UNIVERSITY OF MISSOURI
KANSAS CITY

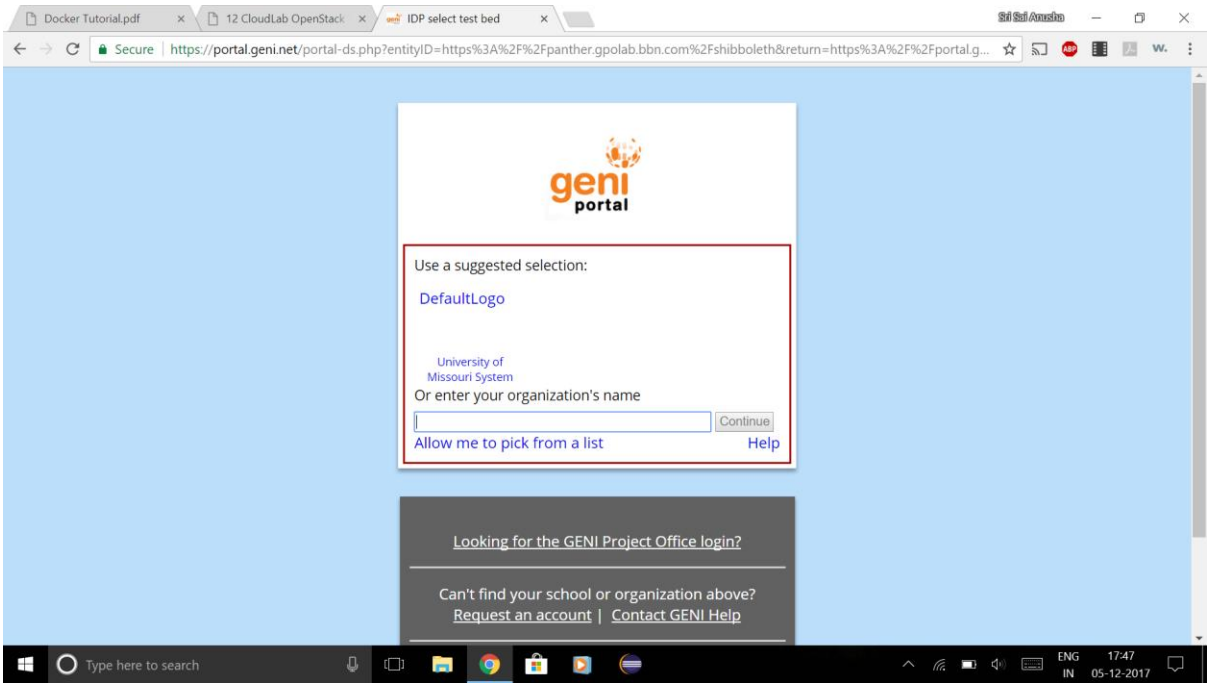
CLOUD COMPUTING
CLOUDLAB OPENSTACK ASSIGNMENT

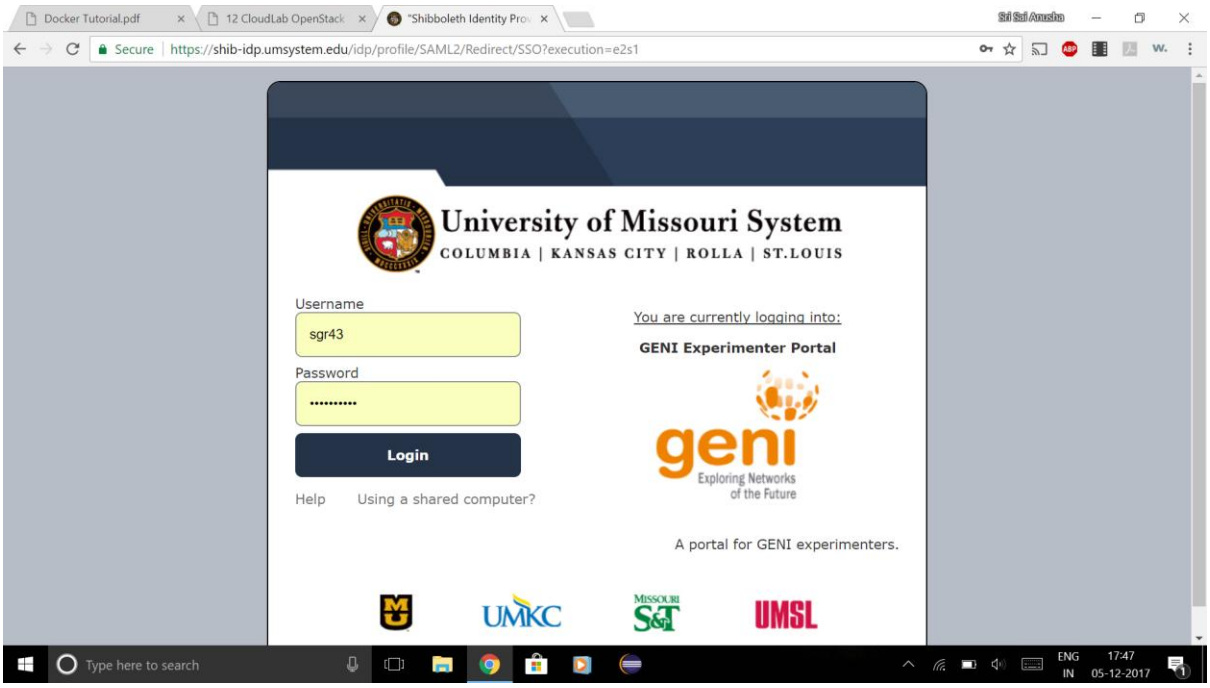
Submitted By:
Sri Sai Anusha Gandu (16230560)

CloudLab is a flexible and scientific infrastructure used for research on the future of cloud computing. CloudLab is built from the software technologies that make up Emulab and parts of GENI, so it provides a familiar, consistent interface for researchers.

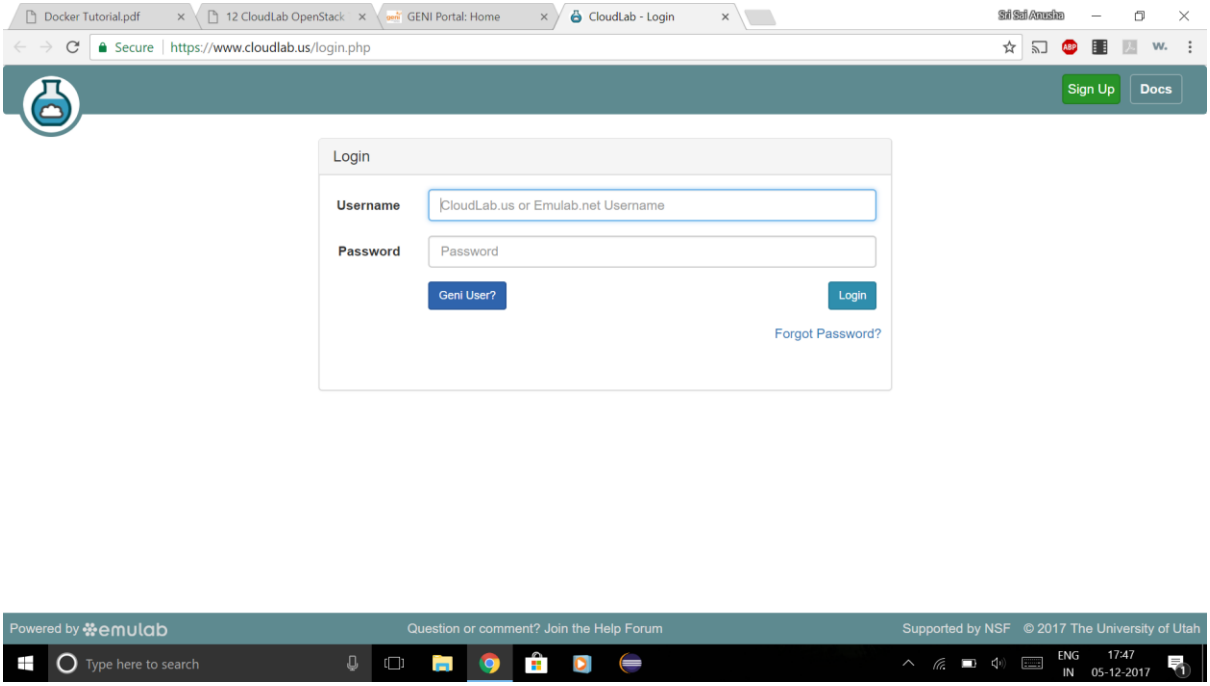
Logging in into CloudLab

We can either create a new account related to CloudLab or can obtain the access if we have an existing GENI account. In this experiment, we make the use of existing GENI account.

