UNIVERSITY OF PETROLIUM AND ENERGY STUDIES

P.O Bidholi, Via-Prem Nagar, Dehradun-248007

LAB REPORT

Introduction to Virtalization And Cloud Computing [IVCC]

Session-2021-22

***Submitted By**: Hitendra Sisodia*

***Roll No:** R2142210352*

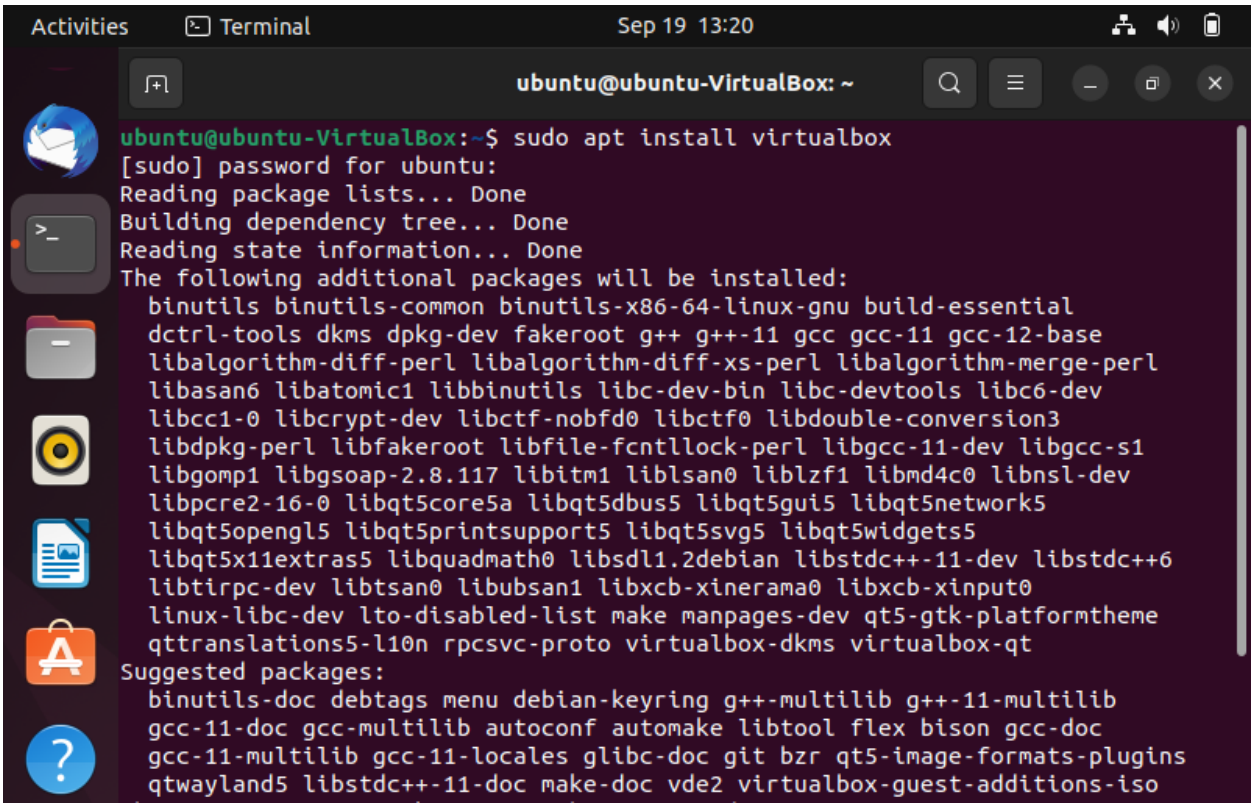
***Sap Id:** 500091882*

***Guided By:** Dr. Anurag Jain*

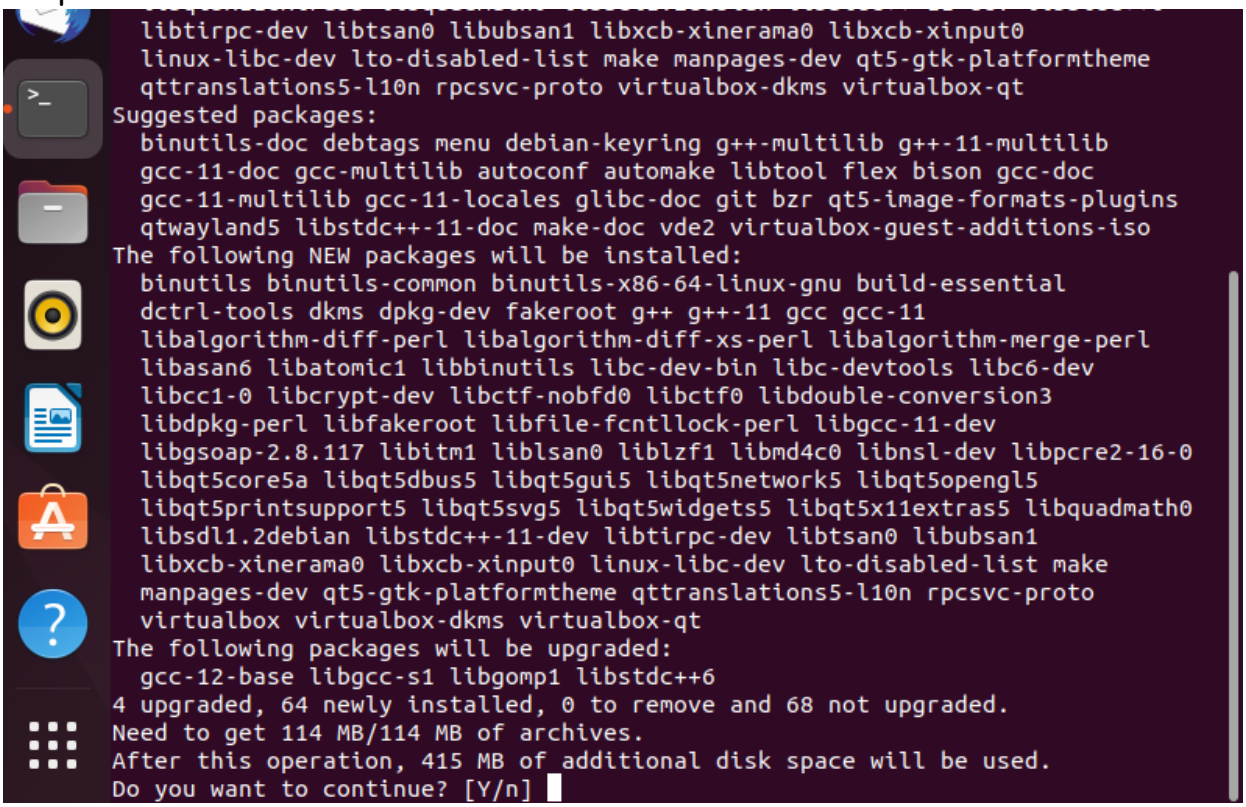
Name: Hitendra Sisodia
Sap id: 500091910

Lab 6: Installing Virt-Manager And Installing VM

Step1: sudo apt install virtulabox: for installing virtualbox setup.



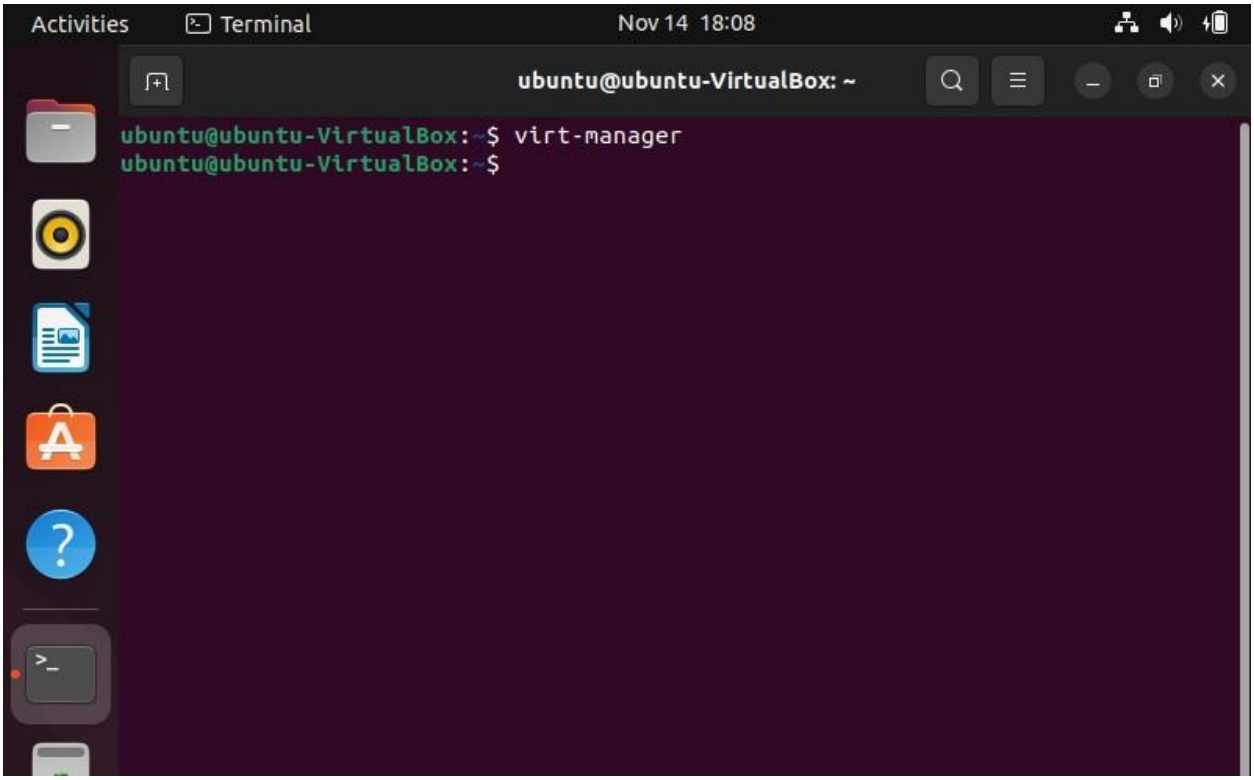
Step2: Press Y for continue.



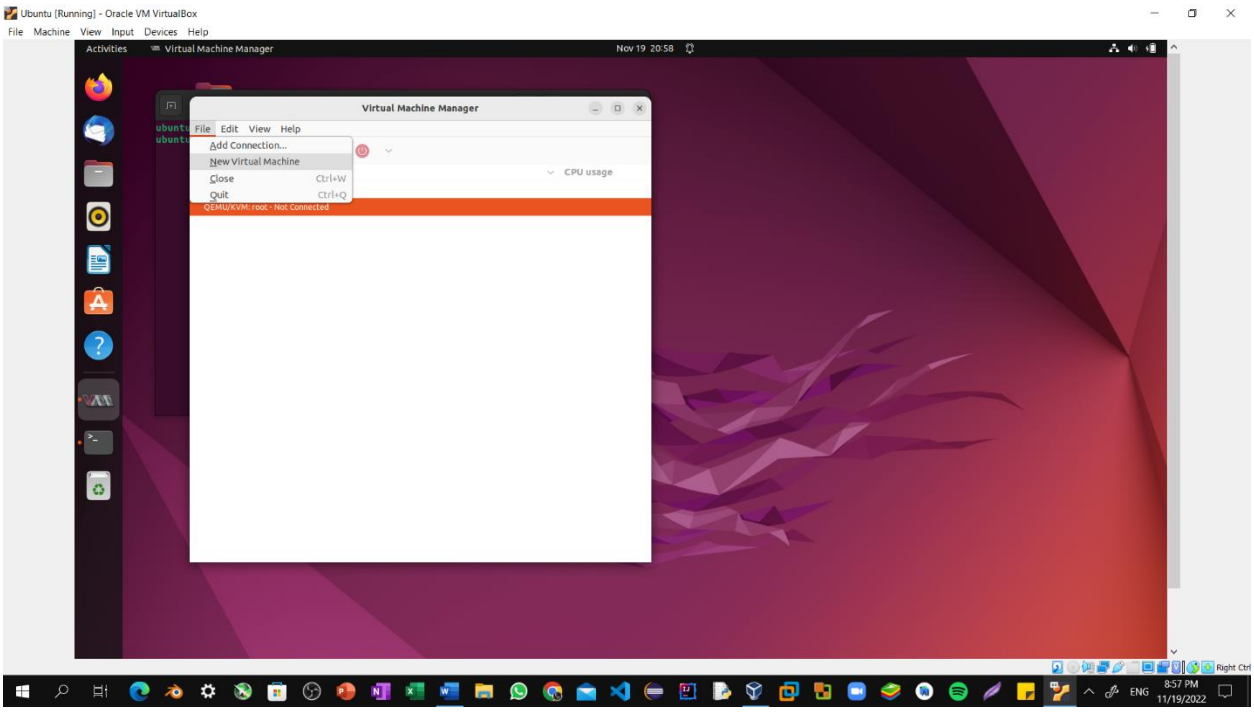
Name: Hitendra Sisodia
Sap id: 500091910

Lab 6: Installing Virt-Manager And Installing VM

Step3: virt-manager: for launching QEMU Interface form terminal.

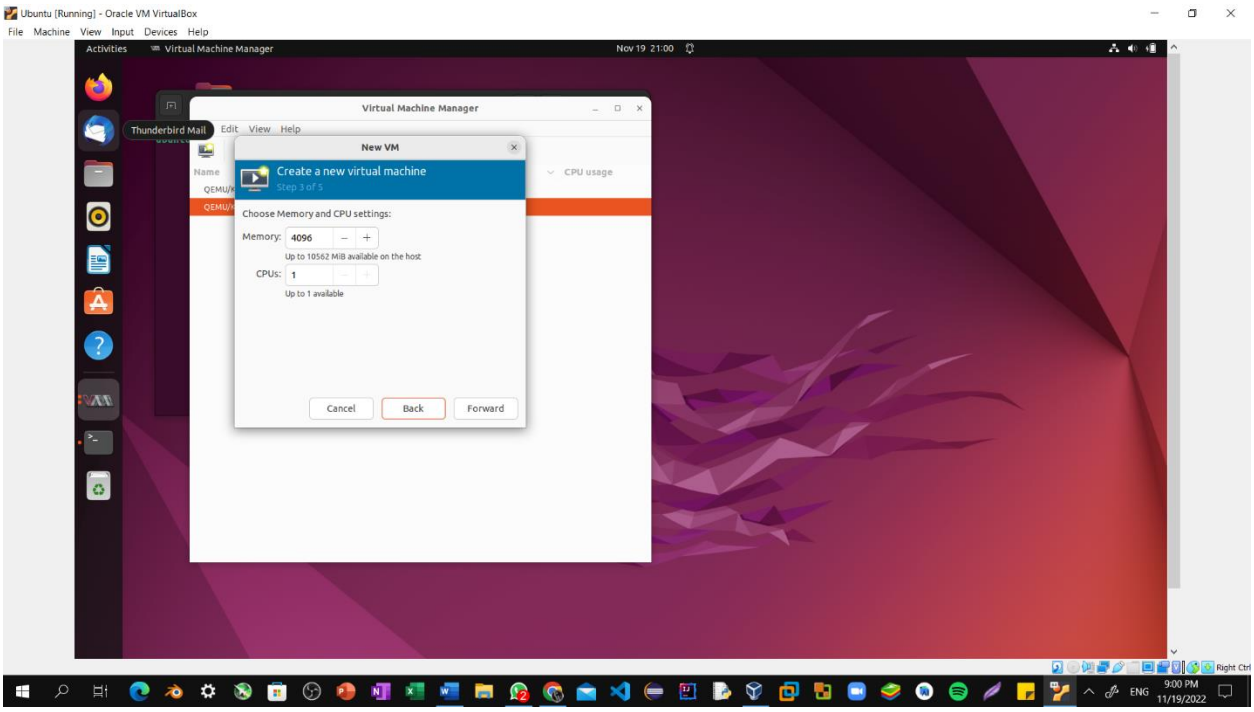


Step4: Click on New Button and Select name of Virtual Operating System i.e., Windows 7.

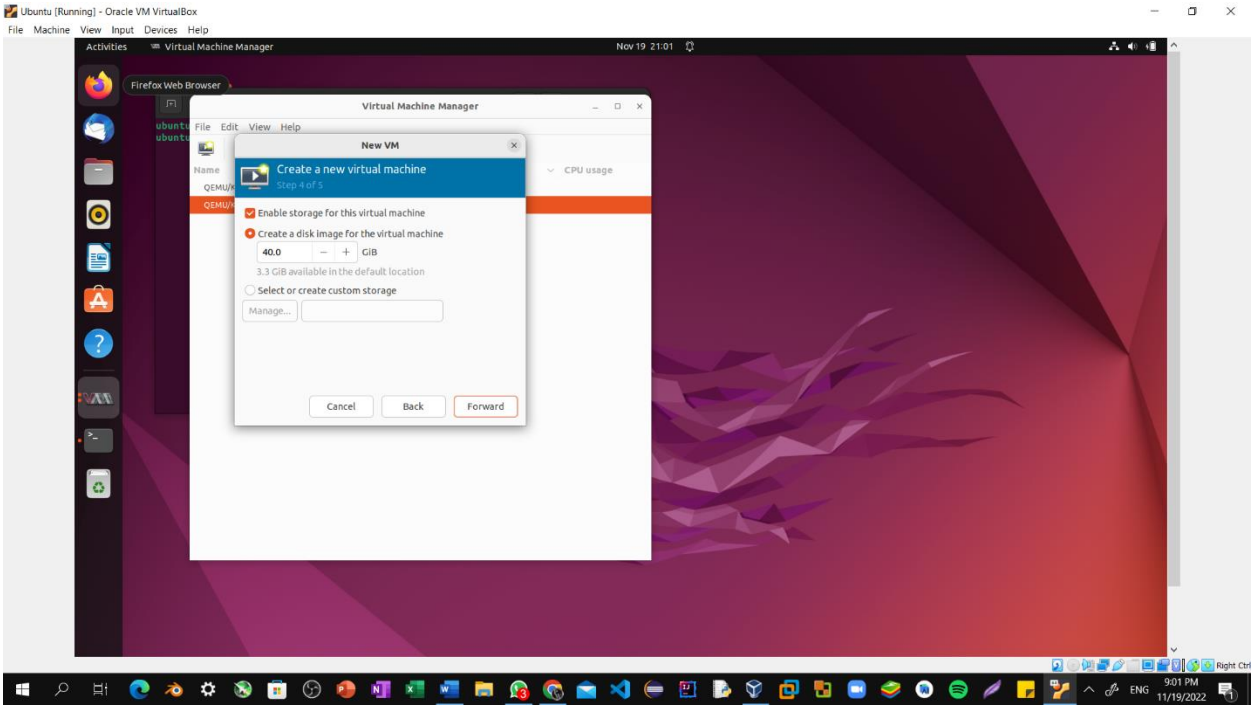


Lab 6: Installing Virt-Manager And Installing VM

Step5: Now Select Memory Size depending upon the Usability.



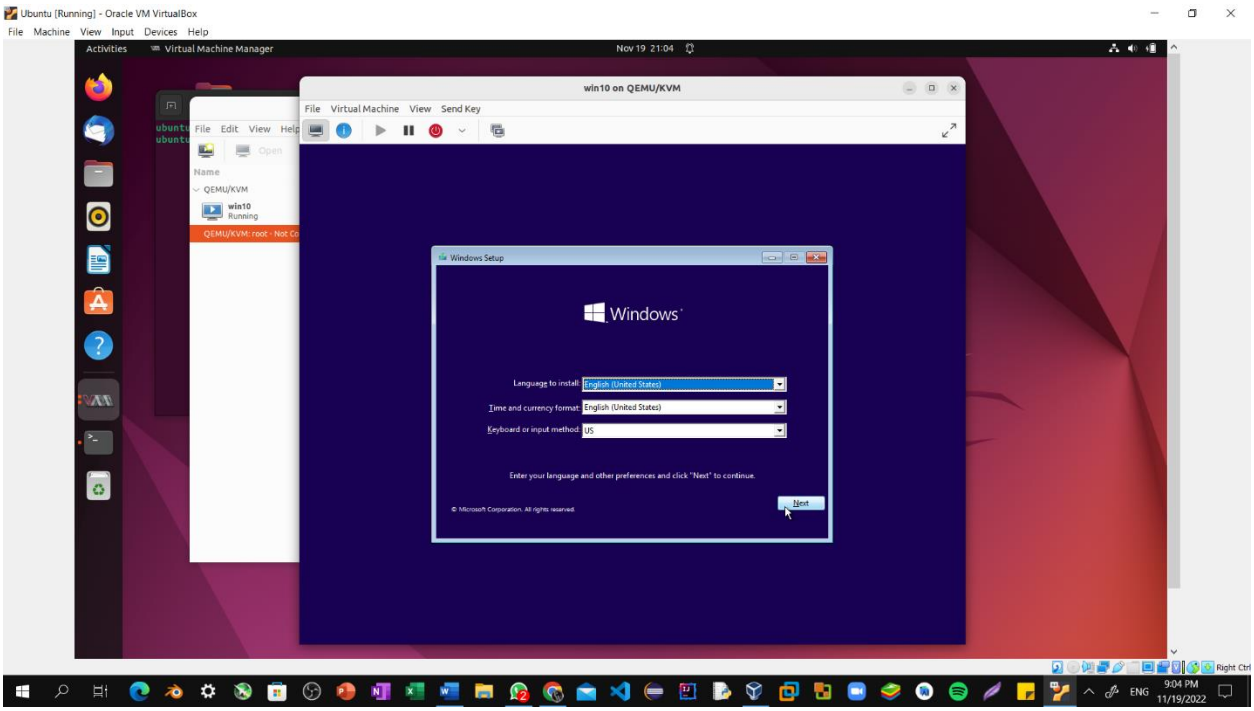
Step6: Select create a Virtual Hard Disk and click next.



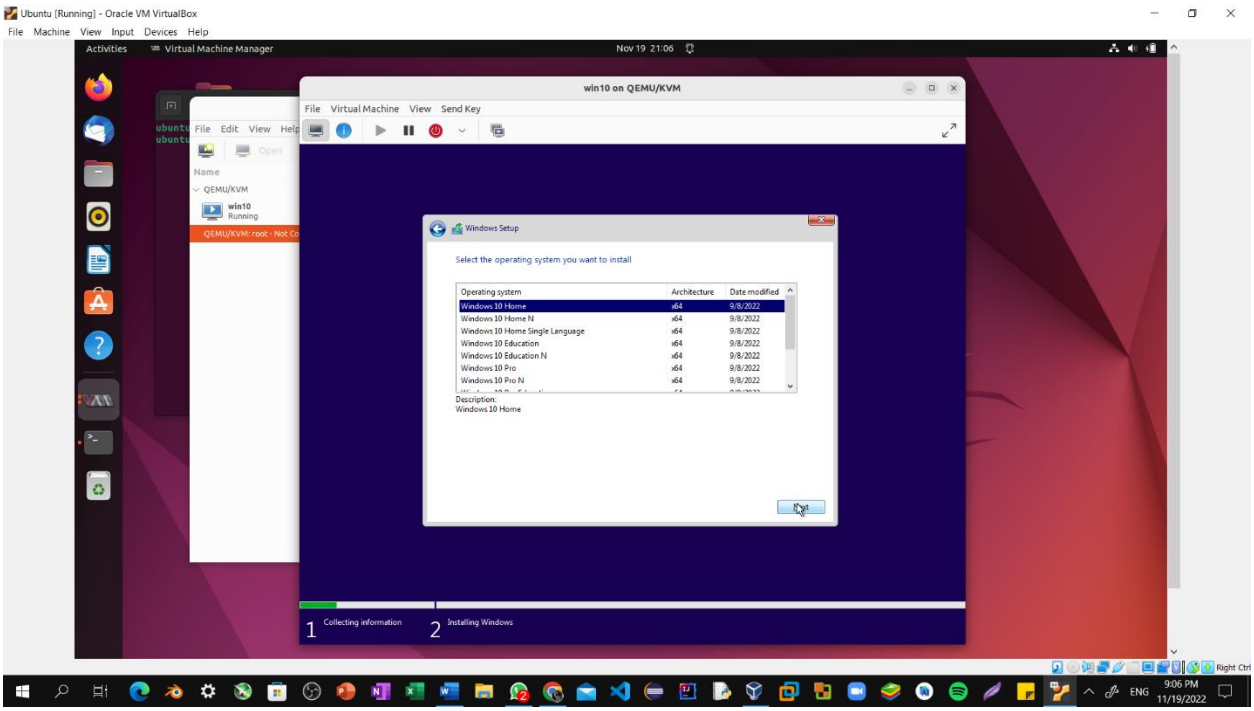
Name: Hitendra Sisodia
Sap id: 500091910

Lab 6: Installing Virt-Manager And Installing VM

Step7: Then Select Install Windows10 and then on next.



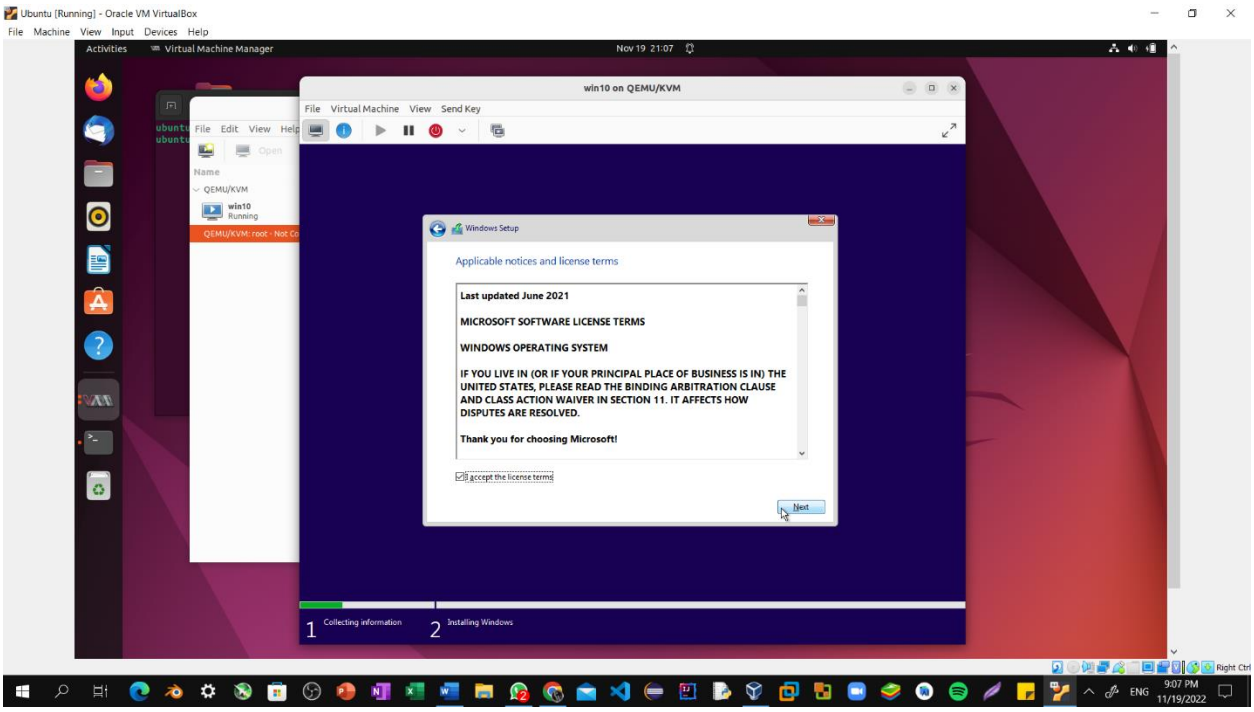
Step8: Select Windows 10 Home and proceed further by clicking on next.



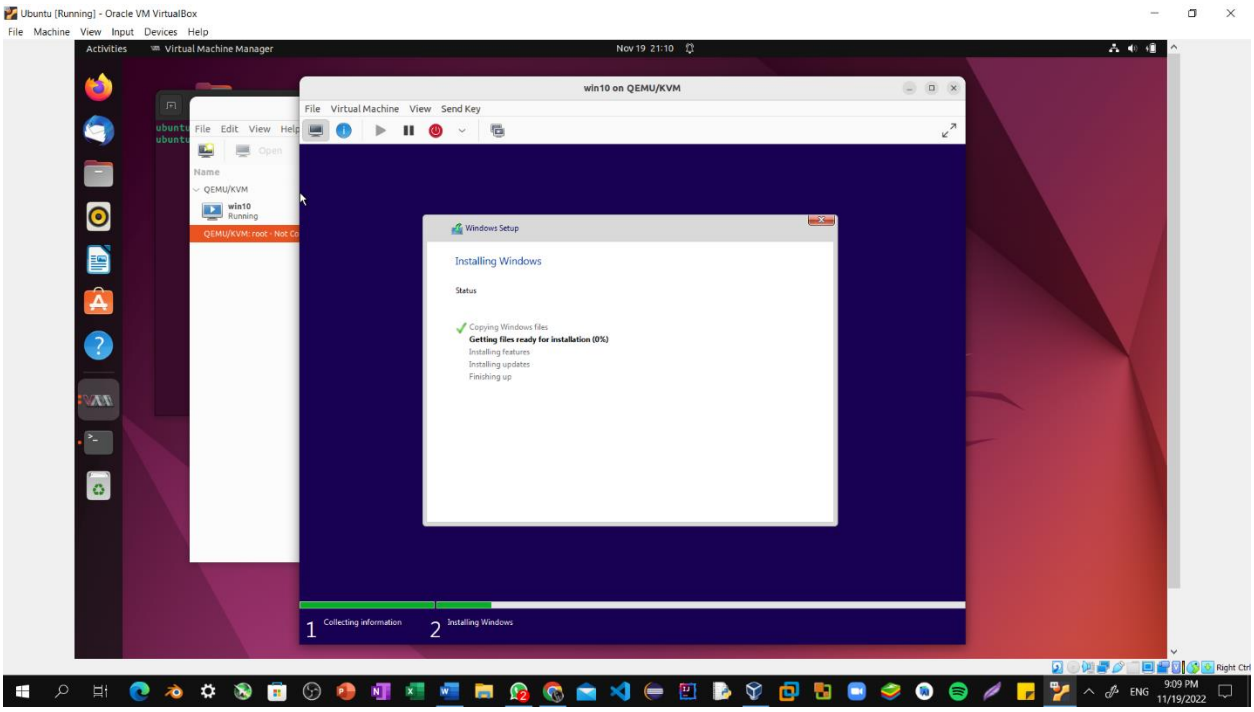
Name: Hitendra Sisodia
Sap id: 500091910

Lab 6: Installing Virt-Manager And Installing VM

Step9: Check I accept the license terms and click on next.

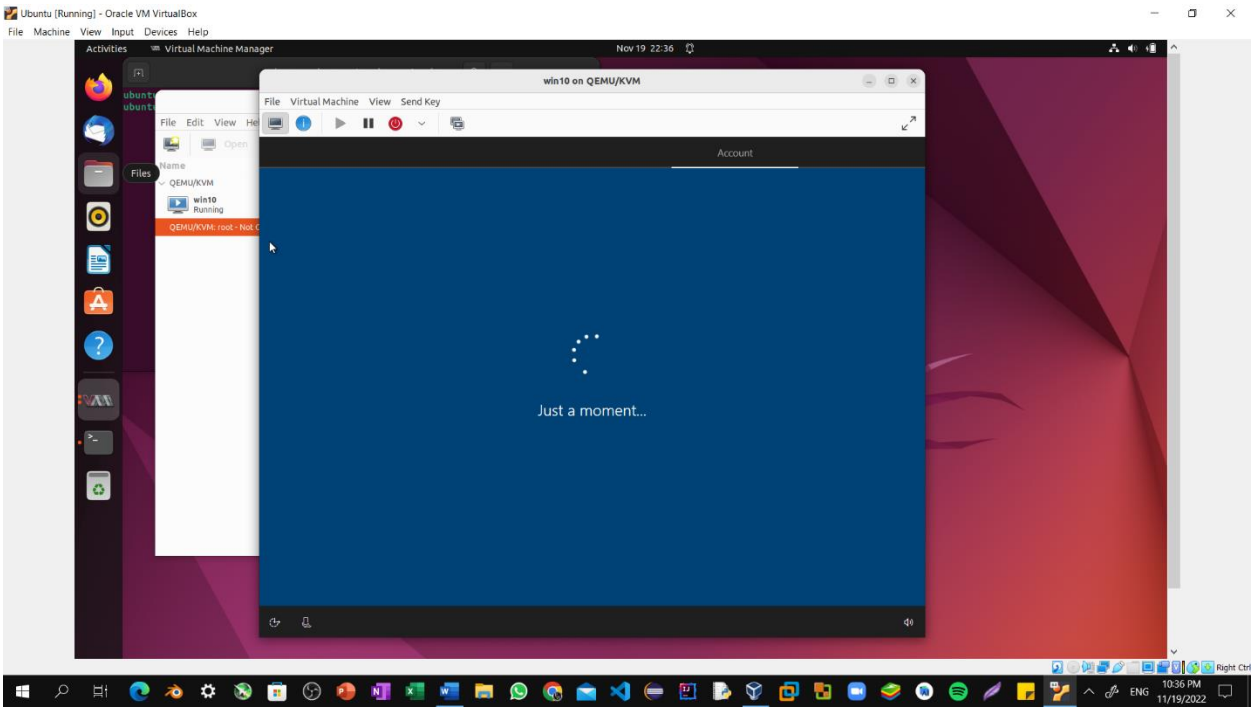


Step10: Getting Files ready for installation.

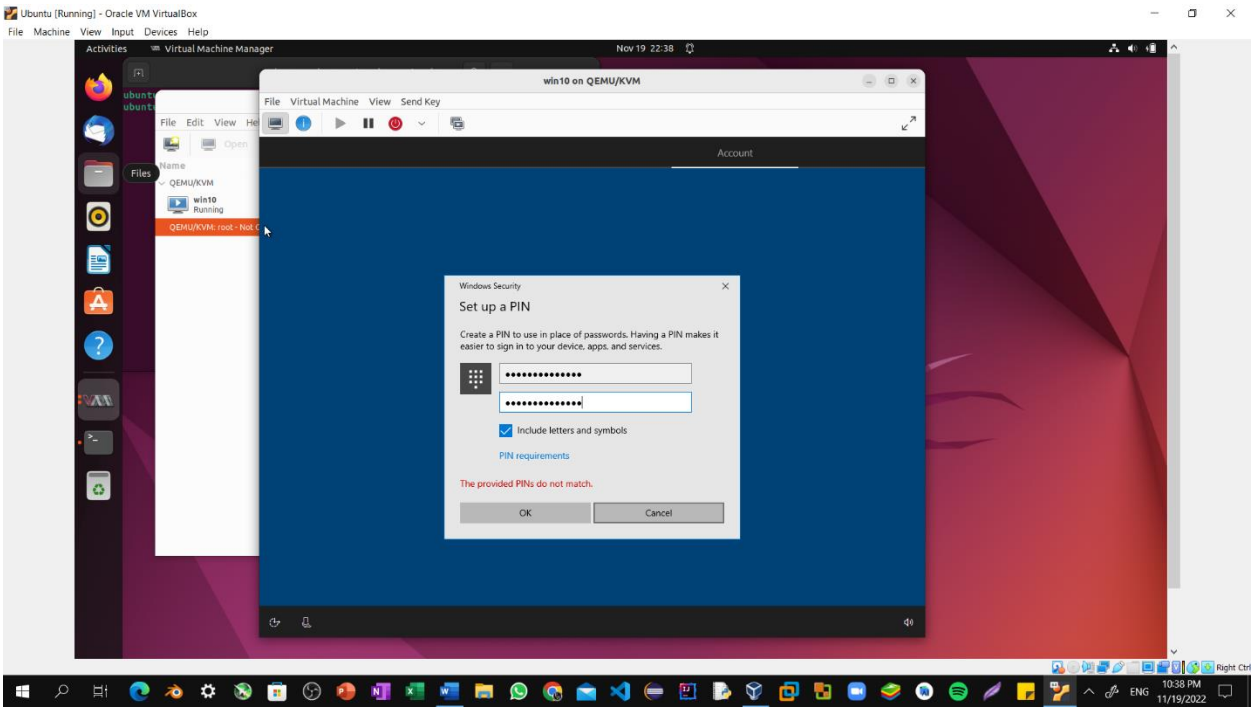


Lab 6: Installing Virt-Manager And Installing VM

Step10: Wait For installation.

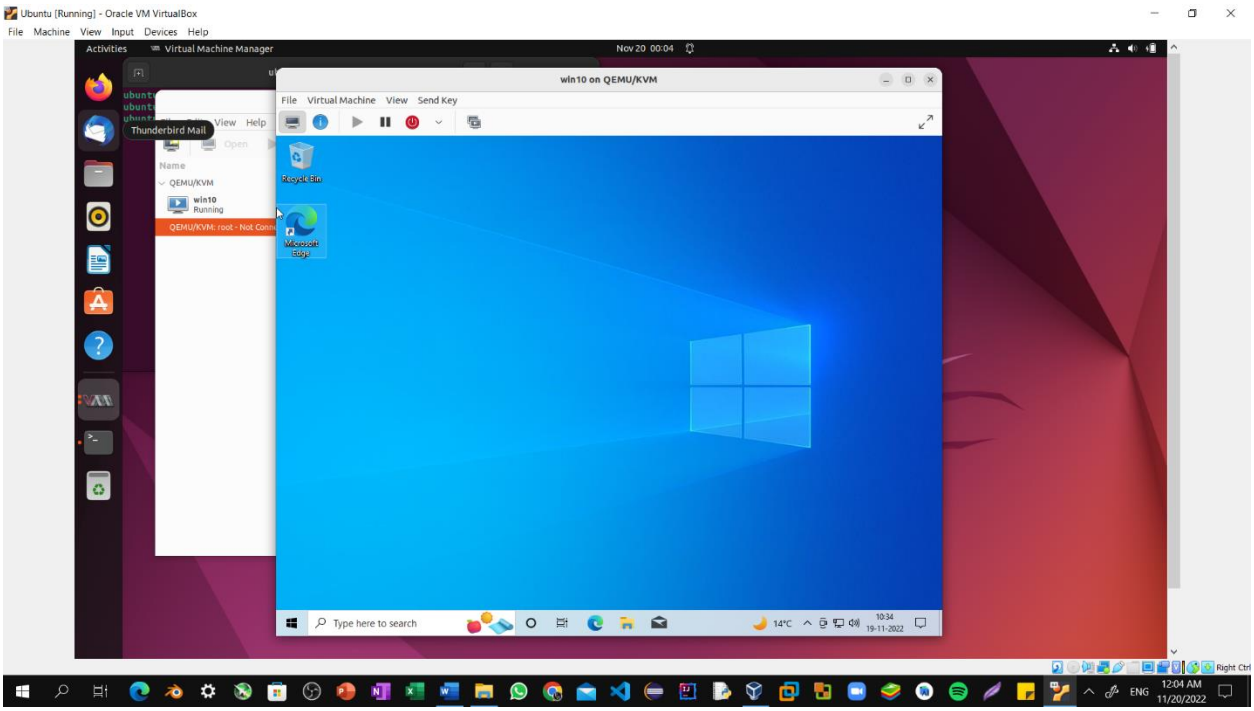


Step11: Setup pin for Windows workspace.



