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| --- | --- |
| IST198  Administration | Version 6: 2017-08-15 |
| These exercises will guide the student through the concepts and topics learned in chapter 4, launch a Linux instance in Mitaka installed on CentOS 7. | Create a Key Pair and Launch a CentOS 7 Instance. |

**Attributions:**

This material is based upon work supported by the National Science Foundation under Grant No. (NSF 1601166).

C:\Users\ronaldsharman\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\OpenStack_Logo_Horizontal.eps Portions of this document, in whole or part, were sourced from the website at https://www.openstack.org

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**Introduction**

You have been hired as an intern with CLOUDTech Inc. CLOUDTech is a Cloud Computing consulting firm and Cloud Provider supporting thousands of clients in the region. The company provides a wide range of services to support migrating client Information Technology infrastructure to a Private, Hybrid or Public Cloud environment. You learned that the company has multiple departments and you will start your internship working with the Cloud hosting department customer support team.

The Cloud hosting department provides multiple platform and vendor Cloud hosting services for Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS) and many other as a service offerings. The support team is responsible for helping customers with any issues related to their Cloud infrastructure hosted at and provided by CLOUDTech.

You will perform hands-on exercises to learn about the Cloud implementation CLOUDTech uses to host customer Cloud environments.

**Lab Objectives**

**Learner will be able to:**

* Create a Key Pair and Launch a CentOS 7 Instance from the Dashboard

**Labs 9-10**

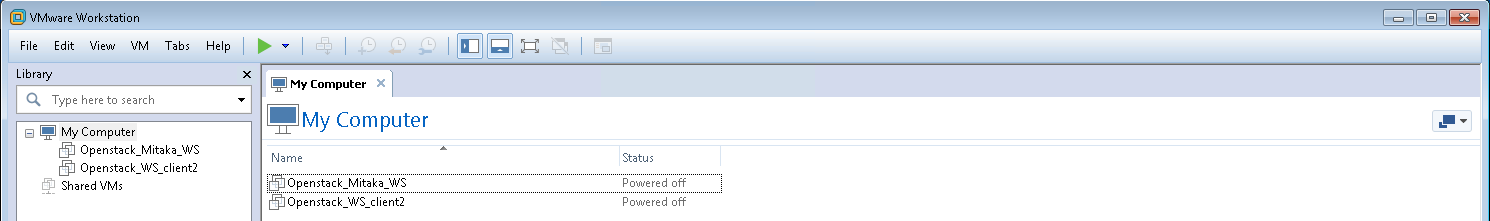
These labs will guide the student through creating a Key Pair and launching a CentOS 7 Instance using the Dashboard.

**(Note: This lab is designed to be completed on an NDG NETLAB System with the IST198\_\_HXXX POD installed. The labs can also be completed on a physical machine with the appropriate software packages installed, or a PC that has VMware Workstation installed with the appropriate virtual machines configured).**

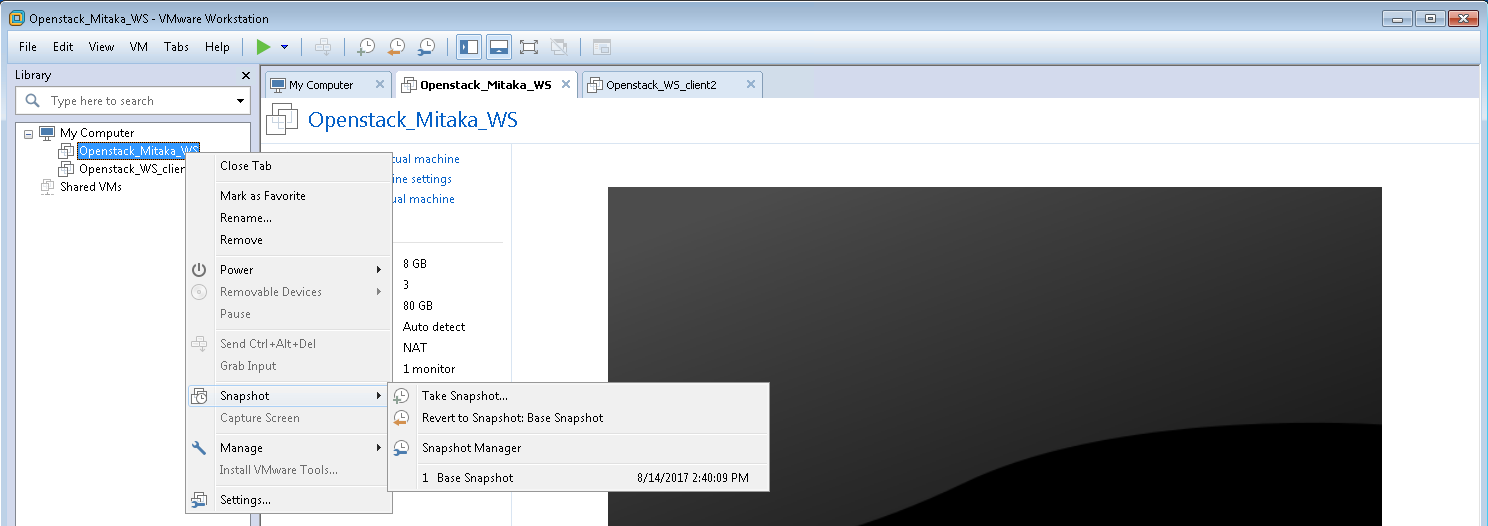
**Prepare the OpenStack Virtual Machines**



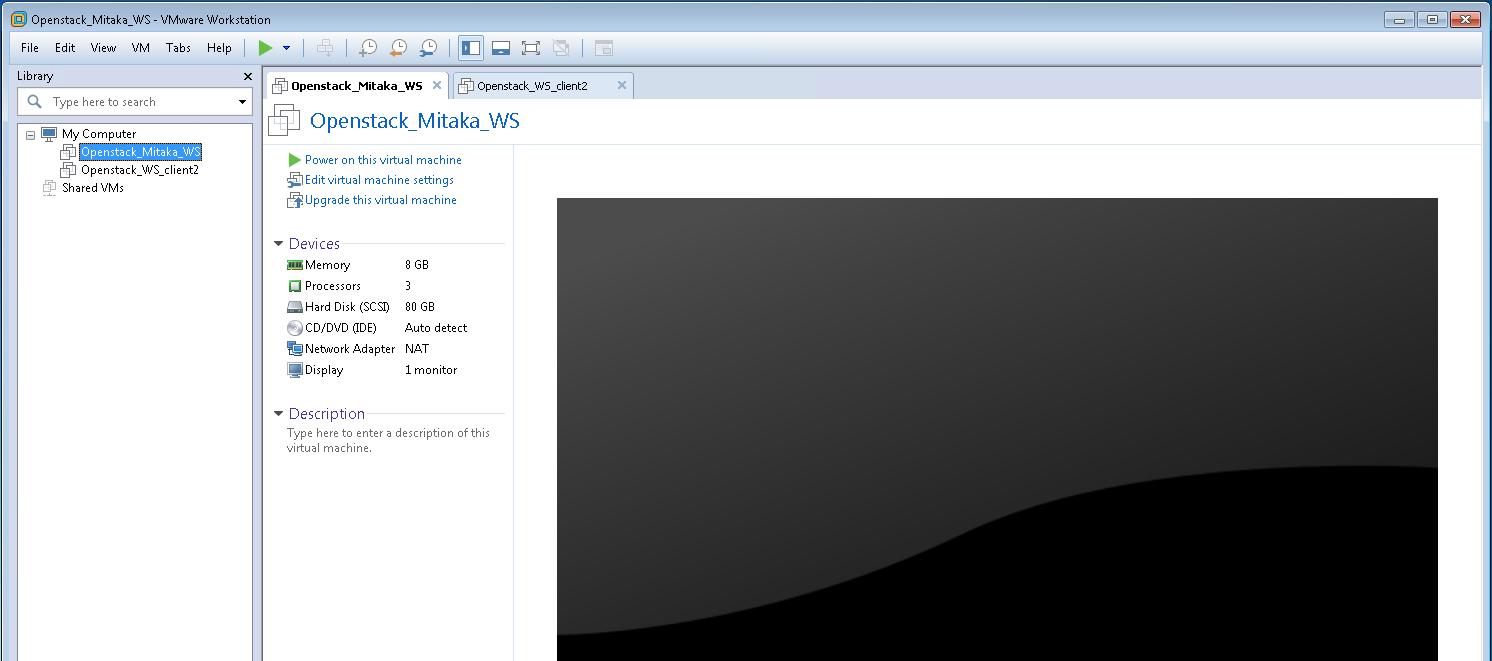
1. **Launch** the **VMware Workstation Pro application**



1. Workstation should have two virtual machines (VM) installed; Openstack\_Mitaka\_WS and Openstack\_WS\_client2.

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1. Ensure that the Openstack\_Mitaka\_WS is at the correct starting point by reverting to the base snapshot. Right Click on Openstack\_Mitaka\_WS then Snapshot>Base Snapshot. Repeat for the Openstack\_WS\_client2 VM.

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1. **Power on** both VMs by selecting one of the two VMs and **clicking** on **Power on this virtual machine**. Repeat for the other VM.

**Lab Scenario**

As part of CLOUDTech’s customer support team, this is your second field visit to XYZ Company. During this visit, you will assist the customer in creating a Key Pair and launching their first cloud instance, a CentOS 7 server.

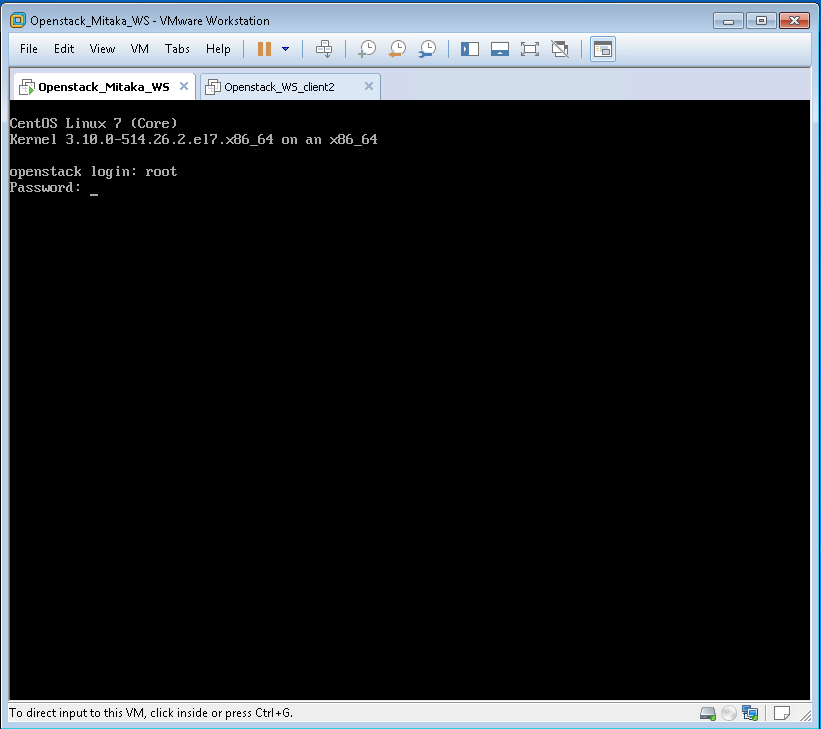
**Lab Settings**

The information in the table below will be needed in order to complete the labs. The task sections that follow provide details on the use of this information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Virtual Machine (VM)** | **IP ADDRESS** | **Account** | **Password** | **VM Type** |
| Client2 | 10.220.0.2 | Student | P@ssword | CentOS 7 Client |
| Server1 | 10.220.0.30 | root | P@ssword | Mitaka |
| Dashboard | 10.220.0.30 | Student | P@ssword | Web Page Login credentials |

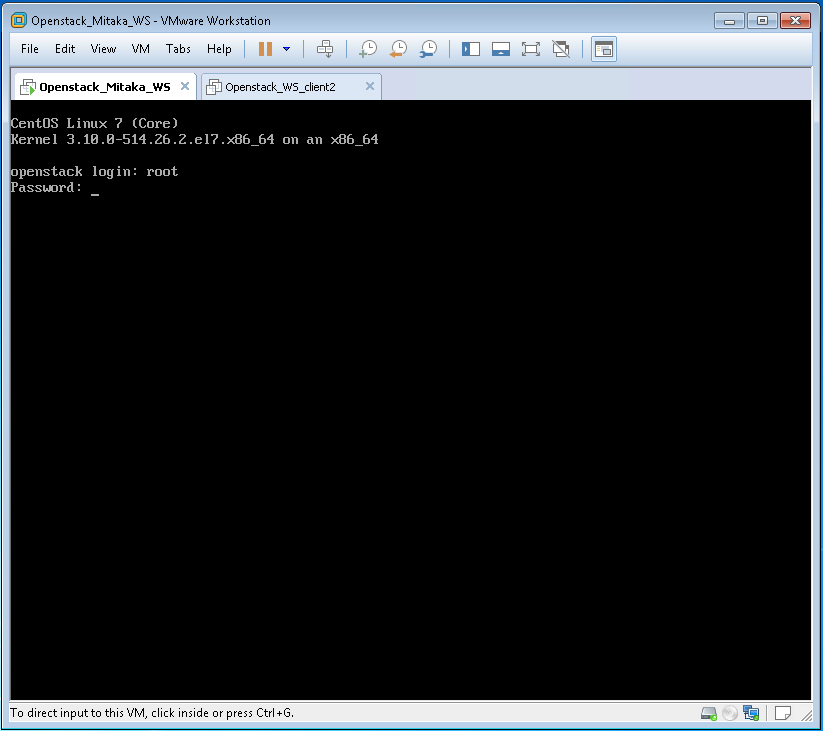
Note: In this OpenStack VMware Workstation environment, the two VMs can be reverted back to their base snapshot at any time. This means that you can explore or experiment without fear of permanently damaging the OpenStack environment. If you make a mistake that you can’t recover from, then stop and revert the appropriate VM to the base snapshot and everything will be back to a known good starting point.

