

Simple Cloud Administration

Cloud Computing Course Project, *OpenStack Admin*

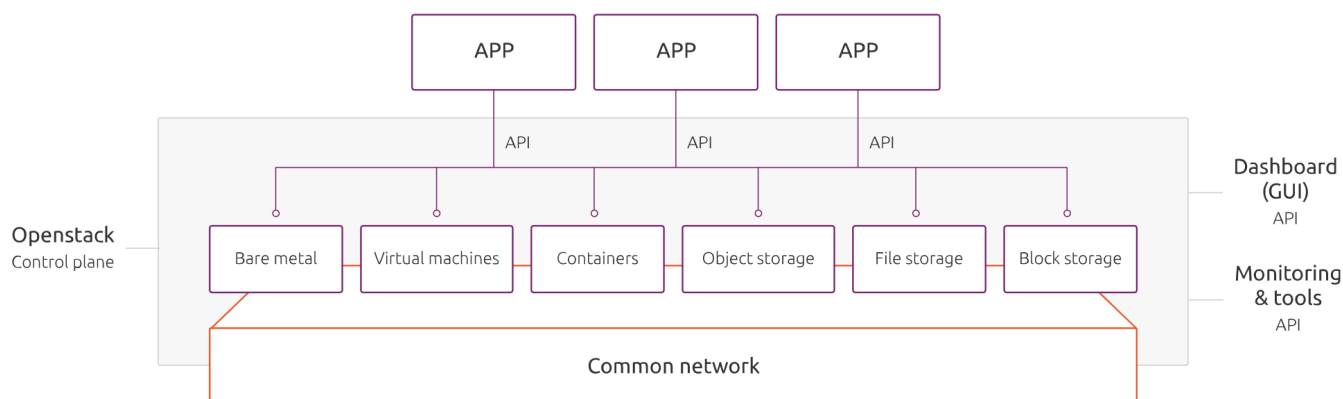
Submission Deadline: *Aban 4th, 1398*



Introduction

Simply put, cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale. You typically pay only for cloud services you use, helping you lower your operating costs, run your infrastructure more efficiently, and scale as your business needs change. Cloud computing is a big shift from the traditional way businesses think about IT resources. Not all clouds are the same and not one type of cloud computing is right for everyone. Several different models, types, and services have evolved to help offer the right solution for your needs.

OpenStack is an open source cloud computing platform that allows businesses to control large pools of compute, storage and networking in a data center. The fact that OpenStack is open source means that anyone that chooses to use it, can access the source code, make changes, and share these with the community. One of the key benefits of this model is that the source code can then be checked by a much larger set of people than proprietary code, which is restricted to its owners. Governed by the OpenStack Foundation, there are more than 34,000 individual contributors and over 550 companies that participate in the project.



Outline

In this project, we'd like you to get familiarized with the OpenStack Lab installation and experience with the OpenStack Dashboard (aka. Horizon). Certainly, there is a lot more that you can learn and this project is just to get you started!

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Description

Initially, we'd like you to set up a local cloud using DevStack described [here](#).

After a successful deployment, you need to login with *admin* user and the password you provided in the *local.conf* (ADMIN_PASSWORD) file. Then, find an ubuntu 16.04 cloud image (you can also make one) and upload it to the DevStack using the Horizon Dashboard or the OpenStack command line interface with the following conditions:

- Name it "Ubuntu 16.04"
- Attach a metadata key-value pair {"os_type": "Linux Ubuntu"}
- Make it public and accessible to every user in the cloud
- Make sure that no instance with less than 512 MB of RAM can be created from this image
- Make sure that no instance with less than 3 GB of Storage can be created from this image

Now, go ahead and create a project called "CloudProject" and add the admin user to it. Then, create a *member* user with your own name and choose the "CloudProject" as its *Primary Project*. As a final step before logging out of *admin* user and logging in with *your own username*, make sure that every user can only create resources within the following limitation:

- 5 Instances
- The number of virtual CPUs and amount of RAM allocated to the DevStack virtual machine
- 5 Volumes

You may have noticed that sometimes you are logged out automatically. This is because OpenStack uses a Token-based authentication and the token you own is expired and as a consequence you are redirected to the login page. Let's fix that! Make tokens valid for 5 hours (*Hint: You can't fix this using Horizon*).

After you logged in to your user, create a network called *PrivateCloud* with the CIDR 20.20.20.0/24 and no gateway set. We'll need you to create 2 instances with the following attributes:

MyUbuntu

- **Source:** *Ubuntu 16.04*
- **VCPUs:** 1
- **RAM:** 512 MB
- **Disk:** 3 GB
- **Network:** 20.20.20.10

MyCirROS

- **Source:** *cirros-0.4.0-x86_64-disk*
- **VCPUs:** 1
- **RAM:** 64 MB
- **Disk:** 1 GB
- **Network:** 20.20.20.20

For your final task automate SSH remote login to the *MyCirROS* instance from *MyUbuntu* instance; use the console interface of your instances in Horizon Dashboard, login to *MyUbuntu* instance, generate SSH key pairs (*ssh-keygen*) and distribute it to the *MyCirROS* instance (*ssh-copy-id*).

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Extra Credit

You may perform one of the following tasks to earn extra credit:

- ✓ After a successful installation of DevStack and creating a compute instance on it, you'll understand that you cannot access the instances through SSH for networking issues. You'll need to configure your DevStack to provide **local** SSH access to instances from your **host** operating system ([hint](#)). Double credit goes to the projects that instances can be accessed through other physical computers.
- ✓ Instead of using DevStack to deploy OpenStack, use **ansible** to deploy an all-in-one OpenStack. Check [this](#) out!
- ✓ Deploy a near-production 2-node OpenStack using ansible (controller- compute). Get started from [here](#)!

Submission

Every student needs to complete this project on his/her own. There won't be any virtual submission, but you are required to deliver the project and make some tests in person on Aban 4th, 1398 at 12 P.M. Every student who is willing to deliver the project needs to send me an email including name and student ID by the end of the Mehr 29th. There will be a schedule stating the exact time of your delivery.

Please note that the project will not be accepted after the deadline and will not be extended!

Good Luck!



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References

- <https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/>
- <https://ubuntu.com/openstack/what-is-openstack>
- <https://docs.openstack.org/devstack/stein/>
- <https://docs.openstack.org/devstack/stein/guides/single-machine.html>
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- <https://docs.openstack.org/project-deploy-guide/openstack-ansible/stein/>