

IST198

OpenStack

Administration

Version 1: 2017-08-18

These exercises will guide the student through the concepts and topics learned in chapter 9, launch a CentOS 7 instance with a customization script and manage attached volumes

Launch a CentOS 7 Instance with a customization script and manage volumes



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Attributions:



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



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Contents

Attributes	1
Contents	2
Introduction	3
Module Objectives	4
Prepare the OpenStack virtual machines	5
Lab Scenario and Settings	7
Run the Lab setup script	8
Access the OpenStack Dashboard	12
Lab 22: Launch a CentOS 7 Instance with customization script	16
Lab 23: Create a volume, attach it to the CentOS 7 instance, mount the volume and create some data on the volume	22
Lab 24: Launch a CentOS7#2 instance and attach the volume from CentOS 7 to the CentOS7#2 instance.	44
Run the grade script	57
Conclusion	61



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.

Module Objectives

Learner will be able to:

- Launch a CentOS 7 Instance with a customization script from the OpenStack Dashboard and manage volumes.

Labs 22-24

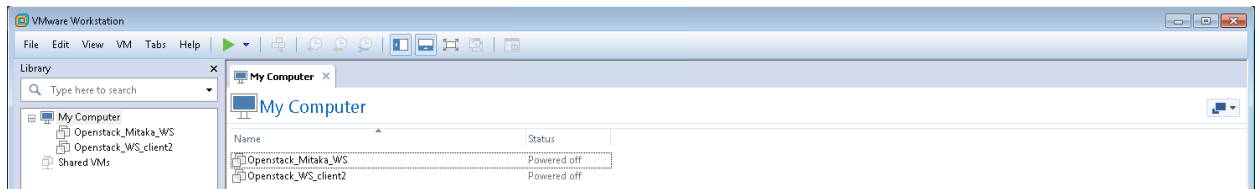
These labs will guide the student through launching a CentOS 7 Instance with a customization script, creating a volume, attaching the volume, creating data on the volume, and moving the volume, with its data, to a new CentOS 7 instance.

(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).

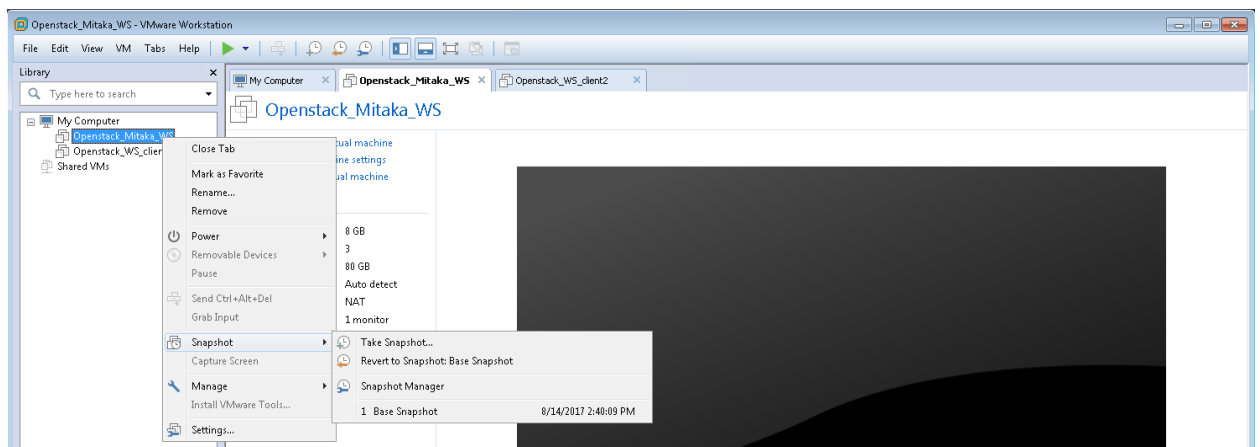
Prepare the OpenStack Virtual Machines



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

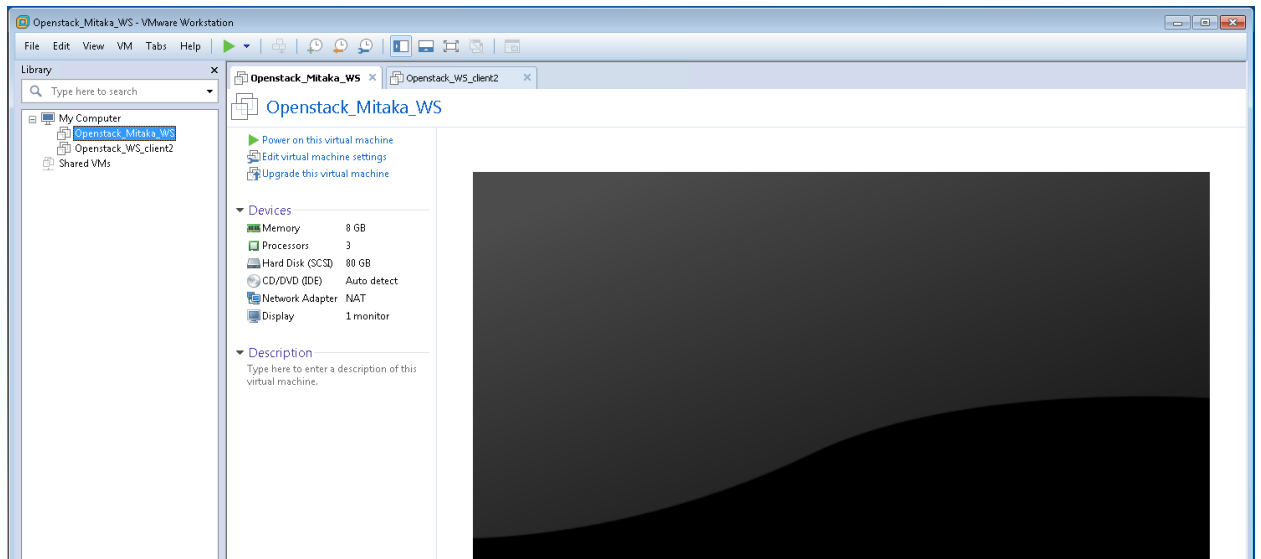


2. Workstation should have two virtual machines (VM) installed; Openstack_Mitaka_v2 and Openstack_Mitaka_client2.



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 9: Launch a CentOS 7 instance with a customization script and manage volumes



4. **Power on** both VMs by selecting one of the two VMs and **clicking on Power on this virtual**

Lab Scenario

As part of CLOUDTech's customer support team, this is the final field visit to XYZ Company. During this visit, you will assist the customer in creating a CentOS 7 and CentOS7#2 instance, creating a volume with data, and attach that volume to the instances.

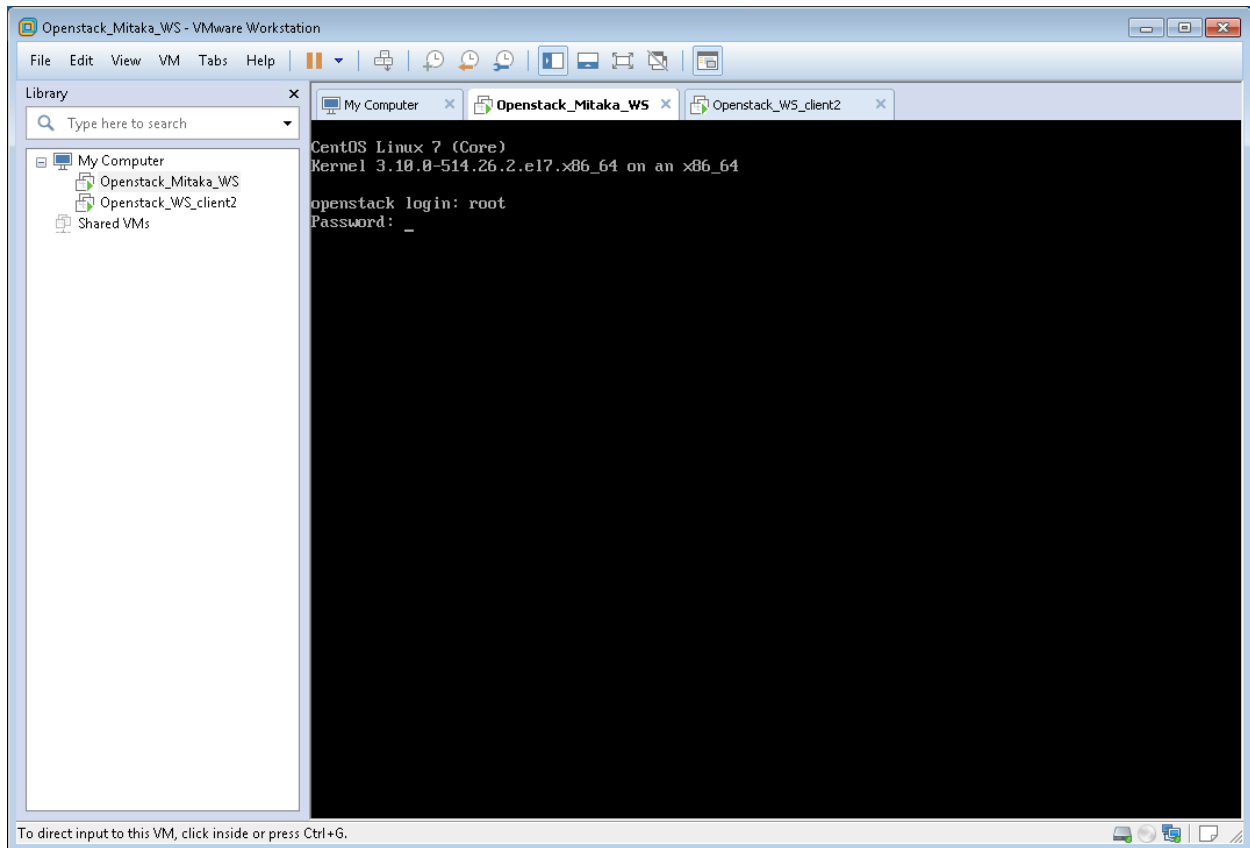
Lab Settings

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: The OpenStack PODs are Normal PODs, in NDG terminology, which means they revert to a snapshot after you are finished with the Lab(s), e.g. click I'M DONE on the Lab Topology. This means that you can explore or experiment without fear of damaging the POD. If you make a mistake that you can't recover from, then end the reservation and make a new POD reservation and everything will be back to a known starting point.

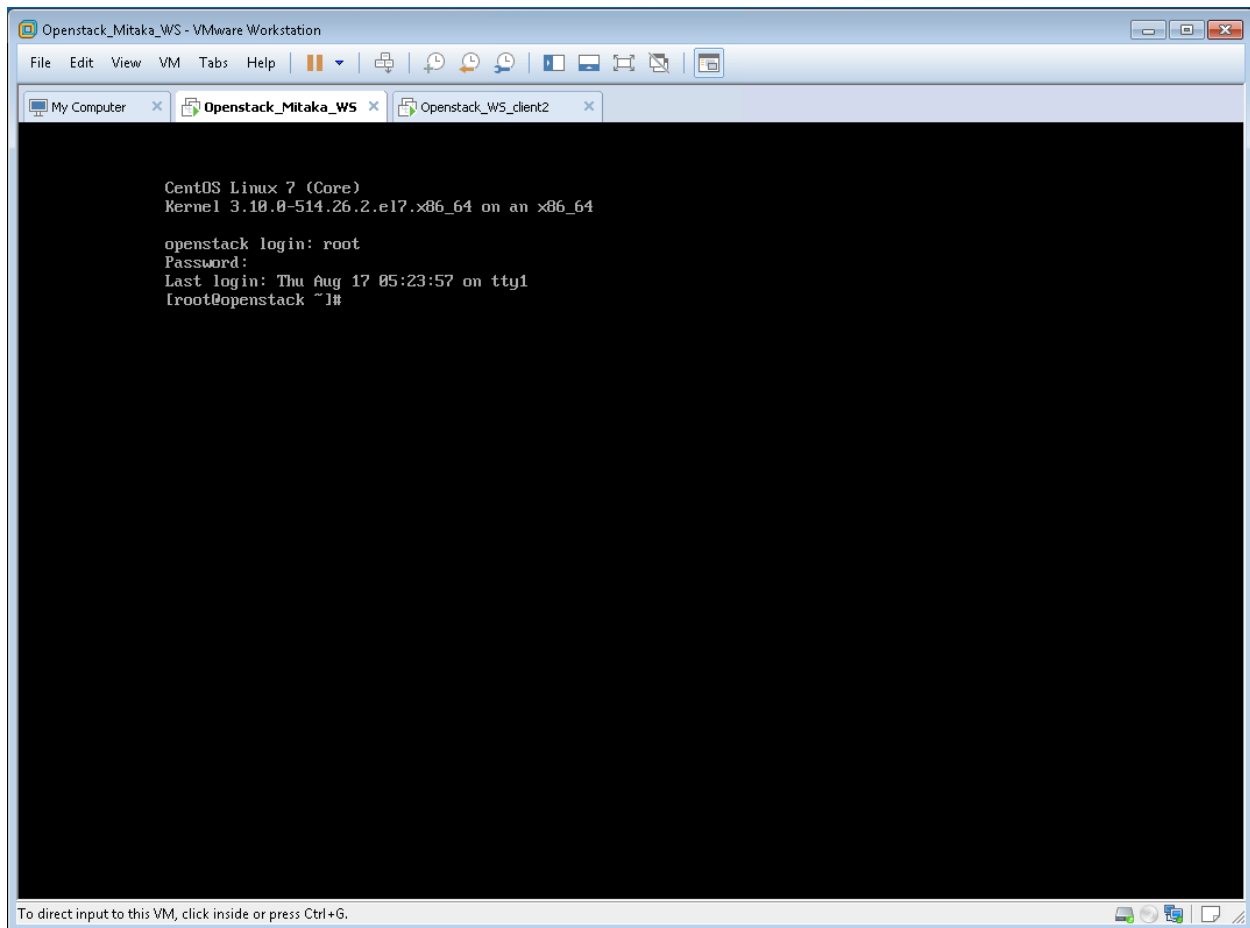
Run the lab setup script



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

Note: The password is NOT visible as you type it

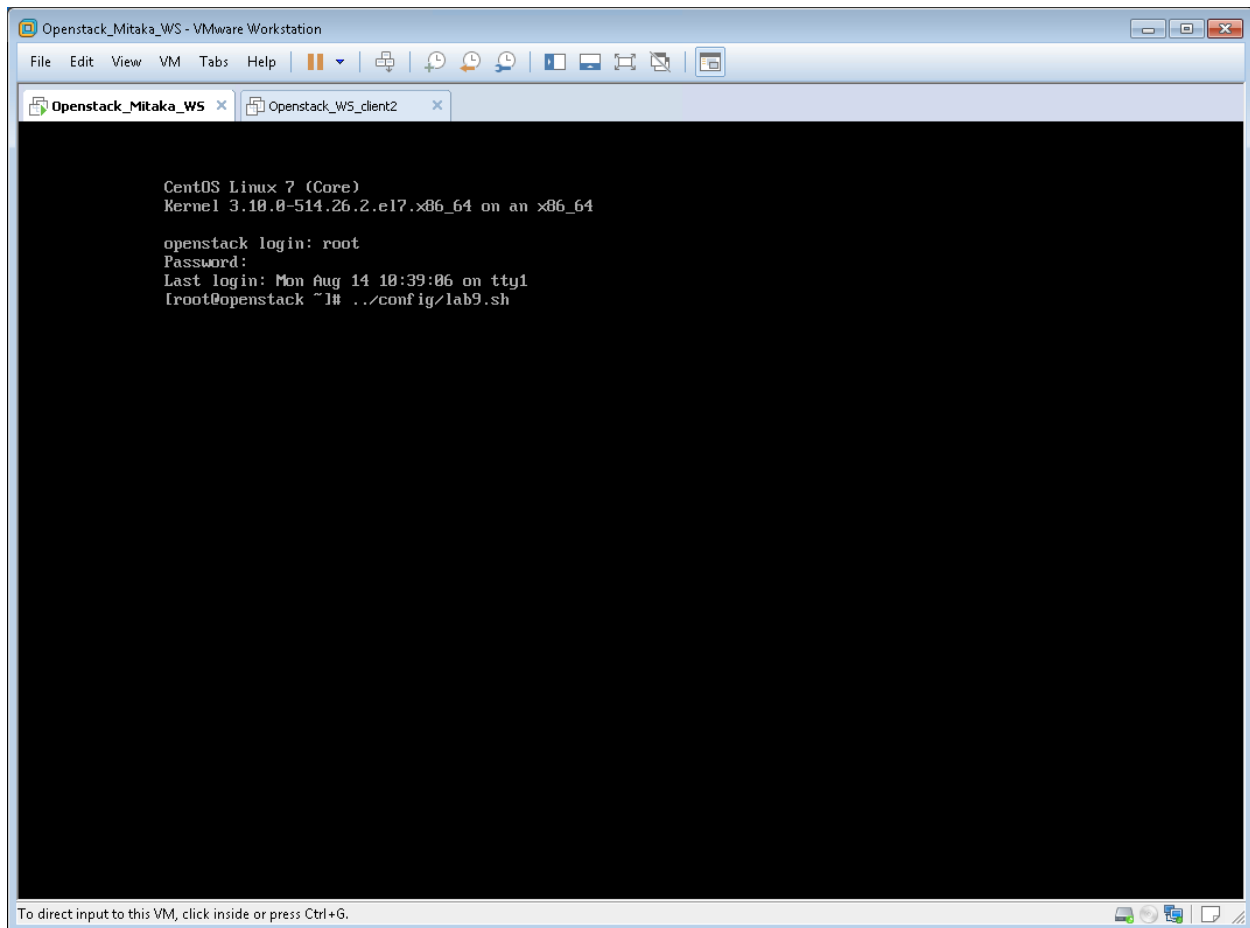
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



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



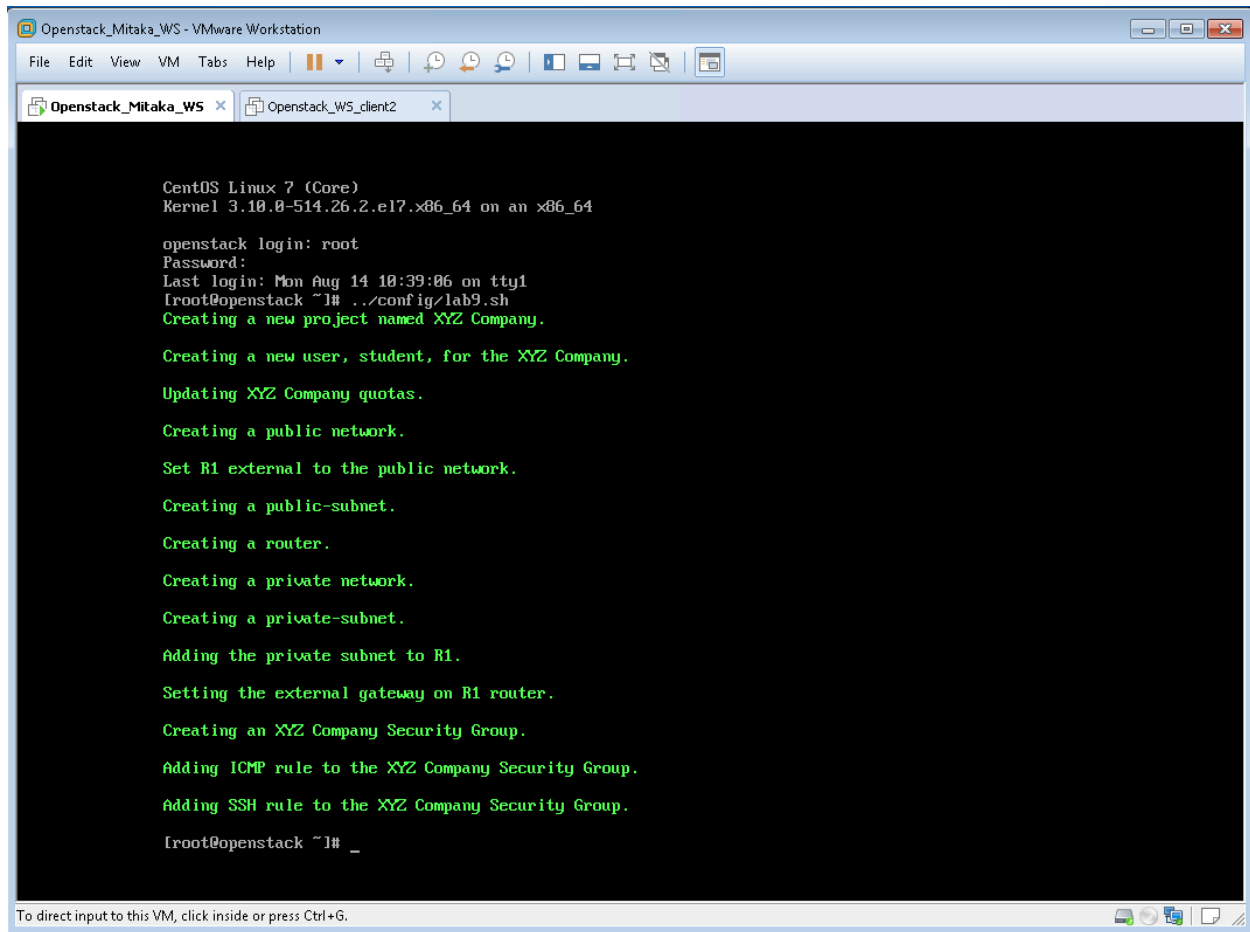
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



3. Type the command; **`../config/lab9.sh`** and **press Enter** as shown in the screen capture above to run the Module 9 setup script



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
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 18:39:06 on tty1
[root@openstack ~]# ../config/lab9.sh
Creating a new project named XYZ Company.

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

Creating a public network.

Set R1 external to the public network.

Creating a public-subnet.

Creating a router.

Creating a private network.

Creating a private-subnet.

Adding the private subnet to R1.

Setting the external gateway on R1 router.

Creating an XYZ Company Security Group.

Adding ICMP rule to the XYZ Company Security Group.

Adding SSH rule to the XYZ Company Security Group.

