
Lab LINUX - Basic Usage of Linux and Openstack Lab Environment

Introduction and Prerequisites

This laboratory is to:

- Learn how to setup a Lab Environment on the Cloud
- Learn the basic usage of Linux on the command line terminal

The following resources and **tools are required** for this laboratory session:

- Any modern web browser.
- Any modern SSH client application:
 - Windows users¹:
 - ssh client (OpenSSL) in Powershell
 - Mac / Unix / Linux users: ssh and ssh-keygen commands are needed
 - OpenSSL packages provide these
- OpenStack Horizon dashboard: <https://ned.cloudlab.zhaw.ch>
- OpenStack account details: please contact the lab assistant in case you already have not received your access credentials.

Time

The entire session will take 90 minutes.

¹ Note that SSH is also available on Windows 10 through Windows Subsystem for Linux

Task 1: Setup a Lab Environment

- Navigate to the OpenStack Horizon dashboard: <https://ned.cloudlab.zhaw.ch> (start VPN if not at ZHAW facilities) and use your credentials to login to the OpenStack Horizon dashboard.
- **NOTE:** if it's the **first time you log in** and you are using the default credentials provided, remember to **change your password** (drop down menu on top right next to the user name -> "settings", then "change password" menu on the left)

Subtask 1.0

Watch the video instruction on Moodle and thereafter follow the instructions below.

Subtask 1.1 Keypairs

Two options exist, on using a key-pair generated on your local PC or one generated by OpenStack.

On OpenStack (recommended option)

Create an SSH key pair on OpenStack (under compute->keys) and download the private key (*.pem) to your machine.

Use your default ssh client (Win Powershell, Linux, Mac) to connect to the machine e.g.:

```
ssh -i .ssh/demo_bsy.pem ubuntu@160.85.37.195
```

Note: If you use Putty (unsupported in this lecture) on Windows you might need to convert the private (*.pem) key file into Putty's format (*.ppk). A guide on how to do this is here:

<https://www.puttygen.com/convert-pem-to-ppk>

- Convert the key to either SSH-1 or SSH-2 format (both should work)
- Use Putty to connect

On your local PC

- Windows users - use the Powershell ssh command
- Linux/Unix/Mac users
 - Use ssh-keygen system utility in a terminal window to generate a key-pair
 - Use RSA as key pair type
 - By default, the generated key pair can be found within your \$HOME/.ssh/ directory.
- The generated key pair has a public part (file typically ending with .pub extension) and a private part which is meant never to be shared with anyone.

Register your public key with OpenStack

- Register your created key pair with your account.
 - Use Compute → Key Pairs → Import Key Pair
 - Import as "text". A public key contains no carriage returns and should look something like this:

```
ssh-rsa
```

```
AAAAB3NzaC1yc2EAAAADAQABAAQCAQDA5vud1PbY84kwgoxnyqCpl6lYH78VegMs2AKCWgP9
..GqWrIDGxYF4FMiAkqS7X48a1K7i58TSF7tRh+FPvTb3F5KMcDvwRayZv3SfA/1HZOv77ID/i4NK7
nGge1Yy4LZQbM26TtUdwJ7u4RwIFJERyza5w== blabla@blabla
```

Subtask 1.2 Understanding Resource Usage and Quotas

- Go to Compute → Overview page,
 - Analyze what you see and discuss what quota is allocated for your project and how many VMs can you realistically create with such quota limitations.
 - Check how many resources are already used, e.g. by previous sessions.

Subtask 1.3 Create your VM

- Create the VM (Compute → Instances → Launch Instance) with a name of your choice, from a basic **Ubuntu** VM image (Boot Source → Image).
- Attach to the 'internal' network.
- Make sure the **ssh key** name and **security groups** (See instructions for NED on Moodle) are set correctly
- Launch the VM.
- Once the VM is created, Associate a Floating IP.

Subtask 1.4 Basic VM Management

- SSH to the VM² using your private SSH key. Create a file named "delta.txt"
- Try to stop and restart the VM
- Try suspending and resuming the VM.

Is the file that was created still available once the VM is SSH'ed into?

² The username is 'ubuntu' e.g. `ssh -i $PRIV_KEY ubuntu@$IP_ADDRESS`

Task 2: Linux Primer

- Navigate to the OpenStack Horizon dashboard: <https://ned.cloudlab.zhaw.ch> (start VPN if not at ZHAW facilities) and use your credentials to login to the OpenStack Horizon dashboard.
- Get familiar with all the Linux command line tools introduced during the Lecture.

Task 3: Cleanup - Stop the bills!

As Cloud Computing, IaaS in our case, is pay per use, you would be billed while your resources are created - even if not used. Prompt deletion of unused resources is a must. Otherwise you would pay for things that you are not using! The resources to be cleaned up include:

- Delete the VM.

Additional Documentation

- OpenStack Horizon documentation can be found on the following pages:
 - User Guide: <https://docs.openstack.org/horizon/latest/>