**Run the lab setup script**

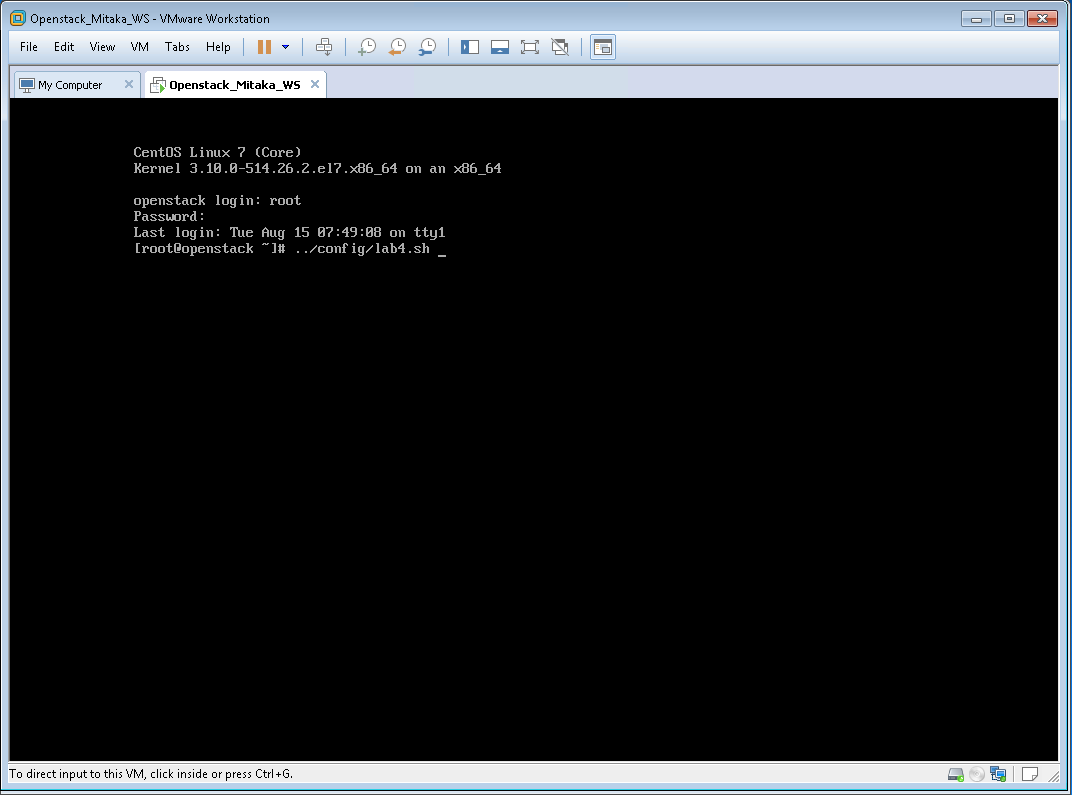
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1. Log in as **root** with the Password: **P@ssword**

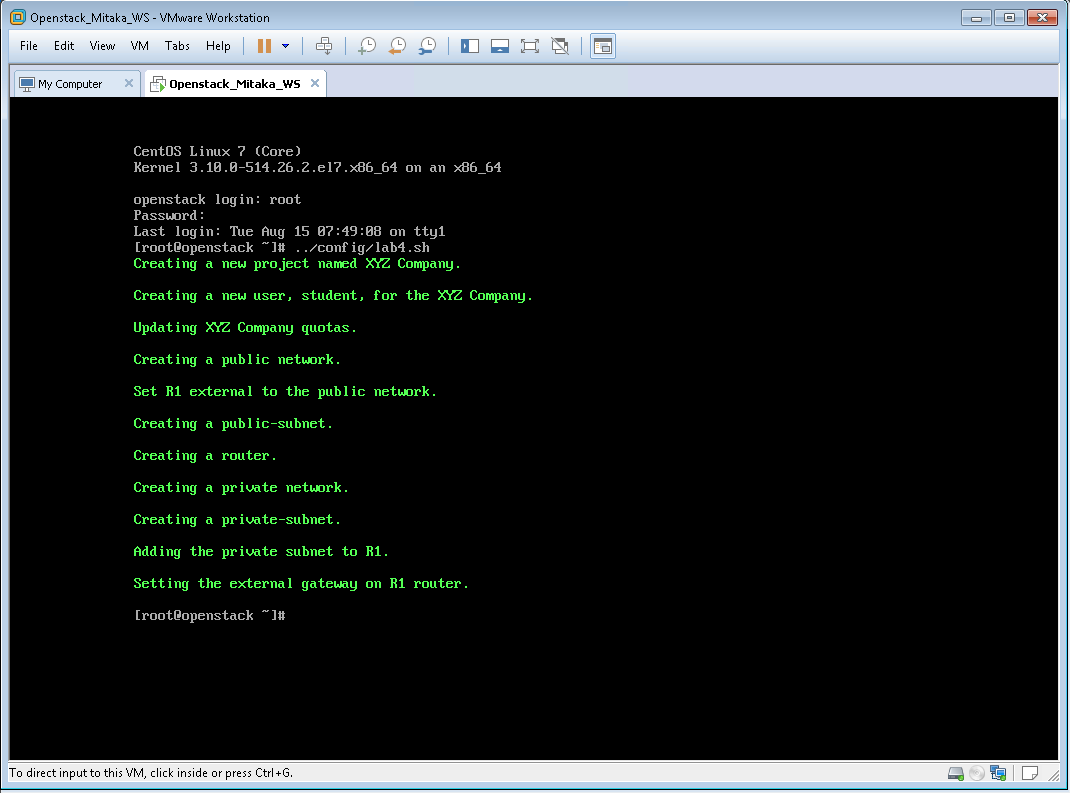
Note: The password is NOT visible as you type it

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1. After successfully logging in as root, you should see this screen. Continue to the next page

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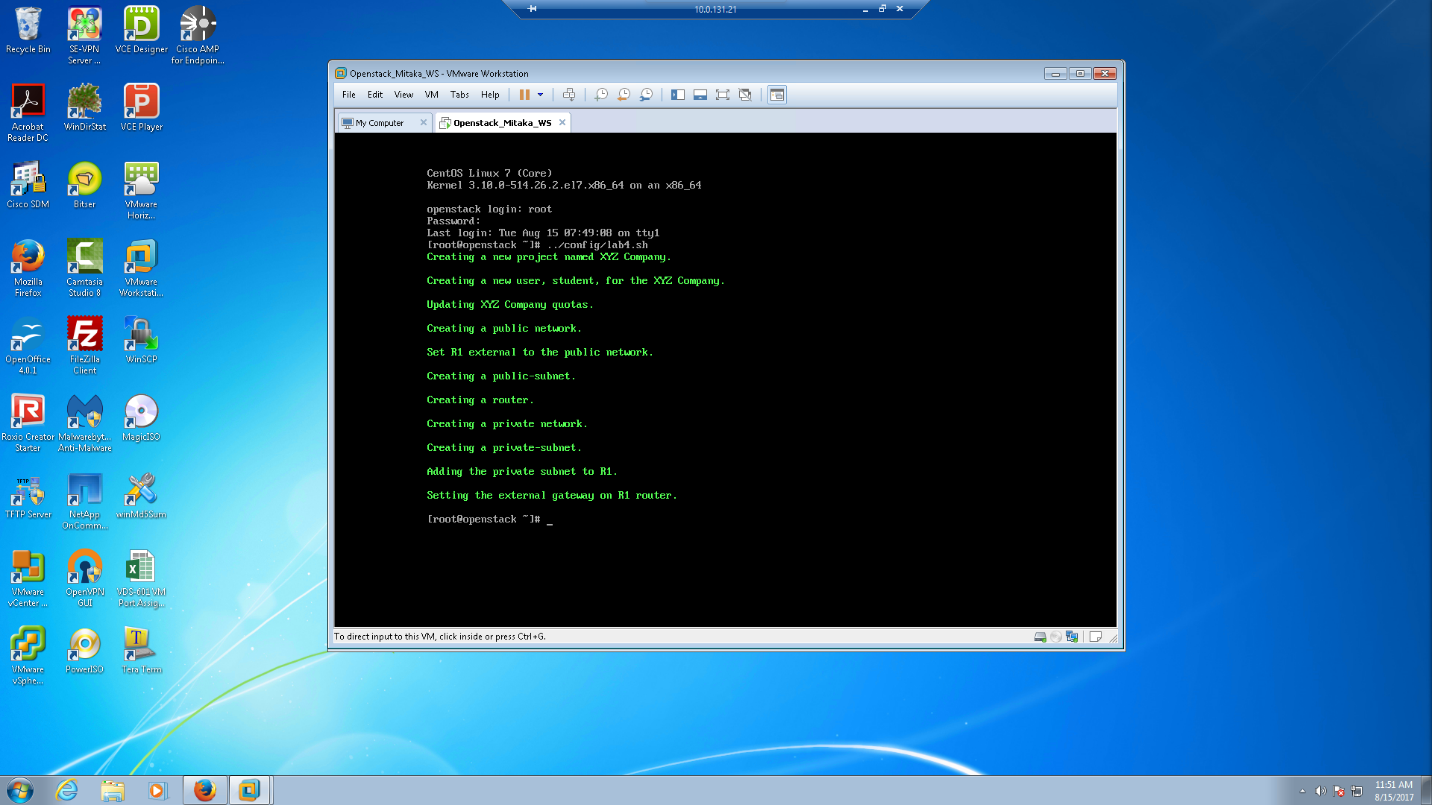
1. Type the command; **../config/lab4.sh** and **press Enter** as shown in the screen capture above to run the Module 4 setup script



1. After the setup command completes, you can **minimize VMware Workstation.**

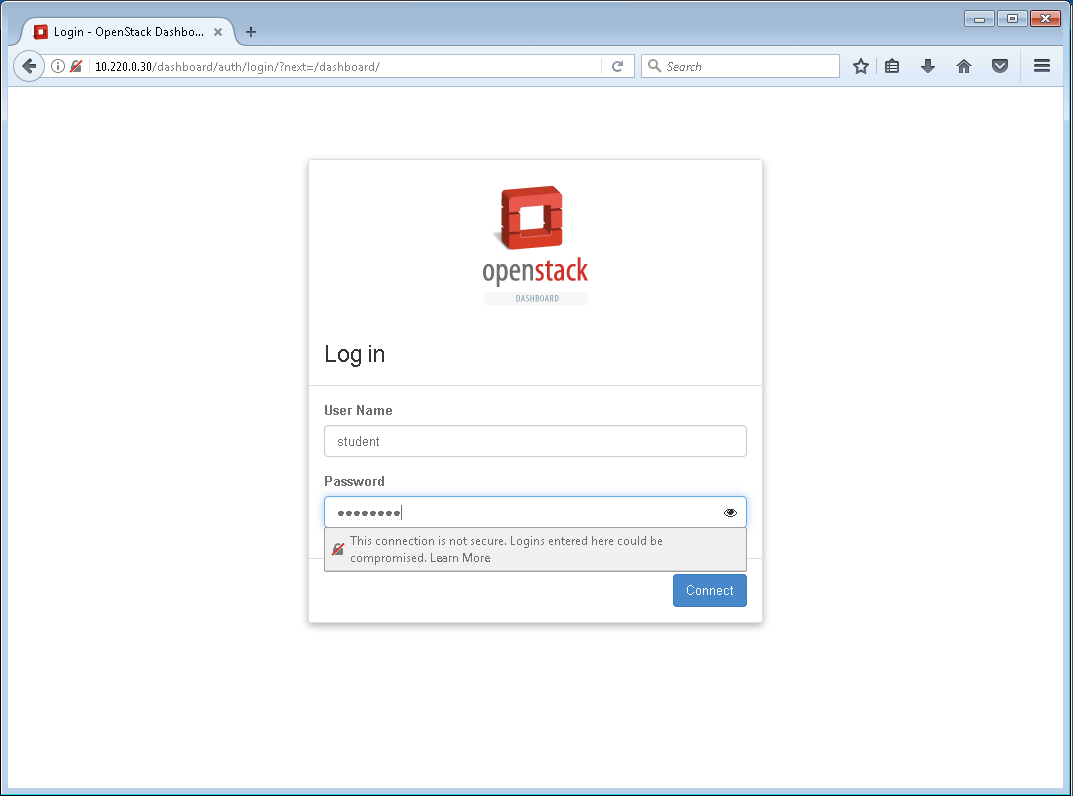
Note: The script is complete when the **[root@openstack ~]#** prompt returns

**Access the OpenStack Dashboard**

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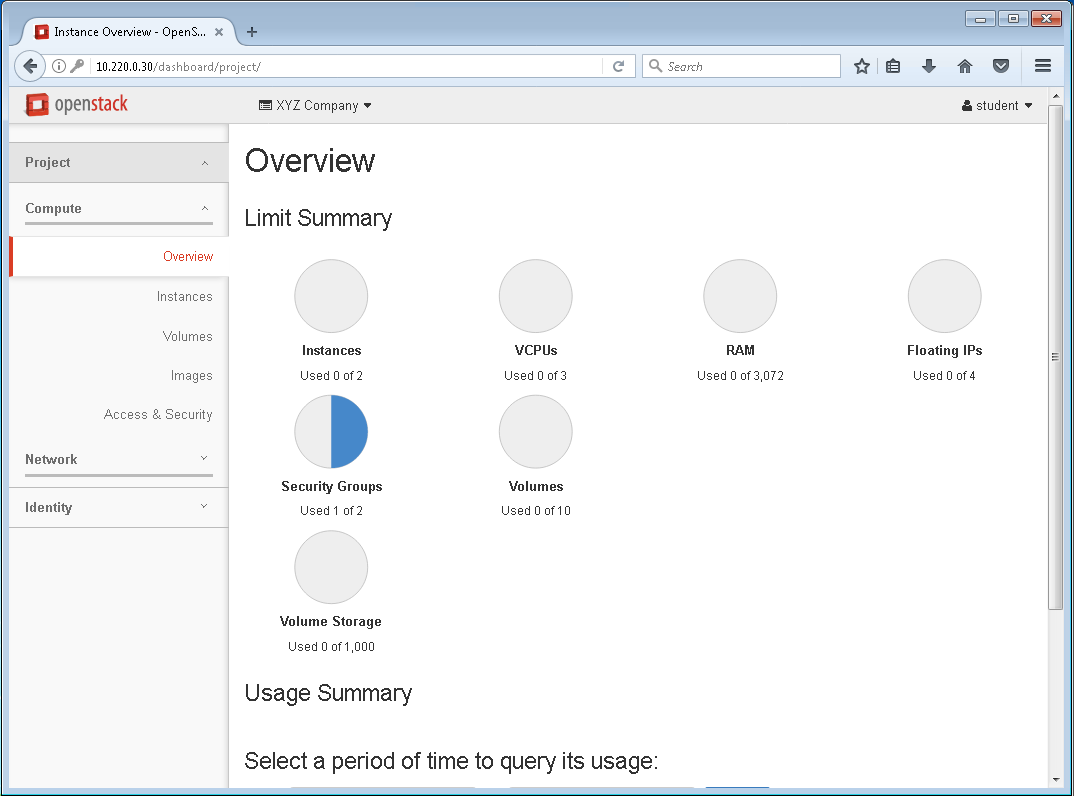
1. On your host, open an internet browser

Note: Openstack\_WS\_client2 is a CentOS 7 desktop VM that you can use as an alternate to the host to accomplish all of the labs, unless specifically noted in the instructions.

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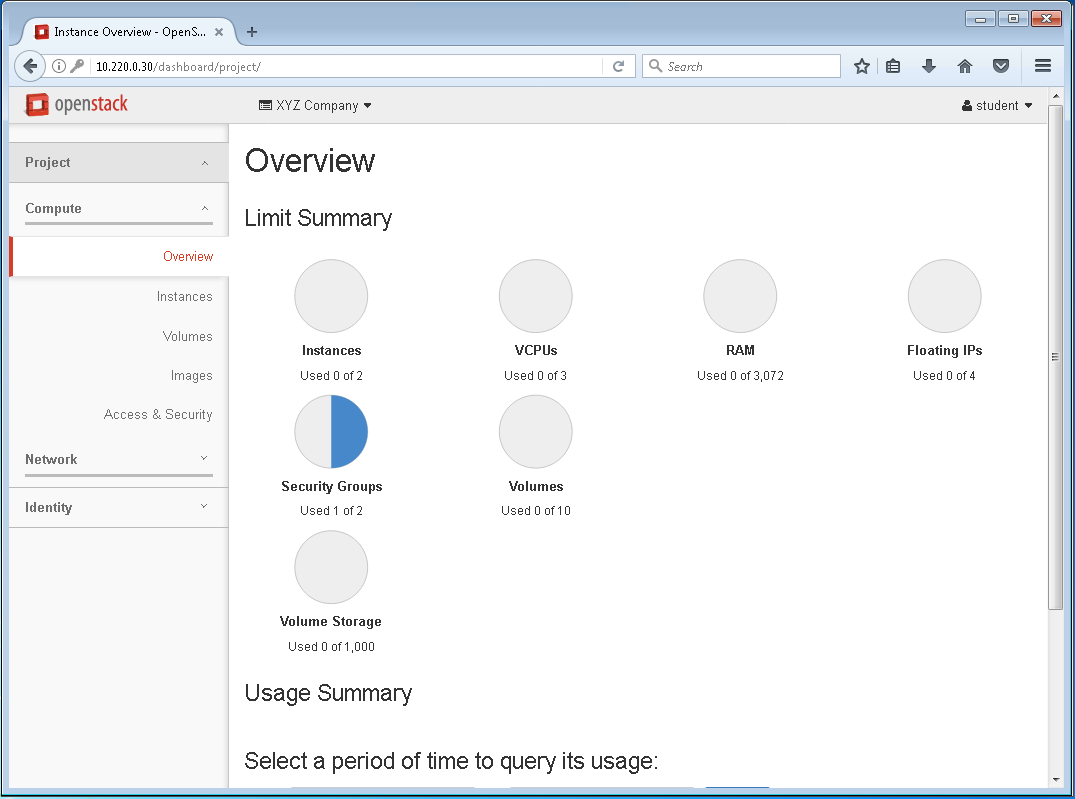
1. **Navigate** to **http://10.220.0.30/dashboard. Login** to the OpenStack Dashboard with the username **student** and **P@ssword** and press **enter** or **click Connect**

Note: User Name entries are not case sensitive, passwords are.