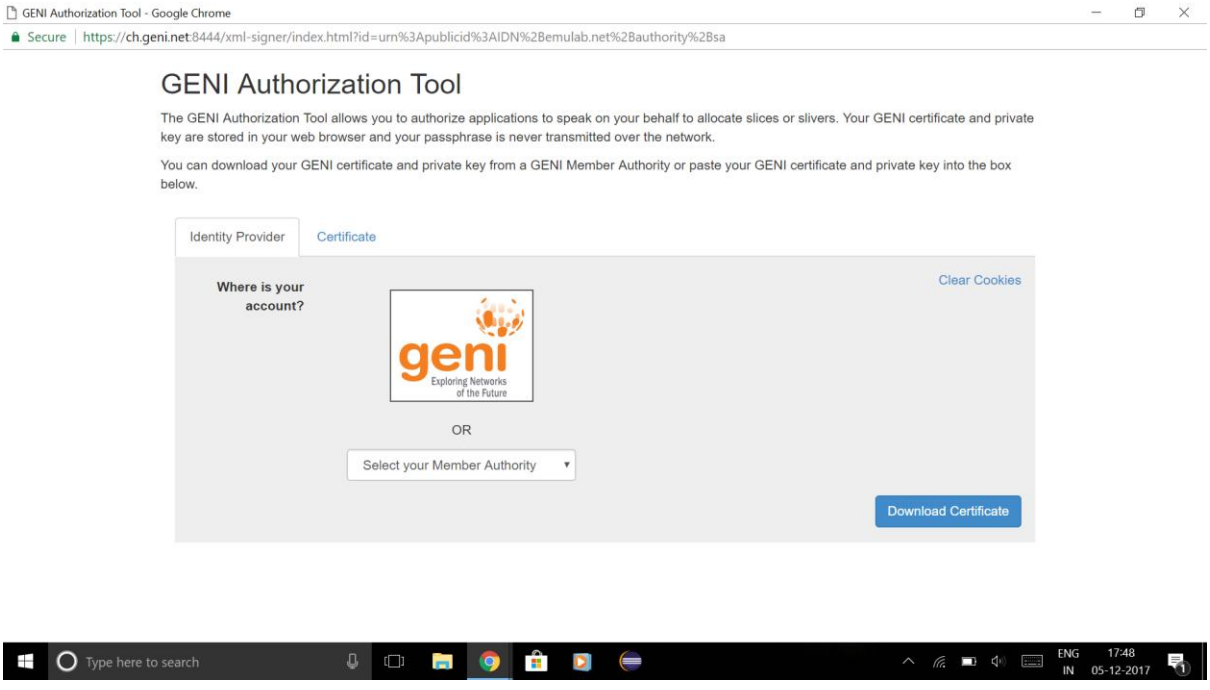




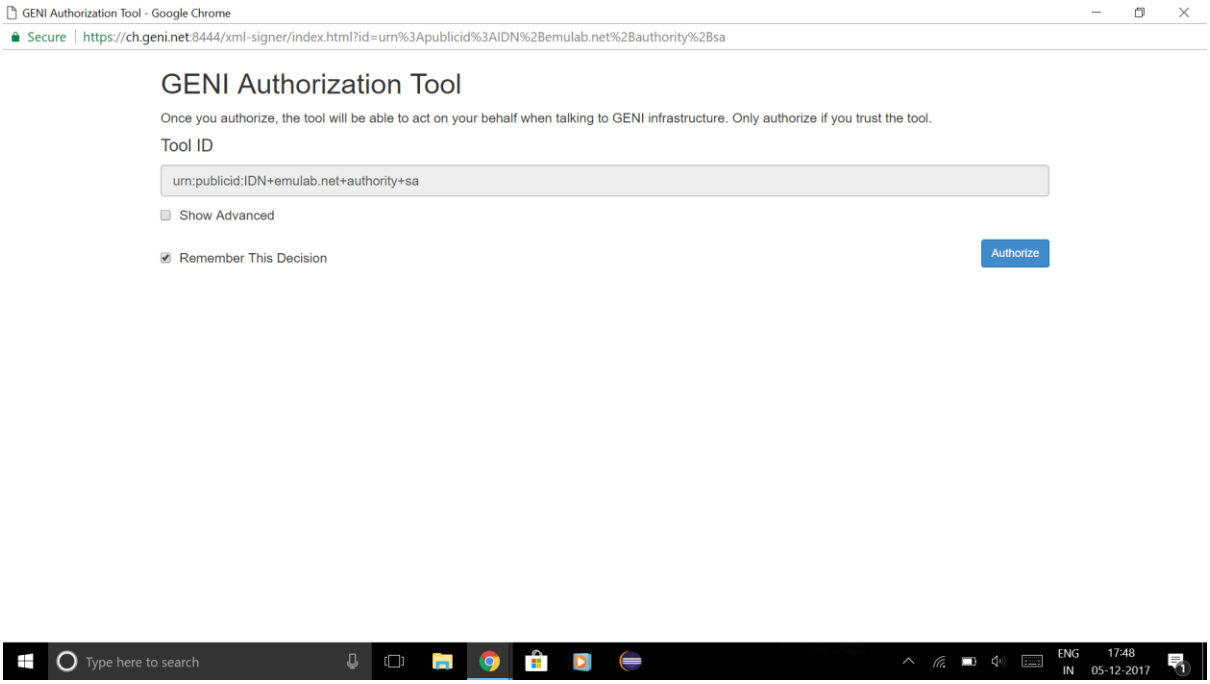
As CloudLab is a partner cloud to GENI, we can log in into CloudLab with the same credentials.



As we already have a GENI account, we select the option of GENI User.



Authorizing the account provides us access to the CloudLab Dashboard.

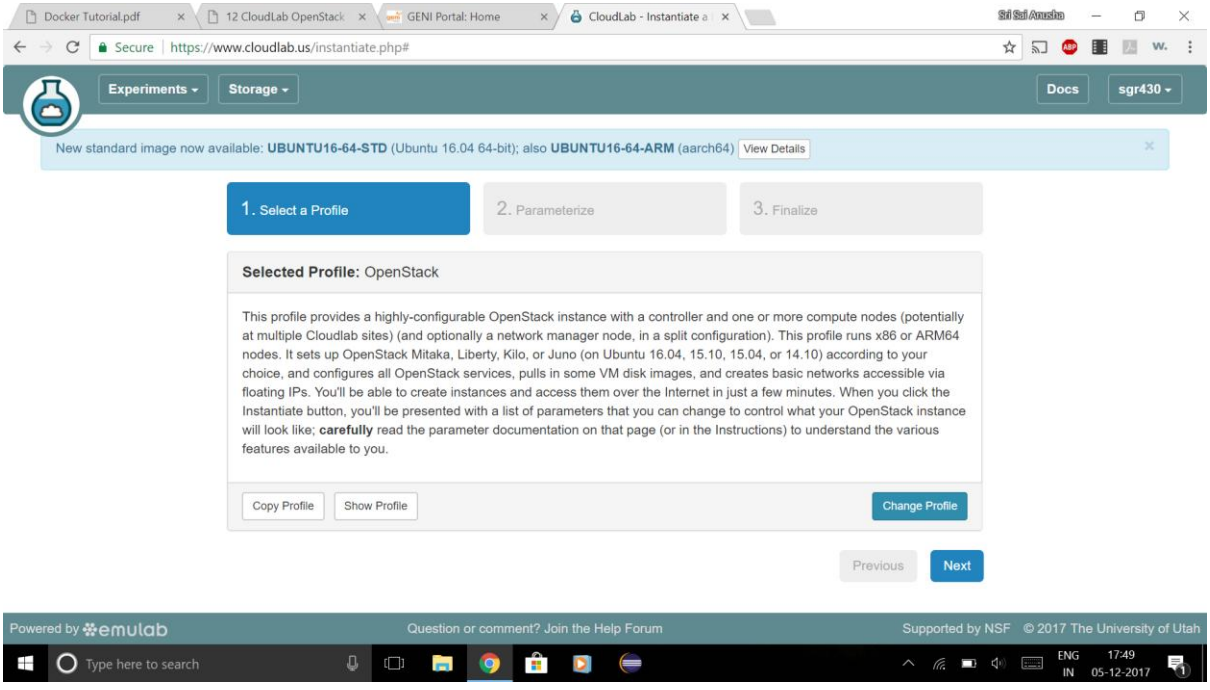


Creating a New Experiment

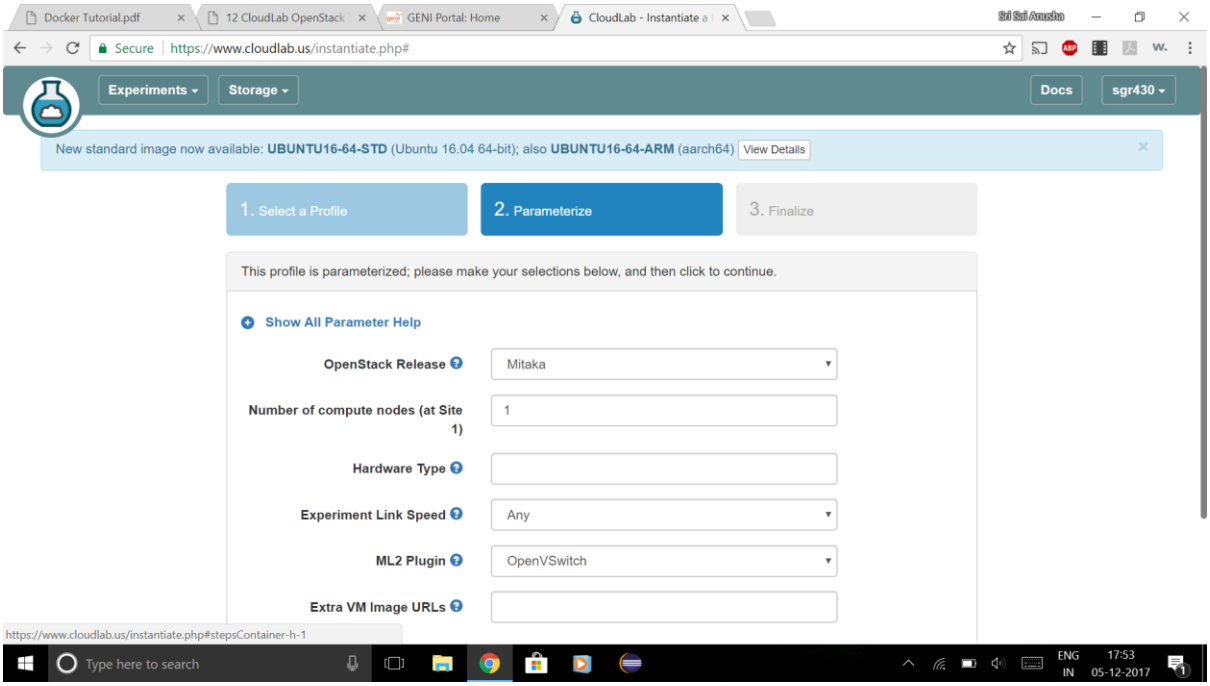
To create a new experiment in CloudLab, we need to follow the steps specified below.

