. At the top center is the OpenStack logo, a red cube with a white square in the middle, and the text "openstack" in a sans-serif font. Below the logo is the word "DASHBOARD" in a smaller font. The main heading is "Log In". There are two input fields: "User Name" and "Password". Below the password field is a blue "Sign In" button.

3 – First page shows the overall resource usage and limit summary.

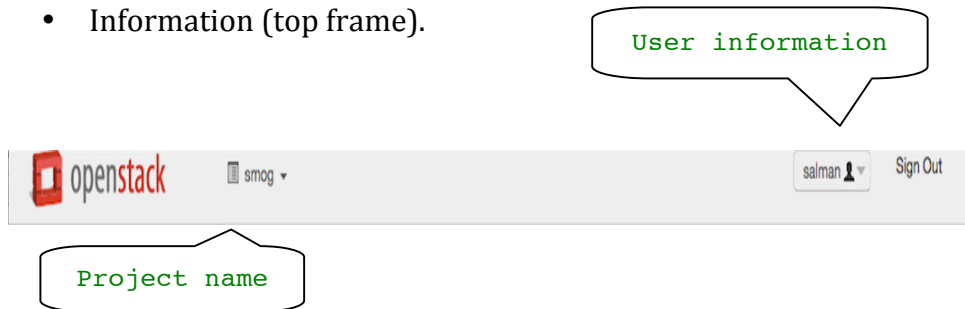


The image shows the OpenStack Dashboard Overview page. The top navigation bar includes the OpenStack logo, the project name "smog", and a user profile for "salman" with a "Sign Out" link. A sidebar on the left contains a "Project" dropdown menu set to "Compute" and a list of navigation items: Overview, Instances, Volumes, Images, Access & Security, Network, and Identity. The main content area is titled "Overview" and "Limit Summary". It features seven circular progress indicators showing resource usage: Instances (Used 11 of 100), VCPUs (Used 60 of 200), RAM (Used 120GB of 500GB), Floating IPs (Used 10 of 50), Security Groups (Used 5 of 10), Volumes (Used 2 of 100), and Volume Storage (Used 9.8TB of 97.7TB). Below this is a "Usage Summary" section with a "Select a period of time to query its usage:" label. It includes "From:" and "To:" date pickers (both set to 2015-03-01 and 2015-03-03), a "Submit" button, and a note: "The date should be in YYYY-mm-dd format." Below the date pickers, it displays: "Active Instances: 8 Active RAM: 72GB This Period's VCPU-Hours: 489.49 This Period's GB-Hours: 44053.91". At the bottom, there is a "Usage" table with a "Download CSV Summary" link.

Instance Name	VCPUs	Disk	RAM	Time since created
twitter-server	8	160GB	16GB	2 weeks, 6 days
Salman Test-e4ae0c42-de08-47a3-b56b-dbeffb662f1f	2	40GB	4GB	1 week, 6 days

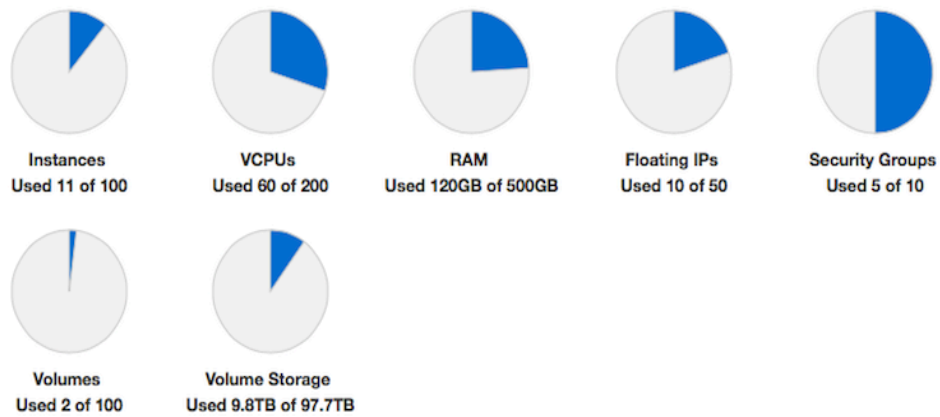
3a – The page has three major sections:

- Information (top frame).