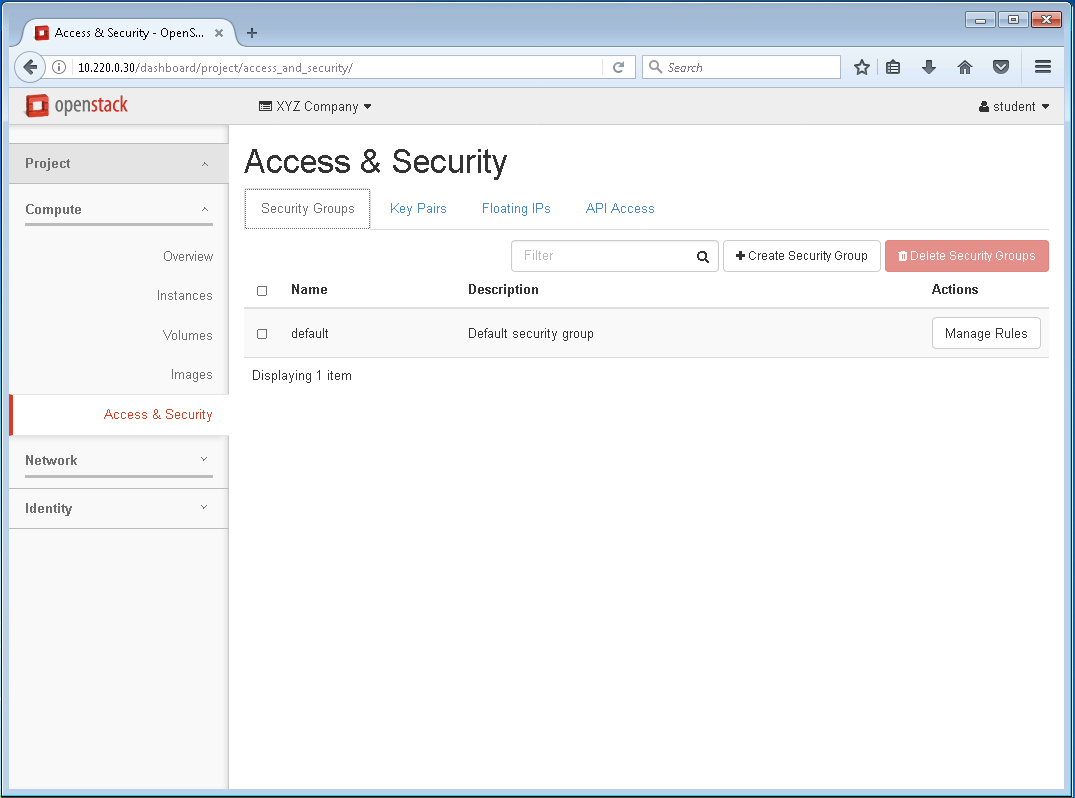


1. This is the homepage of the OpenStack Dashboard as seen from the XYZ Companies’ customer perspective.

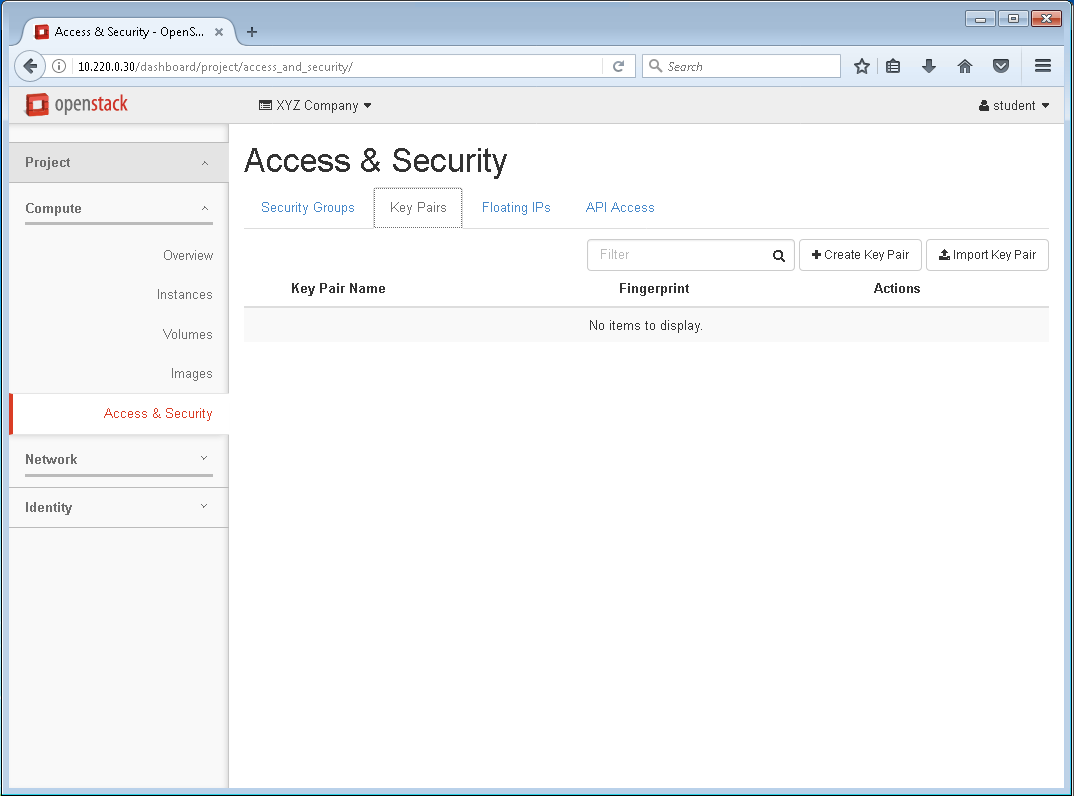
**Lab 9: Create an OpenStack Key Pair**

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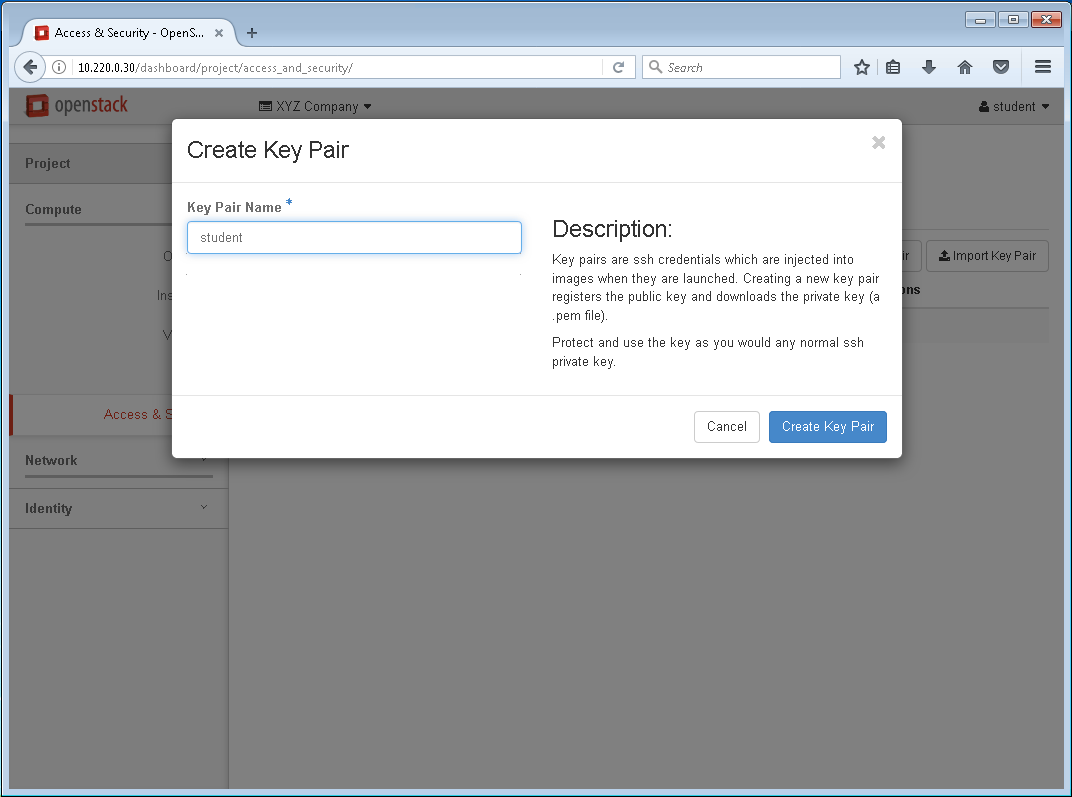
1. From the Compute tab, **Click** on **Access & Security**



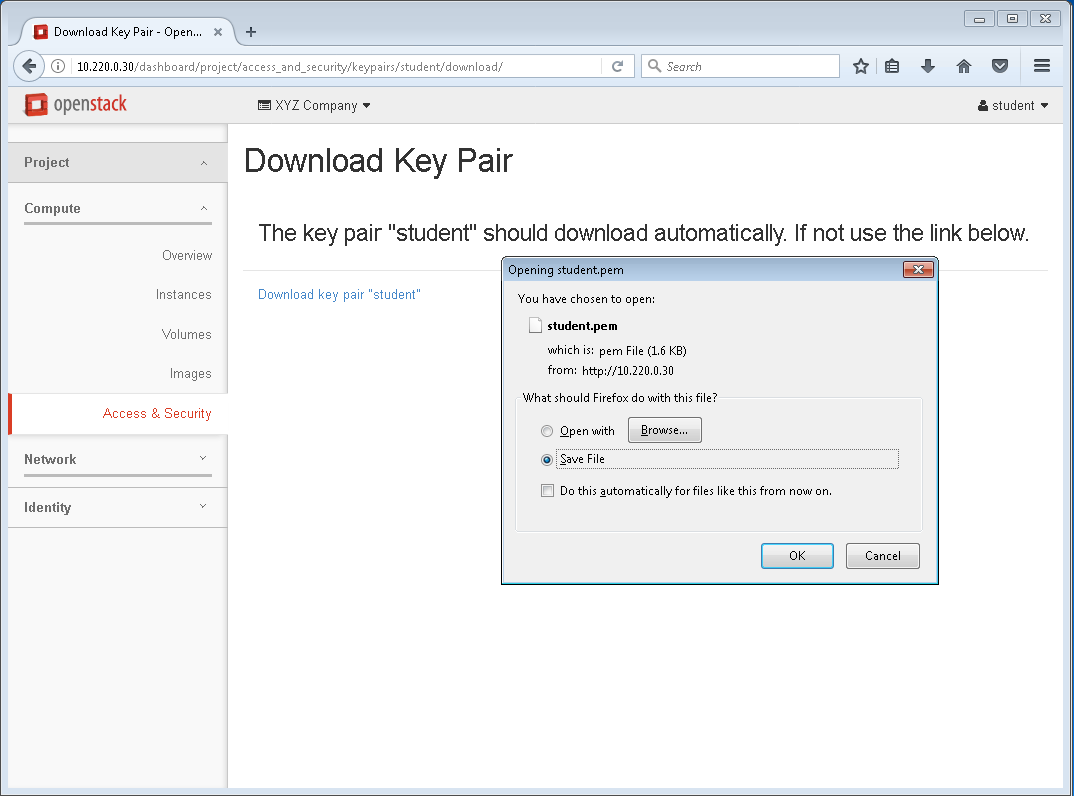
1. **Click** on **Key Pairs**



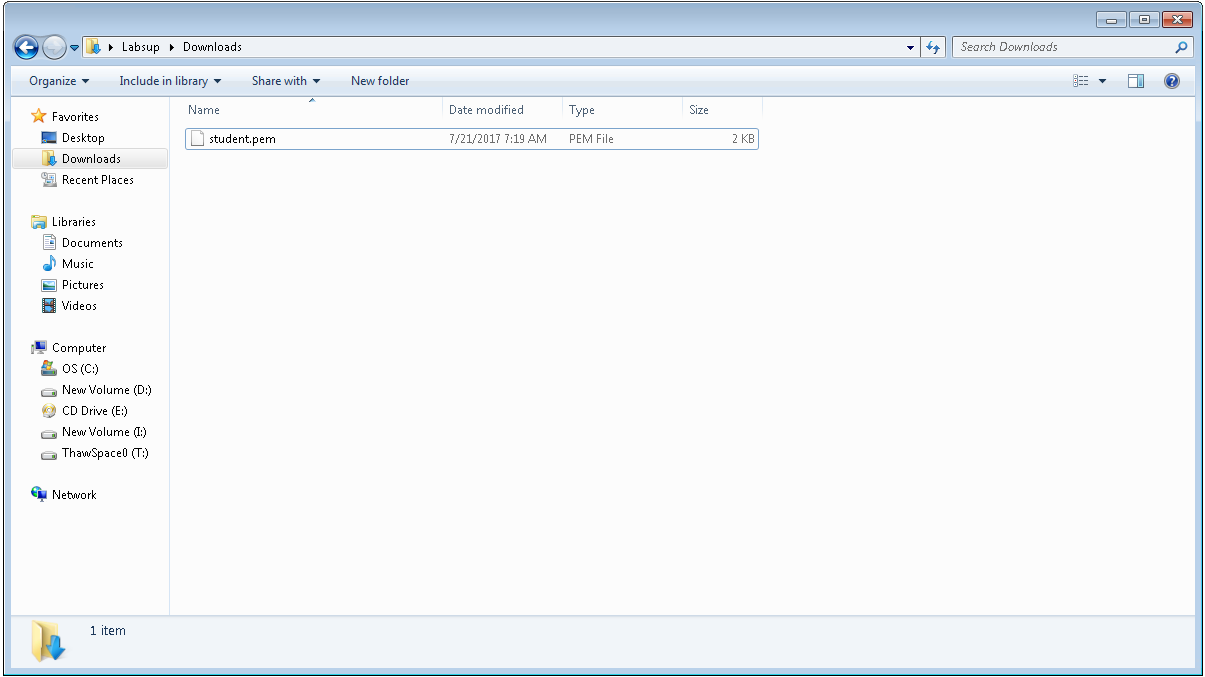
1. **Click** on **Create** **Key Pair**



1. **Enter** “**student**”in the **Key Pair Name** block. **Click Create Key Pair**.



