

IST198

OpenStack

Administration

Version 5: 2017-08-15

These exercises will guide the student through the concepts and topics learned in chapter 3, configure the Networks and Routers on OpenStack Mitaka installed on CentOS 7.

Configure OpenStack Networks and Routers.



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Attributions:



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openstack.

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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 OpenStack Cloud implementation CLOUDTech uses to host customer Cloud environments.

Lab Objectives

Learner will be able to:

- Configure OpenStack Networks and Routers

Lab 6-8

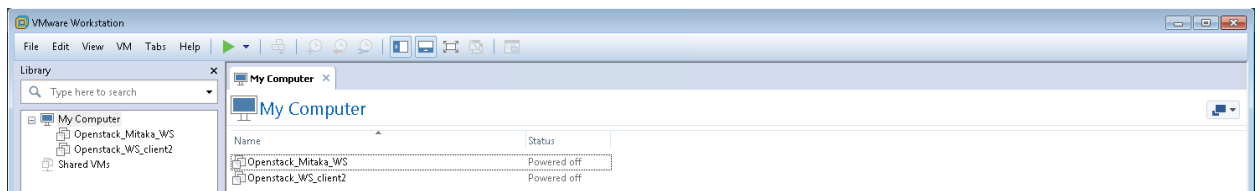
These labs will guide the student through configuring OpenStack Networks and Routers for use by the customer's cloud instances.

(Note: This lab is designed to be completed on an NDG NETLAB System with the IST198_OpenStack_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).

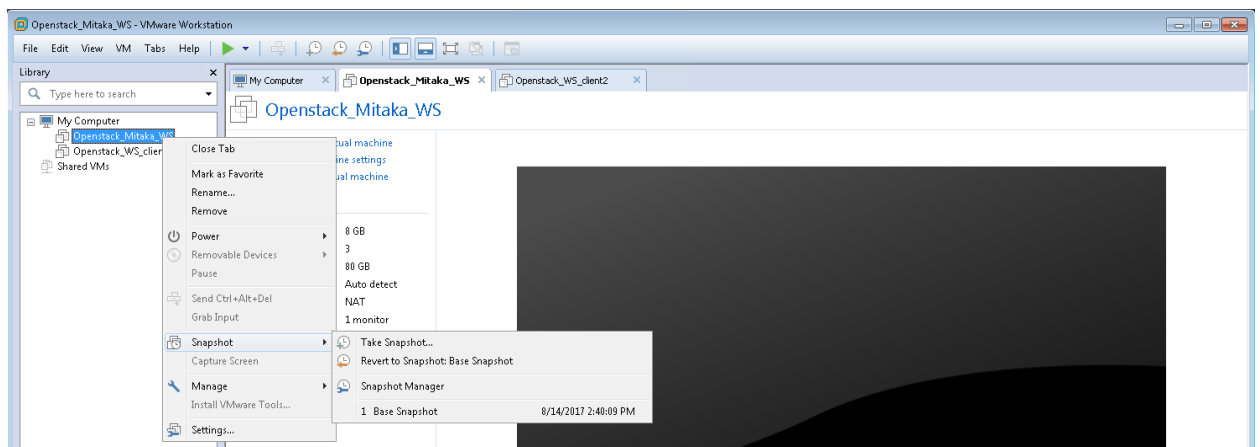
Prepare the OpenStack Virtual Machines



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

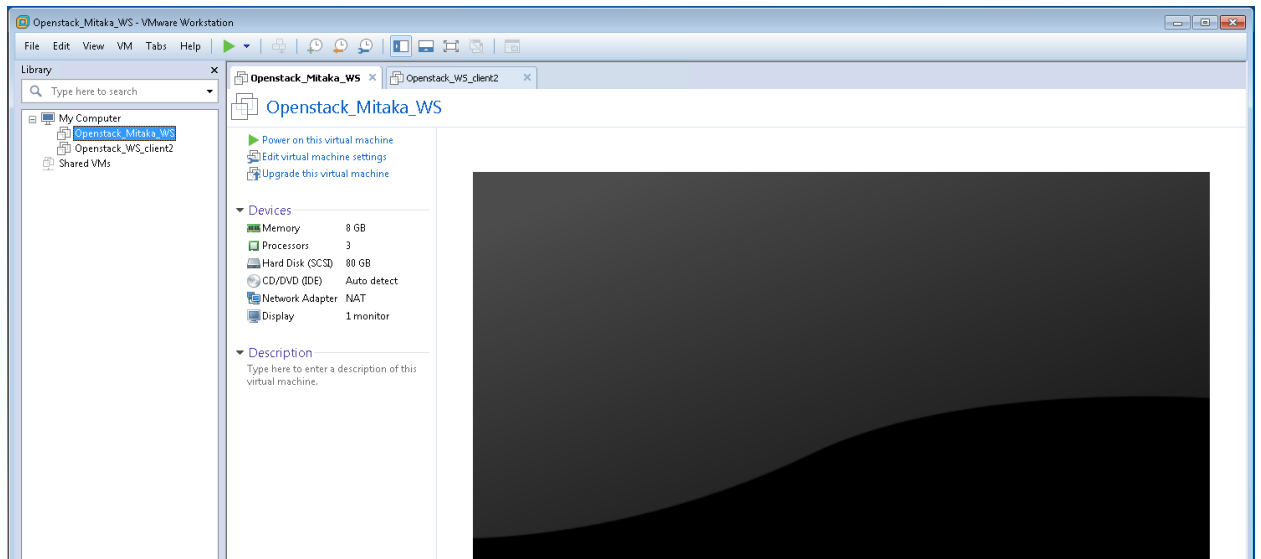


2. Workstation should have two virtual machines (VM) installed; Openstack_Mitaka_WS and Openstack_WS_client2.



3. 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.

Module 3: Configure OpenStack Networks and Routers



4. **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 first field visit to XYZ Company. During this visit, you will assist the customer in configuring their Private Network and Router.

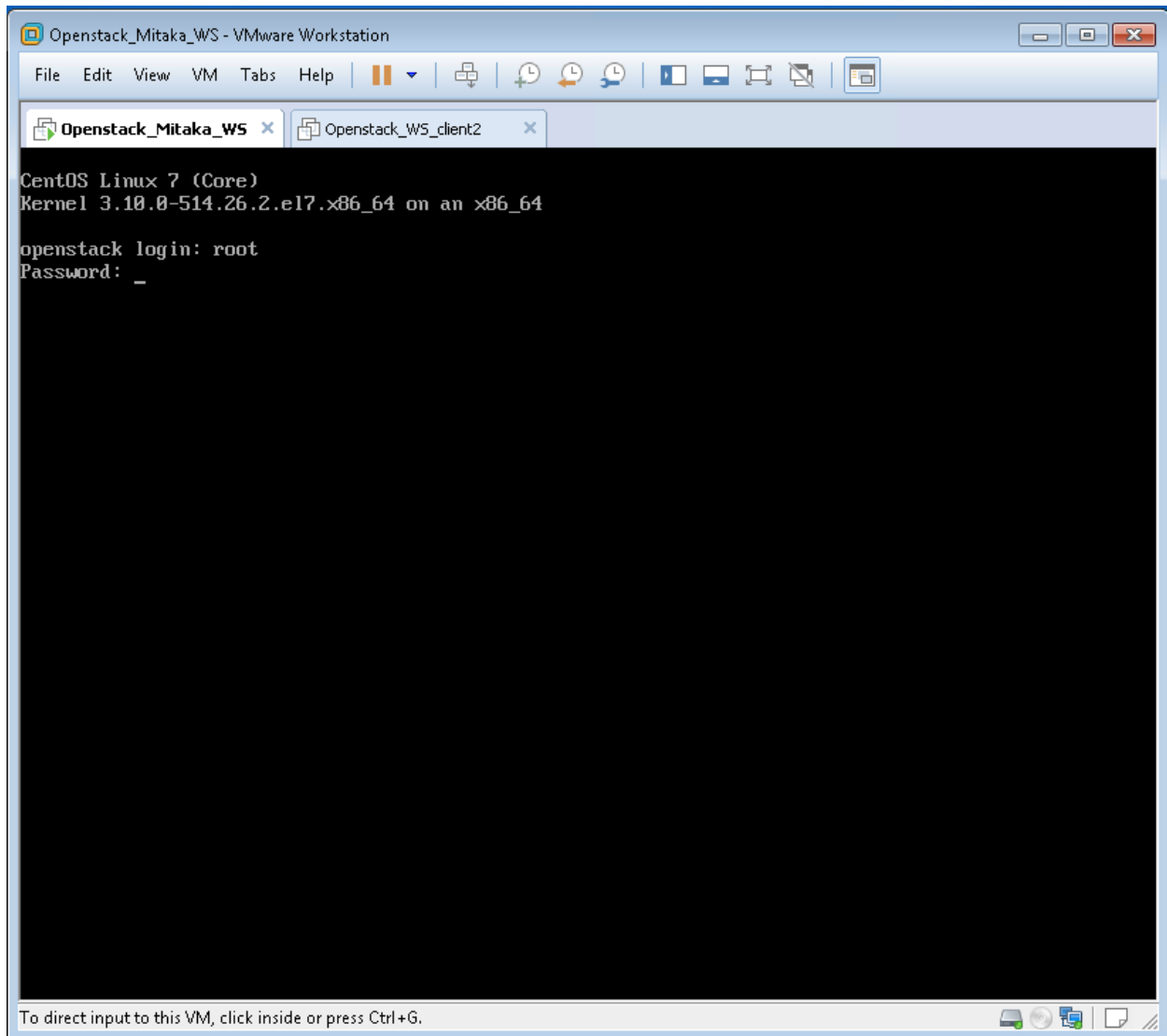
Lab Settings

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	OpenStack Mitaka
OpenStack 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.

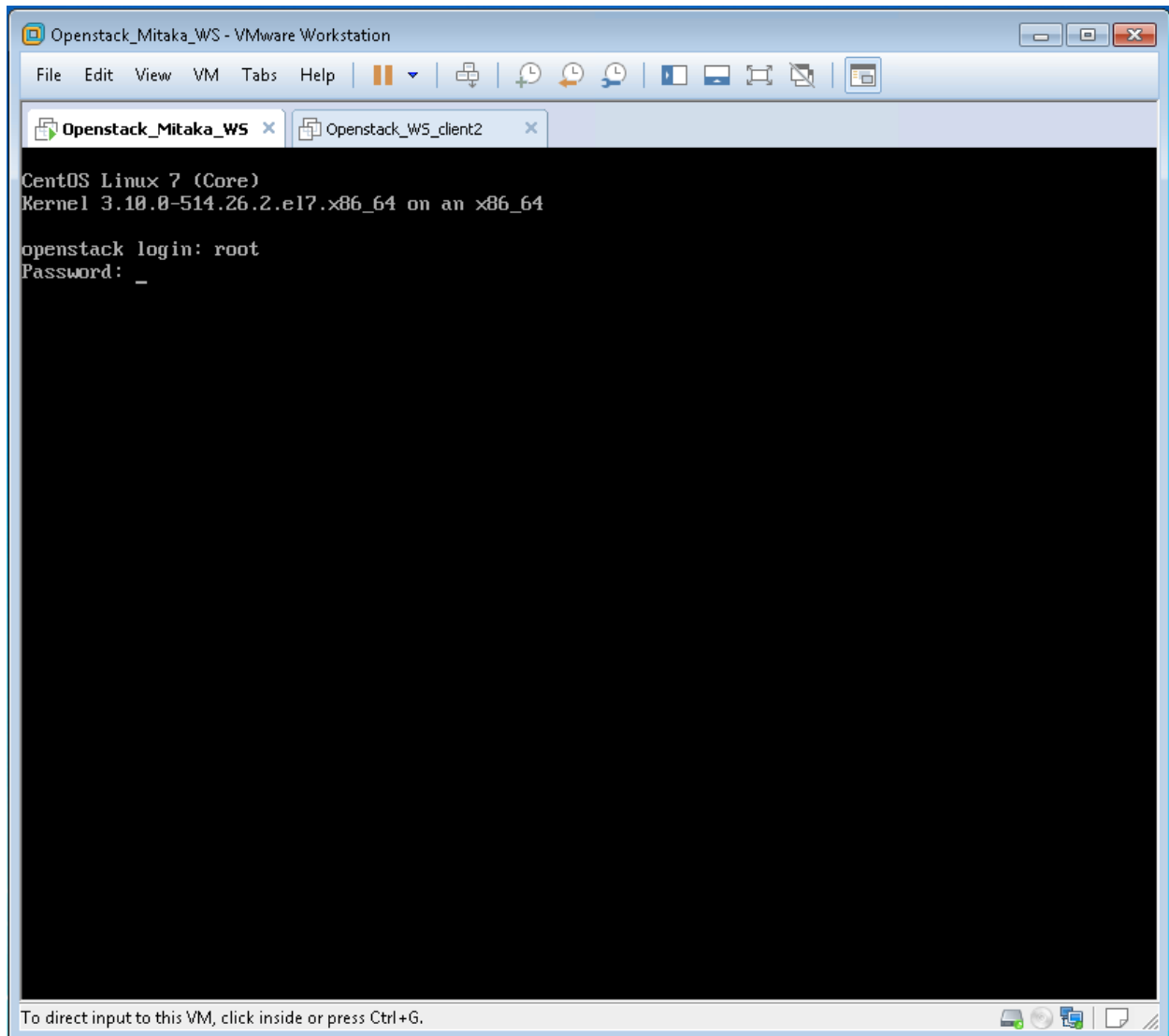
Run the lab setup script



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

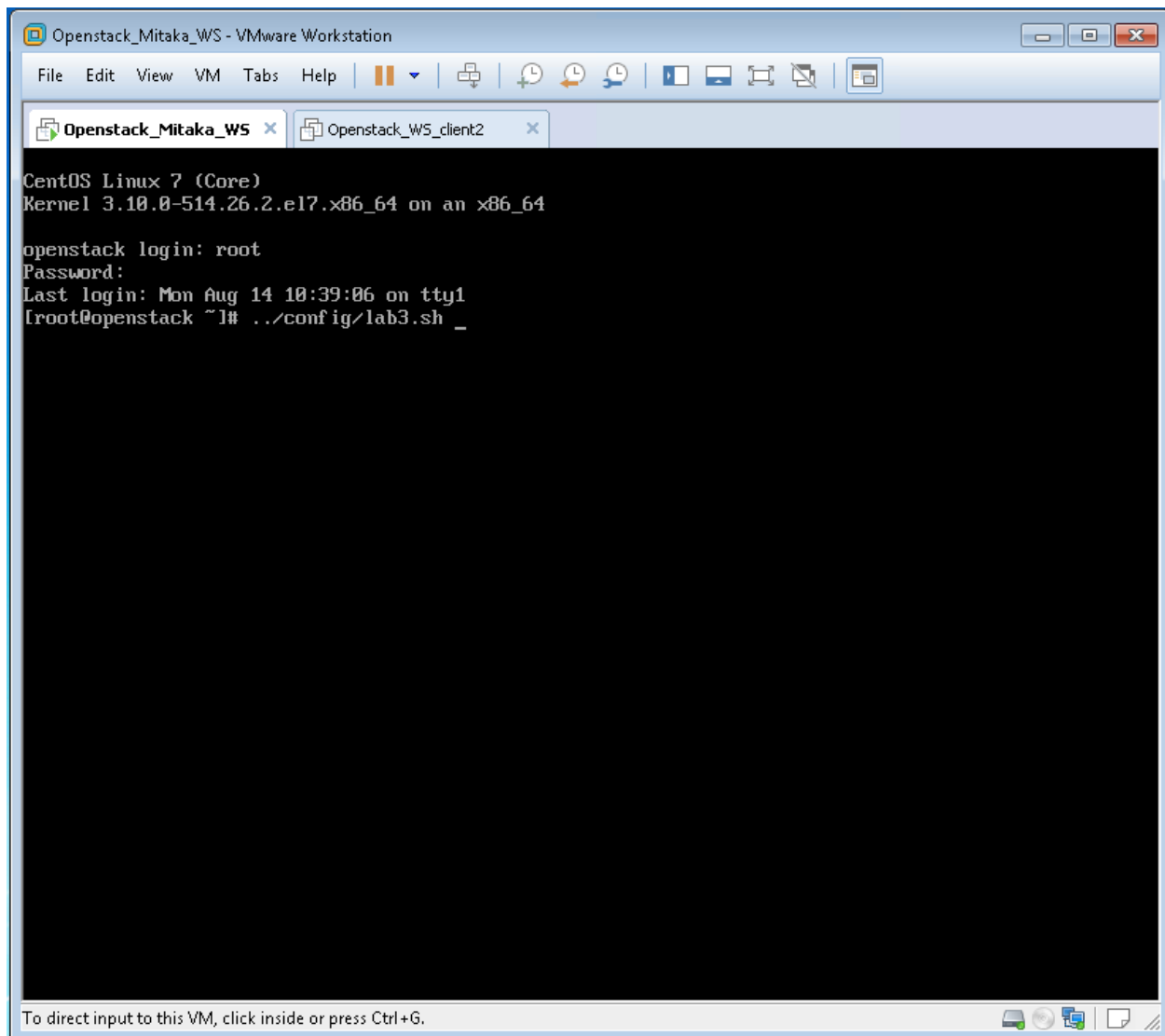
Note: The password is NOT visible as you type it