- Select a Profile
- Parameterize
- Finalize

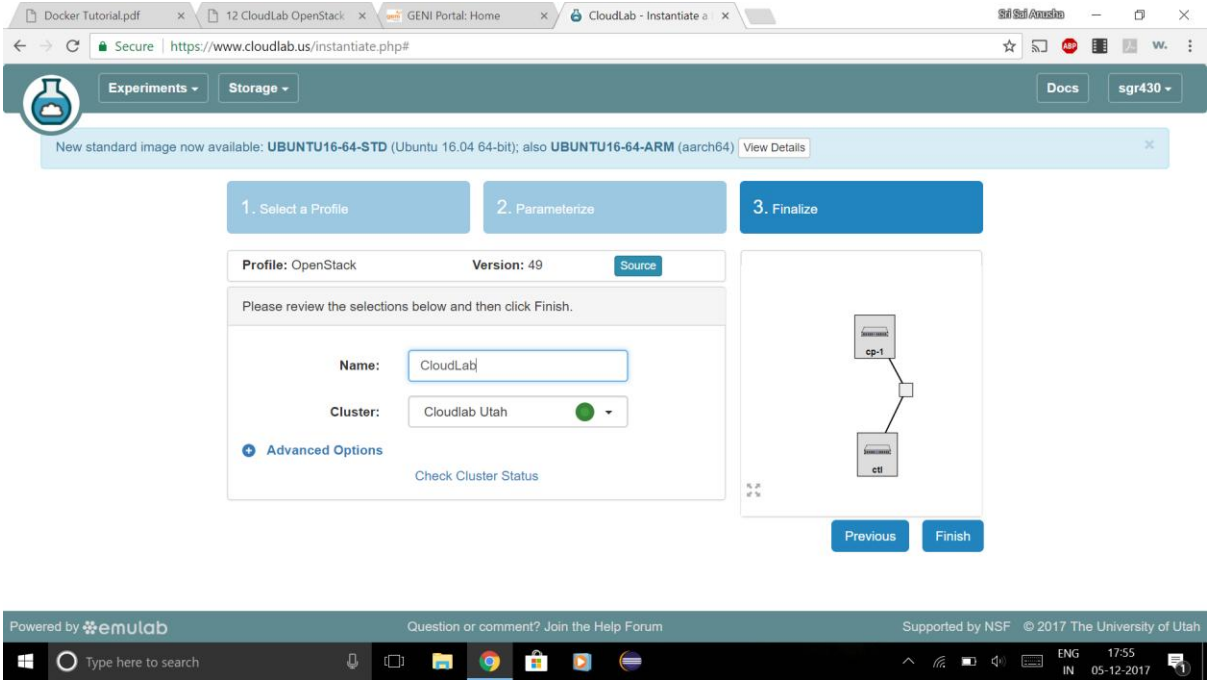
Select a Profile



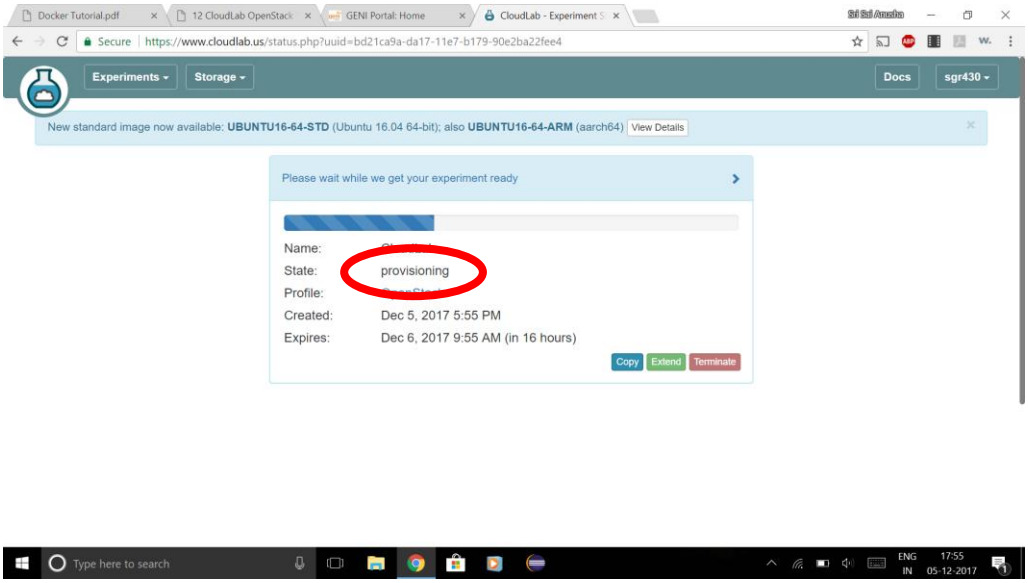
Parameterize



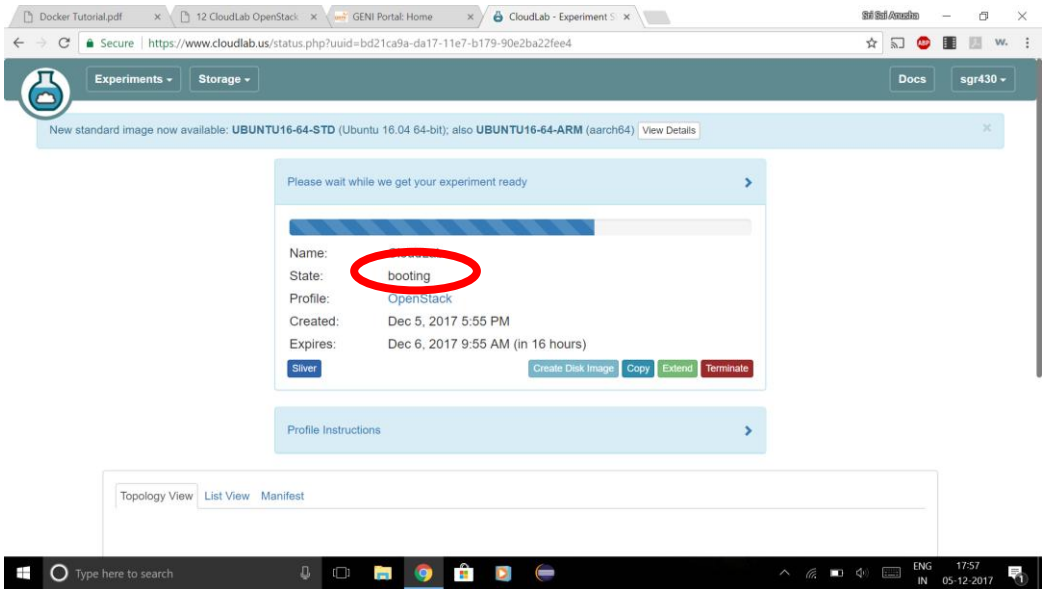
Finalize



Finalizing the experiment gives the output as shown below.
It goes through provisioning and booting phase to get the nodes ready for the experiment.


Docker Tutorial.pdf
12 CloudLab OpenStack
GENI Portal: Home
CloudLab - Experiment
Secure
https://www.cloudlab.us/status.php?uuid=bd21ca9a-da17-11e7-b179-90e2ba22fee4
Experiments
Storage
Docs
sgr430
New standard image now available: UBUNTU16-64-STD (Ubuntu 16.04 64-bit); also UBUNTU16-64-ARM (aarch64)
View Details
Please wait while we get your experiment ready
Name:
State:
provisioning
Profile:
Created:
Dec 5, 2017 5:55 PM
Expires:
Dec 6, 2017 9:55 AM (in 16 hours)
Copy
Extend
Terminate

Type here to search
ENG
IN
17:55
05-12-2017


Docker Tutorial.pdf
12 CloudLab OpenStack
GENI Portal: Home
CloudLab - Experiment
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https://www.cloudlab.us/status.php?uuid=bd21ca9a-da17-11e7-b179-90e2ba22fee4
Experiments
Storage
Docs
sgr430
New standard image now available: UBUNTU16-64-STD (Ubuntu 16.04 64-bit); also UBUNTU16-64-ARM (aarch64)
View Details
Please wait while we get your experiment ready
Name:
State:
booting
Profile:
OpenStack
Created:
Dec 5, 2017 5:55 PM
Expires:
Dec 6, 2017 9:55 AM (in 16 hours)
Sliver
Create Disk Image
Copy
Extend
Terminate
Profile Instructions
Topology View
List View
Manifest

Type here to search
ENG
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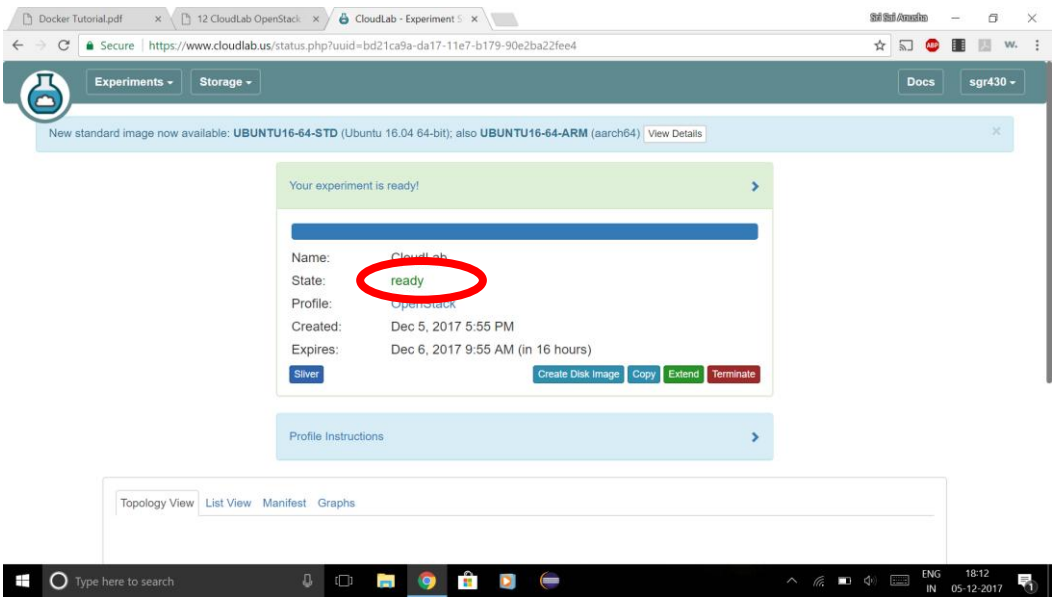
17:57
05-12-2017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12 CloudLab OpenStack
CloudLab - Experiment
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https://www.cloudlab.us/status.php?uuid=bd21ca9a-da17-11e7-b179-90e2ba22fee4
Experiments
Storage
Docs
sgr430
New standard image now available: UBUNTU16-64-STD (Ubuntu 16.04 64-bit); also UBUNTU16-64-ARM (aarch64)
View Details
Your experiment is ready!
Name:
State:
ready
Profile:
Created:
Dec 5, 2017 5:55 PM
Expires:
Dec 6, 2017 9:55 AM (in 16 hours)
Sliver
Create Disk Image
Copy
Extend
Terminate
Profile Instructions
Topology View
List View
Manifest
Graphs

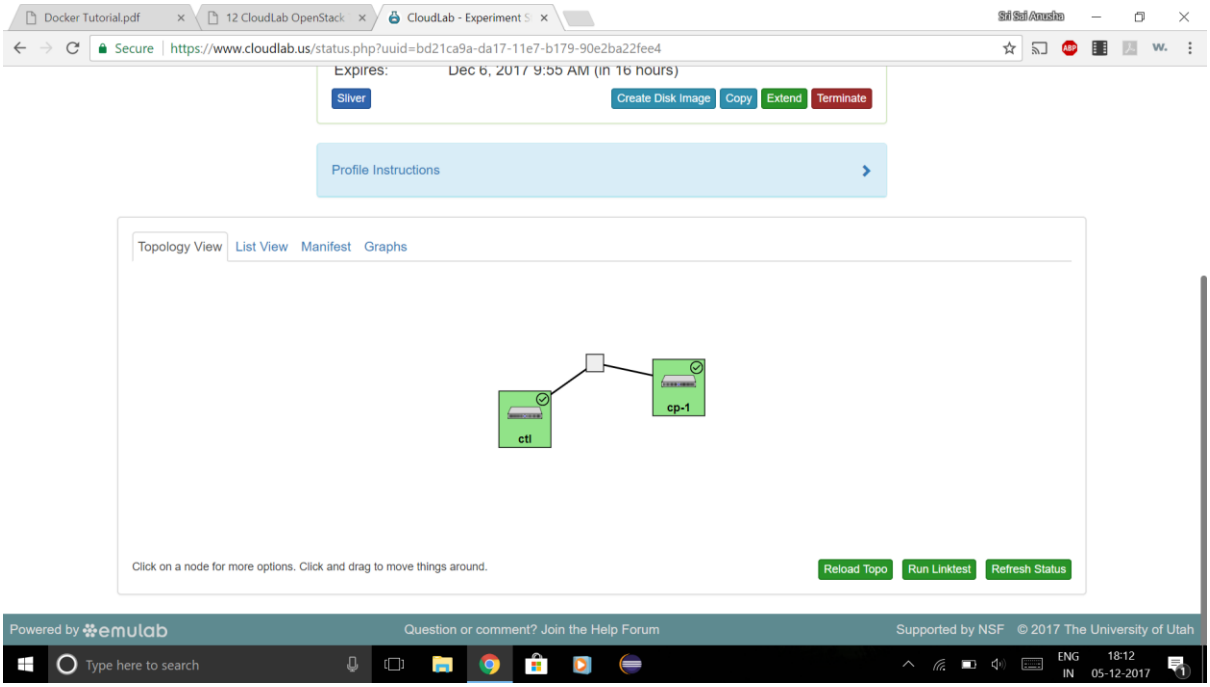
Type here to search
ENG
IN
18:12
05-12-2017

Viewing the Experiment

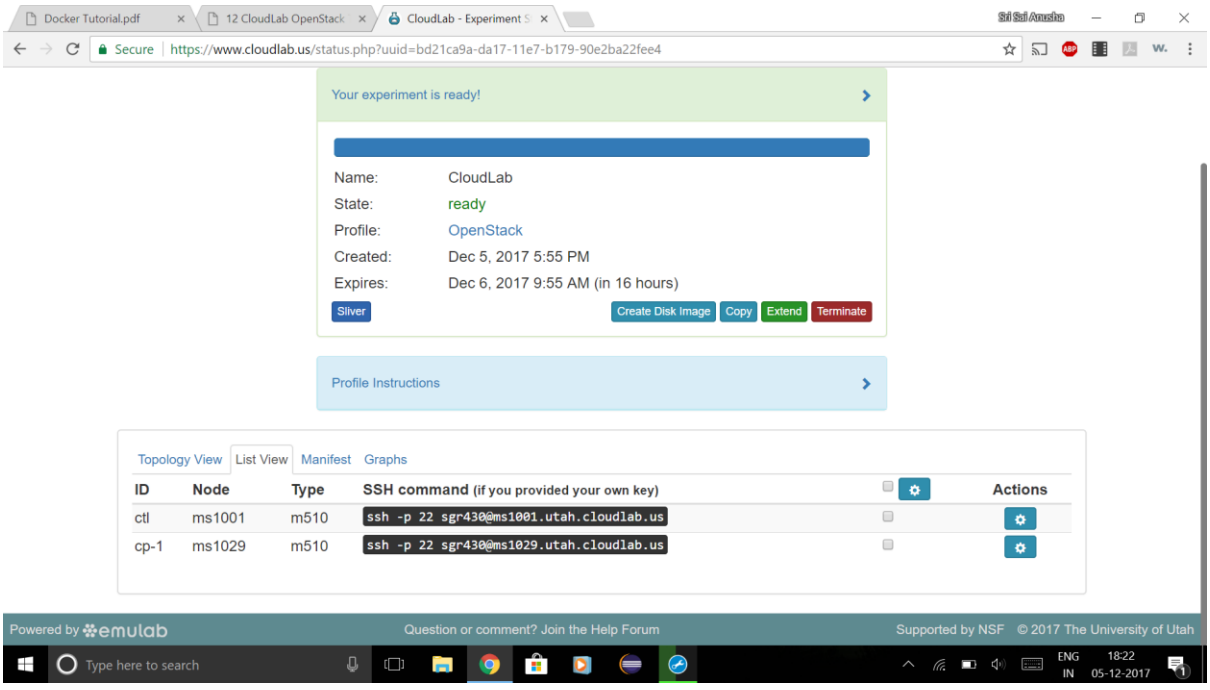
The experiment can be viewed in different ways.