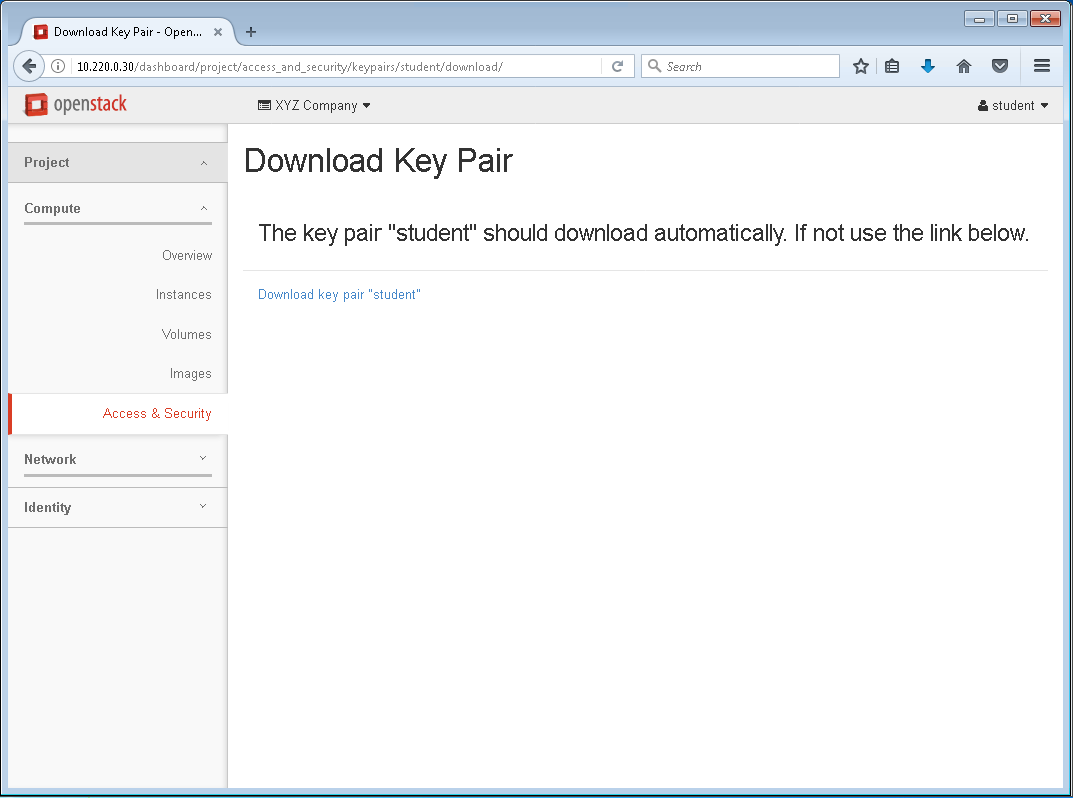
1. You should see a windows popup asking if you want to open or save the student.pem (1.64KB) from: http://10.220.0.30? **Click** on **Ok**



1. **Check** the **Downloads folder** on the **host PC** for the **student.pem file**

Continue to Lab 10

**Lab 10: Launch a CentOS 7 Instance**



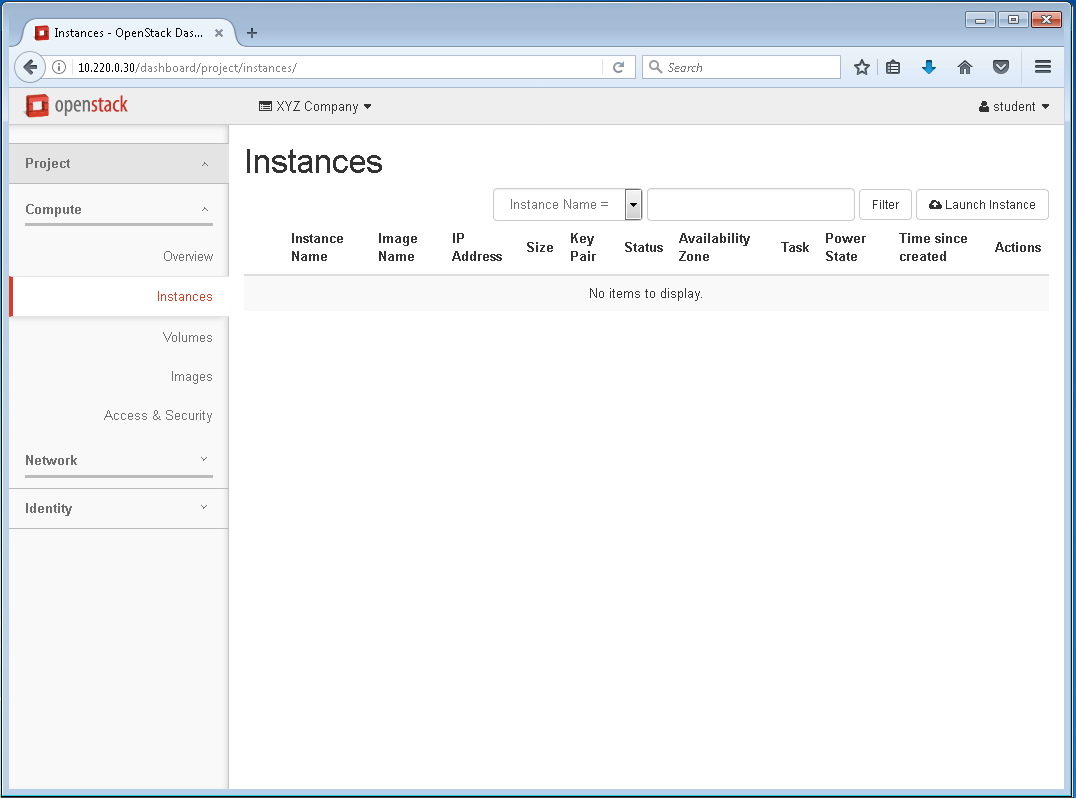
1. **Click** on the **Instances** tab.

Note: Although the customer has only one Project, **XYZ Company**, you should always ensure that you have selected the correct project, before you start making any changes.

Virtual Machine Image

A virtual machine image is a single file which contains a virtual disk that has a bootable operating system installed on it. The image files come in different formats, for example: AKI/AMI/ARI, ISO, OVF, QCOW2, RAW, VDI, VHD, VHDX, and VMDK to name a few. Most of these disk formats are specific to an entities such as Amazon, Microsoft, VMware, Virtual Box, and open source Linux Hypervisors.

We will be using the QEMU copy-on-write version 2 (QCOW2) disk format exclusively throughout this course.



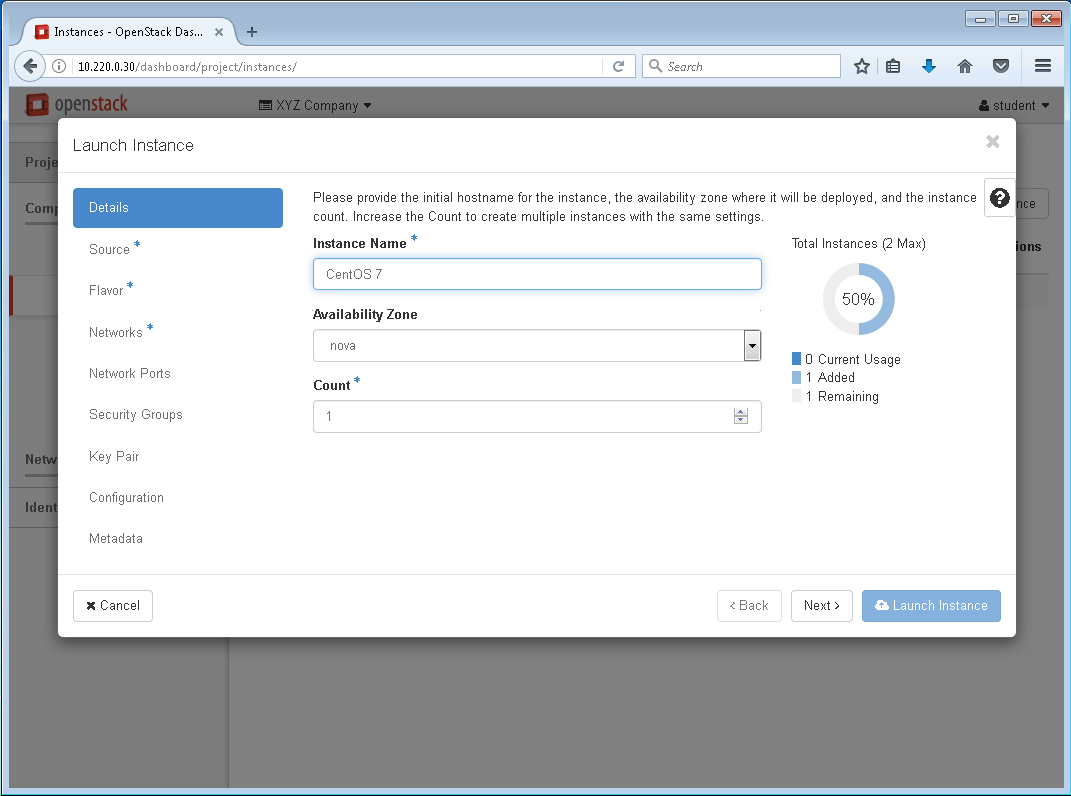
1. **Click** on **Launch Instance**

Virtual Machine Image

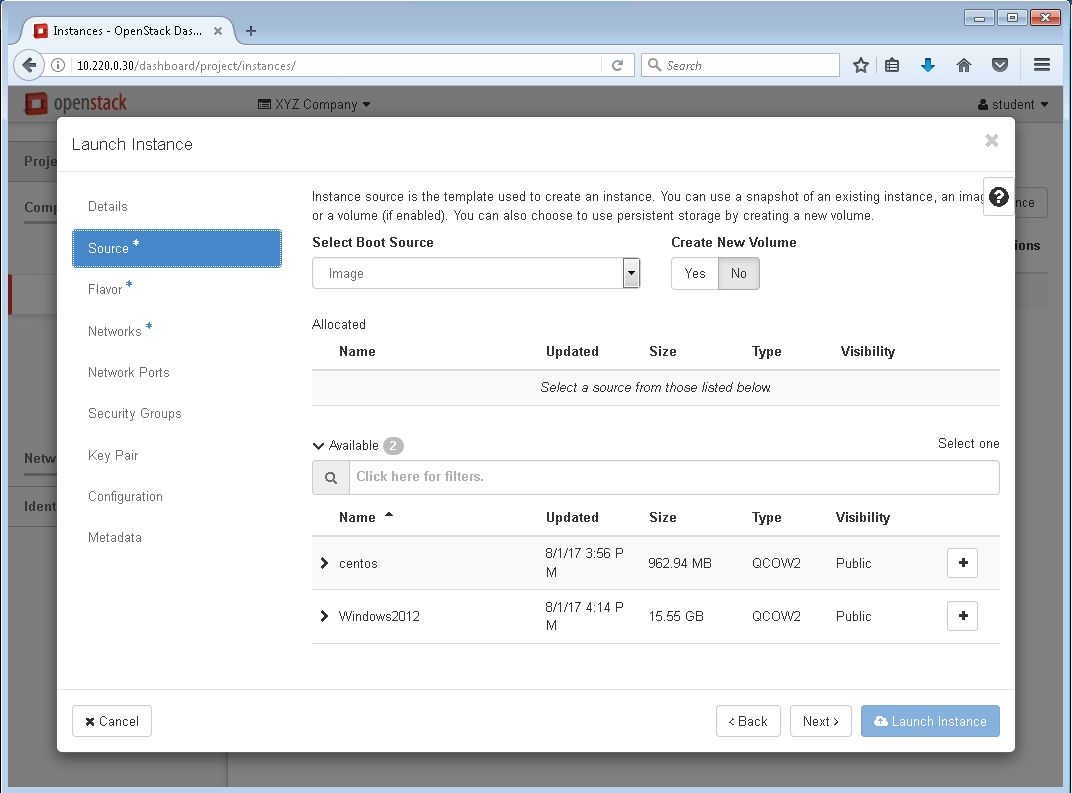
Virtual machine images are available from numerous sources for download, which include open source, commercial vendors, or can even be created by the user.

For example: Open Source CentOS 7 images can be downloaded from the following URL: http://cloud.centos.org/centos/7/images

Windows Cloud Images (Evaluation) from the following URL: https://cloudbase.it/windows-cloud-images/

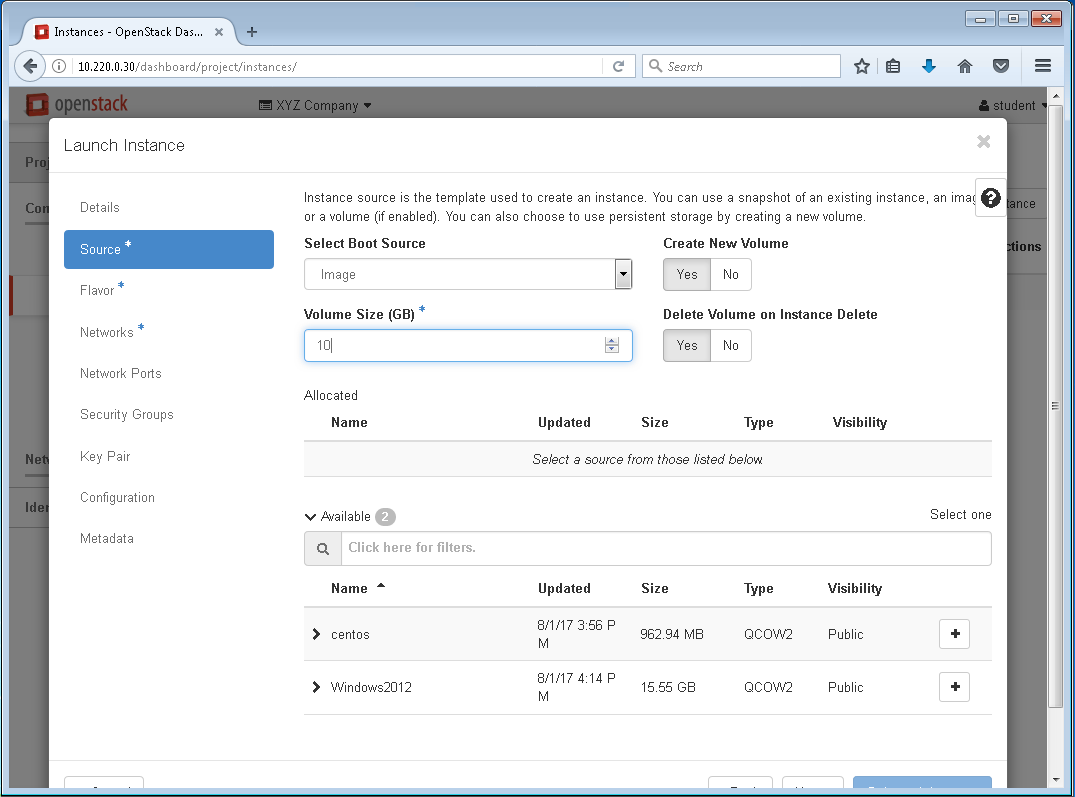


1. The **Launch Instance** wizard should open, **Enter** **CentOS 7** the Instance Name block and keep the **default Availability Zone** and **Count**. **Click** on the **Source** tab.