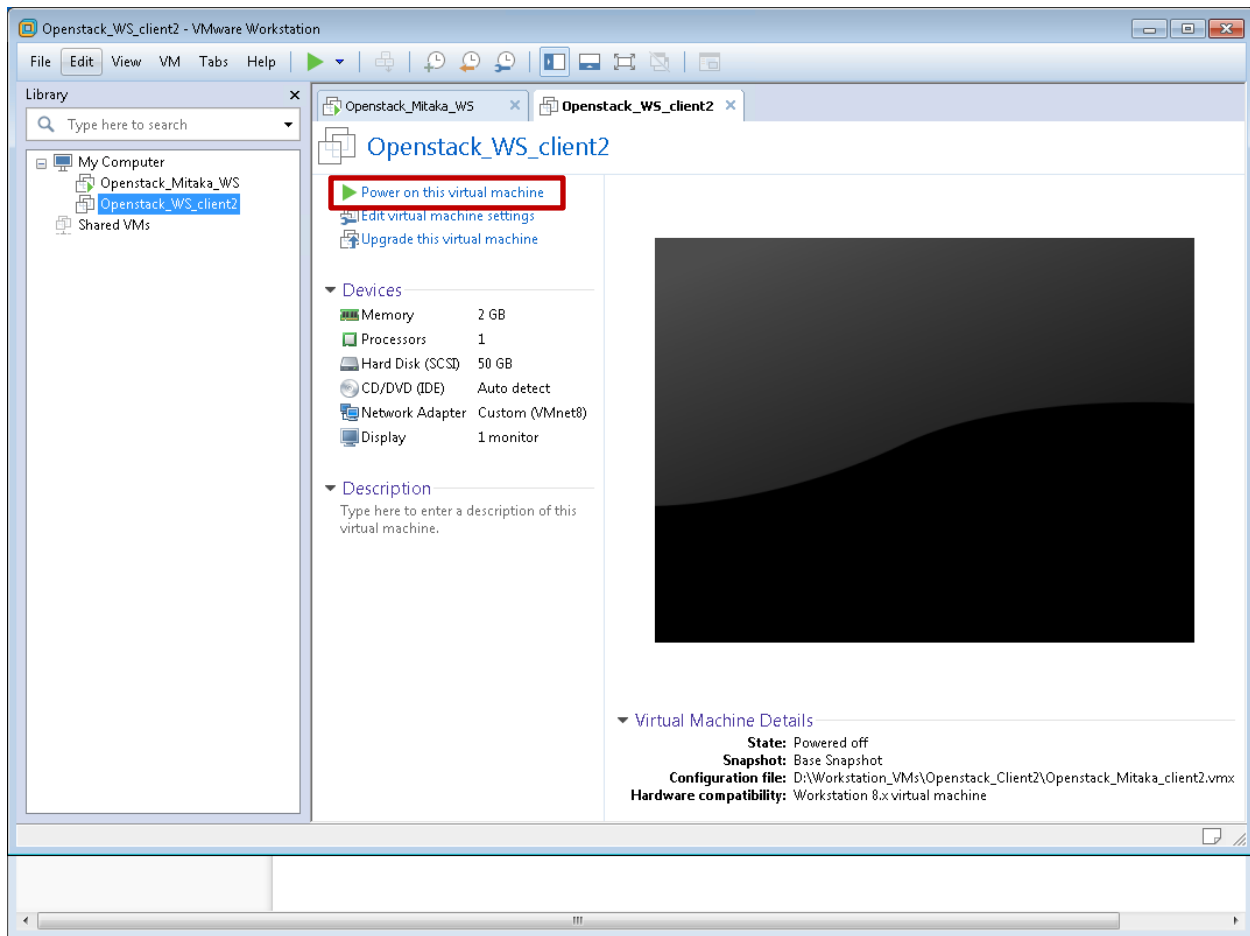
[root@openstack ~]# _
```

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

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

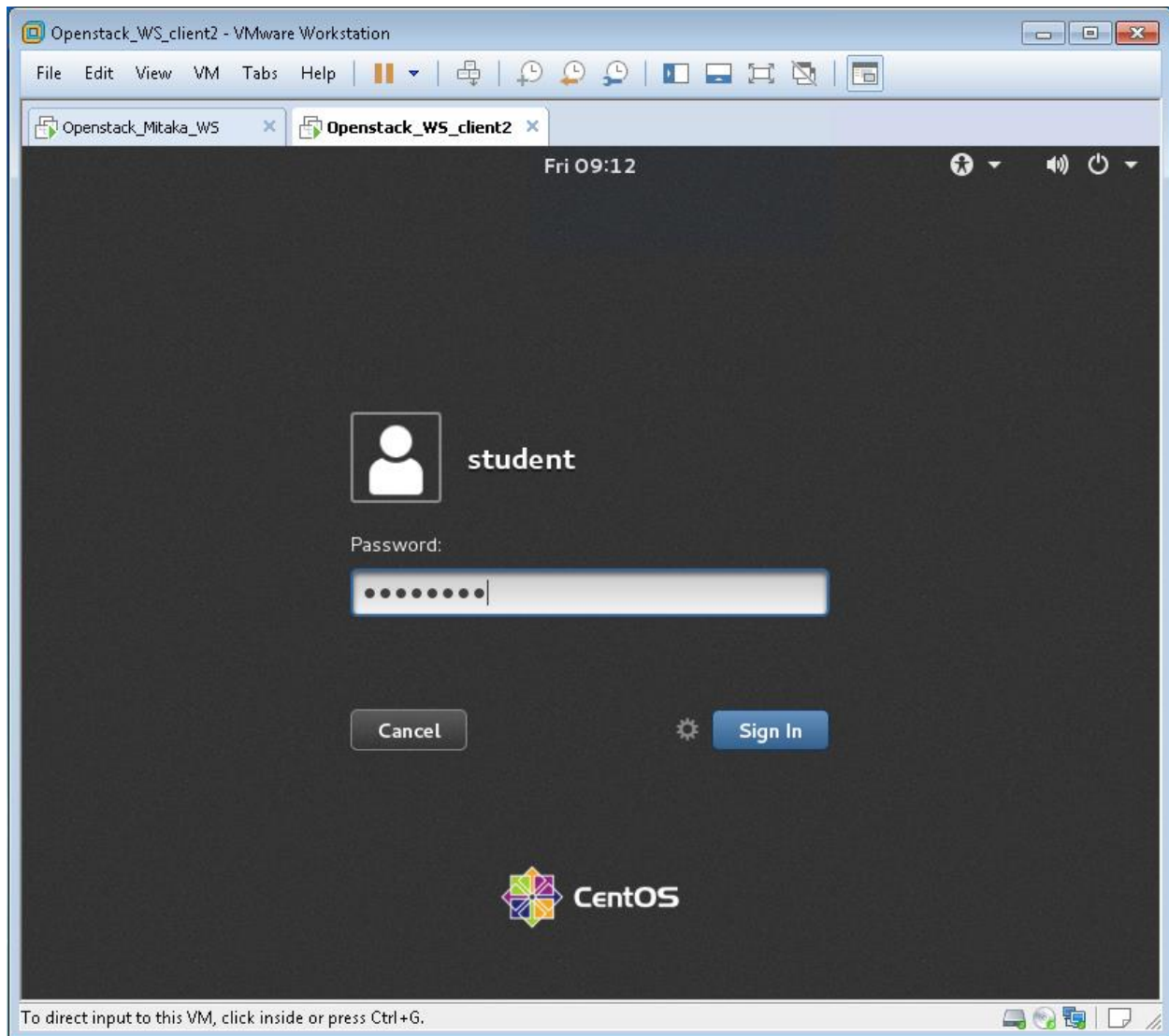


Access the OpenStack Dashboard



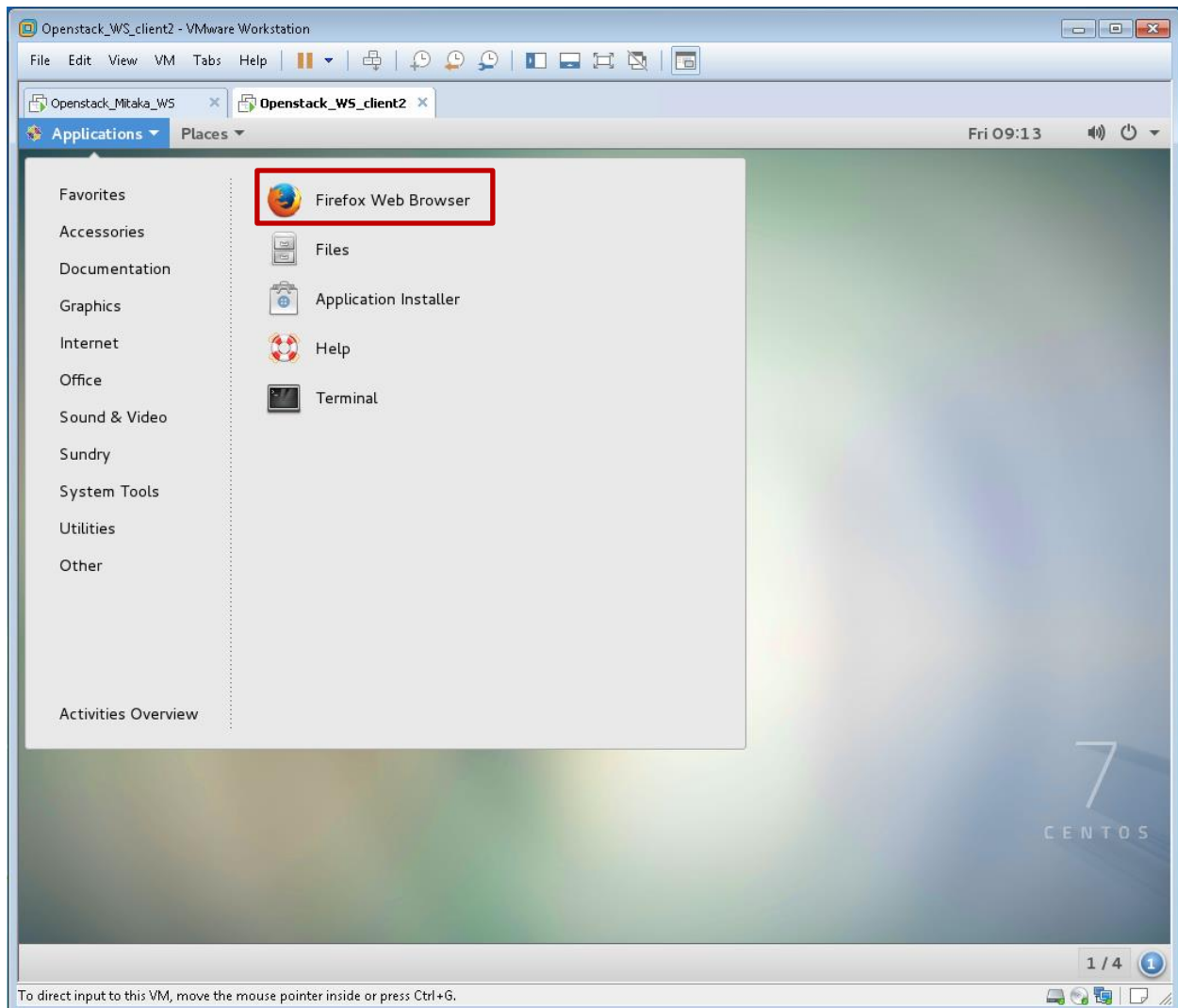
1. **Power on the Openstack_WS_client2 VM in Workstation.**

Note: Do not use the Windows host for this lab.

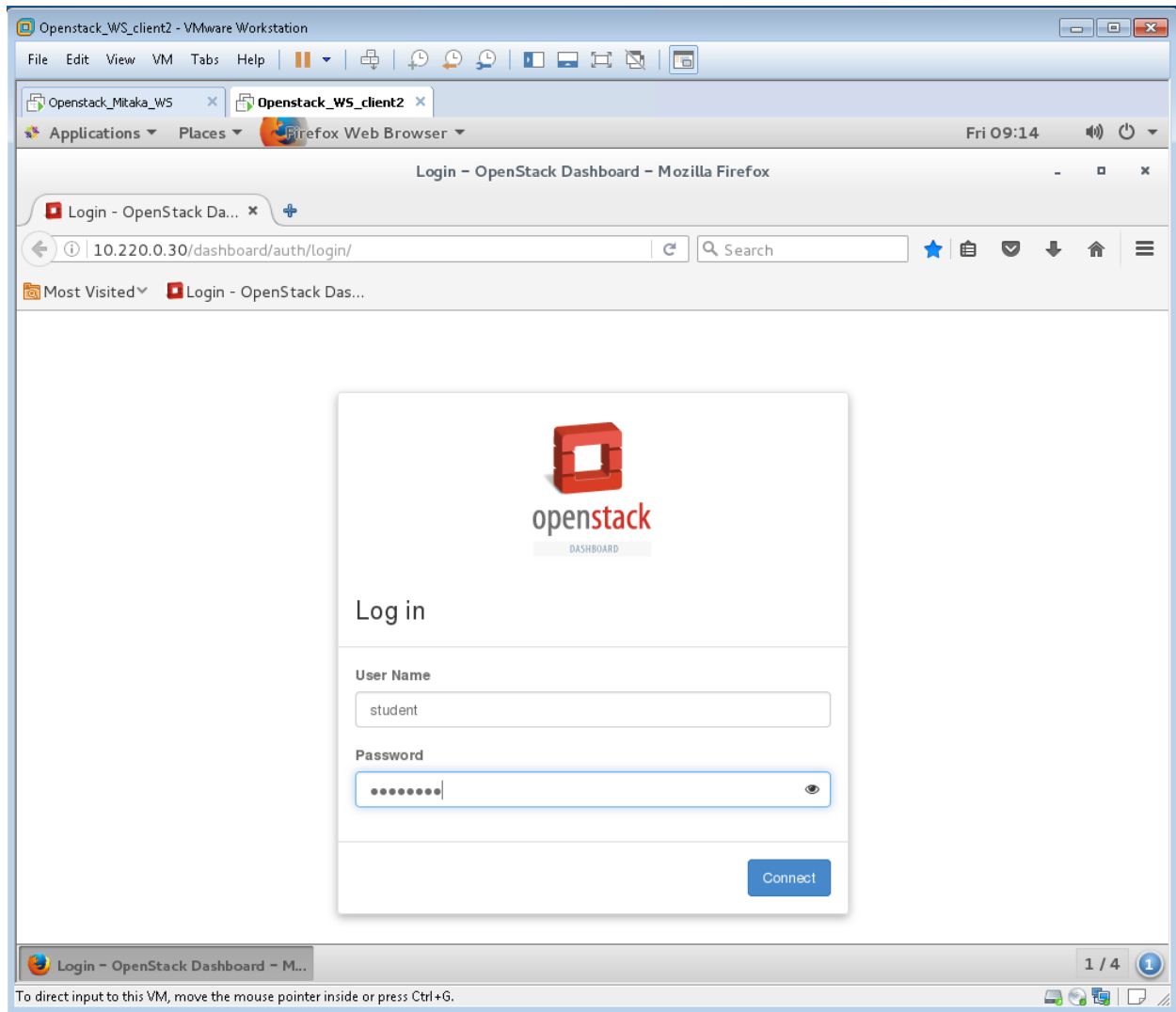


2. **Enter** the password of **P@ssword** to access the CentOS 7 Client virtual machine.

Note: If the screen is black, tap the spacebar to wake up the VM.



3. **Open** Firefox Web Browser from **Applications>Firefox Web Browser** to access the **OpenStack Dashboard** log in page.

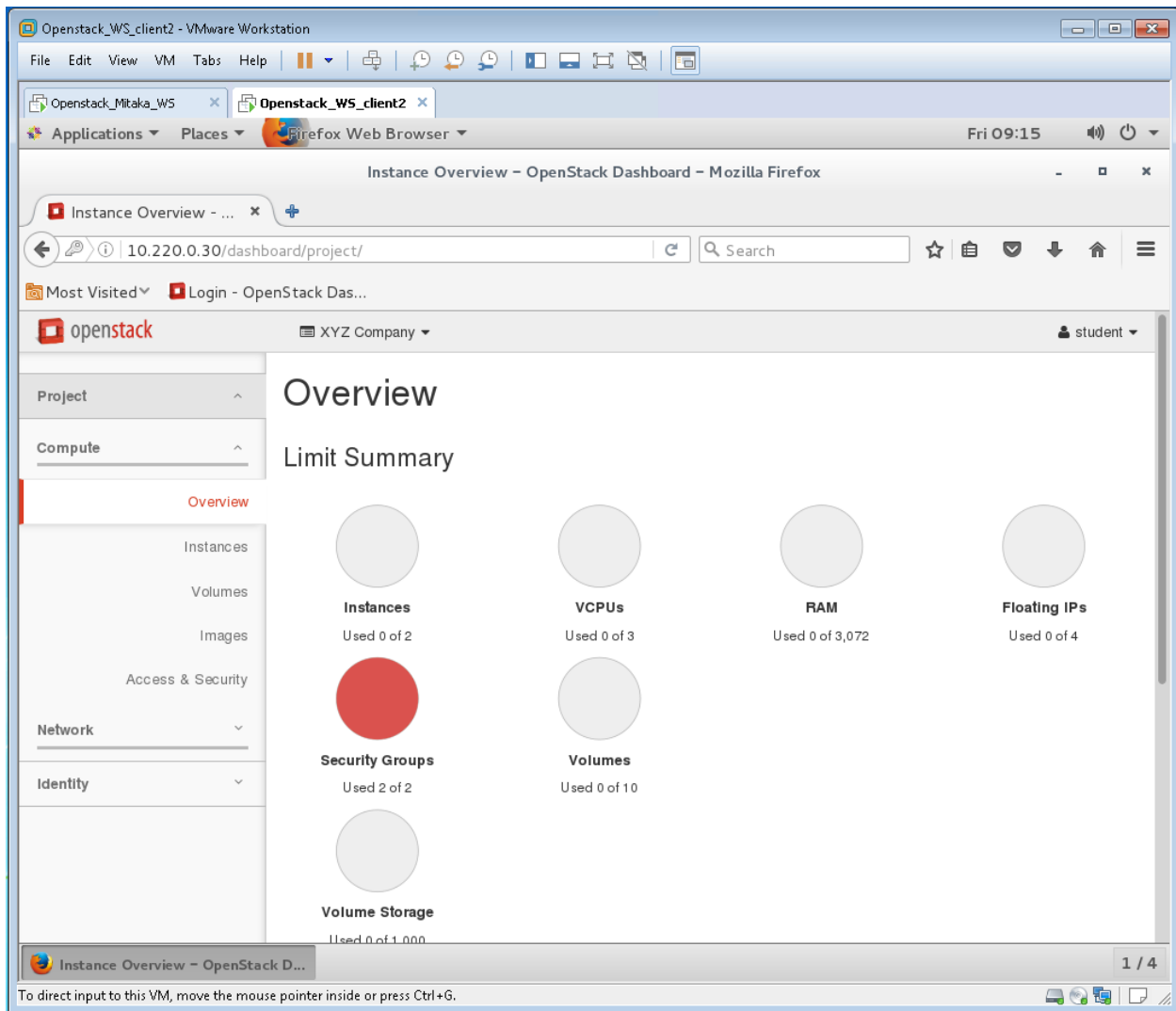


4. **Login** to the OpenStack Dashboard with the username **Student** and **P@ssword** and press **enter** or **click Connect**.

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

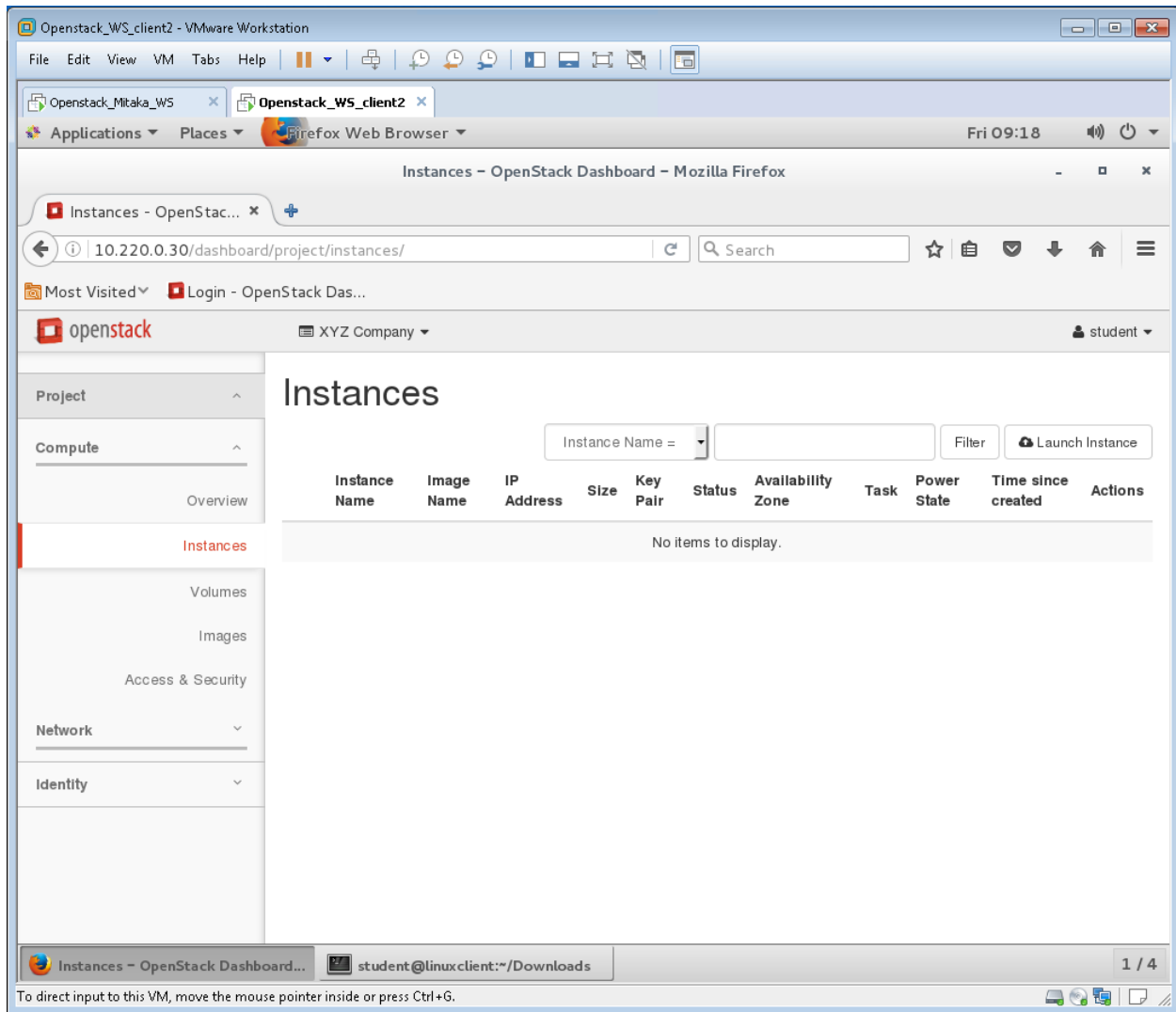
Note: In the Openstack_WS_client2 VMs the Firefox home page is set to open the OpenStack Dashboard Login page.

Lab 22: Launch a CentOS 7 instance with a customization script



1. Using the command line, extract the public key from the private key file, using the techniques learned in the previous lab.

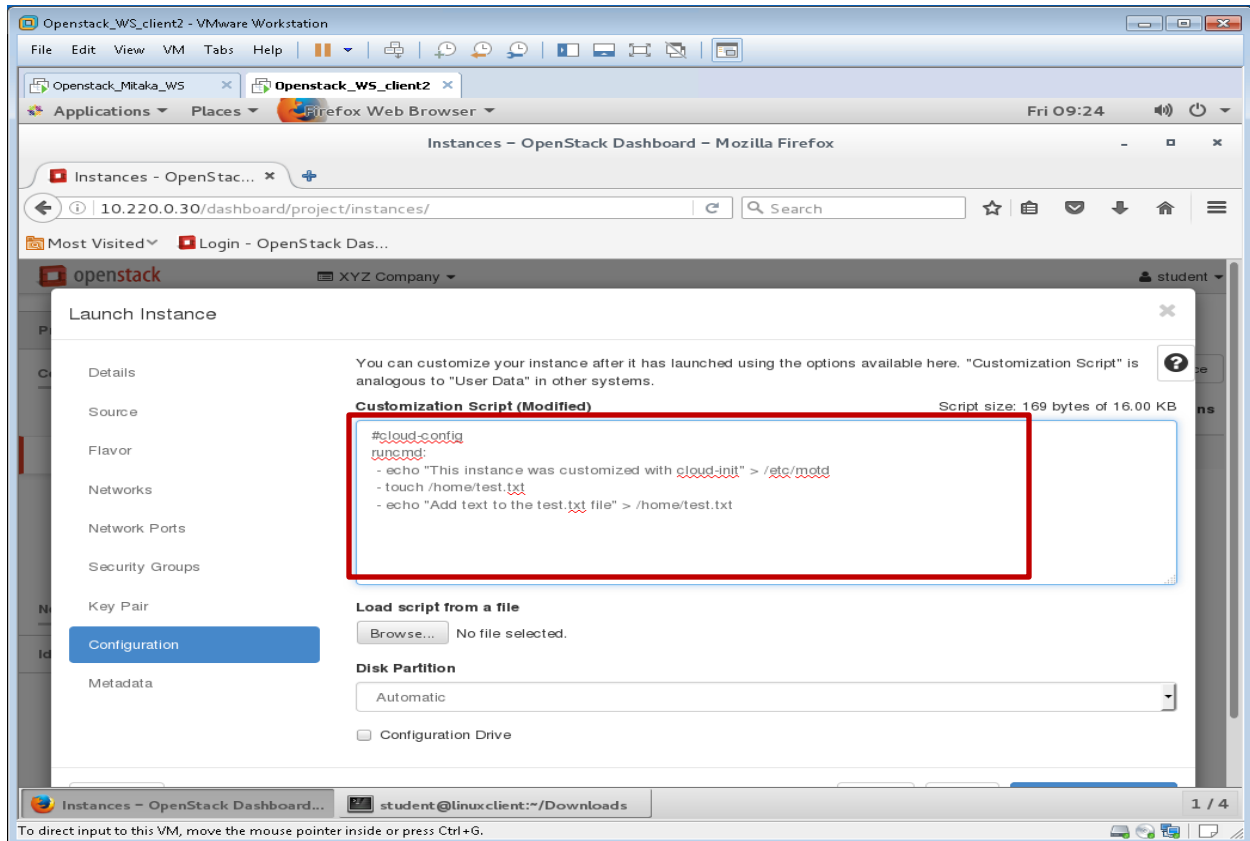
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



2. Using the techniques learned in previous labs, **prepare** to **launch** an **instance** using the information in the table below. **DO NOT launch the instance yet!**

Instance Name	CentOS 7
Source	CentOS (see next page for more information)
Flavor	m1.small
Network	Private
Security Group	XYZ Company
Key Pair	Student
Configuration	Customization script
Floating IP Address	10.220.0.12



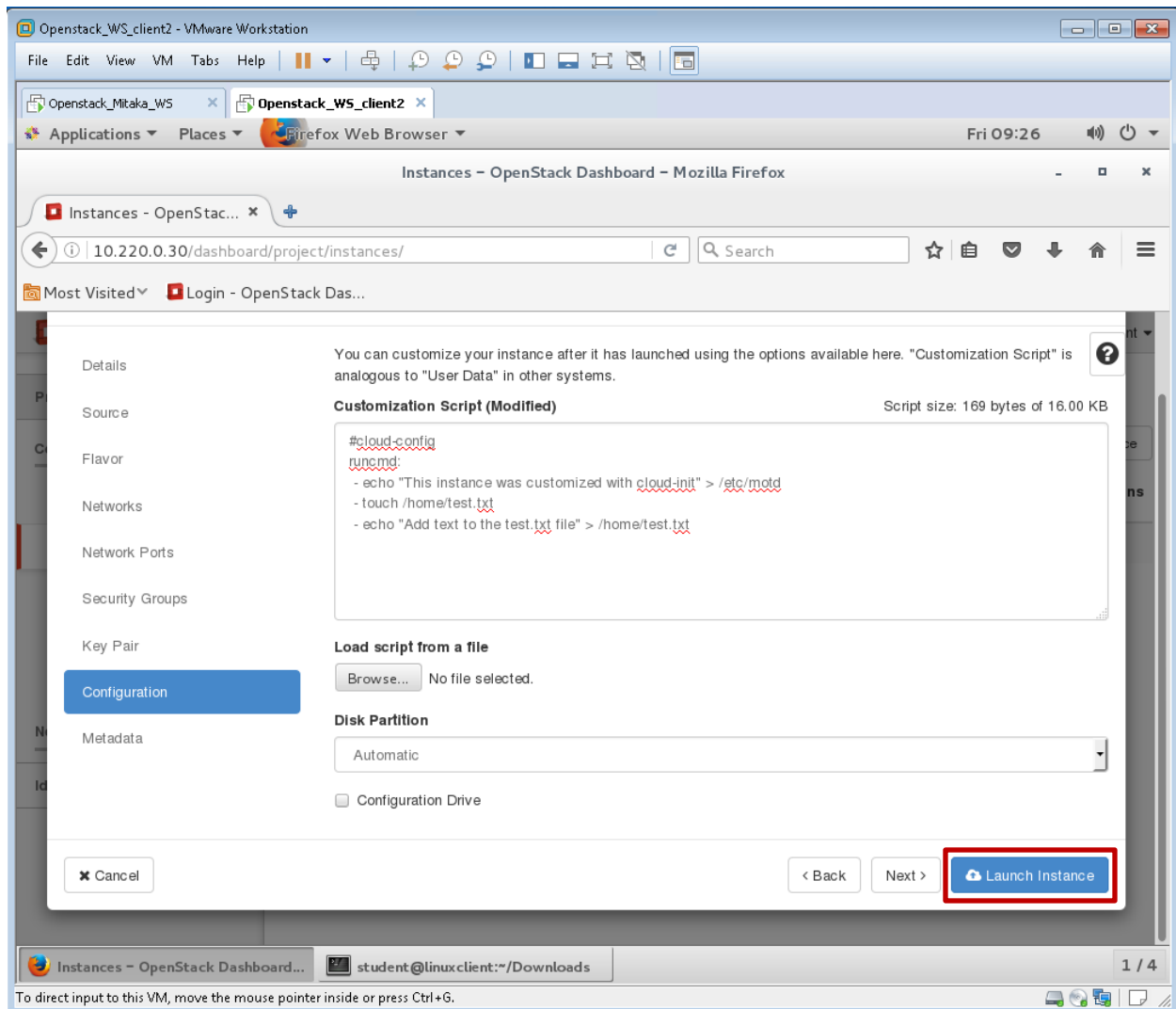


3. **Configuration:** After entering the information into the Details through Key Pair tabs, continue to the Configuration tab where you will enter the commands listed below needed to customize this instance. This is similar to the user_data.txt file that was used in the previous lab.