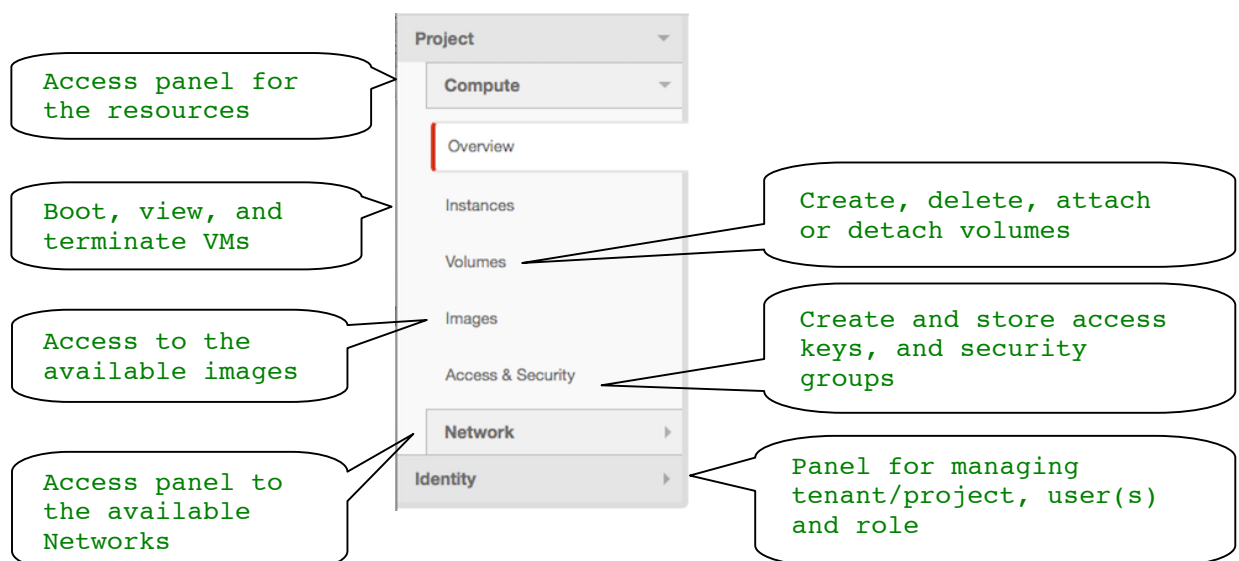


- Limit summary (middle frame).

Limit Summary



- Control panel (left frame).



4 - The “Instances” menu shows the information of running virtual machines (VMs).

The screenshot shows the OpenStack 'Instances' page. A callout 'Launch VMs' points to the 'Launch Instance' button. Another callout 'Terminate running instance' points to the 'Terminate Instances' button. A third callout 'Instance name gives detailed information regarding the VM' points to the instance name column in the table.

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
<input type="checkbox"/> molns_vm_smog	MOLNS_OpenStack_smog_1425053667	10.0.1.58 130.238.29.45	m1.xlarge	fshfjshfjs	Active	nova	None	Running	4 days, 6 hours	Create Snapshot
<input type="checkbox"/> test-install-pyurdme-precise	Ubuntu (Precise)	10.0.1.52 130.238.29.11	m1.large	smogkey	Active	nova	None	Running	5 days, 13 hours	Create Snapshot
<input type="checkbox"/> test-install-pyurdme	Ubuntu (Trusty)	10.0.1.51 130.238.29.95	m1.large	smogkey	Active	nova	None	Running	5 days, 13 hours	Create Snapshot
<input type="checkbox"/> hadoop-master	hadoop-1.2.1-base	10.0.1.50	m1.large	smogkey	Active	nova	None	Running	6 days, 10 hours	Create Snapshot
<input type="checkbox"/> molns_vm_smog-test	MOLNS_OpenStack_smog-test_1424700536	10.0.1.19	m1.large	dflkjshfjhsdfj	Active	nova	None	Running	1 week, 1 day	Create Snapshot

4a – Following are the possible actions one can perform on the VMs.

The screenshot shows the 'Create Snapshot' dropdown menu for an instance. Callouts explain various actions: 'Save running state of the instance' points to 'Create Snapshot'; 'Attach or detach live IP' points to 'Associate Floating IP' and 'Disassociate Floating IP'; 'Access VM via VNC console' points to 'Console'; 'Different states for the VM' points to 'Pause Instance', 'Suspend Instance', 'Soft Reboot Instance', 'Hard Reboot Instance', and 'Shut Off Instance'.