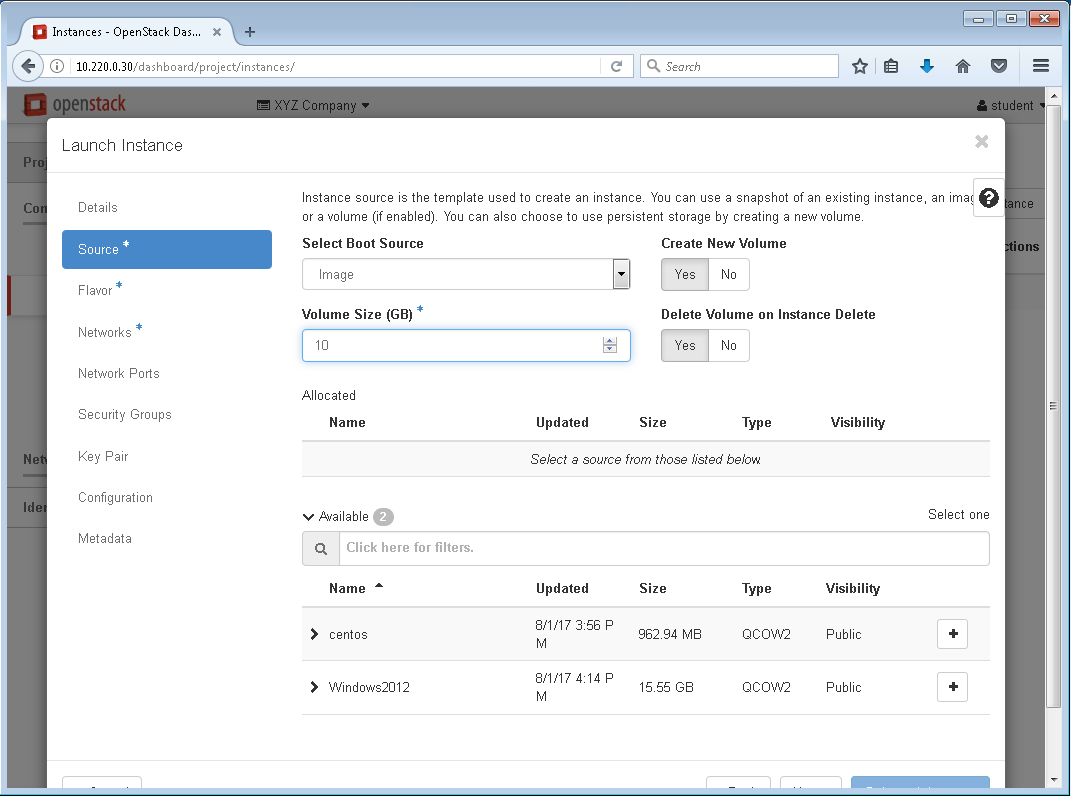


1. **Accept** the **default Image** for the **Select Boot Source** and **click** on **Yes** to **Create New Volume**

Note: The instance can launch successfully without selecting Create New Volume, but using the create new volume feature allows for automatically deleting the volume with the instance whereas launching an instance without selecting create new volume requires that the administrator manually recover the disk space, which is not shown in this series of labs.

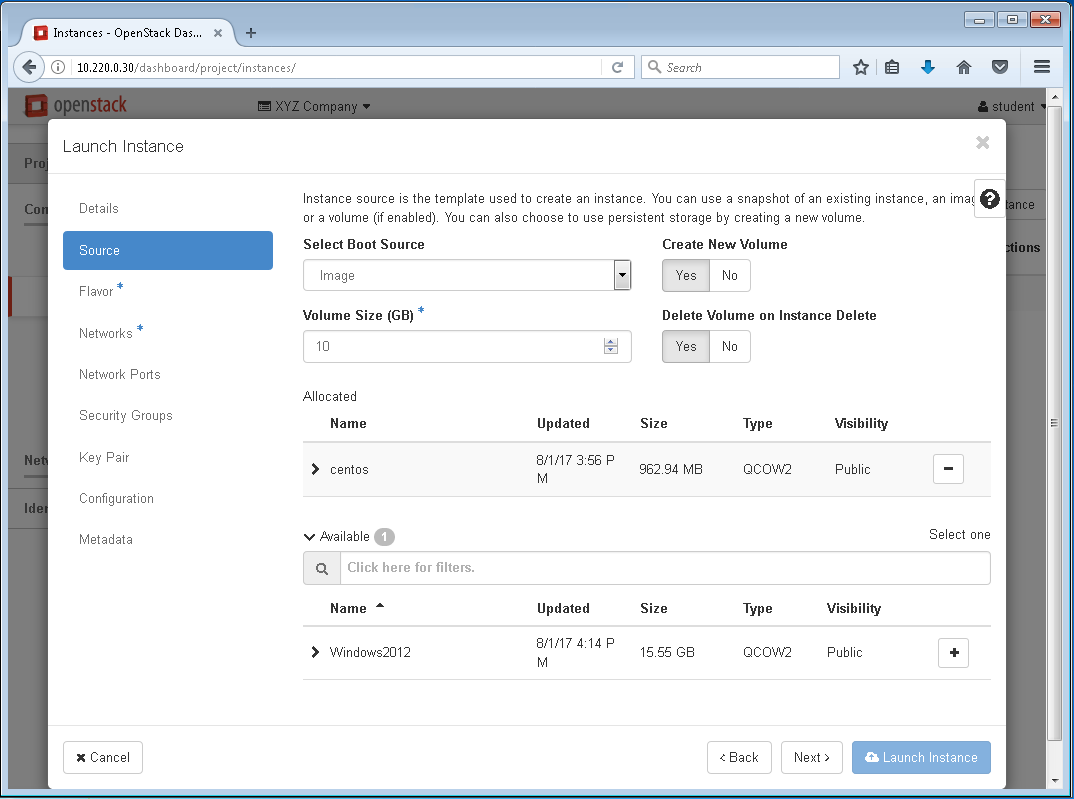


1. **Change** the **default Volume Size (GB)** from 1 to **10** and **Click** on **Yes** to **Delete Volume on Instance Delete**

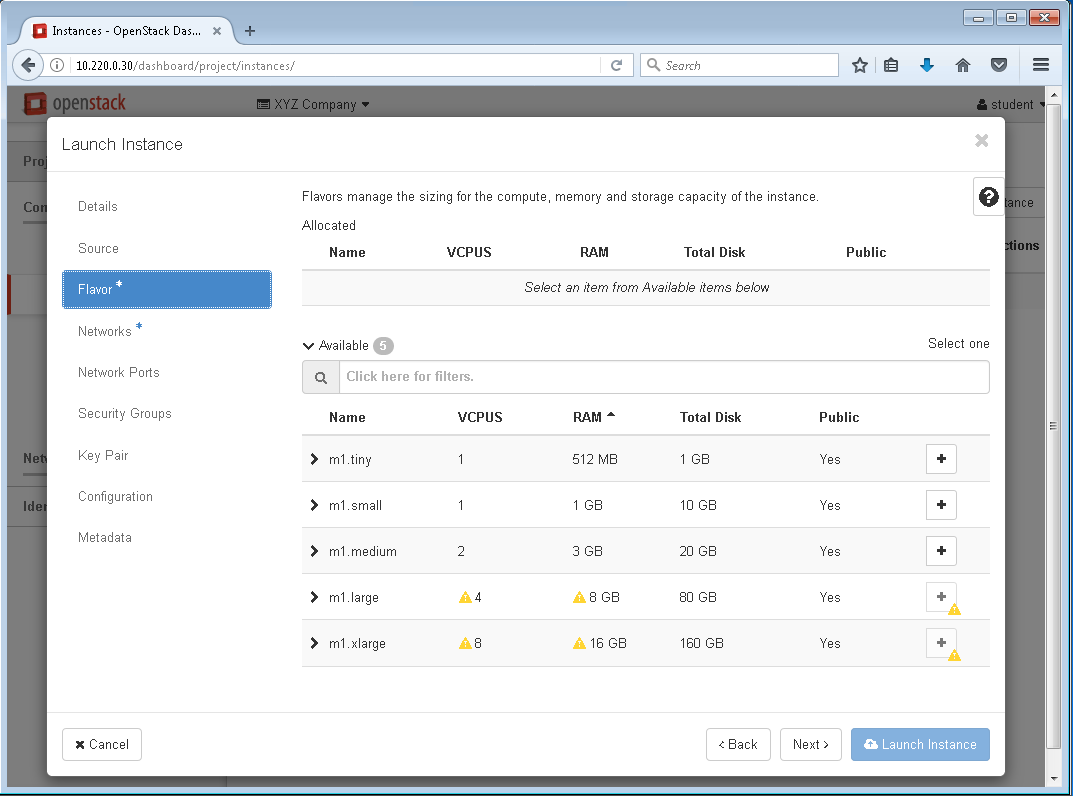
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1. **Click** on the **+** iconto **select** the **centos image**

Note: You can see information about when the image was updated, its size, type and visibility. CLOUDTech set the Visibility to Public as contracted for by XYZ Company.



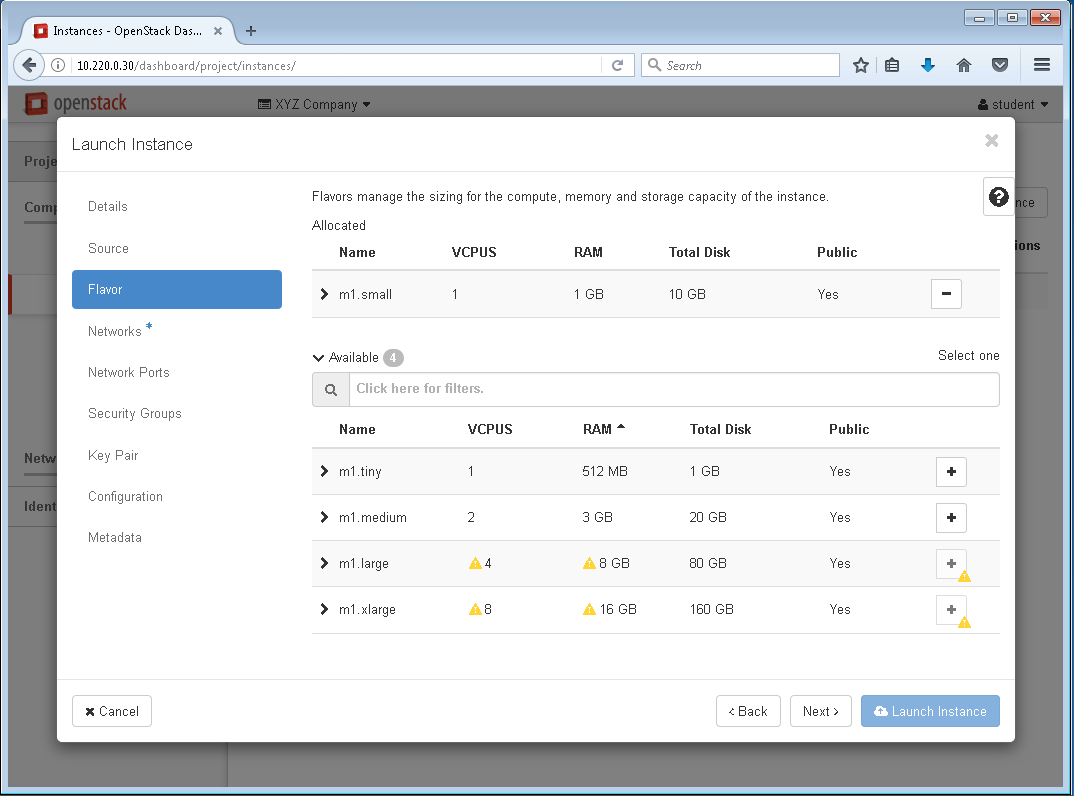
1. **Click on** the **Flavor** tab.



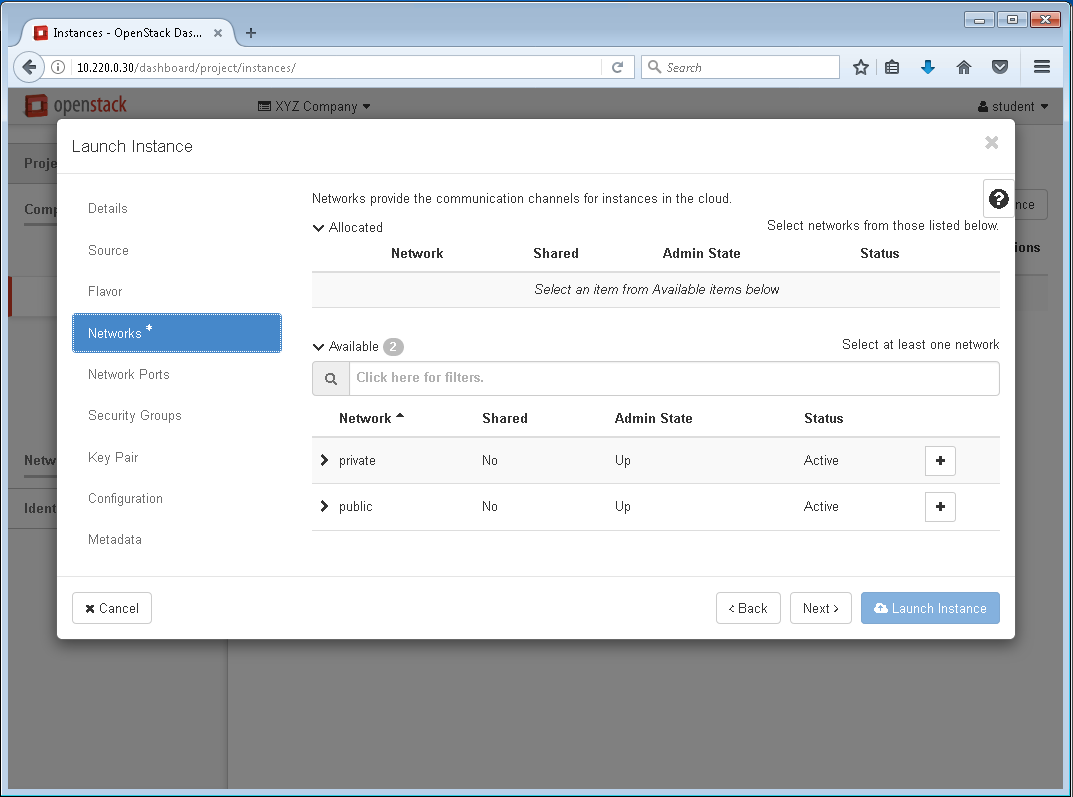
1. Flavors manage the sizing for the compute, memory and storage capacity of the instance. In this case they range from tiny to xlarge. If you hover your mouse over the yellow triangle, you will see that the large and xlarge require more resources then XYZ Company’s quotas permit. For this instance, **Click** on the **+ tab** to move the **m1.small** flavor to the Allocated block above, shown on next page.

Flavor

Flavors define the compute (VCPUS), memory (RAM), and storage capacity (Total Disk), resources of the virtual machine, and whether the flavor is public (available to others users). Having a variety of flavors available, allows a more efficient use the total amount of resources contracted for with CLOUDTech.