- Topology View
- List View
- Manifest View
- Graphs

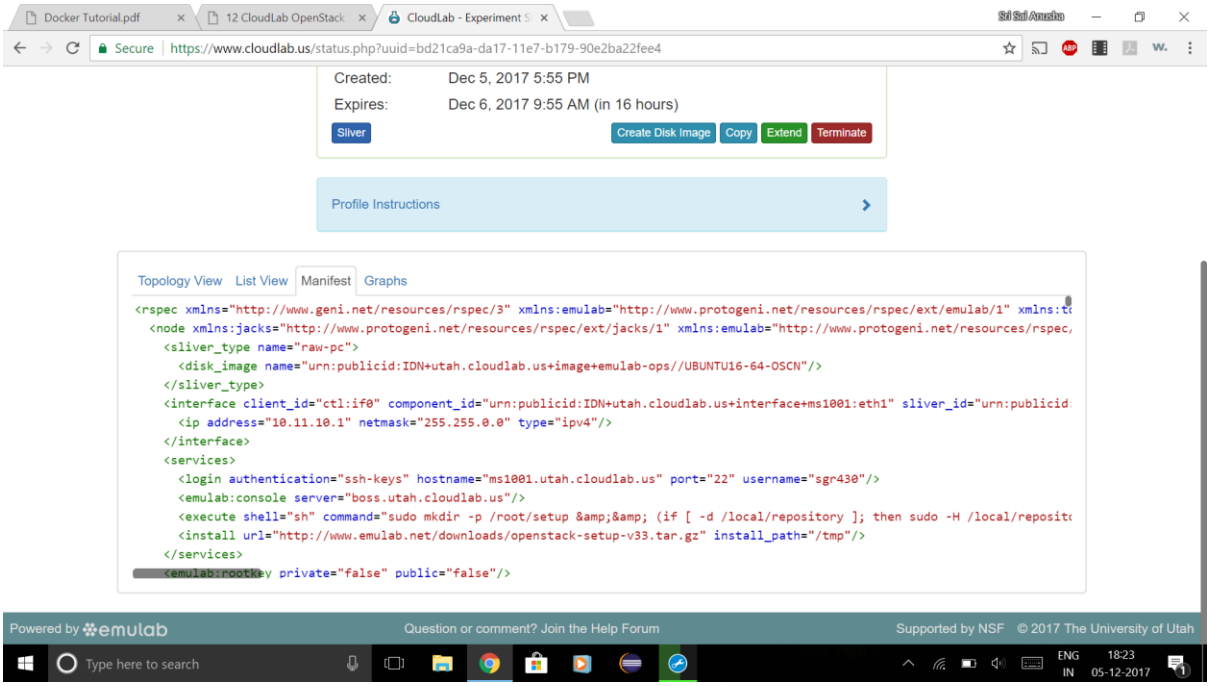
Topology View



List View

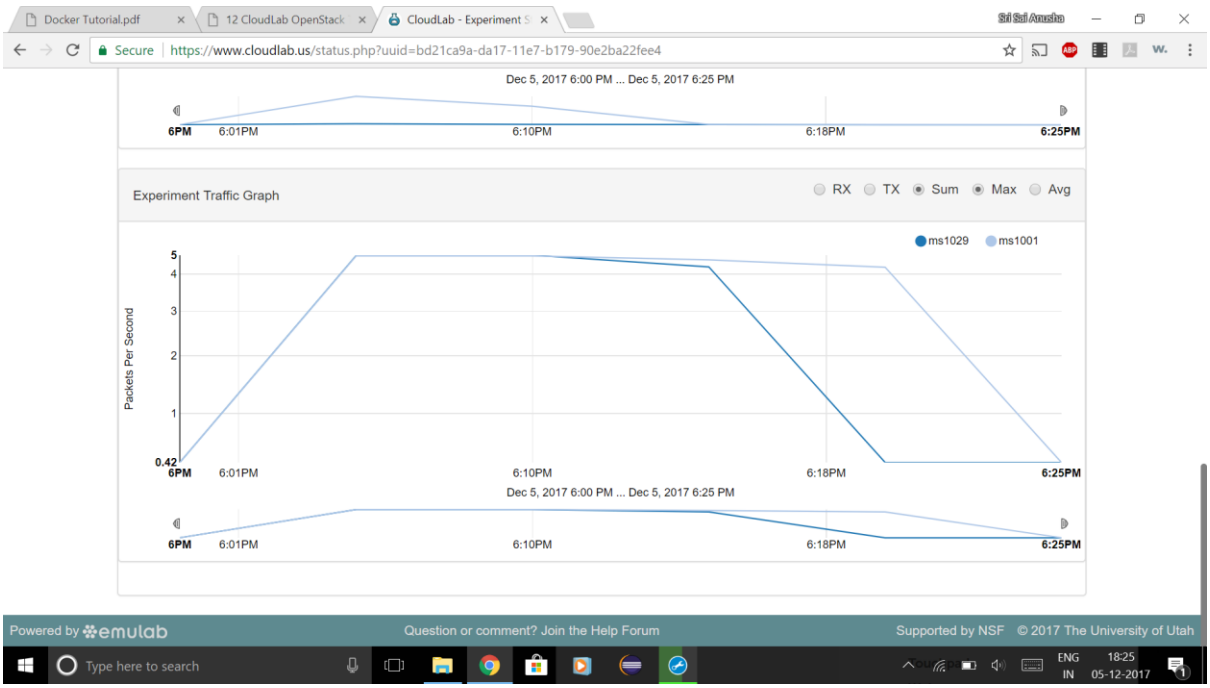


Manifest View

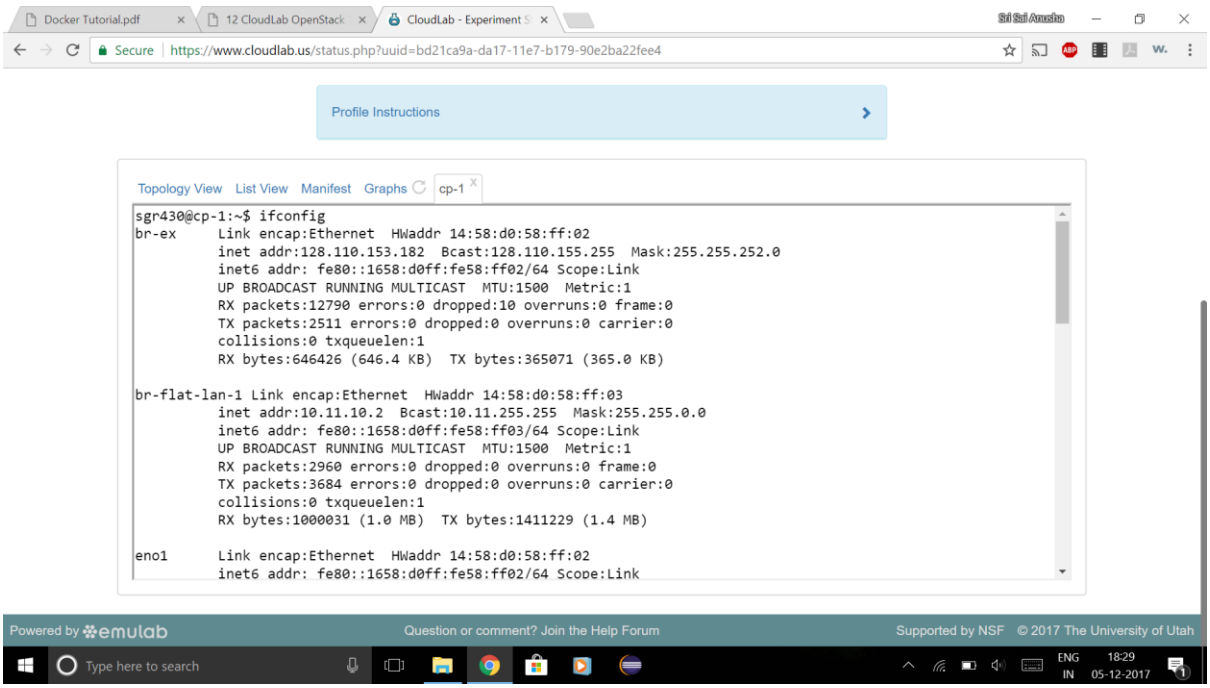


Graphs

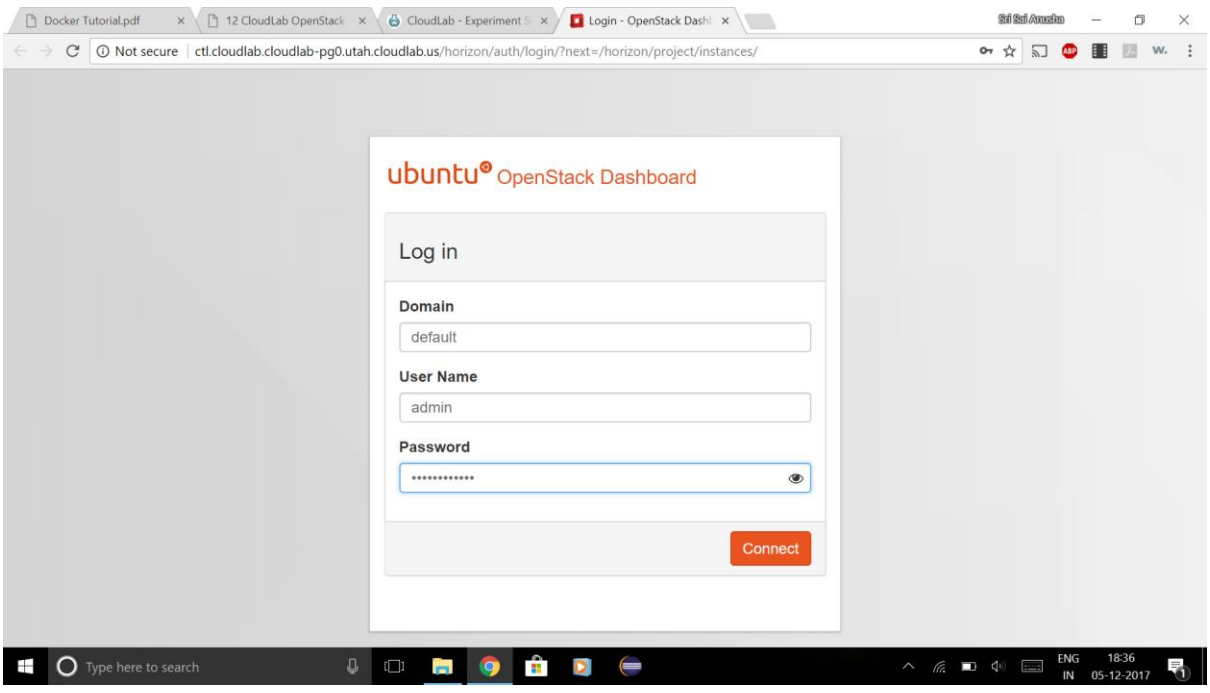
Shown below are the graphs for Load Average, Control Traffic and Experiment Traffic