Module 3: Configure OpenStack Networks and Routers

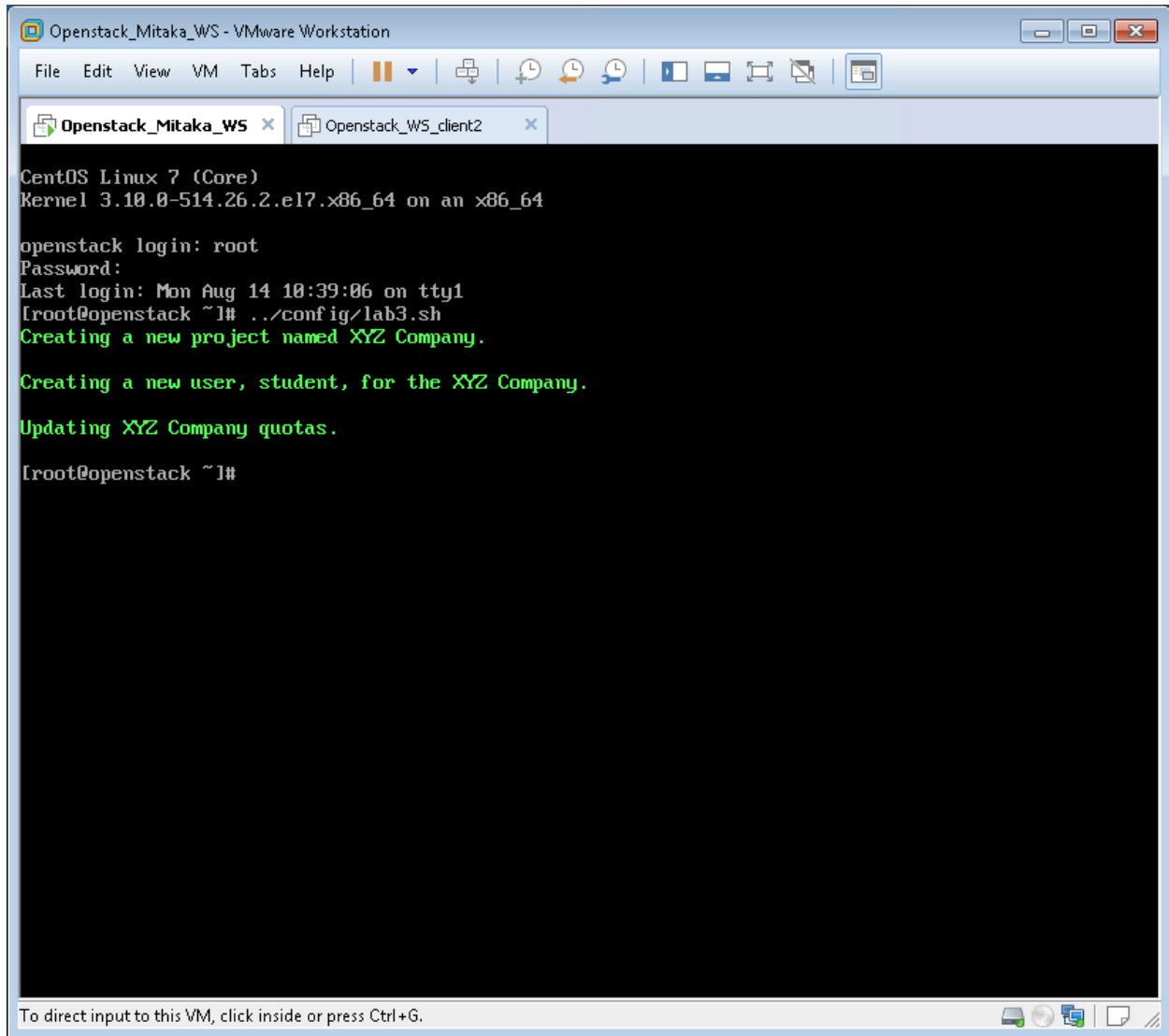


2. After successfully logging in as root, you should see this screen. Continue to the next page

Module 3: Configure OpenStack Networks and Routers



3. Type the command; `../config/lab3.sh` and **press Enter** as shown in the screen capture above to run the Module 3 setup script



```
CentOS Linux 7 (Core)
Kernel 3.10.0-514.26.2.el7.x86_64 on an x86_64

openstack login: root
Password:
Last login: Mon Aug 14 10:39:06 on tty1
[root@openstack ~]# ../config/lab3.sh
Creating a new project named XYZ Company.

Creating a new user, student, for the XYZ Company.

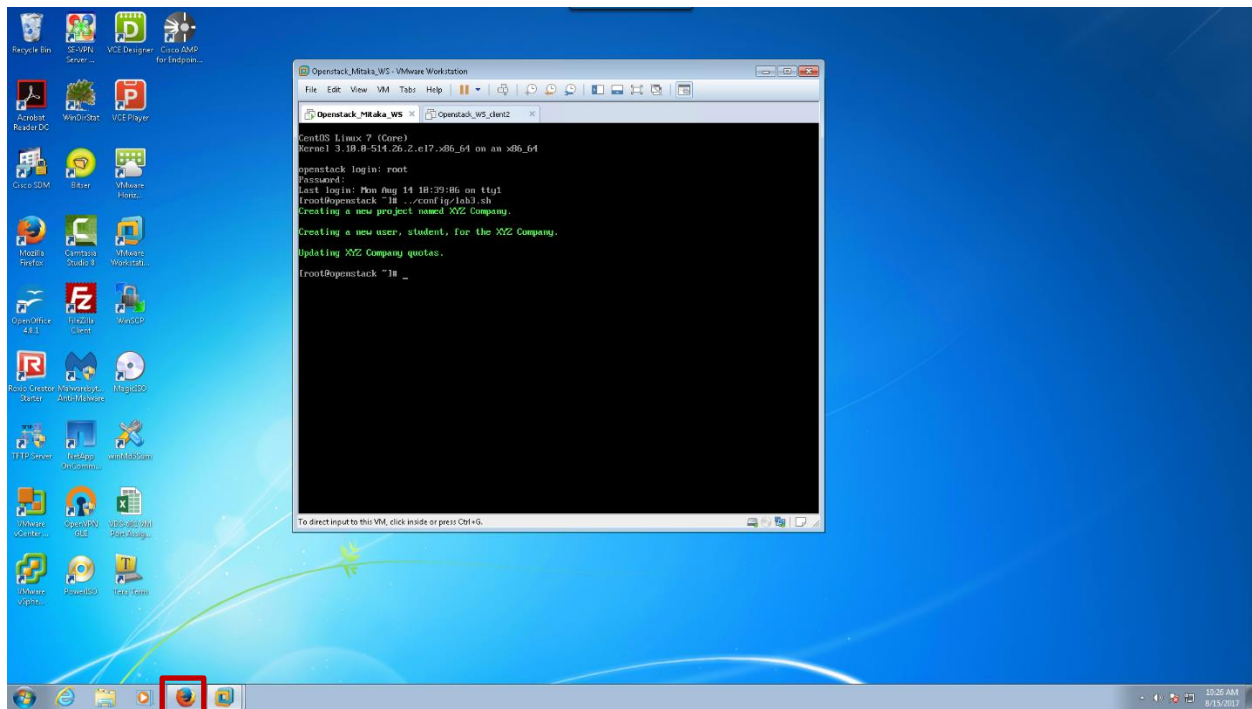
Updating XYZ Company quotas.

[root@openstack ~]#
```

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

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

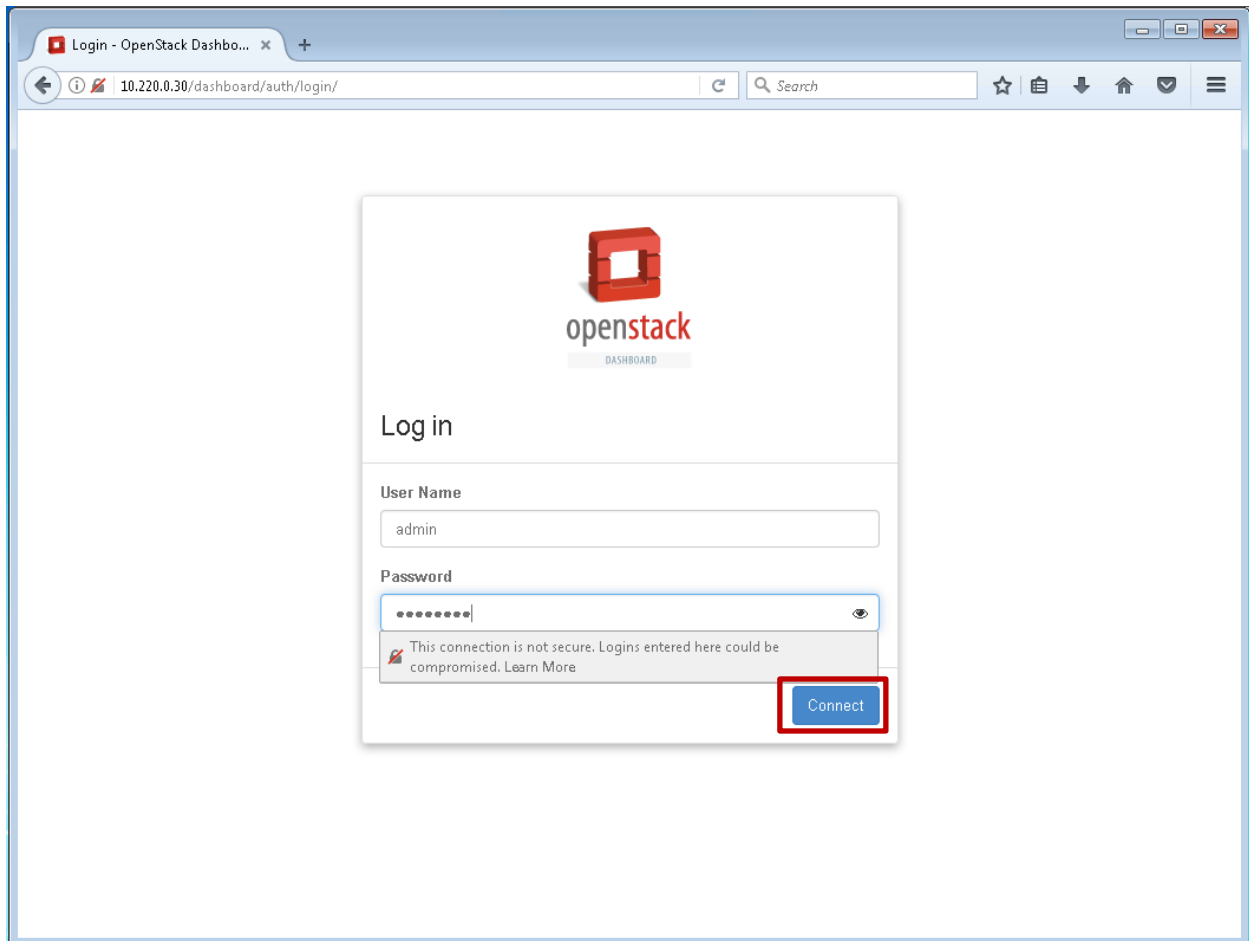
Access the OpenStack Dashboard



1. On your Windows host PC, 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.

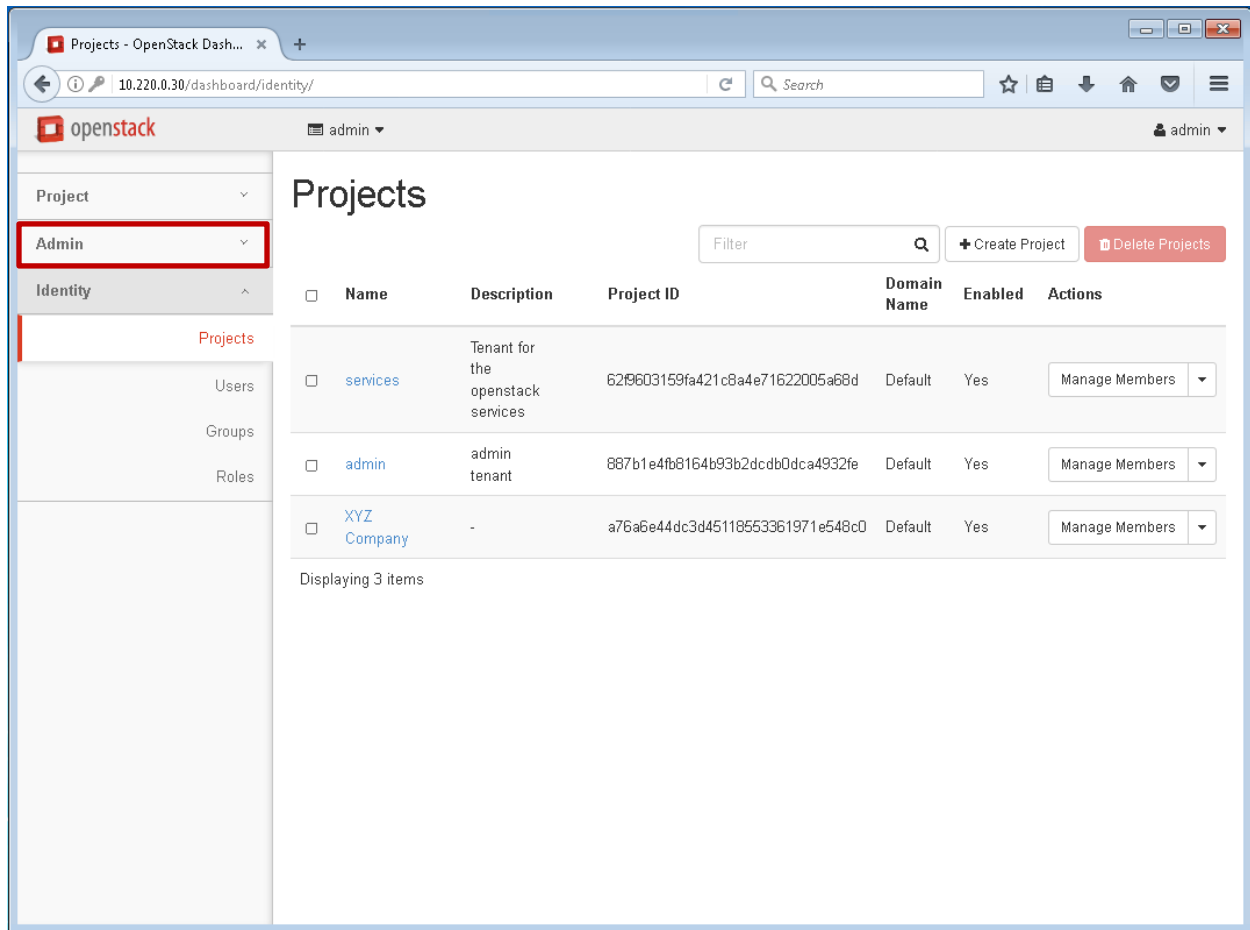
Module 3: Configure OpenStack Networks and Routers



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

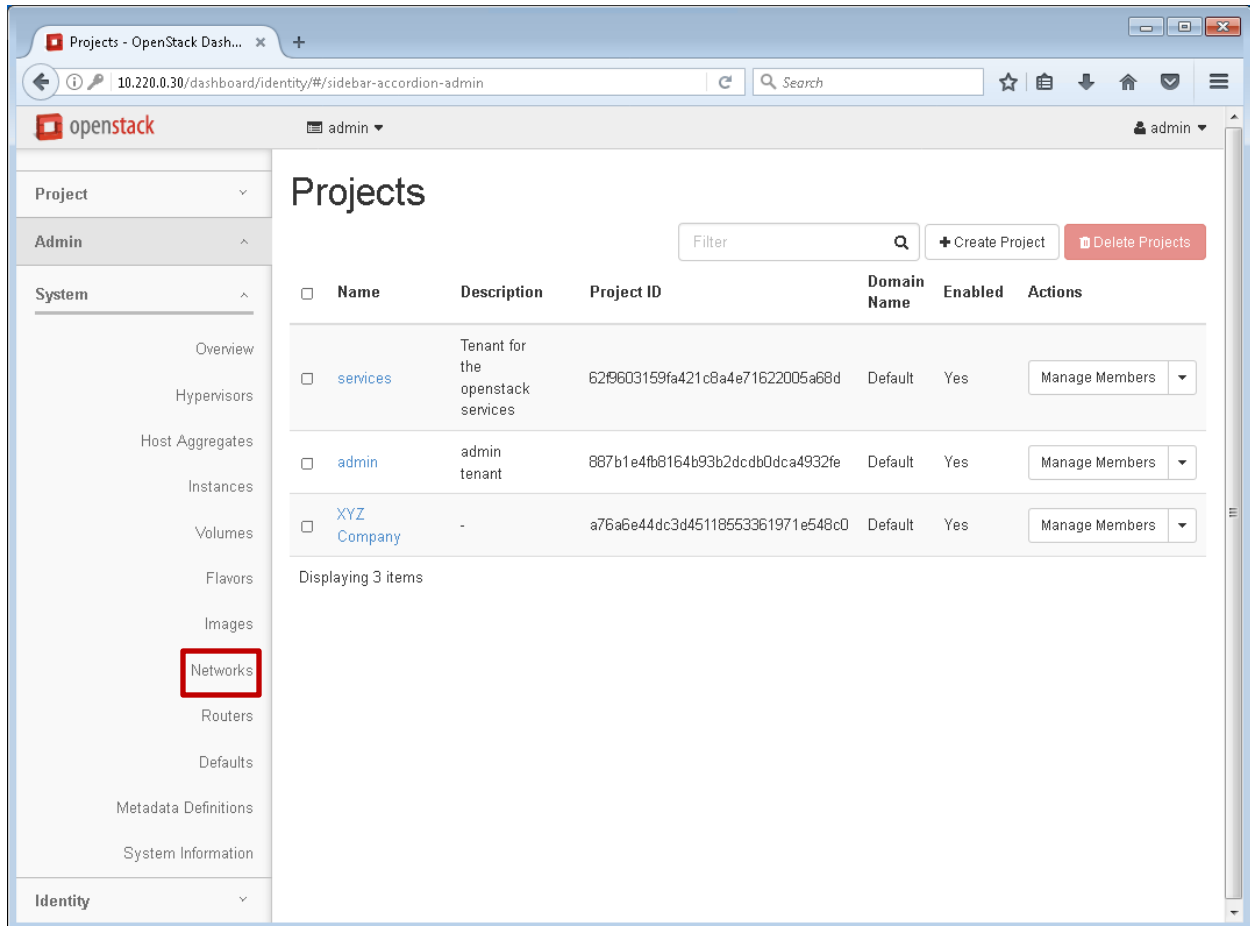
Note: User Name entries are not case sensitive, passwords are.

Lab 6: Add and configure a Public Network



1. Select the **Admin** tab in the left pane.

Module 3: Configure OpenStack Networks and Routers



2. Select Networks

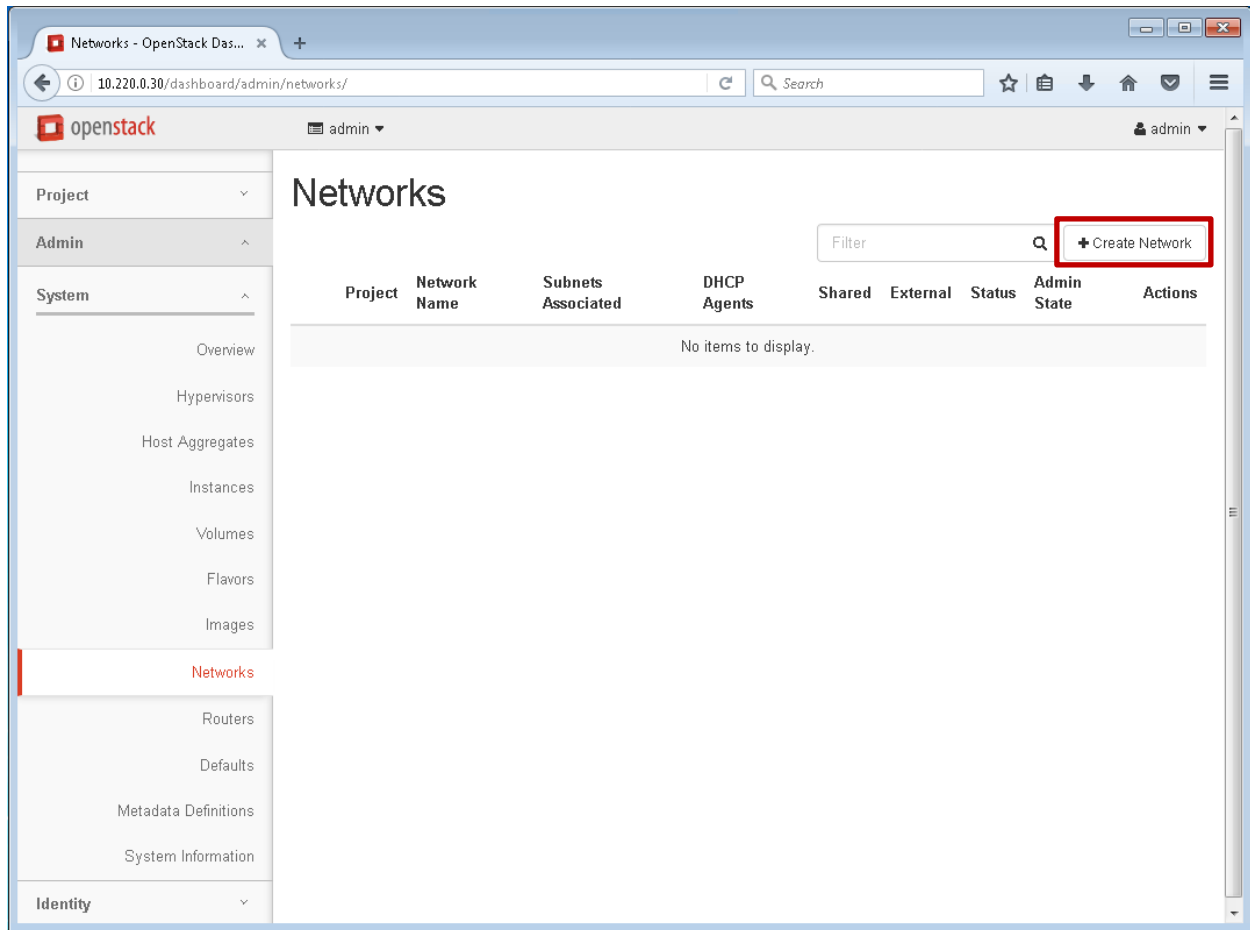
Networks

When an instance is created in OpenStack, it is automatically assigned a fixed IP address in the network to which the instance is assigned. This IP address is permanently associated with the instance until the instance is terminated.