- Create Snapshot
- Associate Floating IP
- Disassociate Floating IP
- Edit Instance
- Edit Security Groups
- Console
- View Log
- Pause Instance
- Suspend Instance
- Resize Instance
- Soft Reboot Instance
- Hard Reboot Instance
- Shut Off Instance
- Rebuild Instance
- Terminate Instance

5 – “Volume” menu shows the status of the created volumes.

Detailed information about volumes

Create new volumes

VM name to which volume is attached

Volume is available as /dev/vdb

Name	Description	Size	Status	Type	Attached To	Availability Zone	Bootable	Encrypted	Actions
Test		5GB	In-Use	-	Attached to Salman Test-e4ae0c42-de08-47a3-b56b-dbefb662f1f1 on /dev/vdb	nova	No	No	Edit Volume
twitter-data	Disk with some twitter data on it.	10000GB	In-Use	-	Attached to twitter-server on /dev/vdb	nova	No	No	Edit Volume

5a– Actions on the available volume(s).

User can modify the volume attachment

Create another copy of the volume based on its current state

Allow external volume images to be uploaded in the cloud

- Edit Attachments
- Create Snapshot
- Upload to Image

6- Images are the entire state of the operating system stored on a non-volatile form such as files. "Images" menu shows the available images and their status in the system.

Name gives detailed information about images

Images can be private (project), shared within a group or public

The screenshot shows the 'Images' page in the OpenStack dashboard. A sidebar on the left contains navigation links for Project, Compute, Overview, Instances, Volumes, Images (highlighted), Access & Security, Network, and Identity. The main content area is titled 'Images' and includes filters for Project (9), Shared with Me (0), and Public (3), along with '+ Create Image' and 'Delete Images' buttons. Below these is a table with columns: Image Name, Type, Status, Public, Protected, Format, Size, and Actions. Three images are listed: Ubuntu (Precise), Ubuntu (Trusty), and cirros. Each row has a 'Launch' button. A callout points to the 'Image Name' column, and another points to the 'Public' column.

<input type="checkbox"/>	Image Name	Type	Status	Public	Protected	Format	Size	Actions
<input type="checkbox"/>	Ubuntu (Precise)	Image	Active	Yes	No	QCOW2	249.6 MB	Launch
<input type="checkbox"/>	Ubuntu (Trusty)	Image	Active	Yes	No	QCOW2	245.0 MB	Launch
<input type="checkbox"/>	cirros	Image	Active	Yes	No	QCOW2	12.6 MB	Launch

Displaying 3 items

7 – Access and Security page.

Useful to write codes that needs to interact with the cloud

The screenshot shows the 'Access & Security' page in the OpenStack dashboard. The sidebar on the left is the same as in the previous image, with 'Access & Security' highlighted. The main content area is titled 'Access & Security' and has tabs for Security Groups, Key Pairs, Floating IPs, and API Access (selected). Below the tabs is the 'API Endpoints' section, which includes a 'Download OpenStack RC File' button and a table with columns: Service and Service Endpoint. Six services are listed: Compute, Network, Volume2, Image, Volume, and Identity. A callout points to the 'API Endpoints' section.

Service	Service Endpoint
Compute	http://smog.uppmax.uu.se:8774/v2/db8ac8cc448f48a8a9b1b0d7c302a79d
Network	http://smog.uppmax.uu.se:9696
Volume2	http://smog.uppmax.uu.se:8776/v2/db8ac8cc448f48a8a9b1b0d7c302a79d
Image	http://smog.uppmax.uu.se:9292
Volume	http://smog.uppmax.uu.se:8776/v1/db8ac8cc448f48a8a9b1b0d7c302a79d
Identity	http://smog.uppmax.uu.se:5000/v2.0

Displaying 6 items

7a – Security Groups tab in Access & Security page.