Lab 6: Installing Virt-Manager And Installing VM

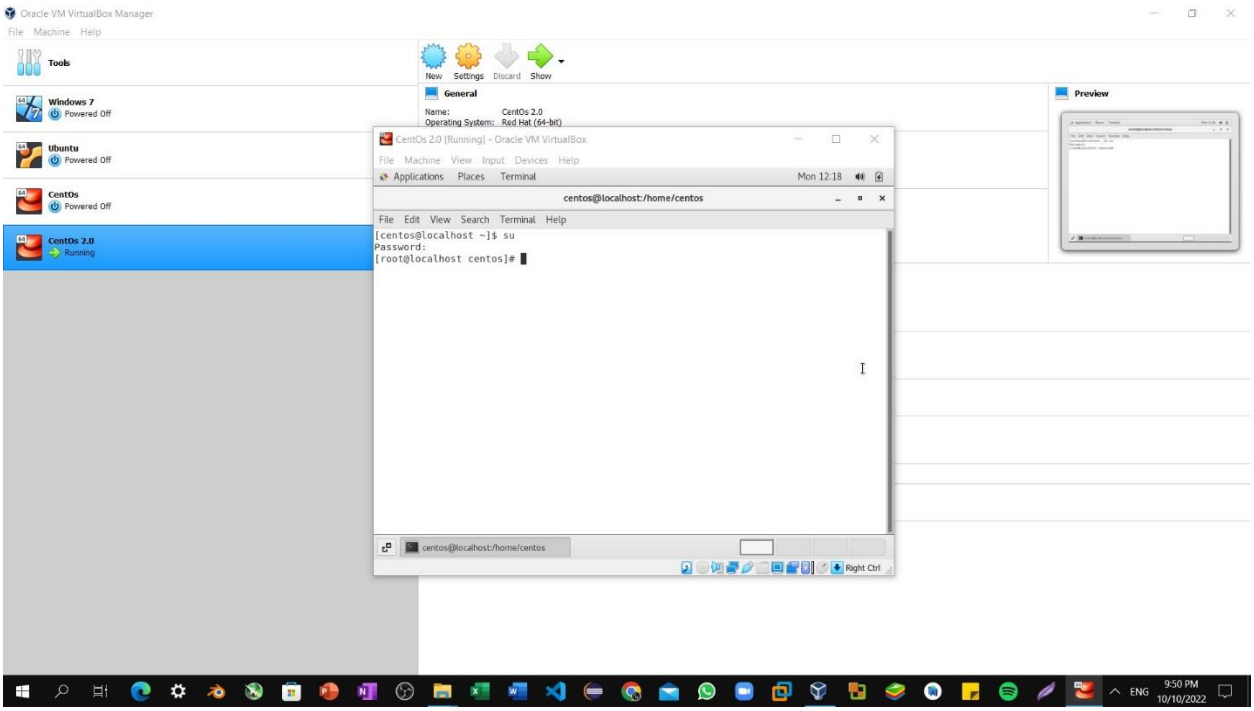
Step12: Windows 10 Workspace.



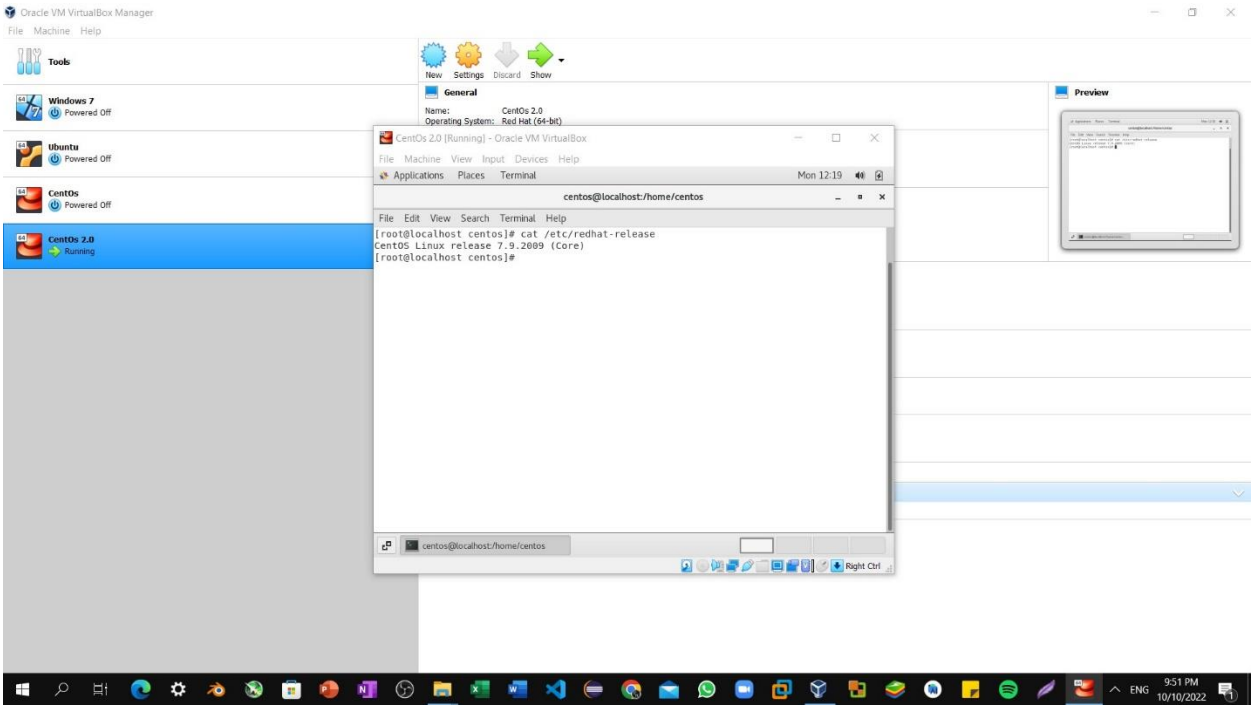
Name: Hitendra Sisodia
Sap id: 500091910

Lab 7: Installing QEMU & KVM Through Commands

Step1: Enter in the root mode using su command

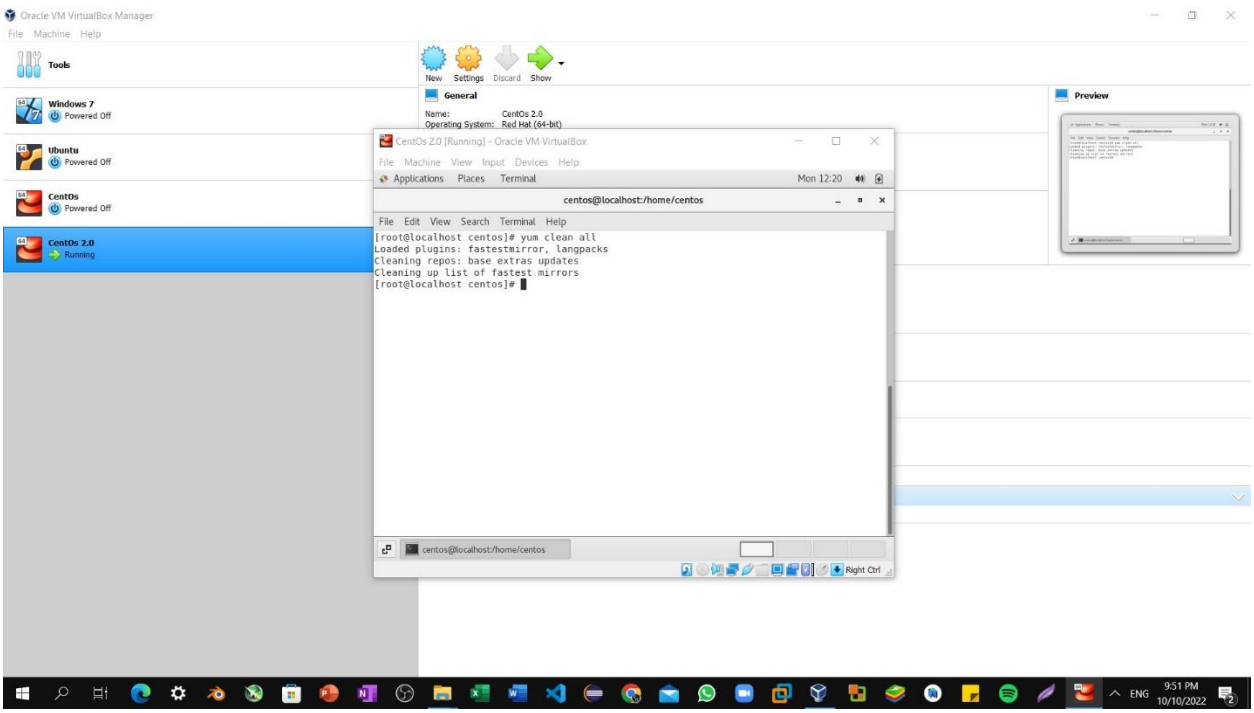


Step2: cat /etc/redhat-release: Enter the following Linux command to display the current operating system information and its version.

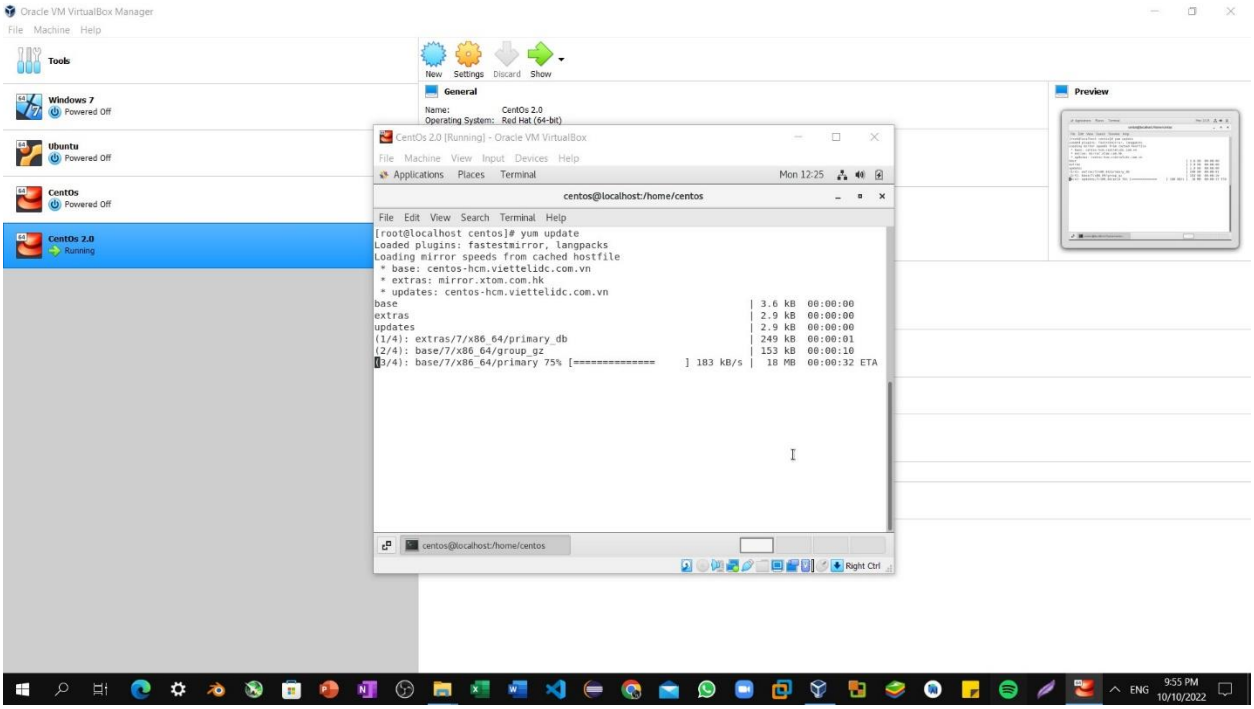


Lab 7: Installing QEMU & KVM Through Commands

Step3: yum clean all: Enter the following commands in order for the operating system to be cleaned and updated.

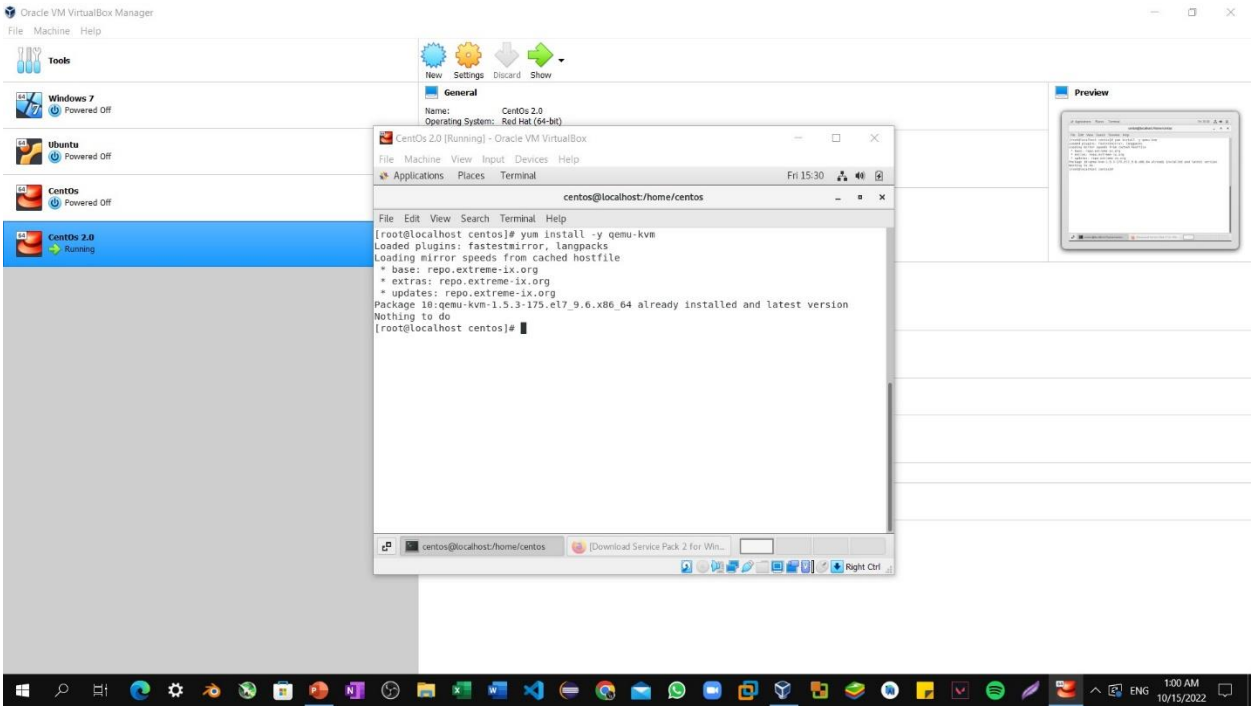


Step4: yum update: Enter the following commands in order for the operating system to be cleaned and updated. Then reboot your system.

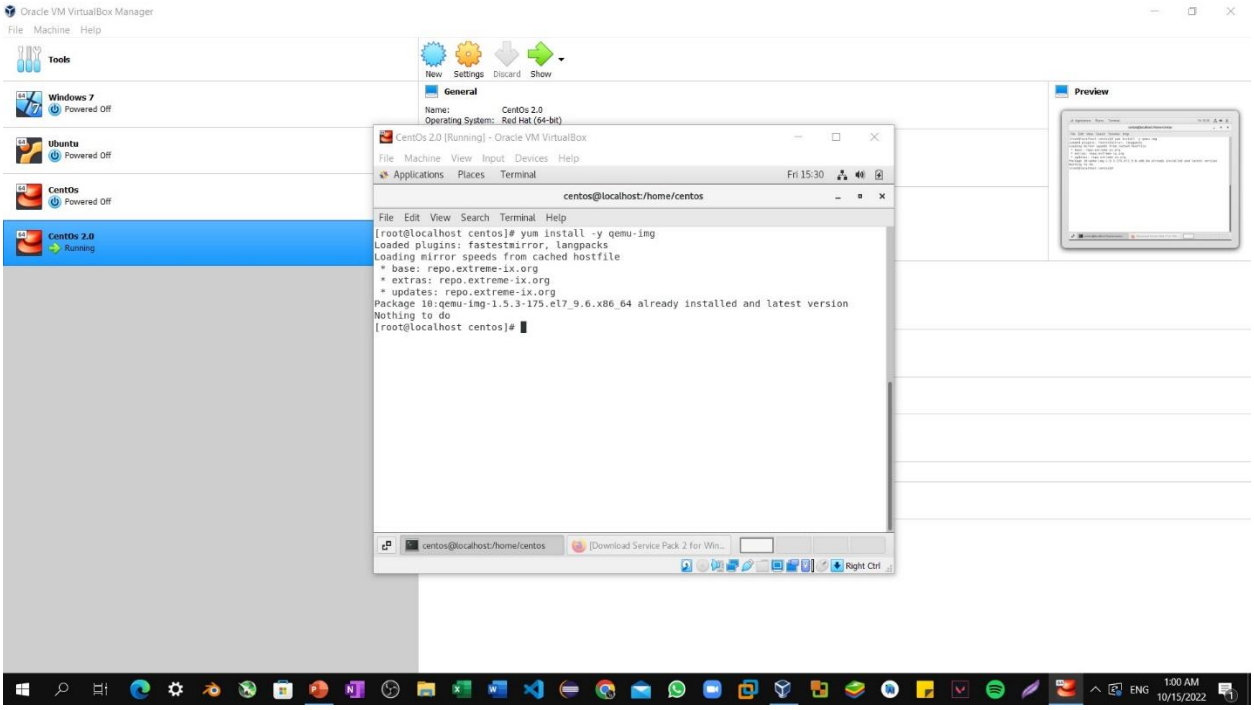


Lab 7: Installing QEMU & KVM Through Commands

Step5: yum install -y qemu-kvm: This package provides the user-level KVM emulator and facilitates communication between hosts and guest virtual machines.

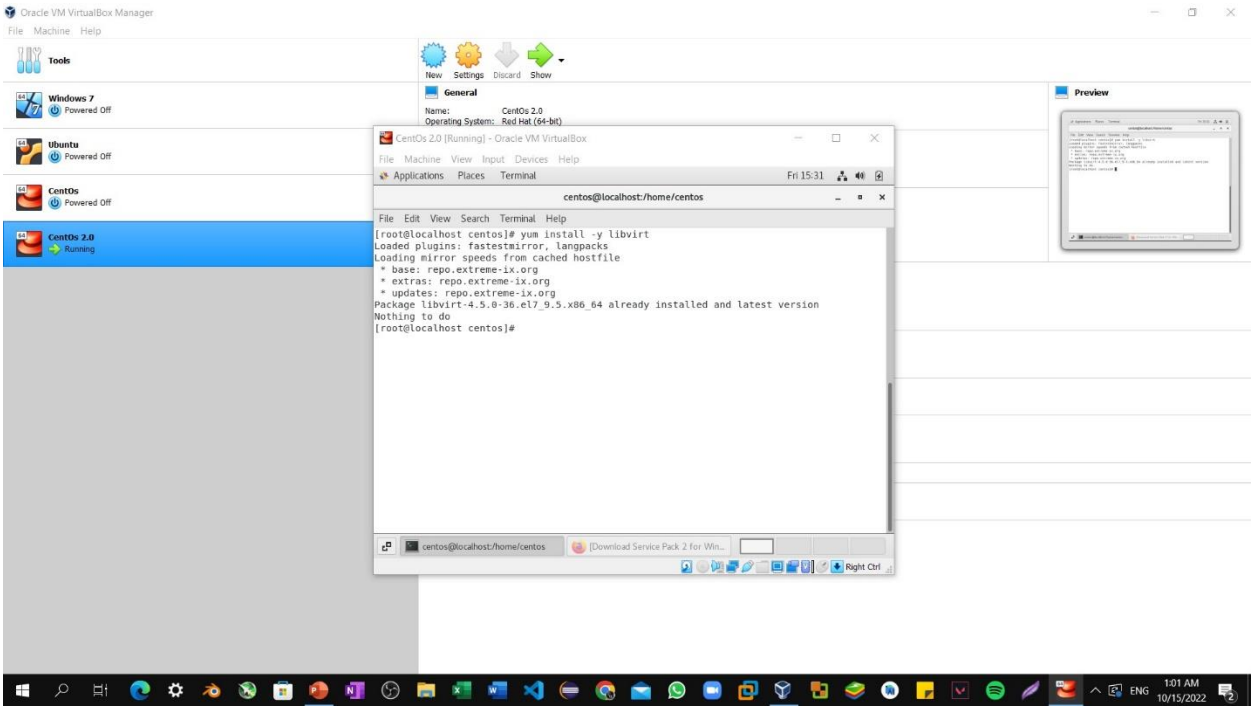


Step6: yum install -y qemu-img: This package provides disk management for guest virtual machines. The qemu-img package is installed as a dependency of the qemu-kvm package.

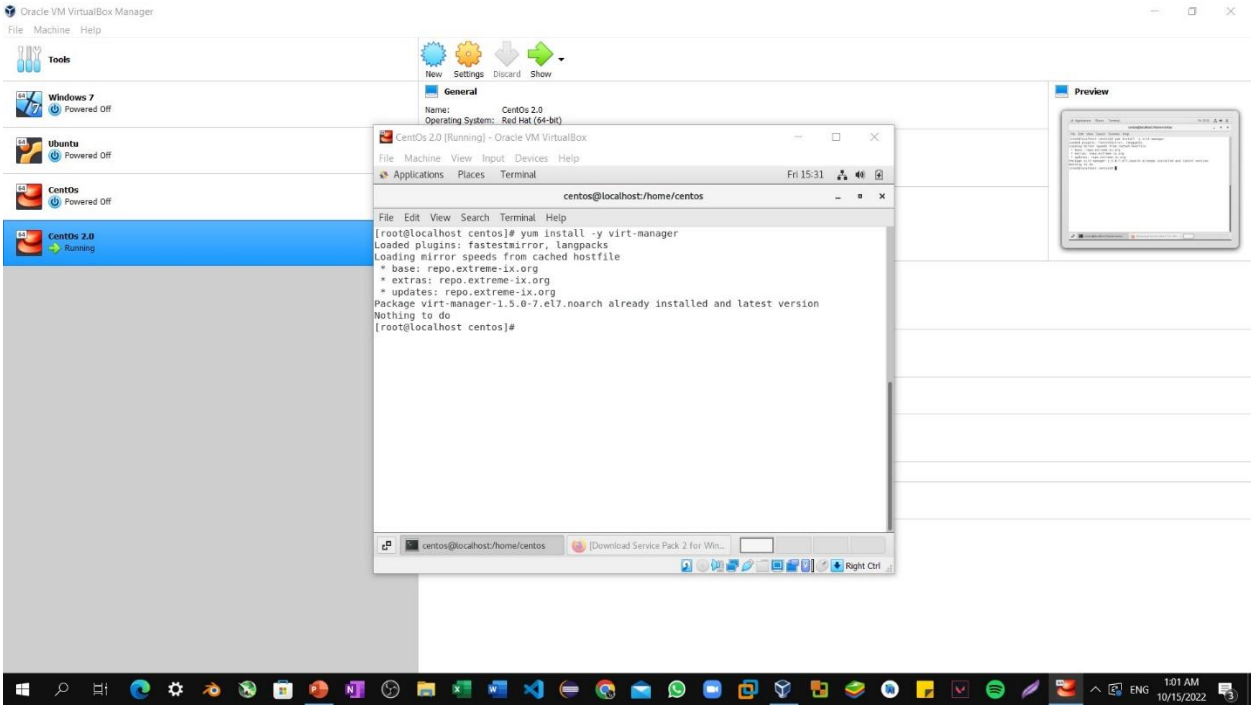


Lab 7: Installing QEMU & KVM Through Commands

Step7: yum install -y libvirt: This package provides the server and host-side libraries for interacting with hypervisors and host systems.

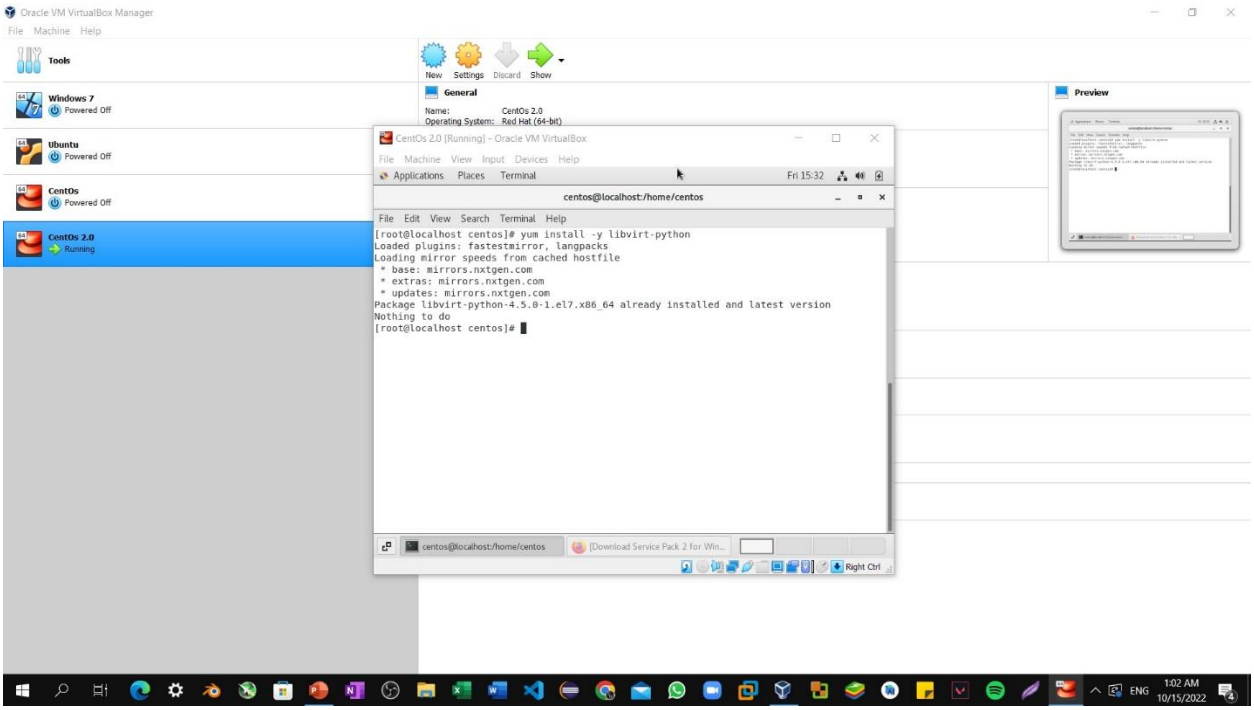


Step8: yum install -y virt-manager: This package provides the virt-manager tool, also known as Virtual Machine Manager.

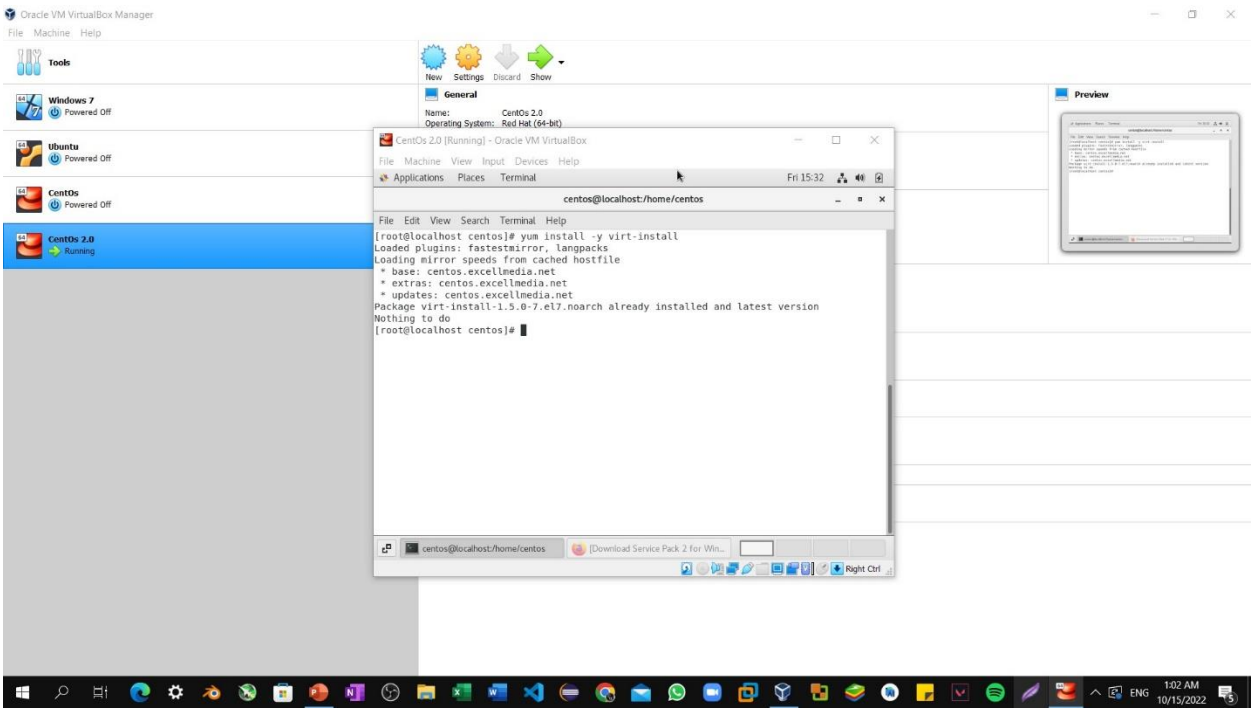


Lab 7: Installing QEMU & KVM Through Commands

Step9: yum install -y libvirt-python: This package contains a module that permits applications written in the Python programming language to use the interface.

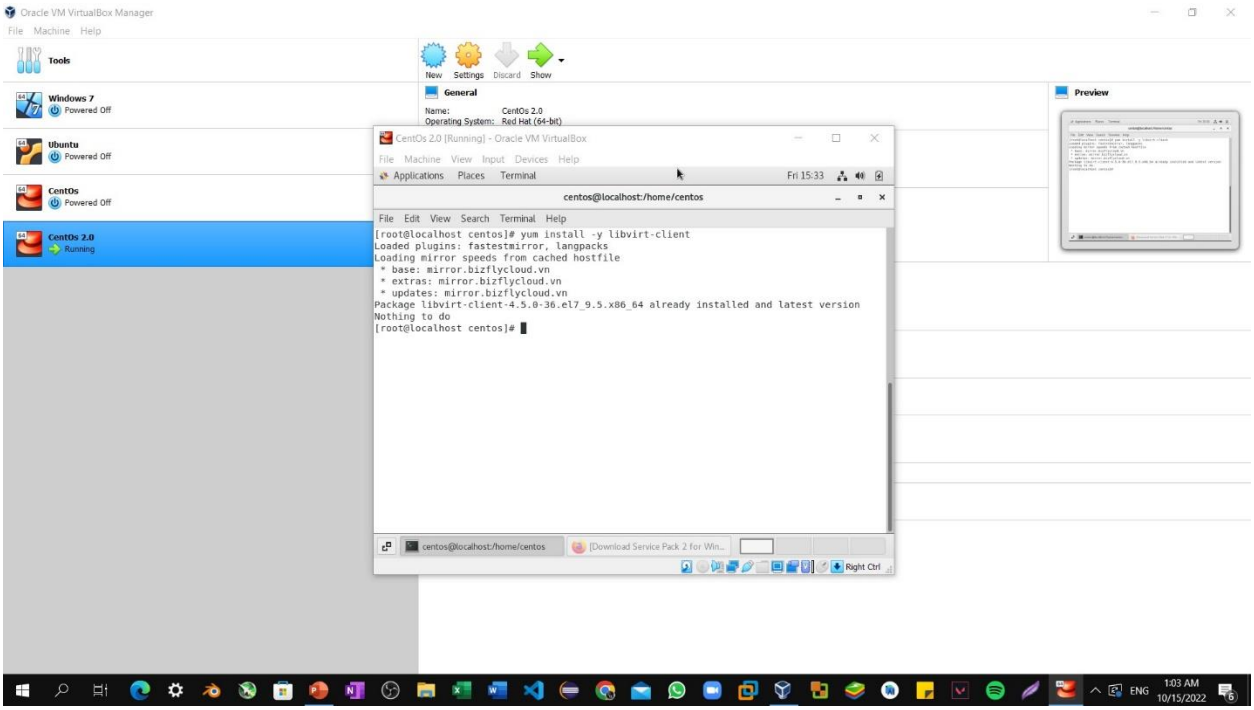


Step10: yum install -y virt-install: This package provides the virt-install command for creating virtual machines from the command line.

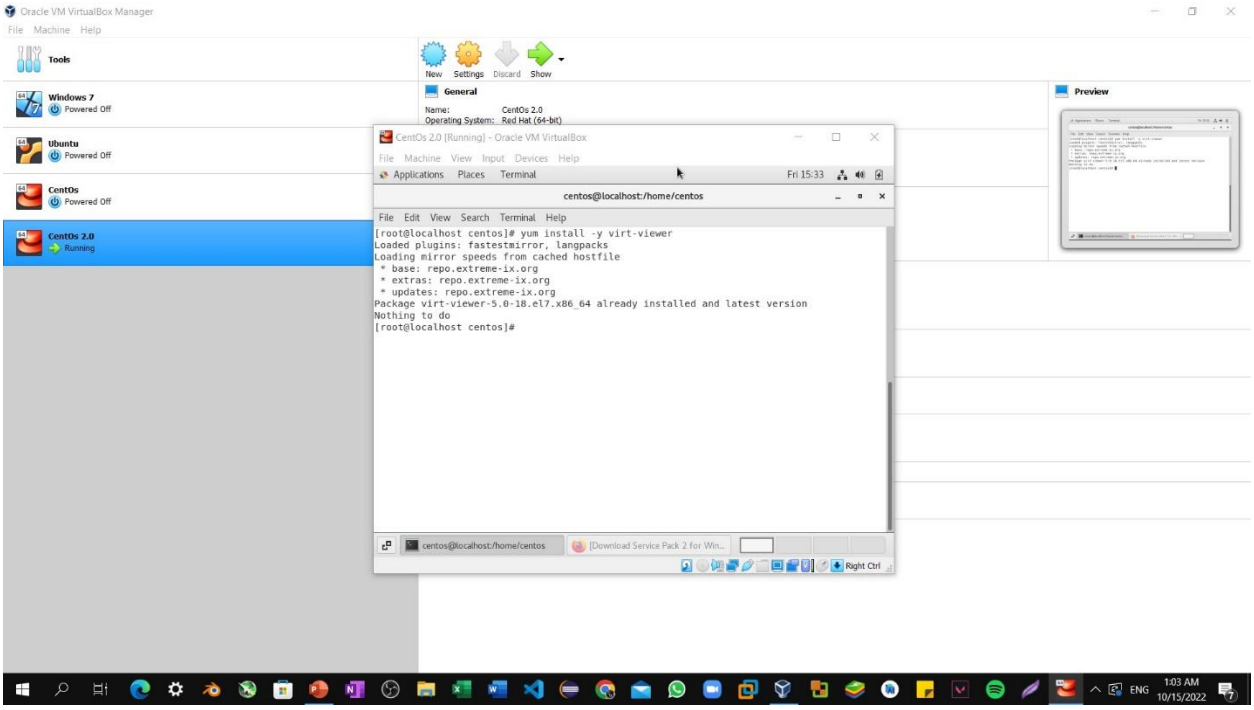


Lab 7: Installing QEMU & KVM Through Commands

Step11: yum install -y libvirt-client: This package provides the client-side APIs and libraries for accessing libvirt servers.

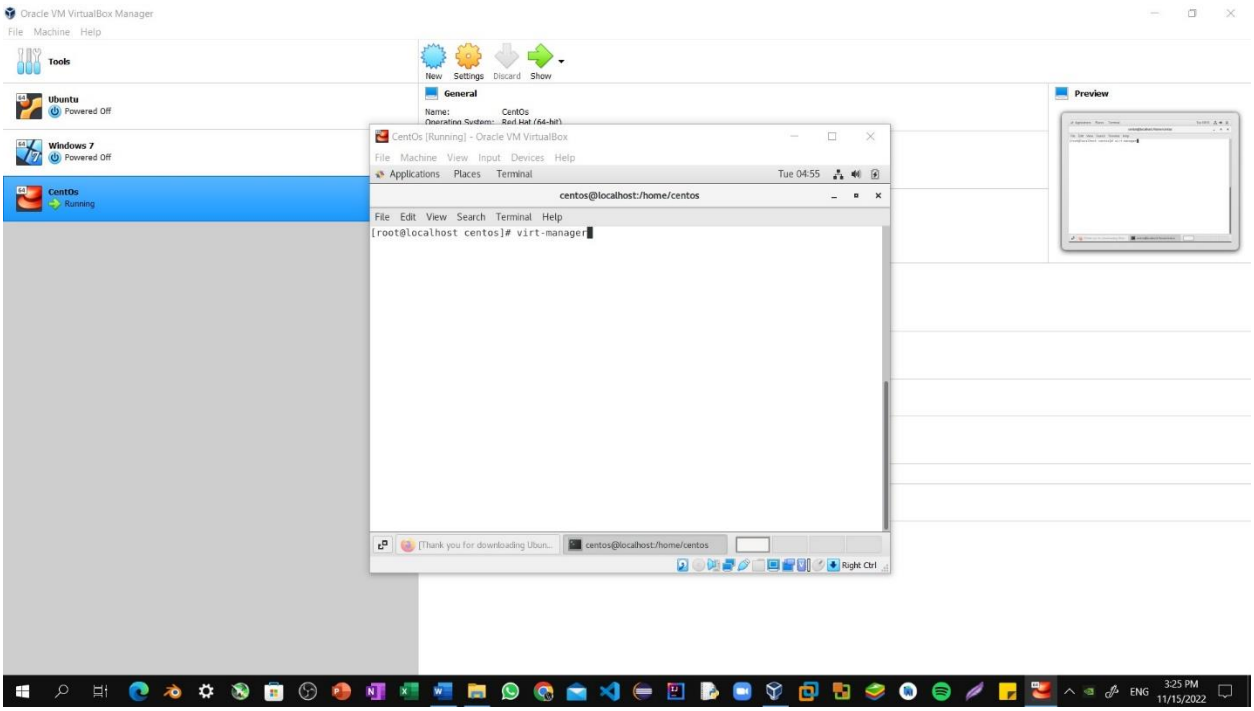


Step12: yum install -y virt-viewer: The virt-viewer package is designed for, Virtual Machine Viewer. Virtual Machine Viewer provides a graphical console client for connecting to virtual machines.