However, in addition to the fixed IP address, a floating IP address can also be attached to an instance. Unlike fixed IP addresses, floating IP addresses can have their associations modified at any time, regardless of the state of the instances involved.

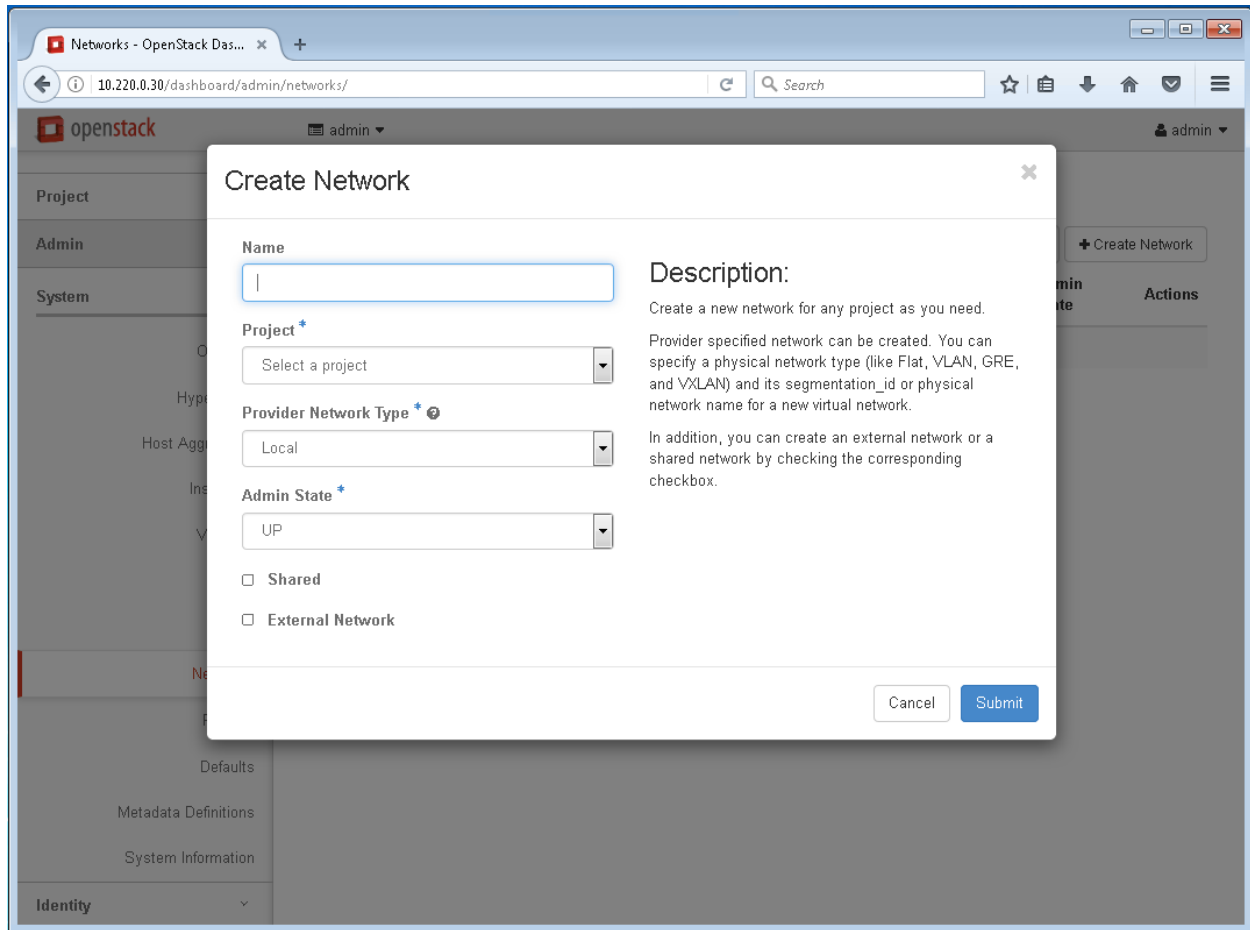
Private IP addresses (fixed IP addresses) are used for communication between instances, and public addresses (floating IP addresses) are used for communication with networks outside the cloud, including the Internet.

Module 3: Configure OpenStack Networks and Routers



3. Select Create Network

Module 3: Configure OpenStack Networks and Routers



4. The Create Network wizard should open.

Module 3: Configure OpenStack Networks and Routers

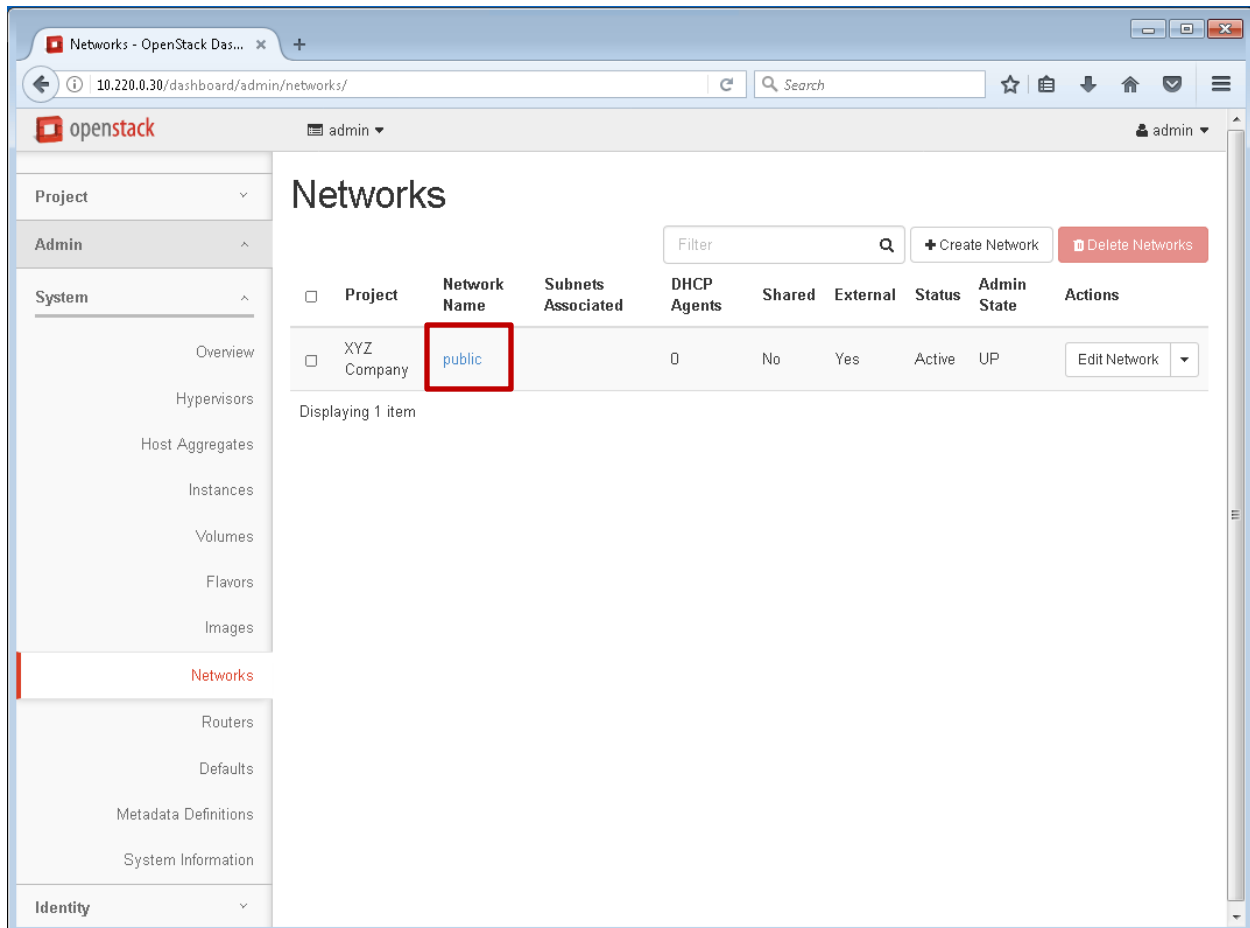
The screenshot shows the OpenStack dashboard with the 'Create Network' dialog box open. The dialog box has a title bar 'Create Network' and a close button. It contains the following fields and options:

- Name:** A text input field containing 'public'.
- Project:** A dropdown menu showing 'XYZ Company'.
- Provider Network Type:** A dropdown menu showing 'VXLAN'.
- Segmentation ID:** A text input field containing '1005'.
- Admin State:** A dropdown menu showing 'UP'.
- Shared:** An unchecked checkbox.
- External Network:** A checked checkbox.
- Description:** A text area with instructions: 'Create a new network for any project as you need. Provider specified network can be created. You can specify a physical network type (like Flat, VLAN, GRE, and VXLAN) and its segmentation_id or physical network name for a new virtual network. In addition, you can create an external network or a shared network by checking the corresponding checkbox.'
- Buttons:** 'Cancel' and 'Submit' buttons at the bottom right. The 'Submit' button is highlighted with a red rectangle.

5. **Enter** the Network Name of **public**, and using the dropdown menu for Project, Provider Network Type and Segmentation ID enter the information as shown in the screen capture and the table below. **Select External Network** and **Click Submit**

Name	public
Project	XYZ Company
Provider Network Type	VXLAN
Segmentation ID	1005
External Network	checked

Module 3: Configure OpenStack Networks and Routers



- The network name **public** and external status of **Yes** should be present on the same line as XYZ Company. To add the required subnet information, **Click** on the **public** network name hyperlink

Public Network

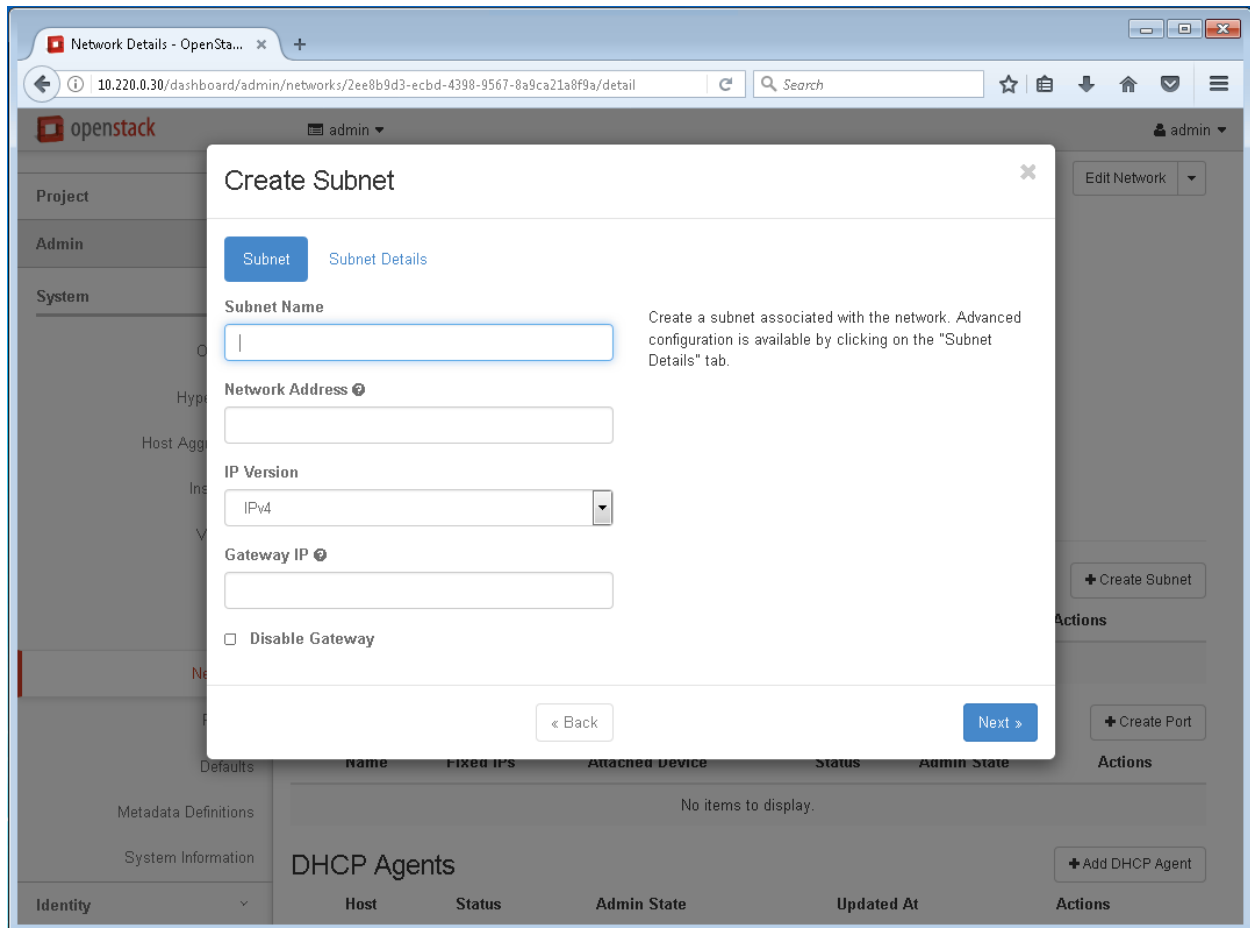
The Network Controller provides virtual networks to enable compute servers to interact with each other and with the public network. All machines must have a public and private network interface

Module 3: Configure OpenStack Networks and Routers

The screenshot shows the OpenStack dashboard interface for network management. The left sidebar contains navigation links for Project, Admin, System, Overview, Hypervisors, Host Aggregates, Instances, Volumes, Flavors, Images, Networks (highlighted), Routers, Defaults, Metadata Definitions, System Information, and Identity. The main content area is titled 'Networks / public' and includes an 'Edit Network' button. Below this is the 'Network Overview' section with details for the 'public' network, including its ID, Project ID, Status (Active), Admin State (UP), Shared status (No), External Network (Yes), MTU (1450), and Provider Network (Network Type: vxlan, Physical Network: -, Segmentation ID: 1005). The 'Subnets' section is currently empty, displaying a table with columns for Name, CIDR, IP Version, Gateway IP, and Actions, and a '+ Create Subnet' button highlighted with a red box. Below the subnets is the 'Ports' section, also empty, with a '+ Create Port' button. The 'DHCP Agents' section is at the bottom, with an '+ Add DHCP Agent' button.

7. Click on Create Subnet

Module 3: Configure OpenStack Networks and Routers



8. The Create Subnet wizard should open

Subnet

Logical subdivision of an IP network.

Module 3: Configure OpenStack Networks and Routers

Network Details - OpenSta... x +

10.220.0.30/dashboard/admin/networks/2ee8b9d3-ecbd-4398-9567-8a9ca21a8f9a/detail

openstack admin

Project

Admin

System

Hypervisor

Host Agent

Network

Metadata Definitions

System Information

Identity

Create Subnet

Edit Network

+ Create Subnet

+ Create Port

+ Add DHCP Agent

Subnet

Subnet Details

Subnet Name

public-subnet

Network Address

10.220.0.0/23

IP Version

IPv4

Gateway IP

10.220.0.30

☐ Disable Gateway

Create a subnet associated with the network. Advanced configuration is available by clicking on the "Subnet Details" tab.

< Back

Next >

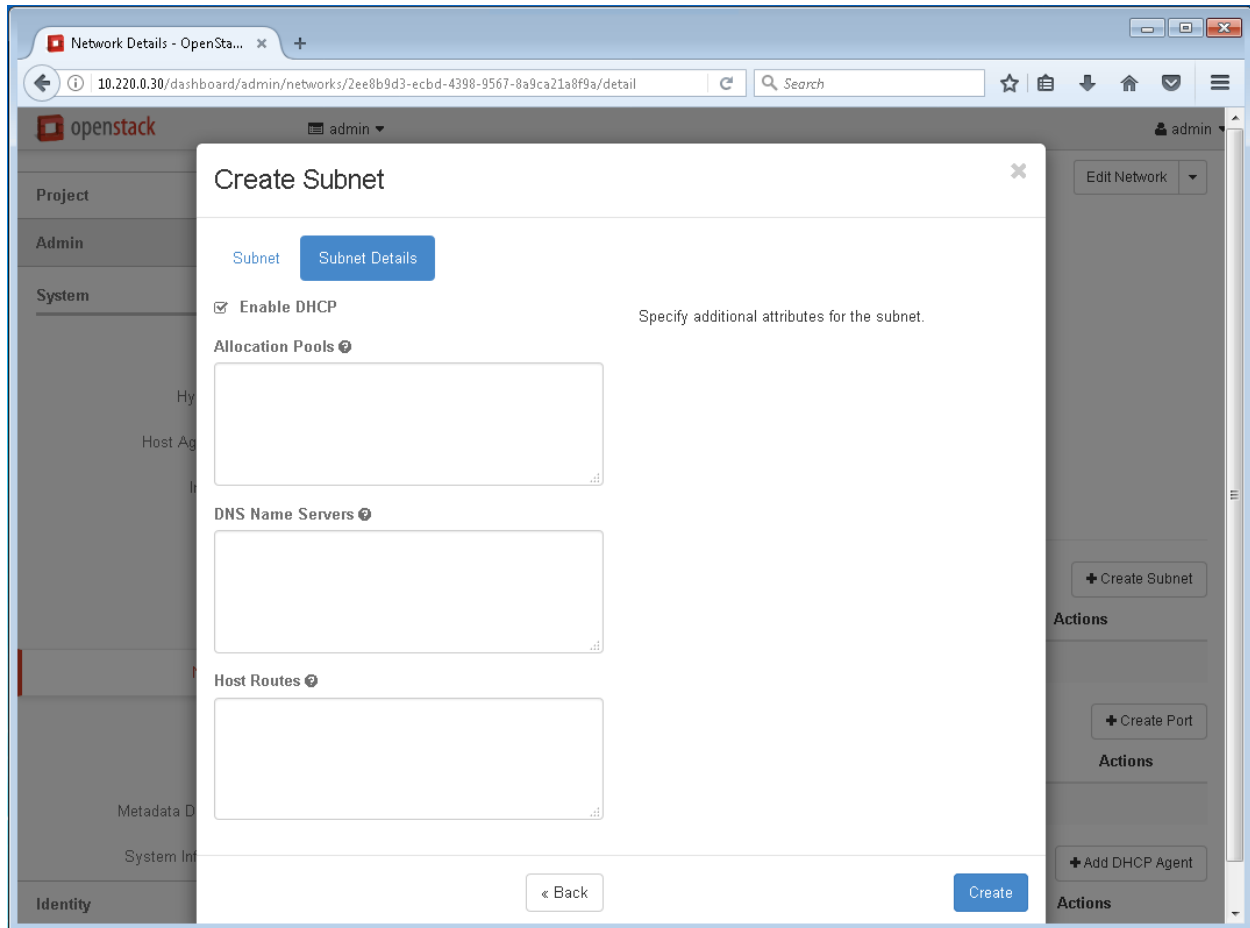
DHCP Agents

Name	Fixed IP's	Attached Device	Status	Admin State	Updated At	Actions
No items to display.						