1. You can see that the m1.small flavor has moved to the **Allocated** block. **Click** on the **Networks** tab

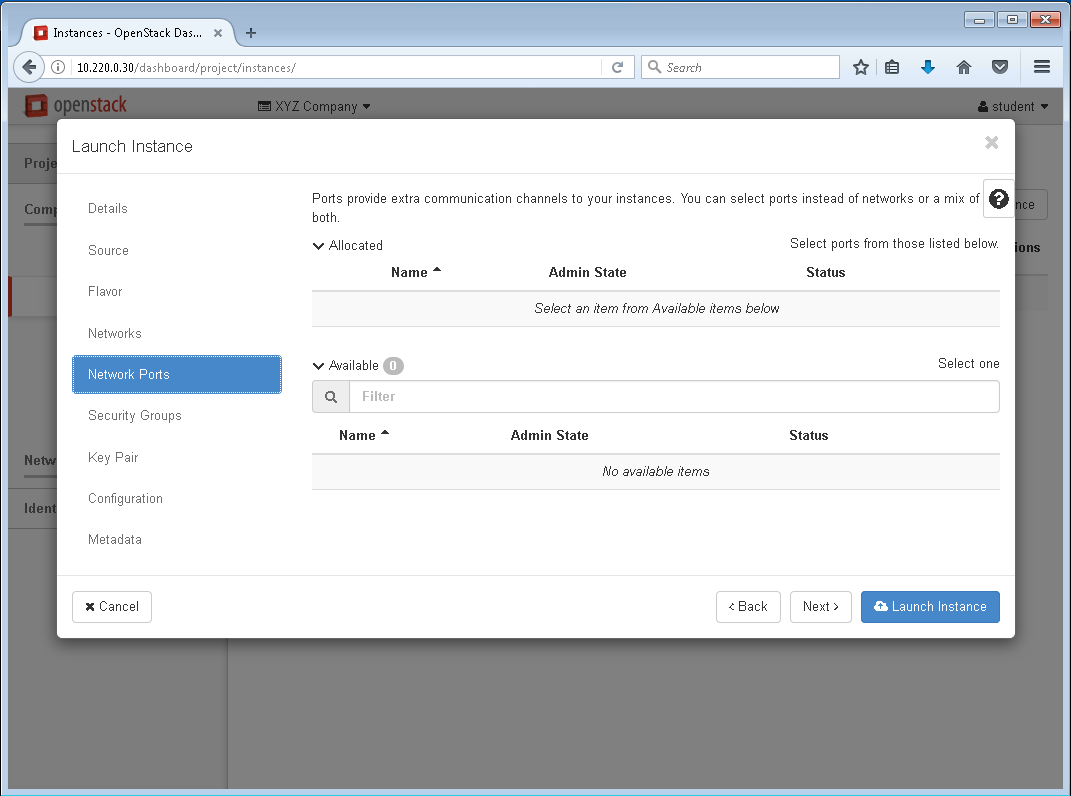


1. Networks provide the communication channels for instances in the cloud. Of the two available networks, **Click** on the **+** tab to **select** the **private network** and move it up to the Allocated block as shown in the Flavors step. **Click** on **Network Ports**

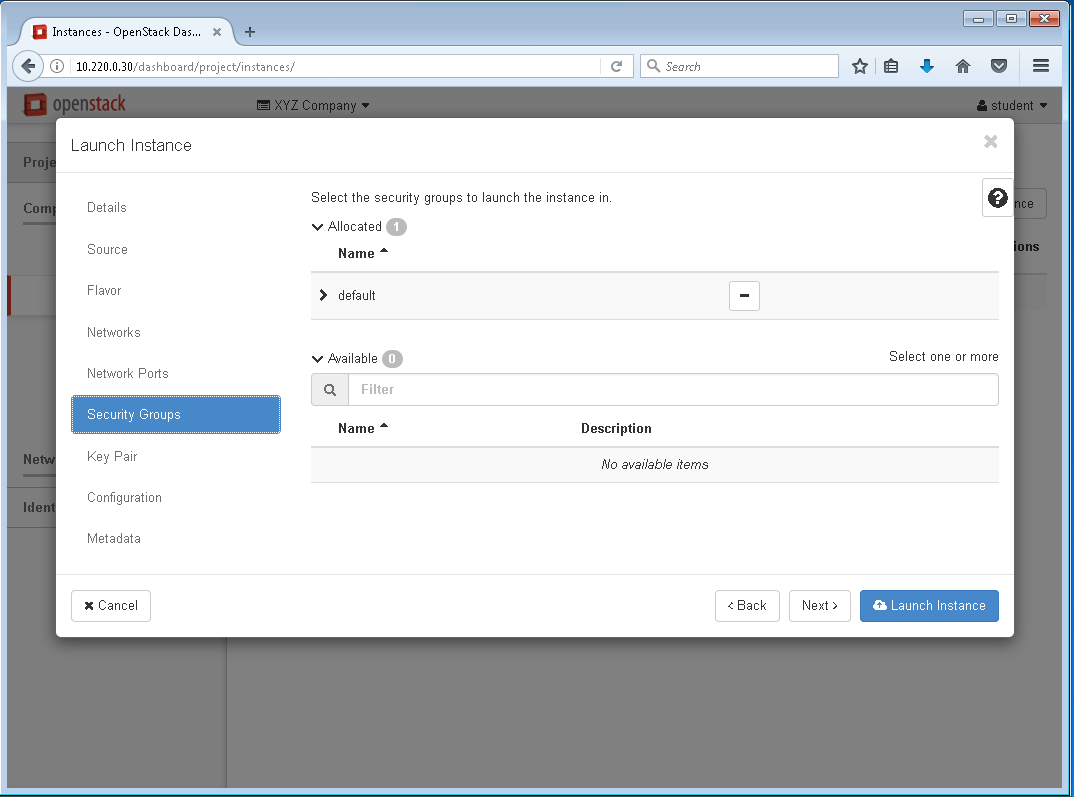
Note: The public network will be allocated in the next lab.

Networks

When launching an instance, select the private network to allocate to the instance. The public (external) network will be allocated as a Floating IP address in a separate process during a later lab.



1. Port provide extra communication channels to your instances. You can select ports instead of networks or a mix of both. We will not use any Network Ports in this lab. **Click** on the **Security Groups** tab

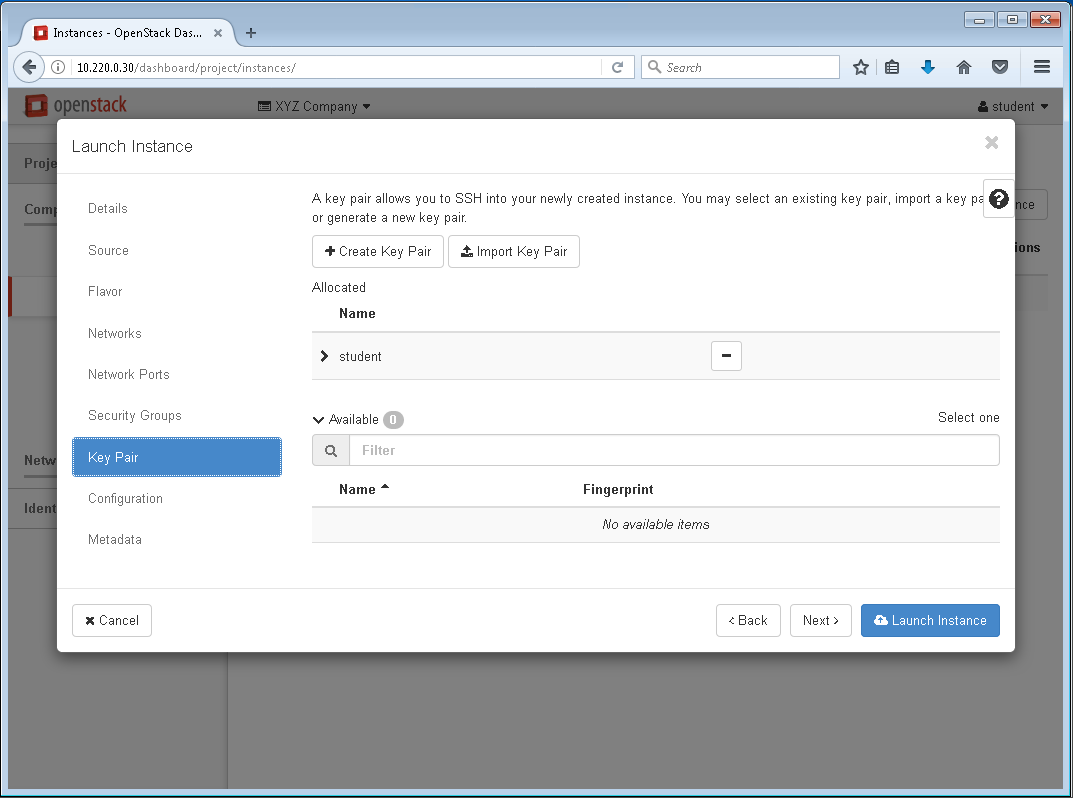


1. The **Default security group** is selected by default. **Click** on the **Key Pair** tab

Note: For this instance we will use the default security group, in later labs you will create a new Security Group that is dedicated to the XYZ Company project.

Security Groups

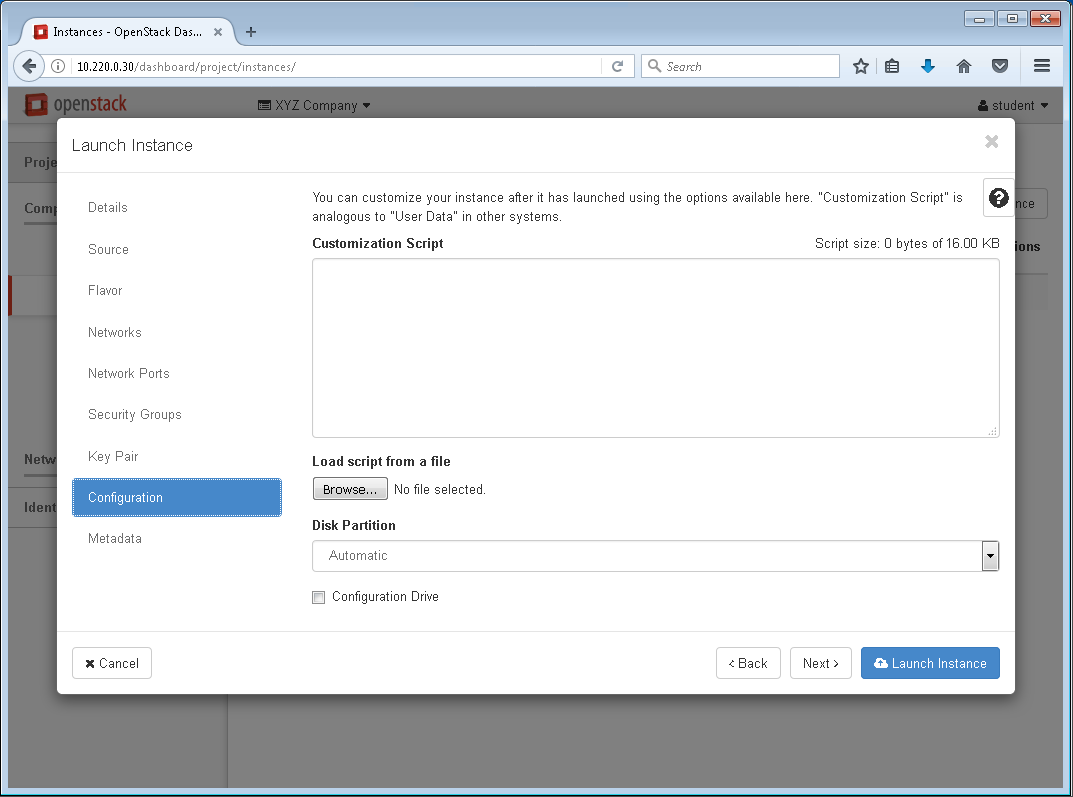
A Security Group is a named collection of network access rules that limit network traffic to instances. By default all outbound network traffic from an instance is allowed and all inbound network traffic to an instance is blocked , unless specifically allowed by a rule. You will configure several security group rules in later labs.



1. A key pair allows you to SSH into your newly created instance. You may select an existing key pair, import a key or generate a new key pair. The student key pair is selected by default. **Click** on **Configuration**

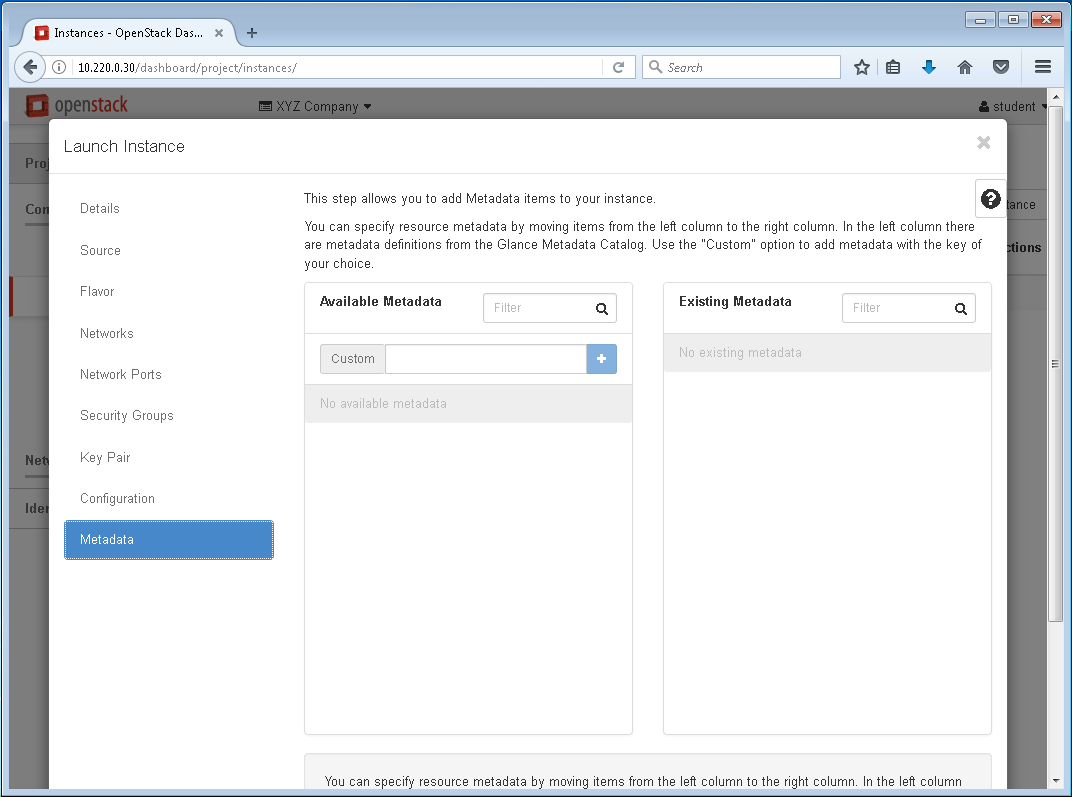
Key Pair

Key pairs are a more secure method to logon to a system then using the traditional user name and password. Key pairs should be assigned to an individual user and not assigned to a project. Each individual user needs to download or import their specific key pair. Managing key pairs will be addressed in later labs.