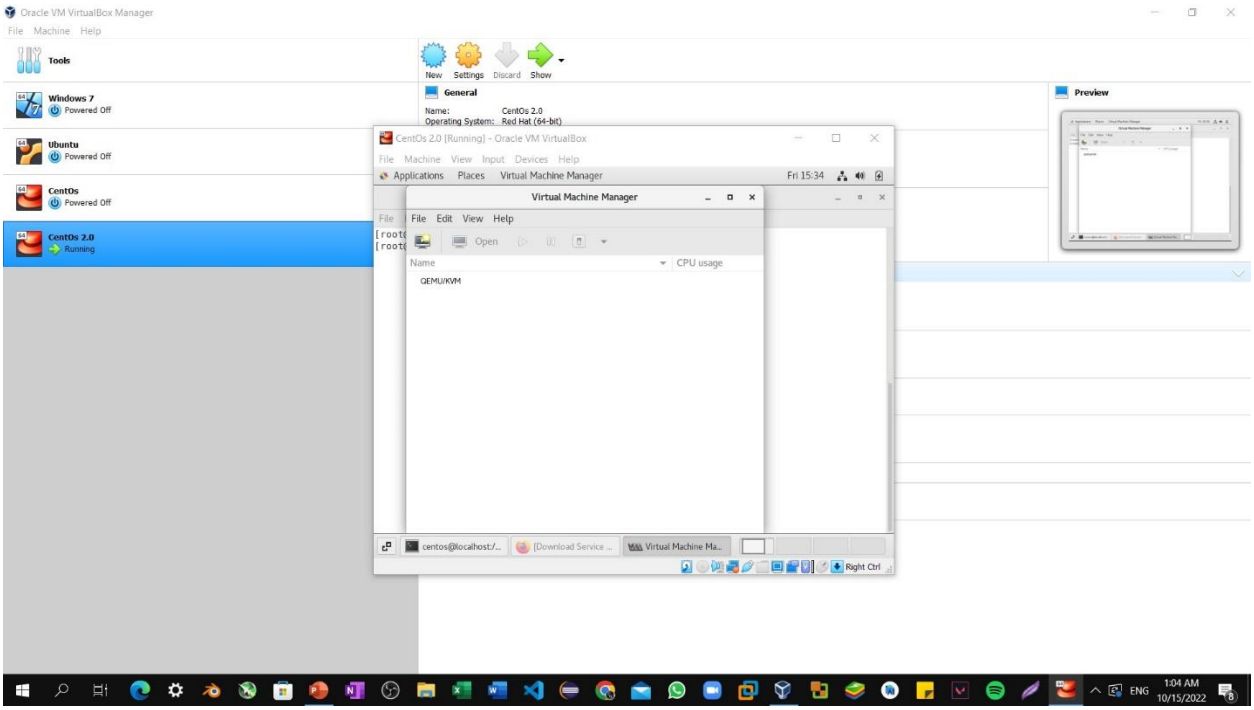


Lab 7: Installing QEMU & KVM Through Commands

Step13: virt-manager: Opening KVM Interface.



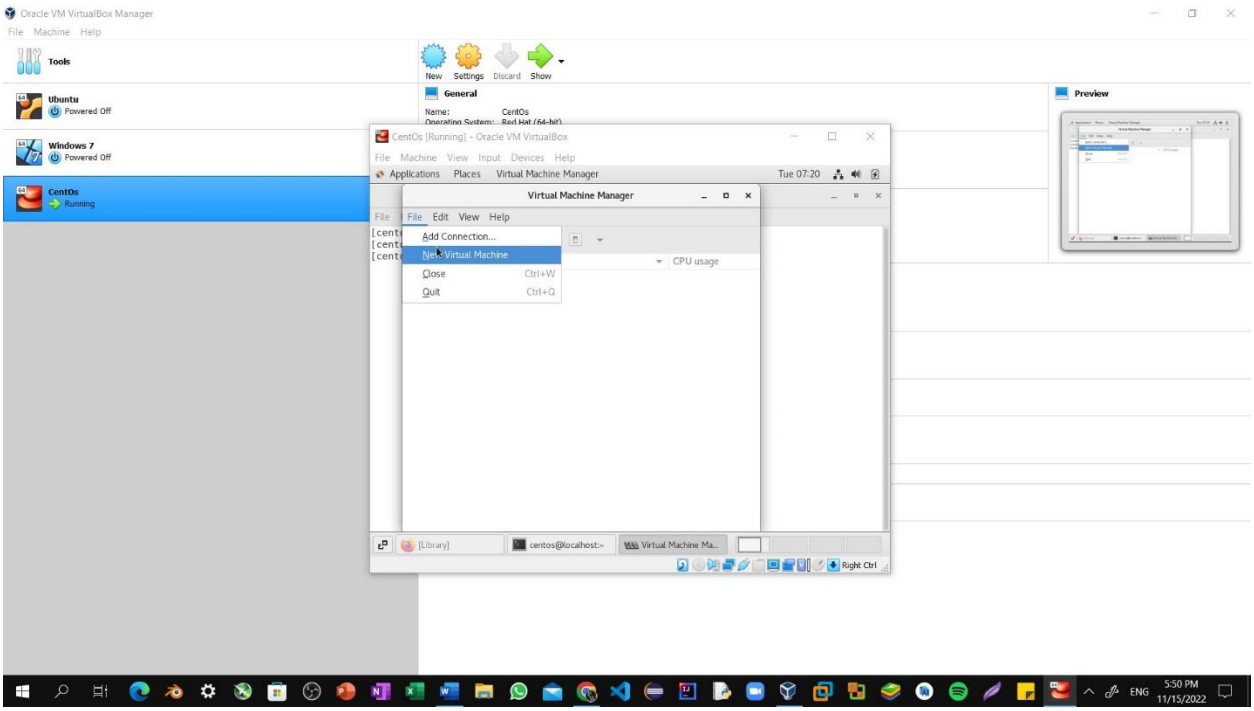
Step14: KVM Interface



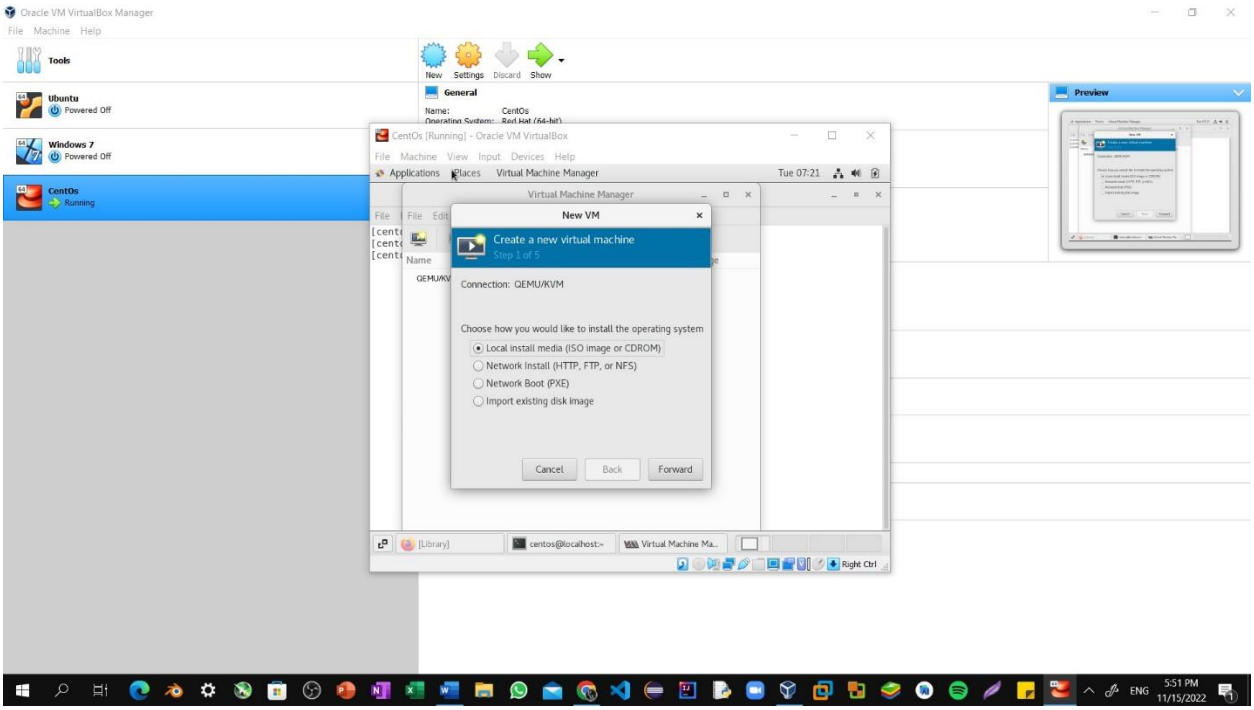
Name: Hitendra Sisodia
Sap id: 500091910

Lab 8: Installing Ubuntu Within VM Using QEMU

Step1: Go to file section, and click on New Virtual Machine.

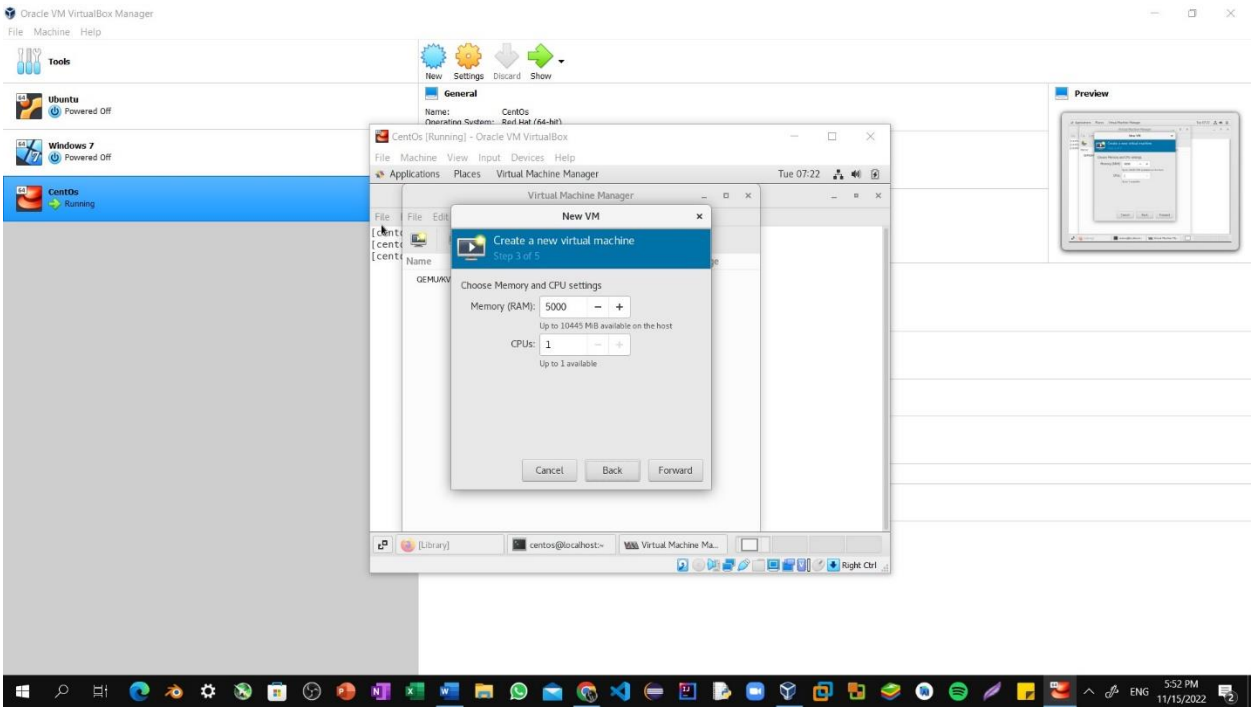


Step2: Remain Default Setting as it is and click on forward.

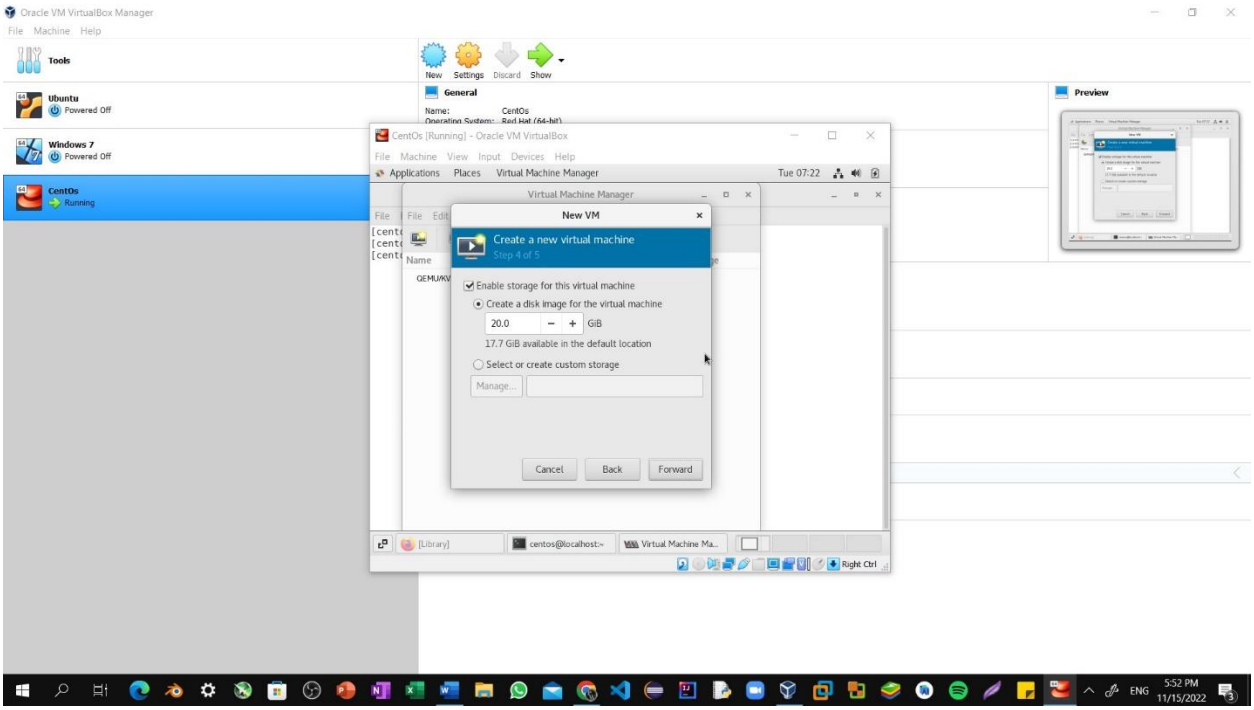


Lab 8: Installing Ubuntu Within VM Using QEMU

Step3: Now Select Memory and CPU depending upon the Usability.

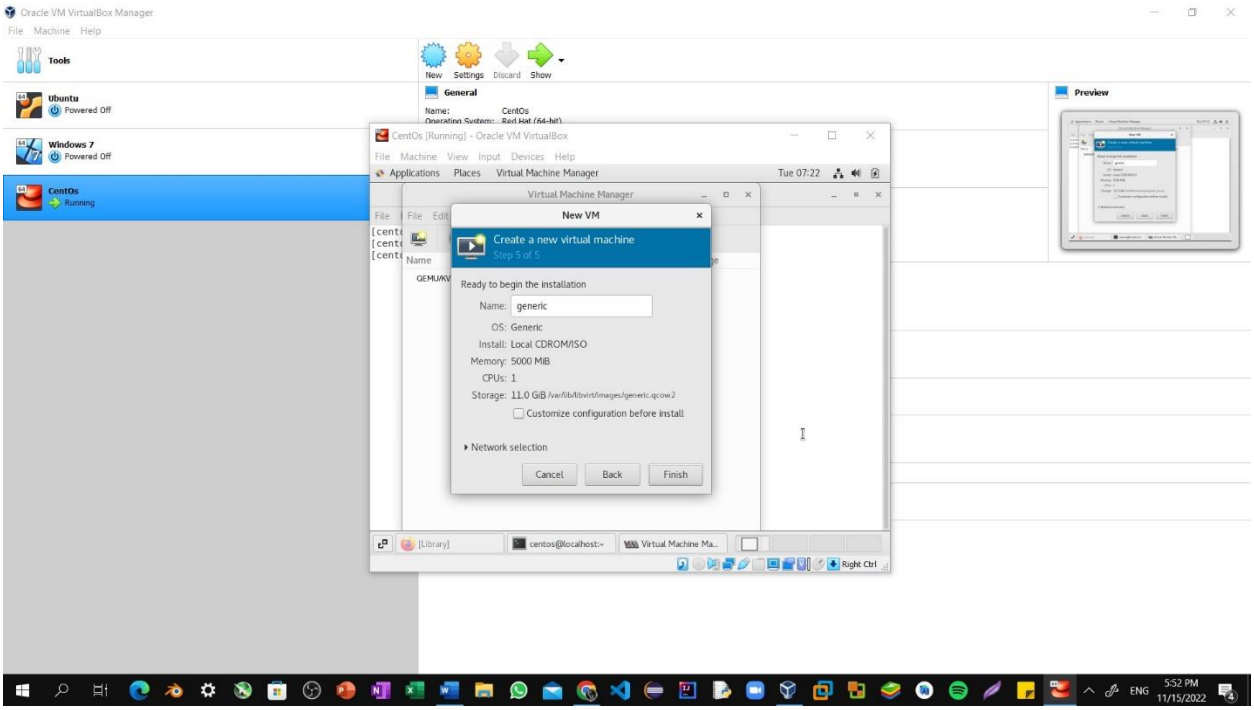


Step4: Now, Keep The default Settings as it is and then proceed further.

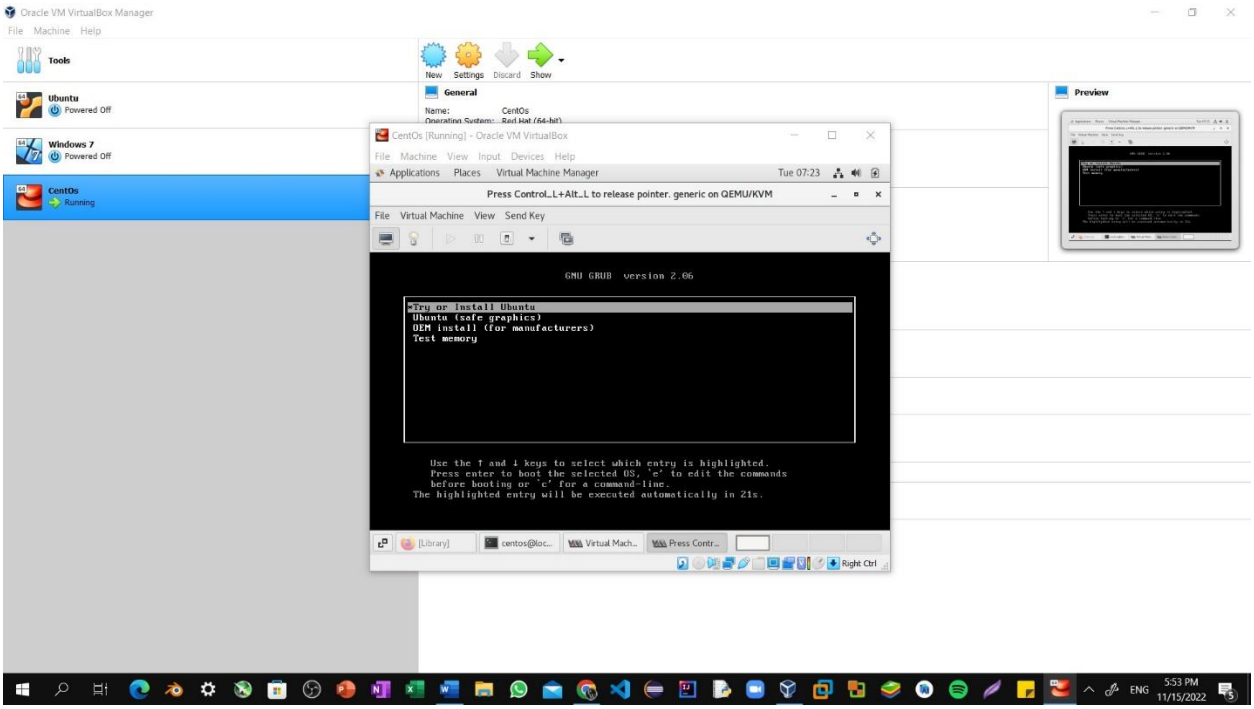


Lab 8: Installing Ubuntu Within VM Using QEMU

Step5: Now, Keep The default name as generic settings as it is and then Finish button.

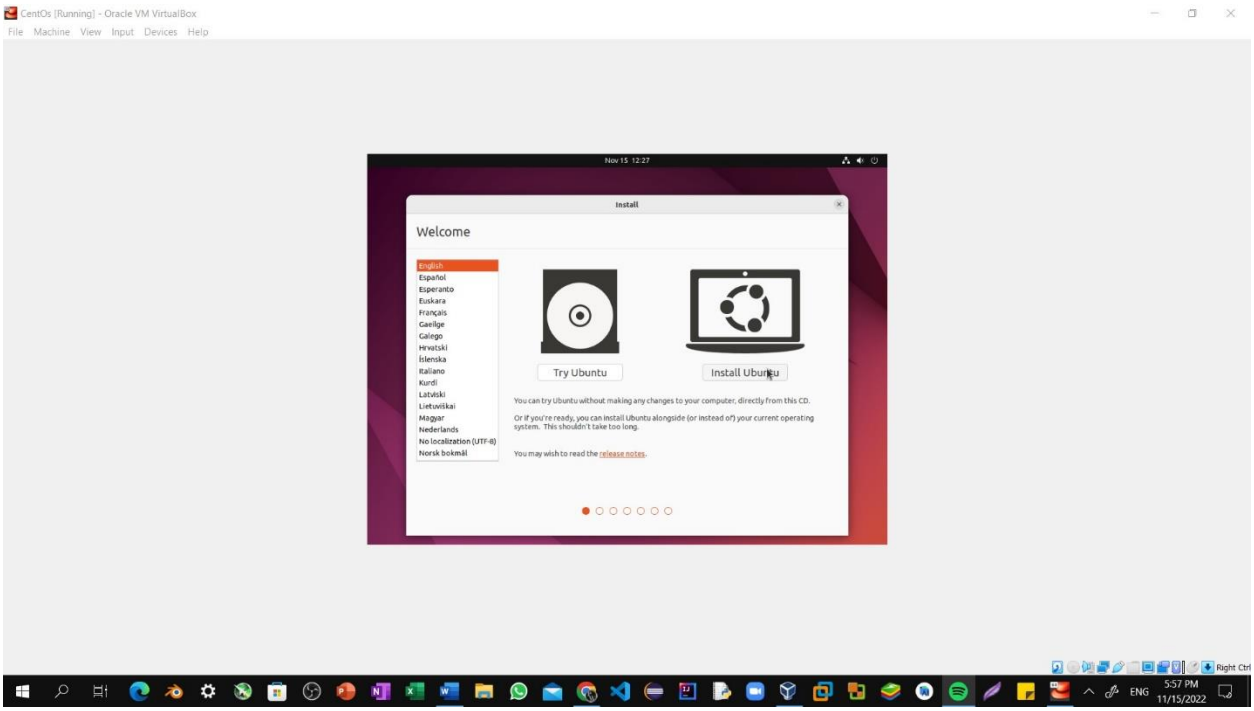


Step6: Now start the installation of virtual machine by clicking install ubuntu.

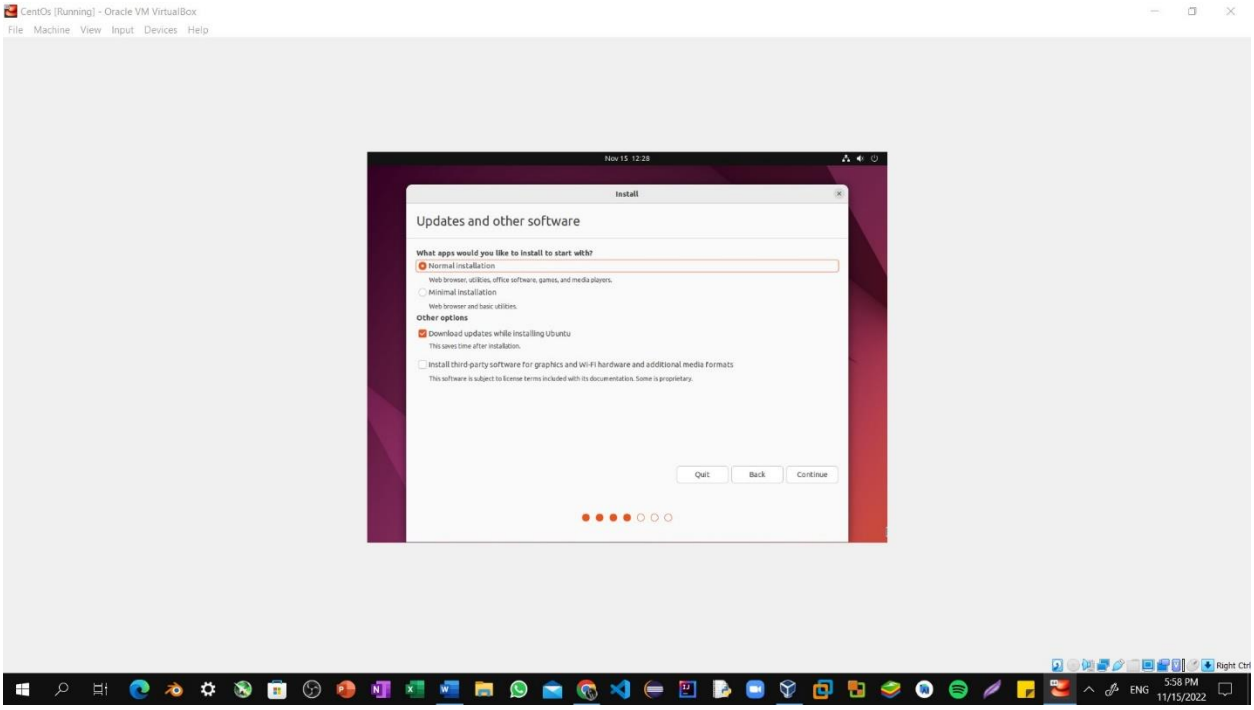


Lab 8: Installing Ubuntu Within VM Using QEMU

Step7: Now select English language and Click on Install Ubuntu.

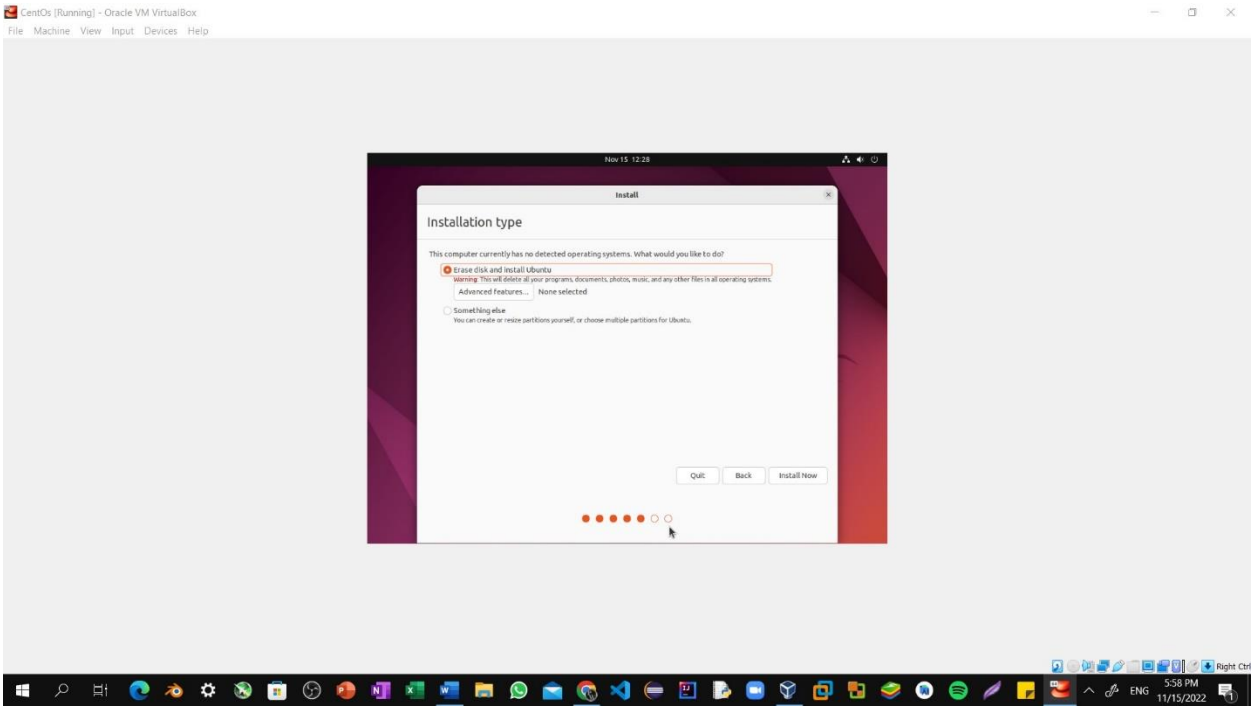


Step8: Check normal installation, download updates while installing ubuntu, install third party software for graphics and then click on next.

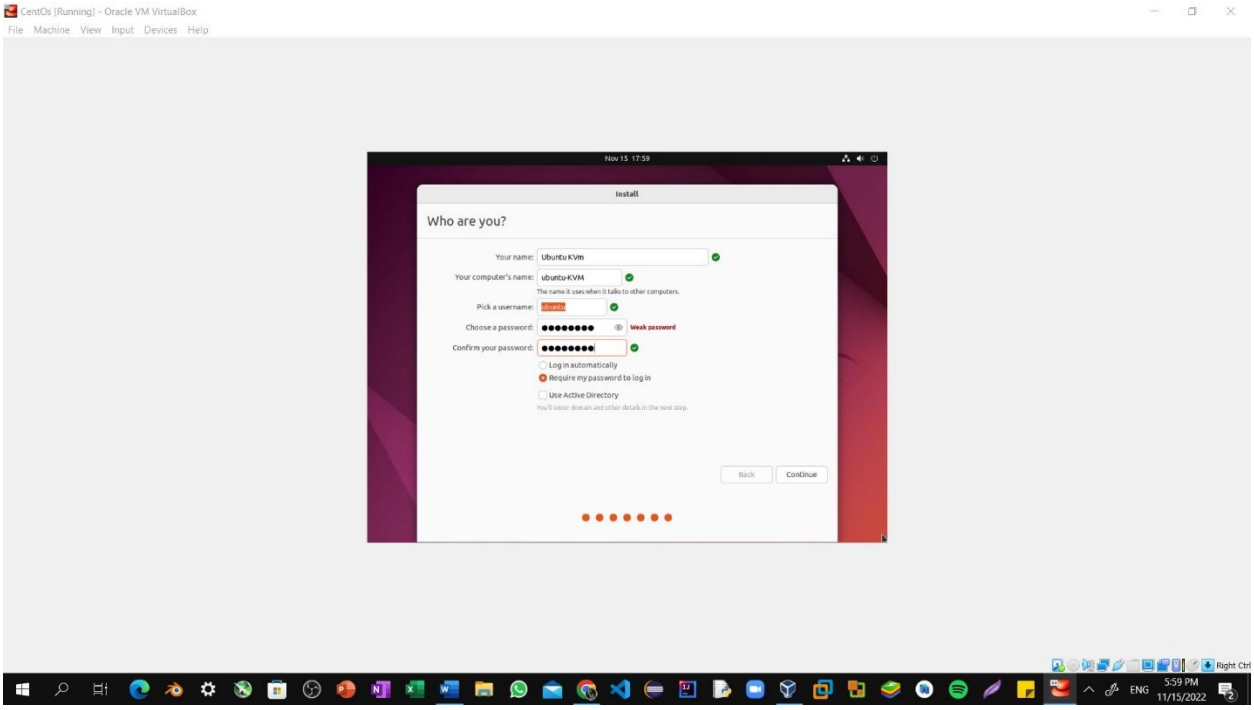


Lab 8: Installing Ubuntu Within VM Using QEMU

Step9: Check Erase Disk and install ubuntu, this Erase Disk option doesn't affect current operating system it only make changes to Virtual Disk. Now Check Install Now option.

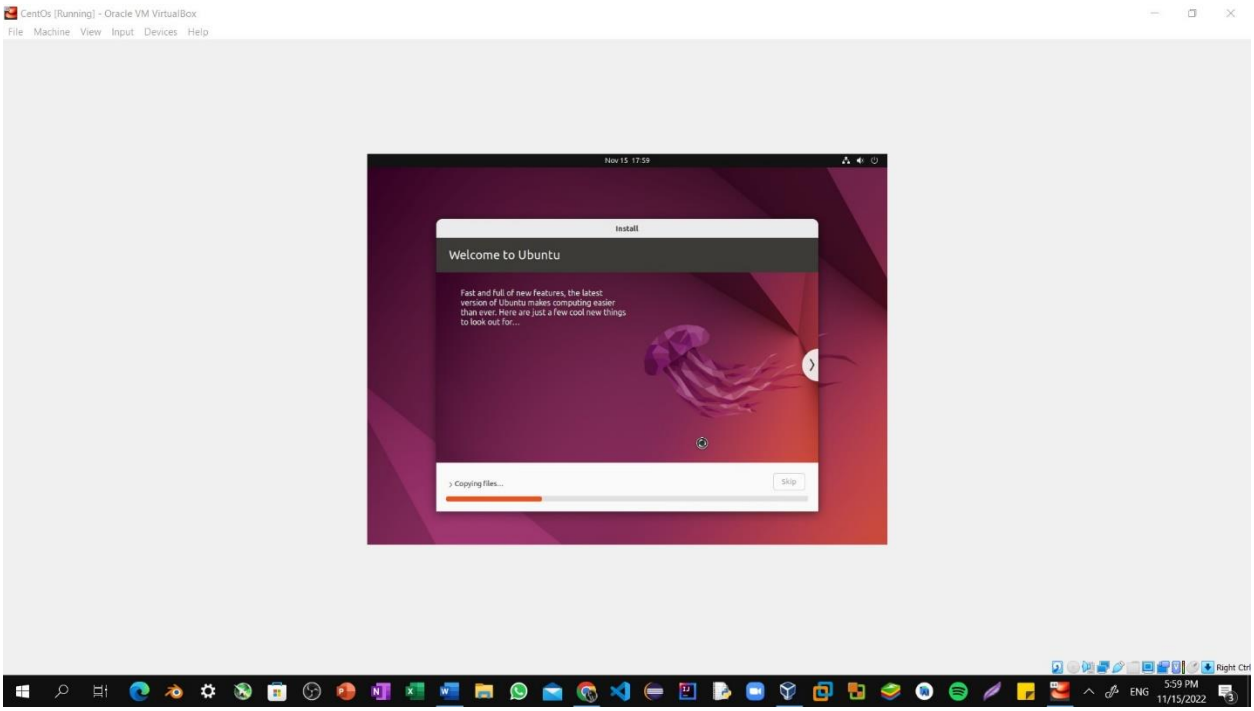


Step10: Now setup virtual machine username and password.

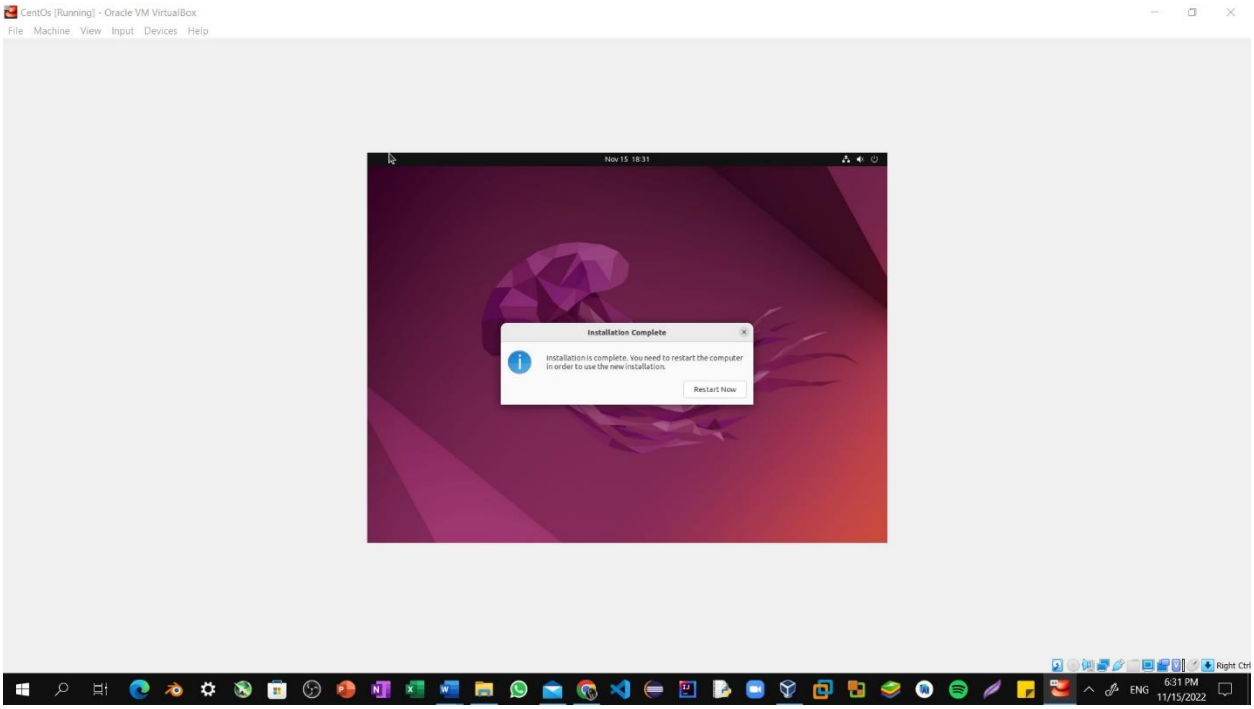


Lab 8: Installing Ubuntu Within VM Using QEMU

Step11: Now wait for few minutes until installation get completed.