9. Enter the Subnet Name of **public-subnet** and enter the information as shown in the screen capture and the table below. Click **Next**

Subnet Name	public-subnet
Network Address	10.220.0.0/23
IP Version	IPv4 (default setting)
Gateway IP	10.220.0.30

Note: The Gateway IP address is the IP address of the OpenStack server, this is was required to simplify the VMware Workstation networking environment, so you would not normally see this IP addressing scheme in a production environment



10. The Edit Subnet wizard should open

Dynamic Host Configuration Protocol (DHCP)

A network protocol that configures devices that are connected to a network so that they can communicate on that network by using the Internet Protocol (IP). The protocol is implemented in a client-server model where DHCP clients request configuration data, such as an IP address, a default route, and one or more DNS server addresses from a DHCP server. A method to automatically configure networking for a host at boot time. Provided by both Networking and Compute.

Module 3: Configure OpenStack Networks and Routers

The screenshot shows the 'Create Subnet' dialog in the OpenStack dashboard. The 'Enable DHCP' checkbox is checked. The 'Allocation Pools' field is highlighted with a red box and contains the text '10.220.0.10,10.220.0.15'. The 'Create' button at the bottom right is also highlighted with a red box. The background shows the OpenStack dashboard interface with a sidebar and a top navigation bar.

11. **Leave the Enable DHCP checked, this is the default setting. Enter the IP Addresses, separated by a comma, as shown in the screen capture and the table below. Click Create**

Allocation Pools	10.220.0.10,10.220.0.15
------------------	-------------------------

Note: The Enable DHCP option allows the OpenStack server to allocate IP addresses, in a typical production environment there would be a server or router dedicated to allocate IP addresses. If the network environment has a dedicated DHCP server or router, the Enable DHCP option would be deselected

Module 3: Configure OpenStack Networks and Routers

The screenshot shows the OpenStack dashboard interface. The left sidebar contains a navigation menu with categories: Project, Admin, and System. Under System, there are links for Overview, Hypervisors, Host Aggregates, Instances, Volumes, Flavors, and Images. The 'Networks' link is highlighted in red. The main content area is titled 'Networks / public' and includes an 'Edit Network' button. Below this is the 'Network Overview' section, which lists various attributes of the network. The 'Subnets' section shows a table with one subnet, 'public-subnet', which is highlighted with a red box. The 'Ports' section shows 'No items to display.' and the 'DHCP Agents' section is partially visible at the bottom.

Name	CIDR	IP Version	Gateway IP	Actions
<input type="checkbox"/> public-subnet	10.220.0.0/23	IPv4	10.220.0.30	<input type="checkbox"/> Edit Subnet

12. Verify that the public-subnet was created with the desired CIDR, IP Version and Gateway IP. **Click Networks** in the left pane to return to the Networks overview pane

The public network and public-subnet are ready for use by the XYZ Company.

Continue to lab 7.

Lab 7: Add and configure a Private Network

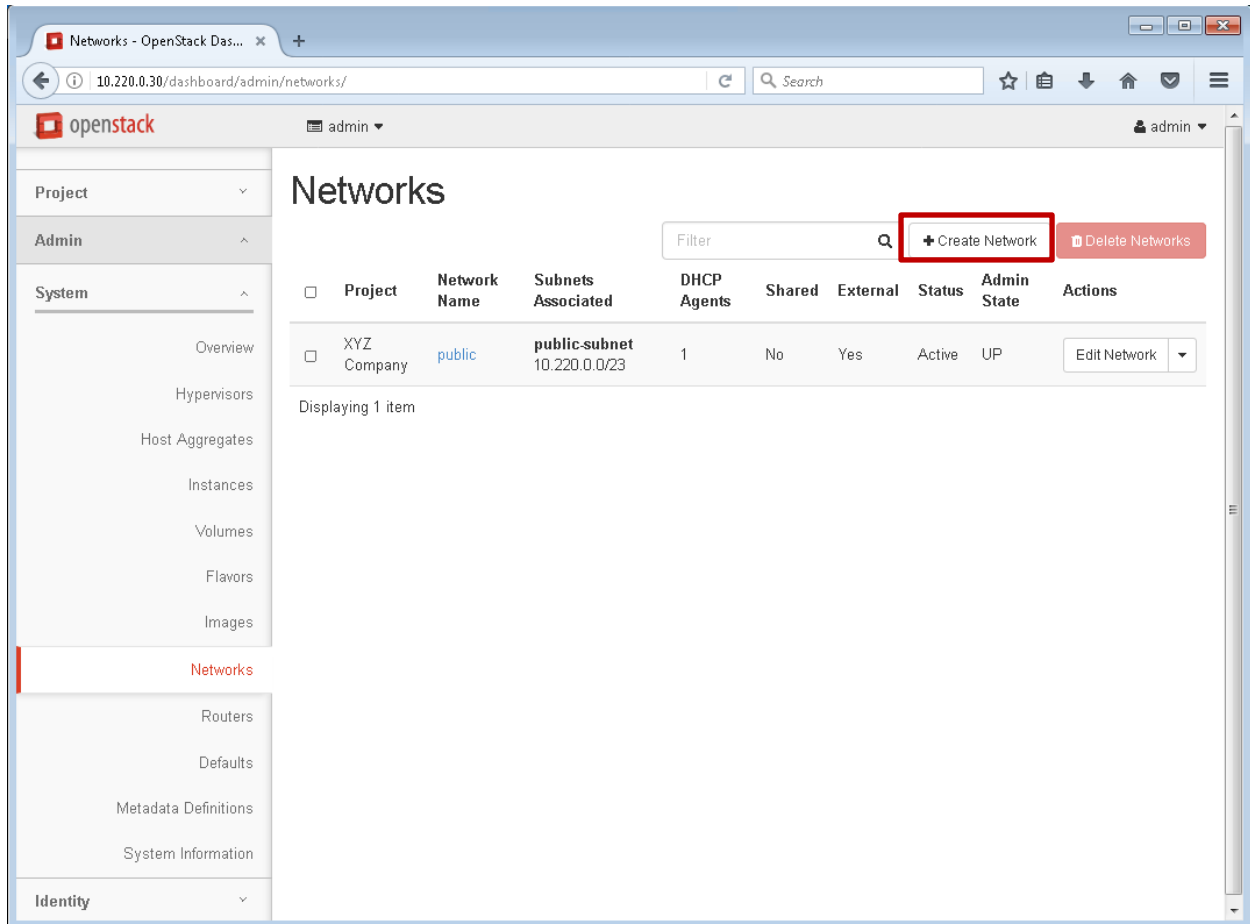
The screenshot shows the OpenStack dashboard interface for network management. The left sidebar contains a navigation menu with the following items: Project, Admin, System, Overview, Hypervisors, Host Aggregates, Instances, Volumes, Flavors, Images, **Networks** (highlighted with a red box), Routers, Defaults, Metadata Definitions, System Information, and Identity. The main content area displays the details for a network named 'public'. The 'Network Overview' section lists the following attributes: Name (public), ID (2ee8b9d3-ecbd-4398-9567-8a9ca21a8f9a), Project ID (a76a6e44dc3d45118553361971e548c0), Status (Active), Admin State (UP), Shared (No), External Network (Yes), MTU (1450), and Provider Network (Network Type: vxlan, Physical Network: -, Segmentation ID: 1005). Below this, the 'Subnets' section shows a table with one subnet: 'public-subnet' with CIDR 10.220.0.0/23, IP Version IPv4, and Gateway IP 10.220.0.30. The 'Ports' section is currently empty, displaying 'No items to display.' The 'DHCP Agents' section is also empty.

1. Click on Networks

Private Networks

Private Networks, also known as Self-service and internal networks primarily enable general (non-privileged) projects to manage networks without involving administrators. These networks are entirely virtual and require virtual routers to interact with provider and external networks such as the Internet. Self-service networks also usually provide DHCP and metadata services to instances.

Module 3: Configure OpenStack Networks and Routers



2. Click on Create Network

Networks

OpenStack networking service, project name Neutron, allows users to create and attach virtual interfaces and/or devices that perform the same functions that their physical counterparts do. Typically, the OpenStack environment will include one or more internal networks (private) and an external network (public).

Module 3: Configure OpenStack Networks and Routers

The screenshot shows the OpenStack Networks dashboard with the 'Create Network' dialog box open. The dialog box has a red border and contains the following fields and options:

- Name:** A text input field containing 'private'.
- Project:** A dropdown menu showing 'XYZ Company'.
- Provider Network Type:** A dropdown menu showing 'VXLAN'.
- Segmentation ID:** A text input field containing '1010'.
- Admin State:** A dropdown menu showing 'UP'.
- Shared:** An unchecked checkbox.
- External Network:** An unchecked checkbox.
- Buttons:** 'Cancel' and 'Submit' buttons at the bottom right, with 'Submit' highlighted by a red border.

The background shows the OpenStack dashboard interface with a sidebar on the left and a top navigation bar.

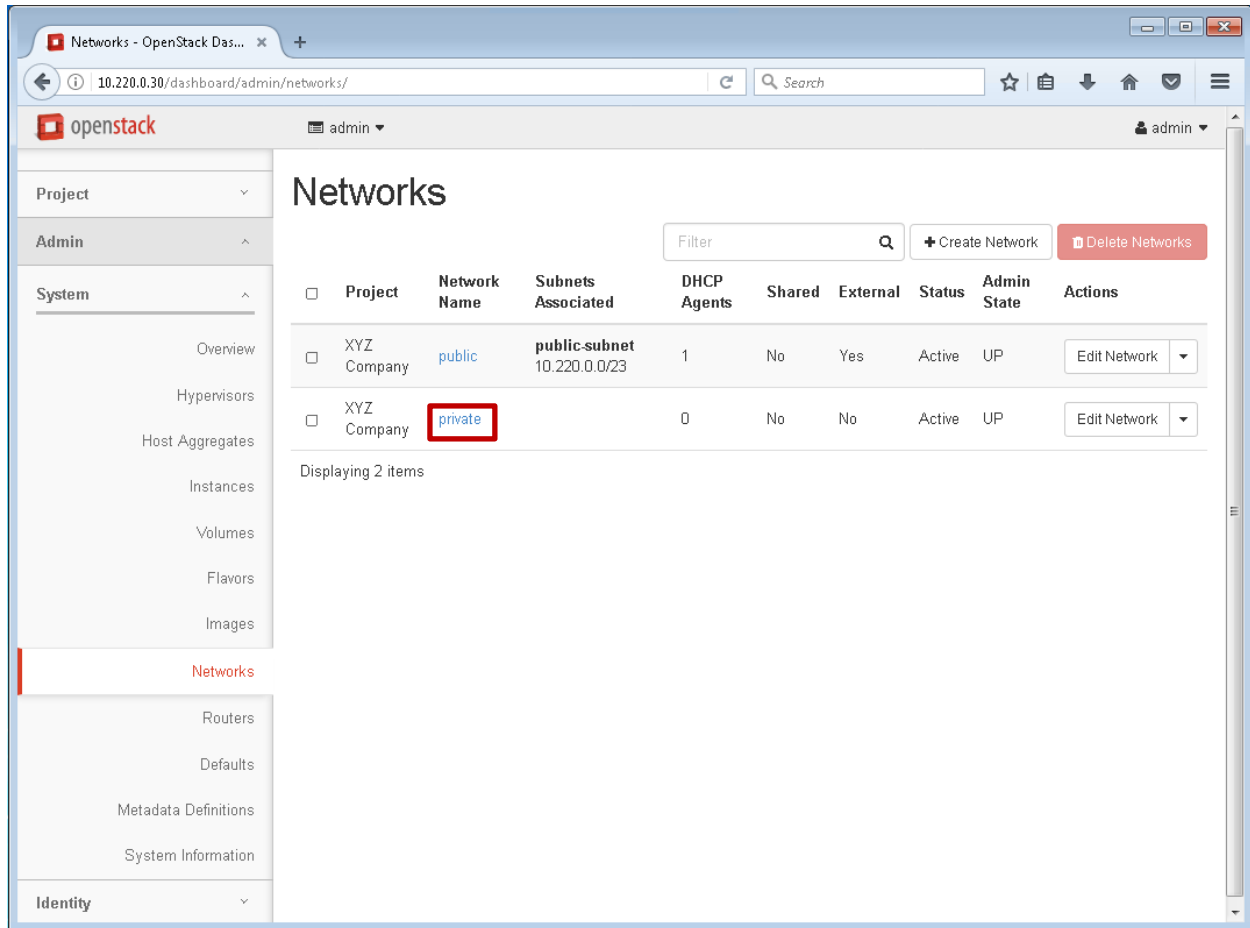
3. Enter the Network Name of **private**, and using the dropdown menu for Project, Provider Network Type and Segmentation ID enter the information as shown in the screen capture and the table below. Click **Submit**

Name	private
Project	XYZ Company
Provider Network Type	VXLAN
Segmentation ID	1010

External Network

The public network allows instances to communicate with networks that are outside of the cloud, for example: The Internet.

Module 3: Configure OpenStack Networks and Routers



The screenshot shows the OpenStack Networks dashboard. The left sidebar contains navigation links for Project, Admin, and System. The main content area is titled 'Networks' and displays a table of networks. The table has columns for Project, Network Name, Subnets Associated, DHCP Agents, Shared, External, Status, Admin State, and Actions. Two networks are listed: 'public' and 'private'. The 'private' network is highlighted with a red box. The 'private' network has 0 subnets associated, 0 DHCP agents, is not shared, is not external, is active, and is in the UP state. The 'public' network has 1 subnet associated, 1 DHCP agent, is shared, is external, is active, and is in the UP state. The 'private' network is highlighted with a red box.

Project	Network Name	Subnets Associated	DHCP Agents	Shared	External	Status	Admin State	Actions
XYZ Company	public	public-subnet 10.220.0.0/23	1	No	Yes	Active	UP	Edit Network
XYZ Company	private		0	No	No	Active	UP	Edit Network

Displaying 2 items

4. Click on private

Module 3: Configure OpenStack Networks and Routers

The screenshot shows the OpenStack dashboard for a private network. The left sidebar contains navigation links for Project, Admin, and System. The main content area is titled 'Networks / private' and includes a 'Network Overview' section with details like Name, ID, Project ID, Status, Admin State, Shared, External Network, MTU, and Provider Network. Below this is a 'Subnets' table with columns for Name, CIDR, IP Version, Gateway IP, and Actions. A '+ Create Subnet' button is highlighted with a red box. The 'Ports' and 'DHCP Agents' sections are also visible, each with a '+ Create Port' and '+ Add DHCP Agent' button respectively.

Name	CIDR	IP Version	Gateway IP	Actions
No items to display.				

Name	Fixed IPs	Attached Device	Status	Admin State	Actions
No items to display.					

Host	Status	Admin State	Updated At	Actions
------	--------	-------------	------------	---------

5. Click Create Subnet

Internal Network

These private networks connect directly to instances and can only be accessed by other instances that are in the same subnet, or are connected by a router, if in a different private subnet.

Module 3: Configure OpenStack Networks and Routers

Network Details - OpenSta... x

10.220.0.30/dashboard/admin/networks/942a87b3-e7e4-4bb3-9794-566d5d5be4d9/detail

openstack admin

Project Admin System

Create Subnet

Subnet Subnet Details

Subnet Name private-subnet

Network Address 192.168.1.0/24

IP Version IPv4

Gateway IP 192.168.1.1

☐ Disable Gateway

< Back Next >

Create a subnet associated with the network. Advanced configuration is available by clicking on the "Subnet Details" tab.

+ Create Subnet

+ Create Port

+ Add DHCP Agent

Actions

Actions

No items to display.

DHCP Agents

Host	Status	Admin State	Updated At	Actions
------	--------	-------------	------------	---------

6. Enter the information as shown in the screen capture and the table below. Click Next

Subnet Name	private-subnet
Network Address	192.168.1.0/24
IP Version	IPv4
Gateway IP	192.168.1.1

Note: The best practice is to use the first available IP address from the network, in this case 192.168.1.1, as the gateway address. If you leave this entry blank, OpenStack will automatically assign the 192.168.1.1 address, or the first available address from the network you have chosen.

Module 3: Configure OpenStack Networks and Routers

The screenshot shows the 'Create Subnet' modal in the OpenStack dashboard. The 'Enable DHCP' checkbox is checked. The 'Allocation Pools' field contains the text '192.168.1.2,192.168.1.10'. The 'Create' button at the bottom right is highlighted with a red box. The 'Subnet Details' tab is selected.

7. **Leave the Enable DHCP checked**, this is the default setting. **Enter** the IP Addresses, separated by a comma, as shown in the screen capture and the table below. **Click Create**

Allocation Pools	192.168.1.2,192.168.1.10
------------------	--------------------------

Note: The allocation pool starts at the second available IP address from the private-subnet network address range. This is because the first IP address, 192.168.1.1, was used as the gateway IP address on the previous create network page.

Note: The DNS Name Servers block is not used in this lab environment. If this were an actual deployment, then you would enter your network's DNS Name Server IP address, even if it's not in the same subnet as the private network. For example, you could enter Google's DNS server IP Address 8.8.8.8

Note: Host Routes is for any additional network route information specific to your setup, which is not used in this lab environment

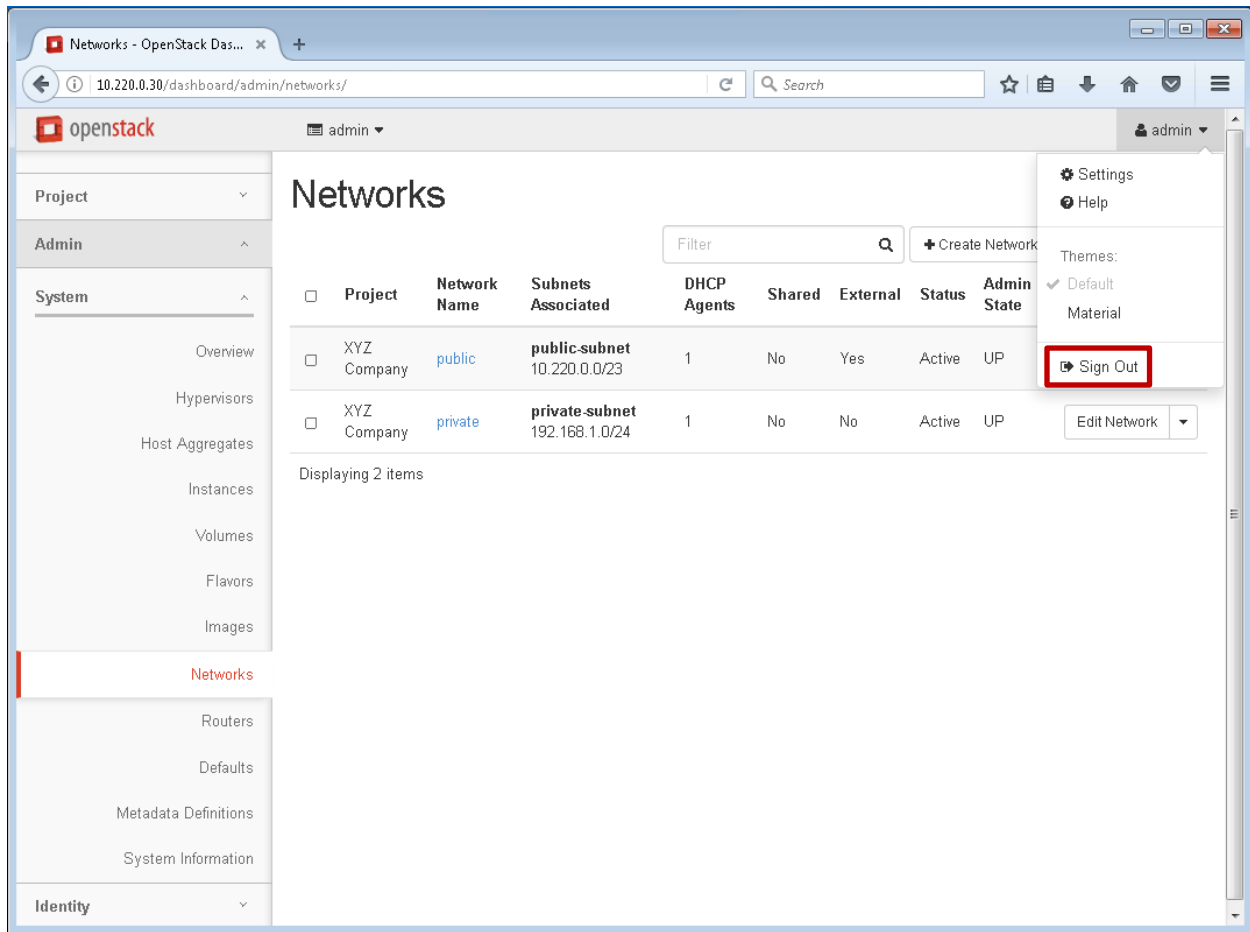
The screenshot shows the OpenStack Networks dashboard. On the left is a sidebar with navigation links: Project, Admin, System, Overview, Hypervisors, Host Aggregates, Instances, Volumes, Flavors, Images, Networks (highlighted in red), Routers, Defaults, Metadata Definitions, System Information, and Identity. The main content area is titled 'Networks' and contains a table of networks. The table has columns: Project, Network Name, Subnets Associated, DHCP Agents, Shared, External, Status, Admin State, and Actions. Two networks are listed: 'public' and 'private'. The 'private' network, associated with 'XYZ Company' and having a subnet of '192.168.1.0/24', is highlighted with a red border. Above the table are filters and buttons for '+ Create Network' and 'Delete Networks'. Below the table, it says 'Displaying 2 items'.