Users can define firewall rules for the VMs

The screenshot shows the 'Access & Security' page with the 'Security Groups' tab selected. The page title is 'Access & Security' and the sub-tab is 'Security Groups'. There are buttons for '+ Create Security Group' and 'Delete Security Groups'. A table lists several security groups:

Name	Description	Actions
newmolns	MOLNs security group	Manage Rules
default	default	Manage Rules
molns	MOLNs security group	Manage Rules
molnstest	MOLNs security group	Manage Rules
fdsfsdfsdfsdfs	MOLNs security group	Manage Rules

Displaying 5 items

7b – By default VMs are not allowed to respond to any network traffic. In order to make a VM respond to e.g. ping or connect to SSH, one needs to open the appropriate ports.

Manage Security Group Rules: default

Security Group Rules

+ Add Rule Delete Rules

Direction	Ether Type	IP Protocol	Port Range	Remote	Actions
Egress	IPv6	Any	-	::/0 (CIDR)	Delete Rule
Ingress	IPv6	Any	-	default	Delete Rule
Ingress	IPv4	Any	-	default	Delete Rule
Egress	IPv4	Any	-	0.0.0.0/0 (CIDR)	Delete Rule
Ingress	IPv4	ICMP	-	0.0.0.0/0 (CIDR)	Delete Rule
Ingress	IPv4	TCP	22 (SSH)	0.0.0.0/0 (CIDR)	Delete Rule

Displaying 6 items

Allow ping for IPv4

Allow SSH connection on port 22

8 – “Networks” menu contains information related to all the networks available in the project. In common settings there are two networks for each project

- Local: Each new VM gets a local IP form this network
- External: To access the machine from Internet, live IP should be assigned to the VM.

The screenshot shows the 'Networks' page in the OpenStack dashboard. A table lists two networks:

Name	Subnets Associated	Shared	Status	Admin State	Actions
smog-net	smog-subnet 10.0.0.0/8	No	ACTIVE	UP	Edit Network
ext-net	ext-subnet 130.238.28.0/23	Yes	ACTIVE	UP	

Callouts identify 'smog-net' as the 'Local network' and 'ext-net' as the 'External network'.

8b – Network Topology shows how different VMs, networks and routers are connected for a specific project.

The screenshot shows the 'Network Topology' page. It displays a diagram where a central router connects two vertical bars representing networks: 'ext-net' (External Network) and 'smog-net' (Local network). Several VMs are shown connected to the 'smog-net' bar. A callout points to the router as the 'Router that connects the networks', and another points to the VMs as 'Running VMs'. A third callout points to the 'ext-net' bar as the 'External Network (ext-net)', and a fourth points to the 'smog-net' bar as the 'Local network (smog-net)'.

Steps to boot an instance

1 – “Create new instance” link is available in “Instances” and “Images” pages (revisit point 4(Create Instance) or 6(Launch)). The link will open following dialog box.

Note: Before start a VM make sure that you have a working ssh keypair available in the cloud. For information about how to generate and inject ssh keypair in OpenStack based cloud, visit: http://docs.openstack.org/user-guide/content/Launching_Instances_using_Dashboard.html

Launch Instance

Details * Access & Security * Networking * Post-Creation * Advanced Options

Availability Zone
nova

Instance Name *

Flavor * ?
m1.tiny

Instance Count * ?
1

Instance Boot Source * ?
Boot from image

Image Name
Select Image

Specify the details for launching an instance.
The chart below shows the resources used by this project in relation to the project's quotas.

Flavor Details

Name	m1.tiny
VCPUs	1
Root Disk	1 GB
Ephemeral Disk	0 GB
Total Disk	1 GB
RAM	512 MB

Project Limits

Number of Instances 11 of 100 Used

Number of VCPUs 60 of 200 Used

Total RAM 122,880 of 512,000 MB Used

Cancel Launch

1b – Security tab

Launch Instance

Details * Access & Security * **Networking *** Post-Creation * Advanced Options

Key Pair

Select a key pair +

Security Groups

- newmoins
- default
- moIns
- moInstest
- fdsfsdfsdfsdfs

Control access to your instance via key pairs, security groups, and other mechanisms.