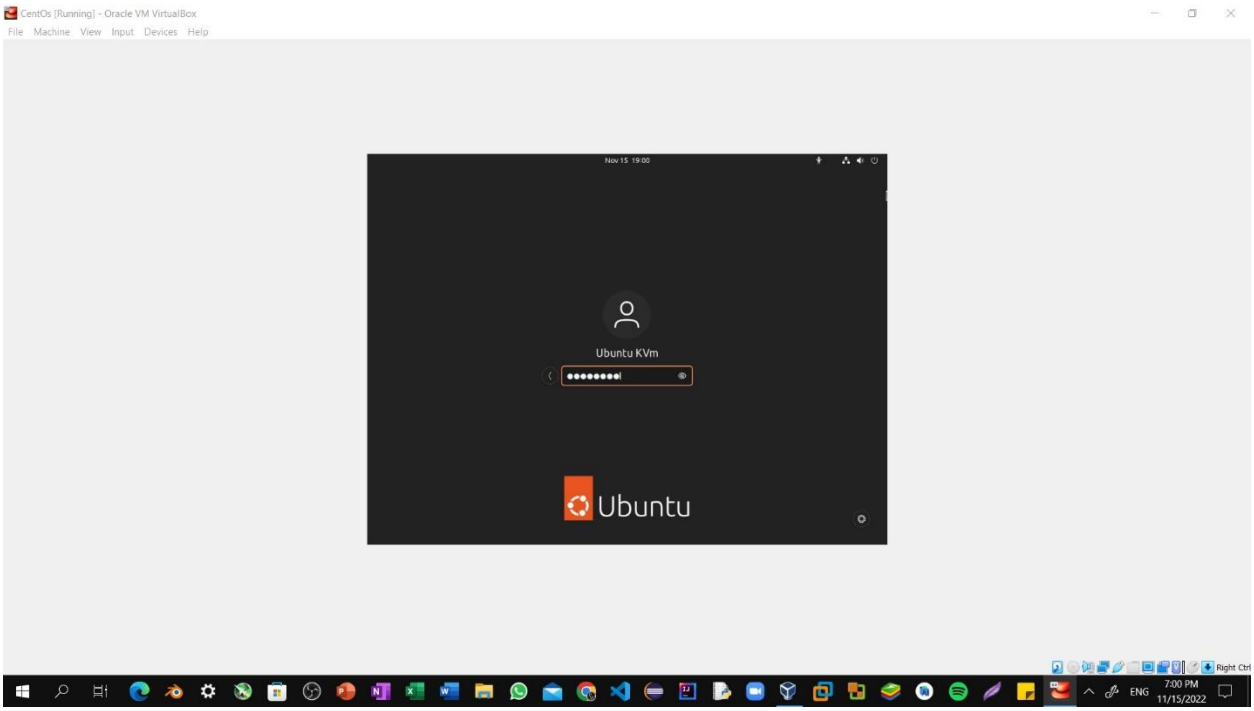


Step12: Once the installation is completed. We need to restart Virtual machine in order to use.

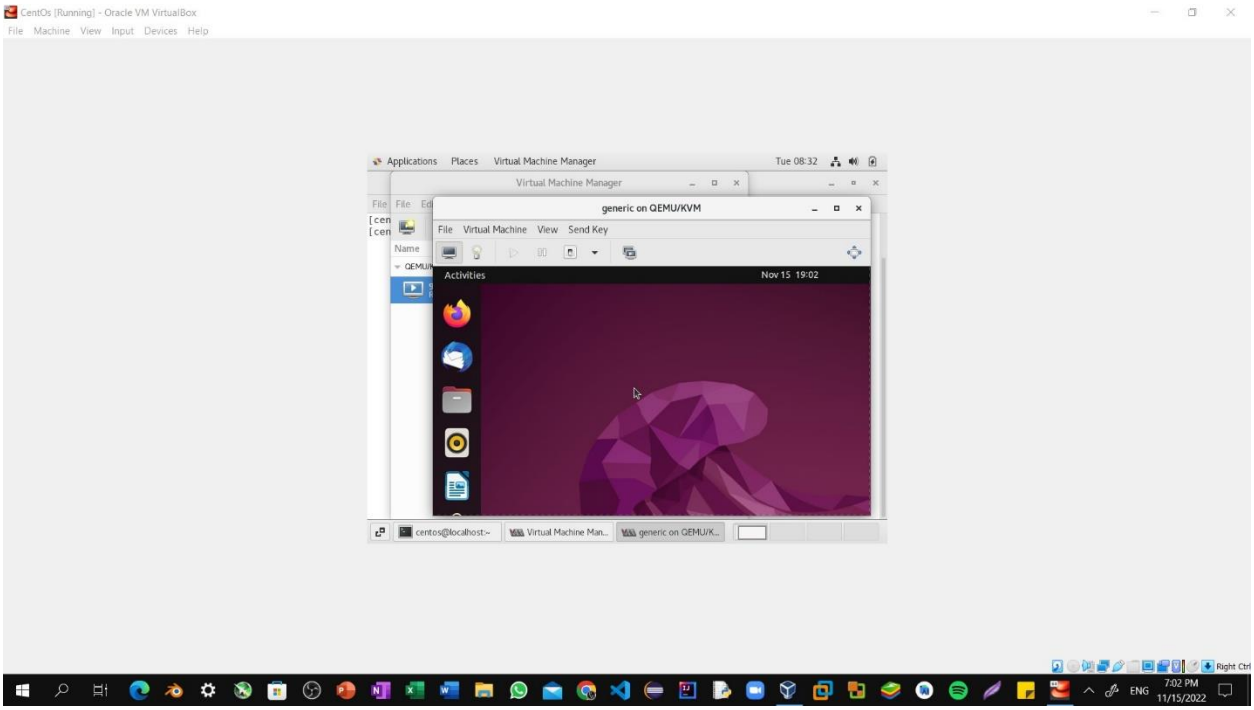


Lab 8: Installing Ubuntu Within VM Using QEMU

Step13: Now, Enter your password and login to your workspace.



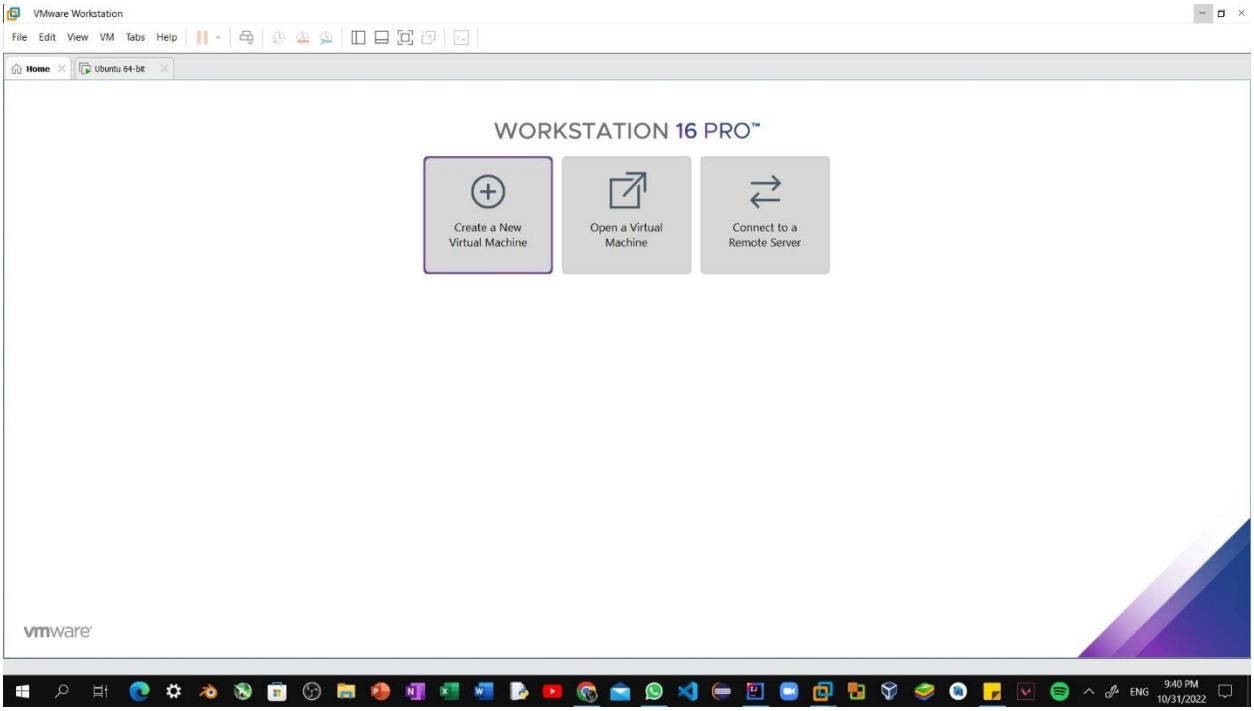
Step14: Ubuntu Workspace.



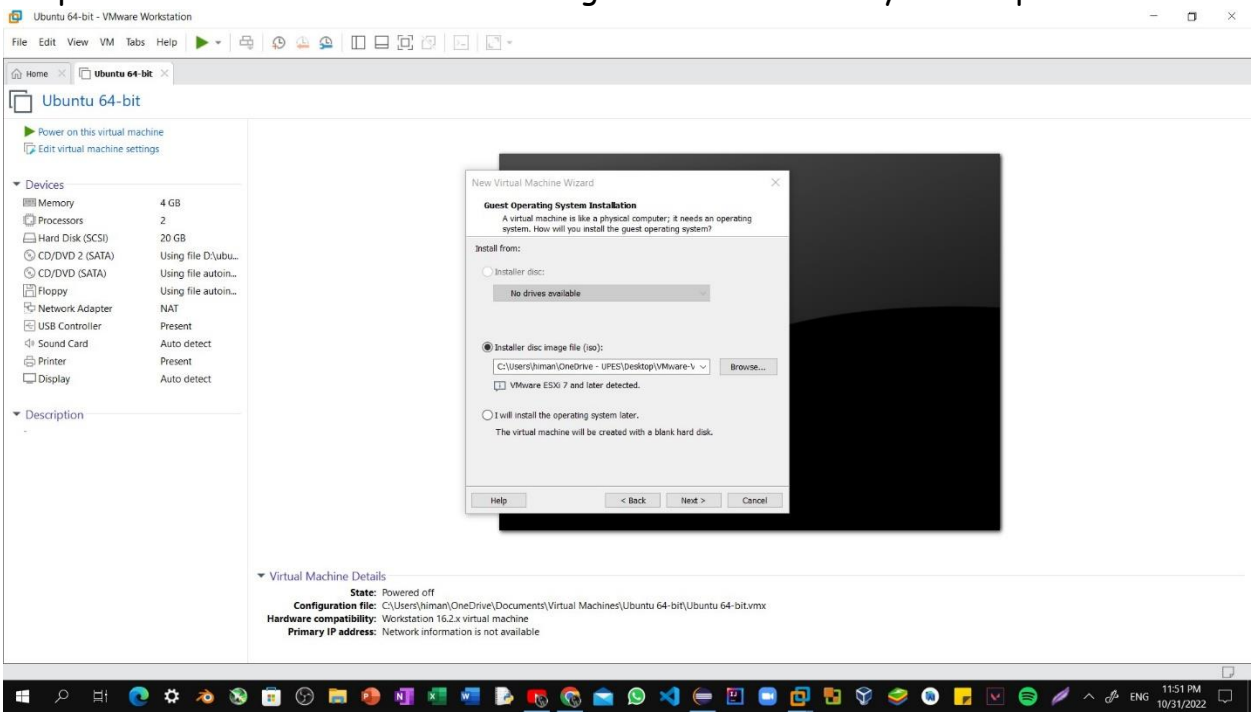
Name: Hitendra Sisodia
Sap id: 500091910

Lab9: Installing Virtual Machine Over EXsi

Step1: Open Workstation pro click on Create a new Virtual machine.

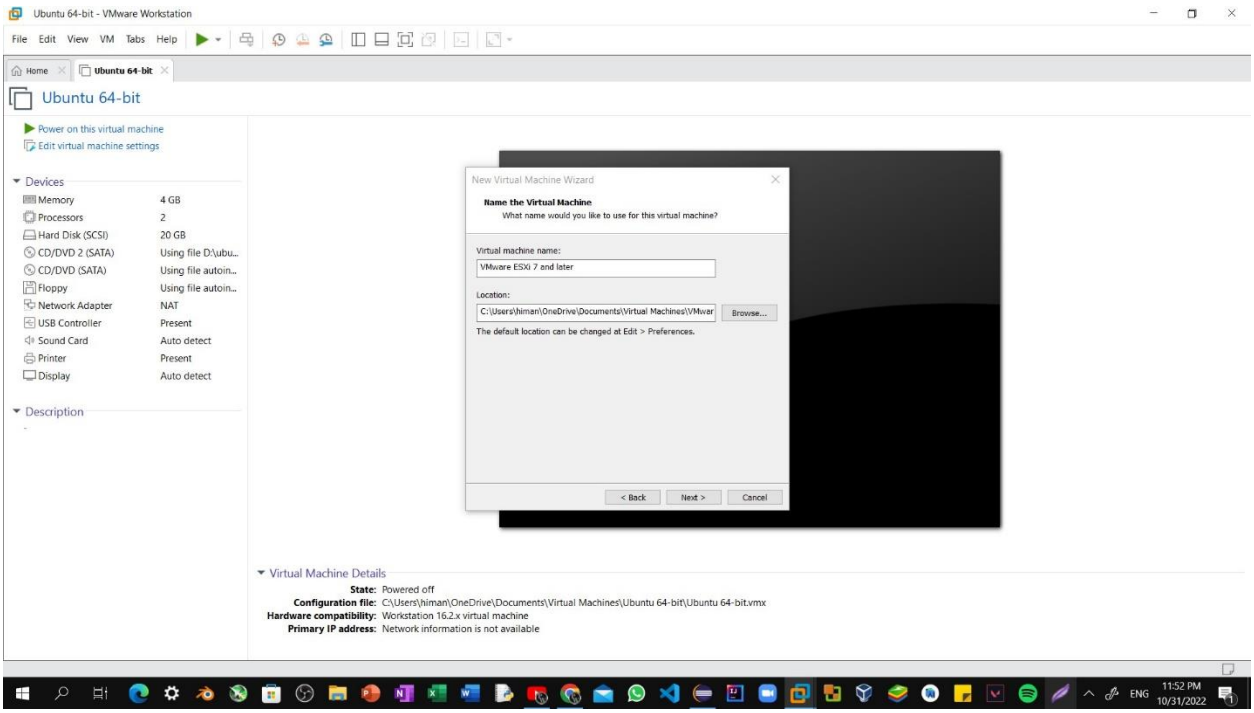


Step2: Select the downloaded disc image file of esxi from your computer.

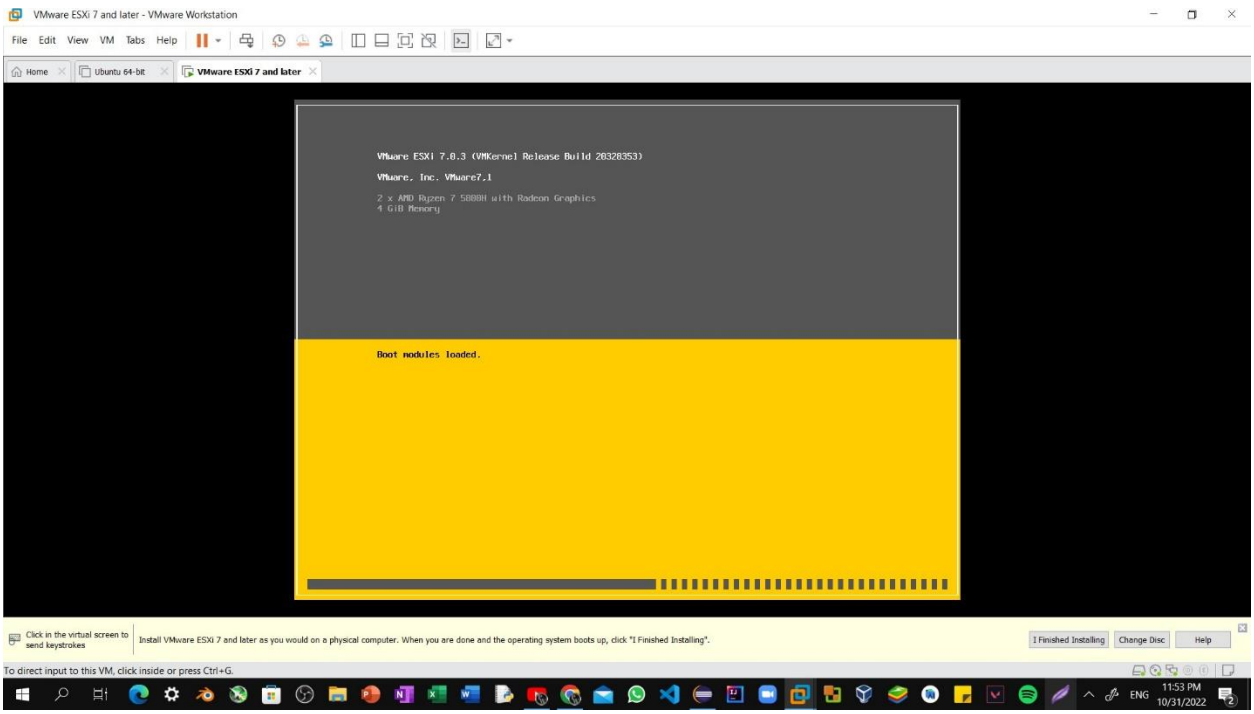


Lab9: Installing Virtual Machine Over EXsi

Step3: Selecting iso file of ESxi.

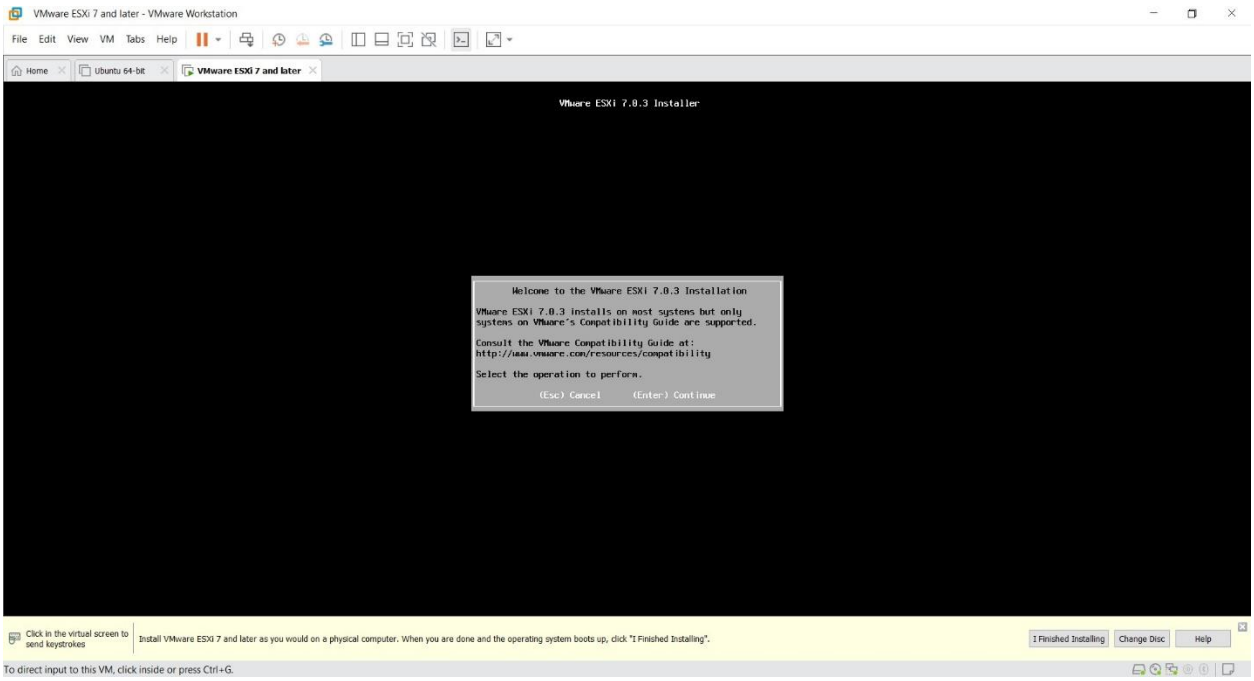


Step4: The installation has been started.

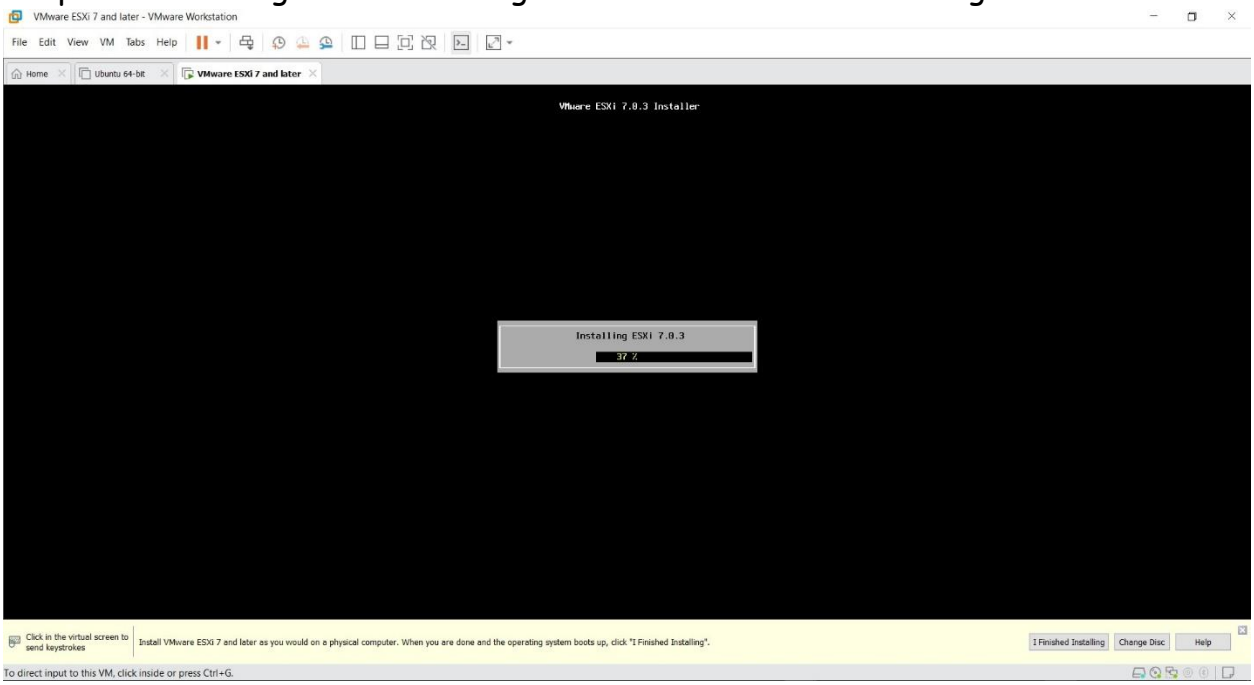


Lab9: Installing Virtual Machine Over EXsi

Step5: Click on continue option.

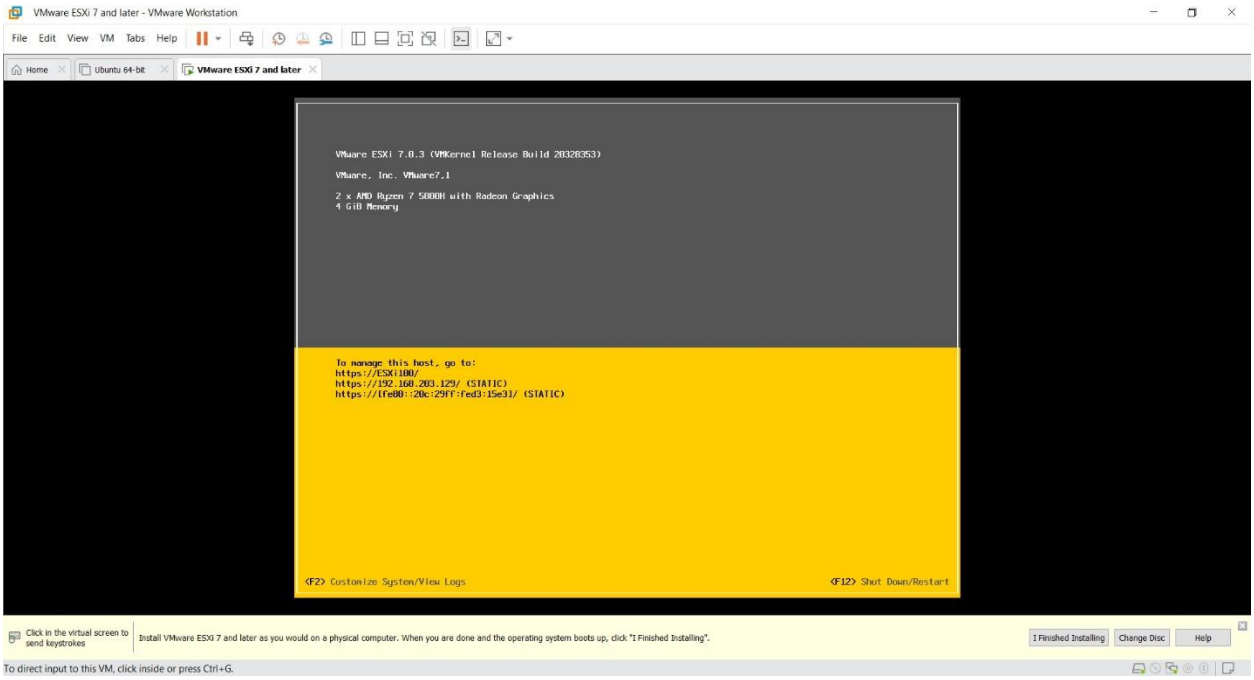


Step6: After doing further settings the installation will start begin.

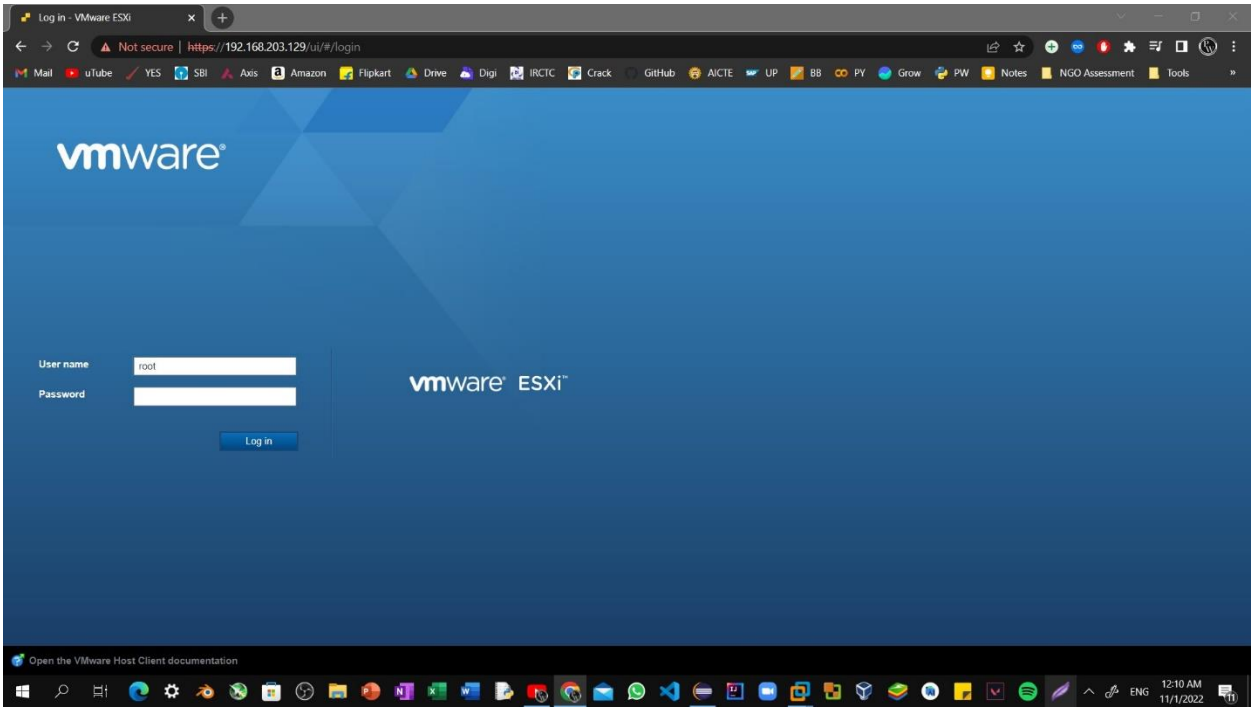


Lab9: Installing Virtual Machine Over EXsi

Step7: After installing esxi on workstation pro you will find your own site which you have type on google.



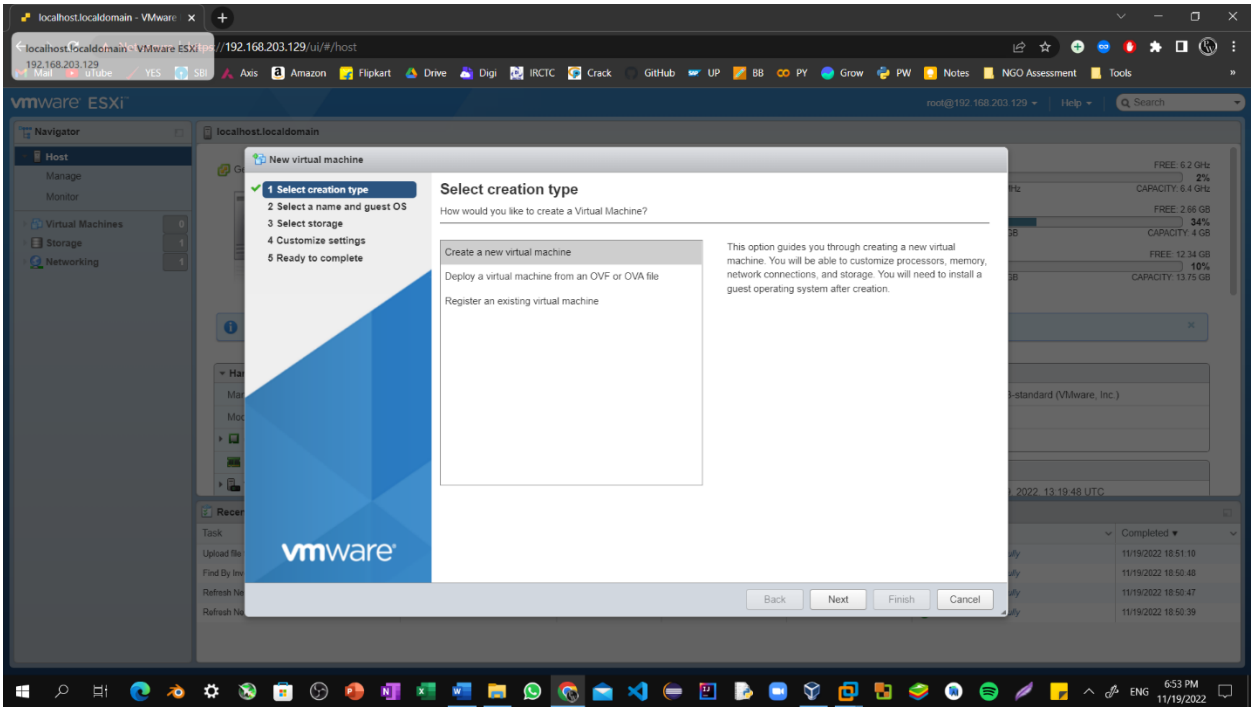
Step8: Open ip address on any web browser.



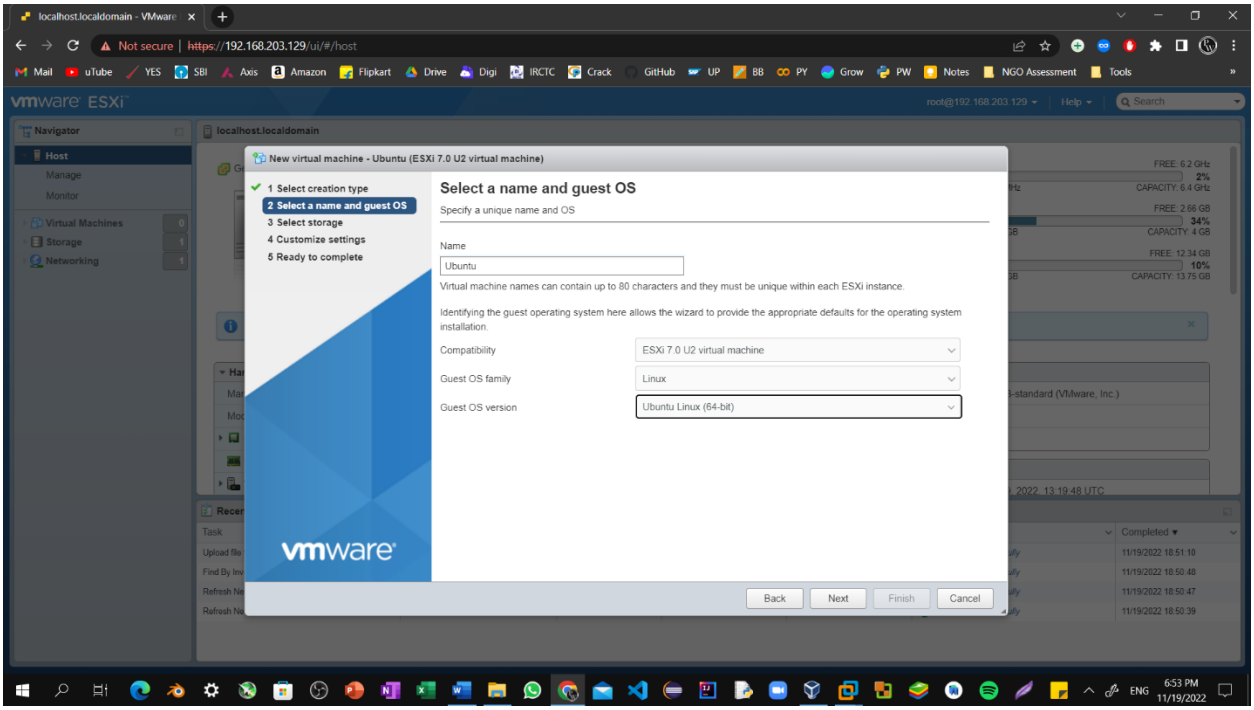
Name: Hitendra Sisodia
Sap id: 500091910

Lab9: Installing Virtual Machine Over EXsi

Step9: Right click on host click on to create new virtual machine.



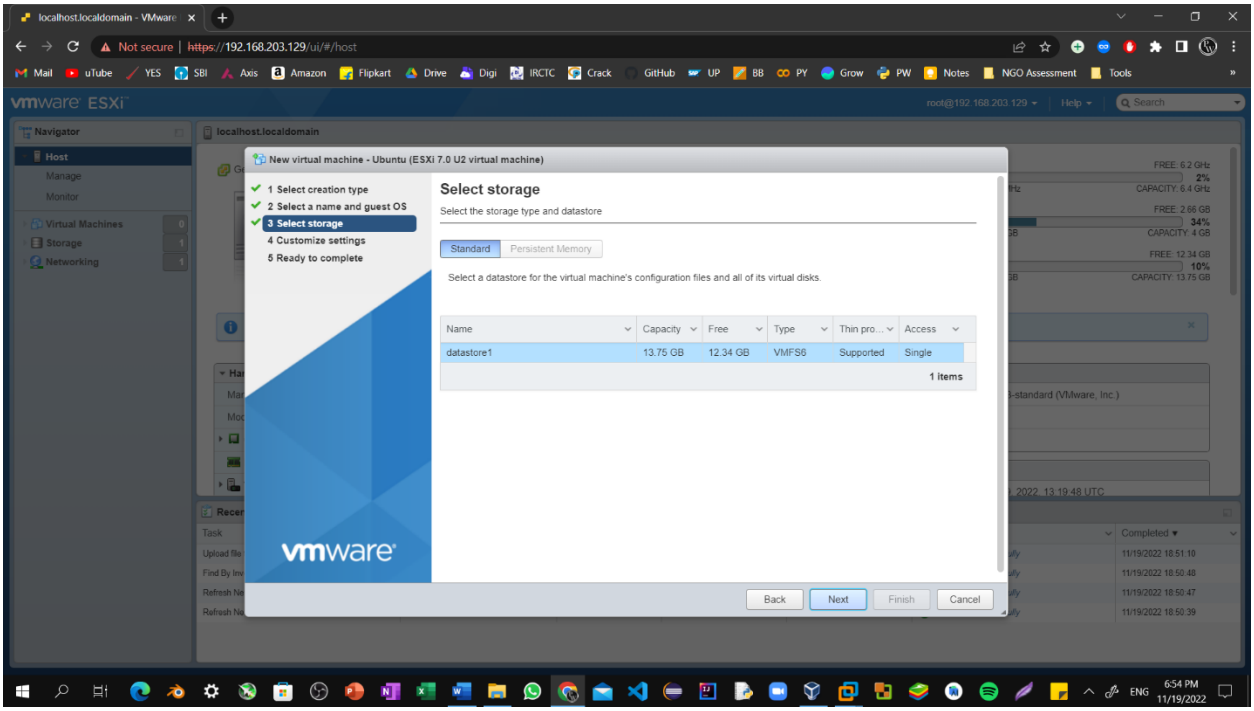
Step10: Choose the virtual machine name, its guest os and guest os version.