```
#cloud-config
runcmd:
  - echo "This instance was customized with cloud-init" > /etc/motd
  - touch /home/test.txt
  - echo "Add text to the test.txt file" > /home/test.txt
```

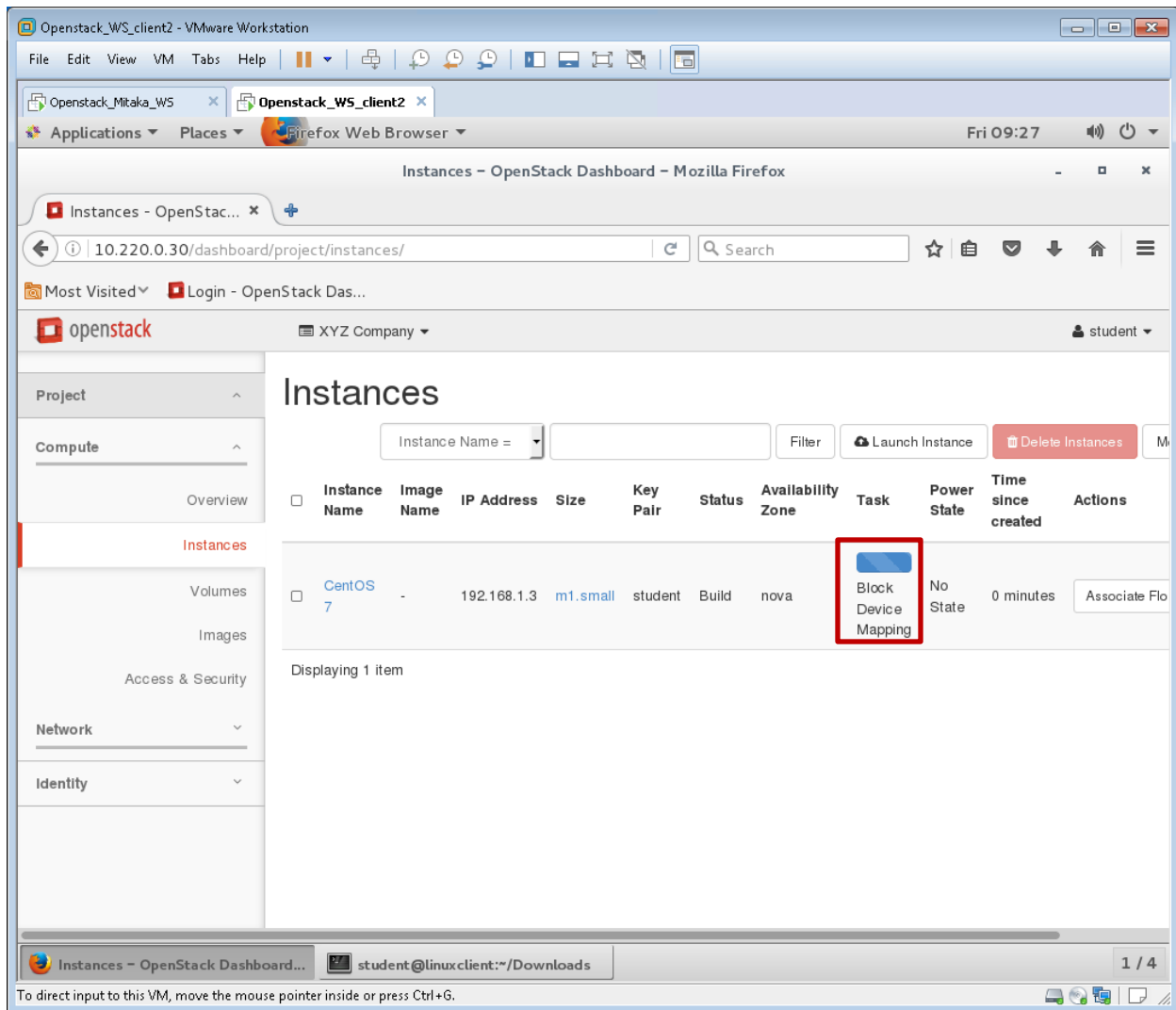
Note: The Customization Script commands are written in YAML syntax, which means that white space is critical and any stray white space will render the customization script useless. The first two commands, (**#cloud-config** and **runcmd:**), are aligned left and the remaining commands **contain a space before and after the hyphen**. If this is not clear, you can use the <http://yamllint.com> website on your internet connected host machine to verify the syntax before launching the instance.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



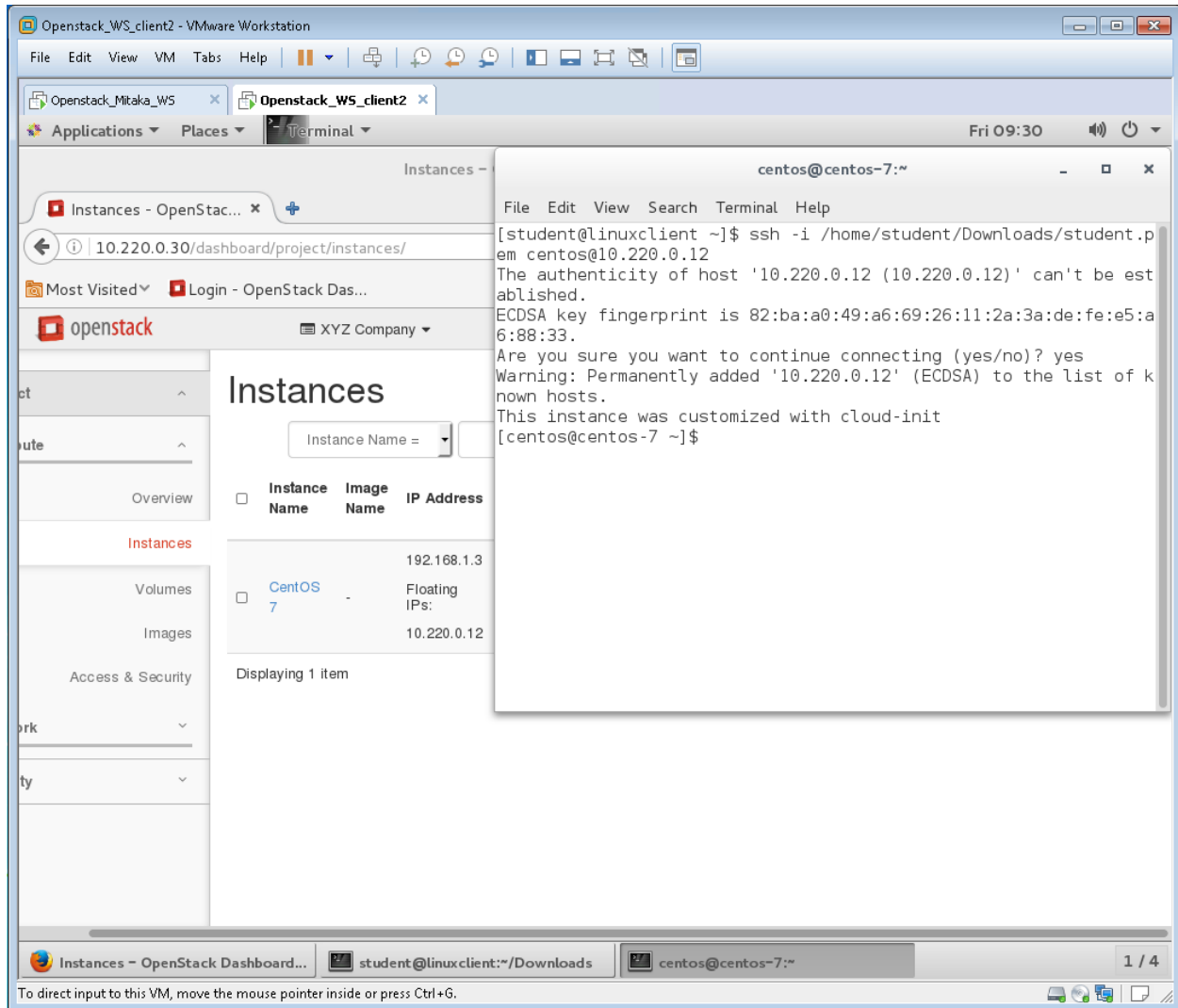
4. Click on Launch Instance.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



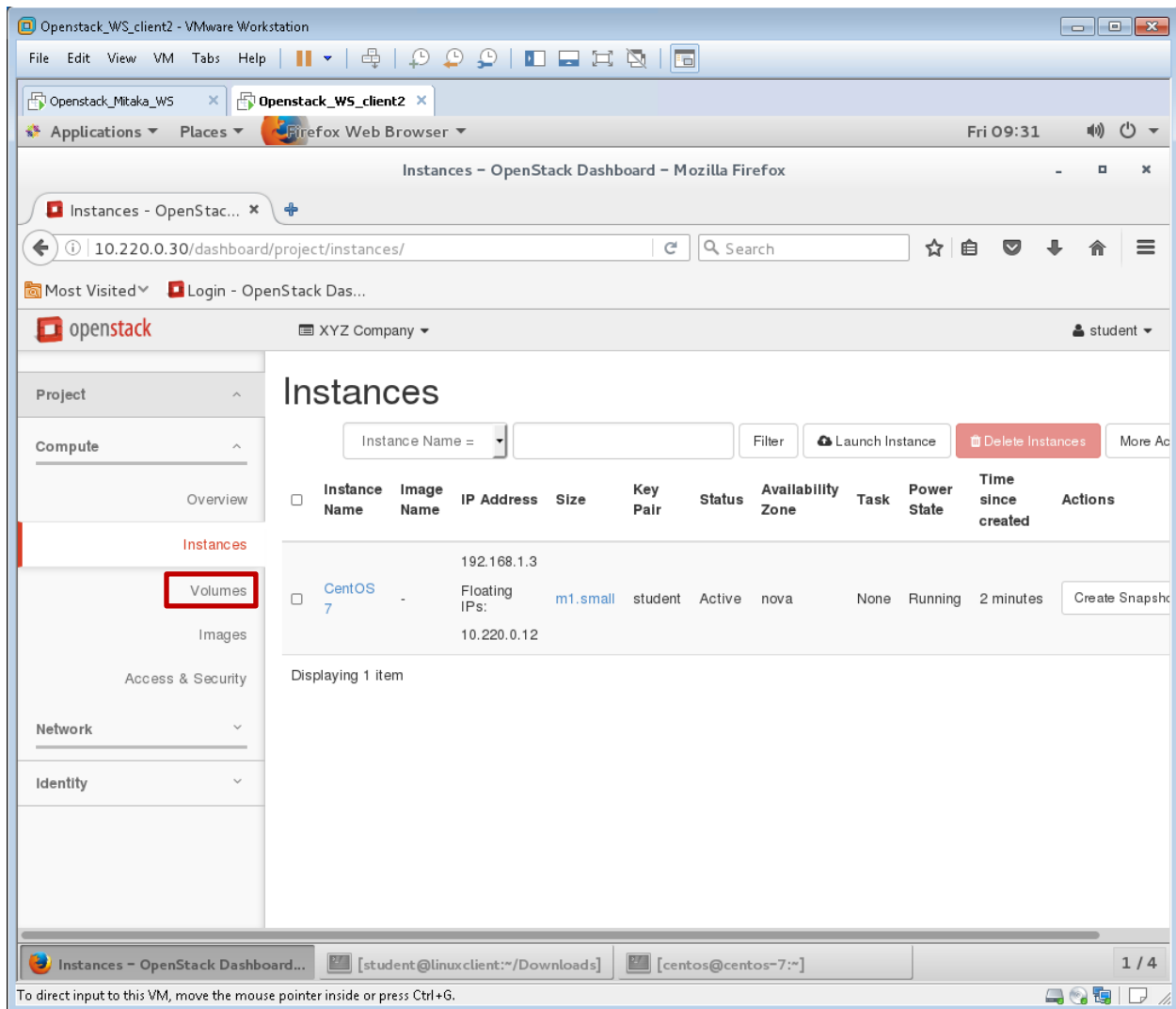
5. The CentOS 7 instance should begin spawning. Associate a Floating IP address to the instance after verifying that the installation has completed.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



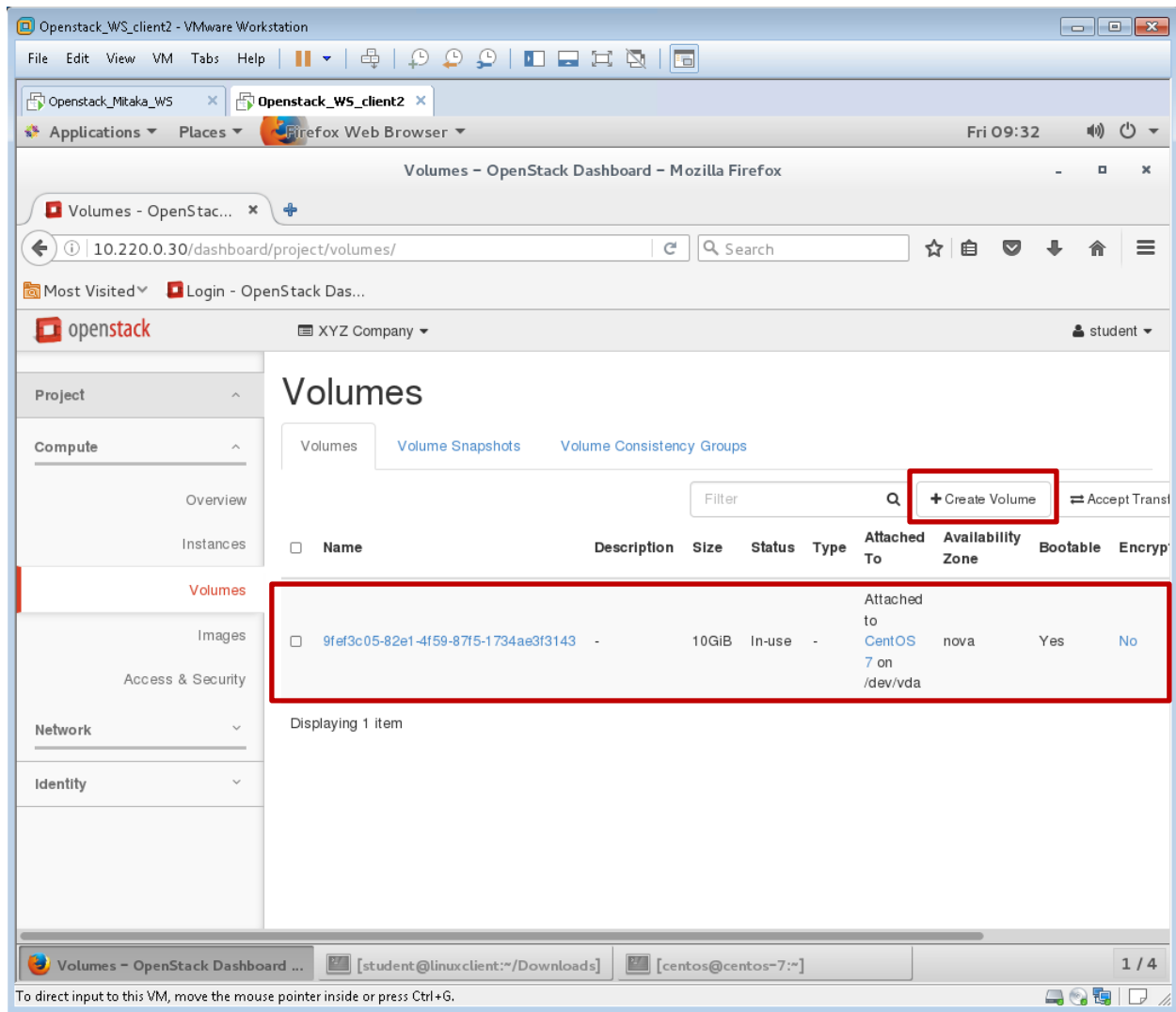
- SSH into the CentOS 7 instance and you should see the “This instance was customized with cloud-init” MOTD, the test.txt file in the /home directory and the text string that was added to the test.txt file. If you do not see any of the information mentioned, then the most likely cause is a stray white space or two was present when typed the commands into the configuration page, delete the instance and try again. Continue to Lab 23.

Lab 23: Create a volume, attach it to the CentOS 7 instance, mount the volume and create some data on the volume



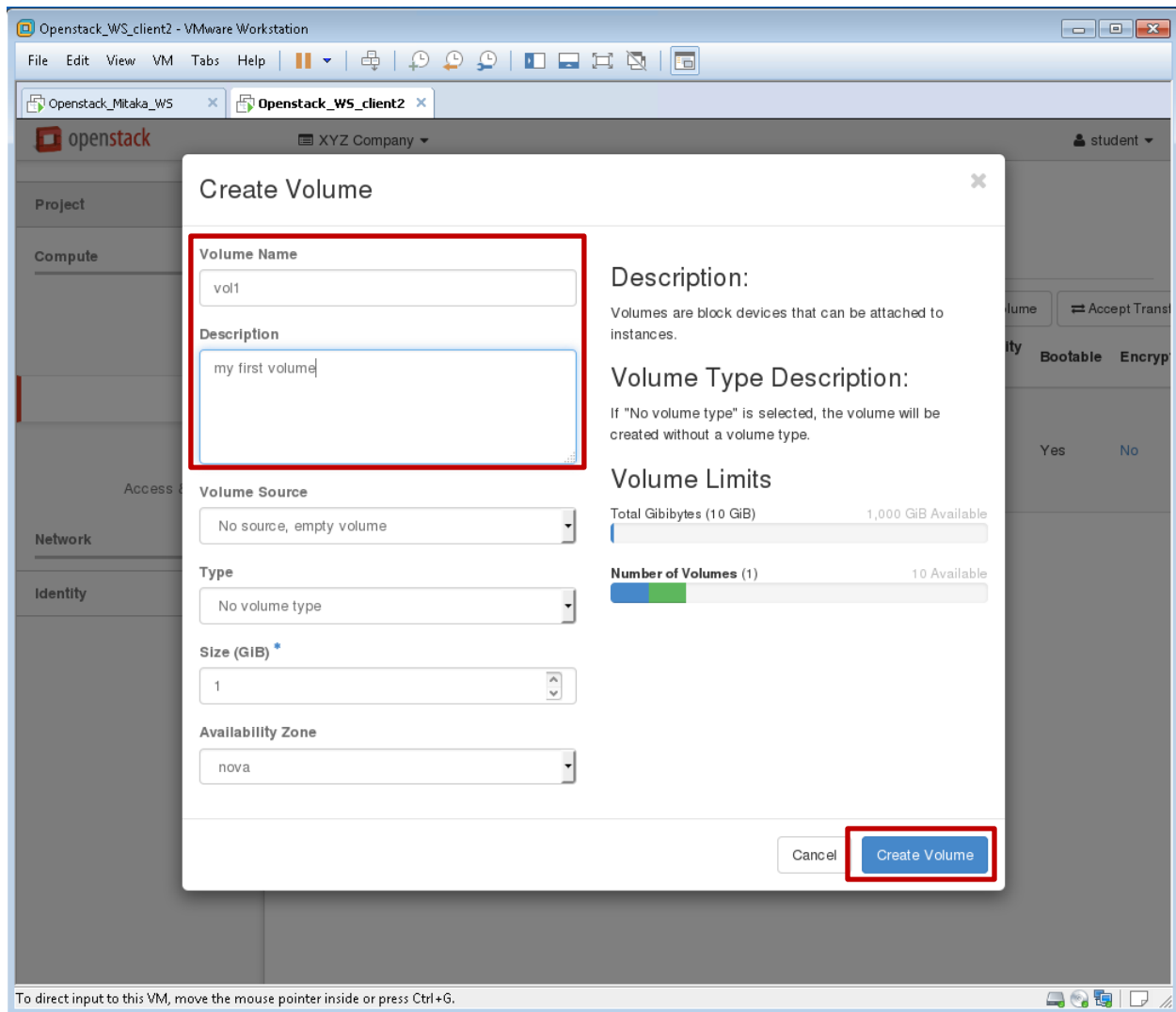
1. Return to the Openstack Dashboard on the client2 VM. **Click on the Volumes tab.**

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



2. You should see the 10GB volume that was created for the CentOS 7 instance. **Click on Create Volume.**

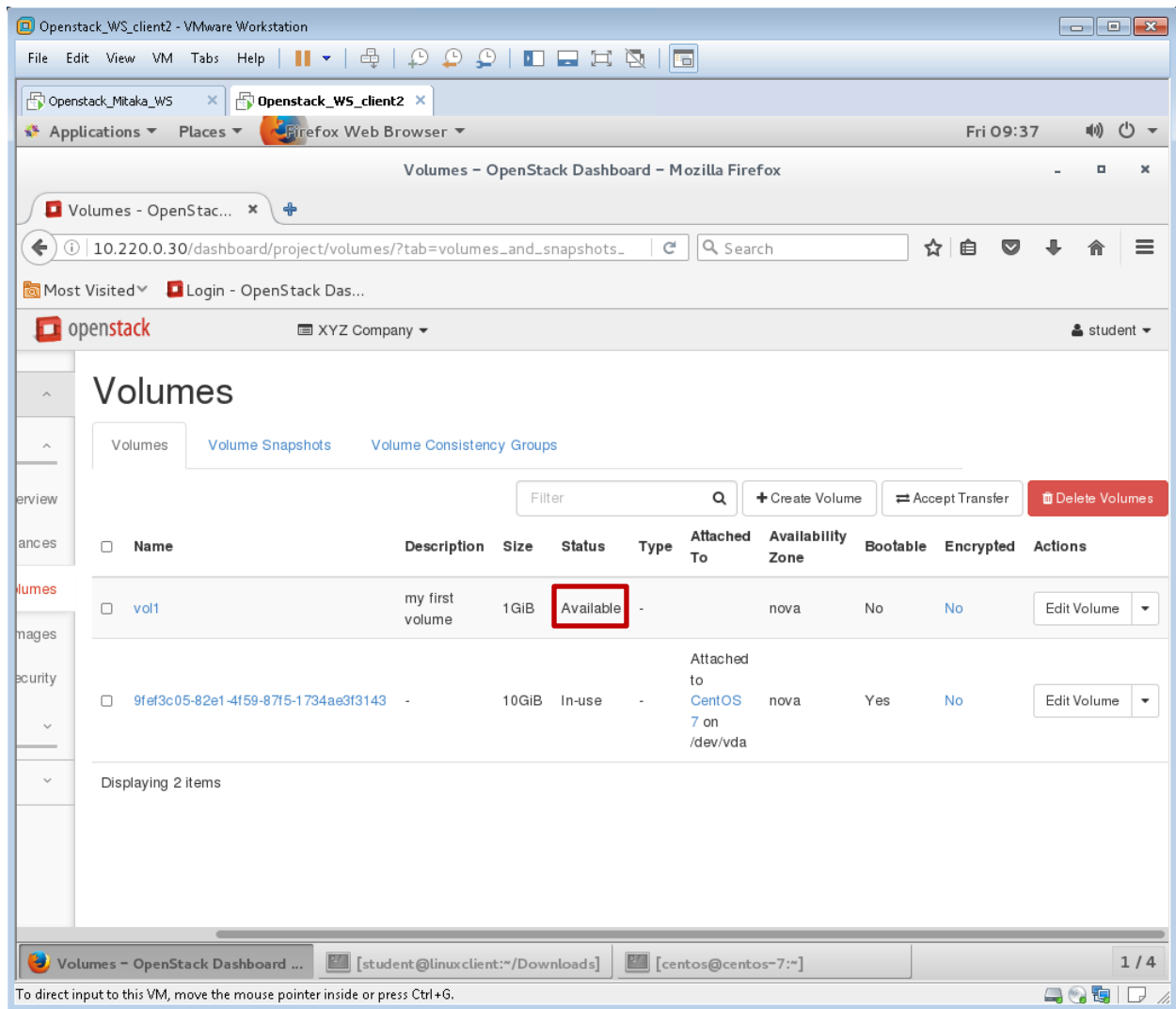
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



3. Enter **vol1** as the **Volume Name** and add something to the **Description** block, and leave the remaining blocks at their default settings. Click **Create Volume**.

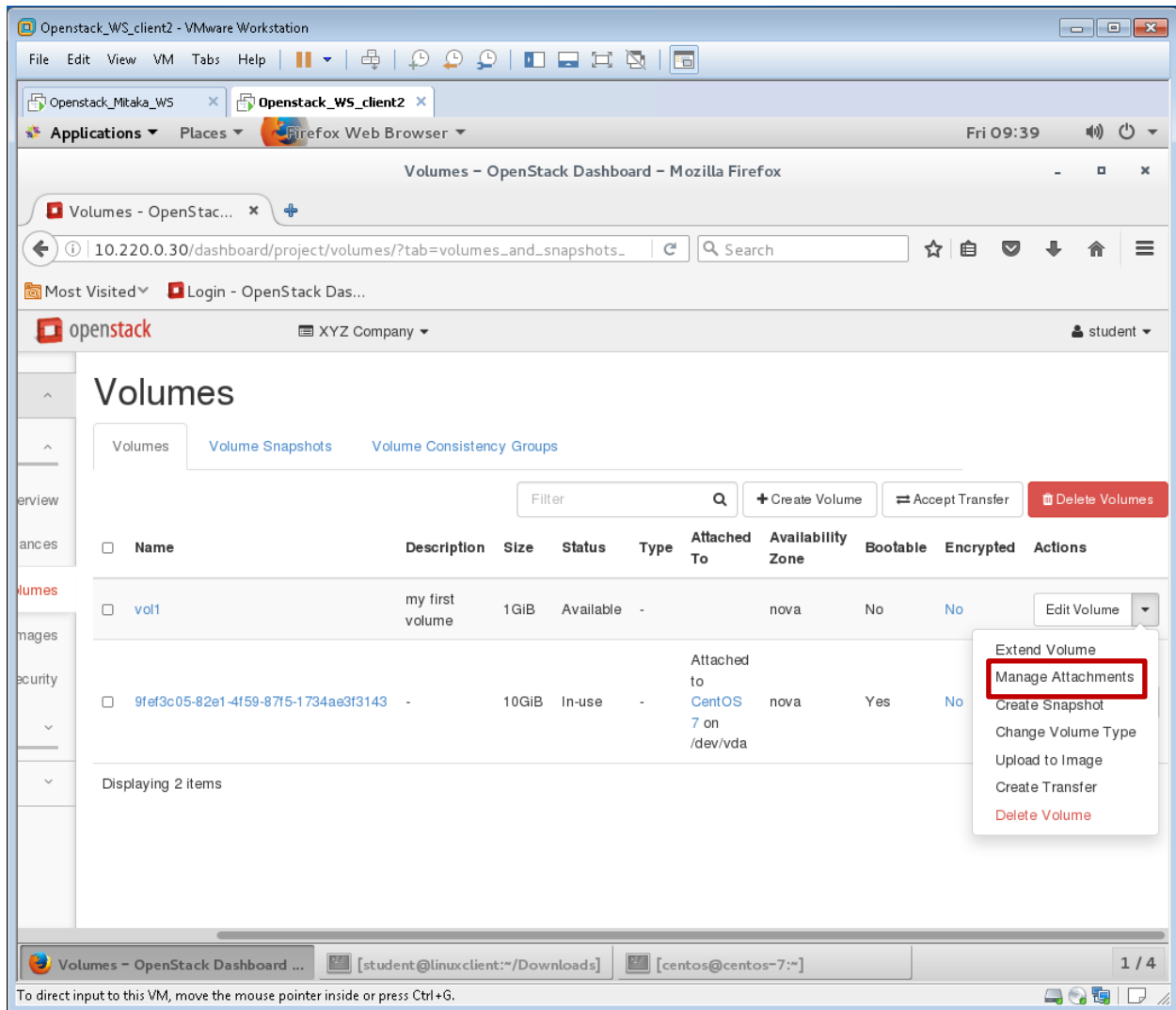


Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



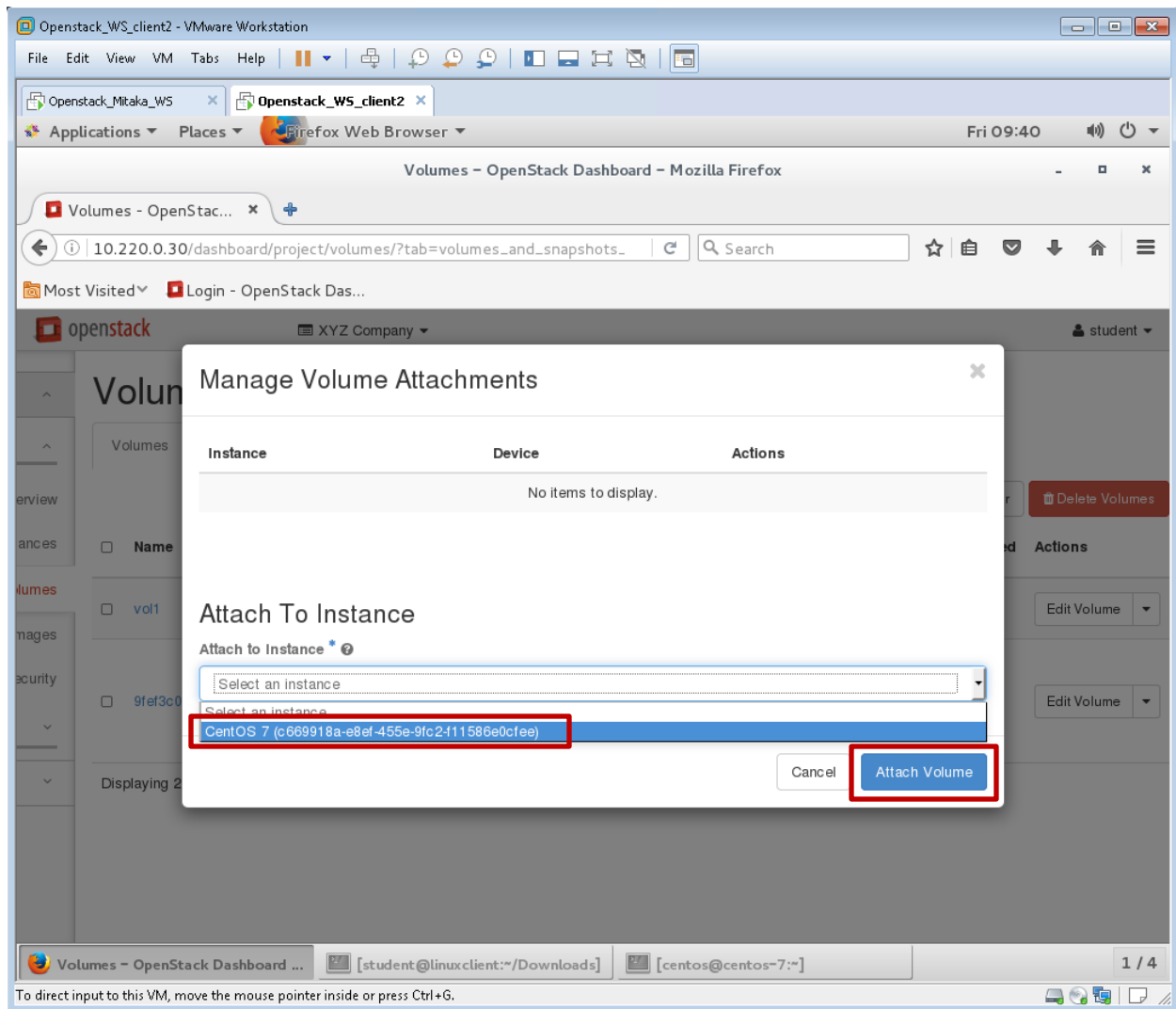
- The **vol1** volume should appear and be marked as **Available** in the **Status** column. Select the dropdown menu on the vol1 row.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



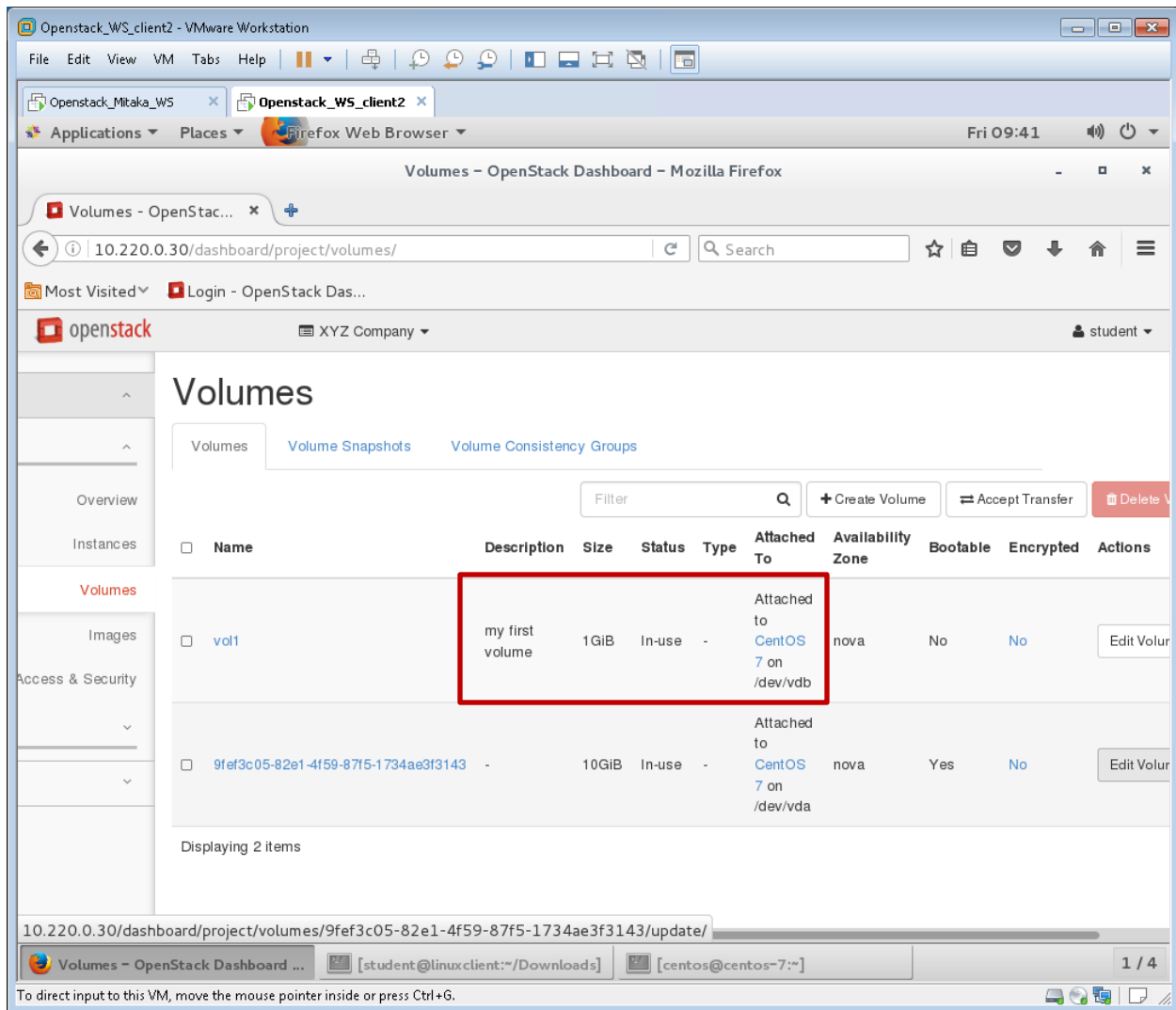
5. Select **Manage Attachments** from the Edit Volume dropdown menu.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



6. **Select the CentOS 7 instance** from the Attach to Instance dropdown menu. **Click on Attach Volume.**

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



The screenshot shows the OpenStack Volumes dashboard. The browser address bar displays `10.220.0.30/dashboard/project/volumes/`. The dashboard header includes the OpenStack logo, 'XYZ Company', and a user profile 'student'. The main content area is titled 'Volumes' and contains a table of volumes. The first volume, 'vol1', is highlighted with a red box. The table columns are: Name, Description, Size, Status, Type, Attached To, Availability Zone, Bootable, Encrypted, and Actions.

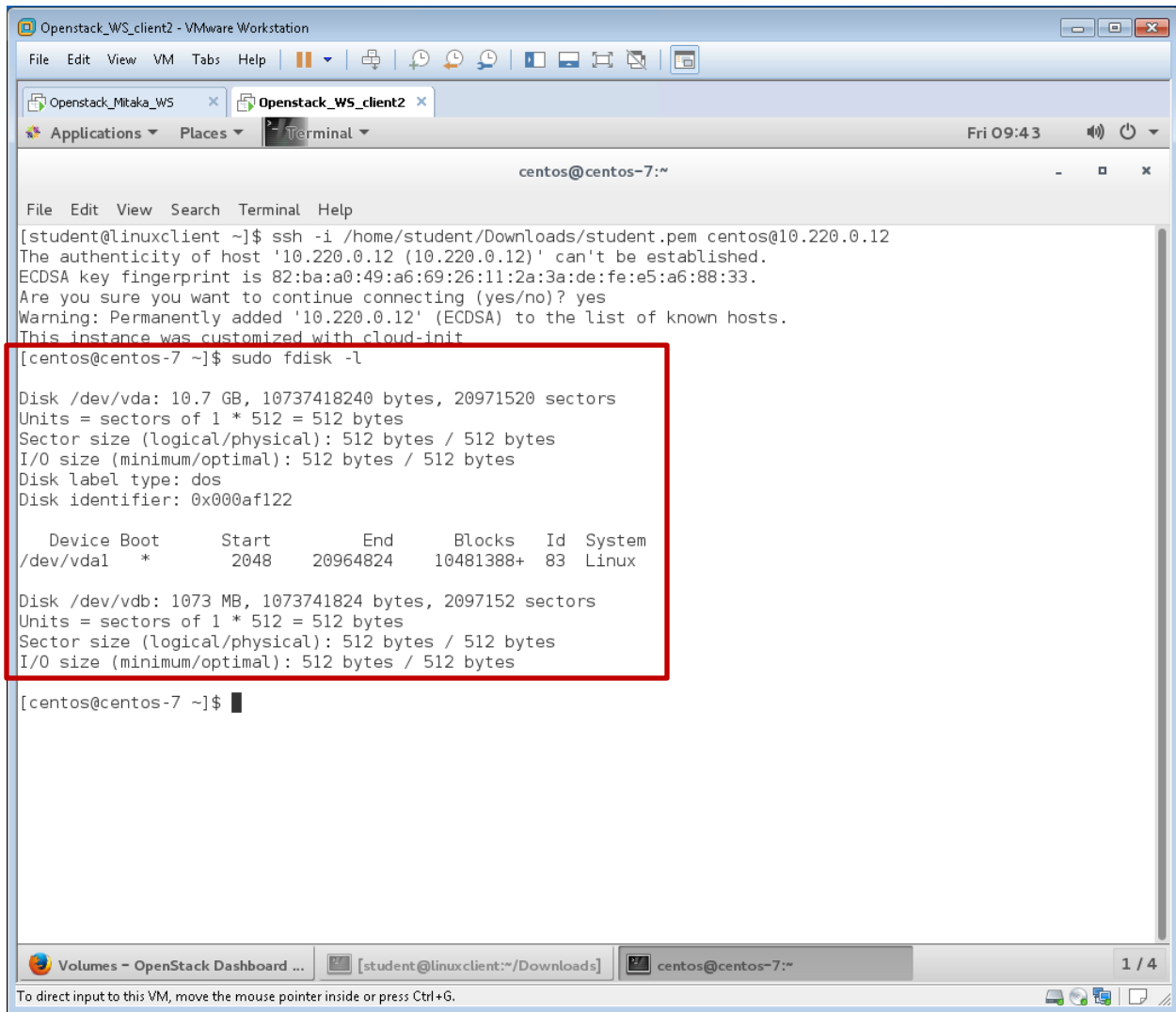
Name	Description	Size	Status	Type	Attached To	Availability Zone	Bootable	Encrypted	Actions
vol1	my first volume	1GiB	In-use	-	Attached to CentOS 7 on /dev/vdb	nova	No	No	Edit Volume
9fef3c05-82e1-4f59-87f5-1734ae3f3143	-	10GiB	In-use	-	Attached to CentOS 7 on /dev/vda	nova	Yes	No	Edit Volume

Displaying 2 items

- The **vol1** volume should show that it is **Attached to CentOS 7 on /dev/vdb** on the Attached to column.

Note: Make a note of **/dev/vdb**, you will need that information to mount the volume on the CentOS 7 instance.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:43

centos@centos-7:~
File Edit View Search Terminal Help

[student@linuxclient ~]$ ssh -i /home/student/Downloads/student.pem centos@10.220.0.12
The authenticity of host '10.220.0.12 (10.220.0.12)' can't be established.
ECDSA key fingerprint is 82:ba:a0:49:a6:69:26:11:2a:3a:de:fe:e5:a6:88:33.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.220.0.12' (ECDSA) to the list of known hosts.
This instance was customized with cloud-init
[centos@centos-7 ~]$ sudo fdisk -l

Disk /dev/vda: 10.7 GB, 10737418240 bytes, 20971520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
   /dev/vda1  *        2048     20964824     10481388+  83  Linux

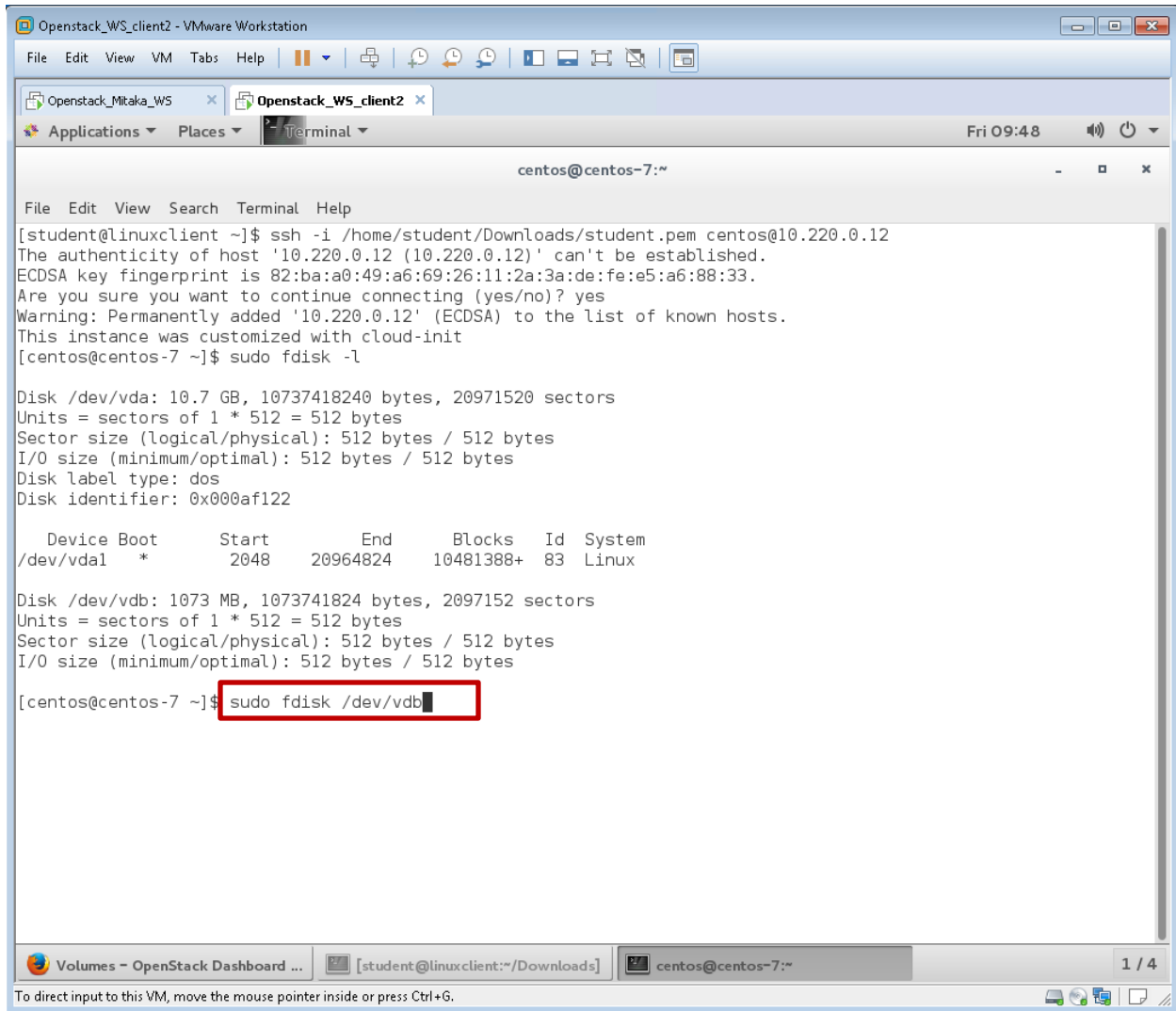
Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos-7 ~]$
```