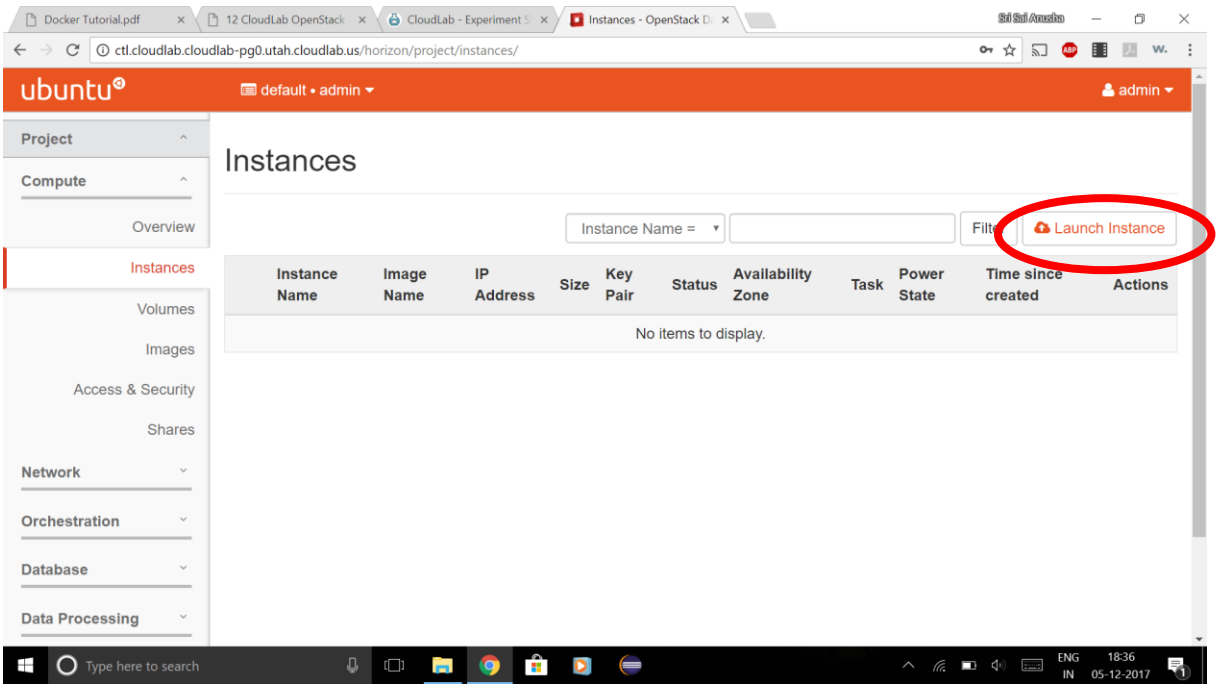
Since the topology is ready for the experiment, we can create a shell or console for the node. We can also reboot or rebuild the system if necessary. Shown below is the screenshot of a running shell of the node.



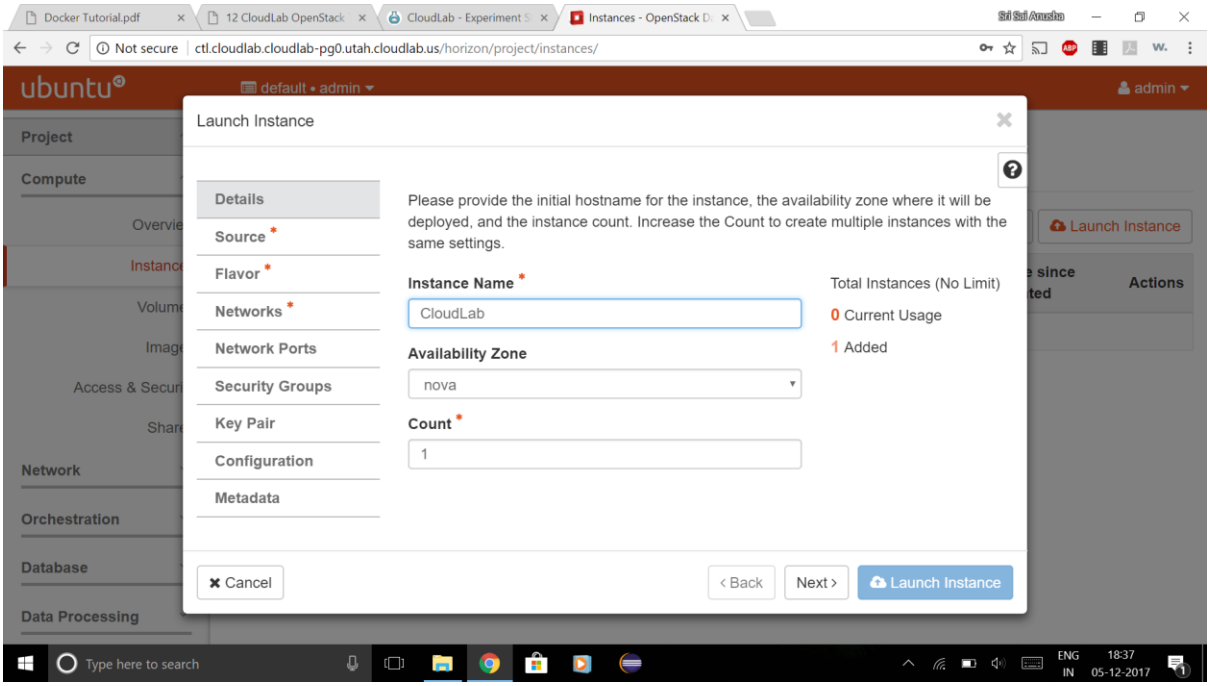
There is a provision to use OpenStack from the CloudLab Dashboard under the Profile Instructions. The password that is used to log on to OpenStack changes frequently and can be obtained from the CloudLab Dashboard.

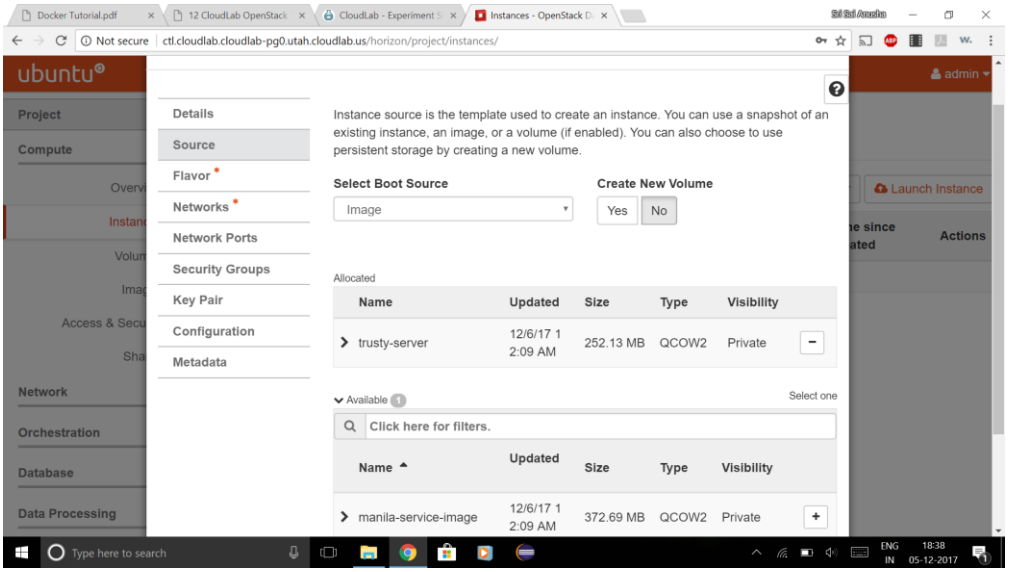


This leads us to the dashboard of OpenStack as shown below.



Here, we need to launch a new instance with the required details, source, flavour and network.

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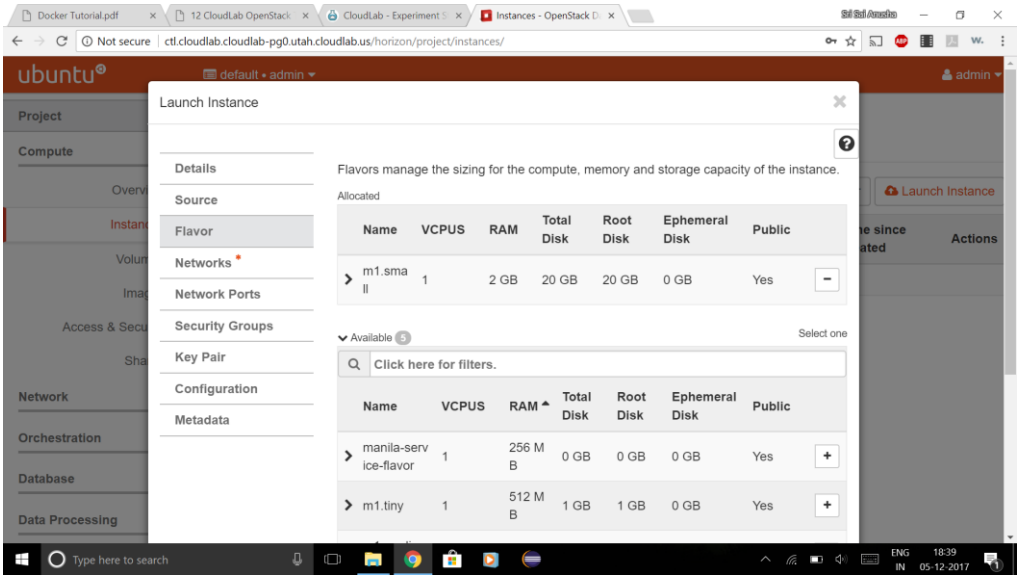
12 CloudLab OpenStack
CloudLab - Experiment
Instances - OpenStack D
Not secure
ctl.cloudlab.cloudlab-pg0.utah.cloudlab.us/horizon/project/instances/
ubuntu
admin
Project
Compute
Network
Orchestration
Database
Data Processing
Launch Instance
Actions
Details
Source
Flavor
Networks
Network Ports
Security Groups
Key Pair
Configuration
Metadata
Instance source is the template used to create an instance. You can use a snapshot of an existing instance, an image, or a volume (if enabled). You can also choose to use persistent storage by creating a new volume.
Select Boot Source
Image
Create New Volume
Yes
No
Allocated
Name
Updated
Size
Type
Visibility
trusty-server
12/6/17 1 2:09 AM
252.13 MB
QCOW2
Private
Available
Select one
Click here for filters.
manila-service-image
372.69 MB
Type here to search
ENG
IN
18:38
05-12-2017