<input type="checkbox"/>	Project	Network Name	Subnets Associated	DHCP Agents	Shared	External	Status	Admin State	Actions
<input type="checkbox"/>	XYZ Company	public	public-subnet 10.220.0.0/23	1	No	Yes	Active	UP	Edit Network
<input type="checkbox"/>	XYZ Company	private	private-subnet 192.168.1.0/24	1	No	No	Active	UP	Edit Network

Displaying 2 items

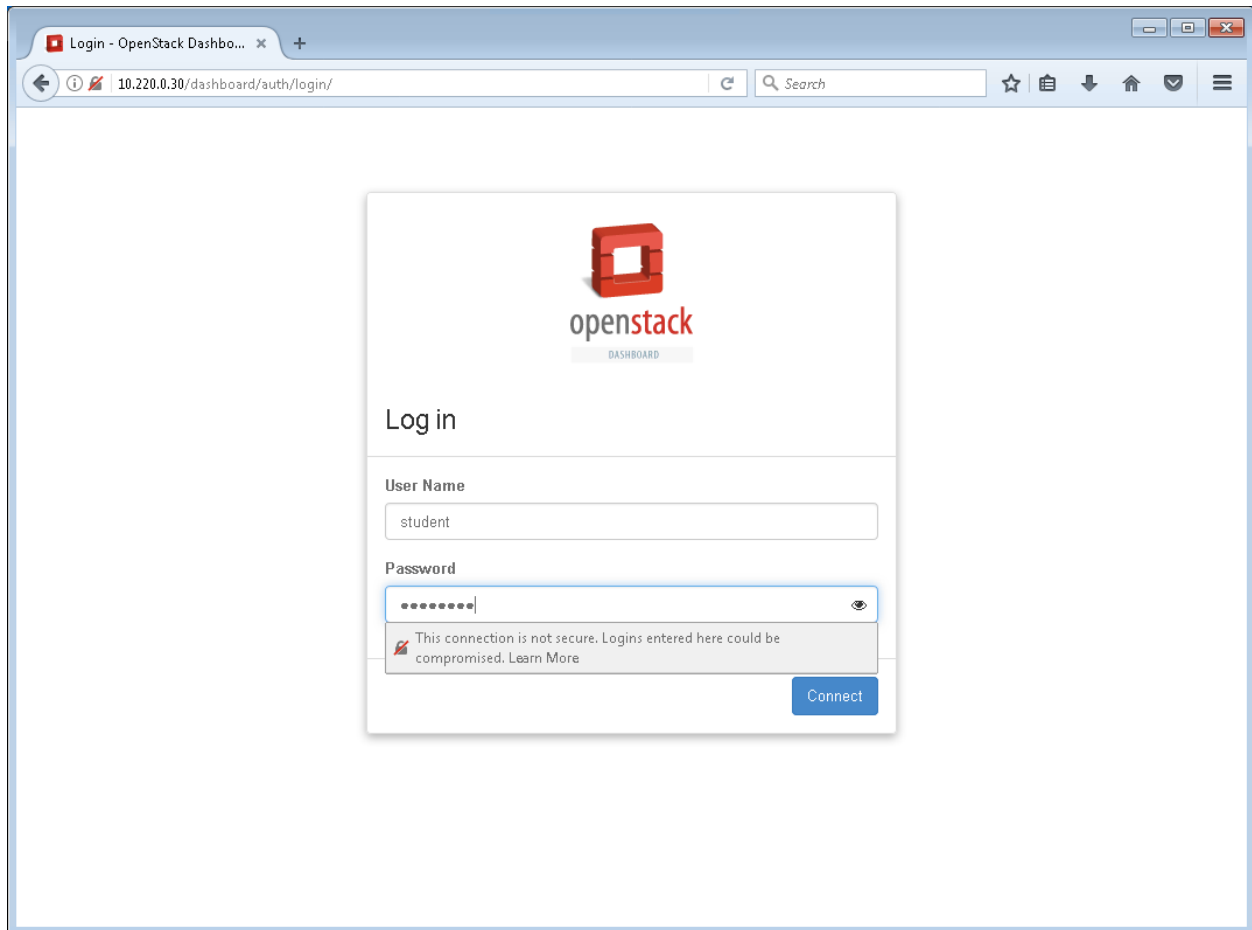
- Continue to Lab 8.

Lab 8: Add and Configure a Network Router



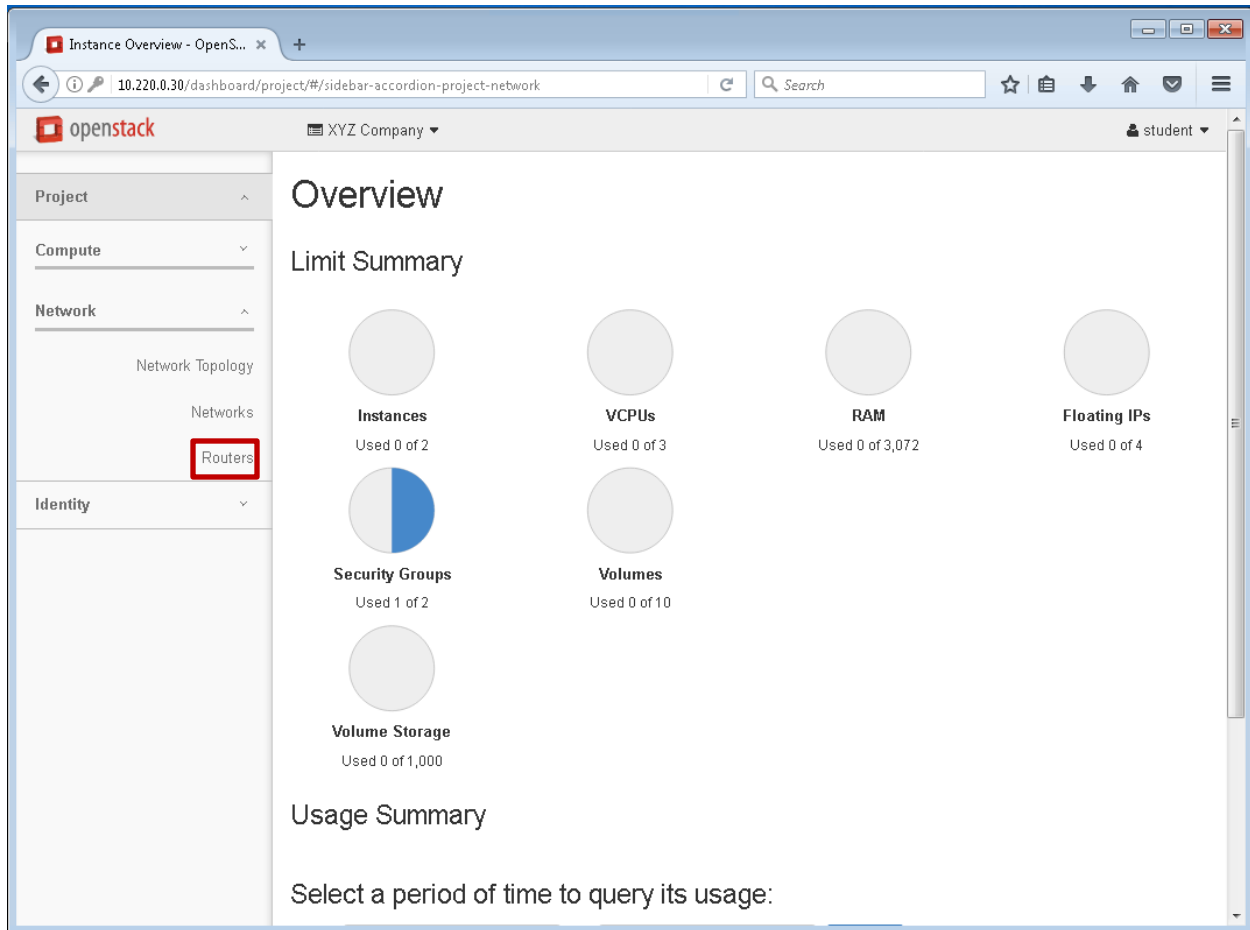
1. **Sign out** from the admin user account.

Module 3: Configure OpenStack Networks and Routers



2. **Log in** as student

Module 3: Configure OpenStack Networks and Routers

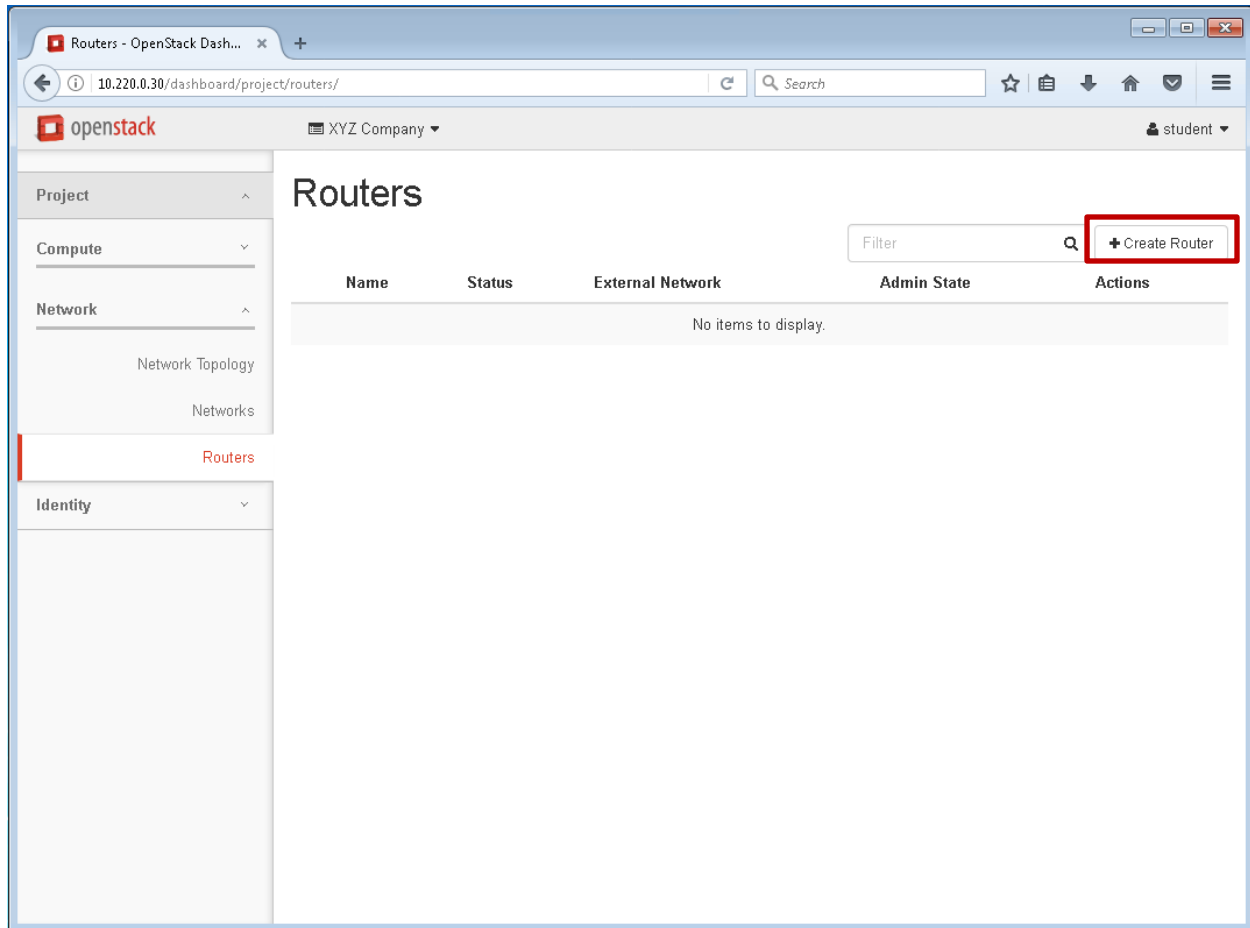


3. Click on **Routers** tab in the left pane

Routers

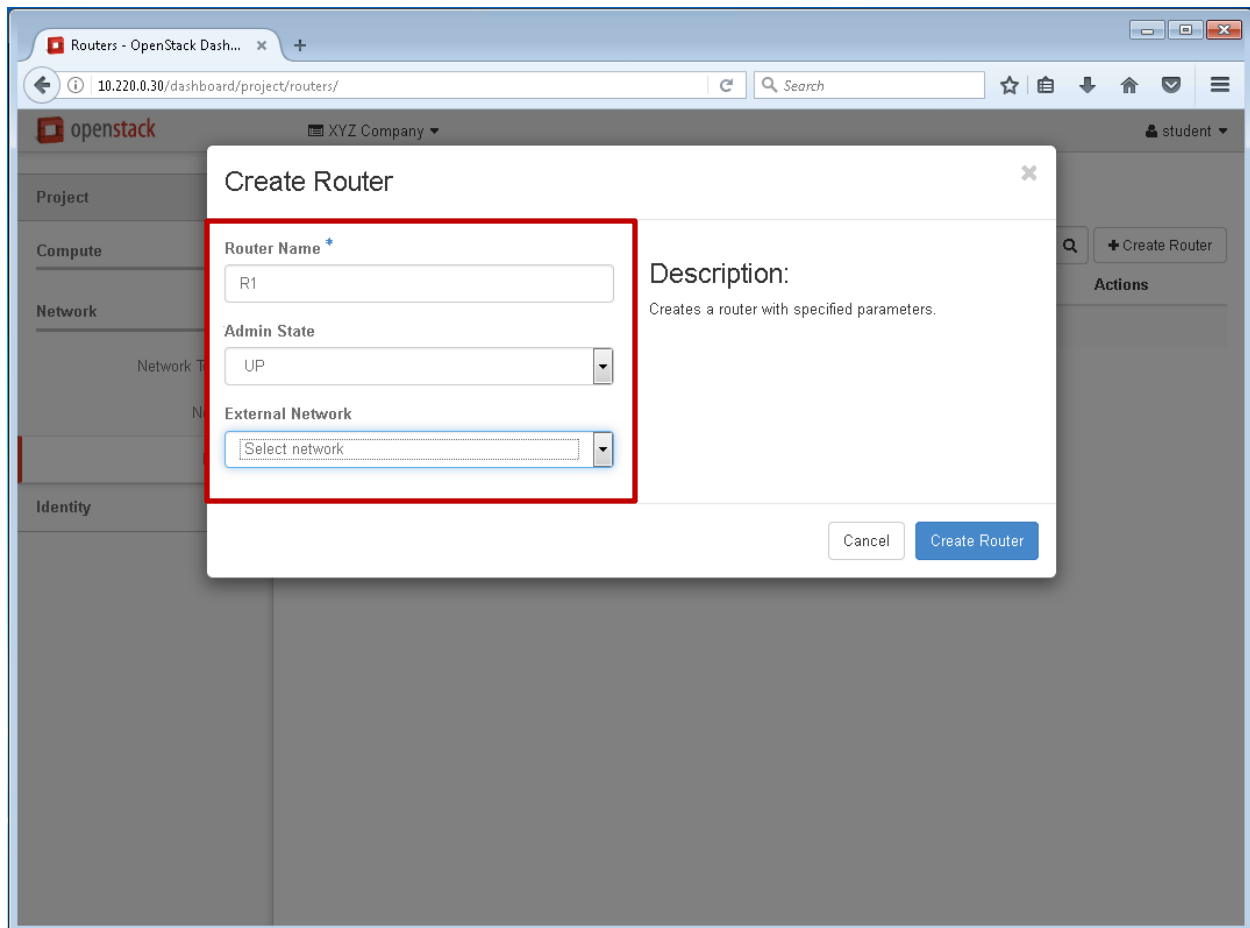
A physical or virtual network device that passes network traffic between different networks. In the OpenStack environment, a router is a virtual device that is required to allow network traffic between the private IP address (fixed IP address) and the public IP address (floating IP address), or between private IP addresses that are in different subnets.