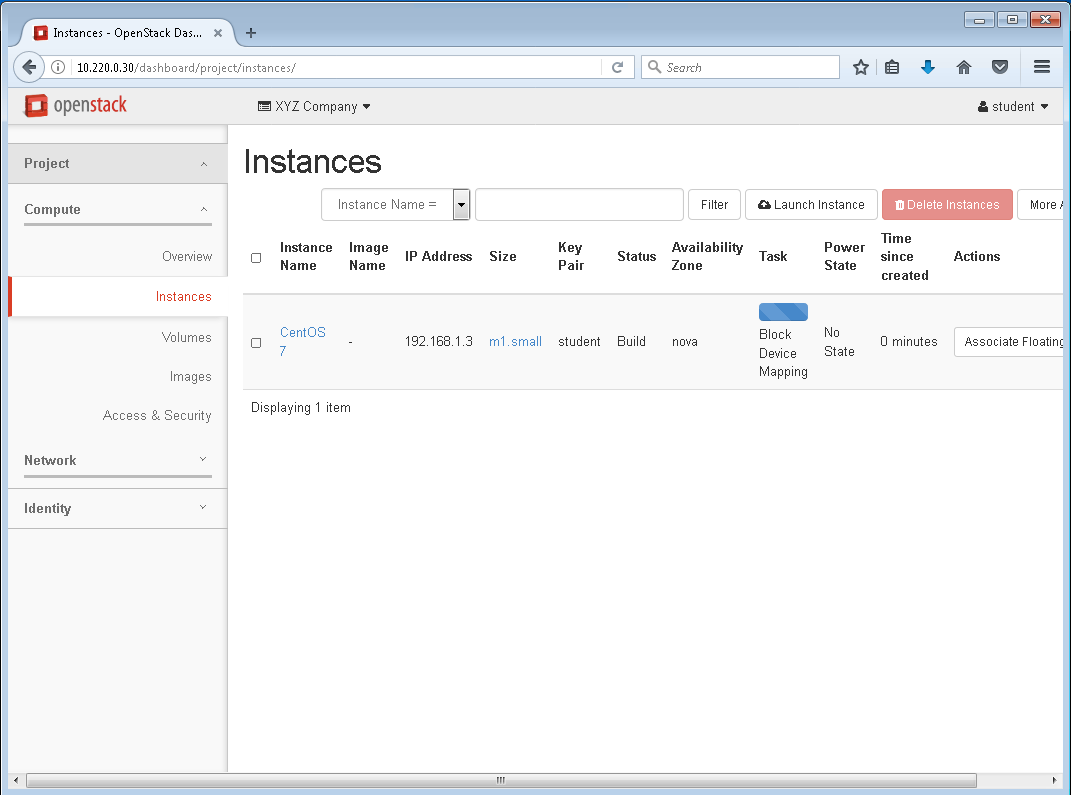


1. You can customize your instance as the instance is building using the Customization Script feature. You will use this feature on a later lab. **Click** on the **Metadata tab**

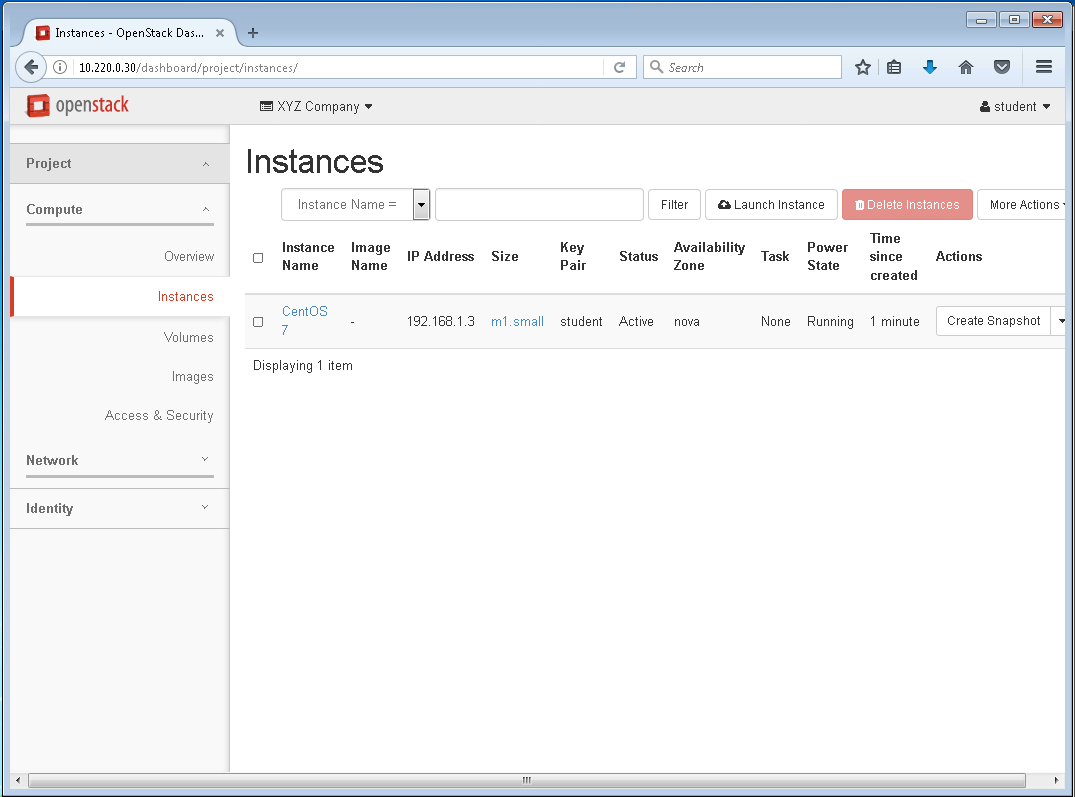
Note: The “Customization Script” is analogous to “User Data” in other systems.



1. This step allows you to add Metadata items to your instance. We will not use this feature. **Click** on **Launch Instance** (not shown, scroll down for Launch Instance button).

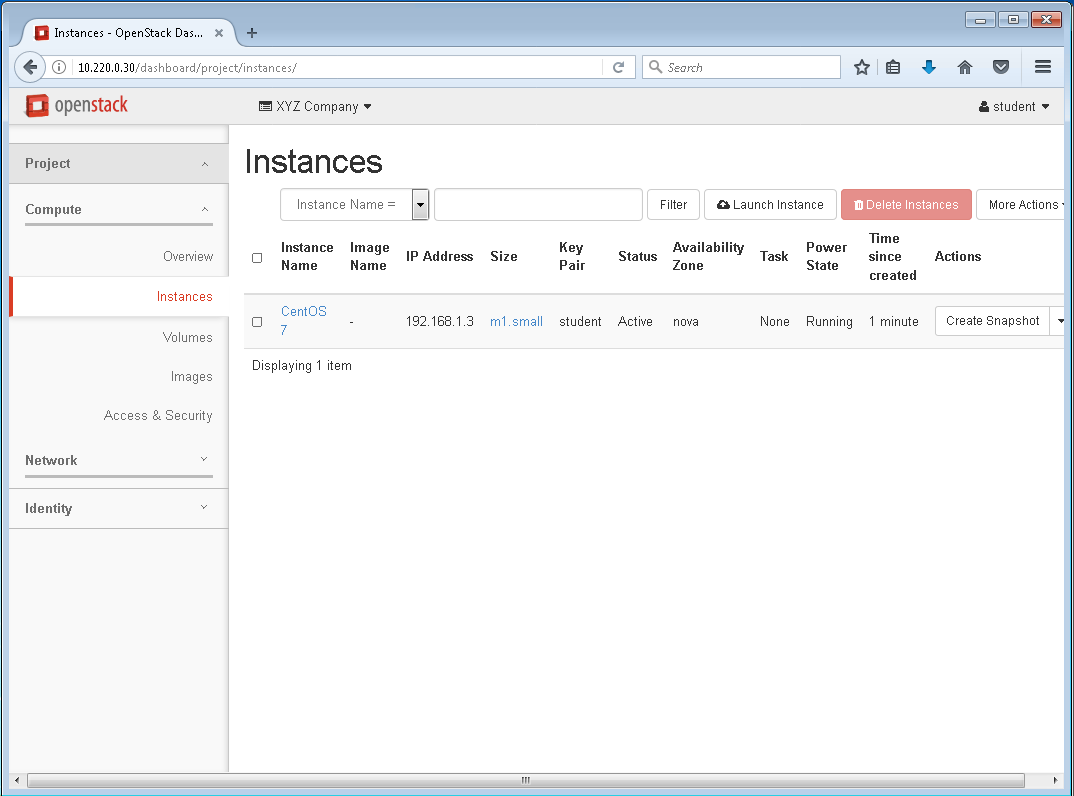


1. The CentOS 7 Instance will indicate Networking, Block Device Mapping, and Spawning. **Continue** to the **next page**

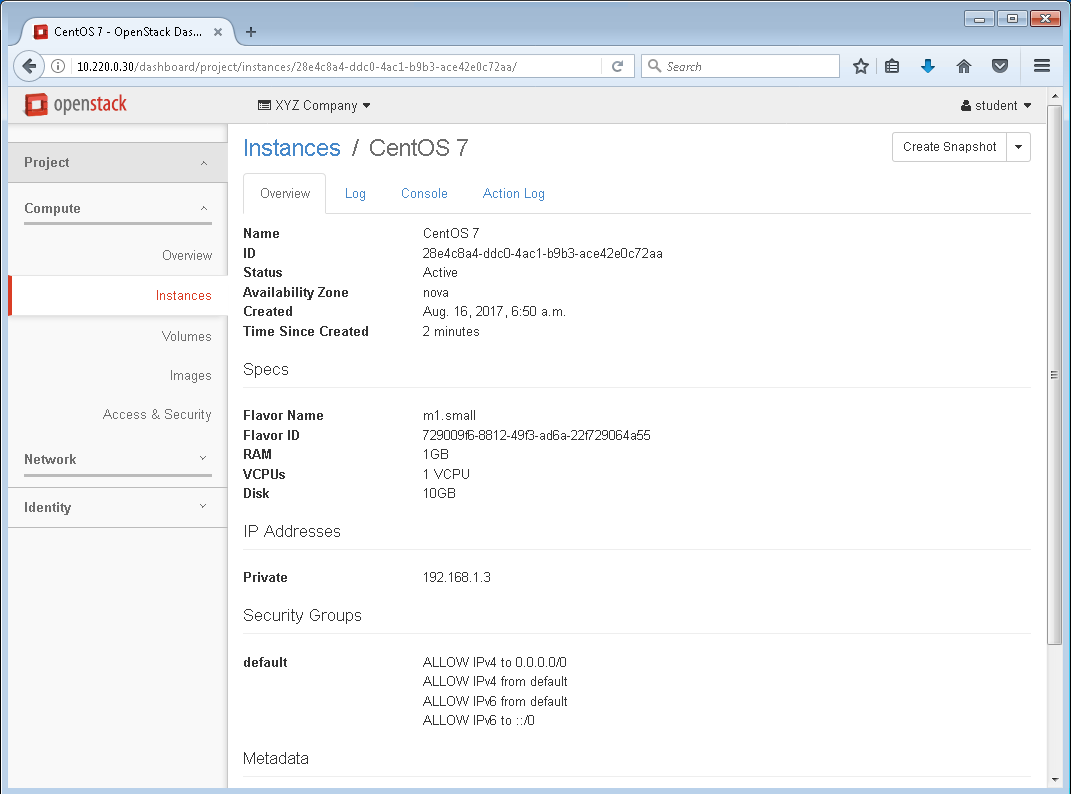


1. Once the **Instance** has finished spawning, the **Power State** will change to **Running**. **Continue** to the **next page**

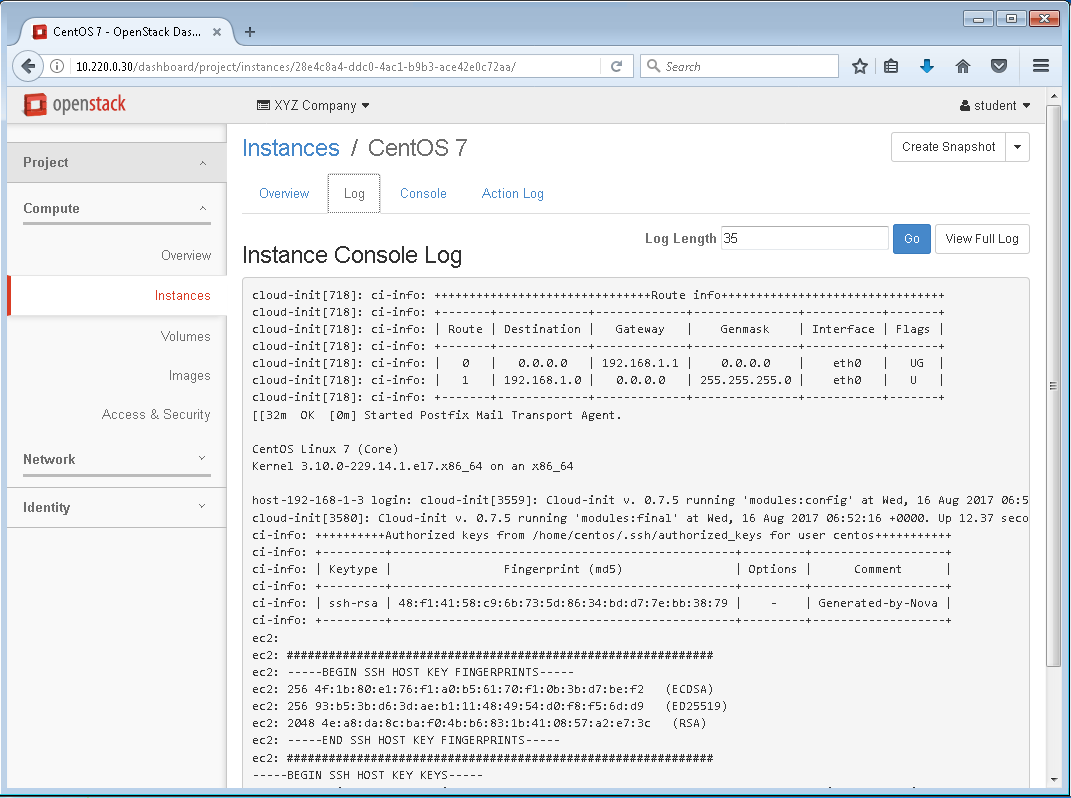
Note: You can also see the private IP Address, 192.168.1.3 that was assigned by DHCP, which you configured in the previous lab. Also, the instances status is Active and you can see Time since created.



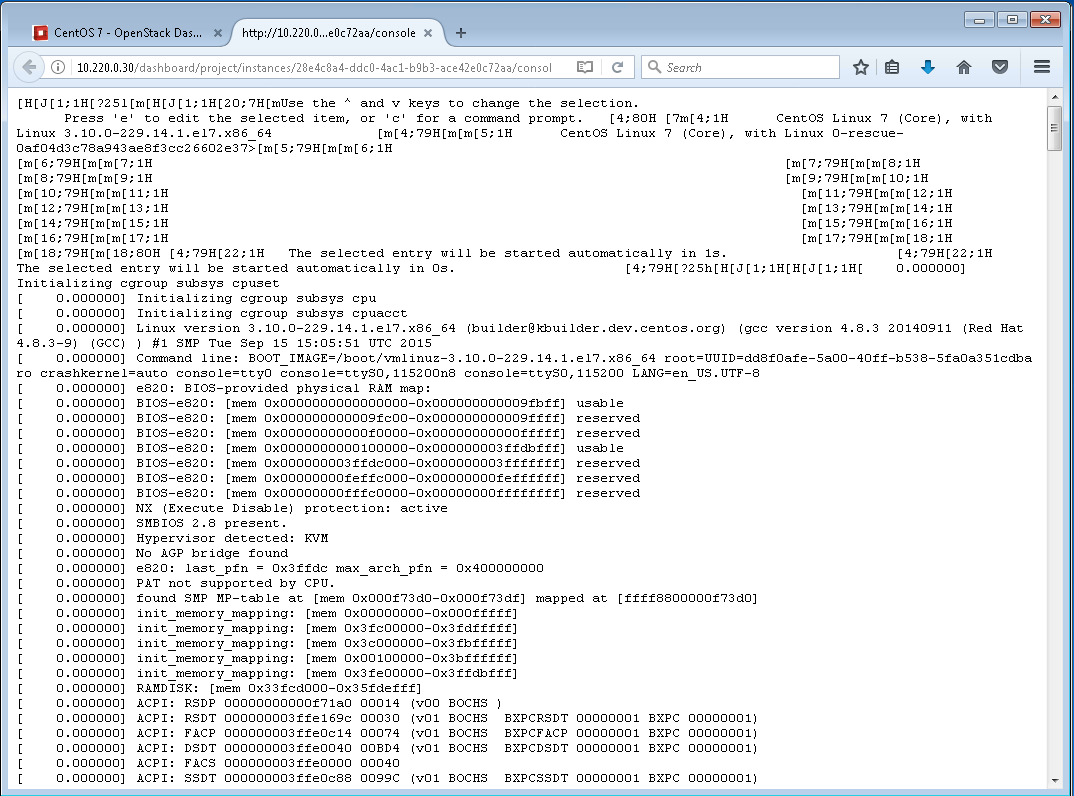
1. **Click** on the **Instance Name CentOS 7**