Launch Instance
default • admin
Flavors manage the sizing for the compute, memory and storage capacity of the instance.
Allocated
Name
VCPUS
RAM
Total Disk
Root Disk
Ephemeral Disk
Public
m1.small
1
2 GB
20 GB
20 GB
0 GB
Yes
Available
Select one
Click here for filters.
manila-service-flavor
256 MB
0 GB
m1.tiny
512 MB
1 GB
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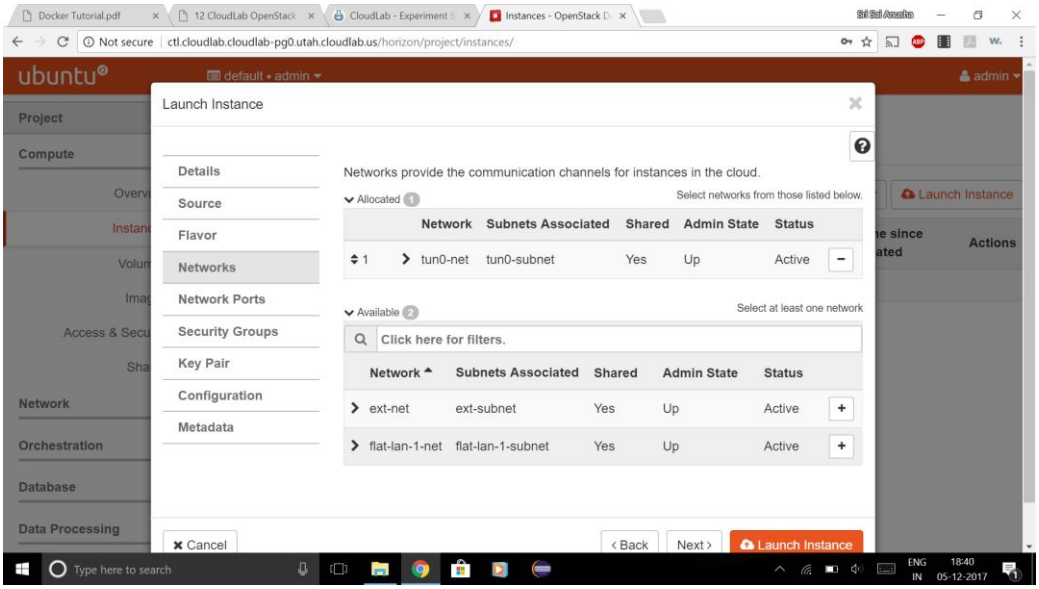
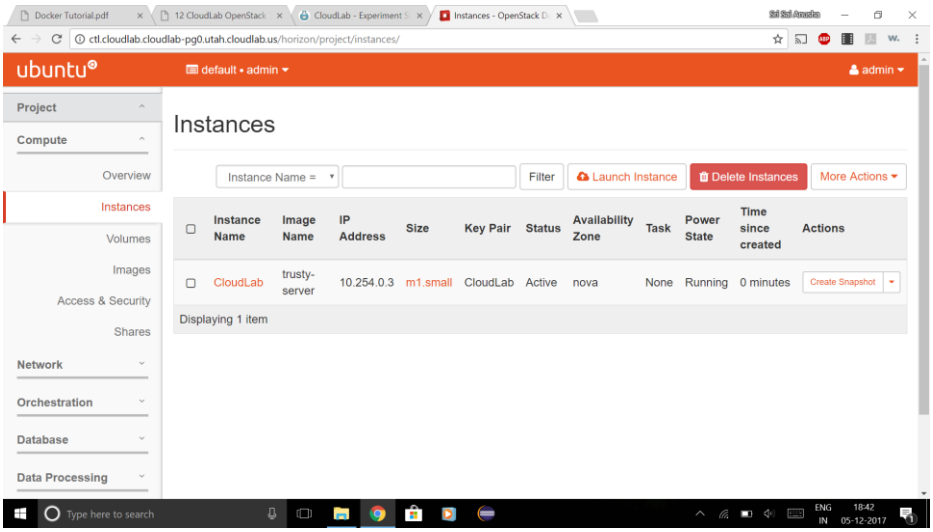
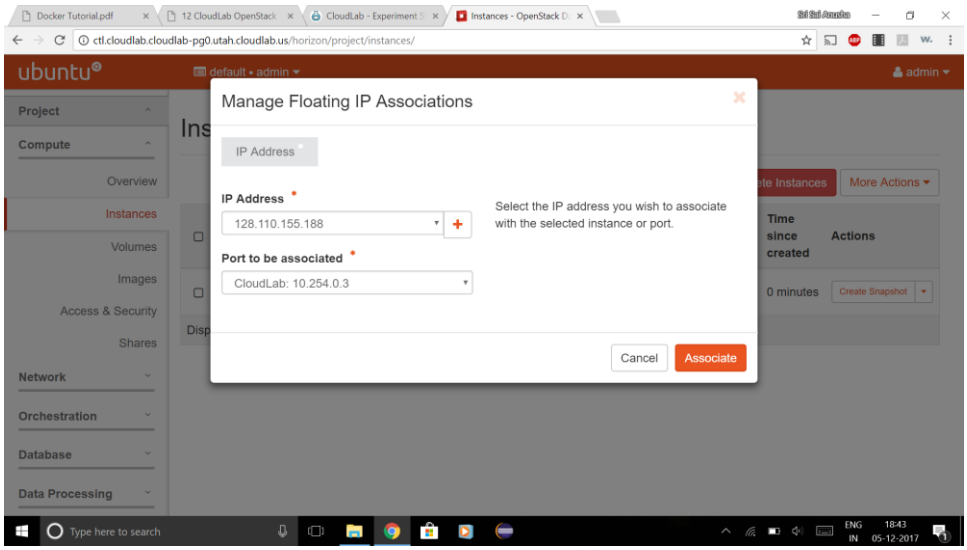
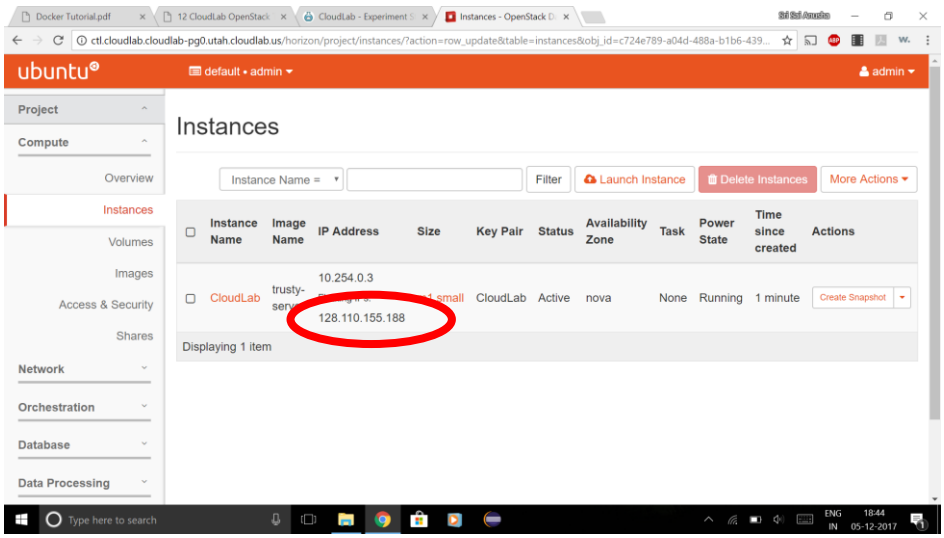
18:39
05-12-2017


Launch Instance
Networks provide the communication channels for instances in the cloud.
Allocated
Select networks from those listed below.
Network
Subnets Associated
Shared
Admin State
Status
tun0-net
tun0-subnet
Yes
Up
Active
Available
Select at least one network
Click here for filters.
ext-net
ext-subnet
flat-lan-1-net
flat-lan-1-subnet
Cancel
Back
Next
Launch Instance
ENG
IN
18:40
05-12-2017

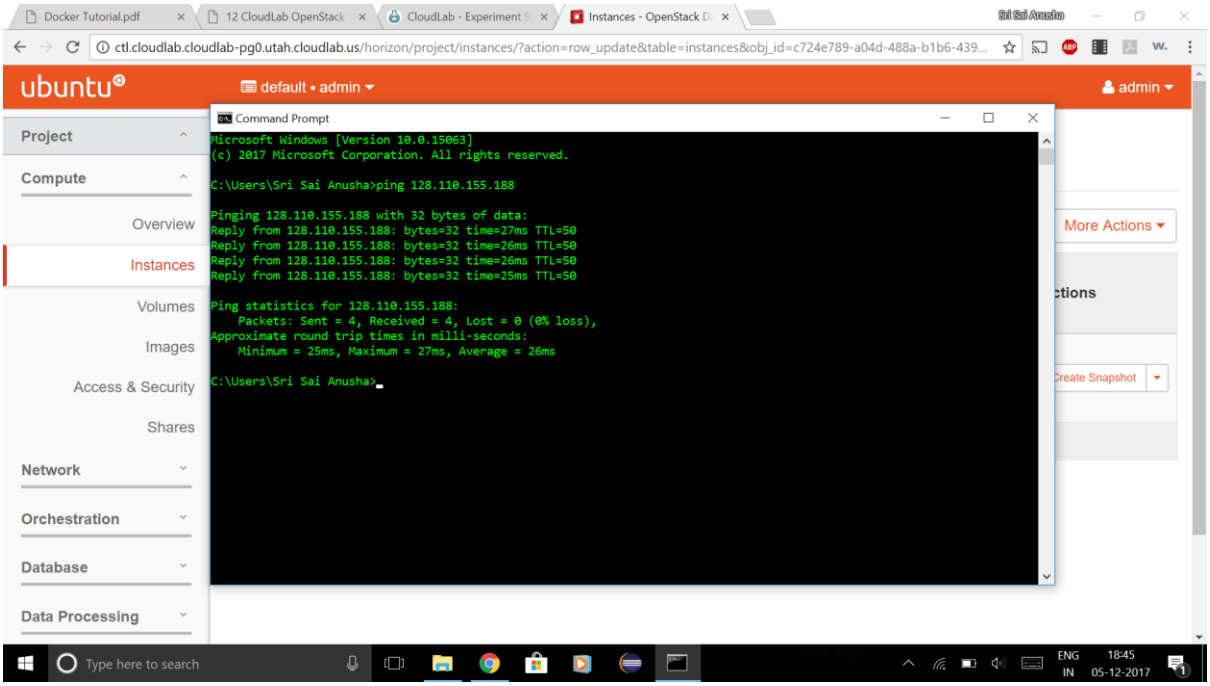
This creates a new instance with the given details and we are supposed to create a floating IP address for the instance. This can be done as shown.