8. Return to the SSH session for the CentOS 7 instance and run the command **#sudo fdisk -l** the command should list the two disks **/dev/vda** and **/dev/vdb** that are present on the CentOS 7 instance. The **/dev/vda** is the disk that the CentOS 7 is installed on and the **/dev/vdb** is the **volume** (disk) that you just created and attached. Although the disk is present, it's not useable yet.

Note: Reminder, you must use **sudo** for any commands that you are running in a Linux instance, because the root user is disabled by default.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal Fri 09:48

centos@centos-7:~
File Edit View Search Terminal Help

[student@linuxclient ~]$ ssh -i /home/student/Downloads/student.pem centos@10.220.0.12
The authenticity of host '10.220.0.12 (10.220.0.12)' can't be established.
ECDSA key fingerprint is 82:ba:a0:49:a6:69:26:11:2a:3a:de:fe:e5:a6:88:33.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.220.0.12' (ECDSA) to the list of known hosts.
This instance was customized with cloud-init
[centos@centos-7 ~]$ sudo fdisk -l

Disk /dev/vda: 10.7 GB, 10737418240 bytes, 20971520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
/dev/vda1  *        2048     20964824    10481388+  83  Linux

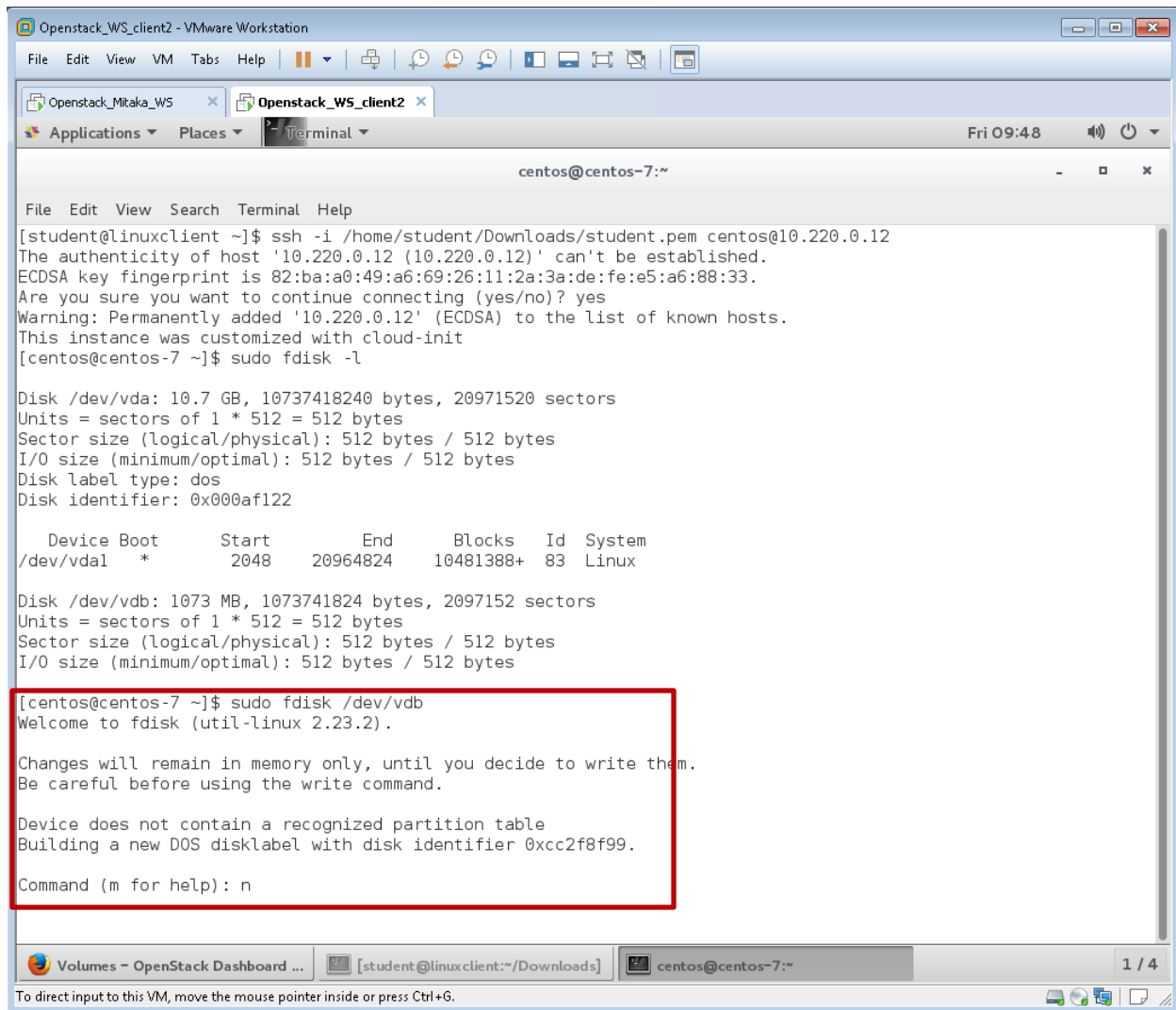
Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos-7 ~]$ sudo fdisk /dev/vdb
```

9. Run the **# sudo fdisk /dev/vdb** command to create space on the /dev/vdb disk for the new drive.



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal Fri 09:48

centos@centos-7:~
File Edit View Search Terminal Help

[student@linuxclient ~]$ ssh -i /home/student/Downloads/student.pem centos@10.220.0.12
The authenticity of host '10.220.0.12 (10.220.0.12)' can't be established.
ECDSA key fingerprint is 82:ba:a0:49:a6:69:26:11:2a:3a:de:fe:e5:a6:88:33.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.220.0.12' (ECDSA) to the list of known hosts.
This instance was customized with cloud-init
[centos@centos-7 ~]$ sudo fdisk -l

Disk /dev/vda: 10.7 GB, 10737418240 bytes, 20971520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
   /dev/vda1  *        2048     20964824     10481388+  83  Linux

Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos-7 ~]$ sudo fdisk /dev/vdb
Welcome to fdisk (util-linux 2.23.2).

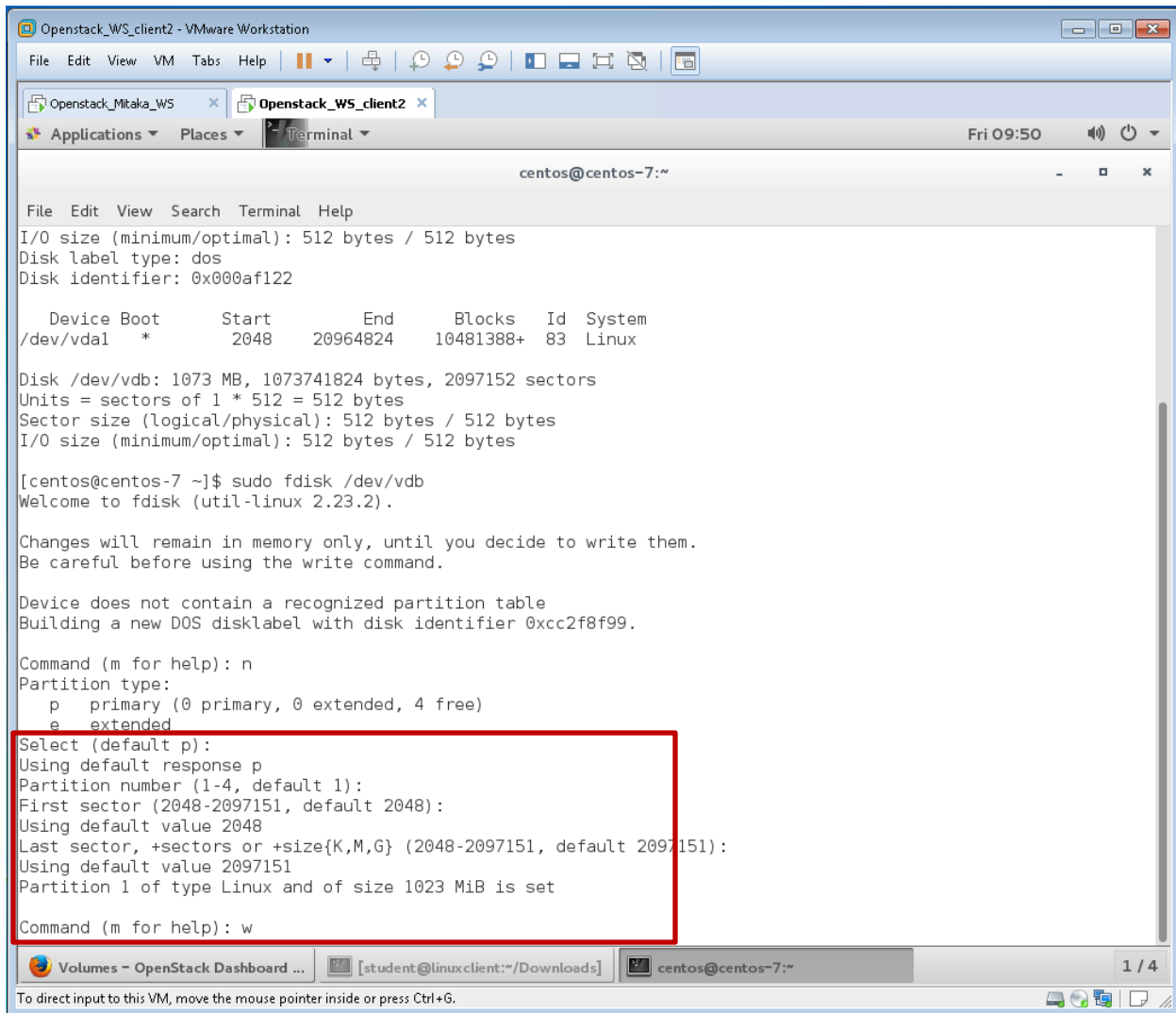
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xcc2f8f99.

Command (m for help): n
```

10. At the first prompt **enter n** for a new partition: Command (m for help): n

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:50

centos@centos-7:~
File Edit View Search Terminal Help
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
/dev/vda1  *        2048     20964824     10481388+   83   Linux

Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos-7 ~]$ sudo fdisk /dev/vdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xcc2f8f99.

Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p):
Using default response p
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2097151, default 2097151):
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set
Command (m for help): w
```

11. Use the **defaults** for the **Partition type p**, **Partition number 1**, **First sector**, and **Last sector** and **enter w** to write the new partition to the **/dev/vdb** disk.



```

Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:52

centos@centos-7:~
File Edit View Search Terminal Help
/dev/vda1 * 2048 20964824 10481388+ 83 Linux

Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos-7 ~]$ sudo fdisk /dev/vdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xcc2f8f99.