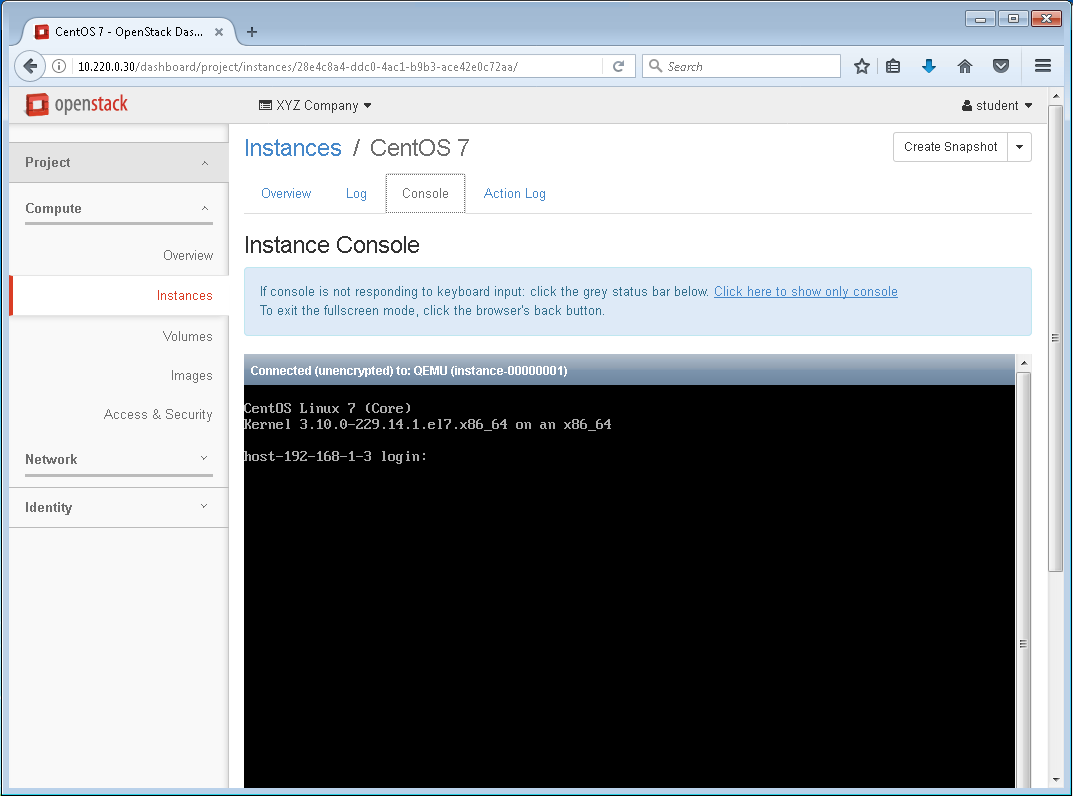
1. On the Instances / CentOS 7 pane, you should see four tabs; **Overview**, **Log**, **Console**, and **Action log**. The Overview tab is a quick method to see basic information about the instance. **Click** on the **Log** tab



1. The Instance Console Log provides a text log of events related to a particular instance. You can also **Click** on the **View Full Log** to see more information.

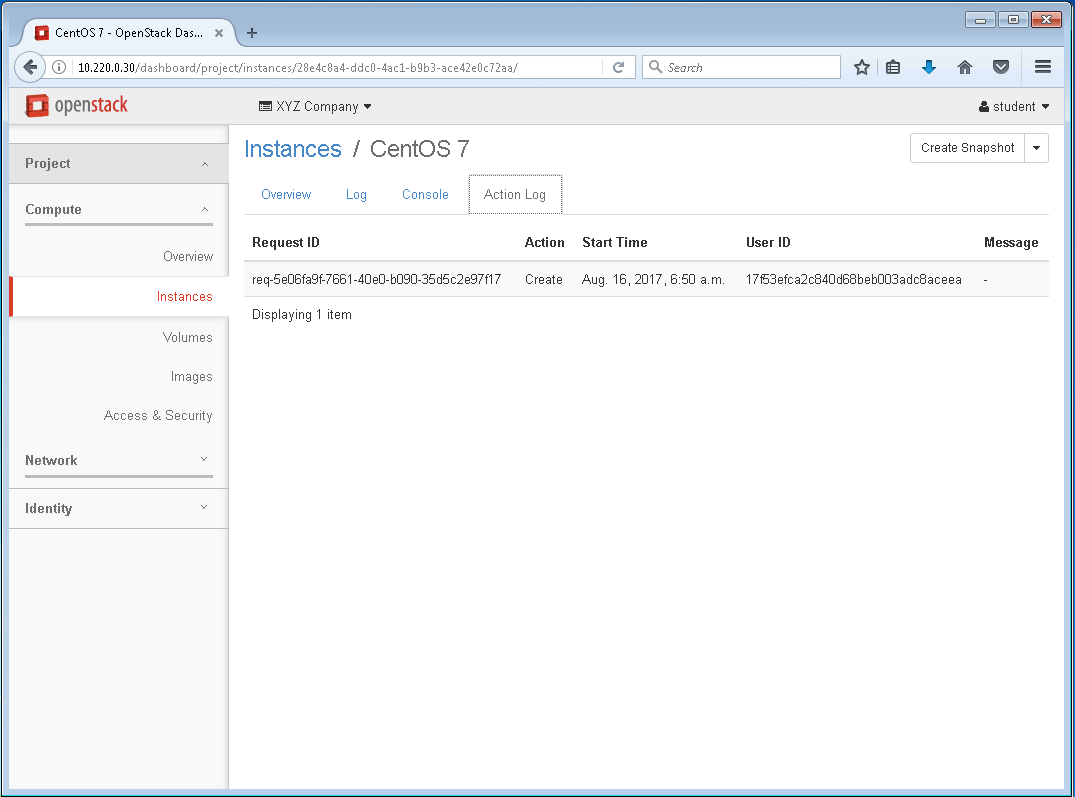


1. The View Full Log tab will open a new web page to view the entire log. Review and close the new web browser page. **Continue** to the **next page**



1. **Click** on the **Console tab**. This will open a console view of your new CentOS 7 instance. **Click** on the **Action Log** tab

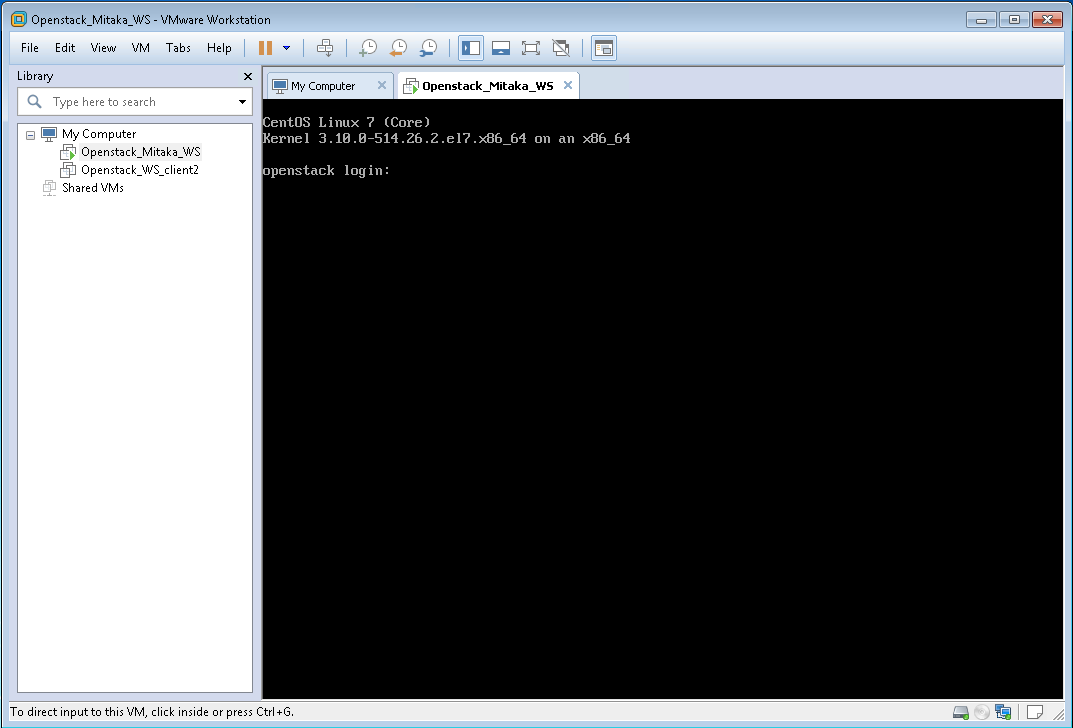
Note: For any instances that have a **Key Pair allocated** to it, **you will not be able to login using this console**.



1. The Action Log provides basic information on the instance.

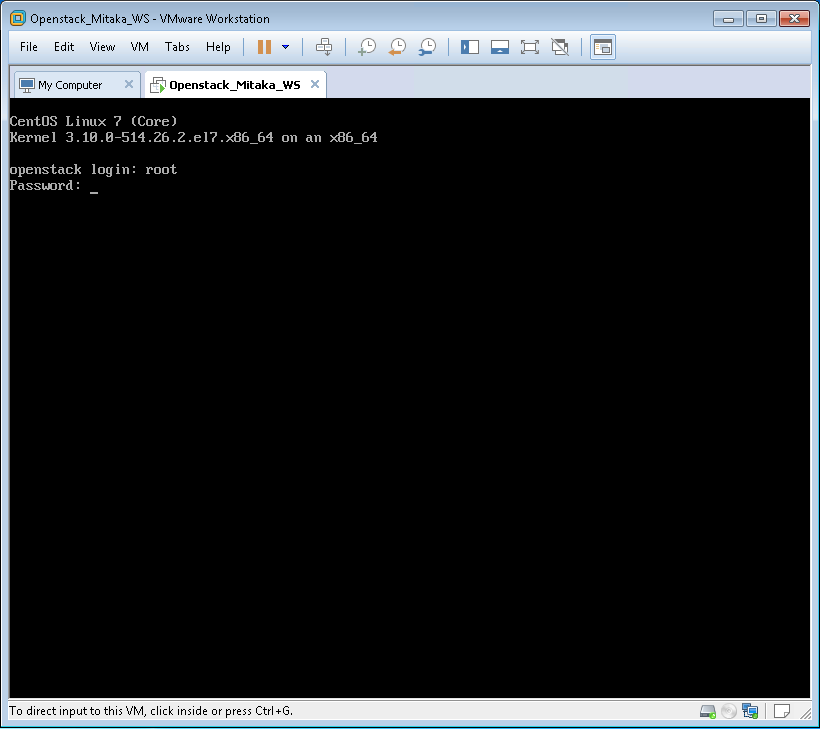
End of Module 4, continue to grade script

**Run the grade script**



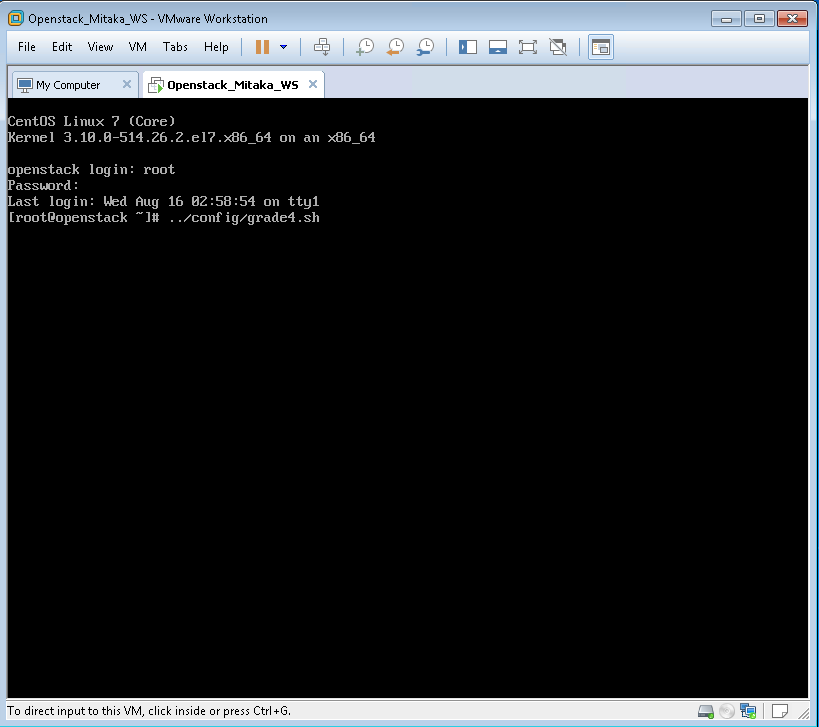
1. Return to Workstation and **Click** on **OpenStack\_Mitaka\_WS VM**

Note: The OpenStack\_Mitaka\_WS console may still be open on your desktop from when you ran the setup script

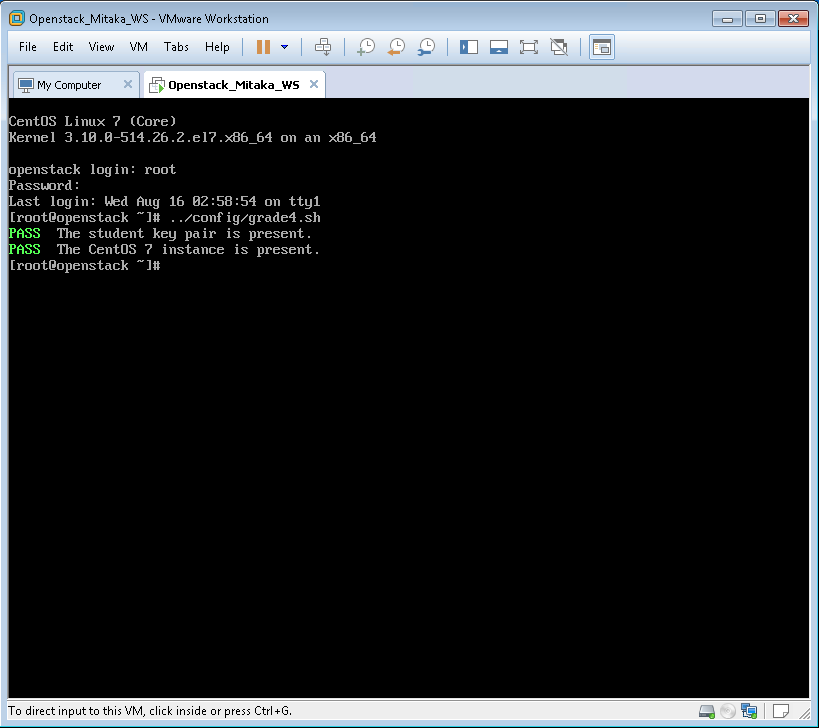


1. Log in as root with the Password: P@ssword

Note: The password is NOT visible as you type it



1. Enter the command; **../config/grade4.sh** and **press Enter**

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1. The grading script will produce an output with **PASS** or **FAIL** for each of the categories, similar to the screen capture above. If you receive a **FAIL** on one or more of the categories, you can go back and fix the issue and run the grading script again, or you can revert the OpenStack\_Mitaka\_v2 VM to the base snapshot and start over again.

This completes Module 4, continue to conclusion

**Conclusion:**

You have successfully assisted the customer with creating a key pair and launching their first instance. There are more configurations that are needed before the CentOS 7 cloud server is ready for the customer to connect to and begin their configurations. Your next field visit to XYZ Company will be to show the user how to permit SSH traffic and how to connect to the server using a Windows virtual machine.