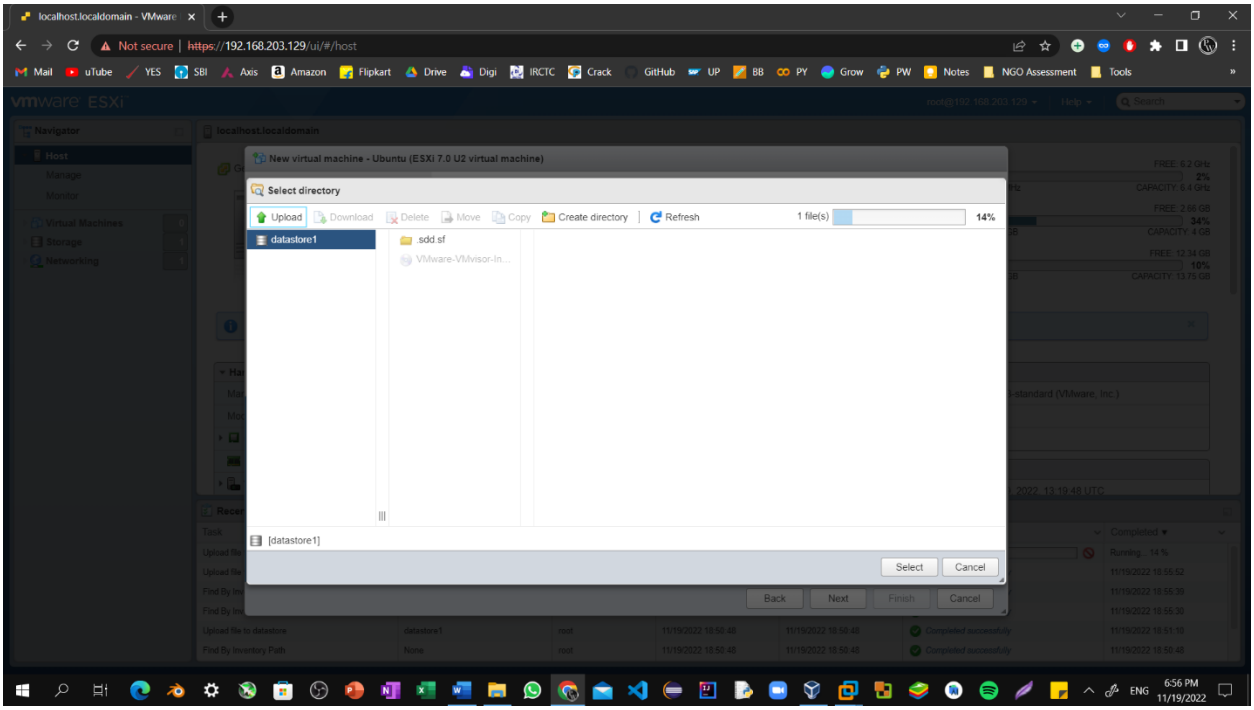
Name: Hitendra Sisodia
Sap id: 500091910

Lab9: Installing Virtual Machine Over EXsi

Step11: Proceed Further by clicking on next.

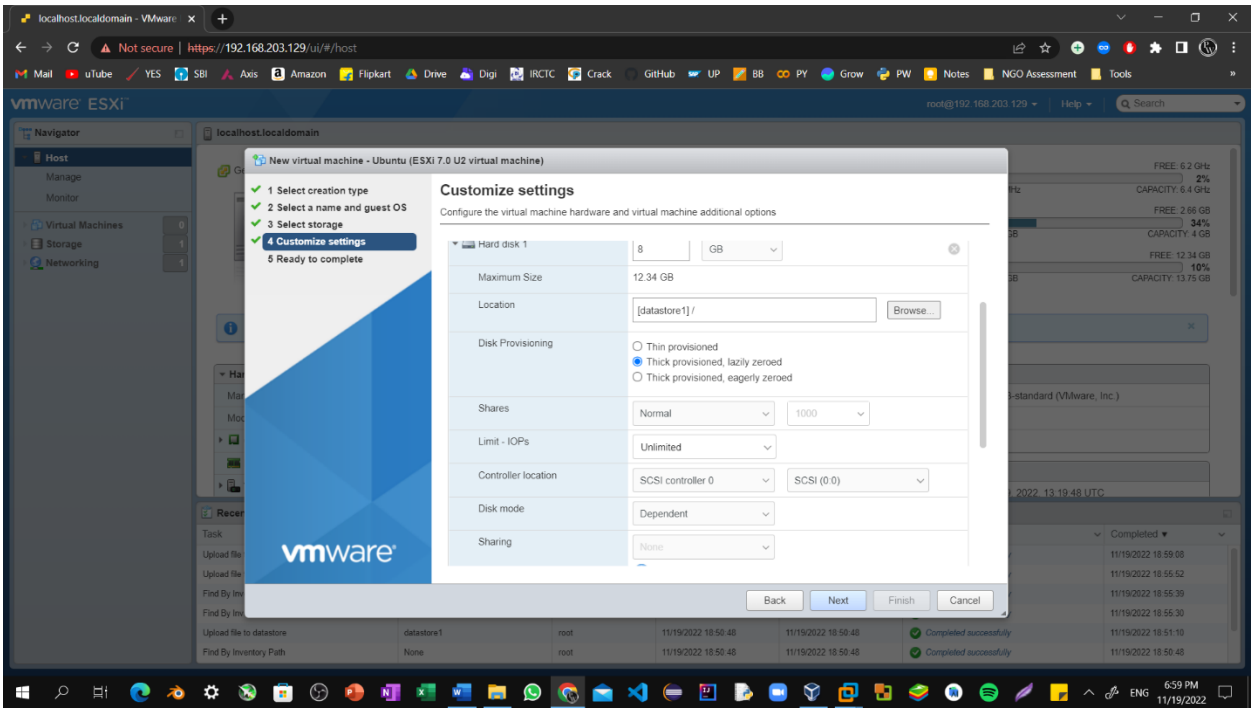


Step12: Upload VM file of Ubuntu by clicking over upload button.

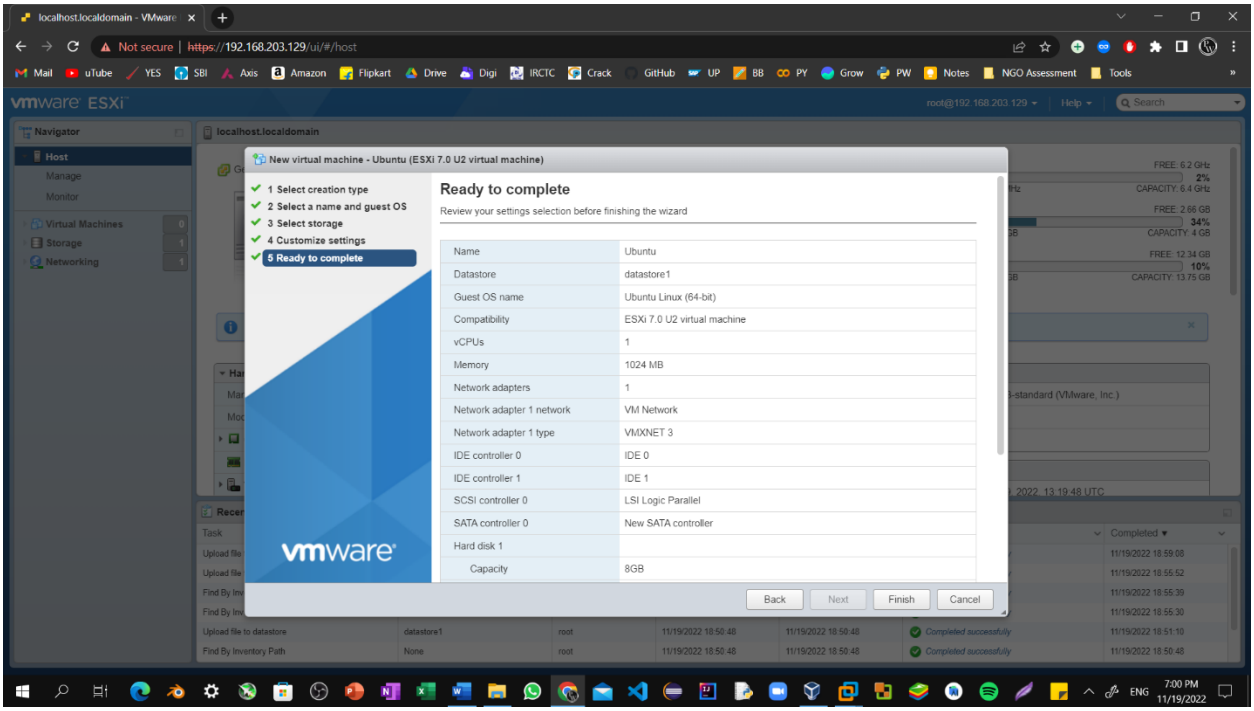


Lab9: Installing Virtual Machine Over EXsi

Step12: Customize the required cpu, memory and select the iso file of your virtual machine.

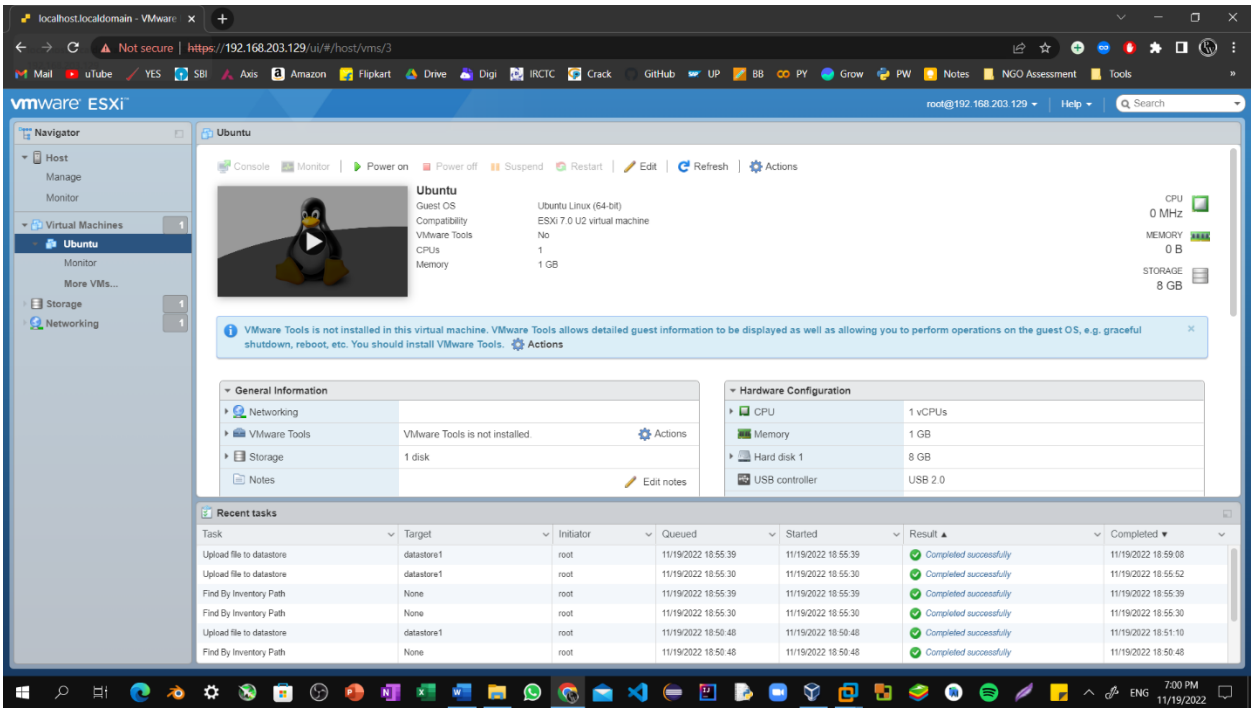


Step13: Click on Finish and to proceed further.

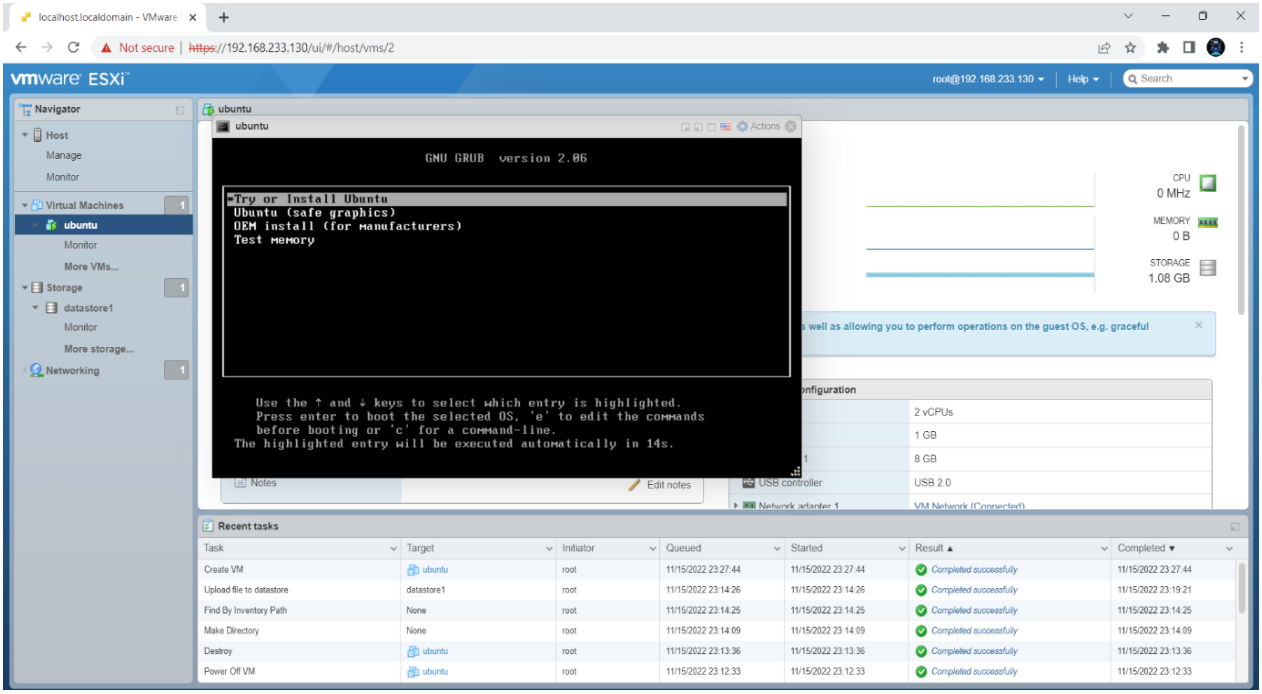


Lab9: Installing Virtual Machine Over EXsi

Step14: Now go to virtual machine tab where you find the virtual machine which is created by you.

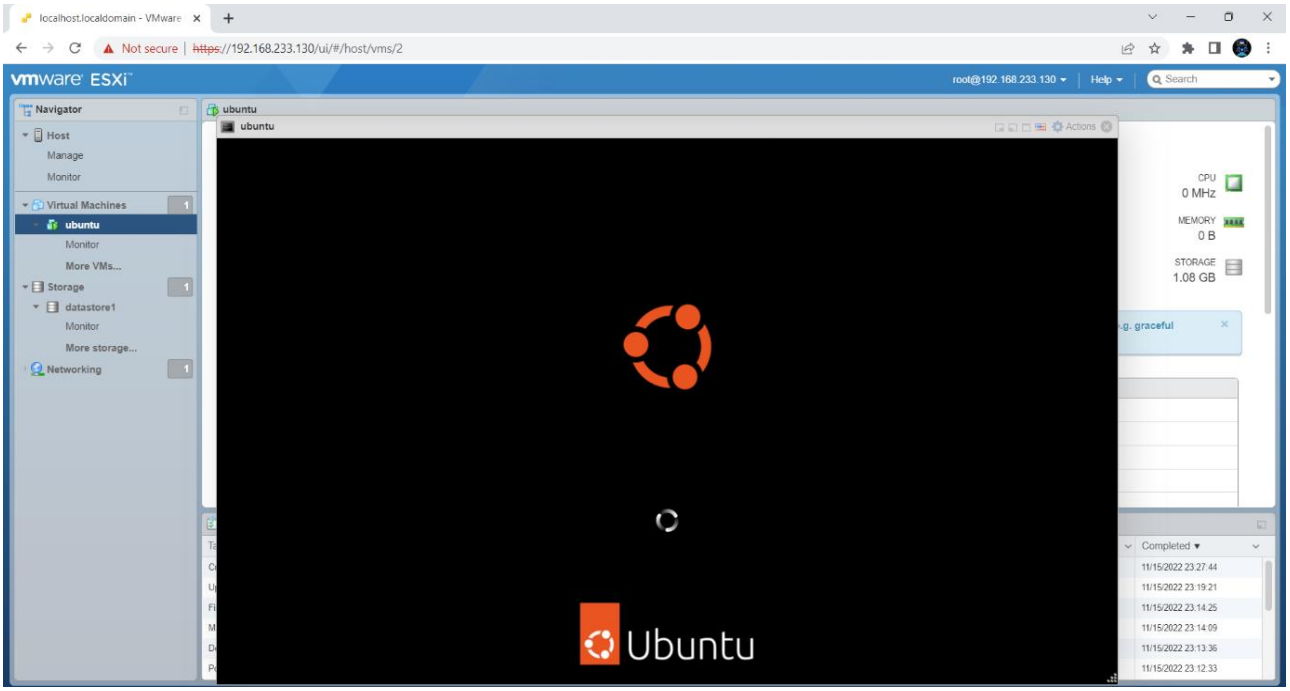


Step15: Click on virtual machine's image and it will start installing.

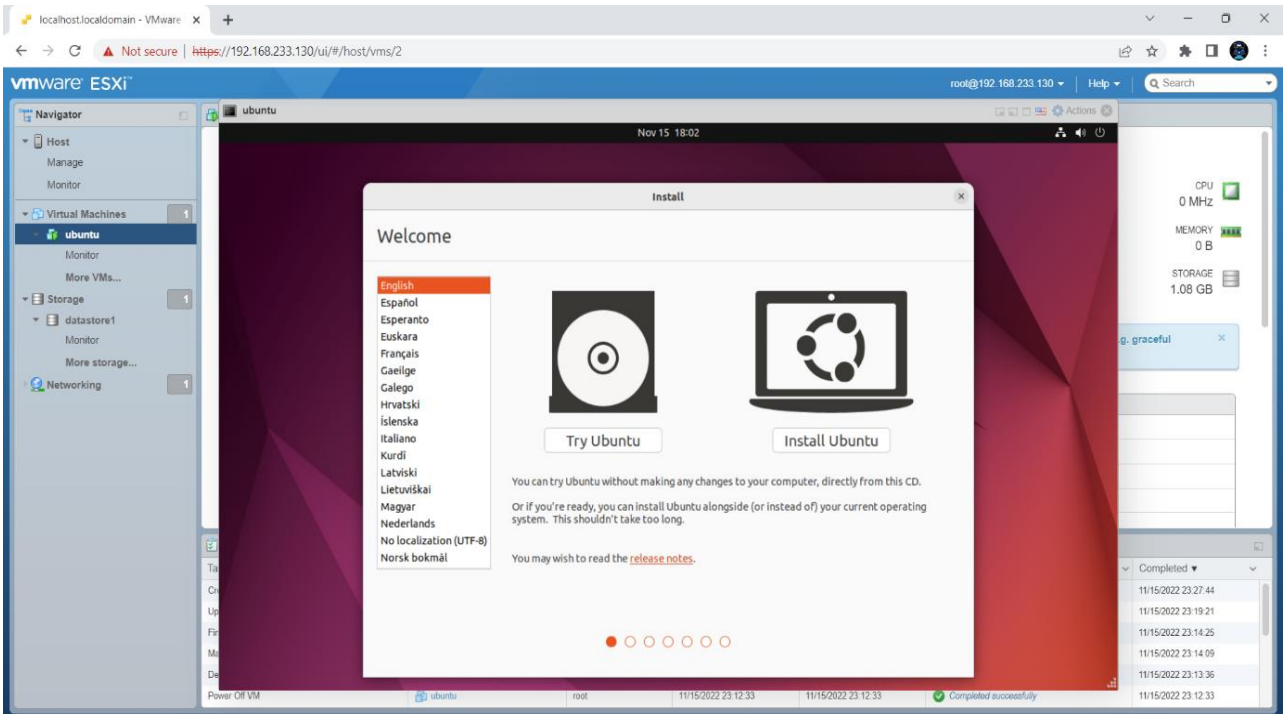


Lab9: Installing Virtual Machine Over EXsi

Step16: Now your virtual machine is installing on esxi.

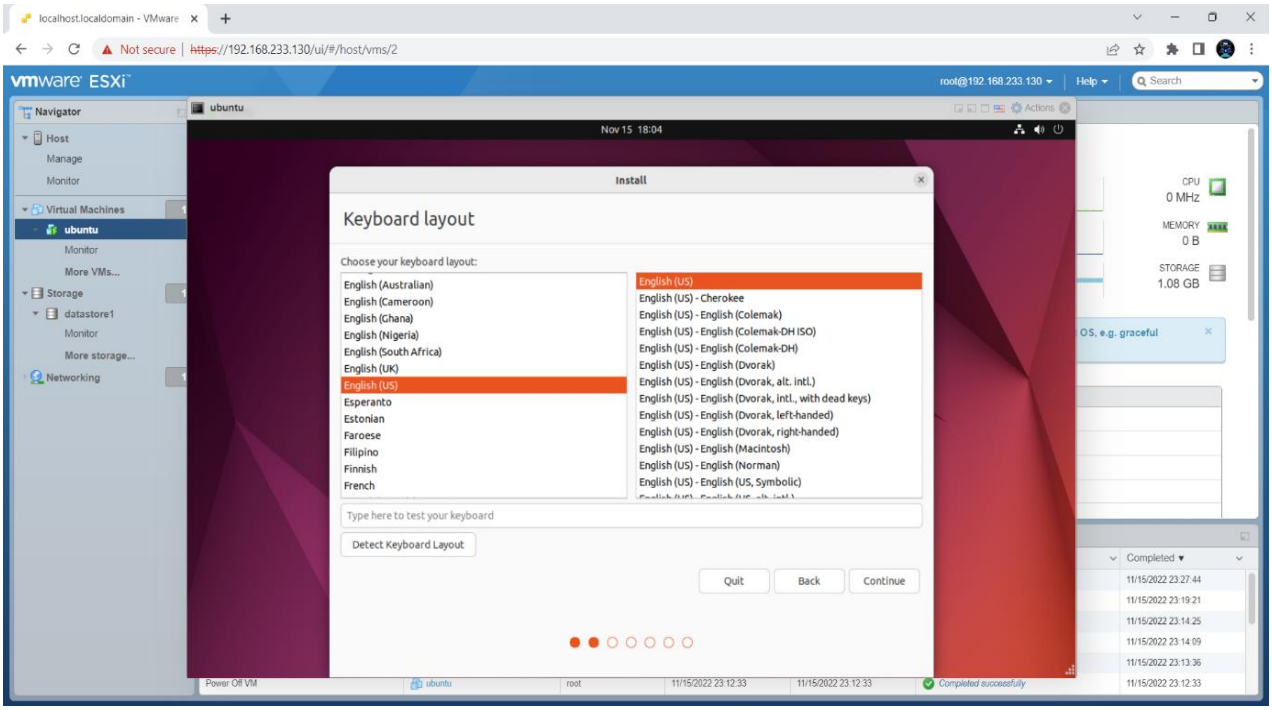


Step17: Now the virtual machine had been successfully installed on esxi.



Lab9: Installing Virtual Machine Over EXsi

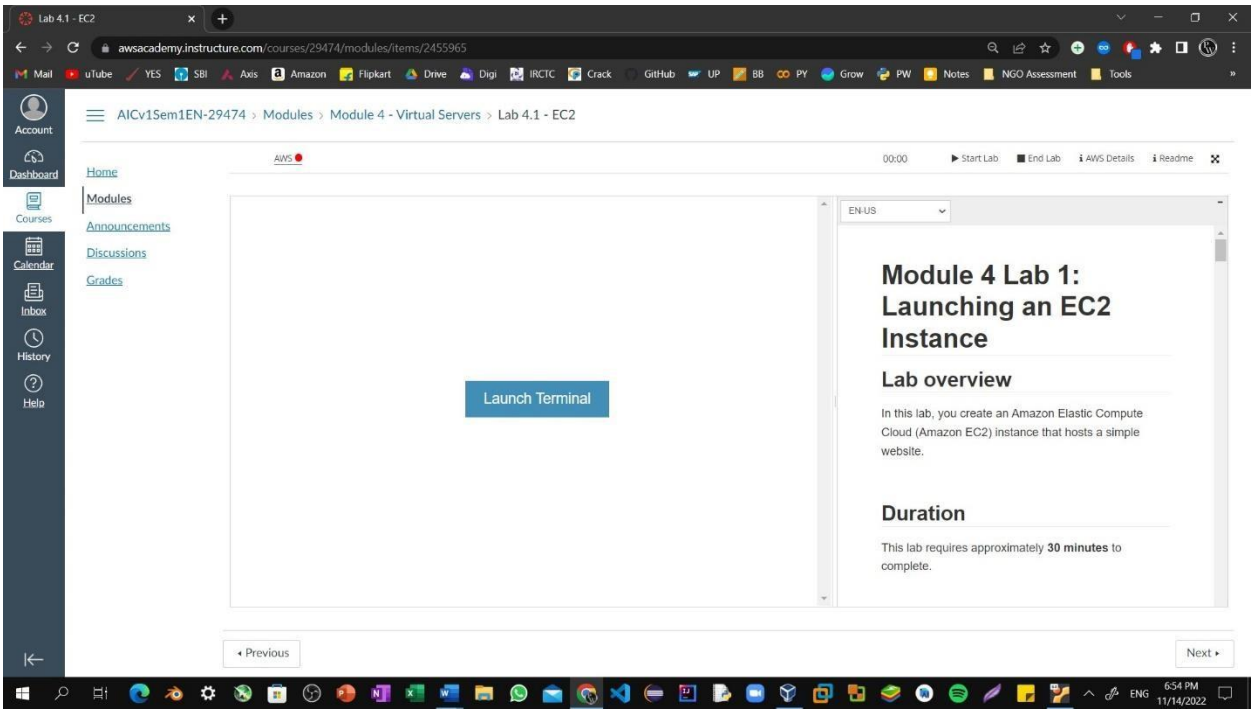
Step18: You can select language to stat further your virtual machine.



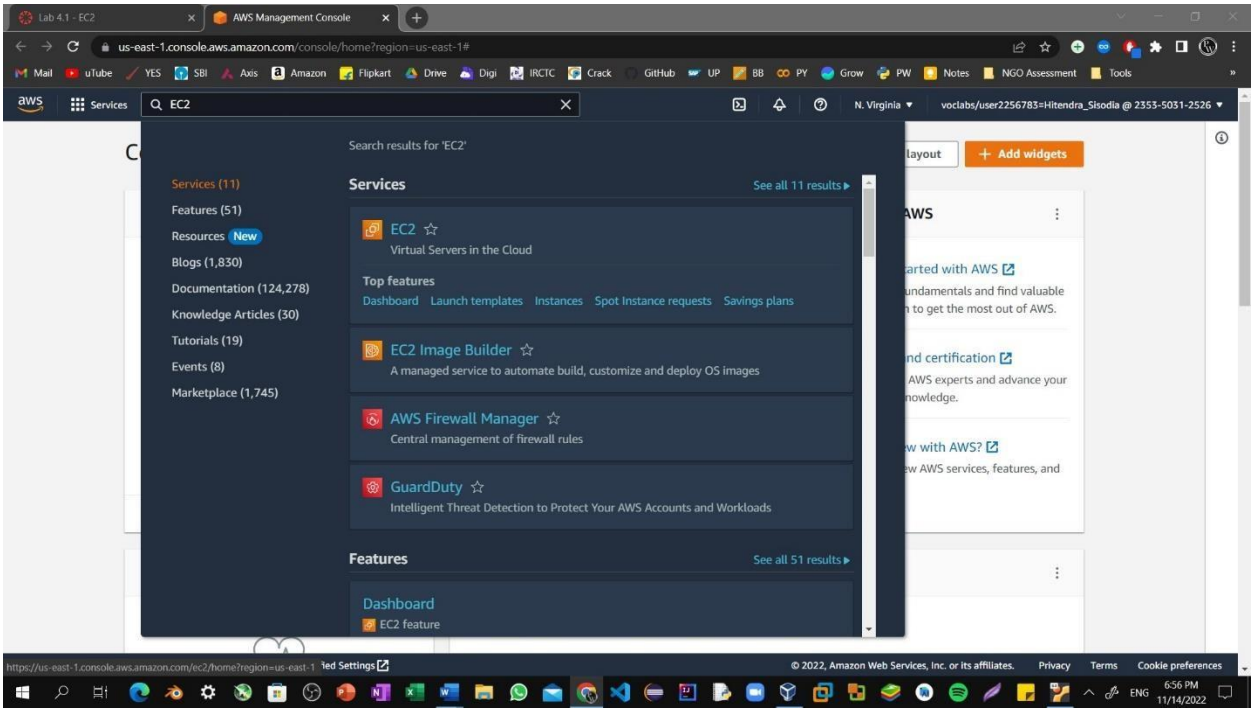
Name: Hitendra Sisodia
Sap id: 500091910

Lab 10.1: Launching an EC2

Step1: To start the lab session, choose **Start Lab** in the upper-right corner of the page.

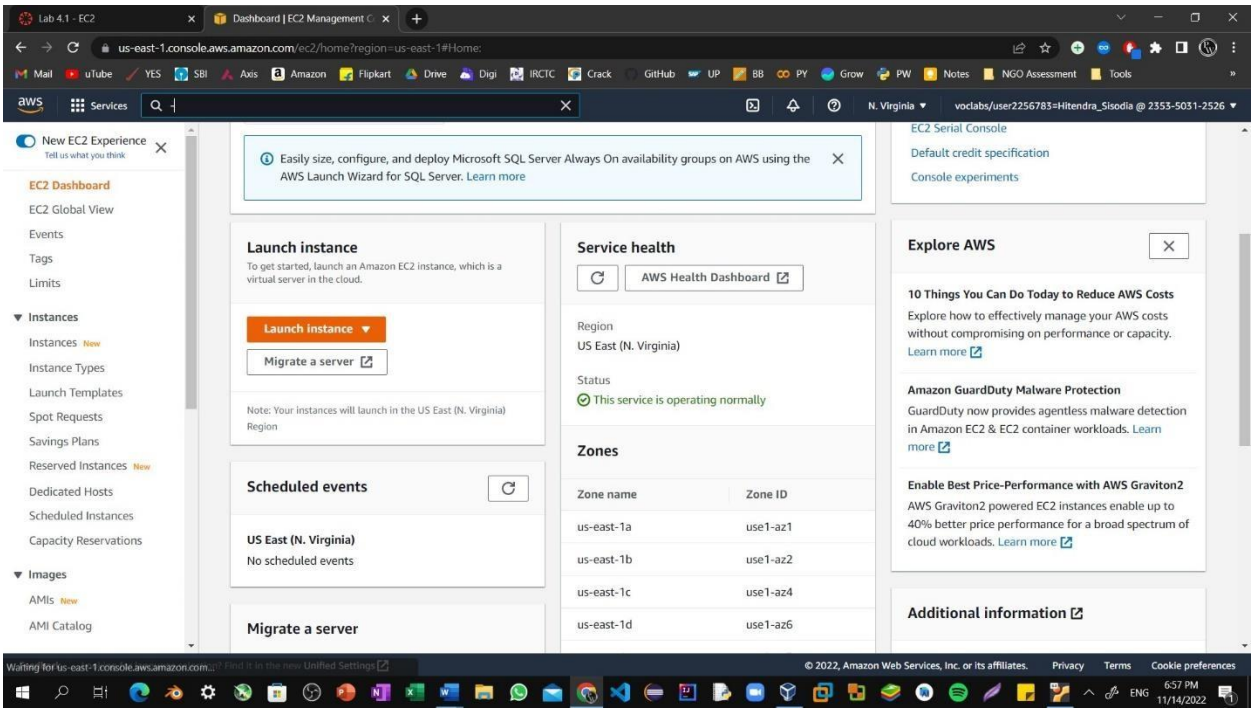


Step2: Choose the **Services** menu, locate the **Compute** services, and select **EC2**.

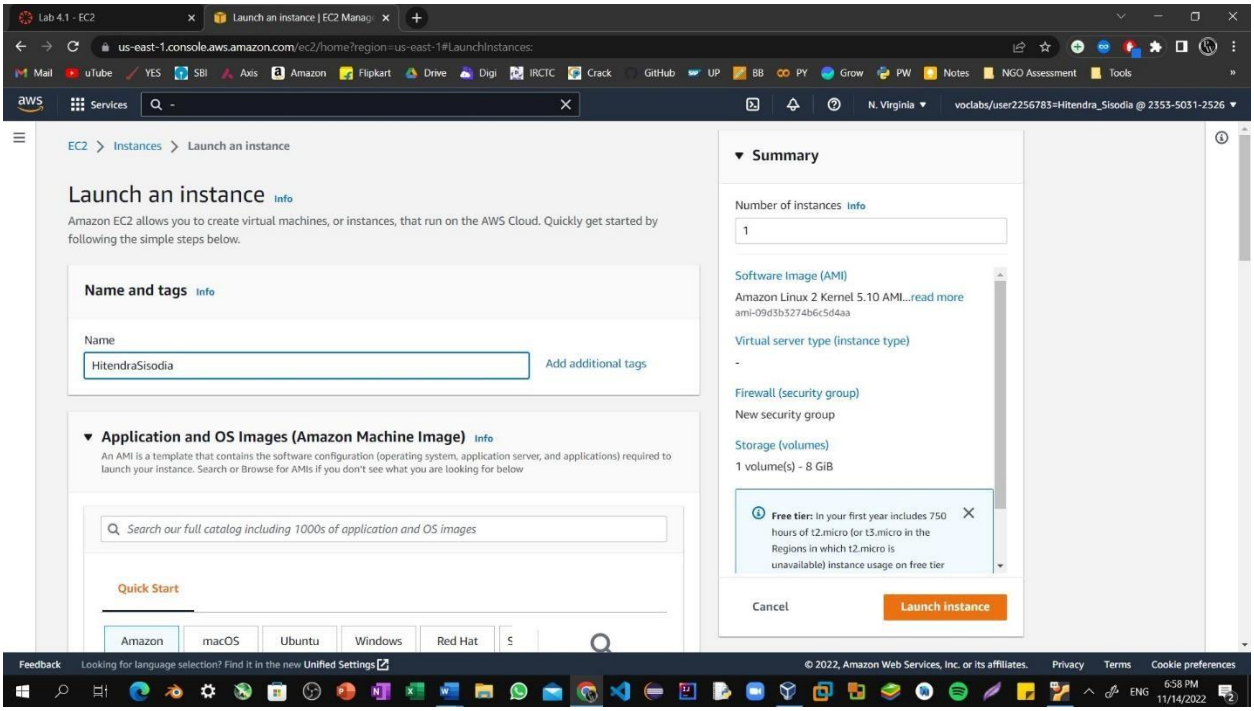


Lab 10.1: Launching an EC2

Step3: Choose the **Launch instance** button in the middle of the page, and then select **Launch instance** from the dropdown menu.

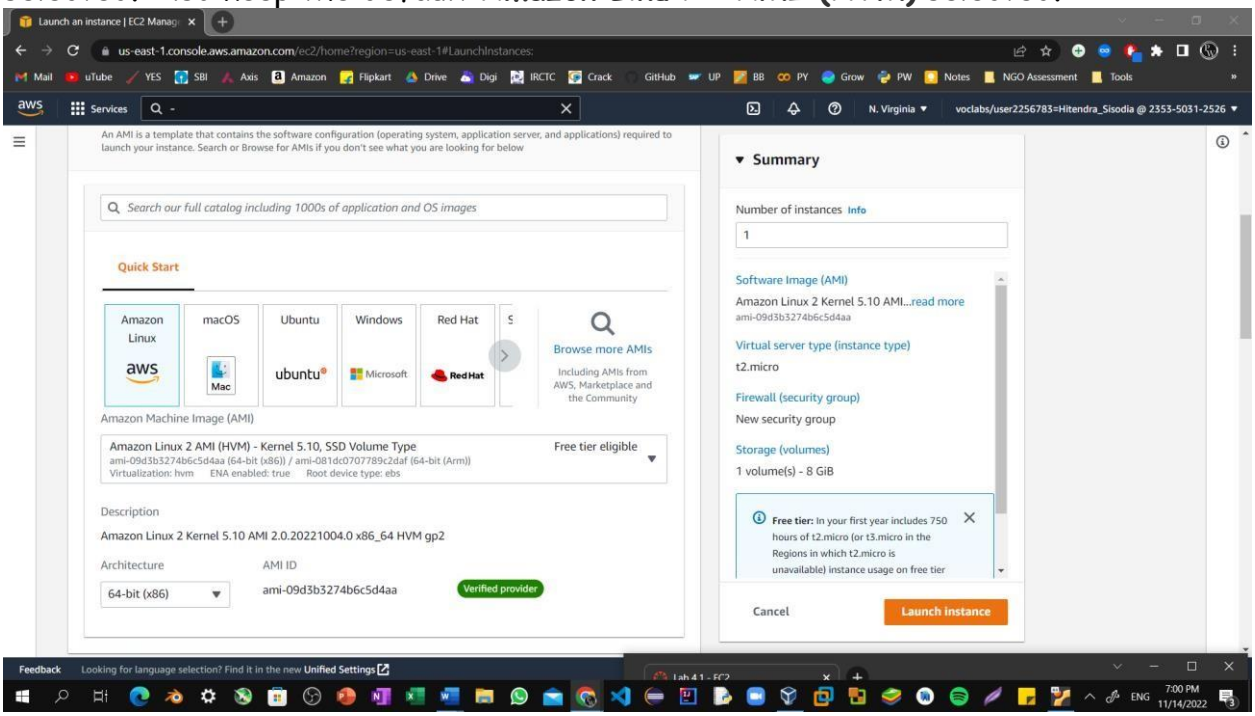


Step4: Name the instance i.e, Hitendra Sisodia.