Module 3: Configure OpenStack Networks and Routers



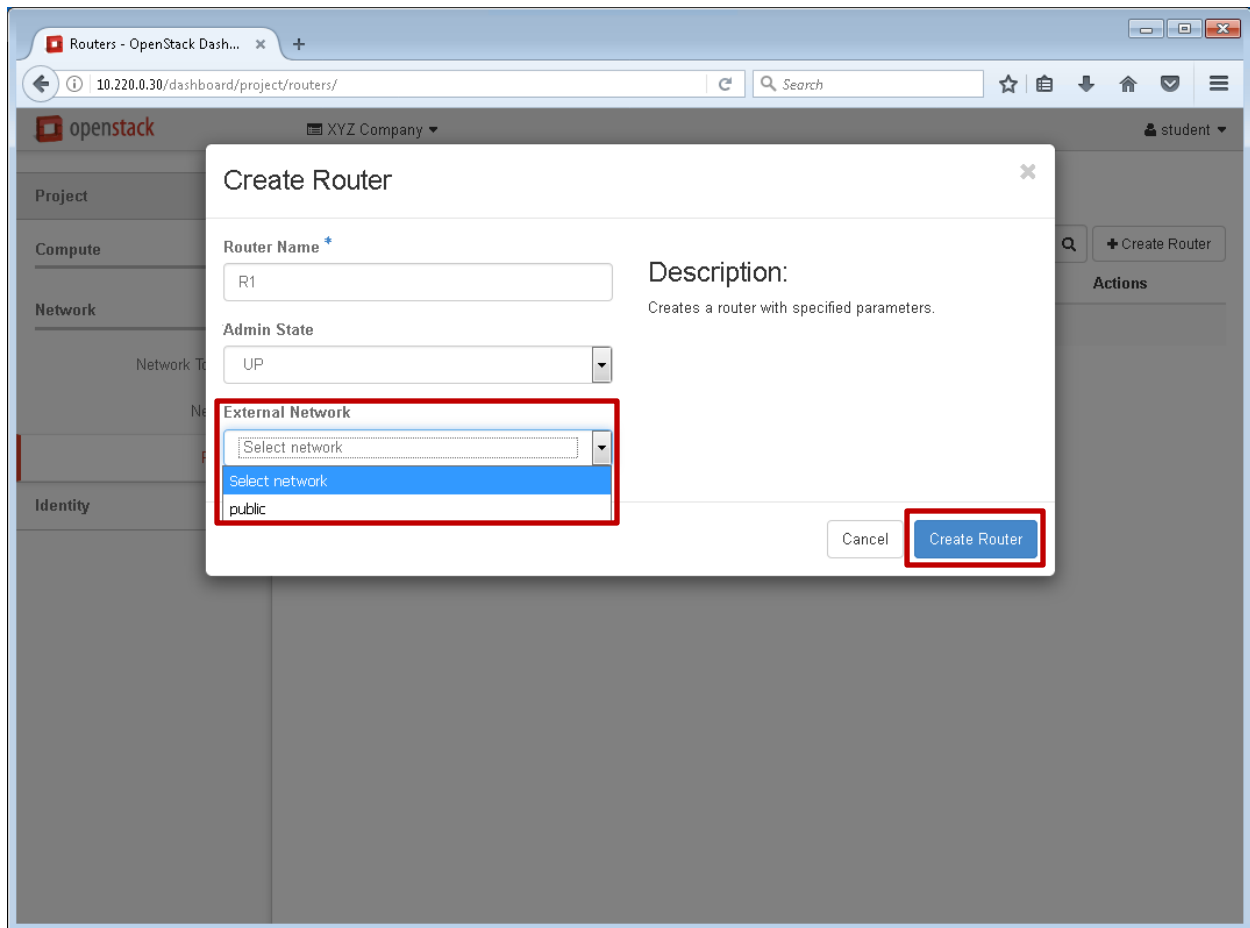
4. Click on the **Create Router**

Module 3: Configure OpenStack Networks and Routers



5. The **Create Router** wizard should open. **Enter R1** in the Router Name block. **Select the drop down menu** to see the available external networks, shown on next page

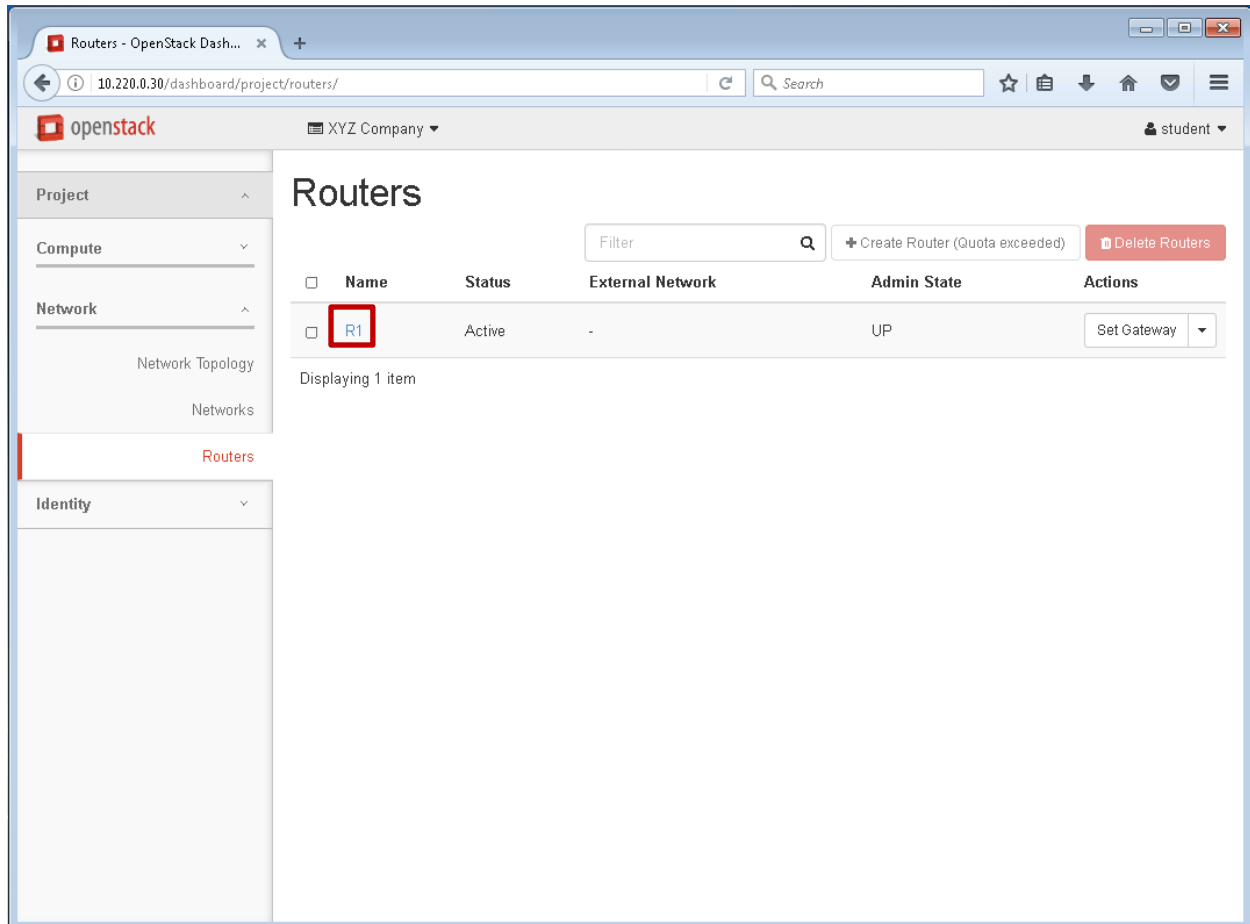
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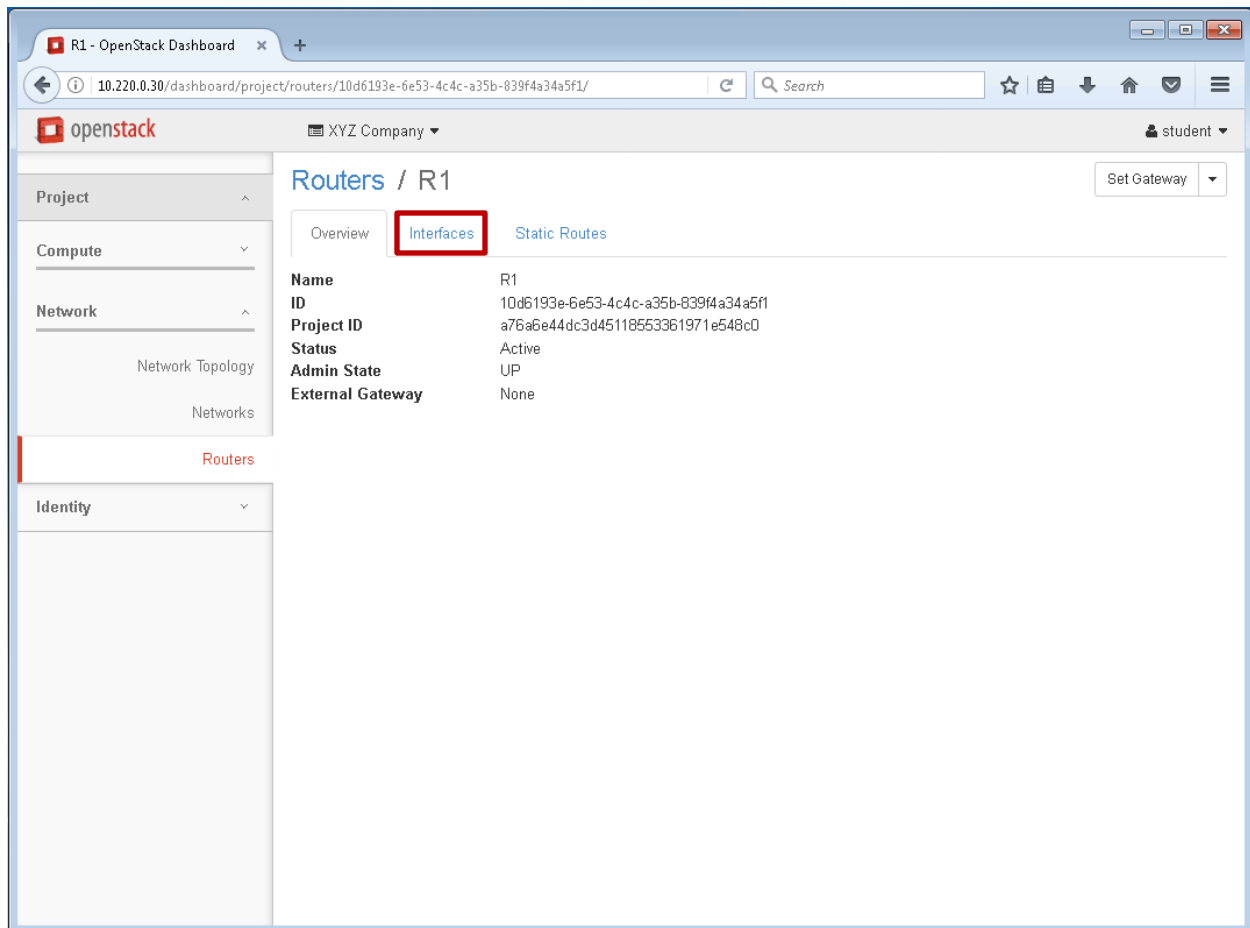
6. Select the **public** network, then Click on **Create Router**

Router Name	R1
External Network	public

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7. Your new **R1** router should appear and the **Status** should be **Active** and Admin State should be **UP**. **Click on R1**

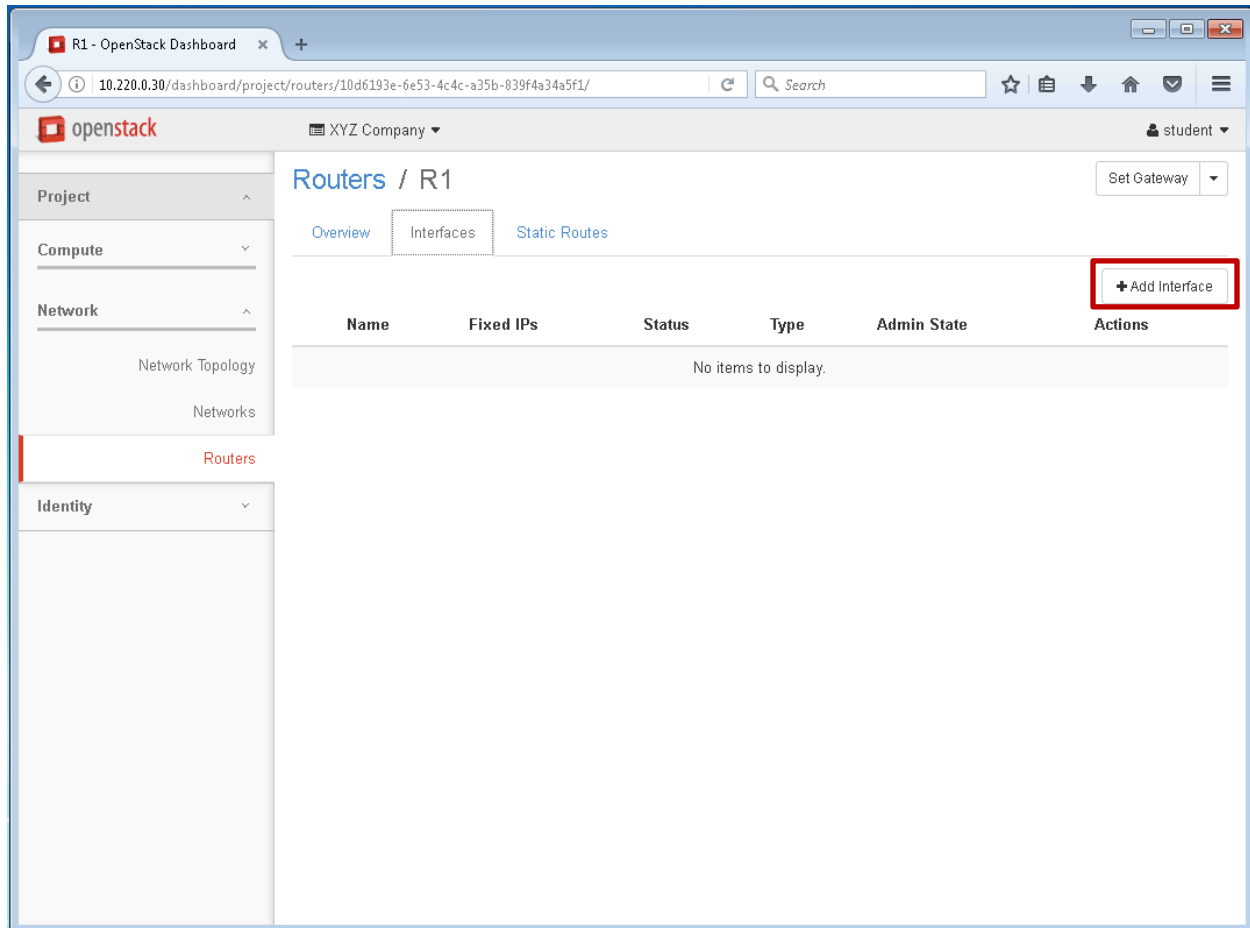


- The **Routers** pane should appear. There are three additional tabs in the center pane; **Overview**, **Interfaces**, and **Static Routes**. The **Overview** pane, pictured, provides additional information about the Router. The **public network** was added to **Router R1** when it was created with the Create Router wizard. We will add the private network next. **Click on the Interfaces tab**

Interfaces

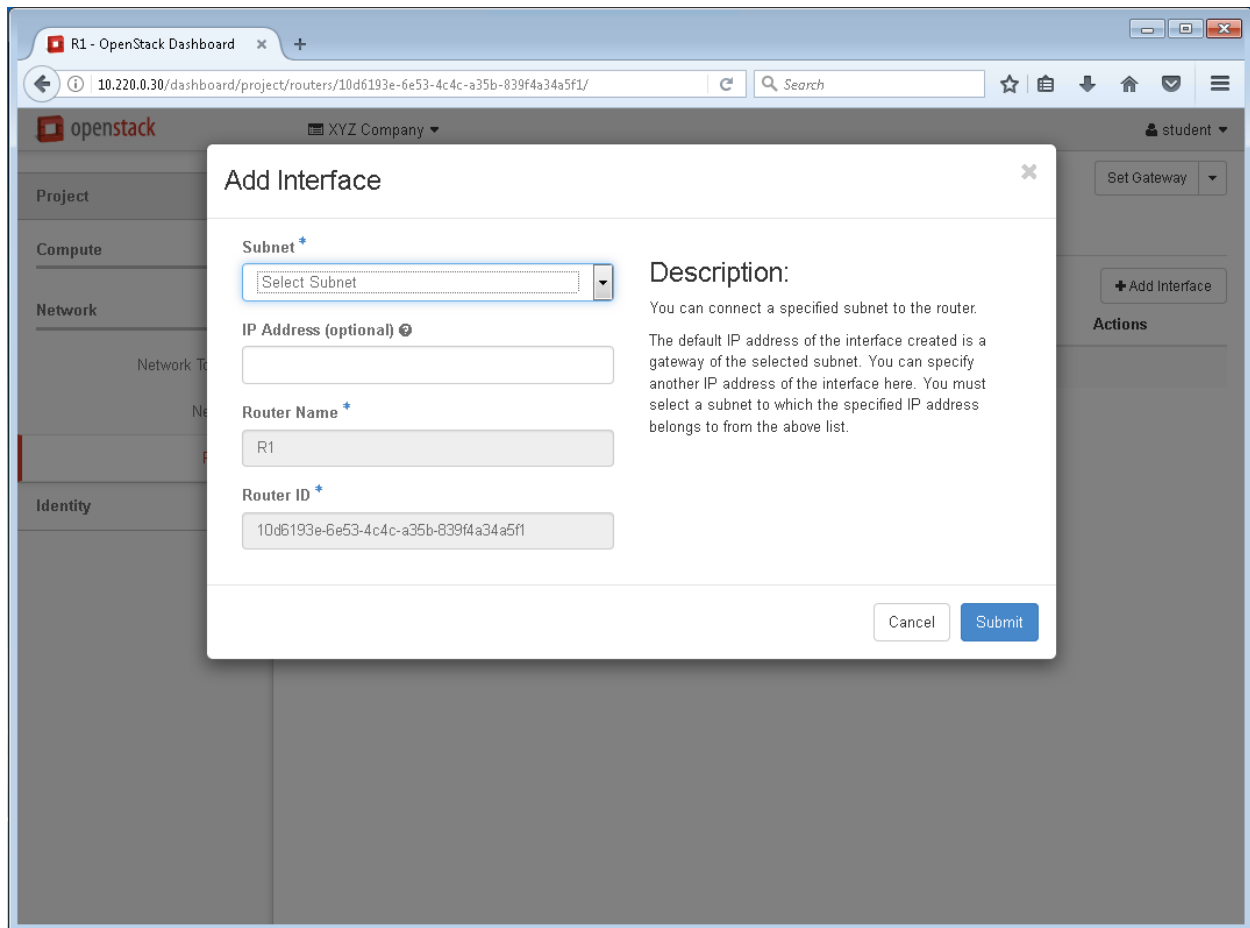
A physical or virtual device that provides connectivity to another device. In this case, you are adding a private interface to the router.