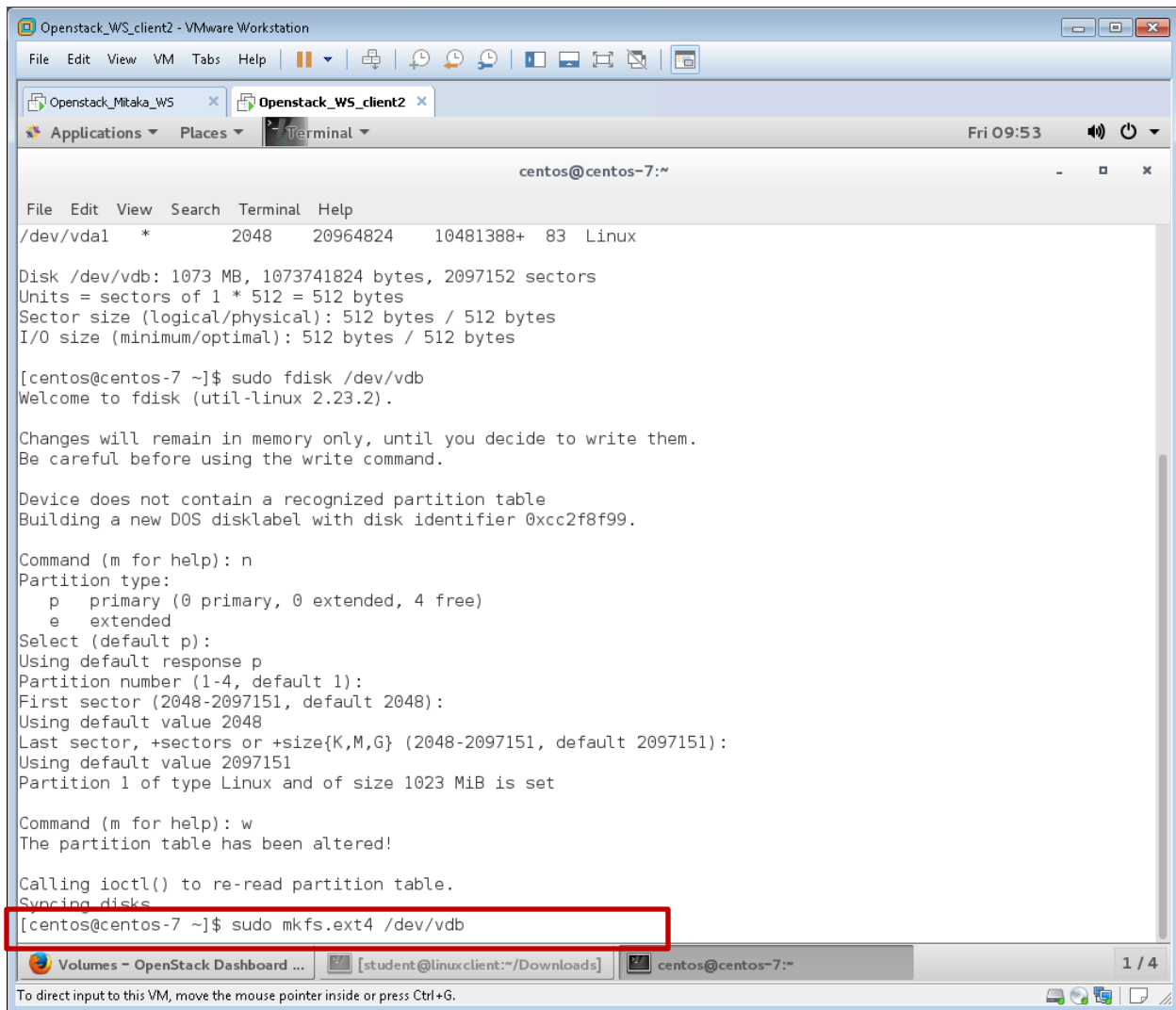
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p):
Using default response p
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2097151, default 2097151):
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
[centos@centos-7 ~]$
  
```

12. After entering `w` and pressing enter, you should see the “The Partition table.....syncing disks.” output, as shown in the screen capture. Next you will create a file system on the new partition.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal Fri 09:53

centos@centos-7:~
File Edit View Search Terminal Help
/dev/vda1 * 2048 20964824 10481388+ 83 Linux

Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos-7 ~]$ sudo fdisk /dev/vdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xcc2f8f99.

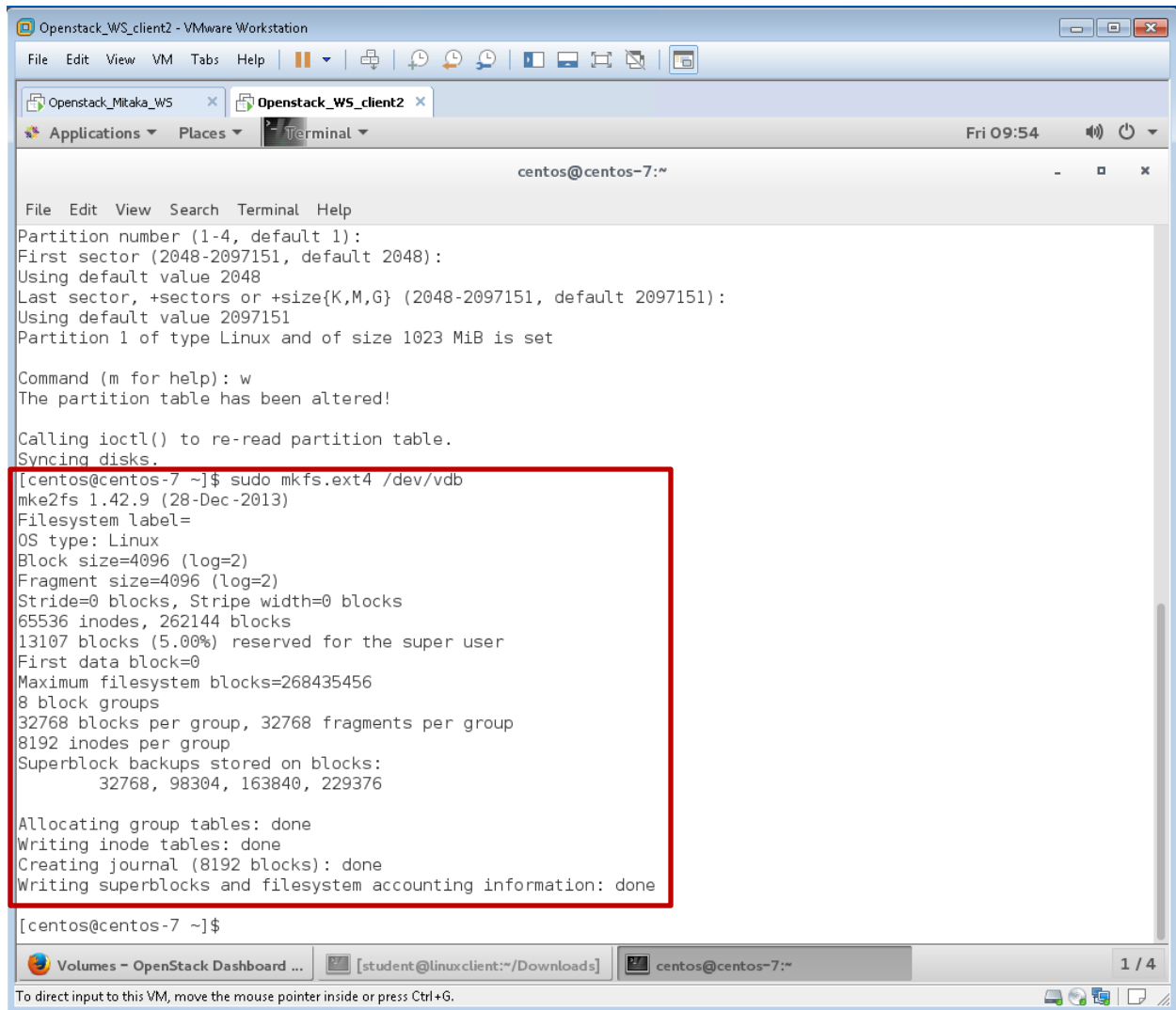
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p):
Using default response p
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2097151, default 2097151):
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks
[centos@centos-7 ~]$ sudo mkfs.ext4 /dev/vdb
```

13. Create a file system on the new volume (disk) /dev/vdb. Enter **# sudo mkfs.ext4 /dev/vdb**

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:54

centos@centos-7:~
File Edit View Search Terminal Help
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2097151, default 2097151):
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
[centos@centos-7 ~]$ sudo mkfs.ext4 /dev/vdb
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

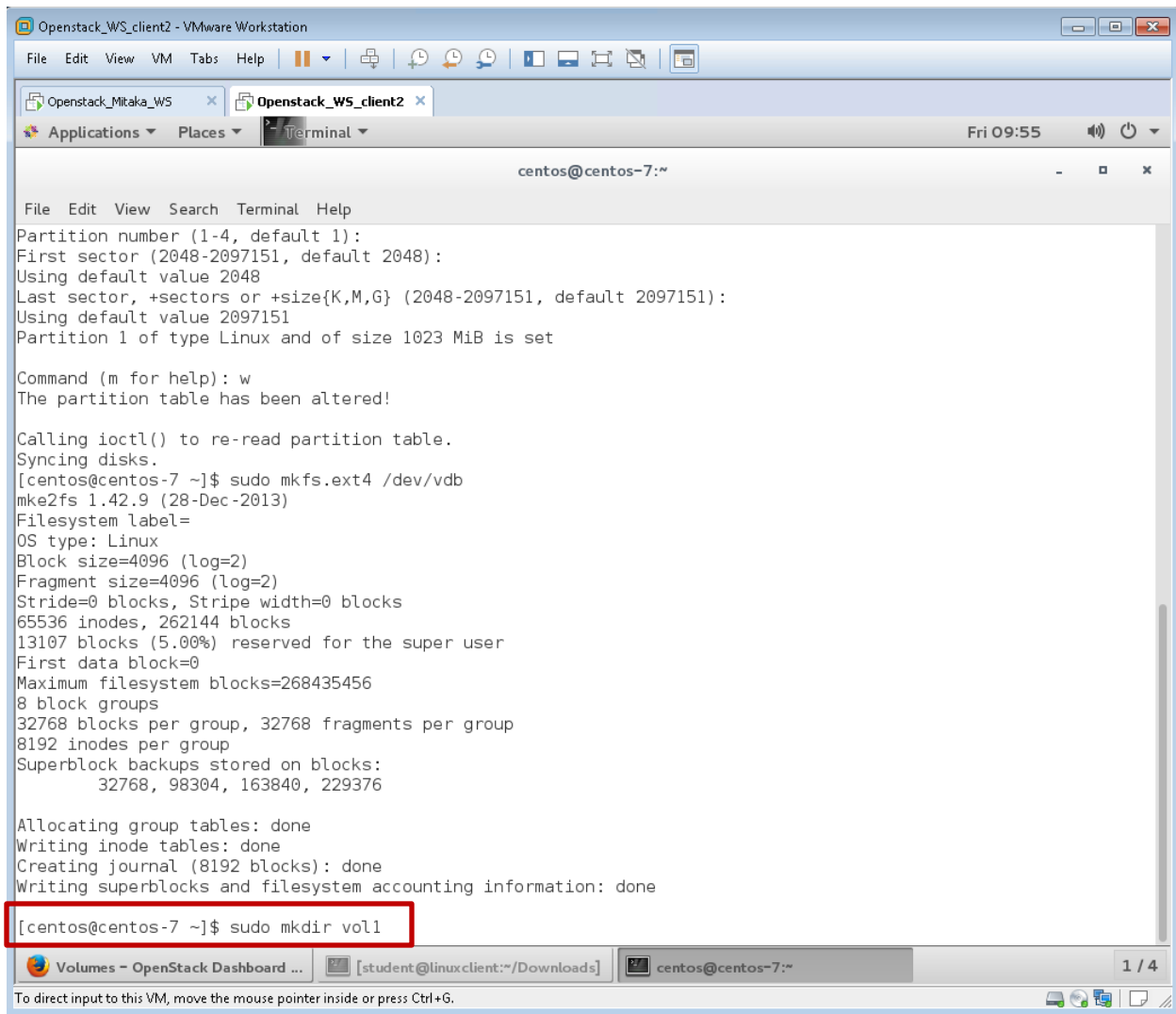
Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[centos@centos-7 ~]$
```

14. You should see similar output, as shown in the screen capture above, as the OS writes the ext4 file system to the /dev/vdb disk.



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:55

centos@centos-7:~
File Edit View Search Terminal Help
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2097151, default 2097151):
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
[centos@centos-7 ~]$ sudo mkfs.ext4 /dev/vdb
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

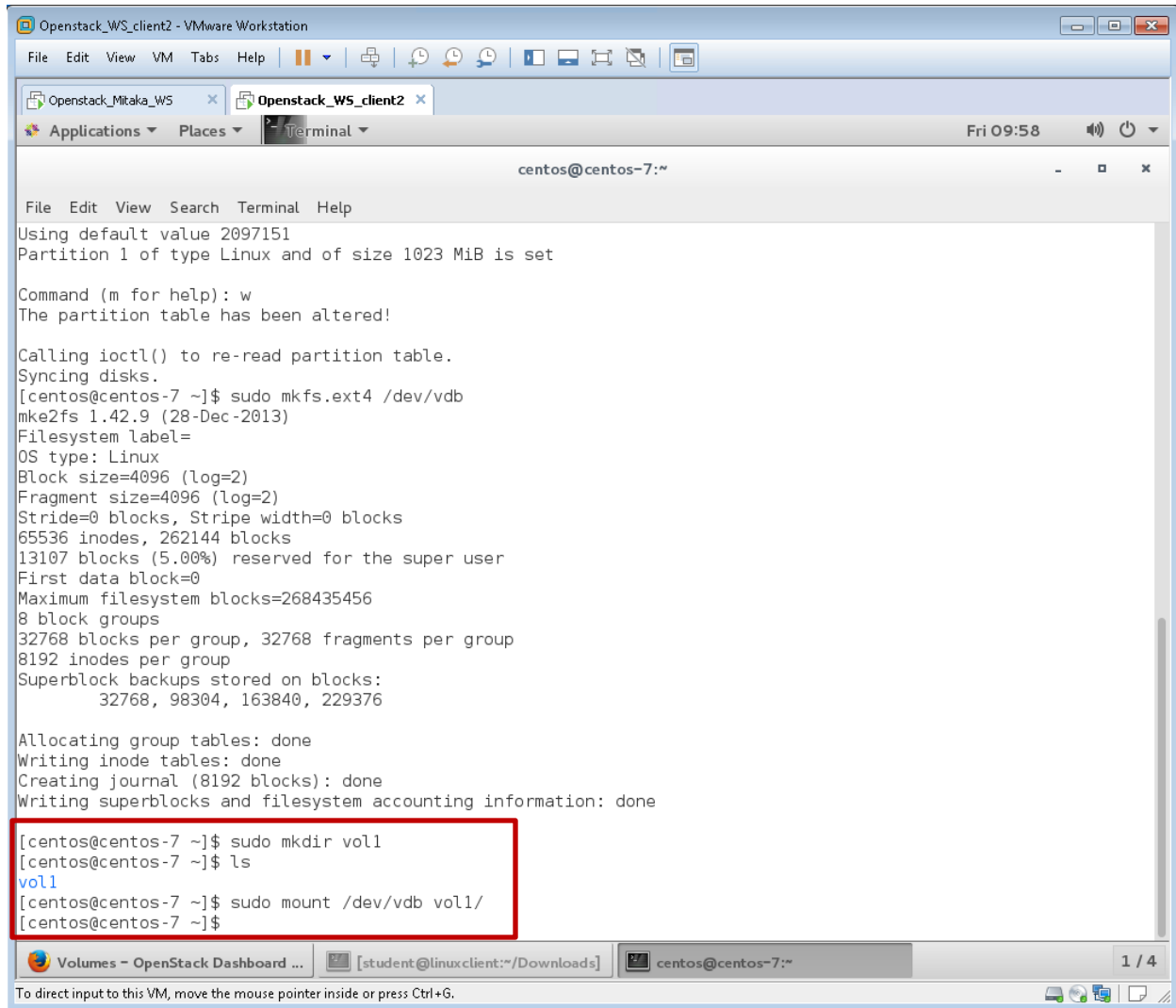
Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[centos@centos-7 ~]$ sudo mkdir vol1
```

15. Create a new directory to mount the new volume. Enter # **sudo mkdir vol1**

Note: The system doesn't produce any output after making the new directory, so you can run the ls command to verify that the new vol1 directory is present.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:58

centos@centos-7:~
File Edit View Search Terminal Help
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
[centos@centos-7 ~]$ sudo mkfs.ext4 /dev/vdb
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

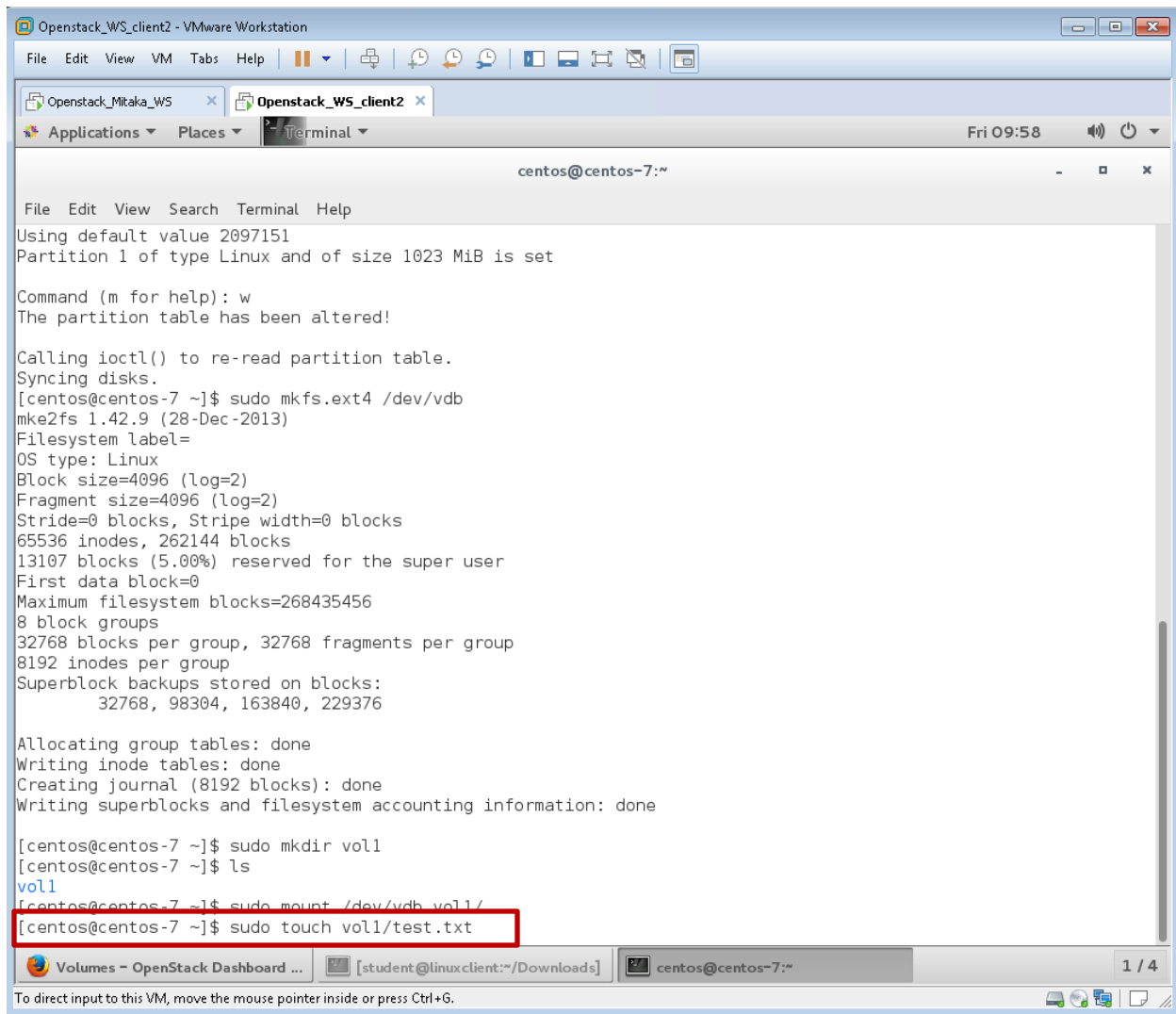
Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[centos@centos-7 ~]$ sudo mkdir vol1
[centos@centos-7 ~]$ ls
vol1
[centos@centos-7 ~]$ sudo mount /dev/vdb vol1/
[centos@centos-7 ~]$
```

16. Mount the /dev/vdb volume (disk) to the new vol1 directory. Enter **# sudo mount /dev/vdb vol1/**

Note: The system doesn't produce any output confirming that the volume was successfully mounted, only errors will produce an output.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal
Fri 09:58
centos@centos-7:~
File Edit View Search Terminal Help
Using default value 2097151
Partition 1 of type Linux and of size 1023 MiB is set

Command (m for help): w
The partition table has been altered!

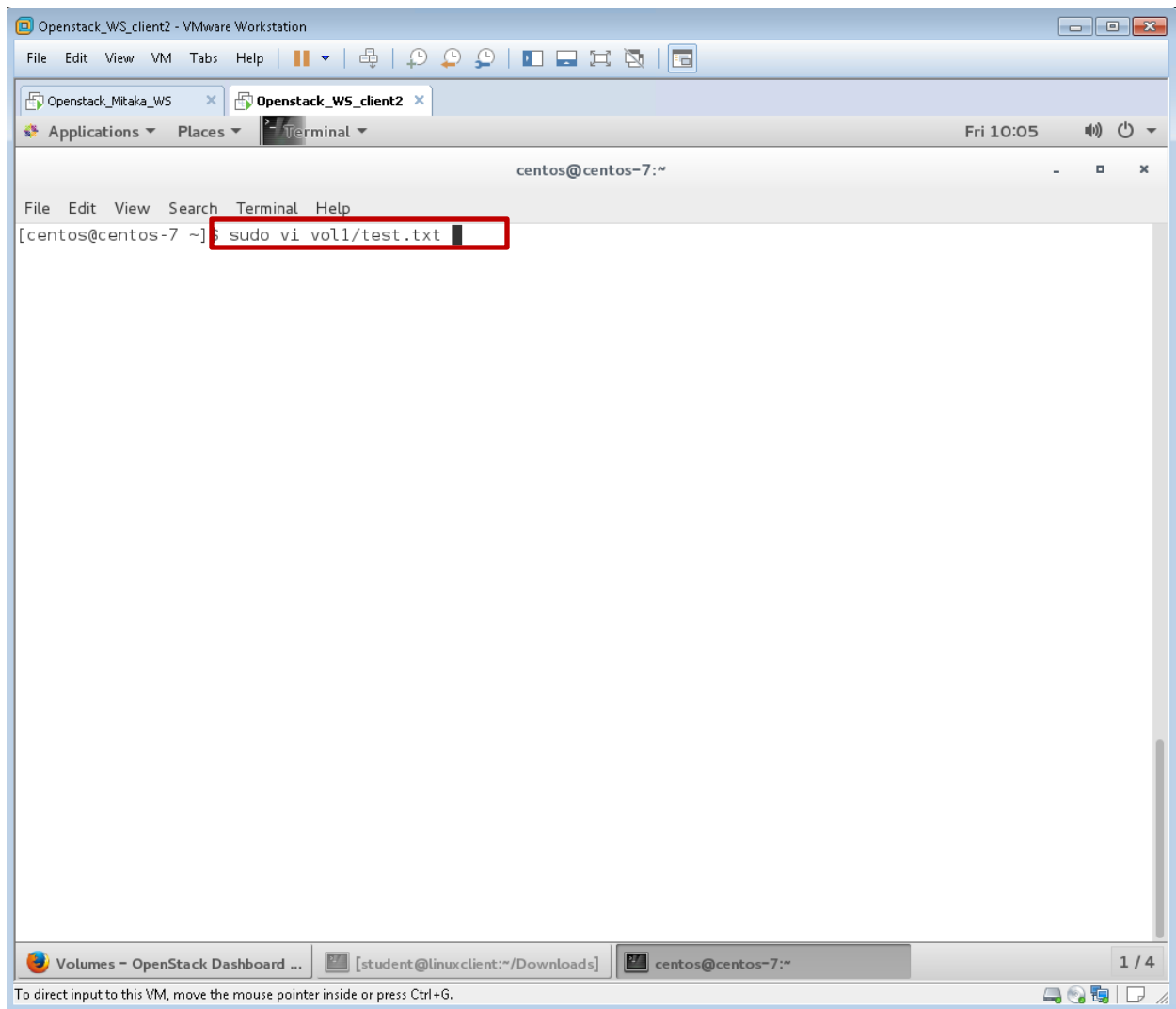
Calling ioctl() to re-read partition table.
Syncing disks.
[centos@centos-7 ~]$ sudo mkfs.ext4 /dev/vdb
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[centos@centos-7 ~]$ sudo mkdir vol1
[centos@centos-7 ~]$ ls
vol1
[centos@centos-7 ~]$ sudo mount /dev/vdb vol1/
[centos@centos-7 ~]$ sudo touch vol1/test.txt
```

17. Create a file in the new directory. Enter **# sudo touch vol1/test.txt**

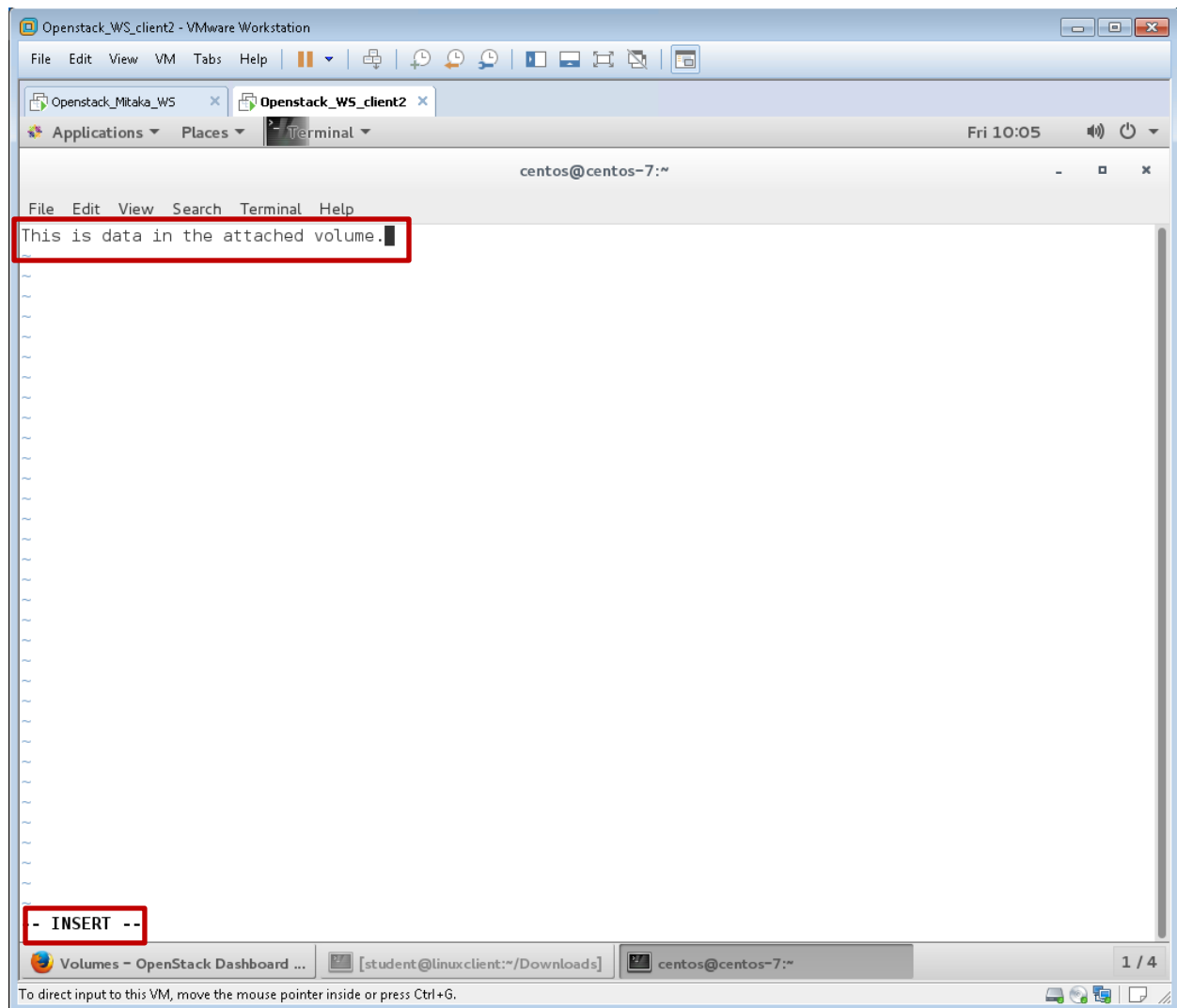
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