Cancel Launch

1c – Networking tab

Launch Instance

Details * Access & Security * **Networking *** Post-Creation * Advanced Options

Selected networks

Available networks

- smog-net (c112bdec-9bb4-46f3-9d22-e0bc142e8562)
- ext-net (8369baba-e428-47e0-ad0b-524e426918b1)

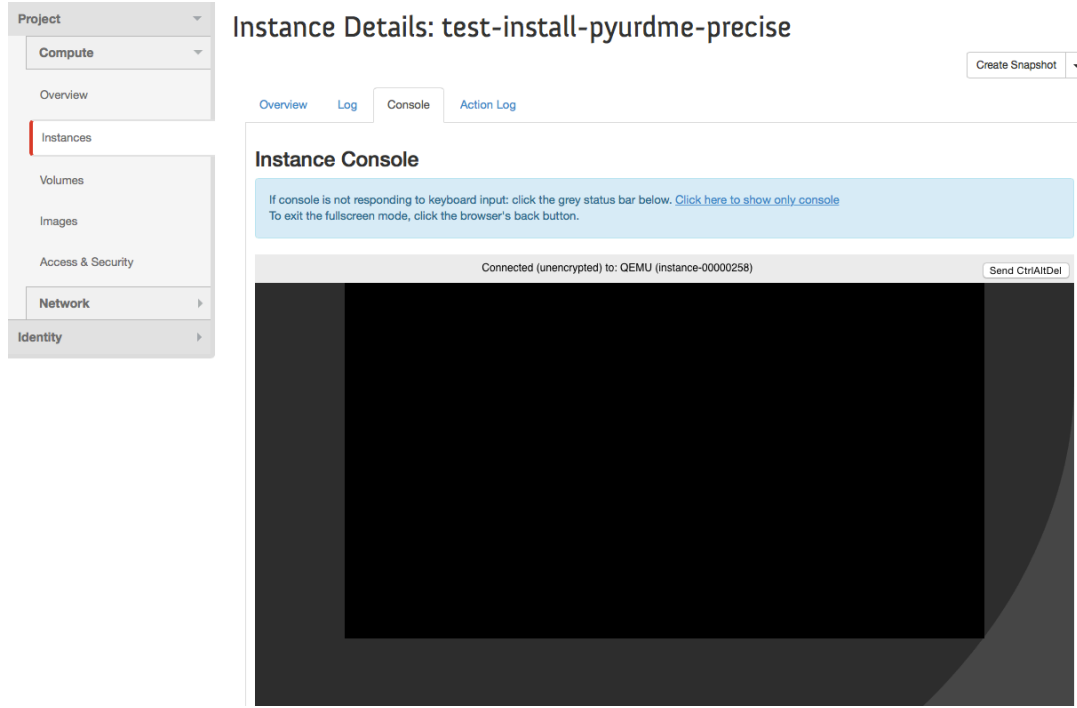
Choose network from Available networks to Selected networks by push button or drag and drop, you may change NIC order by drag and drop as well.

Cancel Launch

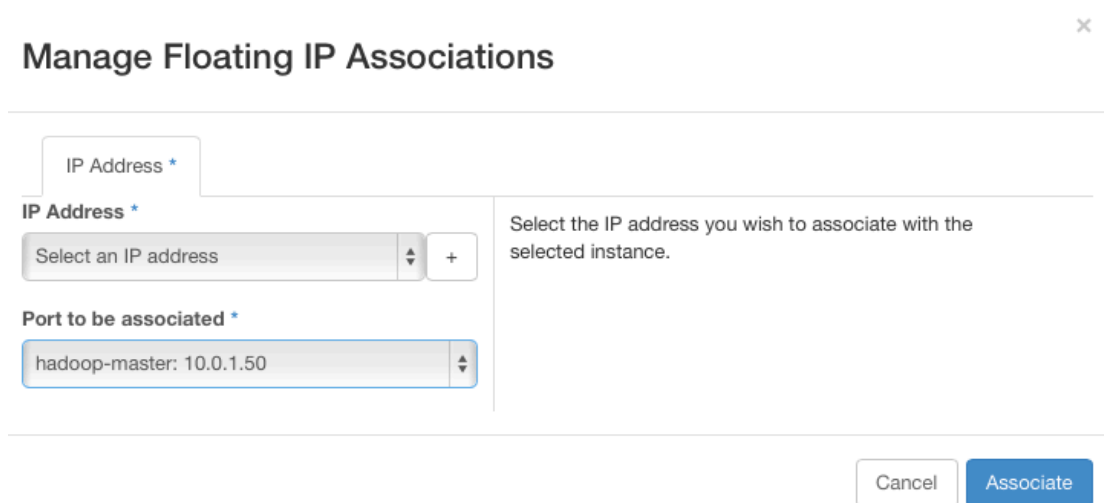
Parameters details	
Instance Name	Assign a name to the virtual machine.
Flavor	Specify the size of the instance to launch.
Instance Count	To launch multiple instances, enter a value greater than 1. The default is 1.