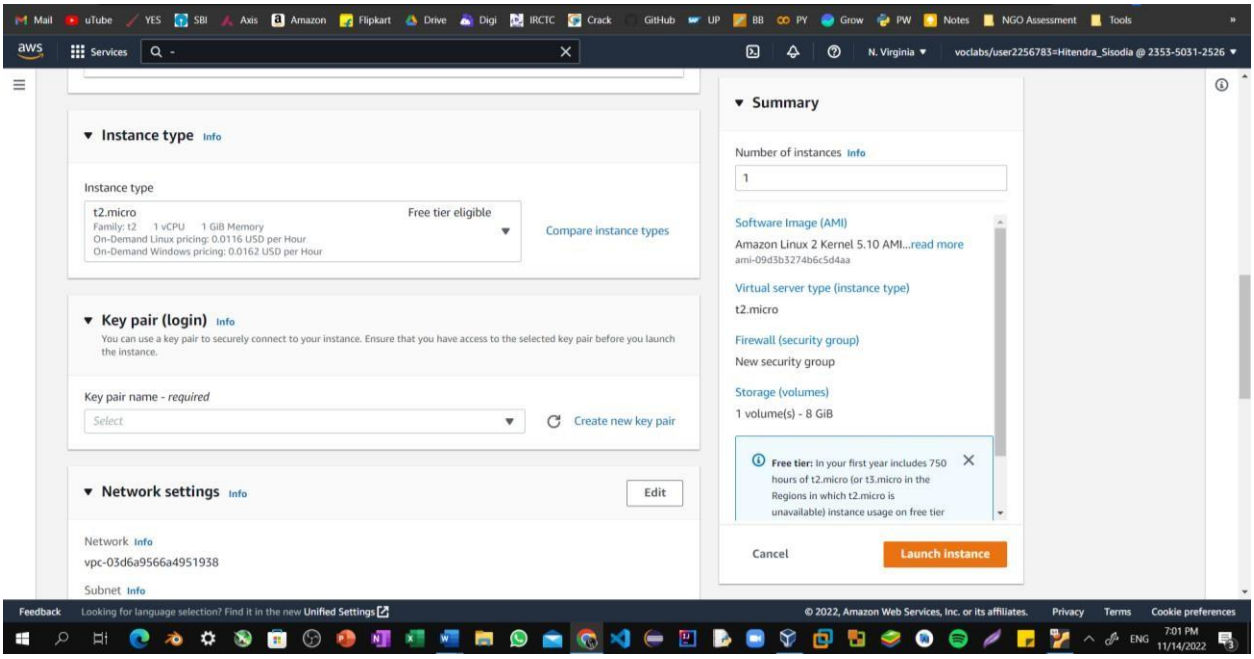


Lab 10.1: Launching an EC2

Step5: Choose an AMI from which to create the instance:
In the list of available *Quick Start* AMIs, keep the default **Amazon Linux AMI** selected. Also keep the default **Amazon Linux 2 AMI (HVM)** selected.

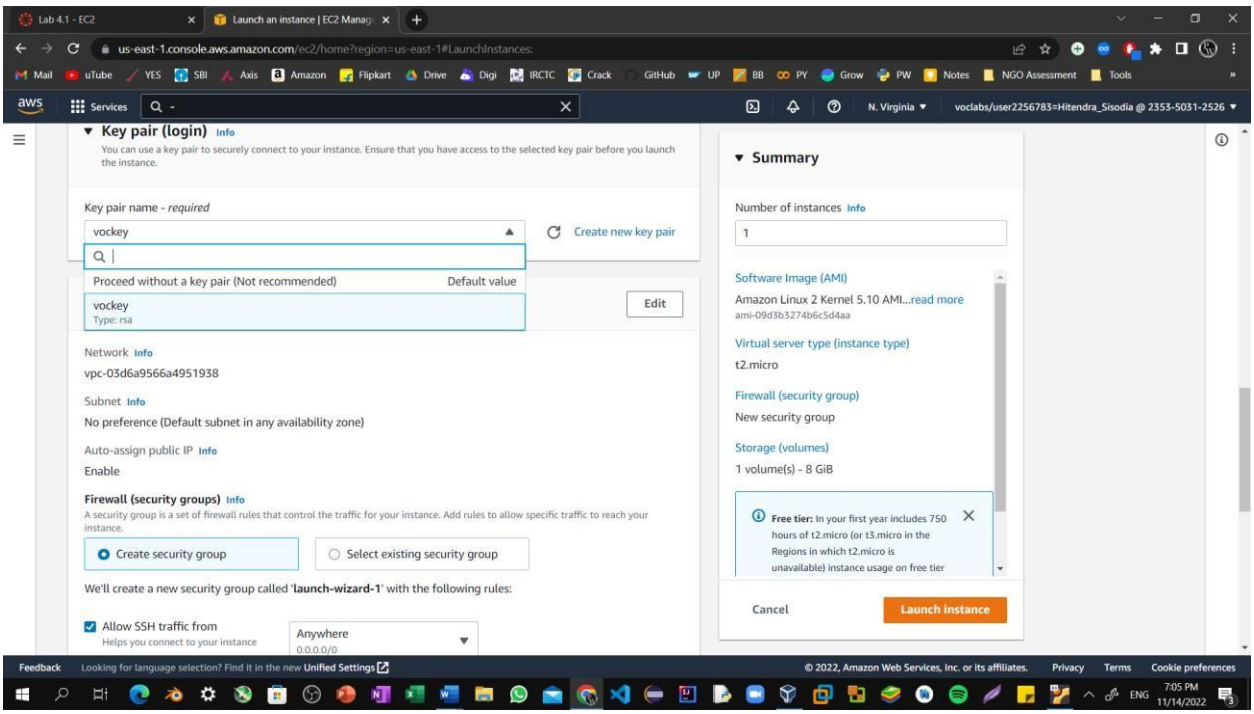


Step6: Specify an Instance type: In the *Instance type* panel, keep the default **t2.micro** selected.

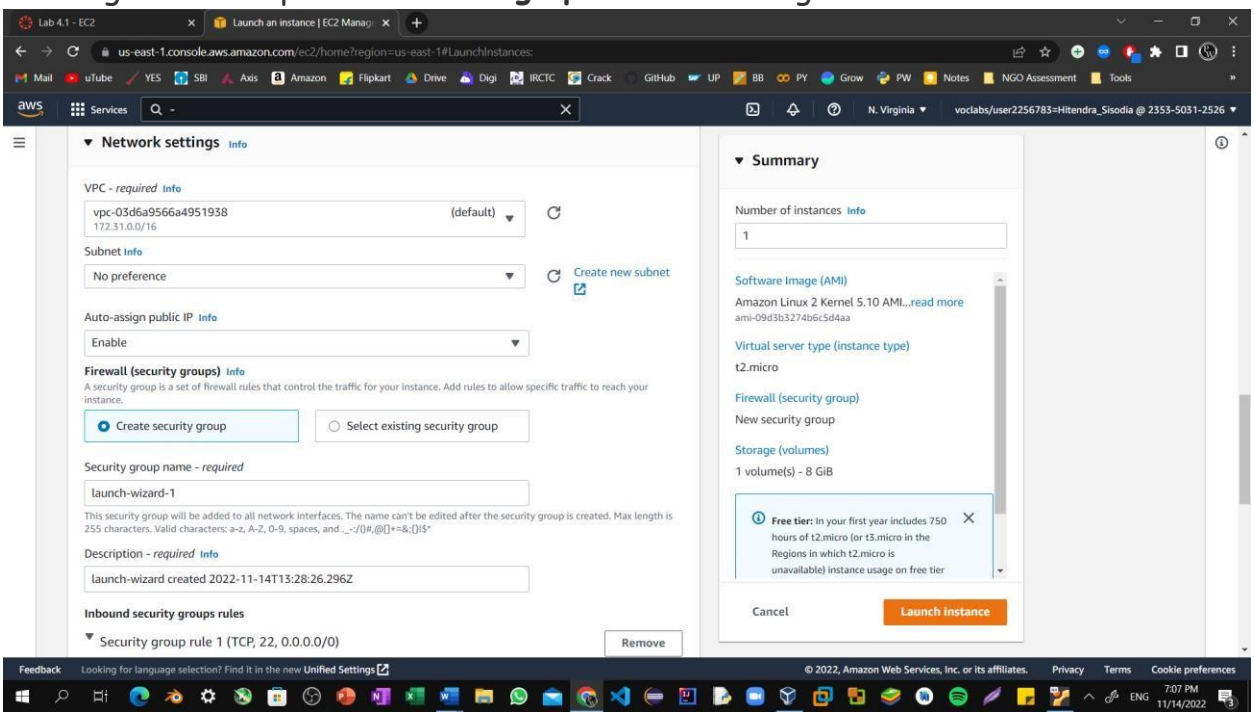


Lab 10.1: Launching an EC2

Step7: Select the key pair to associate with the instance. From the **Key pair name** menu, select **vockey**.

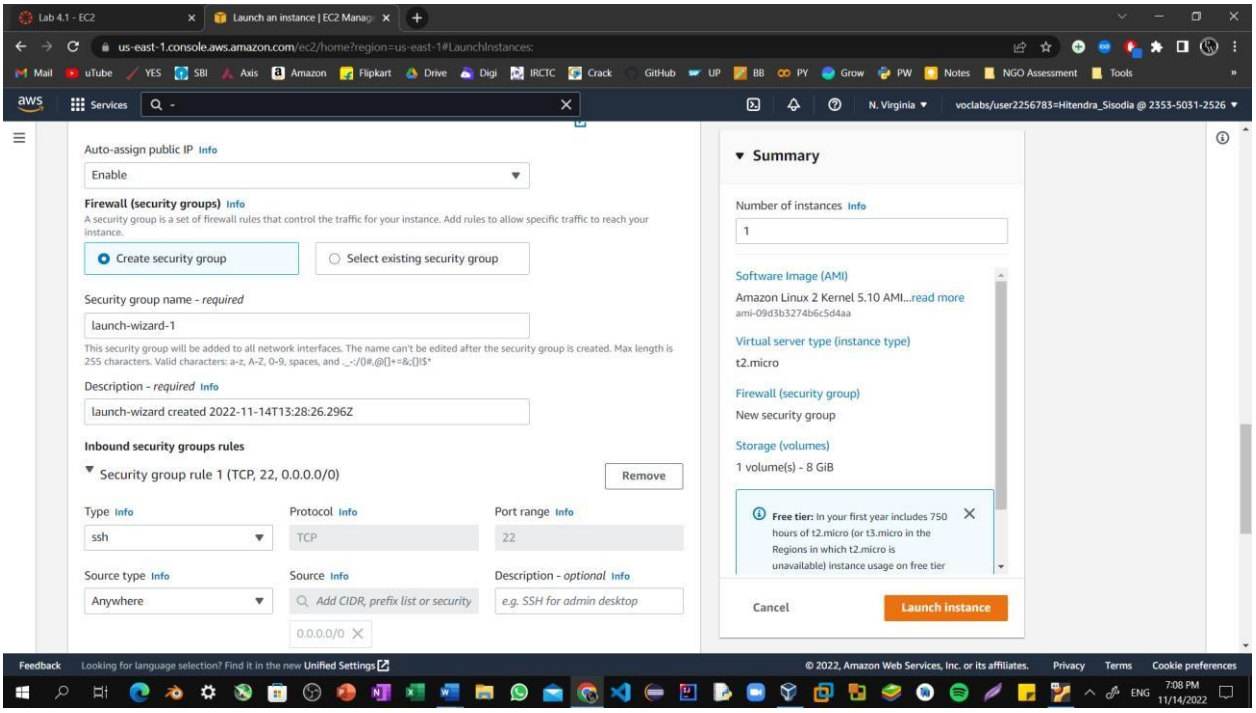


Step8: Next to Network settings, choose **Edit**. Keep the default *VPC* and *subnet* settings. Also keep the **Auto-assign public IP** setting set to **Enable**.

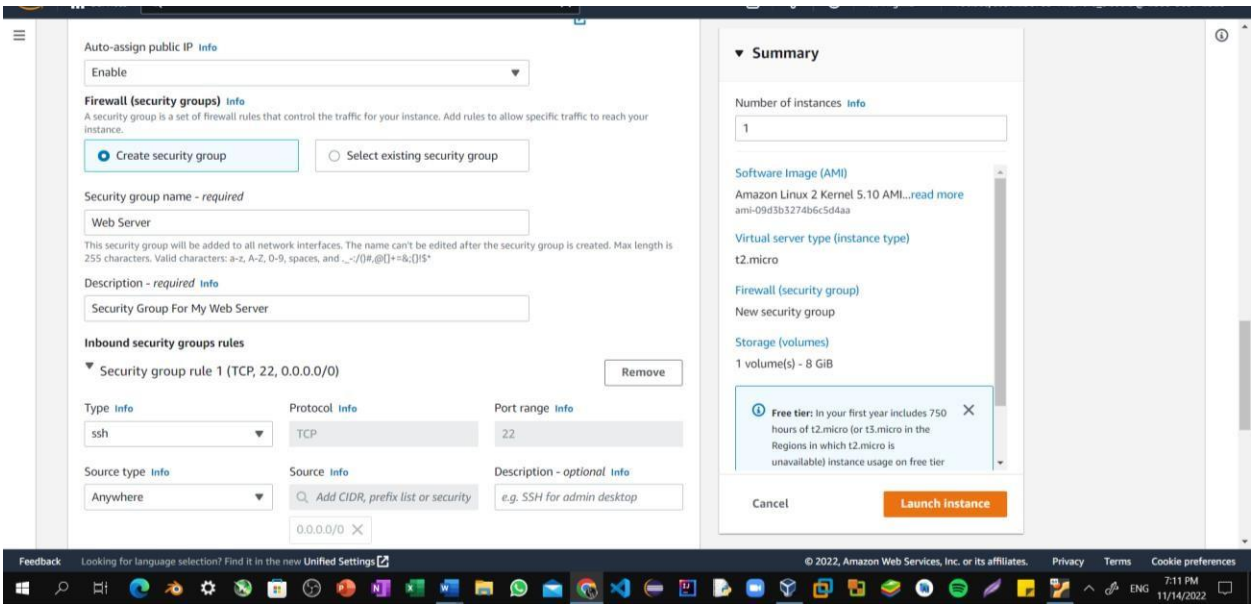


Lab 10.1: Launching an EC2

Step9: Under *Firewall (security groups)*, keep the default **Create security group** option chosen.

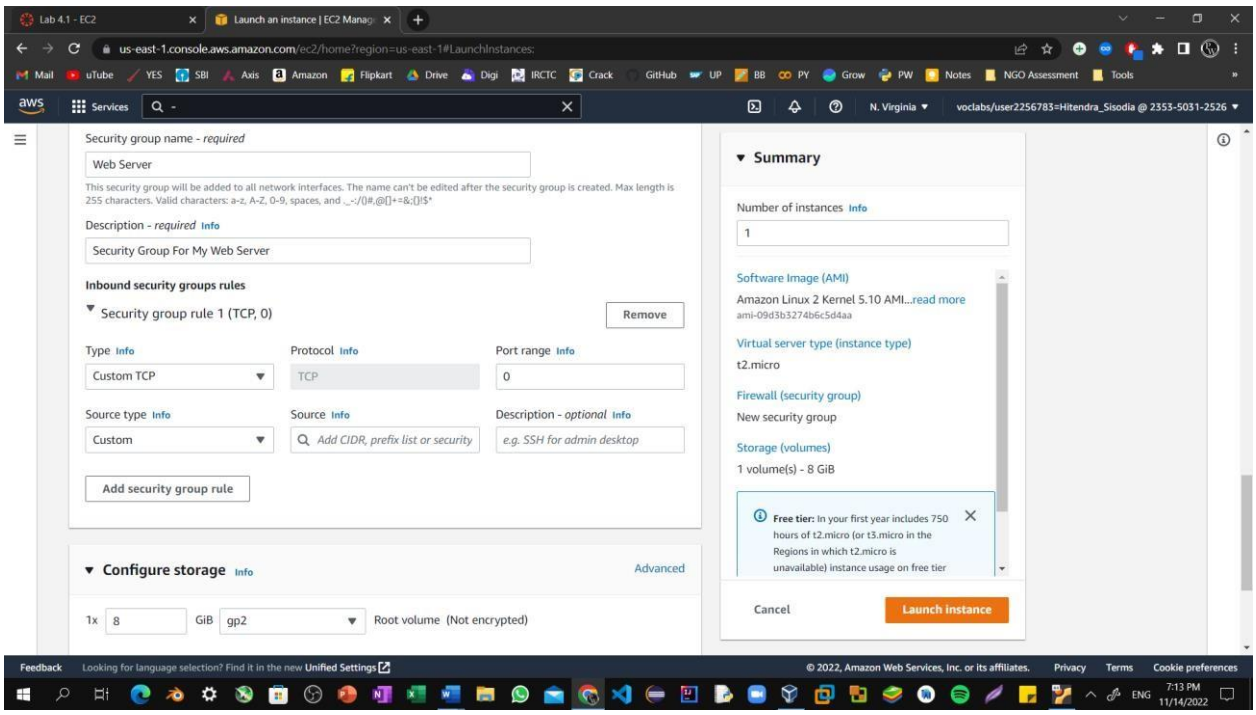


Step10: Configure a new security group:
Keep the default selection **Create a new security group**.
Security group name: Clear the text and enter Web Server.
Description: Clear the text and enter Security group for my web server.

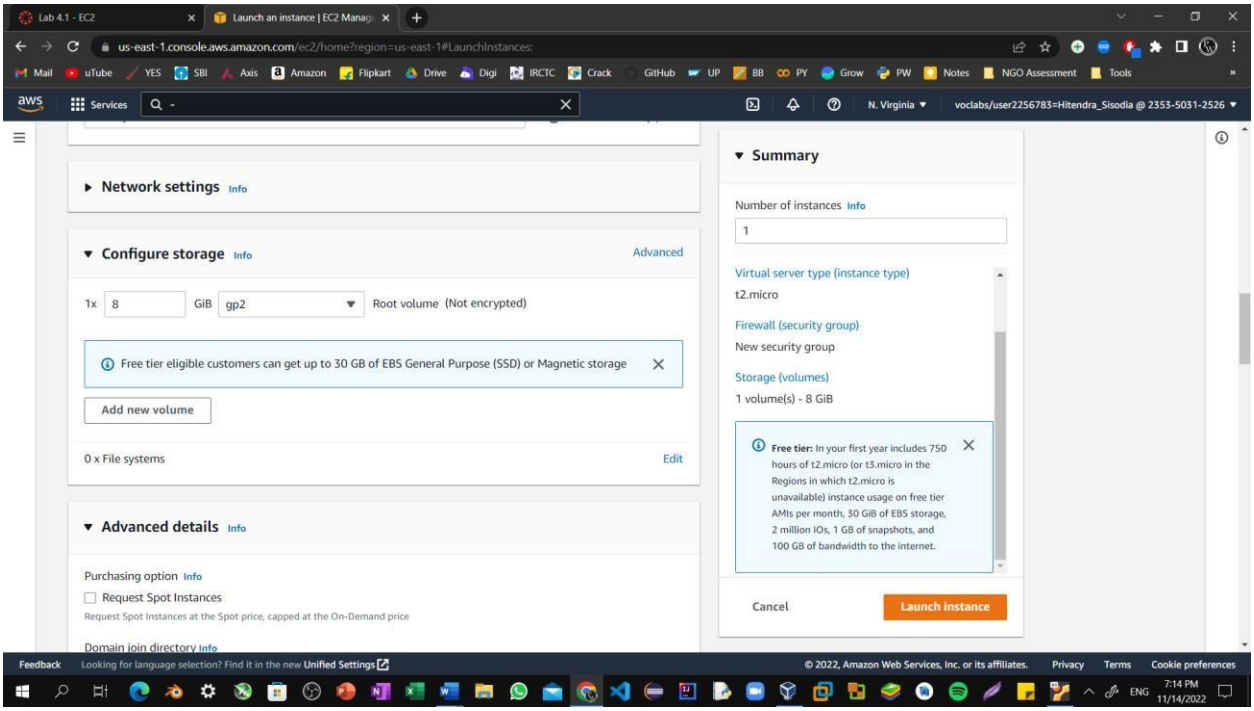


Lab 10.1: Launching an EC2

Step11: Choose **Remove** to remove the default SSH inbound rule.



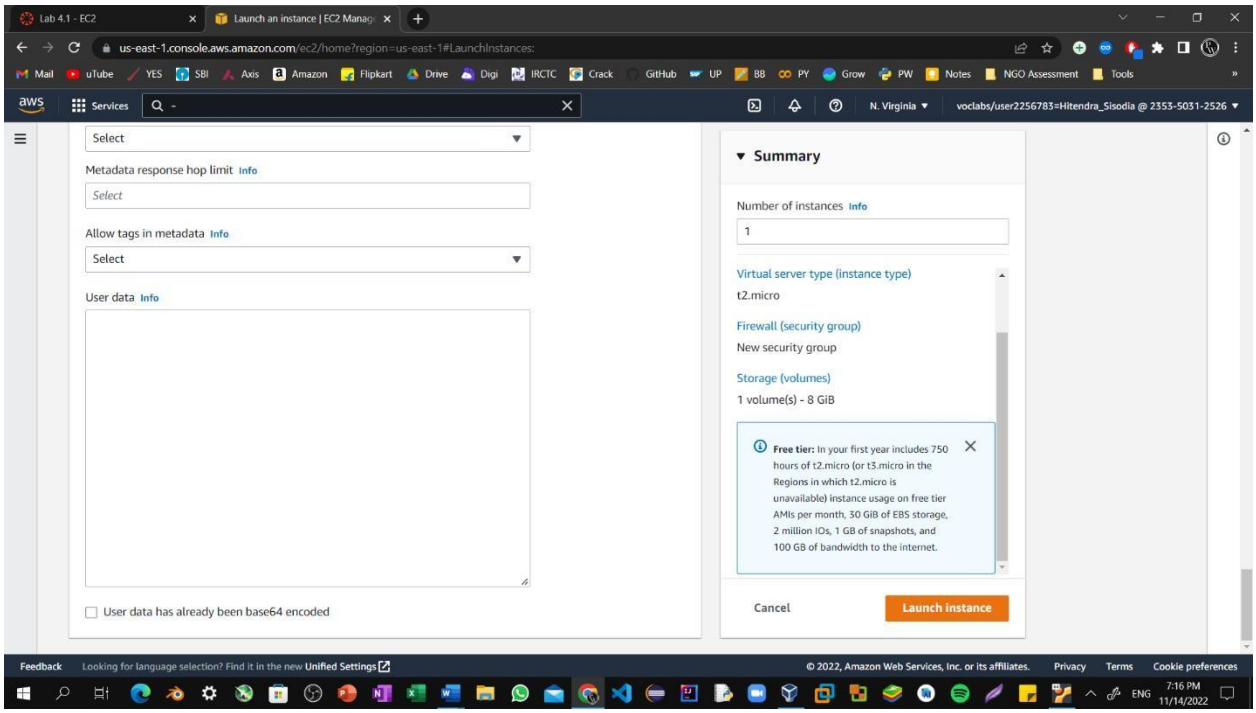
Step12: In the *Configure storage* section, keep the default settings. You will launchthe Amazon EC2 instance using a default Elastic Block Store (EBS) disk volume.



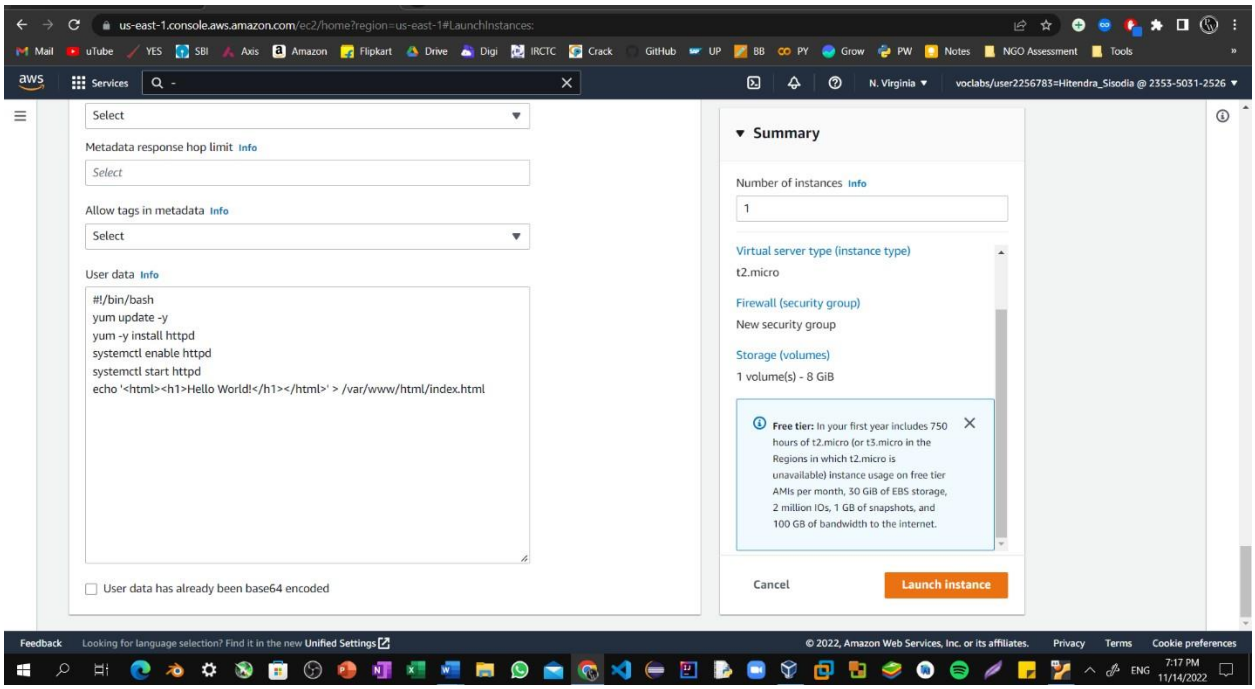
Lab 10.1: Launching an EC2

Step13: Configure a script to run on the instance when it launches:

- Expand the **Advanced details** panel.

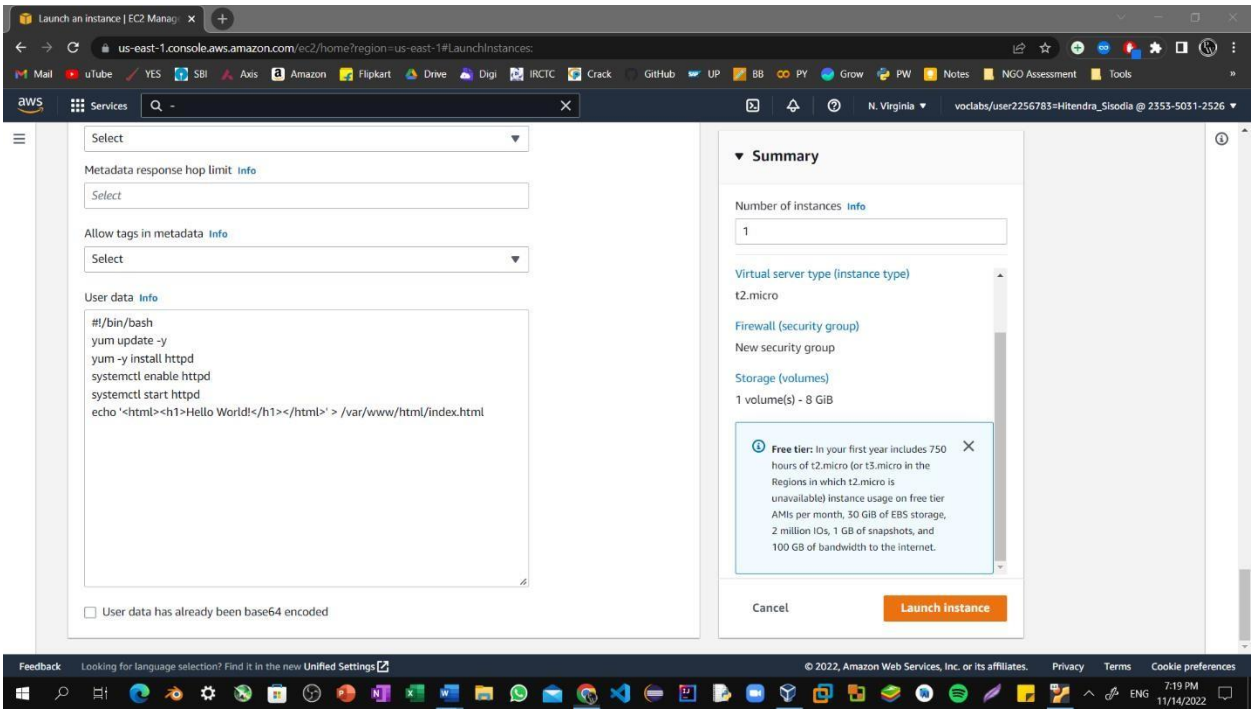


Step14: Scroll to the bottom of the page and then copy and paste the code shownbelow into the **User data** box.

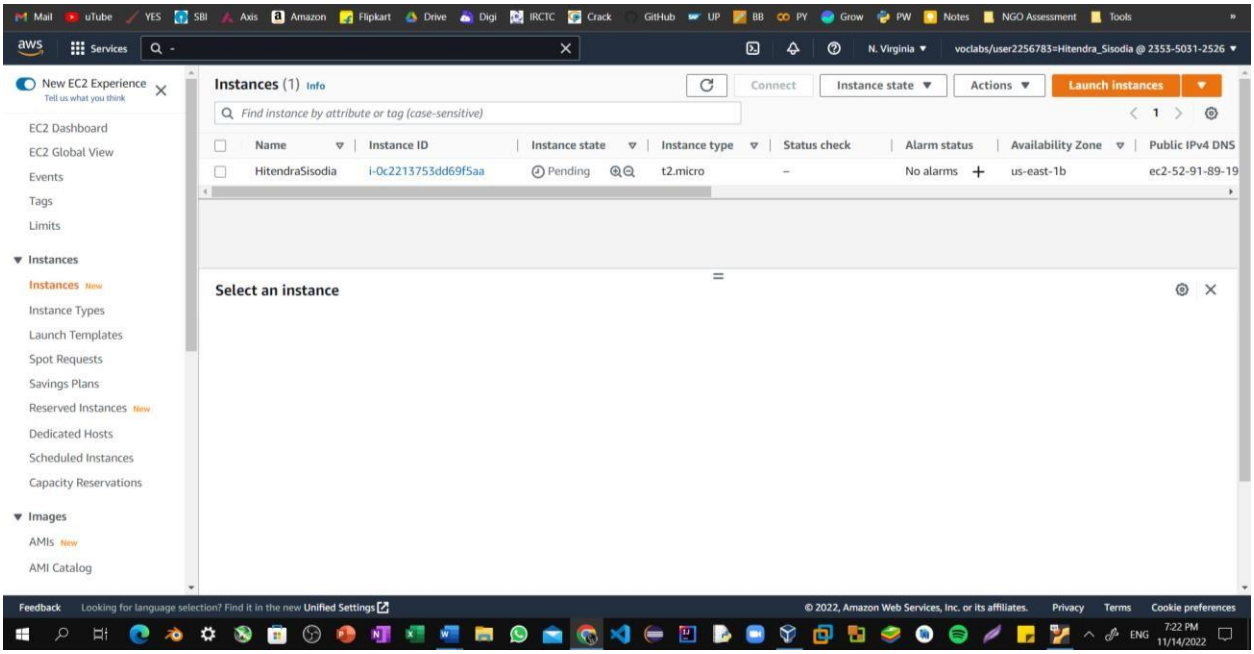


Lab 10.1: Launching an EC2

Step15: At the bottom of the **Summary** panel on the right side of the screenchoose Launch Instances. You will see a Success message.

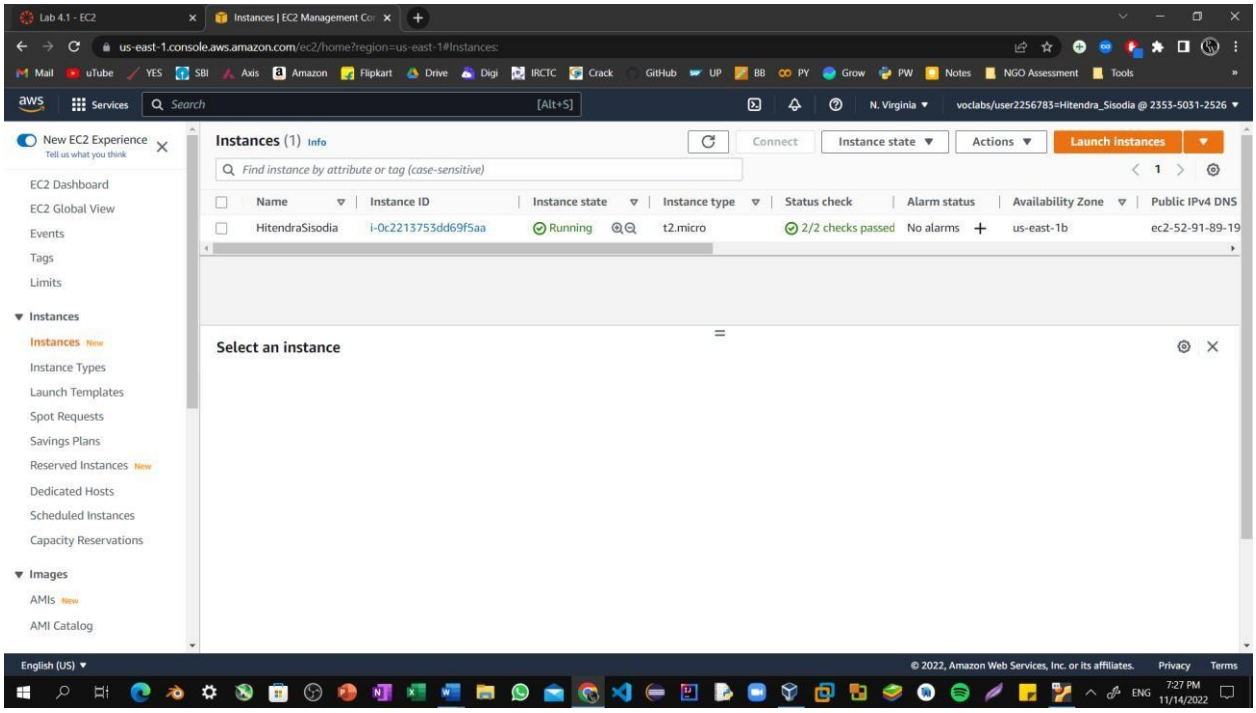


Step16: The instance will first appear in the *Pending* state, which means it is being launched. The state will then change to *Running*, which indicates that the instance has started booting. It takes a few minutes for the instance to boot.

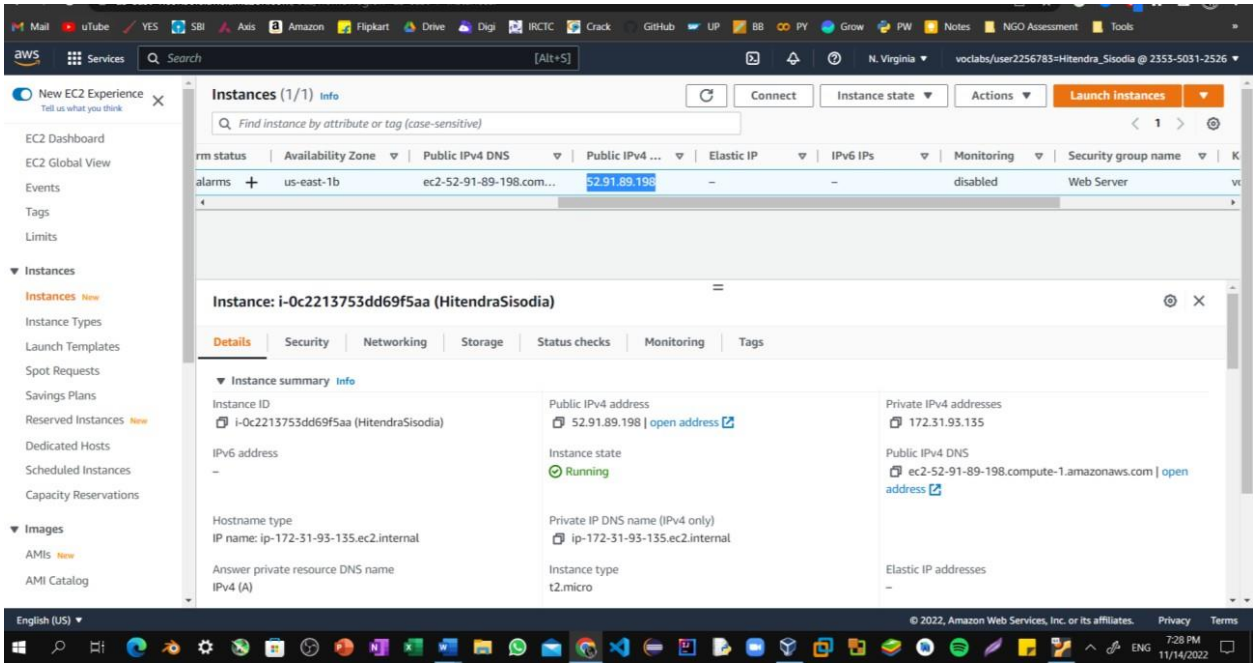


Lab 10.1: Launching an EC2

Step17: Before you continue, wait for your instance to display the following:
Instance state: *Running*
Status check: *2/2 checks passed*

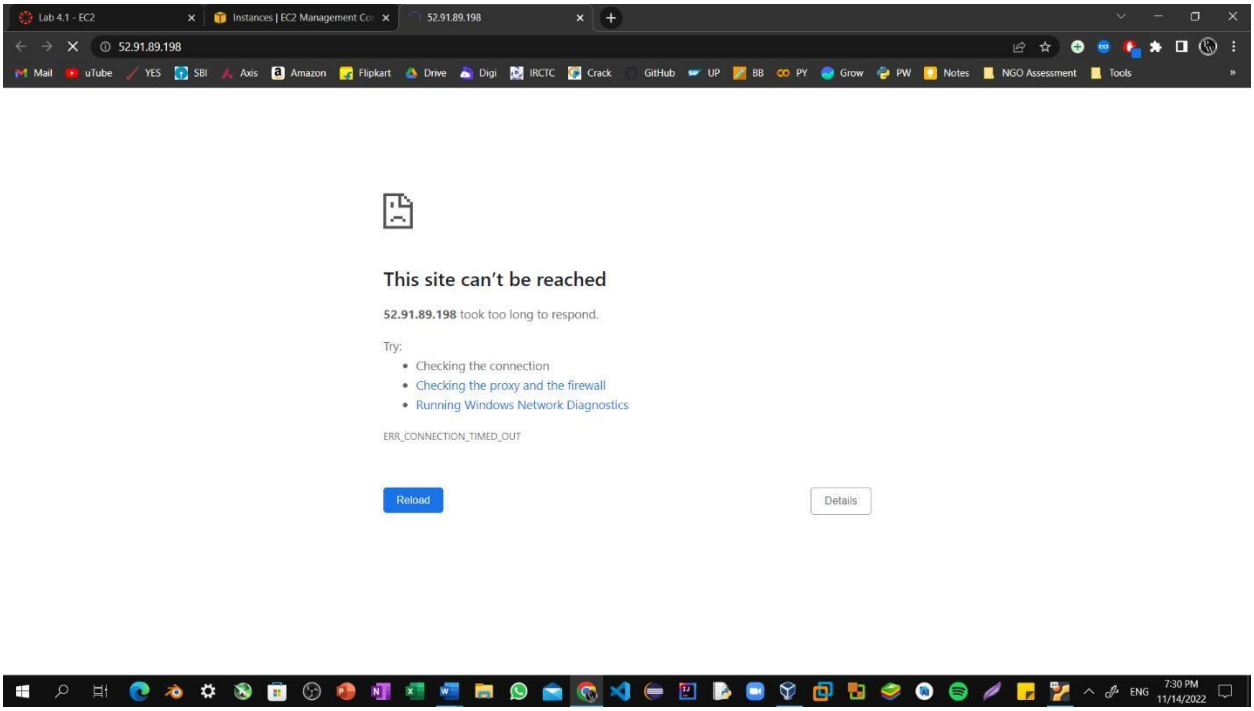


Step18: From the **Details** tab, copy the **Public IPv4 address** value of your instance to your clipboard.