18. Create some data on the new vol1 volume. Enter **# sudo vi vol1/test.txt**

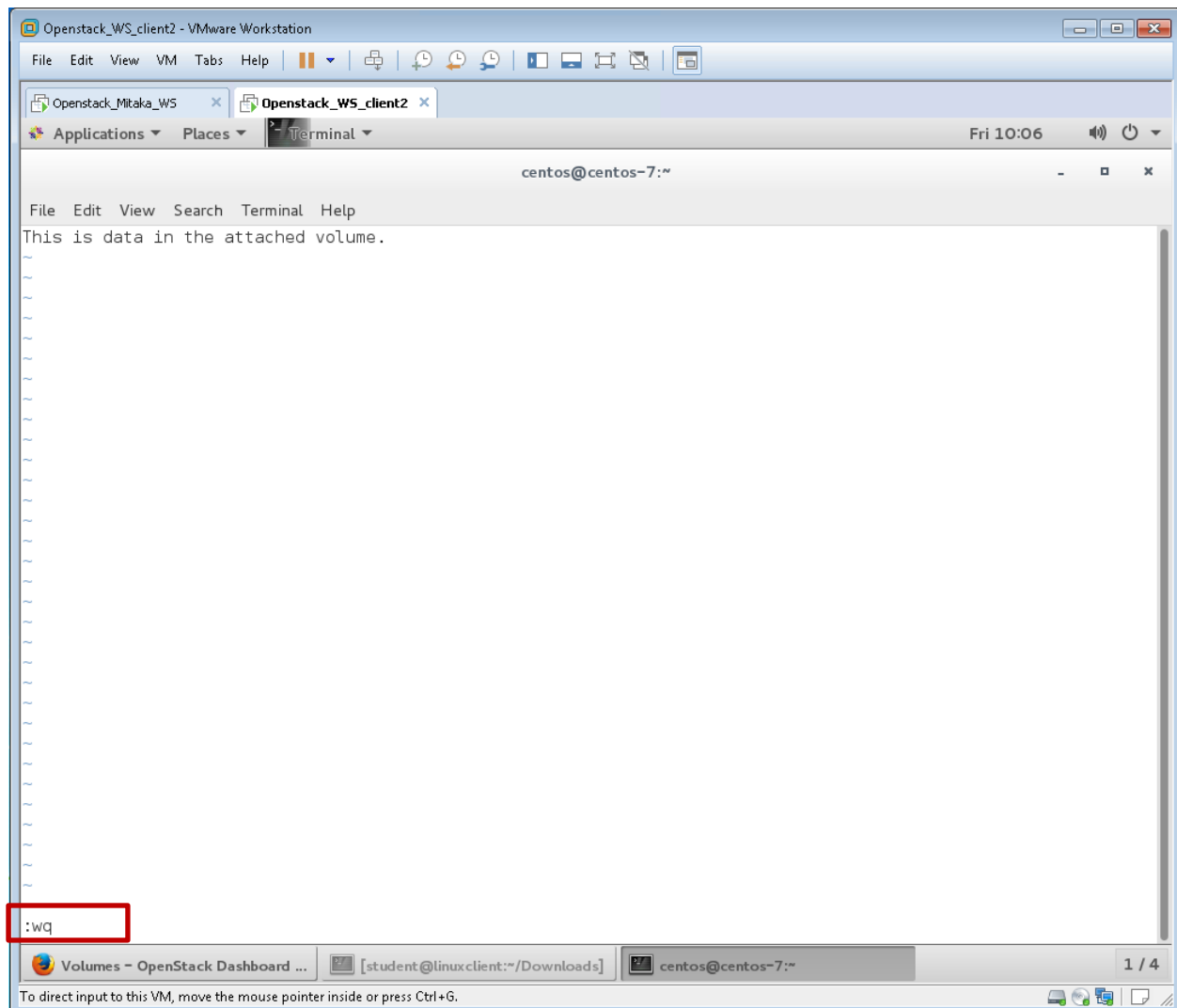


Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



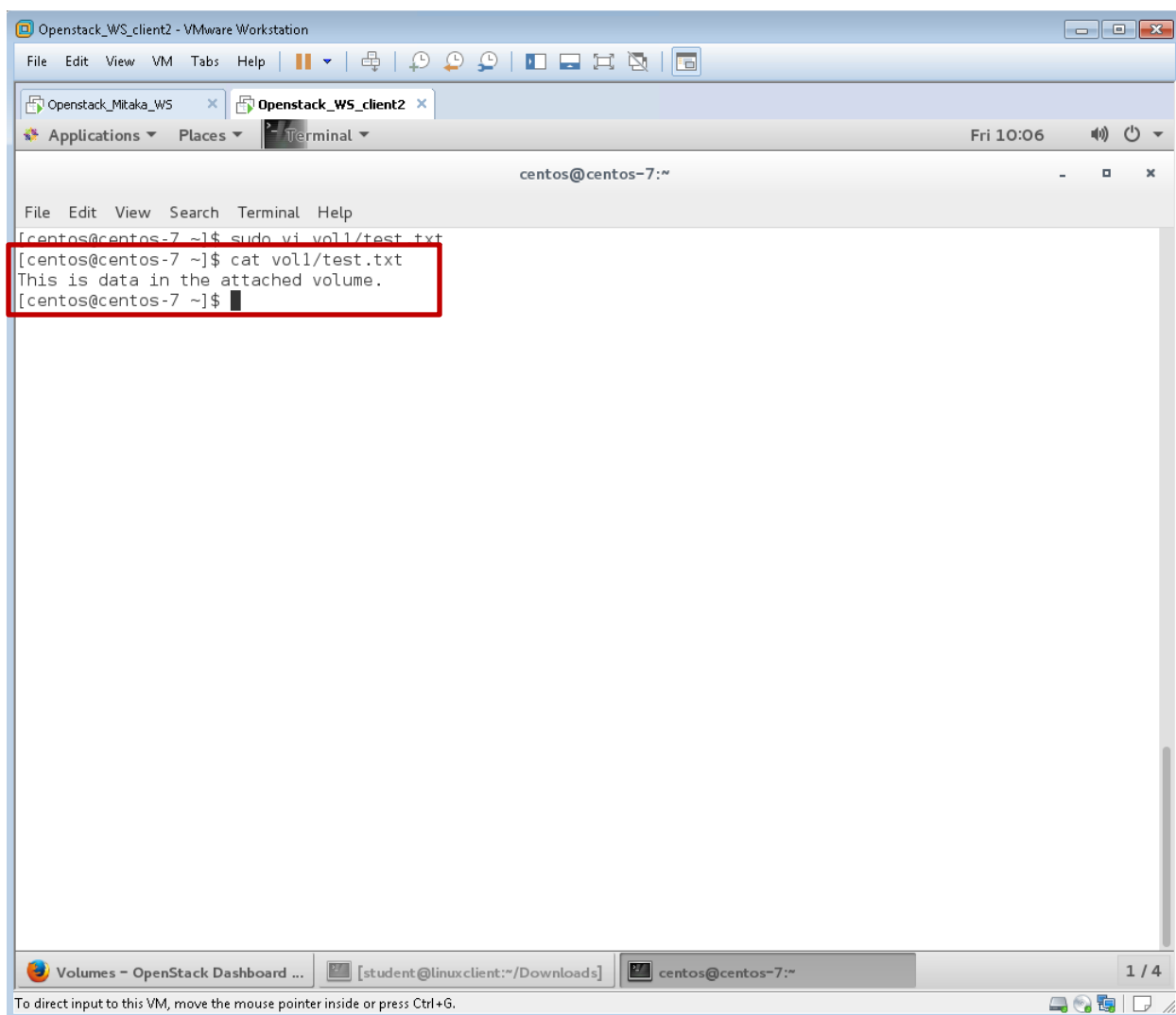
19. Press the **insert** button on your keyboard and add some text to the file. For example; "This is data in the attached volume."

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



20. Press the **Esc** key on your keyboard, followed by **:wq** to write and quit the text.txt file.

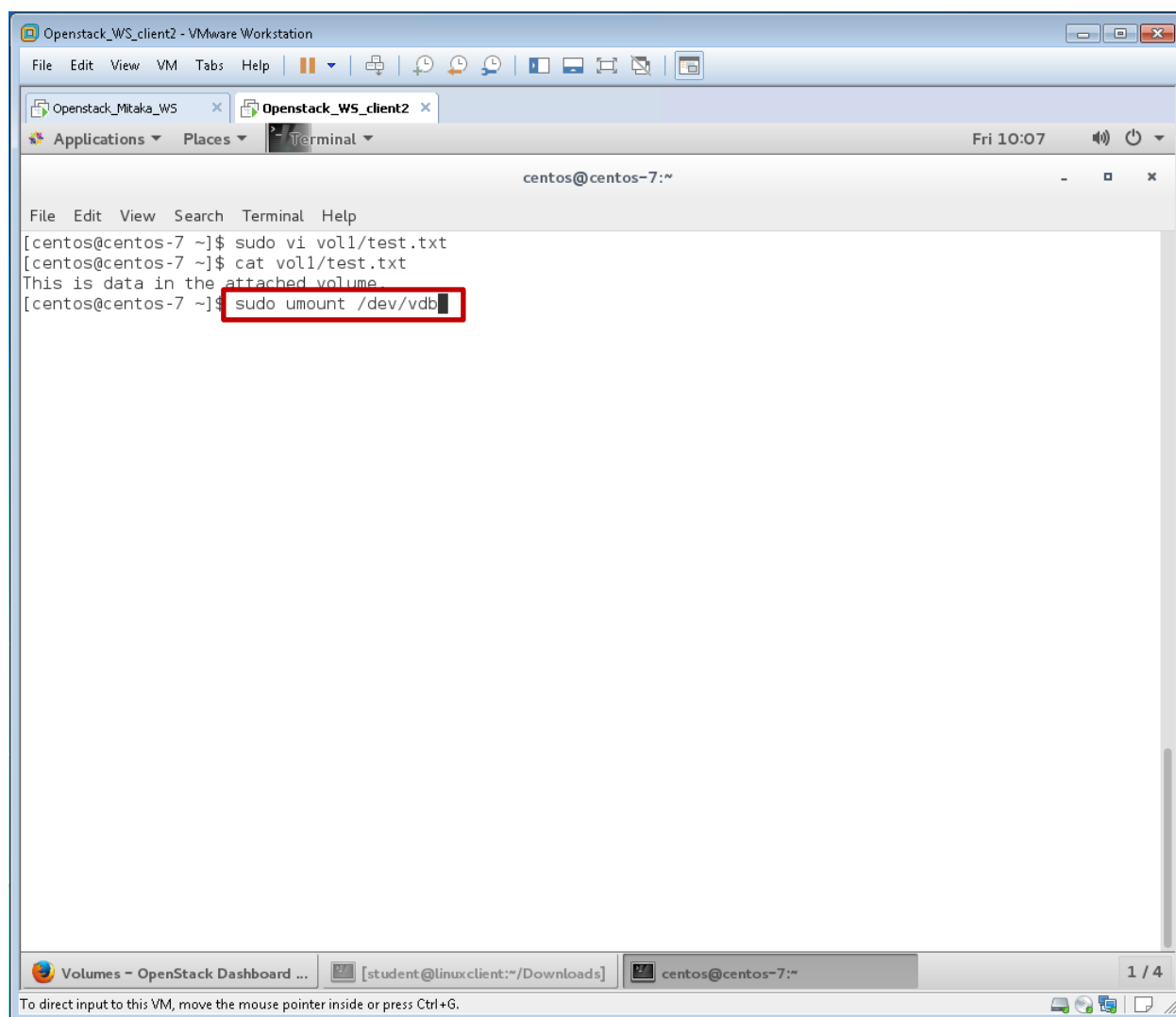
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



21. Verify that the data is present with the **cat vol1/test.txt** command.



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes

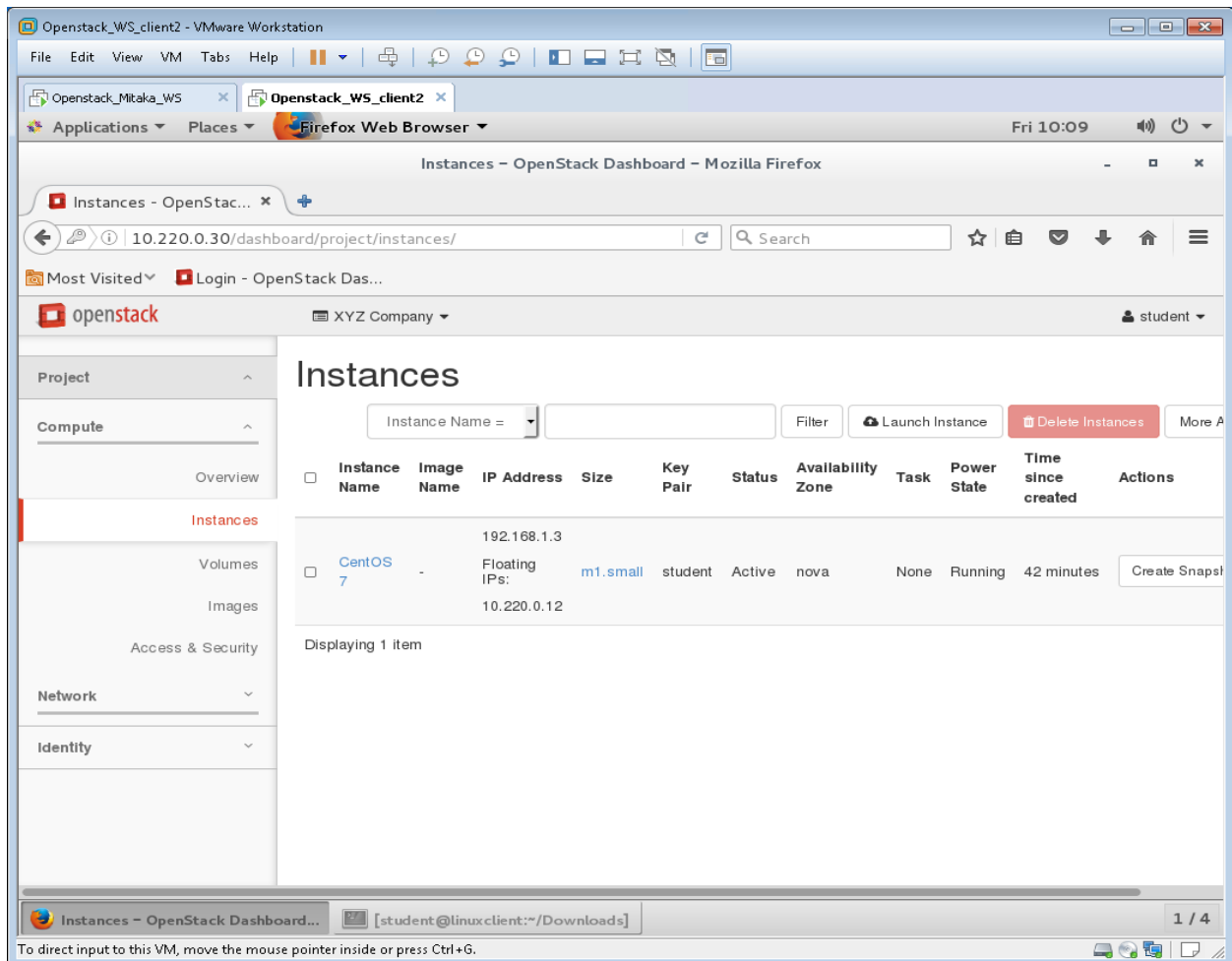


22. Detach the volume from the CentOS 7 instance using the **# sudo umount /dev/vdb vol1/** command. Close the terminal window and return to the Openstack Dashboard.

Continue to Lab 24



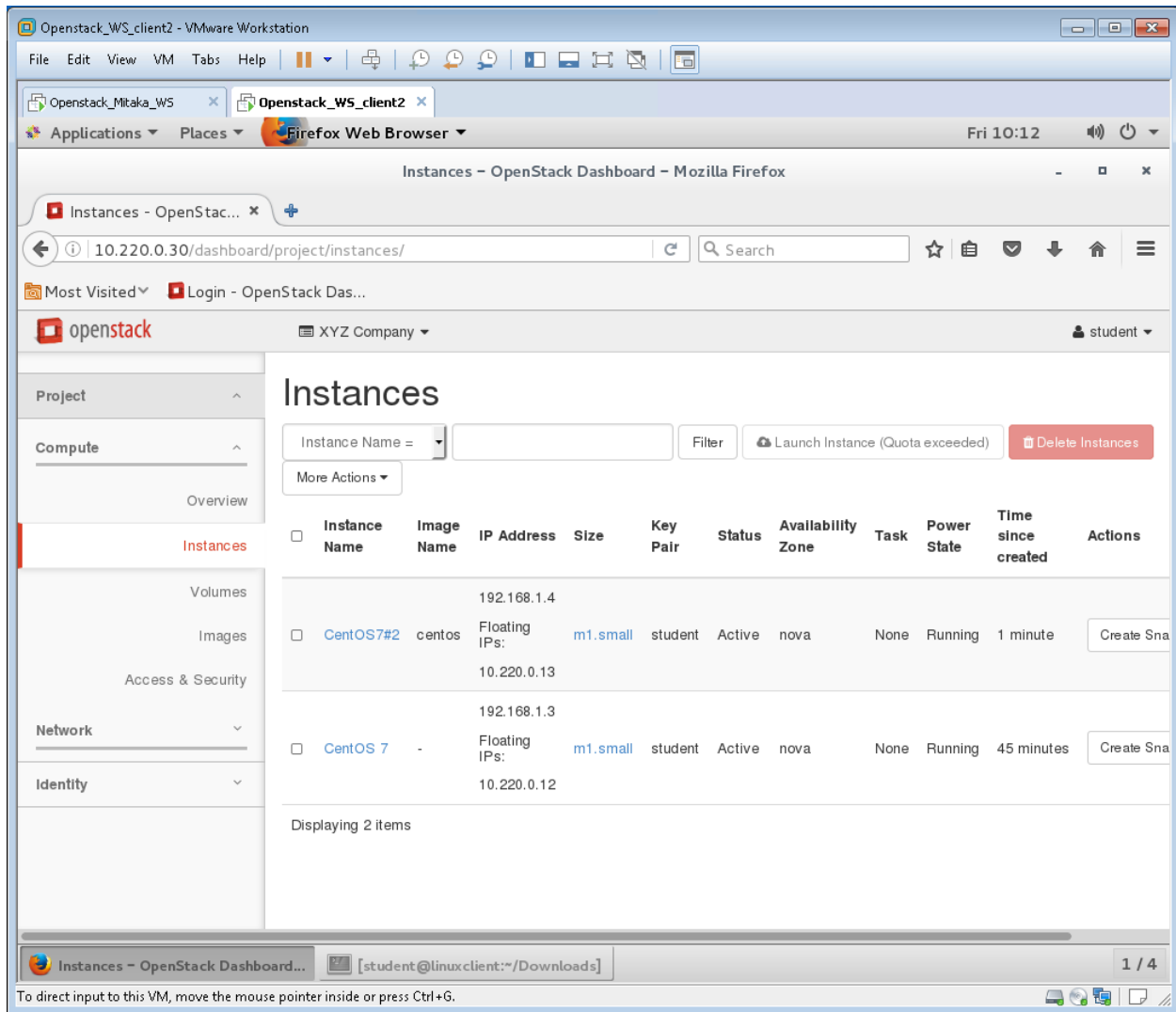
Lab 24: Launch a CentOS7#2 instance and attach the volume with data from CentOS 7 to the CentOS7#2 instance.



1. Create a new CentOS instance using the same techniques as the first CentOS 7 instance with the exception of the customization step. **DO NOT use the Create New Volume feature for this instance.**

Instance Name	CentOS7#2
Source	CentOS
Flavor	m1.small
Network	Private
Security Group	XYZ Company
Key Pair	Student
Floating IP Address	10.220.0.13

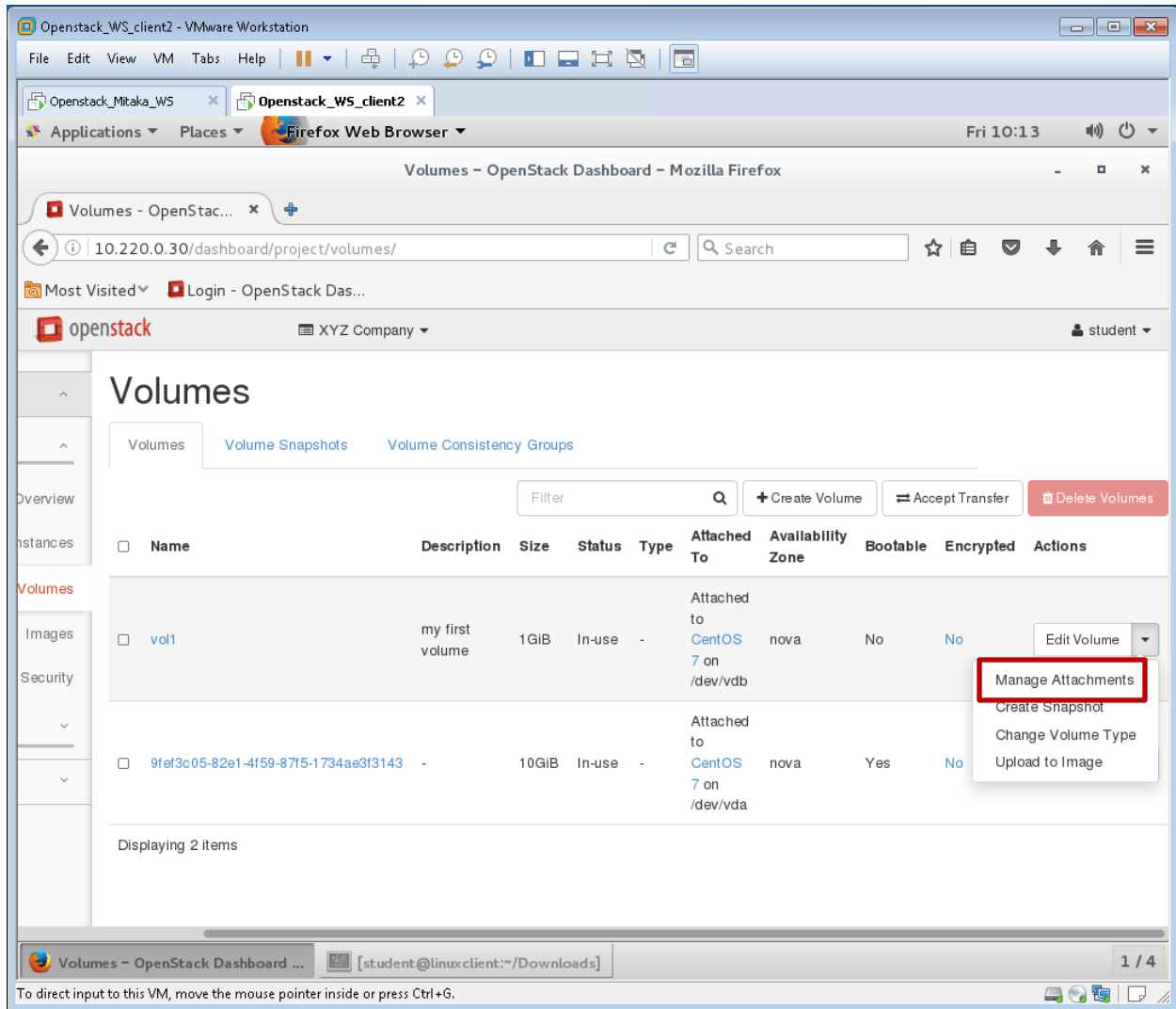
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