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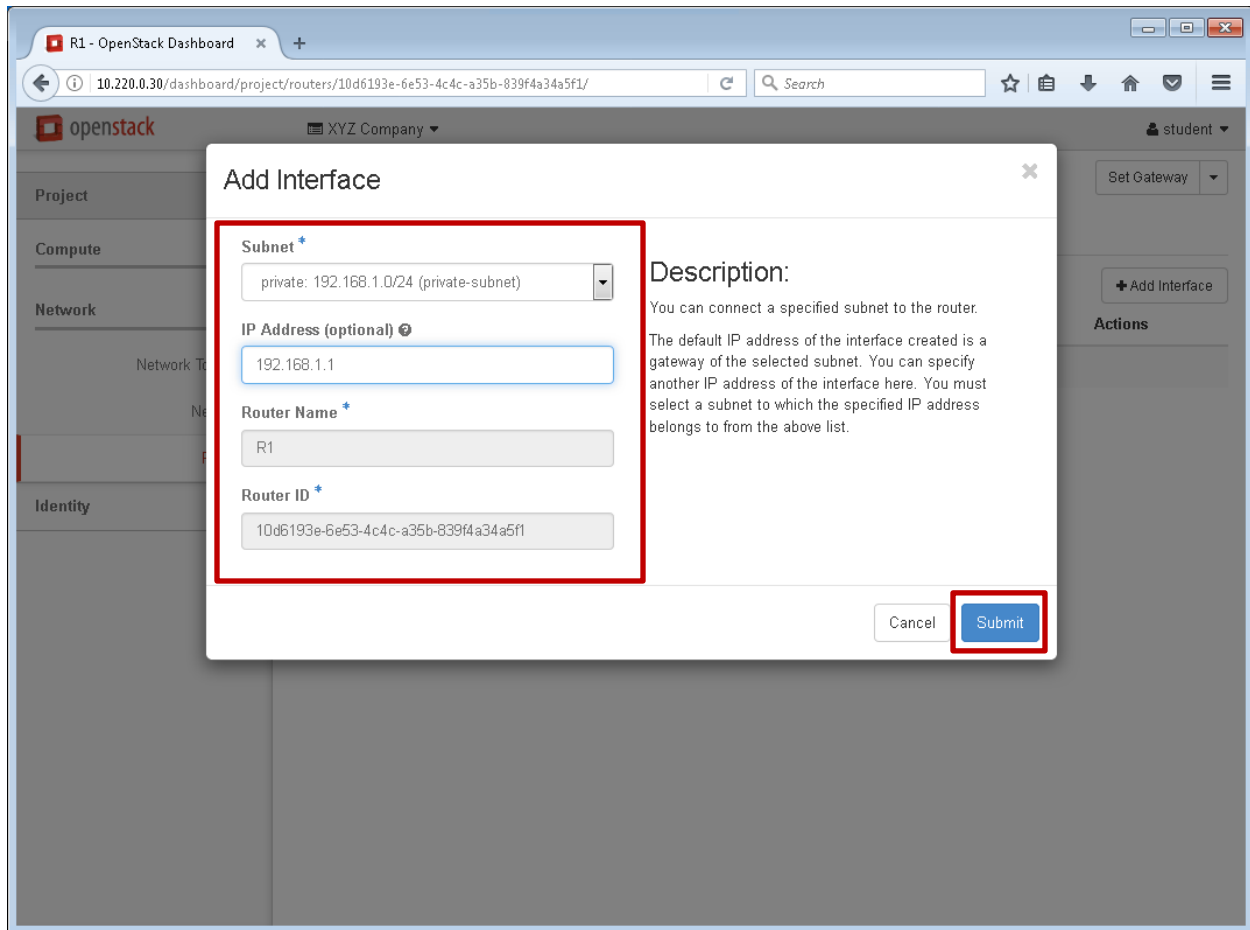
9. Click on Add interface

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10. The **Add Interface** wizard should appear

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11. Select the **Subnet** drop down menu and **Click** on the **private: 192.168.1.0/24 (private-subnet)** network. **Enter** the **IP address 192.168.1.1**. **Click Submit**

Subnet	Private: 192.168.1.0/24 (private-subnet)
IP address	192.168.1.1

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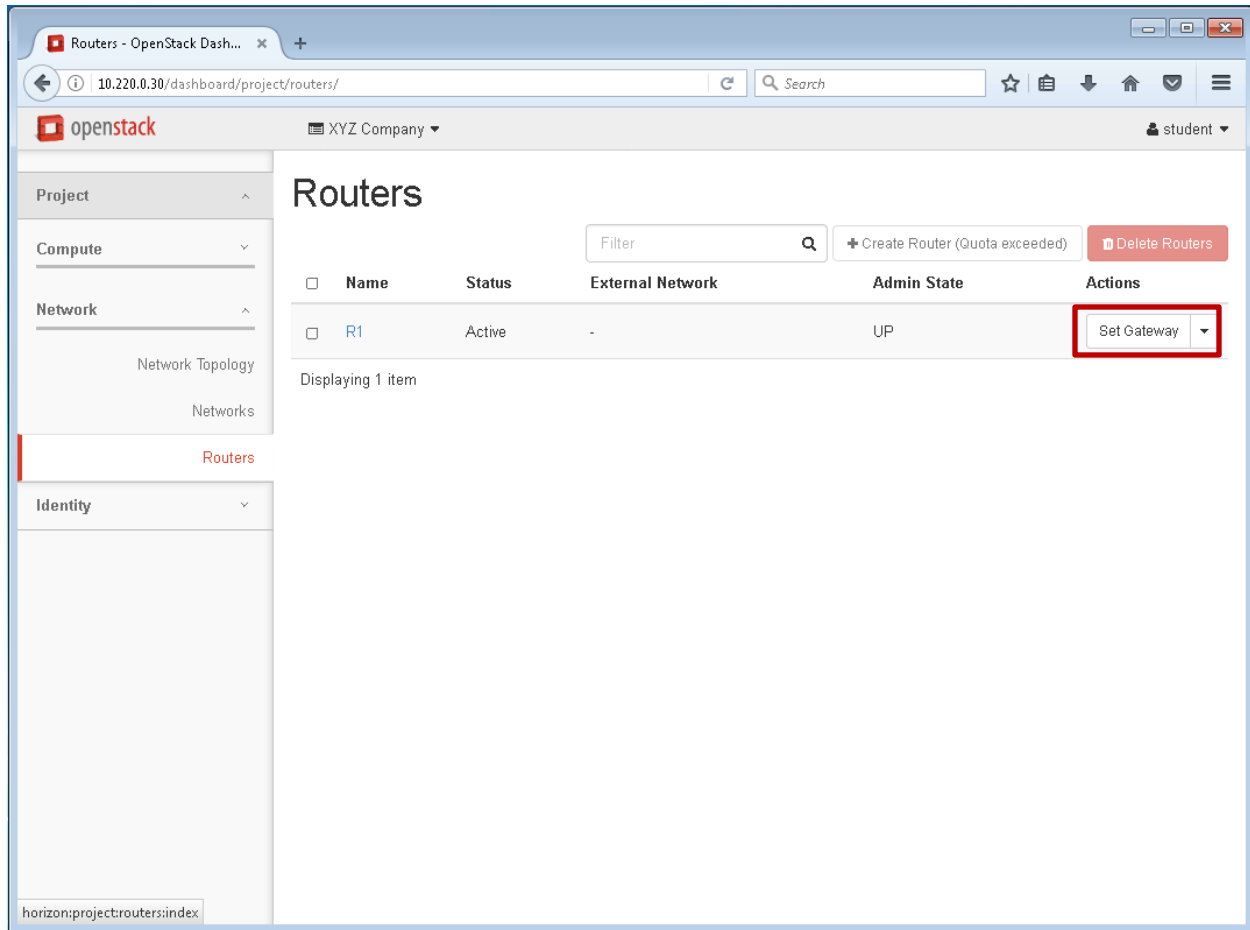
The screenshot shows the OpenStack Dashboard interface. A modal dialog titled "Add Interface" is open. It contains the following fields and information:

- Subnet:** A dropdown menu showing "private: 192.168.1.0/24 (private-subnet)".
- IP Address (optional):** A text input field containing "192.168.1.1". This field is highlighted with a red rectangle.
- Router Name:** A text input field containing "R1".
- Router ID:** A text input field containing "10d6193e-6e53-4c4c-a35b-839f4a34a5f1".
- Description:** A text block on the right side of the dialog stating: "You can connect a specified subnet to the router. The default IP address of the interface created is a gateway of the selected subnet. You can specify another IP address of the interface here. You must select a subnet to which the specified IP address belongs to from the above list."
- Buttons:** "Cancel" and "Submit" buttons at the bottom right. The "Submit" button is highlighted with a red rectangle.

12. Enter the **192.168.1.1** network address in the **IP Address (optional)** block. Click on **Submit**.

Note: The IP address above is the first available IP address in the private subnet and is the same IP address that you assigned as the gateway IP address in lab 7.

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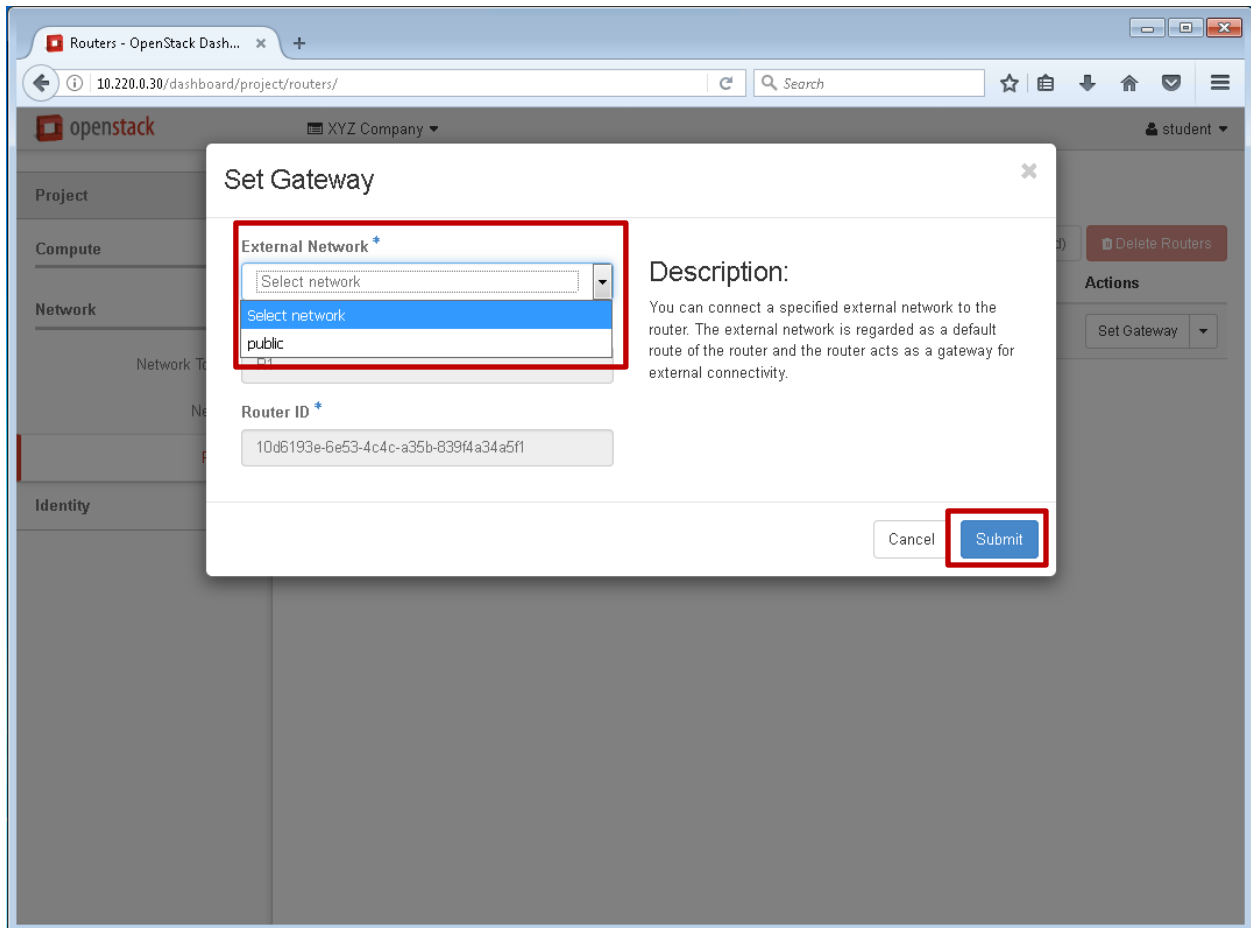
The screenshot shows the OpenStack Horizon interface for managing Routers. The left sidebar contains navigation links for Project, Compute, Network, and Identity. The main content area is titled 'Routers' and includes a filter input, a '+ Create Router (Quota exceeded)' button, and a 'Delete Routers' button. A table lists the routers, with one router, R1, shown. The 'Set Gateway' button in the Actions column for R1 is highlighted with a red box.

Name	Status	External Network	Admin State	Actions
R1	Active	-	UP	Set Gateway

Displaying 1 item

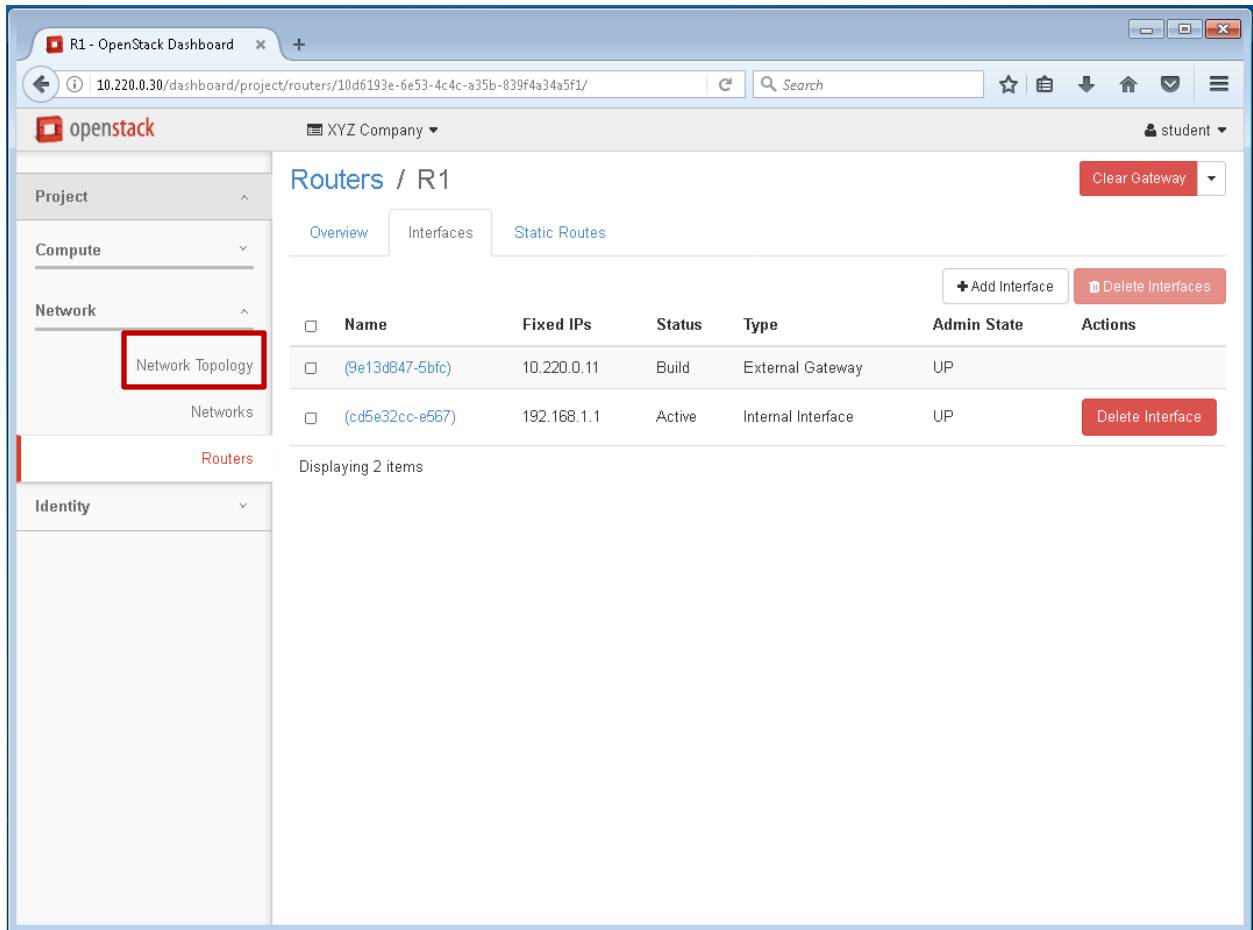
13. Return the **Router tab** and **Click Set Gateway**.

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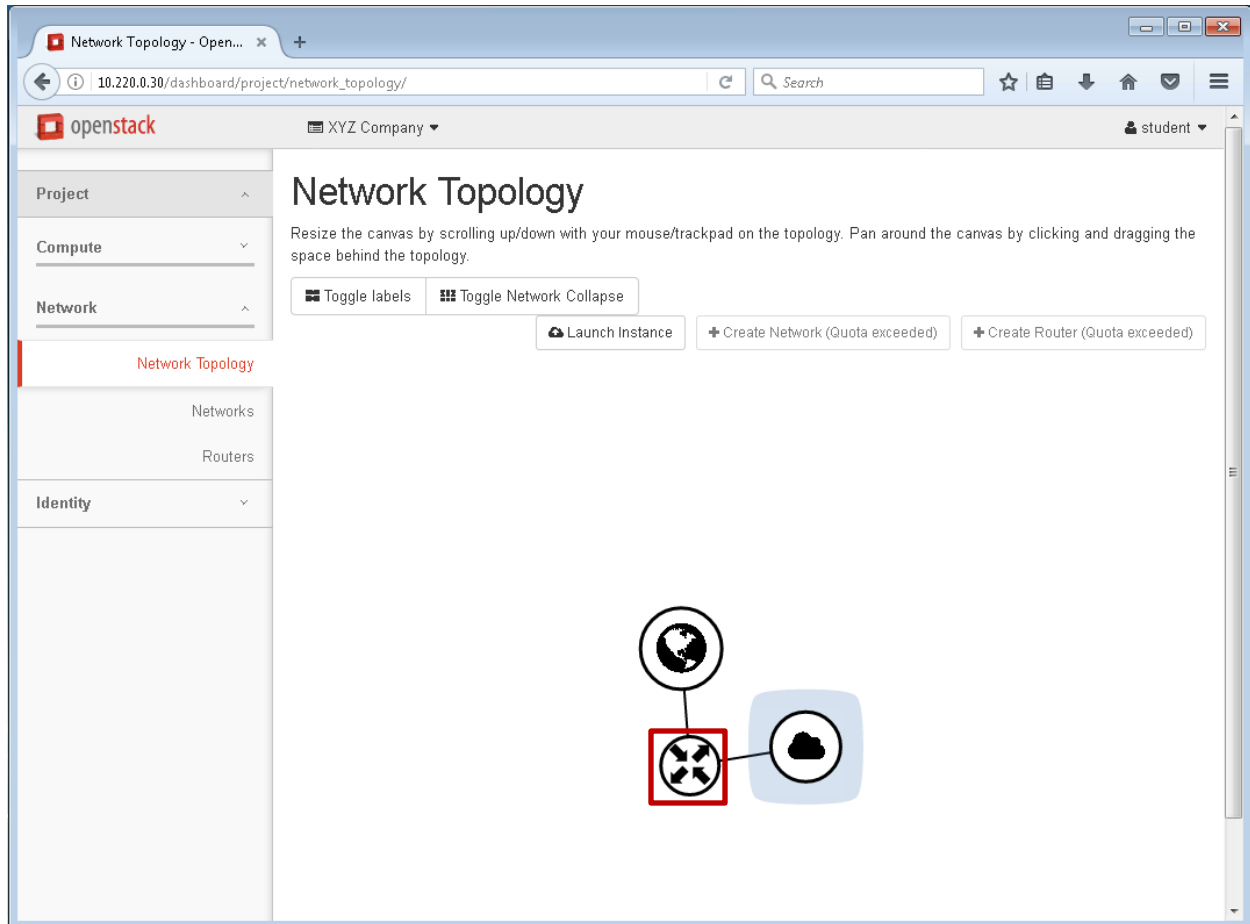
14. From the dropdown menu, **select the public network**. Click **Submit**.