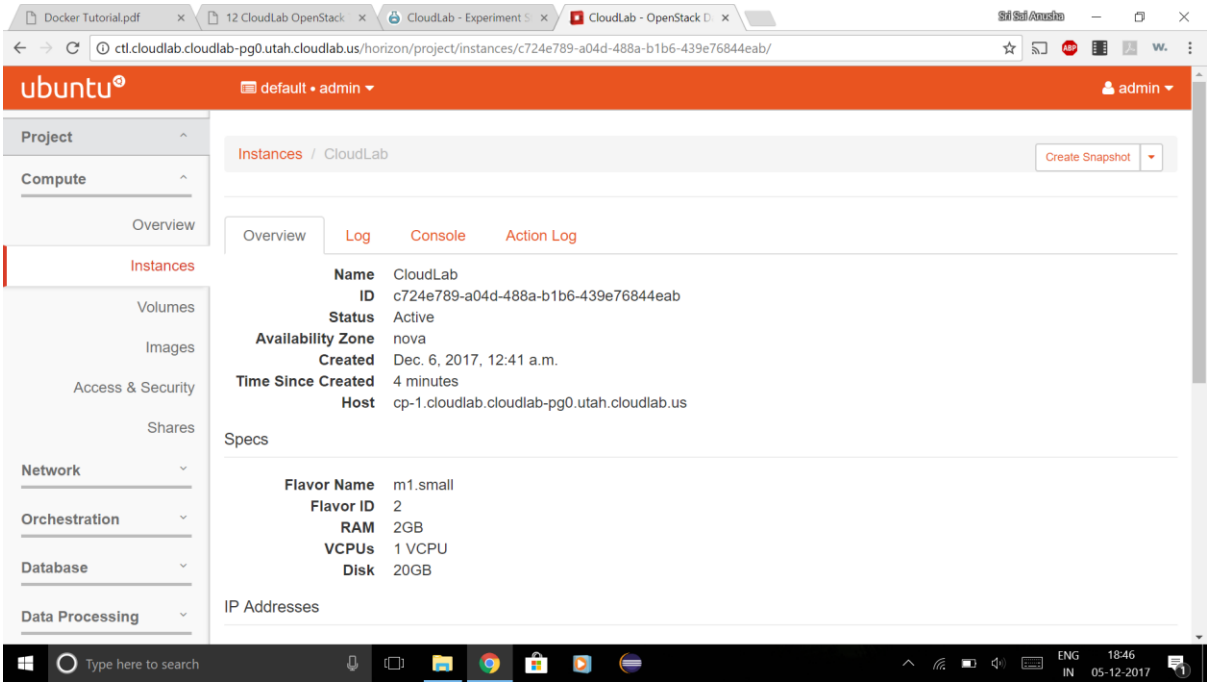




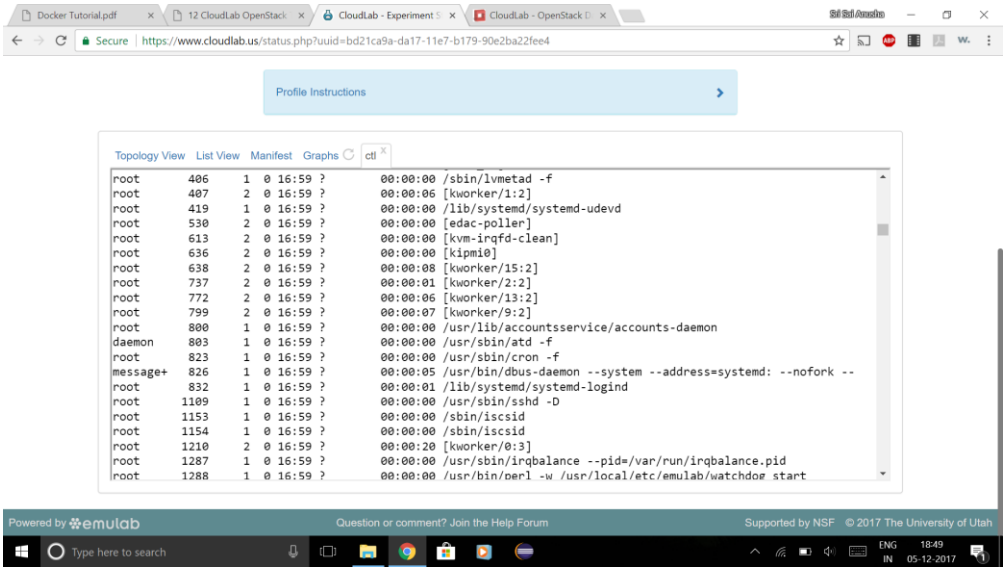
This floating IP address can be ping from any other system and the output will be as follows.



The details of the instance can be obtained from the OpenStack Dashboard.



From the control node in the topology, we can run many commands and obtain the results as shown below.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12 CloudLab OpenStack
CloudLab - Experiment
CloudLab - OpenStack D
Secure
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Profile Instructions
Topology View
List View
Manifest
Graphs
ctl
root 406 1 0 16:59 ? 00:00:00 /sbin/lvmetad -f
root 407 2 0 16:59 ? 00:00:06 [kworker/1:2]
root 419 1 0 16:59 ? 00:00:00 /lib/systemd/systemd-udevd
root 530 2 0 16:59 ? 00:00:00 [edac-poller]
root 613 2 0 16:59 ? 00:00:00 [kvm-irqfd-clean]
root 636 2 0 16:59 ? 00:00:00 [kipmi0]
root 638 2 0 16:59 ? 00:00:08 [kworker/15:2]
root 737 2 0 16:59 ? 00:00:01 [kworker/2:2]
root 772 2 0 16:59 ? 00:00:06 [kworker/13:2]
root 799 2 0 16:59 ? 00:00:07 [kworker/9:2]
root 800 1 0 16:59 ? 00:00:00 /usr/lib/accountsservice/accounts-daemon
daemon 803 1 0 16:59 ? 00:00:00 /usr/sbin/atd -f
root 823 1 0 16:59 ? 00:00:00 /usr/sbin/cron -f
message+ 826 1 0 16:59 ? 00:00:05 /usr/bin/dbus-daemon --system --address=systemd: --nofork --
root 832 1 0 16:59 ? 00:00:01 /lib/systemd/systemd-logind
root 1109 1 0 16:59 ? 00:00:00 /usr/sbin/sshd -D
root 1153 1 0 16:59 ? 00:00:00 /sbin/iscsid
root 1154 1 0 16:59 ? 00:00:00 /sbin/iscsid
root 1210 2 0 16:59 ? 00:00:20 [kworker/0:3]
root 1287 1 0 16:59 ? 00:00:00 /usr/sbin/irqbalance --pid=/var/run/irqbalance.pid
root 1288 1 0 16:59 ? 00:00:00 /usr/bin/perl -w /usr/local/etc/emulab/watchdog start
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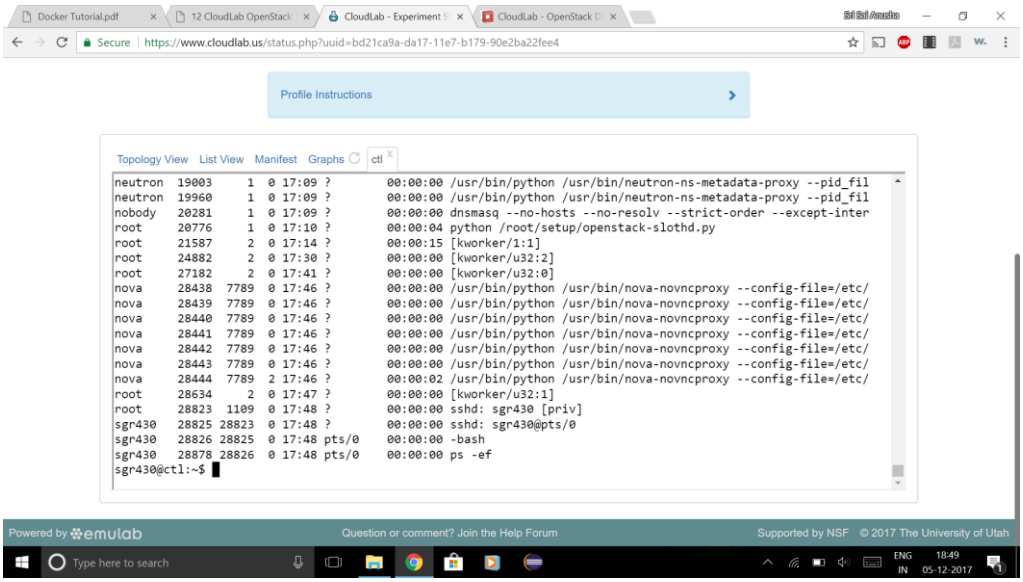
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12 CloudLab OpenStack
CloudLab - Experiment
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Secure
https://www.cloudlab.us/status.php?uuid=bd21ca9a-da17-11e7-b179-90e2ba22fee4
Profile Instructions
Topology View
List View
Manifest
Graphs
ctl
neutron 19003 1 0 17:09 ? 00:00:00 /usr/bin/python /usr/bin/neutron-ns-metadata-proxy --pid_fil
neutron 19960 1 0 17:09 ? 00:00:00 /usr/bin/python /usr/bin/neutron-ns-metadata-proxy --pid_fil
nobody 20281 1 0 17:09 ? 00:00:00 dnsmasq --no-hosts --no-resolv --strict-order --except-inter
root 20776 1 0 17:10 ? 00:00:04 python /root/setup/openstack-slothd.py
root 21587 2 0 17:14 ? 00:00:15 [kworker/1:1]
root 24882 2 0 17:30 ? 00:00:00 [kworker/u32:2]
root 27182 2 0 17:41 ? 00:00:00 [kworker/u32:0]
nova 28438 7789 0 17:46 ? 00:00:00 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
nova 28439 7789 0 17:46 ? 00:00:00 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
nova 28440 7789 0 17:46 ? 00:00:00 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
nova 28441 7789 0 17:46 ? 00:00:00 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
nova 28442 7789 0 17:46 ? 00:00:00 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
nova 28443 7789 0 17:46 ? 00:00:00 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
nova 28444 7789 2 17:46 ? 00:00:02 /usr/bin/python /usr/bin/nova-novncproxy --config-file=/etc/
root 28634 2 0 17:47 ? 00:00:00 [kworker/u32:1]
root 28823 1109 0 17:48 ? 00:00:00 sshd: sgr430 [priv]
sgr430 28825 28823 0 17:48 ? 00:00:00 sshd: sgr430@pts/0
sgr430 28826 28825 0 17:48 pts/0 00:00:00 -bash
sgr430 28878 28826 0 17:48 pts/0 00:00:00 ps -ef
sgr430@ctl:~$
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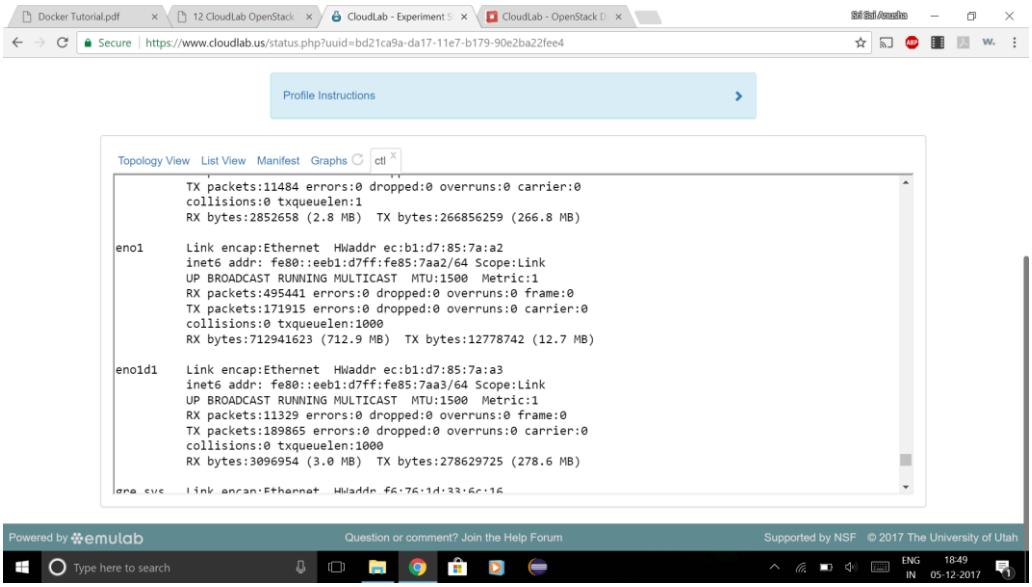
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12 CloudLab OpenStack
CloudLab - Experiment
CloudLab - OpenStack D
Secure
https://www.cloudlab.us/status.php?uuid=bd21ca9a-da17-11e7-b179-90e2ba22fee4
Profile Instructions
Topology View
List View
Manifest
Graphs
ctl
TX packets:11484 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1
RX bytes:2852658 (2.8 MB) TX bytes:266856259 (266.8 MB)
eno1 Link encap:Ethernet HWaddr ec:b1:d7:85:7a:a2
inet6 addr: fe80::eeb1:d7ff:fe85:7aa2/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:495441 errors:0 dropped:0 overruns:0 frame:0
TX packets:171915 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:712941623 (712.9 MB) TX bytes:12778742 (12.7 MB)
eno1d1 Link encap:Ethernet HWaddr ec:b1:d7:85:7a:a3
inet6 addr: fe80::eeb1:d7ff:fe85:7aa3/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:11329 errors:0 dropped:0 overruns:0 frame:0
TX packets:189865 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:3096954 (3.0 MB) TX bytes:278629725 (278.6 MB)
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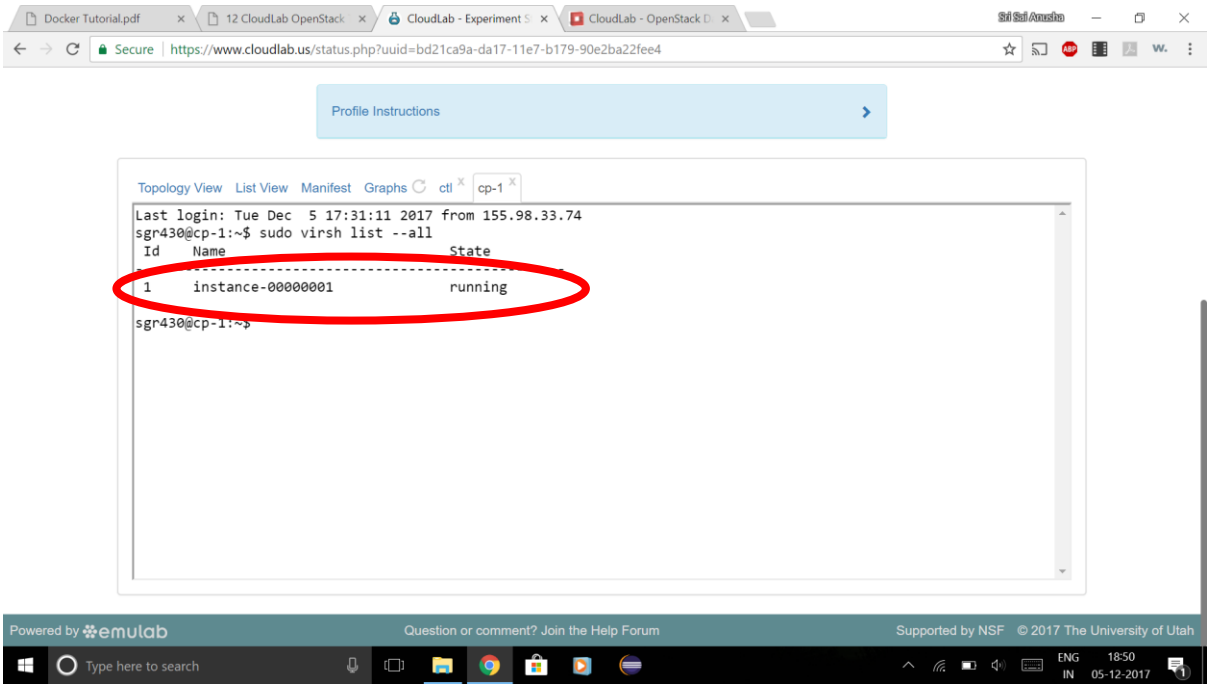
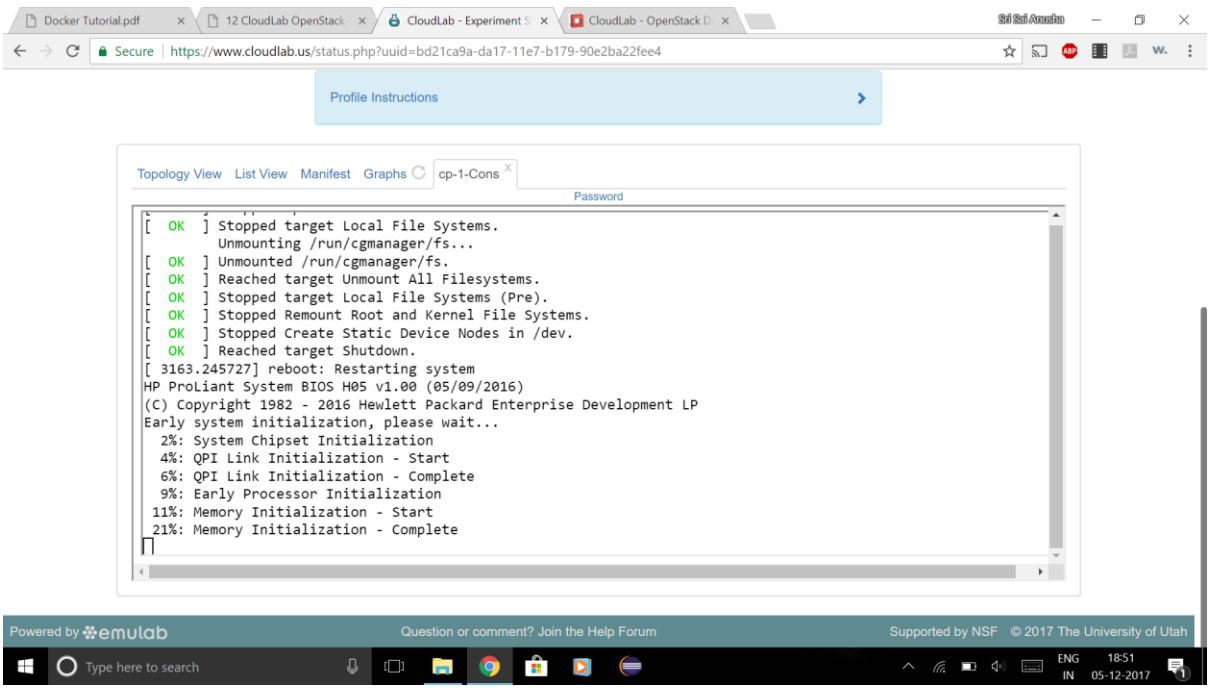
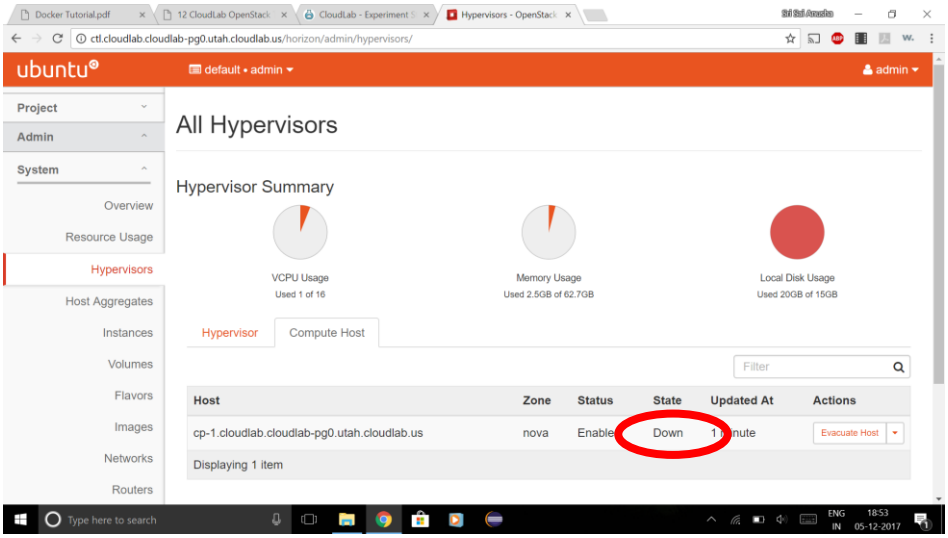
When a command **“sudo virsh list –all”** is run on the other node in the topology, it displays all the instances that are present in the experiment.