2. Your instances page should match the screen capture shown. **Switch to the Volumes tab.**

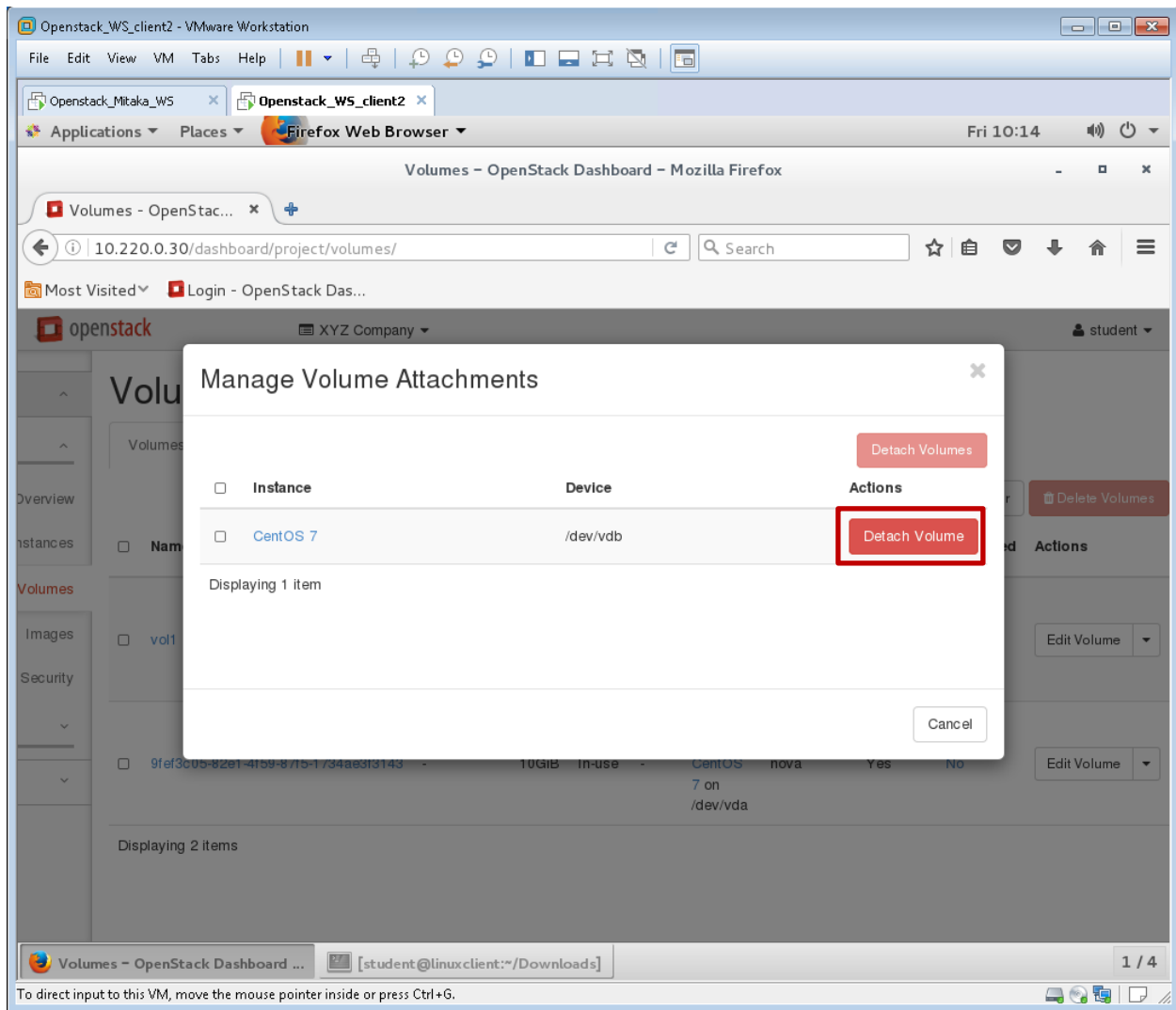


Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



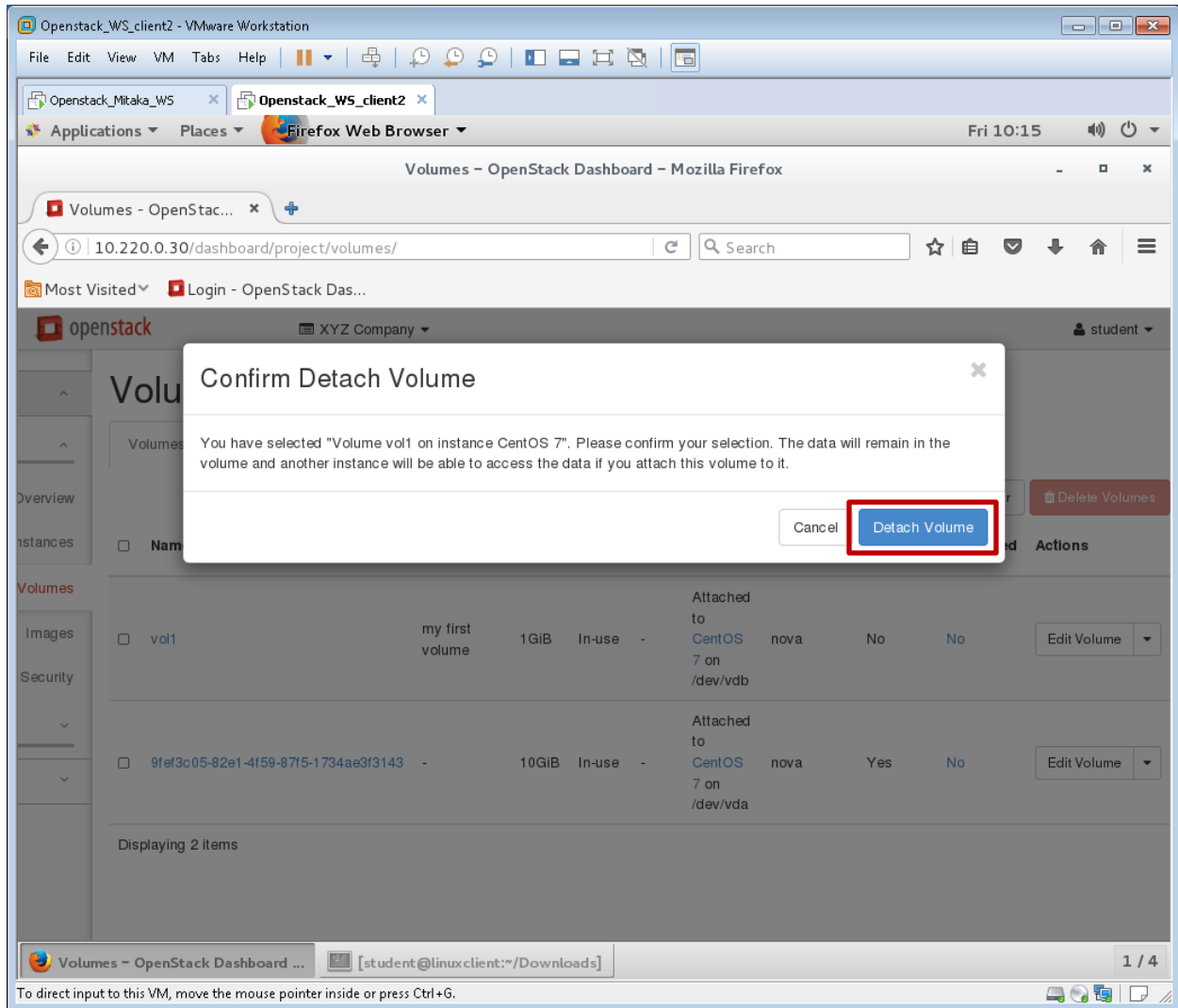
3. **Select Manage Attachments** on the same row as the vol1 volume.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



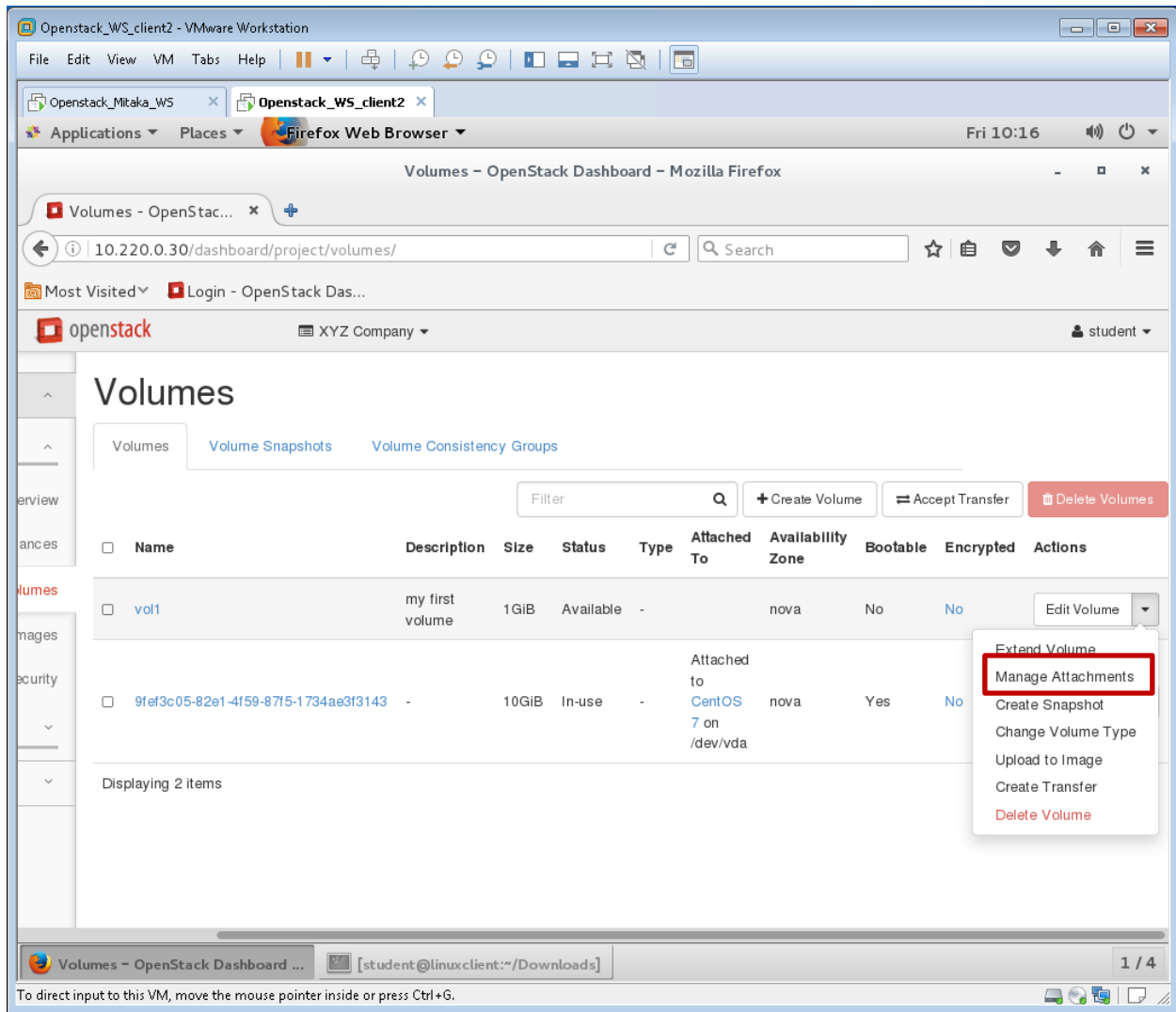
4. Select the **Detach Volume** button to remove the `/dev/vdb` from the CentOS 7 instance.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



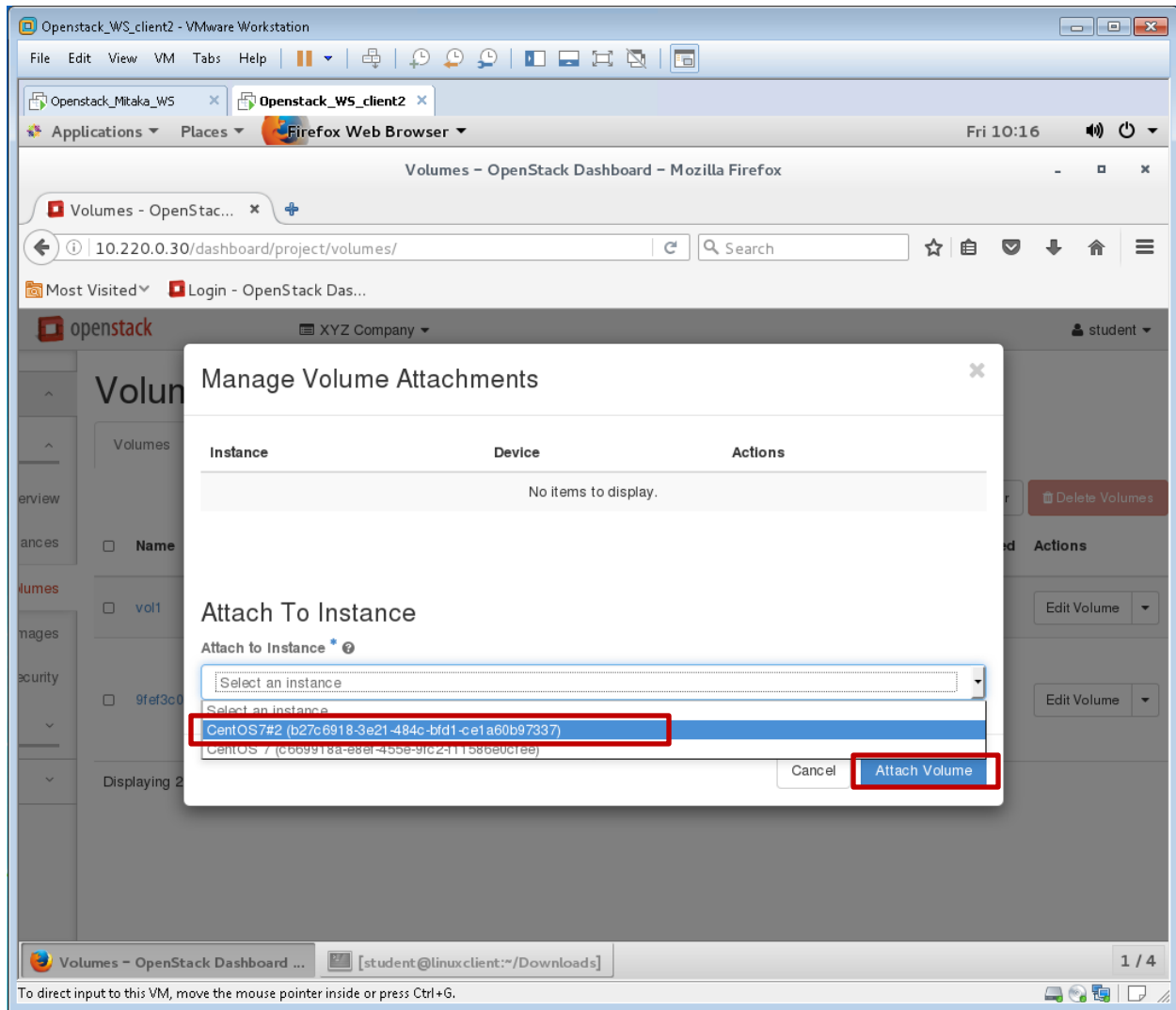
5. Confirm Detach Volume.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



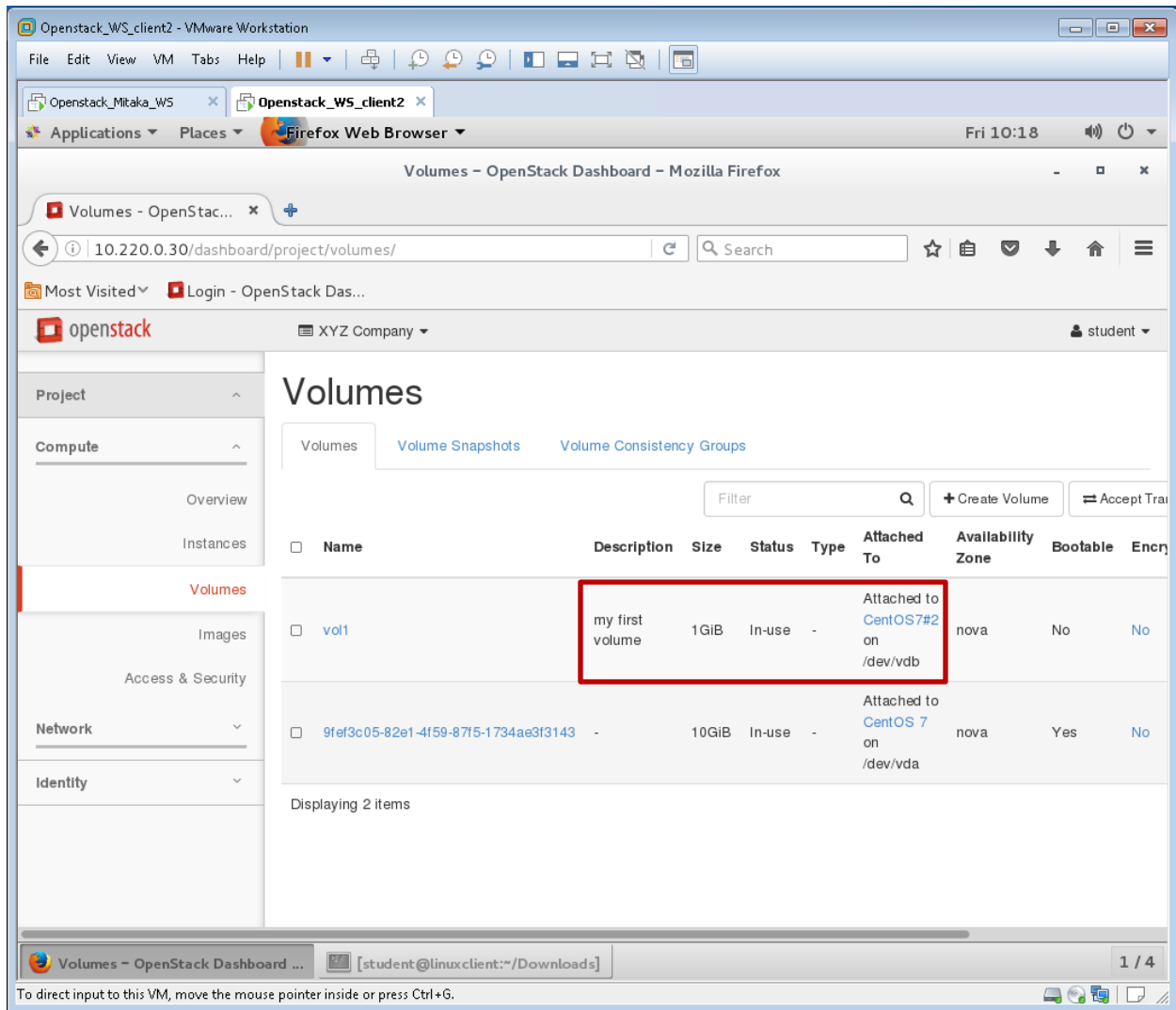
6. **Confirm** that the **vol1** is **Available** in the Status column. **Click on Manage Attachments.**

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



7. Select the **CentOS7#2** instance and click on **Attach Volume**.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes

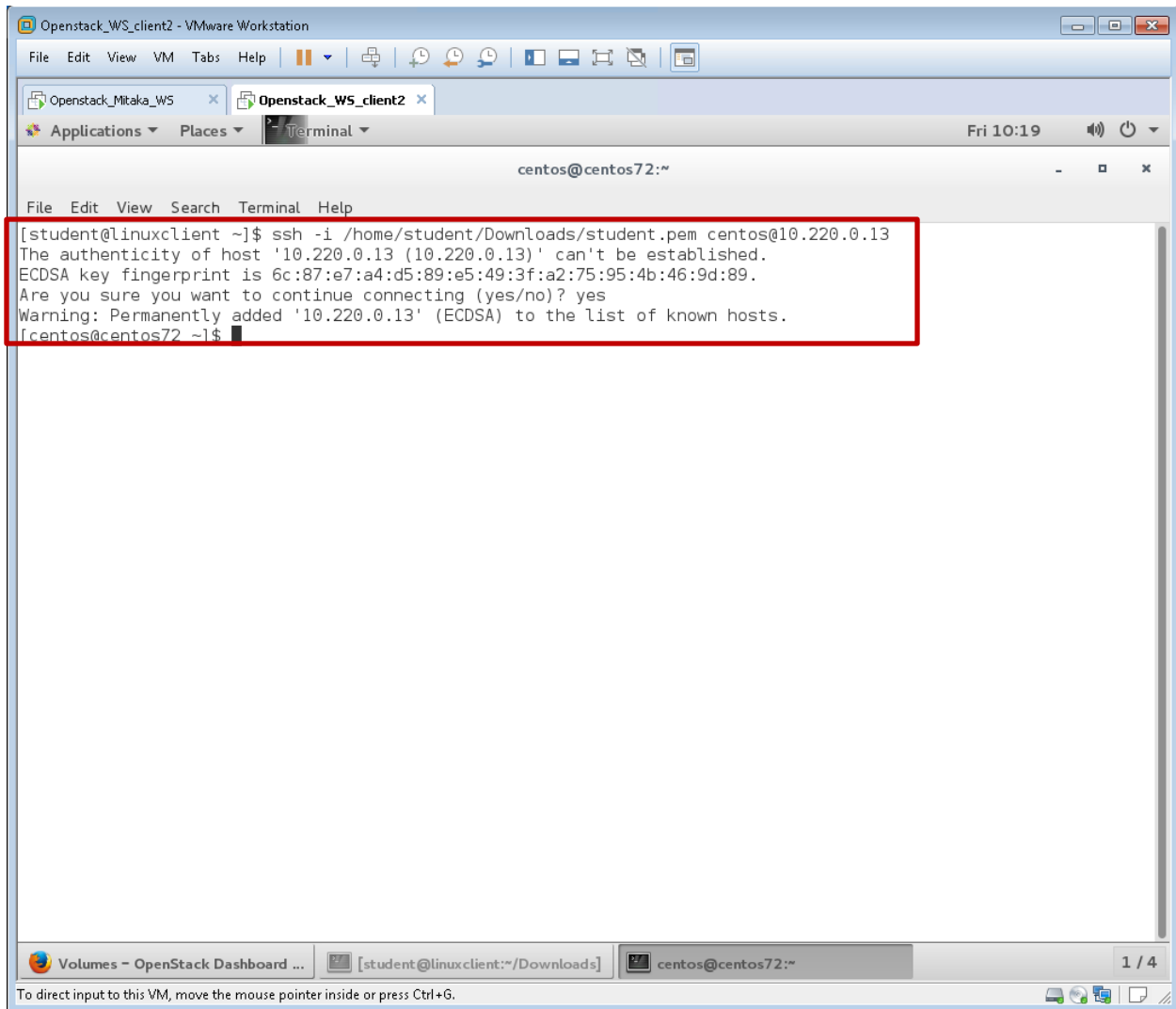


The screenshot shows the OpenStack Volumes dashboard. The left sidebar contains navigation links for Project, Compute, Network, and Identity. The main content area displays a table of volumes. The first volume, 'vol1', is highlighted with a red box. It is a 1GiB volume, in-use, and attached to 'CentOS7#2' on '/dev/vdb'. The second volume is a 10GiB volume, in-use, attached to 'CentOS 7' on '/dev/vda'.

Name	Description	Size	Status	Type	Attached To	Availability Zone	Bootable	Encrypted
vol1	my first volume	1GiB	In-use	-	Attached to CentOS7#2 on /dev/vdb	nova	No	No
9fef3c05-82e1-4f59-87f5-1734ae3f3143	-	10GiB	In-use	-	Attached to CentOS 7 on /dev/vda	nova	Yes	No

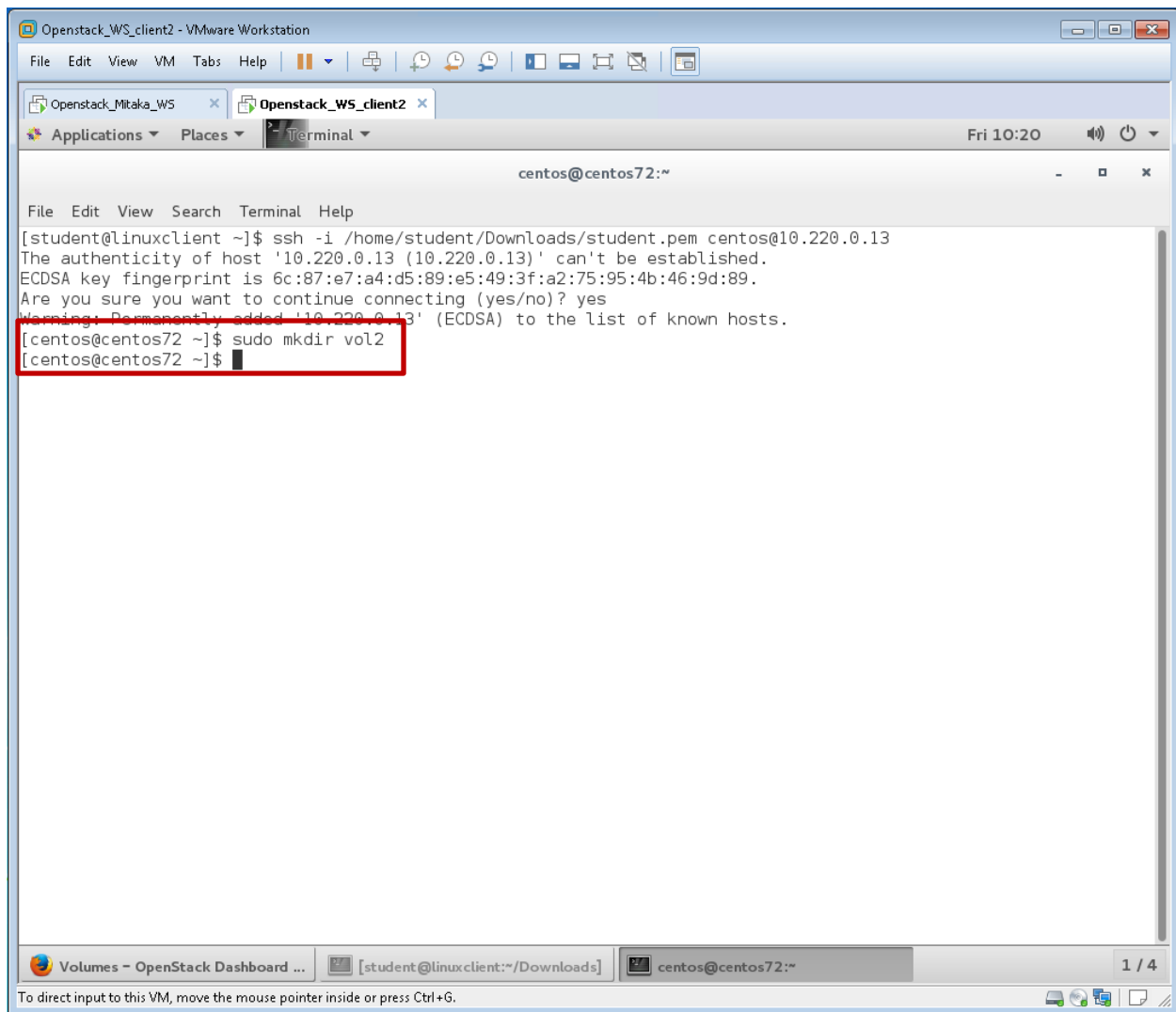
8. Verify that vol1 is Attached to CentOS7#2 on /dev/vdb

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



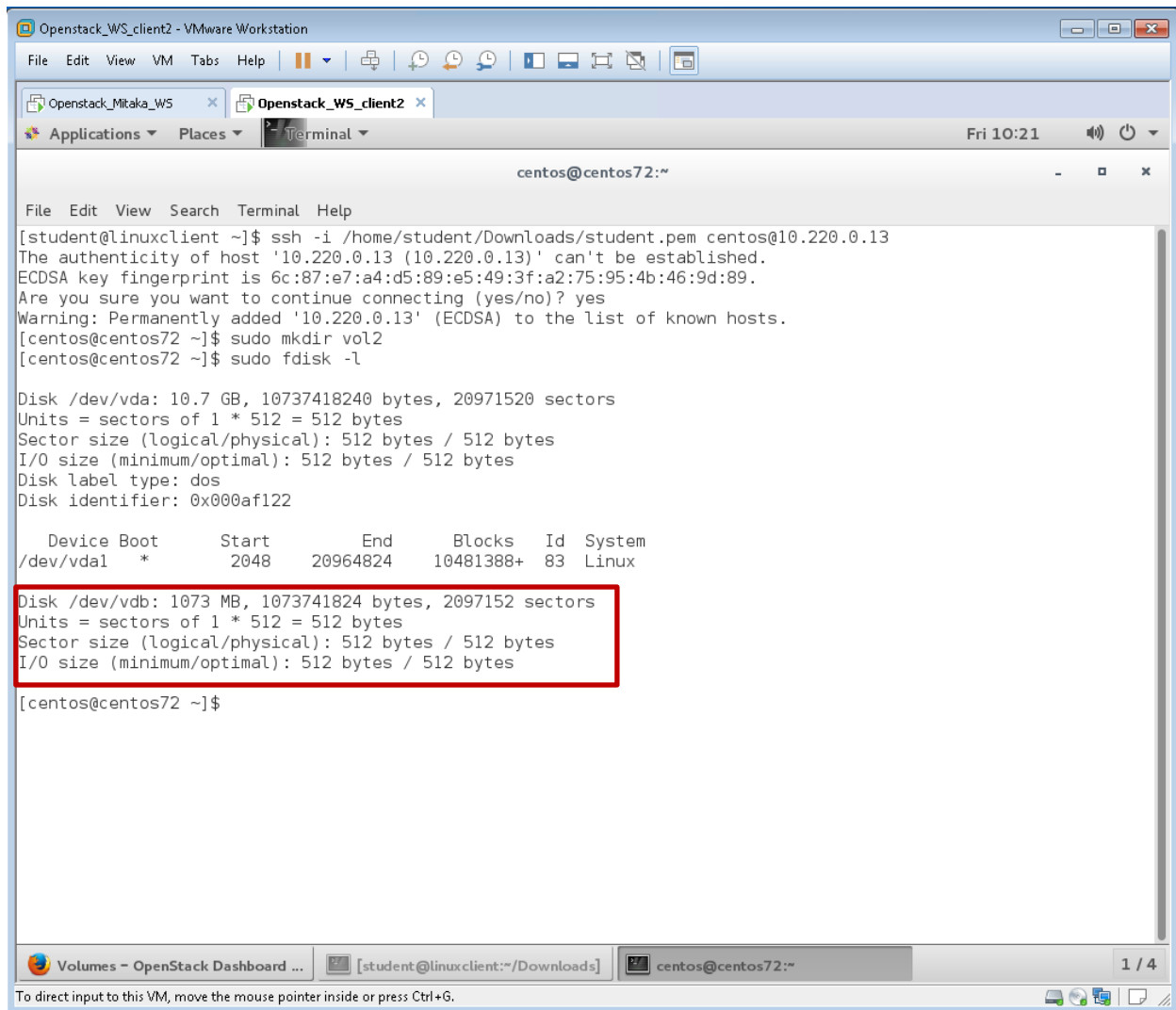
9. SSH into the CentOS7#2 instance.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