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15. Both interfaces should be listed in the center pane. **Click on the Network Topology tab in the left pane**

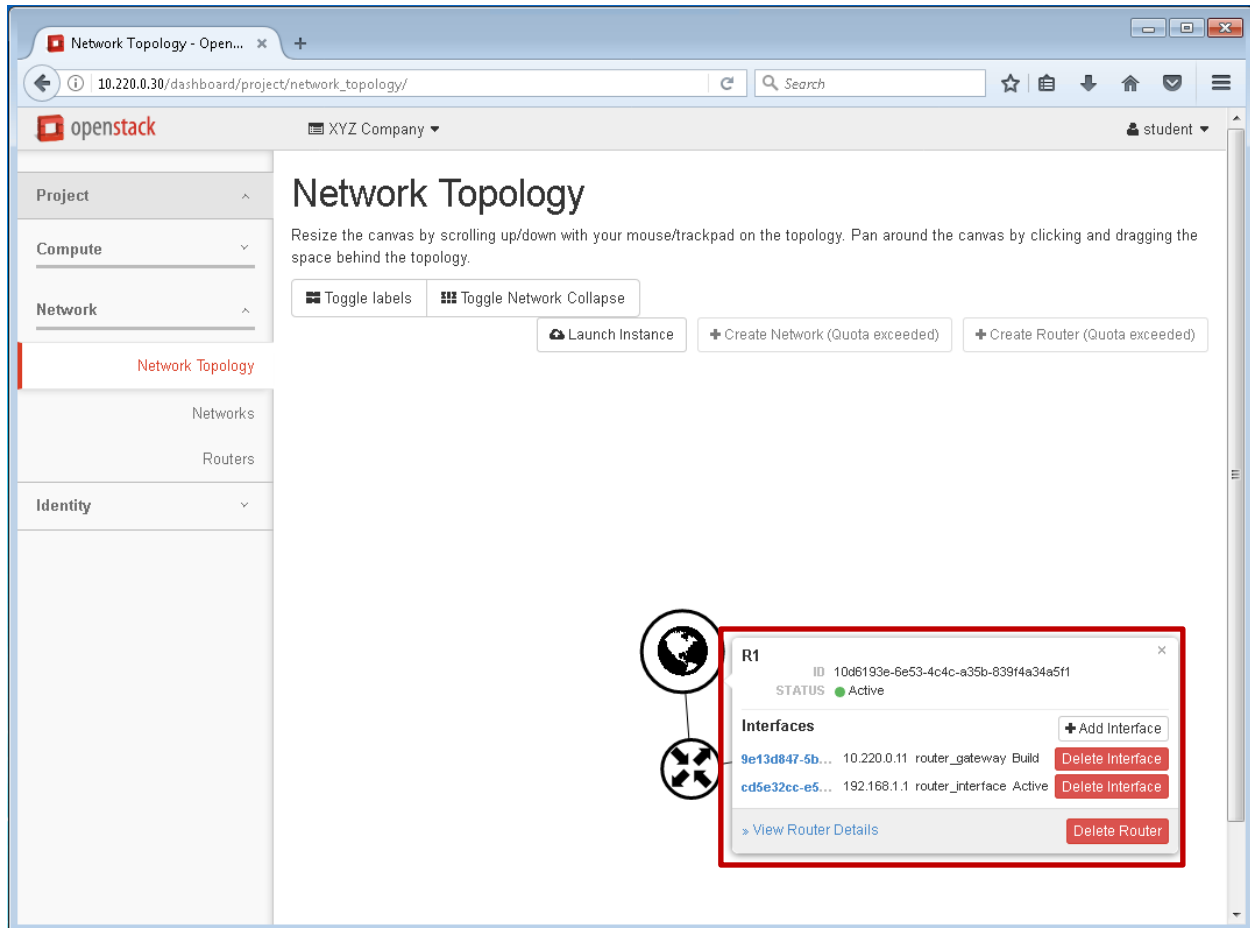
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16. The **Network Topology** pane has a graphic representation of your network. Click on the **center icon** with the four arrows.

Note: The ICON with globe is the WAN (public network) and the ICON with the Cloud is the LAN (private network) if you click on either one, you will see the same type of popup with additional information as you do with the Router ICON.

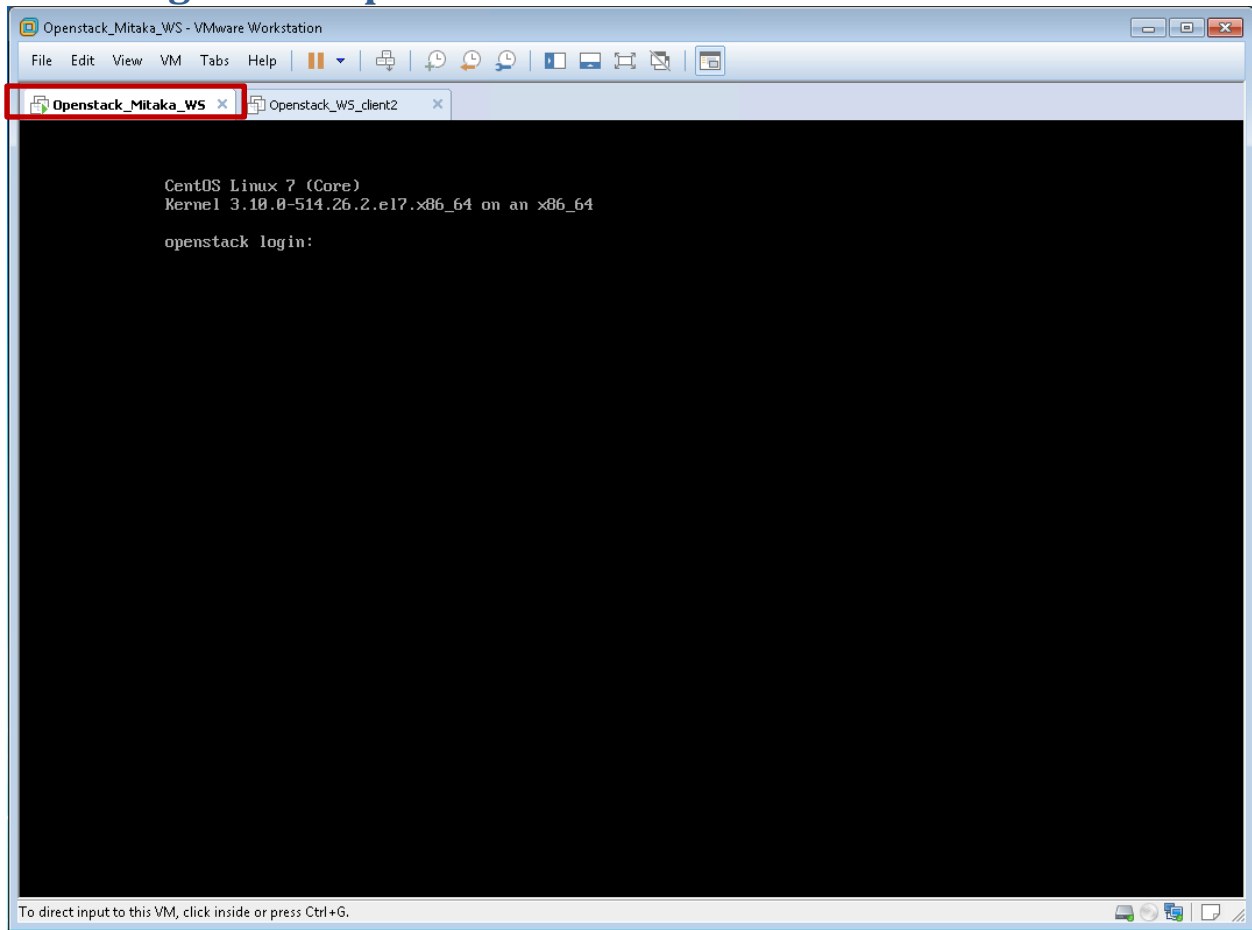
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17. You should see a popup with more information about your router along with options to **Add Interface, Delete Interface, Delete Router**. Additionally, a link to **View Router details**, which takes you back to the **Routers** tab.

This completes Lab 8, continue to grading script

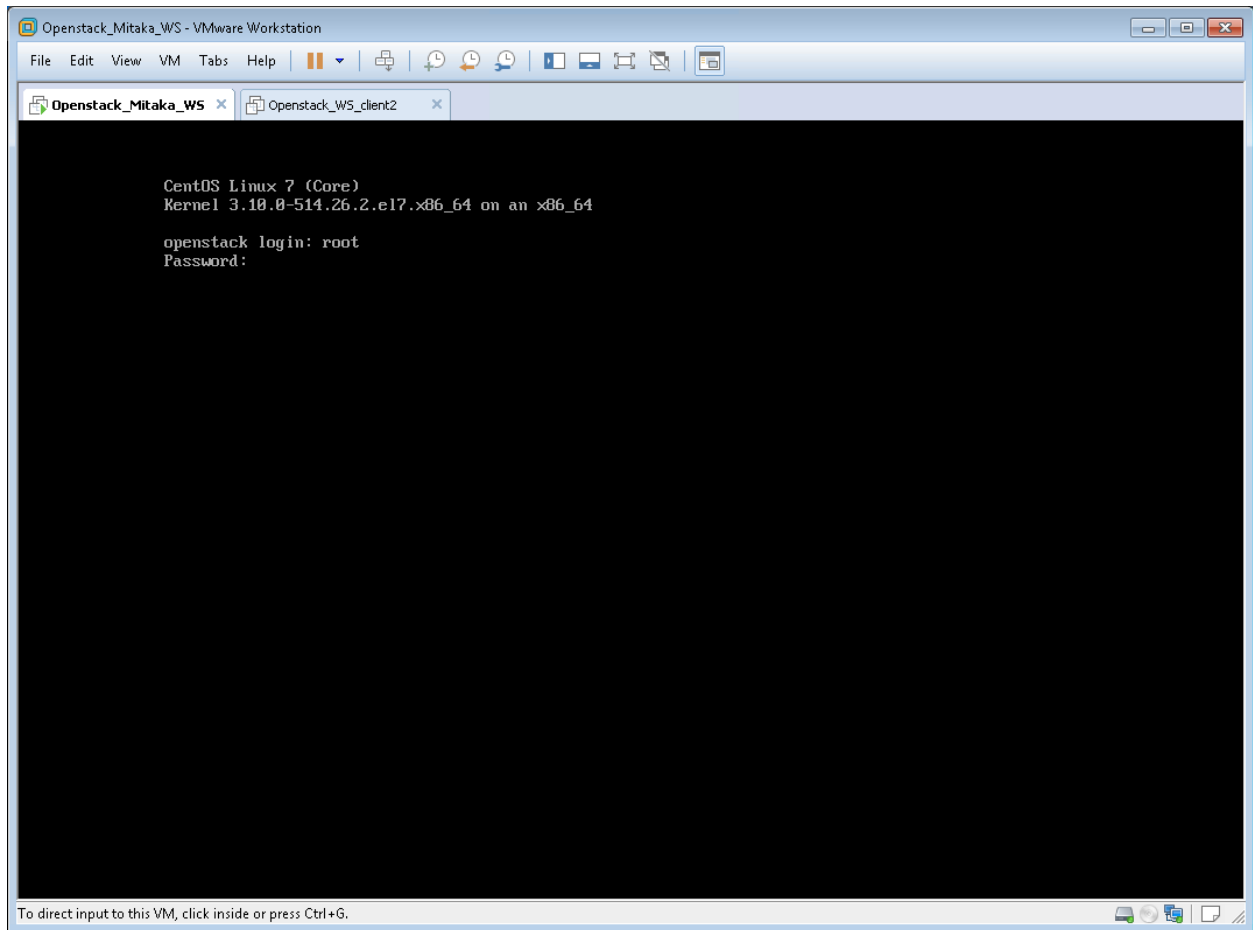
Run the grade script



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

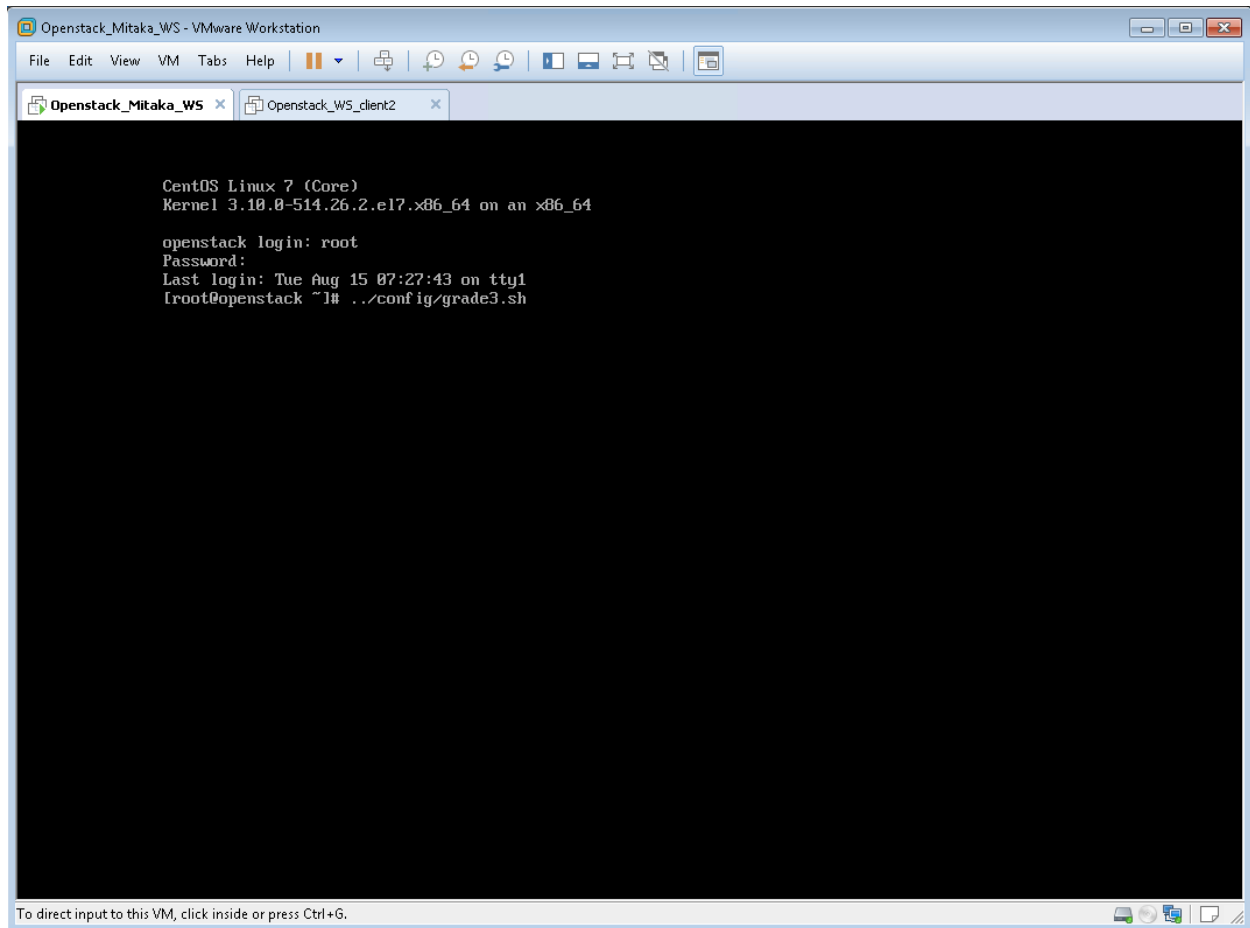
Module 3: Configure OpenStack Networks and Routers



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

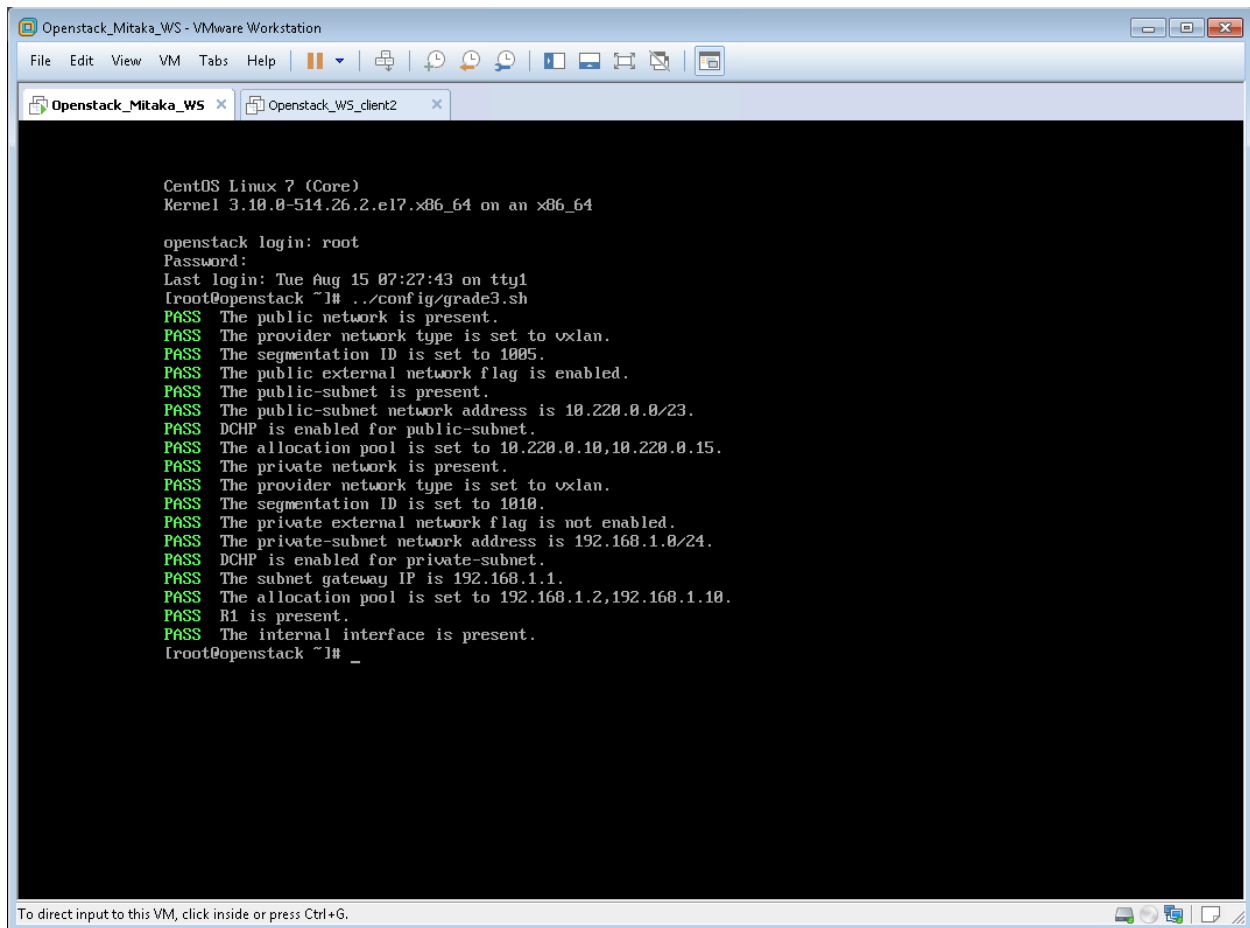
Note: The password is NOT visible as you type it

Module 3: Configure OpenStack Networks and Routers



3. Enter the command; `../config/grade3.sh` and **press Enter**

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```
CentOS Linux 7 (Core)
Kernel 3.10.0-514.26.2.el7.x86_64 on an x86_64

openstack login: root
Password:
Last login: Tue Aug 15 07:27:43 on tty1
[root@openstack ~]# ./config/grade3.sh
PASS The public network is present.
PASS The provider network type is set to vxlan.
PASS The segmentation ID is set to 1005.
PASS The public external network flag is enabled.
PASS The public-subnet is present.
PASS The public-subnet network address is 10.220.0.0/23.
PASS DHCP is enabled for public-subnet.
PASS The allocation pool is set to 10.220.0.10,10.220.0.15.
PASS The private network is present.
PASS The provider network type is set to vxlan.
PASS The segmentation ID is set to 1010.
PASS The private external network flag is not enabled.
PASS The private-subnet network address is 192.168.1.0/24.
PASS DHCP is enabled for private-subnet.
PASS The subnet gateway IP is 192.168.1.1.
PASS The allocation pool is set to 192.168.1.2,192.168.1.10.
PASS R1 is present.
PASS The internal interface is present.
[root@openstack ~]# _
```

4. 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_WS VM to the base snapshot and start over again.

This completes Module 3, continue to conclusion



Conclusion:

The customer now has the minimum network requirements needed configured to successfully launch an instance. After an instance has been launched, additional configuration will be required, to the network management rules, to allow a connection to the server from the public network. Your next field visit to XYZ Company will be to launch a Linux server cloud instance.