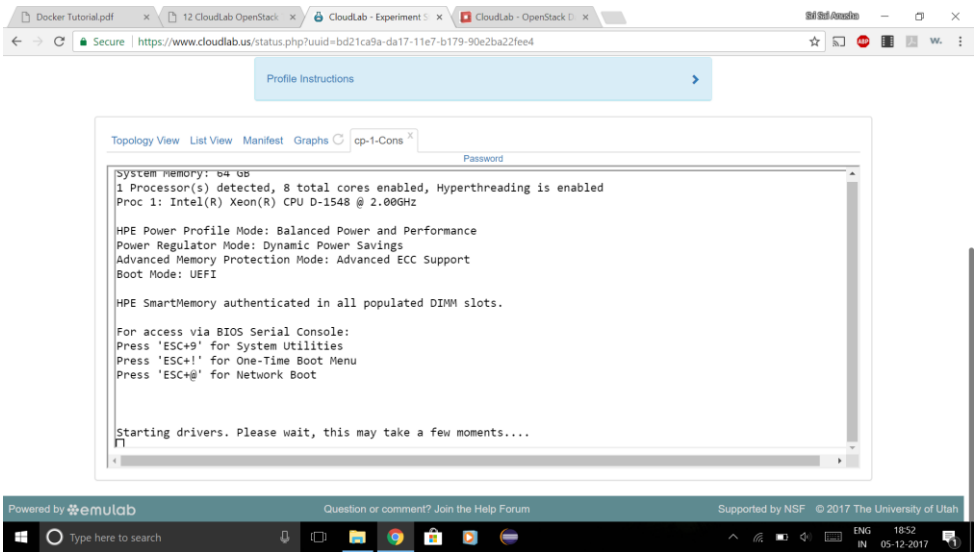
The node when reboot is done shows the following in the console window of the node.

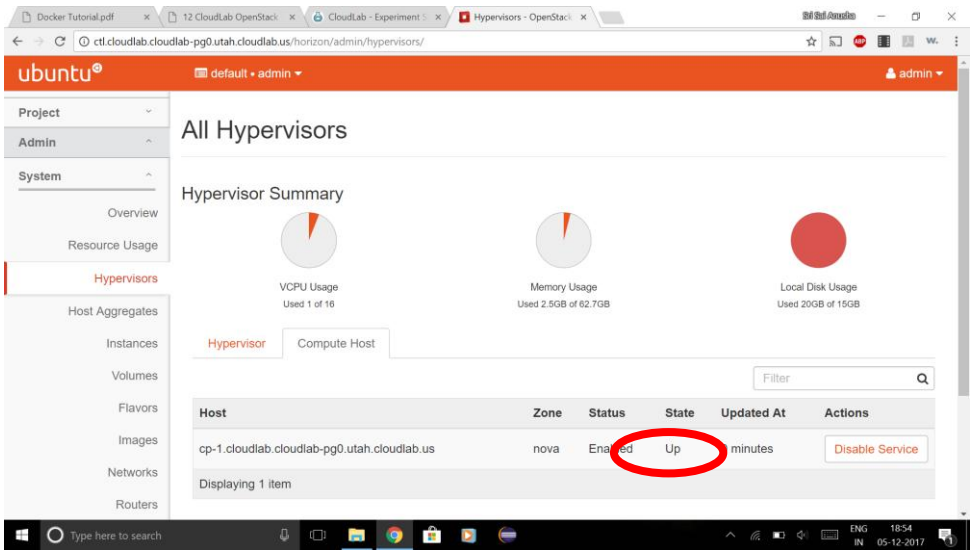


At the same time, when the Hypervisor tab is opened in the OpenStack Dashboard, due to the rebooting of the system, the state of the system goes down.



Once the system is done with rebooting function, the state instantly transitions to up.





When we are done with the experiment, it is a good practice to always terminate it.