10. Create a new directory vol2 to mount the volume (disk) to using the `# sudo mkdir vol2` command.

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal Fri 10:21

centos@centos72:~
File Edit View Search Terminal Help

[student@linuxclient ~]$ ssh -i /home/student/Downloads/student.pem centos@10.220.0.13
The authenticity of host '10.220.0.13 (10.220.0.13)' can't be established.
ECDSA key fingerprint is 6c:87:e7:a4:d5:89:e5:49:3f:a2:75:95:4b:46:9d:89.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.220.0.13' (ECDSA) to the list of known hosts.
[centos@centos72 ~]$ sudo mkdir vol2
[centos@centos72 ~]$ sudo fdisk -l

Disk /dev/vda: 10.7 GB, 10737418240 bytes, 20971520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
/dev/vda1  *        2048     20964824    10481388+  83  Linux

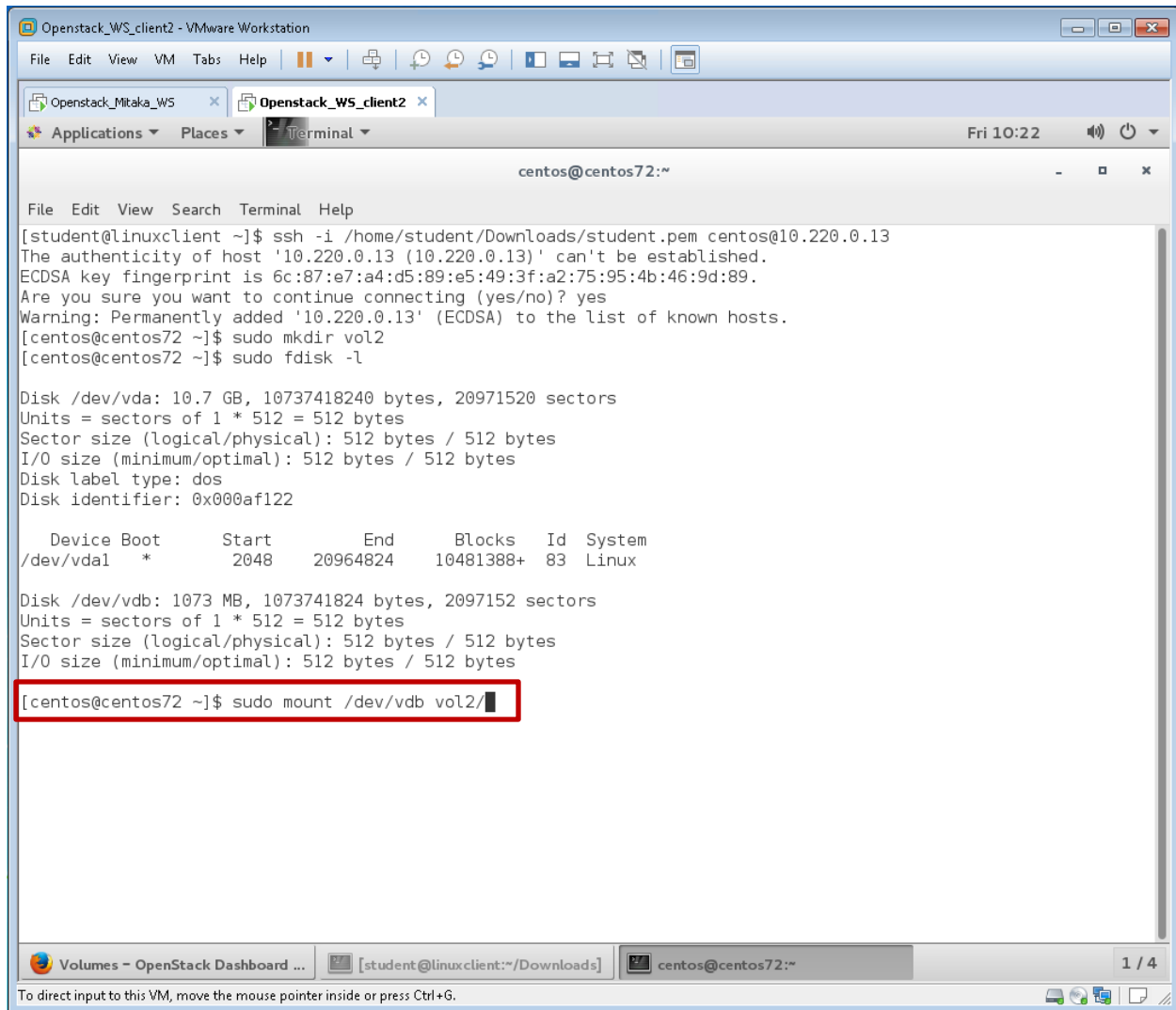
Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos72 ~]$
```

11. Using the # **sudo fdisk -l** command, verify that **/dev/vdb** is present.



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal Fri 10:22

centos@centos72:~
File Edit View Search Terminal Help

[student@linuxclient ~]$ ssh -i /home/student/Downloads/student.pem centos@10.220.0.13
The authenticity of host '10.220.0.13 (10.220.0.13)' can't be established.
ECDSA key fingerprint is 6c:87:e7:a4:d5:89:e5:49:3f:a2:75:95:4b:46:9d:89.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.220.0.13' (ECDSA) to the list of known hosts.
[centos@centos72 ~]$ sudo mkdir vol2
[centos@centos72 ~]$ sudo fdisk -l

Disk /dev/vda: 10.7 GB, 10737418240 bytes, 20971520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
/dev/vda1  *        2048     20964824    10481388+  83  Linux

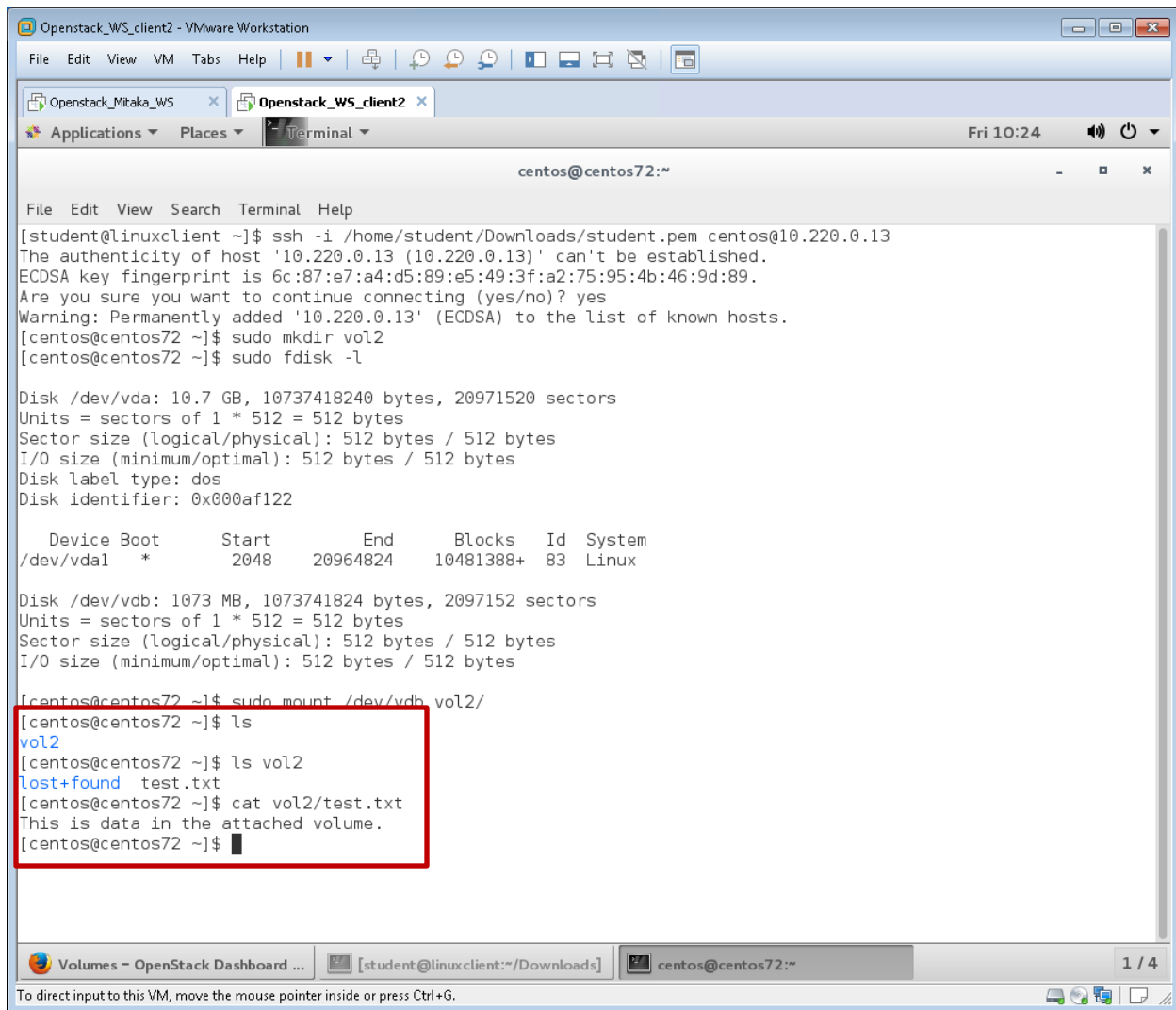
Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos72 ~]$ sudo mount /dev/vdb vol2/
```

12. Mount `/dev/vdb` to the `vol2` directory using the `# sudo mount /dev/vdb vol2/` command.



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



```
Openstack_WS_client2 - VMware Workstation
File Edit View VM Tabs Help
Openstack_Mitaka_WS Openstack_WS_client2
Applications Places Terminal Fri 10:24

centos@centos72:~
File Edit View Search Terminal Help

[student@linuxclient ~]$ ssh -i /home/student/Downloads/student.pem centos@10.220.0.13
The authenticity of host '10.220.0.13 (10.220.0.13)' can't be established.
ECDSA key fingerprint is 6c:87:e7:a4:d5:89:e5:49:3f:a2:75:95:4b:46:9d:89.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.220.0.13' (ECDSA) to the list of known hosts.
[centos@centos72 ~]$ sudo mkdir vol2
[centos@centos72 ~]$ sudo fdisk -l

Disk /dev/vda: 10.7 GB, 10737418240 bytes, 20971520 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000af122

   Device Boot      Start         End      Blocks   Id  System
   /dev/vda1  *        2048     20964824     10481388+  83  Linux

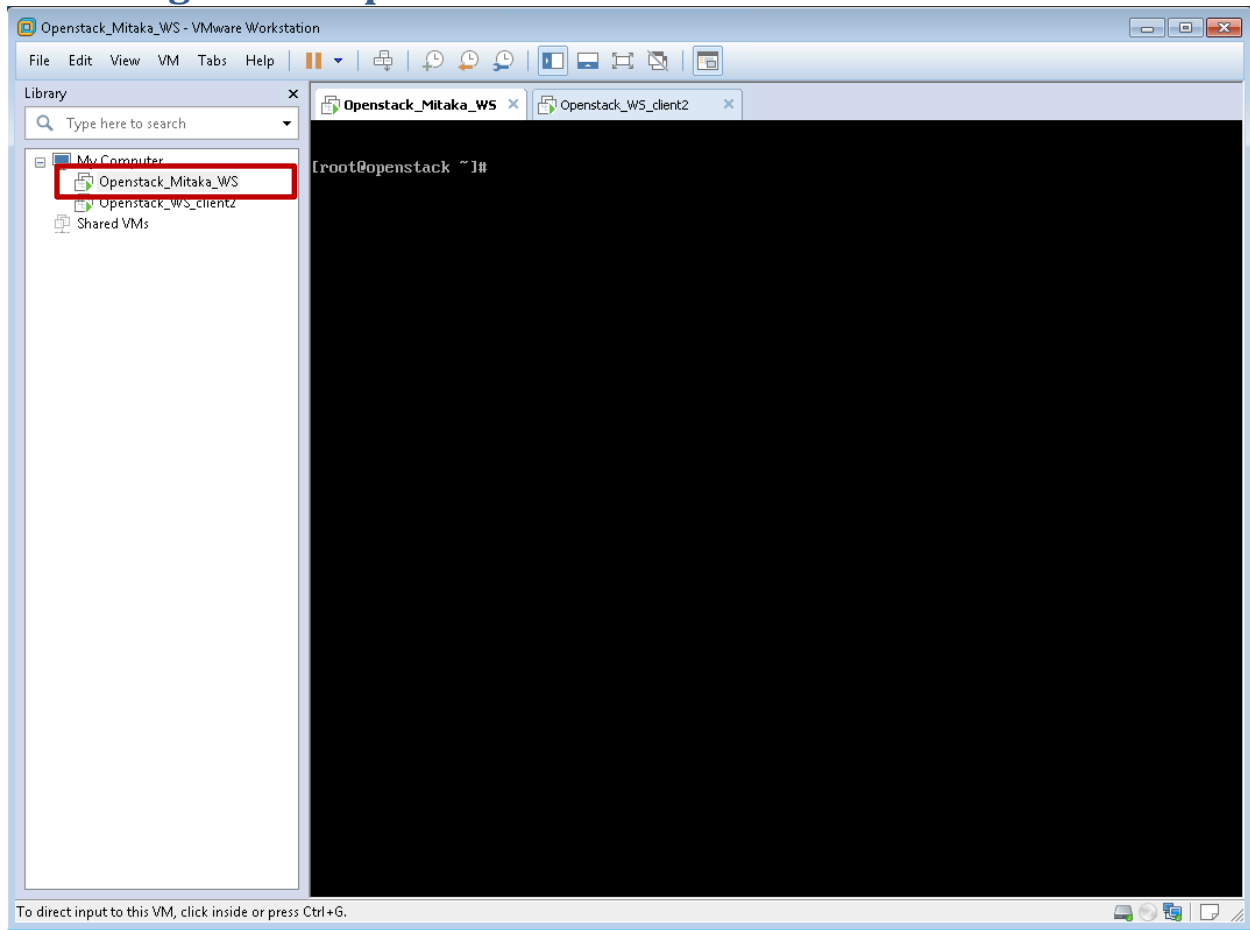
Disk /dev/vdb: 1073 MB, 1073741824 bytes, 2097152 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[centos@centos72 ~]$ sudo mount /dev/vdb vol2/
[centos@centos72 ~]$ ls
vol2
[centos@centos72 ~]$ ls vol2
lost+found test.txt
[centos@centos72 ~]$ cat vol2/test.txt
This is data in the attached volume.
[centos@centos72 ~]$
```

13. Using the `ls` and `cat` commands, verify that the data that was created on `vol1`, while attached to the CentOS 7 instance, is still present. The file system was retained and the only steps required were to create a directory and mount the `/dev/vdb` volume to that directory. Do not detach or unmount the volume, the grade script will look for the attached volume. This completes the Module 9 labs.

Continue to the grade script.

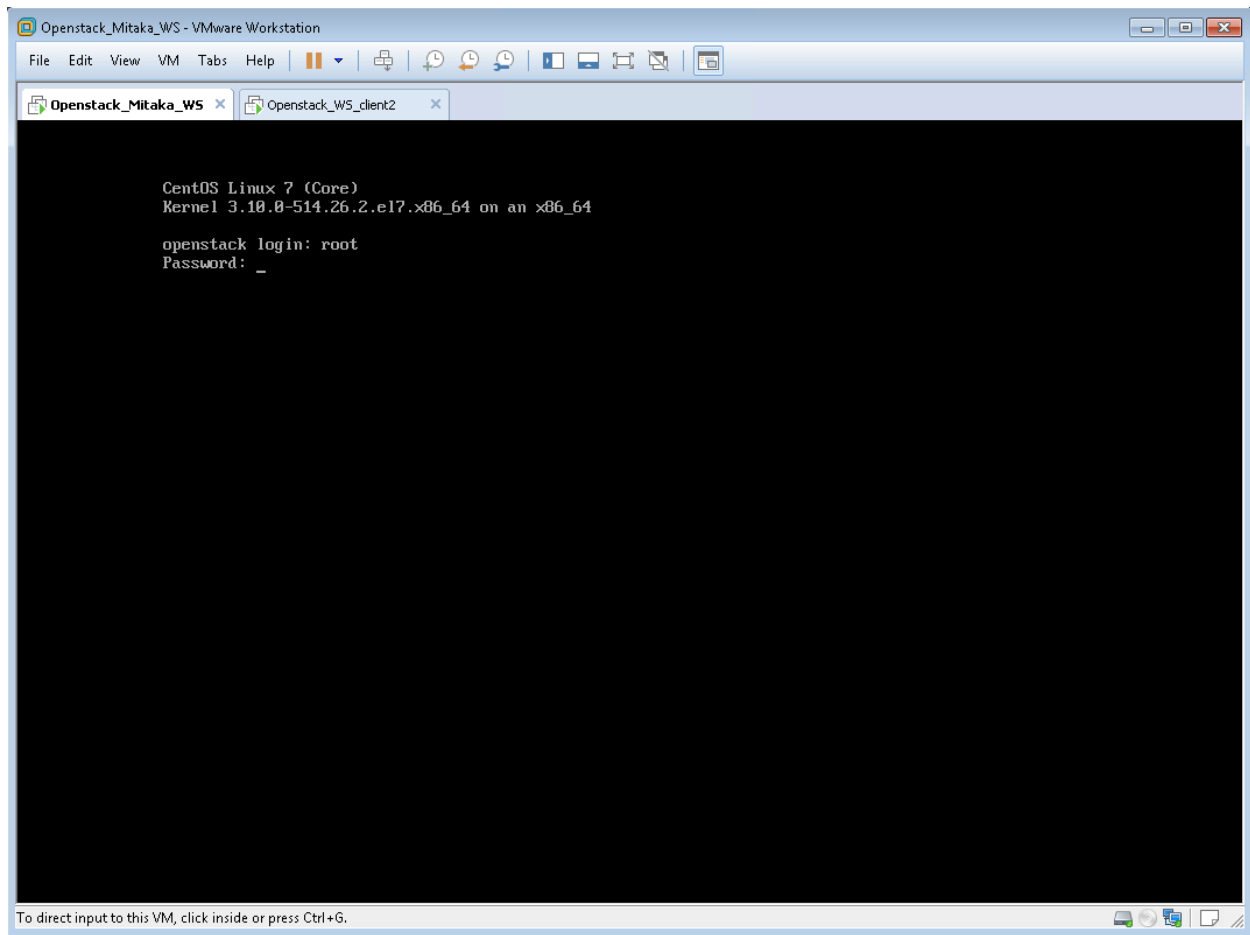
Run the grade script



1. Return to Workstation and **Click on OpenStack_WS VM**

Note: The OpenStack_WS console may still be open on your desktop from when you ran the setup script

Module 9: Launch a CentOS 7 instance with a customization script and manage volumes

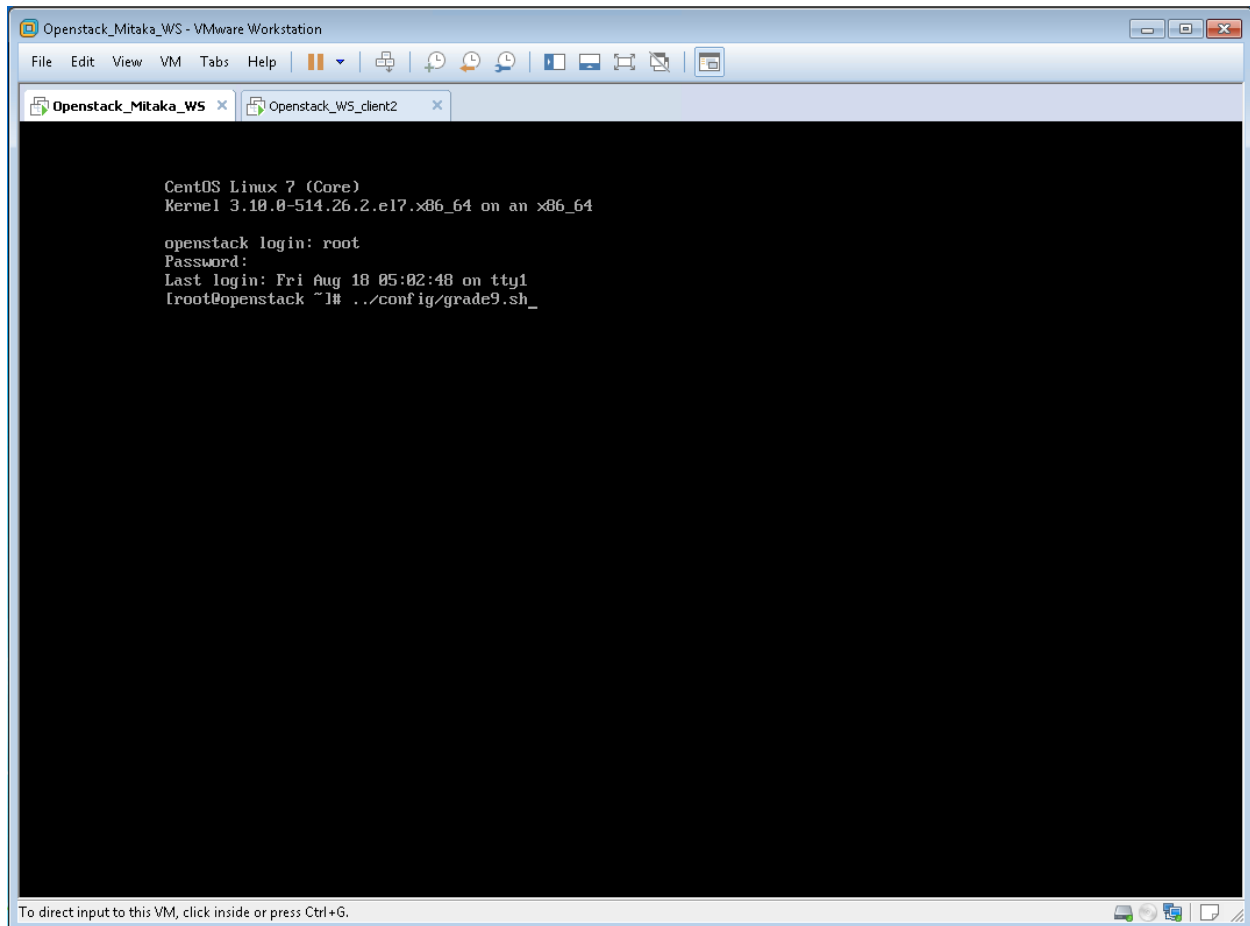


2. Log in as **root** with the Password: **P@ssword**

Note: The password is NOT visible as you type it



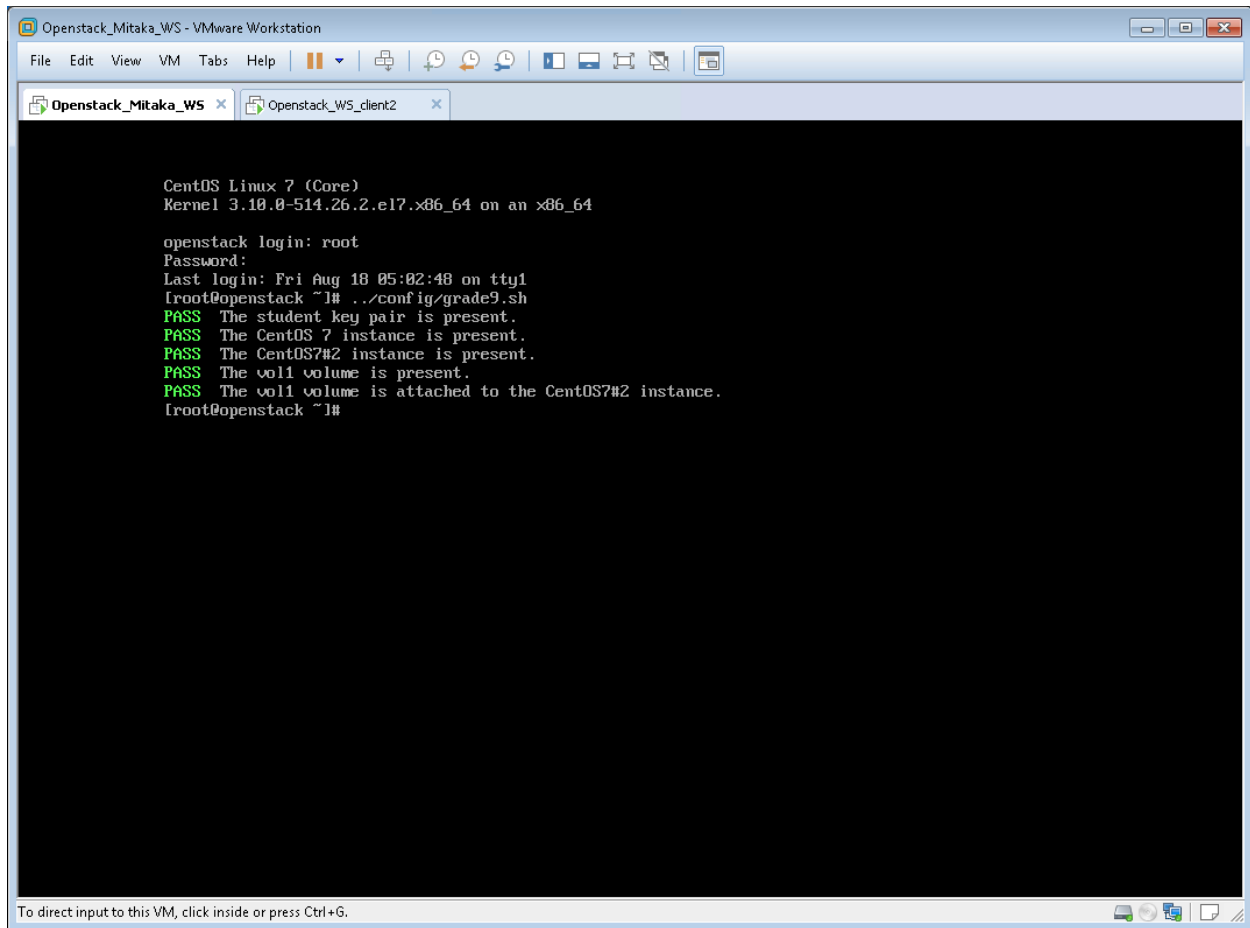
Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



3. Enter the command; `../config/grade9.sh` and **press Enter**



Module 9: Launch a CentOS 7 instance with a customization script and manage volumes



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

openstack login: root
Password:
Last login: Fri Aug 18 05:02:48 on tty1
[root@openstack ~]# ./config/grade9.sh
PASS The student key pair is present.
PASS The CentOS 7 instance is present.
PASS The CentOS7#2 instance is present.
PASS The vol1 volume is present.
PASS The vol1 volume is attached to the CentOS7#2 instance.
[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 9, continue to conclusion



Conclusion:

You have successfully assisted the customer in creating a CentOS instance with a customization script to enable the apache web service and demonstrated how to verify that the service is active. Your next field visit to XYZ Company will be to show the user how to create, attach, and detach a volume on several CentOS 7 instances.