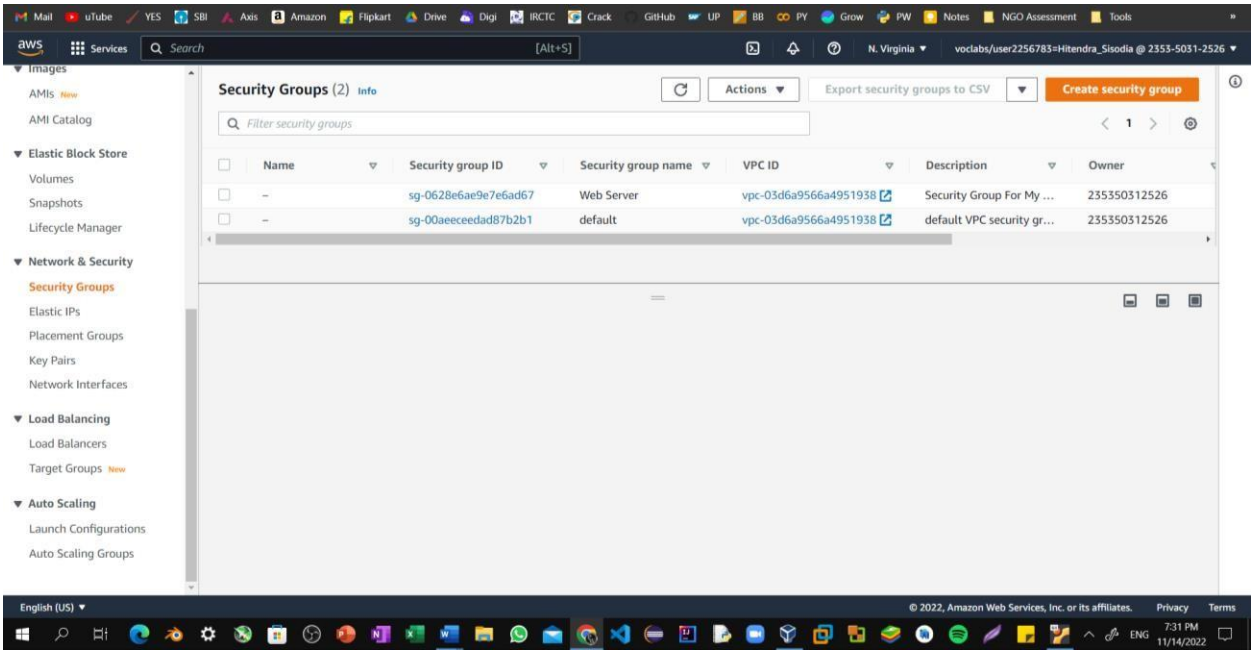


Lab 10.1: Launching an EC2

Step19: Open a new tab in your web browser, paste the public IP address you just copied, and press **Enter**.
The webpage does not load. You must update the security group to be able to access the page.

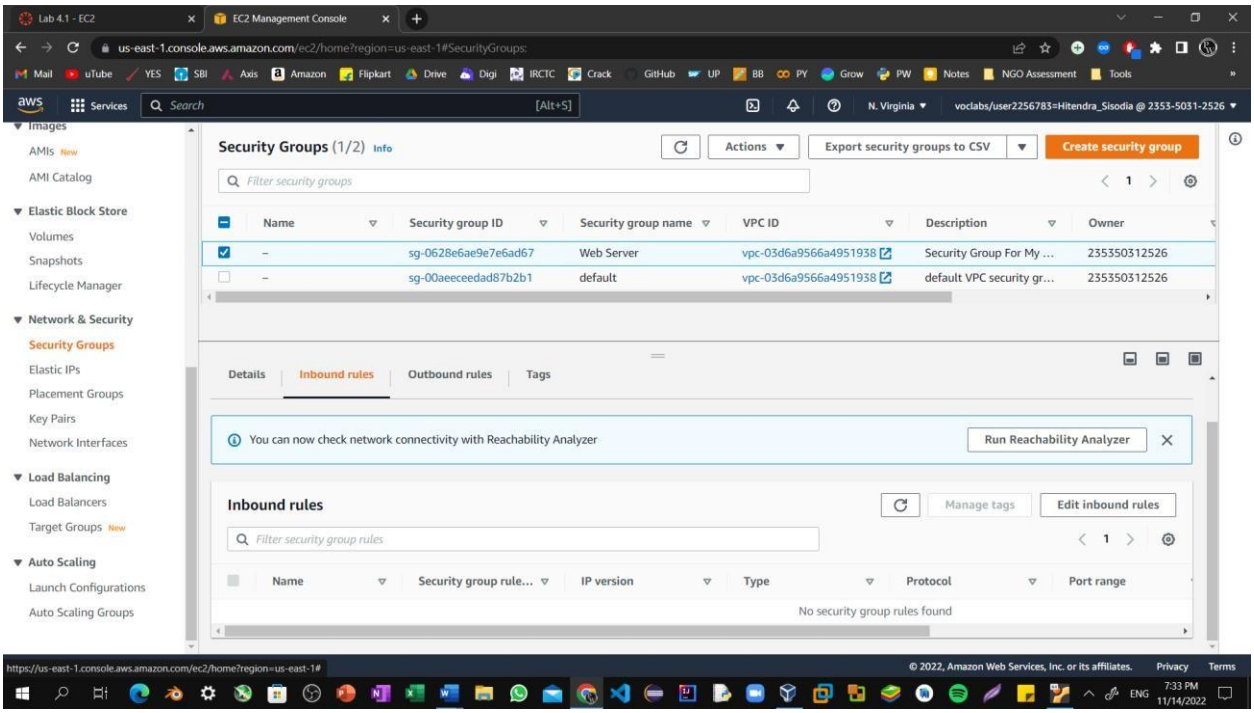


Step20: Return to the **EC2 Management Console** browser tab. In the left navigation pane, under **Network & Security**, choose **Security Groups**.

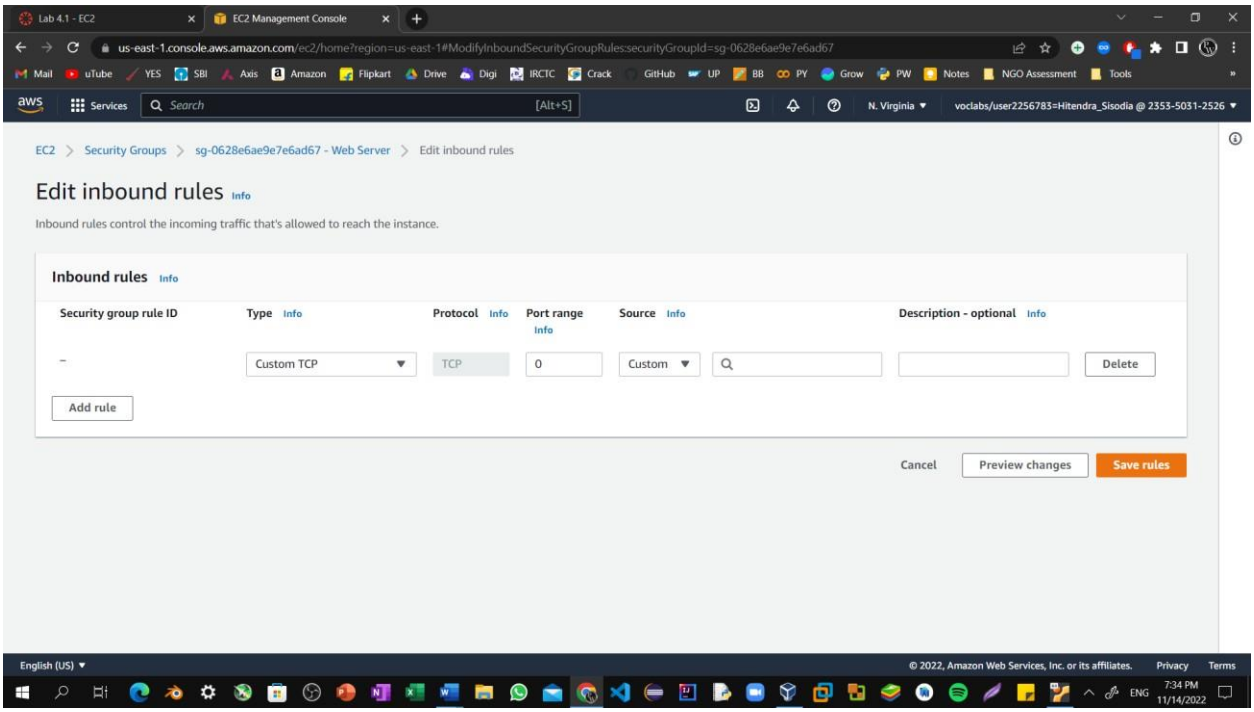


Lab 10.1: Launching an EC2

Step21: Select the **Web Server** security group, which you created when launching your EC2 instance. In the lower pane, choose the **Inbound rules** tab.



Step22: Choose **Edit inbound rules**, and then choose **Add rule**.

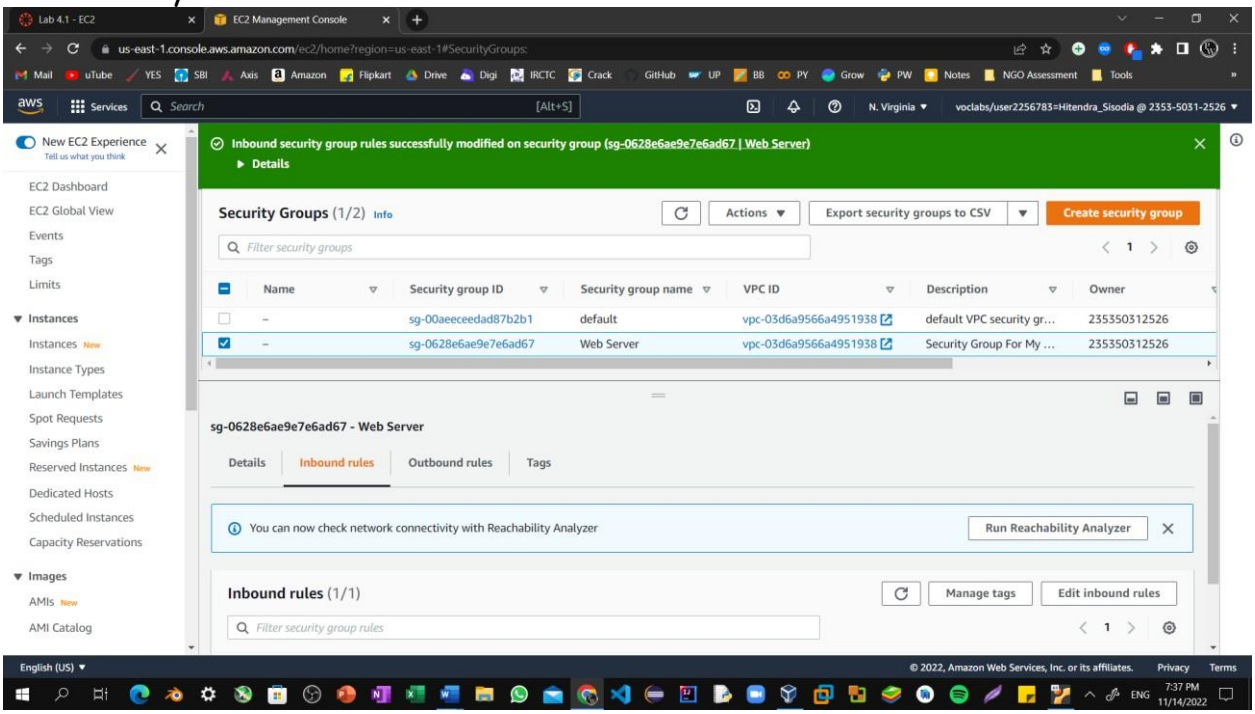


Lab 10.1: Launching an EC2

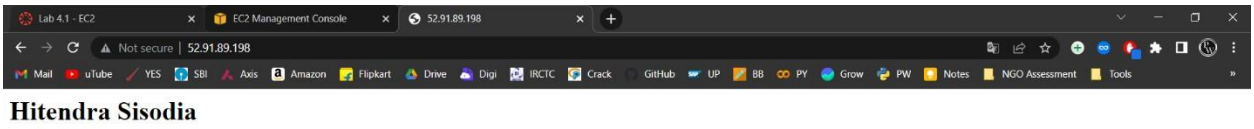
Step23: Configure the following:

Type: HTTP

Source: Anywhere-IPv4 Choose **Save rules**



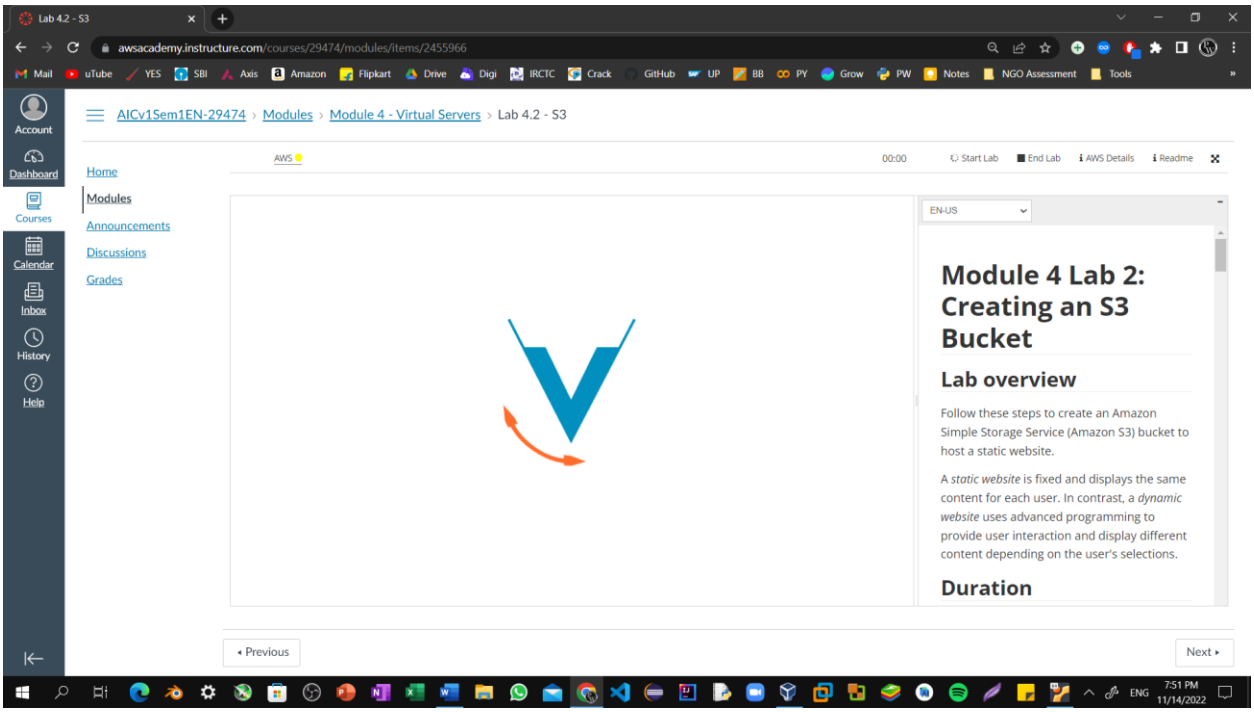
Step24: Return to the tab that you used to try to connect to the web server. The page should display the message *Hitendra Sisodia.*



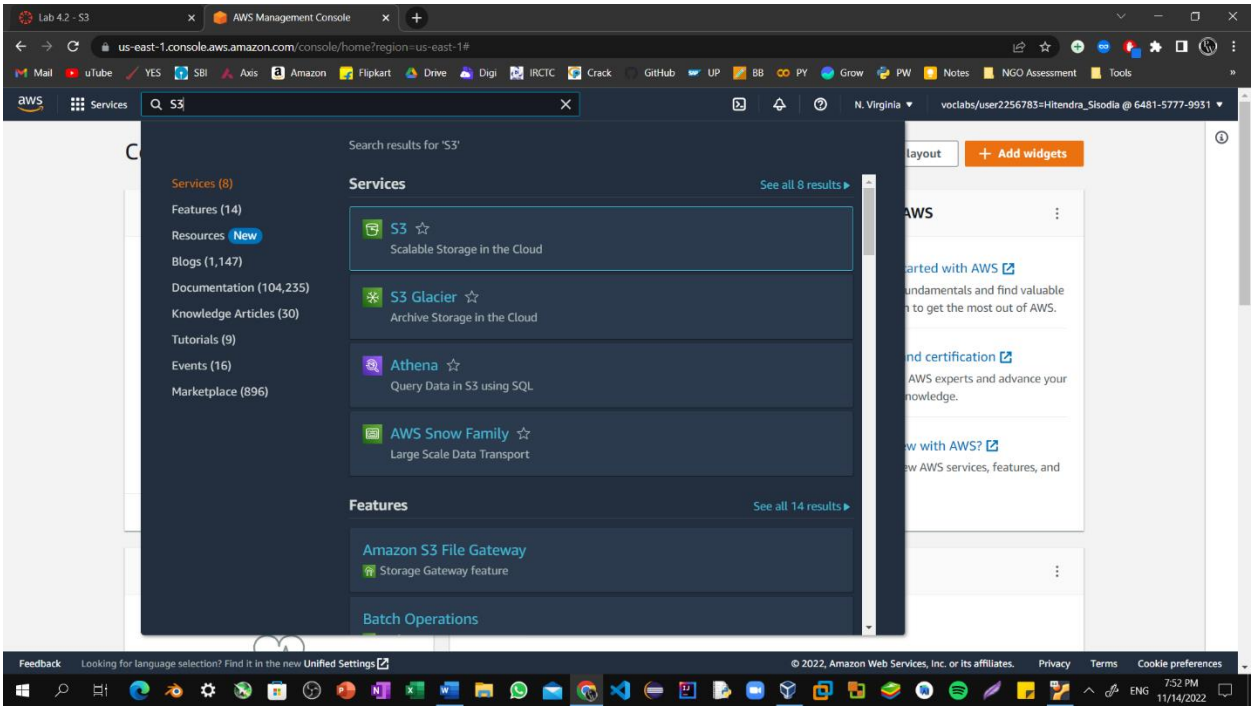
Name: Hitendra Sisodia
Sap id: 500091910

Lab 10.2: Launching an S3 Bucket

Step1: To start the lab session, choose **Start Lab** in the upper-right corner of the page.

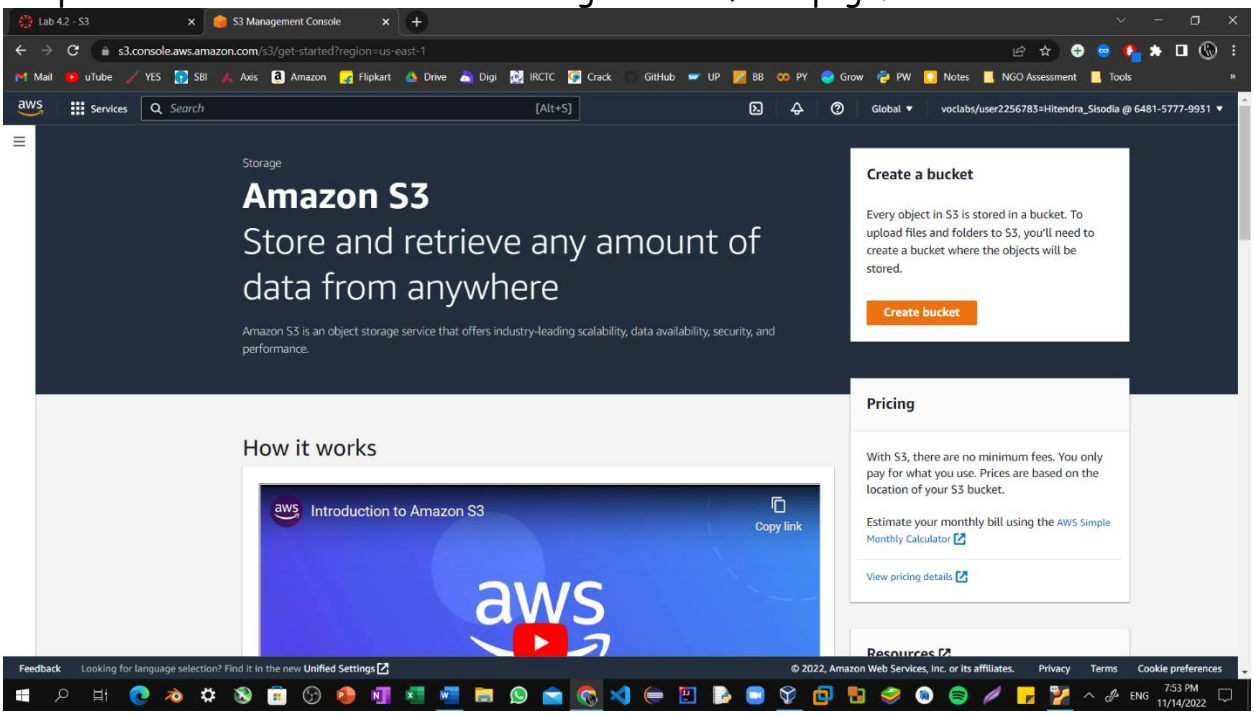


Step2: Choose the **Services** menu, locate the **Storage** services, and select **S3**.

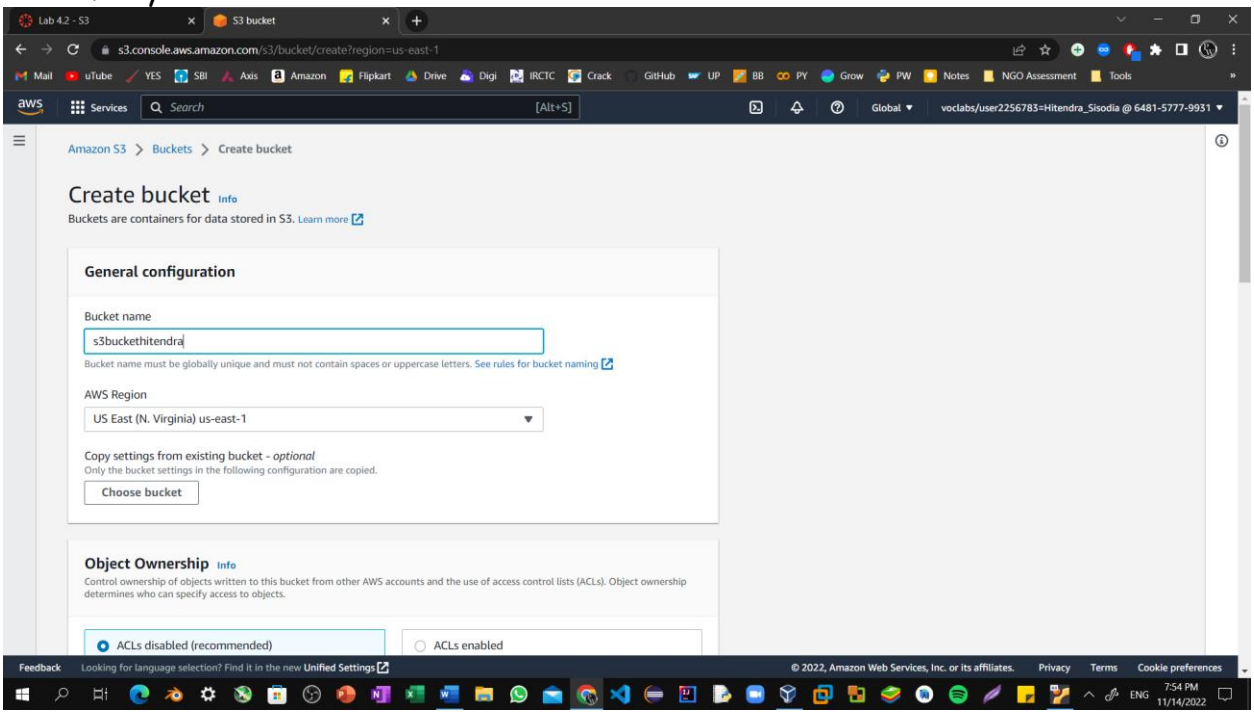


Lab 10.2: Launching an S3 Bucket

Step3: Select **Create bucket** on the right side of the page.

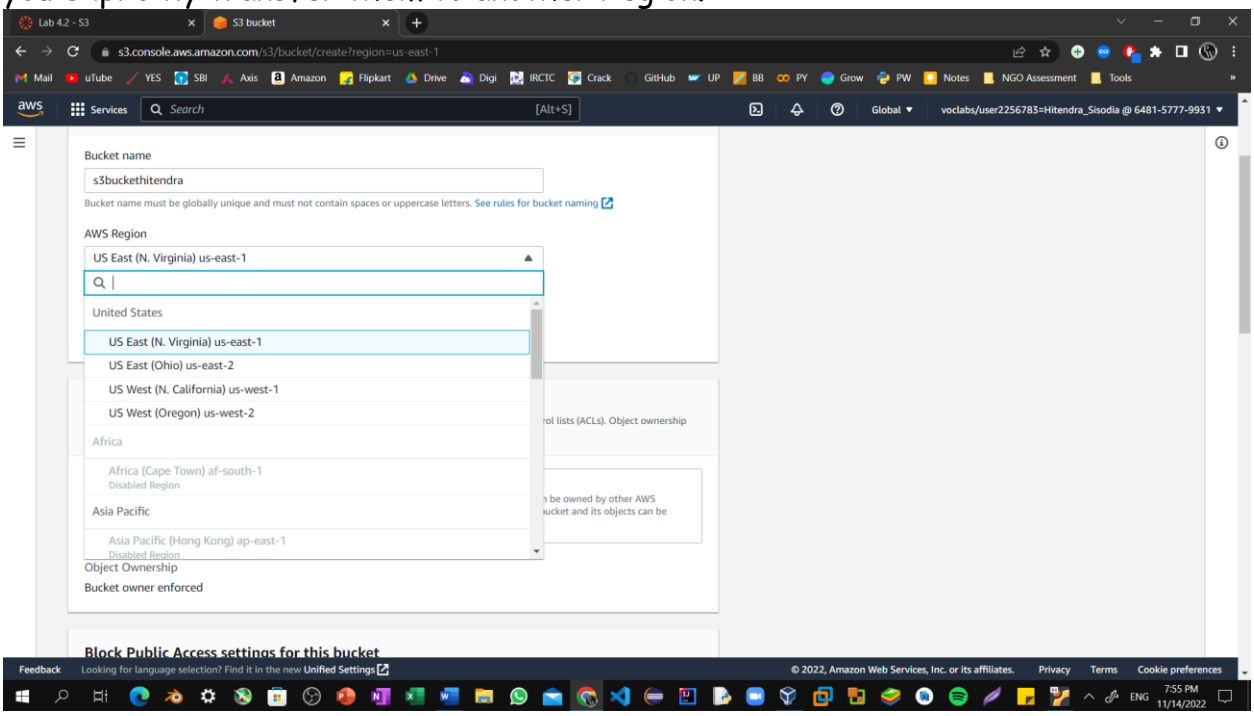


Step4: For **Bucket name**, enter a unique Domain Name System (DNS)-compliant name for your new bucket.

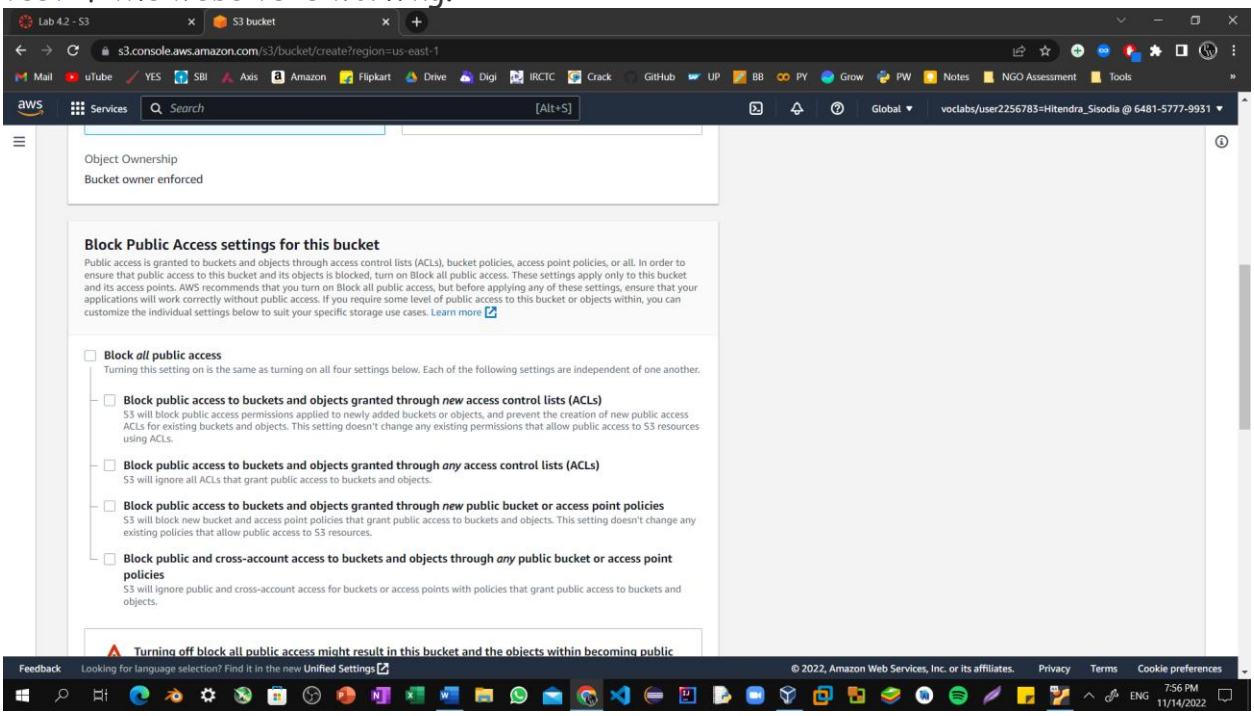


Lab 10.2: Launching an S3 Bucket

Step5: For **Region**, choose the AWS Region where you want the bucket to reside. Choose a Region close to you to minimize latency and costs, or to address regulatory requirements. Objects stored in a Region never leave that Region unless you explicitly transfer them to another Region.

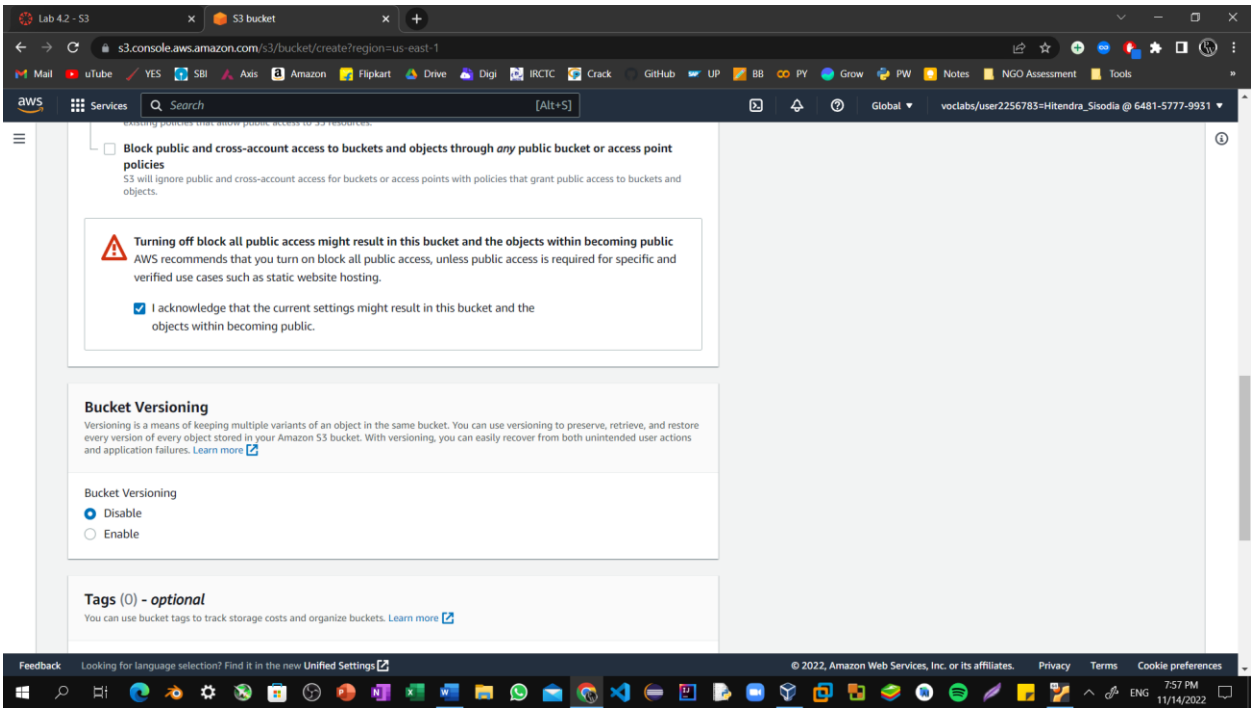


Step6: Uncheck the **Block *all* public access** box because you want to be able to test if the website is working.

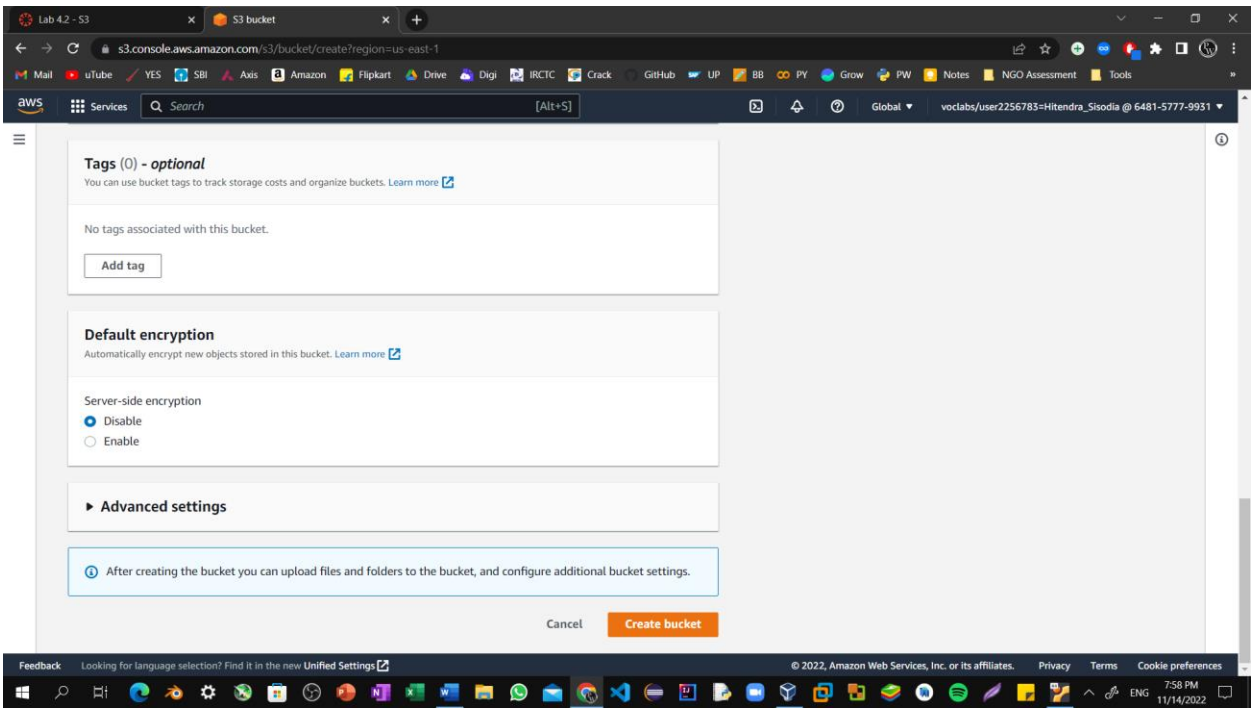


Lab 10.2: Launching an S3 Bucket

Step7: Below the warning, check the box next to **I acknowledge that....**



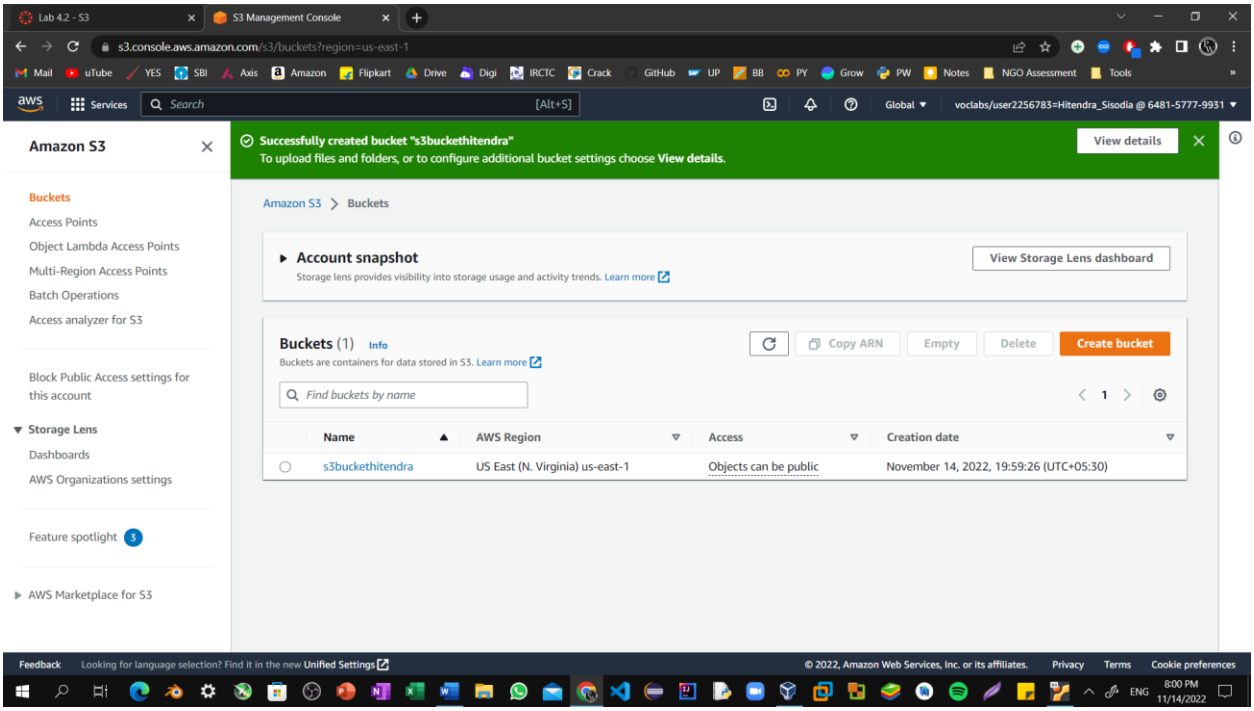
Step8: Scroll to the bottom of the page, and select **Create bucket**.