Instance Boot Source	<p>Boot from image If you choose this option, a new field for Image Name displays. You can select the image from the list.</p> <p>Boot from snapshot If you choose this option, a new field for Instance Snapshot displays. You can select the snapshot from the list.</p> <p>Boot from volume If you choose this option, a new field for Volume displays. You can select the volume from the list.</p> <p>Boot from image (creates a new volume) With this option, you can boot from an image and create a volume by entering the Device Size and Device Name for your volume. Click the Delete on Terminate option to delete the volume on terminating the instance.</p> <p>Boot from volume snapshot (creates a new volume) Using this option, you can boot from a volume snapshot and create a new volume by choosing Volume Snapshot from a list and adding a Device Name for your volume. Click the Delete on Terminate option to delete the volume on terminating the instance. Since you are launching an instance from an image, Boot from image is chosen by default.</p>
Image Name	This field changes based on your previous selection. Since you have chosen to launch an instance using an image, the Image Name field displays. Select the image name from the dropdown list.
Security	
Keypair	Specify a key pair. If the image uses a static root password or a static key set (neither is recommended), you do not need to provide a key pair to launch the instance.
Security Groups	Activate the security groups that you want to assign to the instance. Security groups are a kind of cloud firewall that define which incoming network traffic is forwarded to instances. For details, see the section called "Add a rule to the default security group" . If you have not created any security groups, you can assign only the default security group to the instance.
Network tab	
Selected Networks	To add a network to the instance, click the + in the Available Networks field.
Port-Creation tab	
Customization Script	Specify a customization script that runs after your instance launches.
Advanced Option	
Disk Partition	Select the type of disk partition from the dropdown list. Automatic Entire disk is single partition and automatically resizes. Manual Faster build times but requires manual partitioning.

2 – Once the instance is in “active” state, one can login via VNC console (revisit 4a). Click on the instance name to connect your keyboard (sometimes require multiple clicks). For example, to activate displayed console click on the instance name (instance-00000258).



3 – The newly build image is active and one can access it via VNC (SSH is inaccessible at this stage). To connect using SSH requires a VM to be attached to a floating IP. “Attach floating IP” option is available from “Instances” page (revisit 4a).



Create a volume

1 – “Create new volume” link is available in the “Volumes” page (revisit point 5). The link will open following dialog box.

Create Volume

Volume Name *

Description:

Volumes are block devices that can be attached to instances.

Description

Volume Limits

Total Gigabytes (10,005 GB) 100,000 GB Available

Number of Volumes (2) 100 Available

Volume Source

No source, empty volume

Type

No volume type

Size (GB) *

1
⌵

Availability Zone

Any Availability Zone

Cancel
Create Volume

Parameters details	
Volume Name	Specify a name for the volume.
Description	Optionally, provide a brief description for the volume.
Type	Leave this field blank.
Size (GB)	The size of the volume in gigabytes.
Volume Source	<p>No source, empty volume Creates an empty volume.</p> <p>Snapshot If you choose this option, a new field for Use snapshot as a source displays. You can select the snapshot from the list.</p> <p>Image If you choose this option, a new field for Use image as a source displays. You can select the image from the list.</p> <p>Volume If you choose this option, a new field for Use volume as a source displays. You can select the volume from the list.</p>

Attach volume to a virtual machine

1 – Based on LVM, OpenStack consisted private clouds offer dynamic connection to the volume(s). Remember that one volume can only be attached to a single VM whereas one VM can have multiple volumes. Select a volume from the “Volumes” page, click on “Edit attachments” (revisit point 5 and 5a). The link will open the following page:

Manage Volume Attachments ×

Attachments

Instance	Device	Actions
No items to display.		
Displaying 0 items		

Attach To Instance

Attach to Instance * ⓘ

Select the instance name to attach the selected volume