Lab - Getting Started with OpenStack

# Lab Purpose

This lab will help you get familiar with the OpenStack based lab environment.

# Learning Outcomes

1. Basic understanding of an Infrastructure as a Service (IaaS) cloud management platform such as OpenStack
2. Familiarity with the “Horizon” self-service dashboard interface accessible through the browser
3. Ability to launch a simple test virtual machine instance
   1. Creating key-pair
   2. Selecting “flavors”
   3. Use a cloud-init injection script to allow the user to login to the instance from the browser console
   4. Creating a network on which the instance will be launched
   5. Accessing the Virtual Machine through the browser using HTML 5 consoles

## Relevant NICE Cybersecurity Framework Version NIST 800-181, TASKS and KSAs (<https://www.nist.gov/itl/applied-cybersecurity/nice/resources/nice-cybersecurity-workforce-framework>)

|  |  |
| --- | --- |
| **TASK(S)** | T0489 |
| **Knowledge ID** | K0056, K0230, K0056, K0336, K0610 |
| **Skill ID** | S0073 |
| **Ability ID** |  |

# Prerequisites

## Environment

1. You should have already received instructions on logging into the lab environment from your instructor
2. Any computer with Internet access should work. Latest versions of Chrome and Firefox browsers are preferable.

## Background Knowledge

1. Familiarity with virtualization concepts and basic working knowledge of Linux command line will be beneficial but not required.

# Lab Task 1: Login and explore the Horizon dashboard

1. In your web browser address bar, enter the URL for the OpenStack Horizon Dashboard. This will be provided by your instructor or the system administrator (sysadmin).
2. Enter the Domain, User Name, and Password provided by the instructor/sysadmin and click on “Connect”.
3. You should now see the OpenStack Horizon Dashboard.

# Lab Task 2: Launch an instance

## Familiarize with the OpenStack Horizon Dashboard

1. On the left-hand side will be several drop-down menus.
2. Spend a few minutes navigating through the menus to become familiar with where to find various functions you may want to perform

## Create a Virtual Network

1. Navigate Project🡪 Network🡪 Networks
2. Click on “Create Network”
3. Enter a name for your network (for example: “student1 network”) and leave the other parameters the same (make sure “Create Subnet” has a checkmark). Click “Next”.
4. Give the subnet a name (for example: “student1 subnet”). Enter a Network Address in CIDR (Classless Inter-Doman Routing) format. This should be a network prefix designated for private intranets. For example: 192.168.0.0/24 (see “Further Learning/Links/Resources” below)
5. Leave the other parameters unchanged and advance to the next screen. Ensure that DHCP is enabled and proceed to create the network.

## Spin up an instance of Ubuntu Linux

1. Navigate Project🡪 Compute🡪 Images
2. Locate Ubuntu Server image in the list
3. Click on the “Launch” button on the right-hand side
4. Give the instance you are about to create a name. Your sysadmin will tell you which Availability Zone to use but mostly likely you will leave the zone unchanged.
   1. Leave the Count set to 1 (that is we are launching only 1 instance).
5. Set the “Select Boot Source” option to “Image”. “Create New Volume” should be “No”. Proceed to the next screen.
6. You will now select a pre-set resource allocation for your instance called a flavor. Your sysadmin will recommend a flavor. For Ubuntu Server, a flavor with 1 GB of RAM and disk space of at least 10 GB should be sufficient.
7. On the next screen, select the network you created in previous steps. Proceed through the next two screens as no configuration is necessary.
8. You are now at the key-pair generation option which allows Secure Shell (SSH) access into the virtual machine. While importing your own pre-generated key-pair is an option, most students will choose to create a key pair. You will be given the option of downloading the private key. You should do so and save it in a place it can be found. You will use it for future lab assignments. The key pair will be automatically added to your instance configuration.
9. On the next screen, create an cloud-init injection script that will permit logging into the Ubuntu instance from the web browser console. Type or cut-and-paste the following script into the “Customization Script” textbox:

**#cloud-config**

**password: mypassword**

**chpasswd: { expire: False}**

**ssh\_pwauth: True**

Please note that the spaces are important. You may change “mypassword” to the password of your choice.

10. You are now ready to spin-up the instance! Click on “Launch Instance” to proceed.

11. Navigate Project🡪 Compute 🡪 Instances.

12. You see your newly created instance running. When the status of the instance is shown as “Active” (you may need to refresh your browser) and Power State as “Running”, you are ready to login

13. Click on the name of your Instance, and select the “Console” tab

14. You are now at the login for the Ubuntu instance. The username will be: “ubuntu”. The password will be what you made it in the injection script.

# Submission Instructions

This lab has no submission requirements.

# Further Learning/Links/Resources

1. <https://docs.openstack.org/horizon/latest/user/log-in.html>
2. <https://docs.openstack.org/horizon/latest/user/launch-instances.html>
3. <https://www.arin.net/knowledge/address_filters.html>

End of Lab