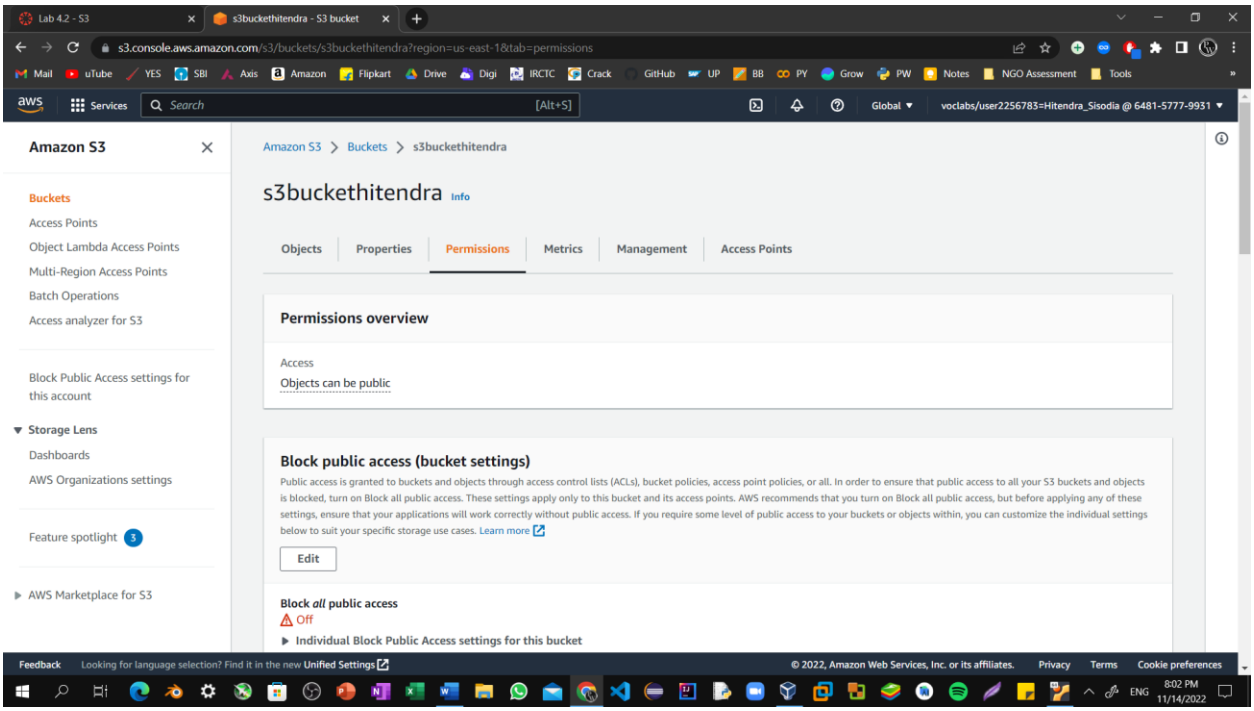
Name: Hitendra Sisodia
Sap id: 500091910

Lab 10.2: Launching an S3 Bucket

Step9: Successfully created Bucket.

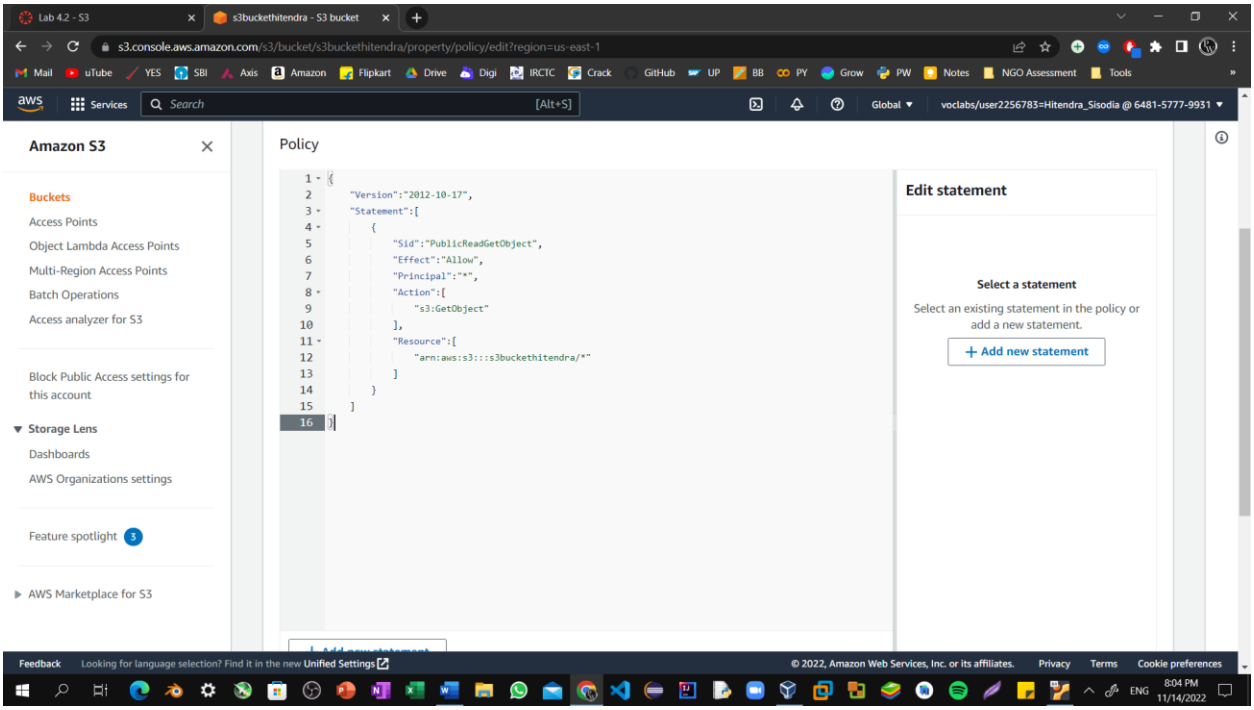


Step10: Choose the link for your bucket's name, and then select the permission tab.

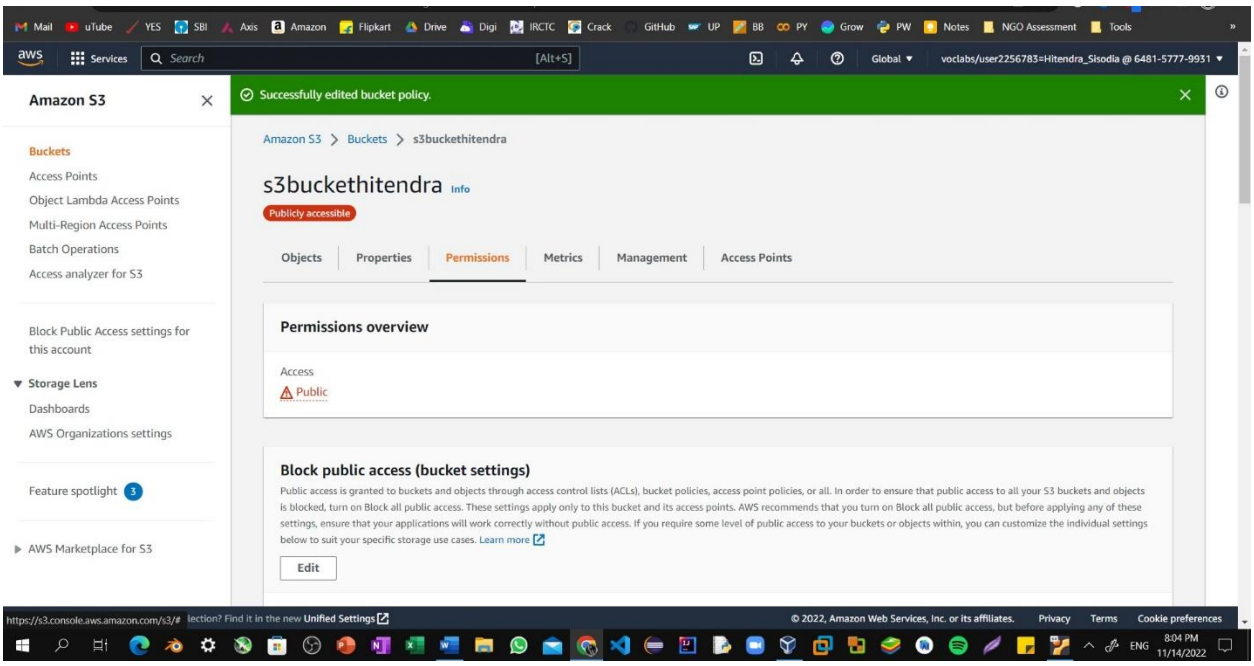


Lab 10.2: Launching an S3 Bucket

Step11: In the **Bucket policy** section, choose **Edit**.
To grant public read access for your website, copy the following bucket policy, and paste it in the policy editor.

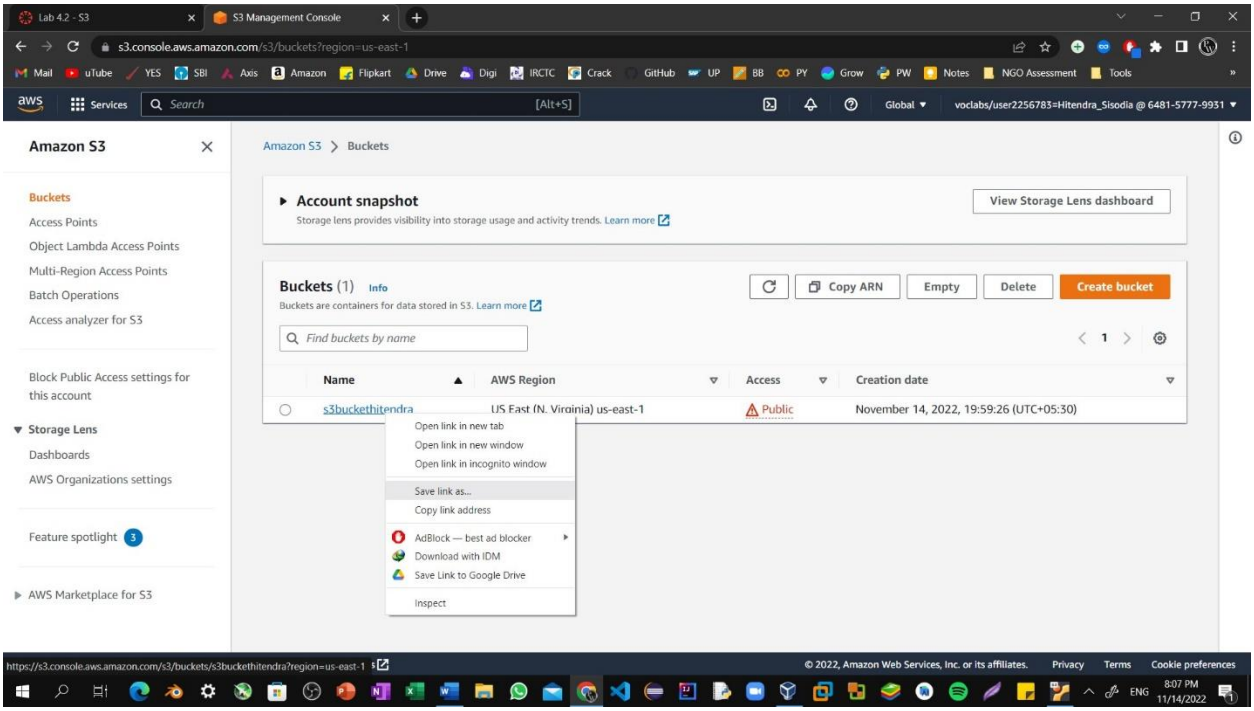


Step12: In the policy, replace **example-bucket** with the name of your bucket.
Select **Save changes**.

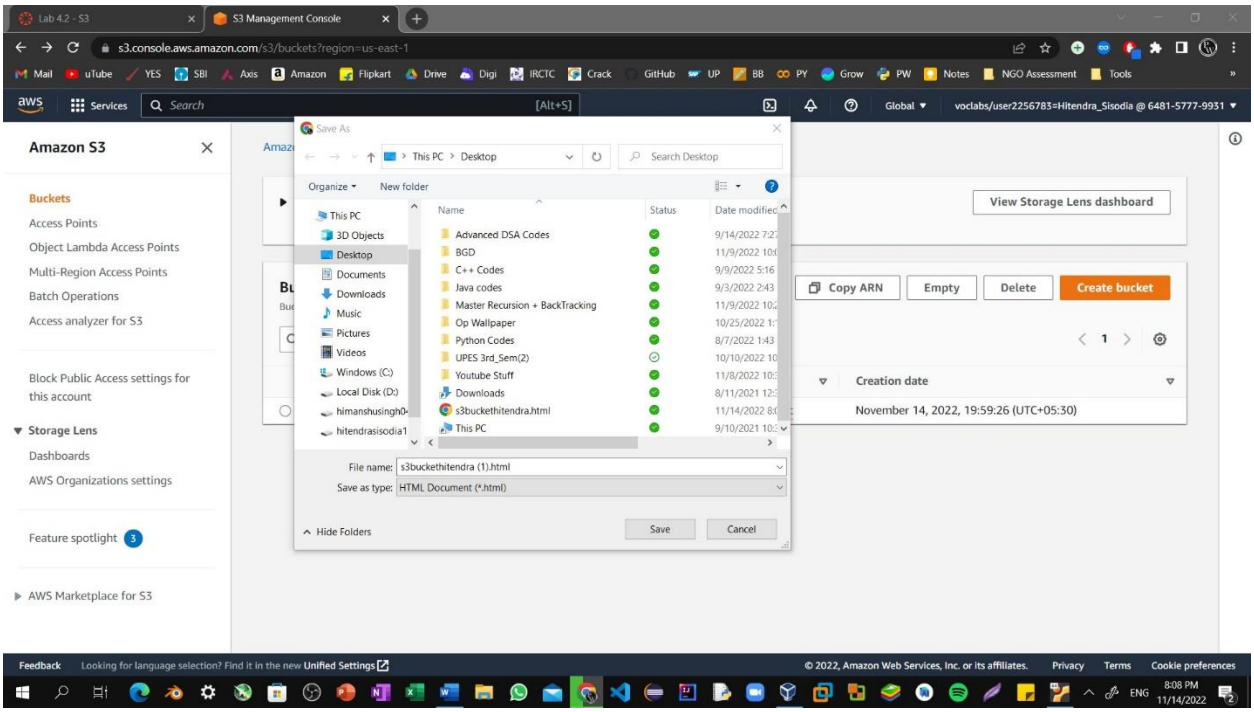


Lab 10.2: Launching an S3 Bucket

Step13: Open the context menu (right-click) for the following link, and then choose **Save link as**: index.html

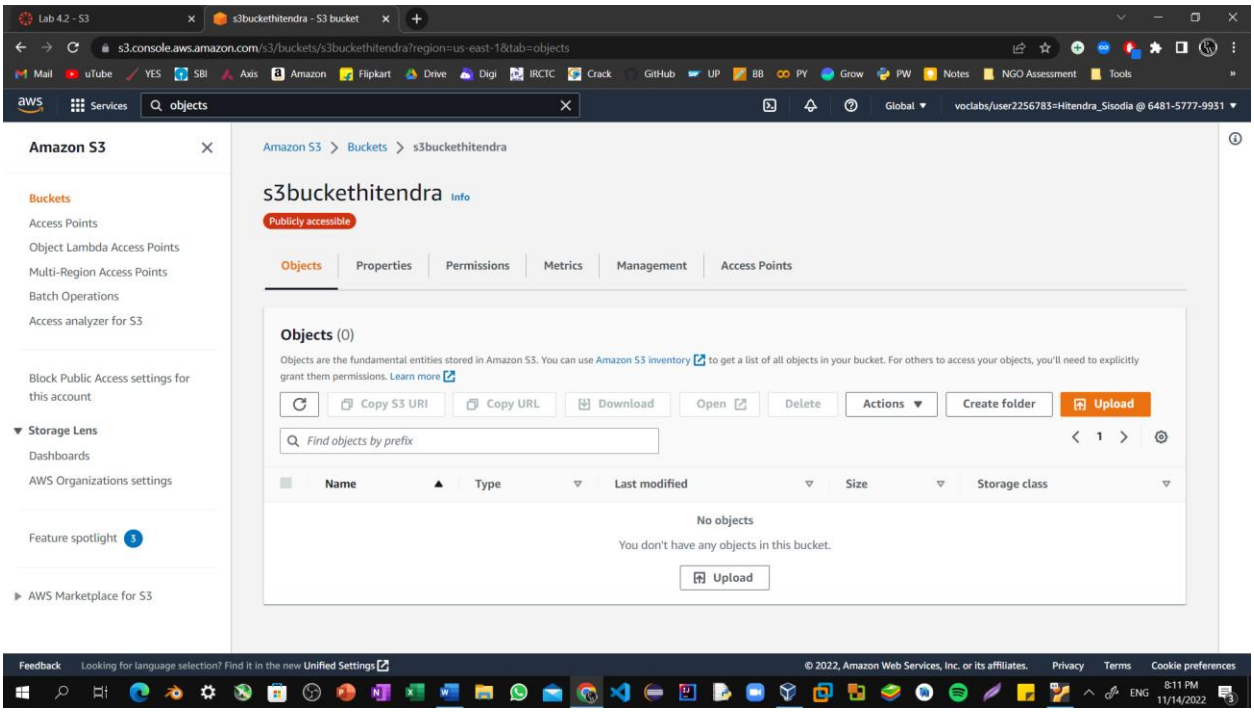


Step14: Save the index.html file to your local computer.

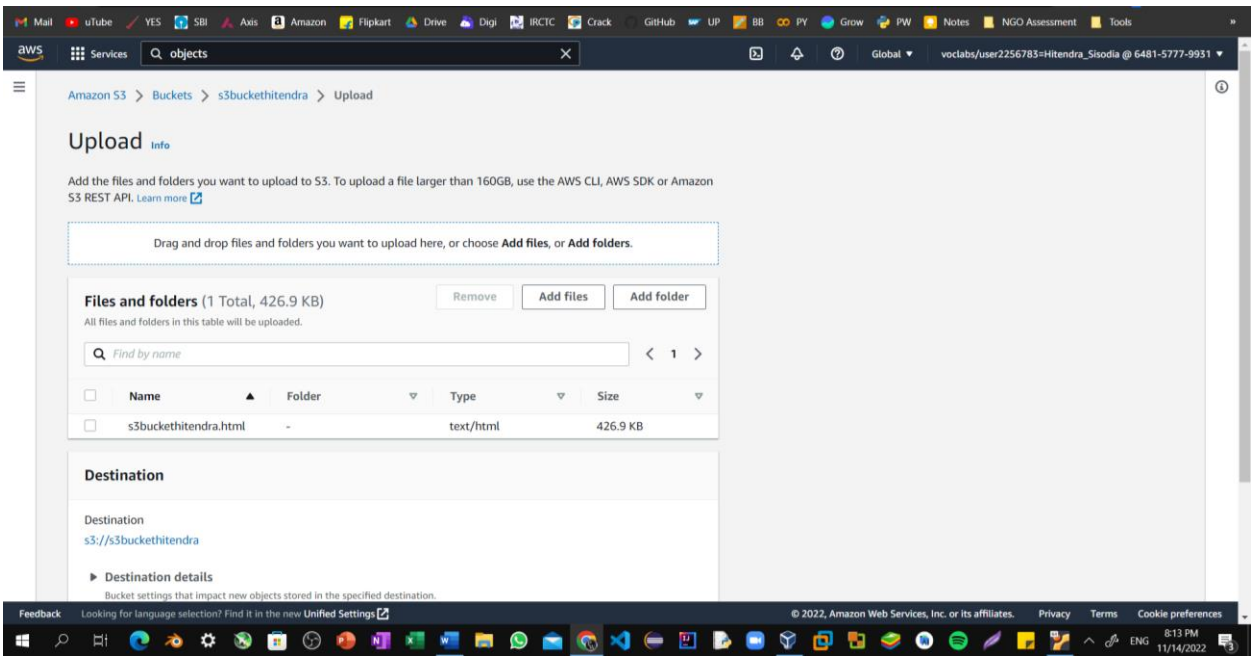


Lab 10.2: Launching an S3 Bucket

Step15: In the console, choose the **Objects** tab.

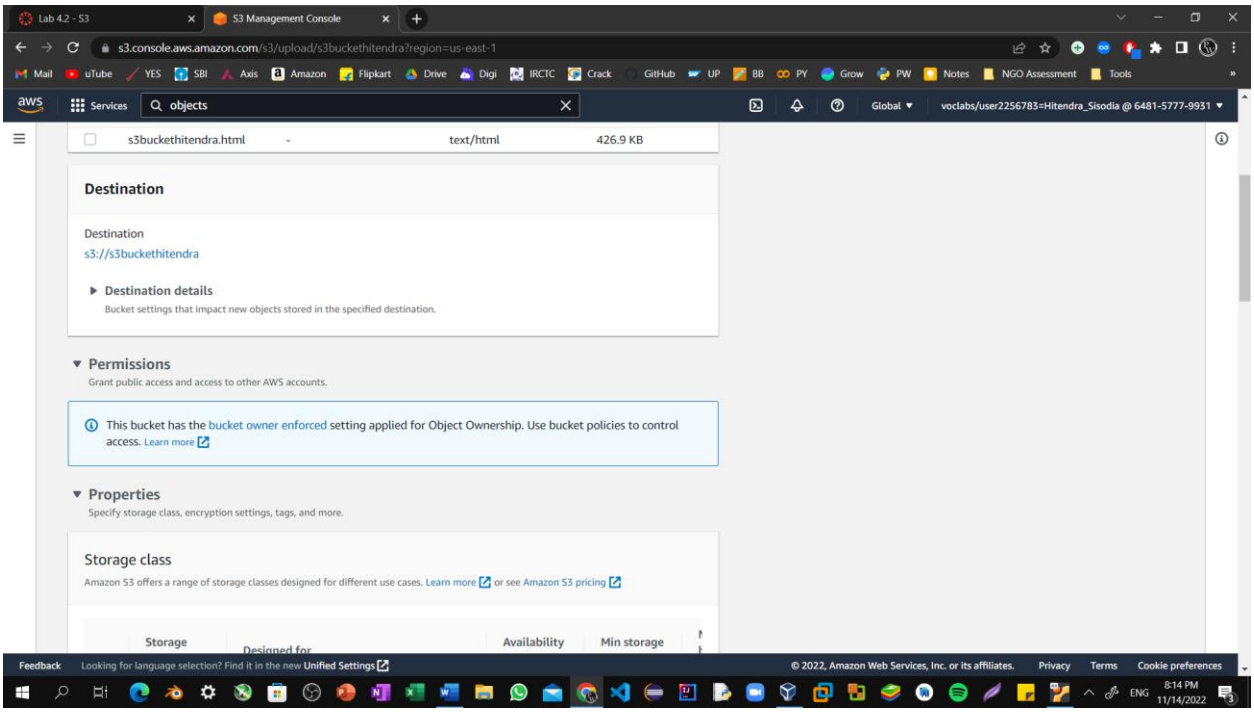


Step16: Upload the index.html file to your bucket.
Choose **Upload**.
Drag and drop the index.html file onto the upload page.
As an alternative, choose **Add files**, navigate to the file, and choose **Open**.

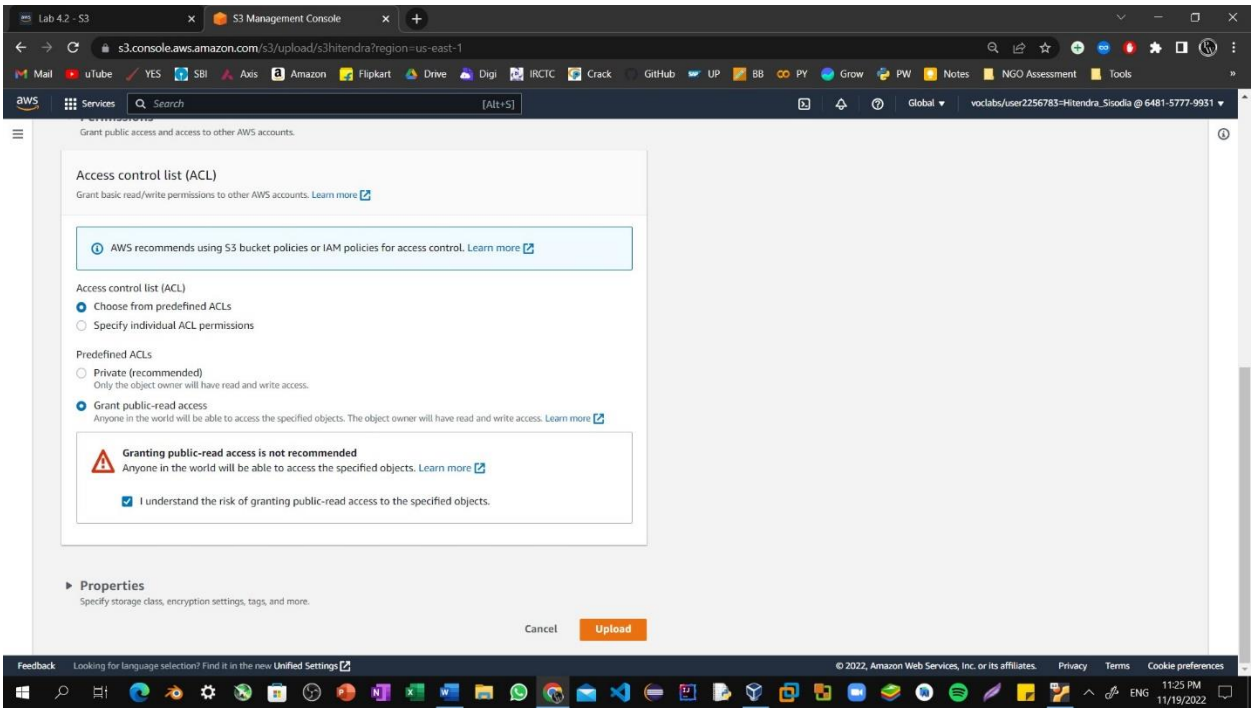


Lab 10.2: Launching an S3 Bucket

Step17: Expand the **Permissions** section.

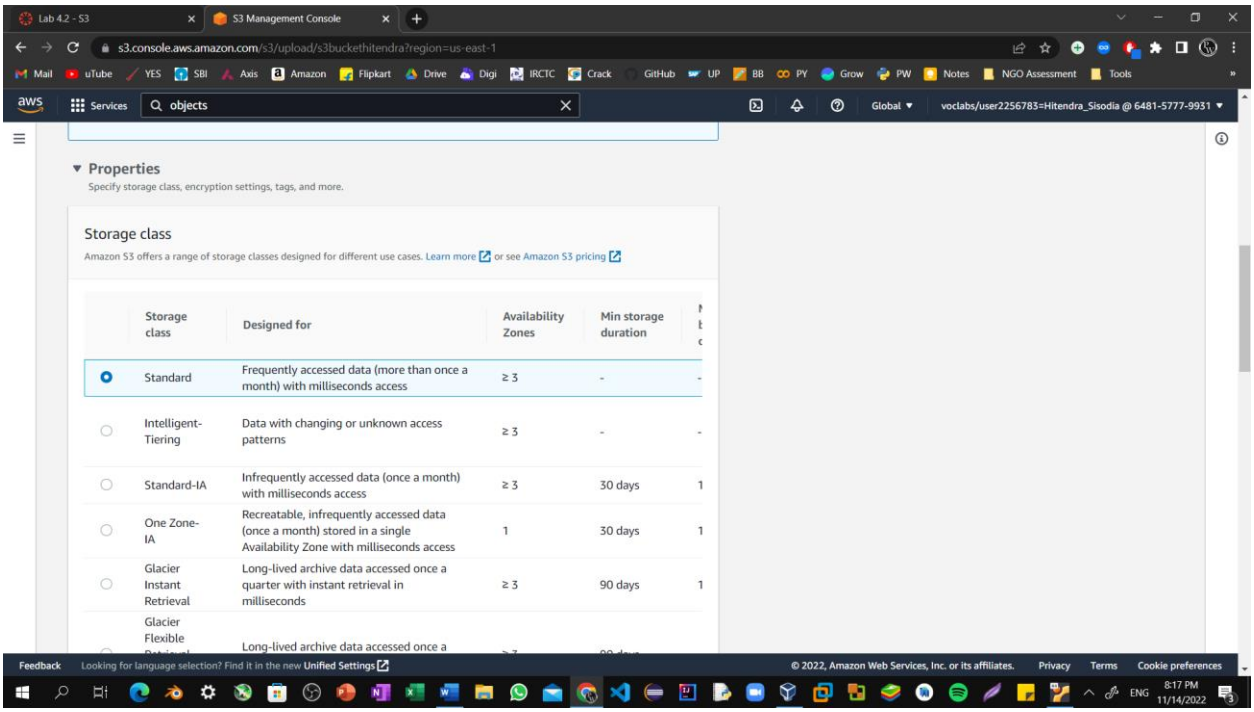


Step18: Under **Predefined ACLs**, select **Grant public-read access**. A warning message similar to **Granting public-read access is not recommend** appears below the setting you selected.

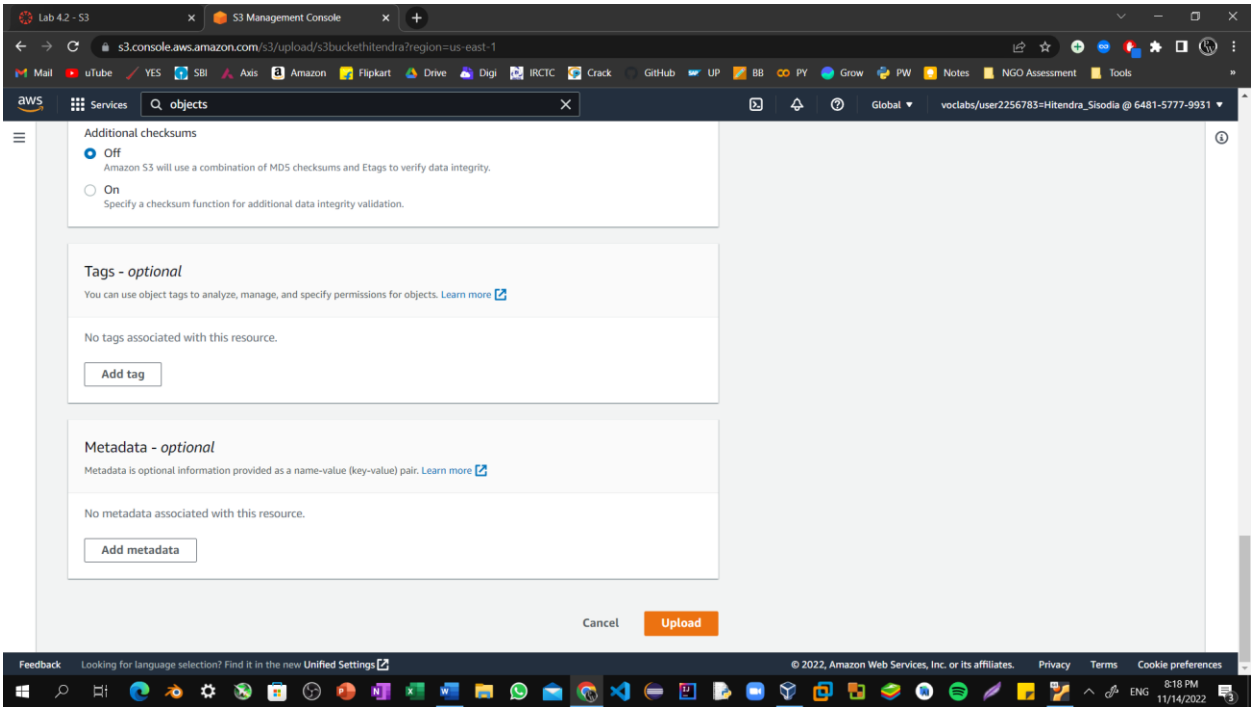


Lab 10.2: Launching an S3 Bucket

Step19: Expand the **Properties** section. Ensure that the **Standard** storage class is selected.

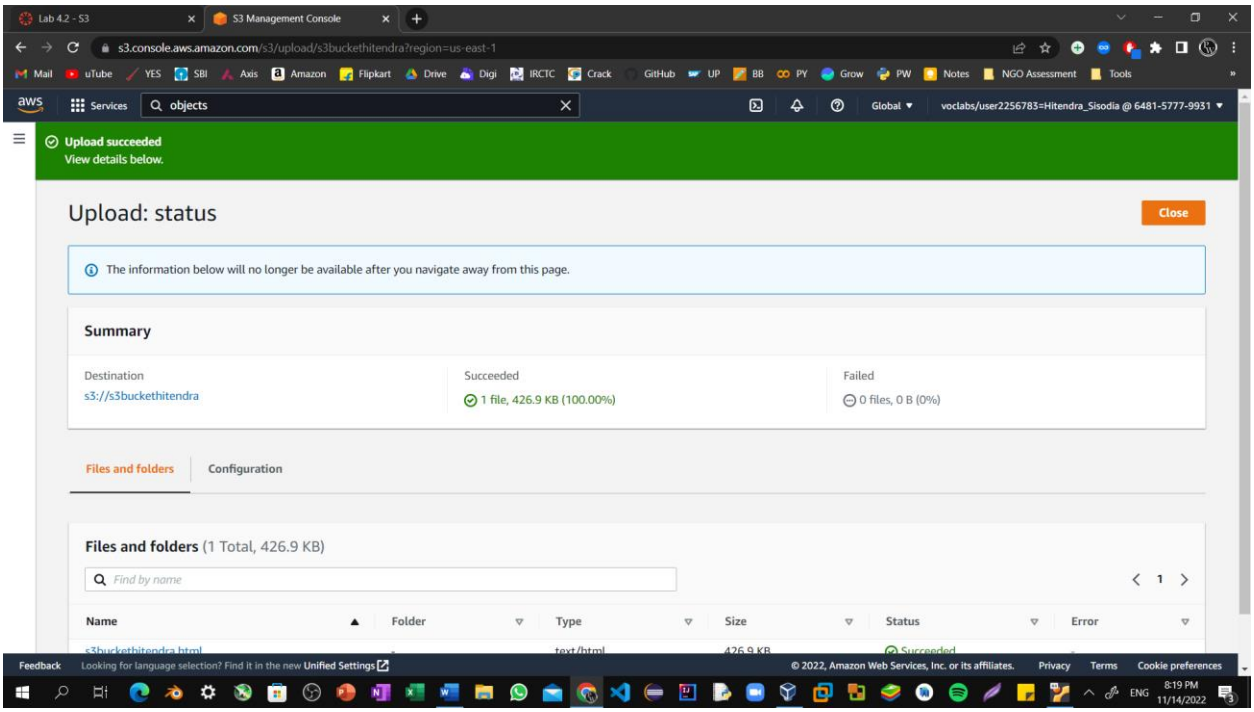


Step20: At the bottom of the page, choose **Upload**.

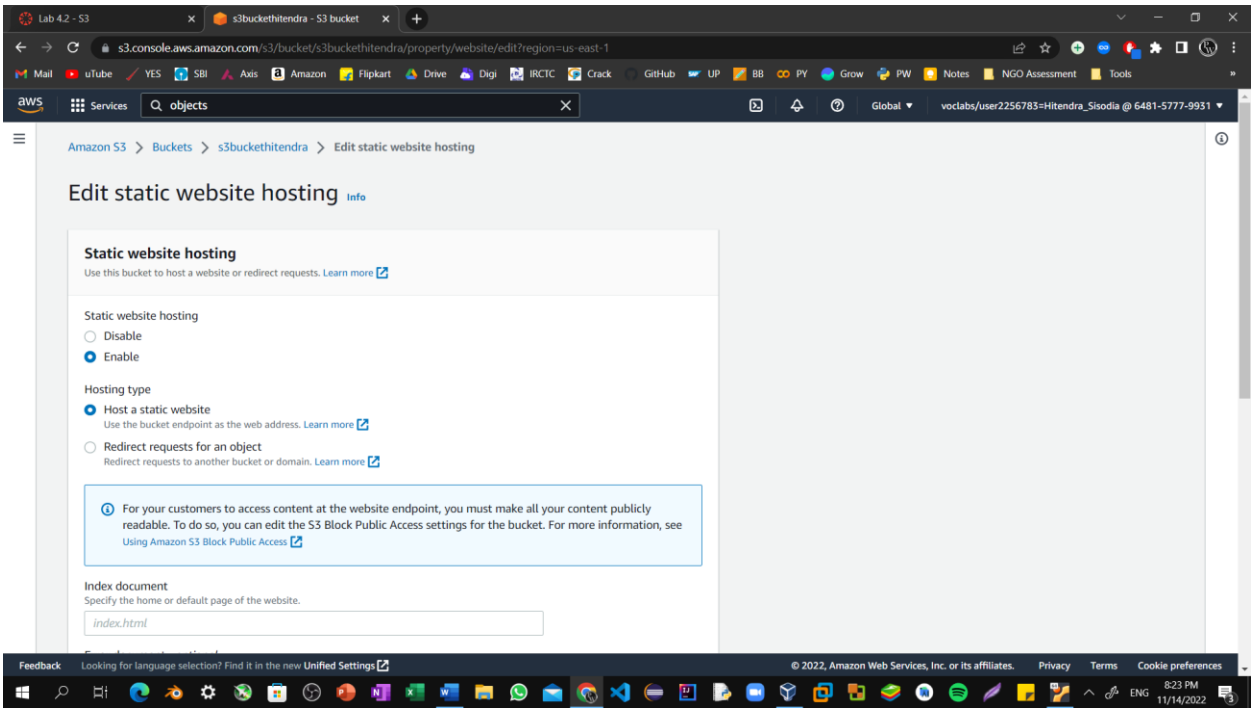


Lab 10.2: Launching an S3 Bucket

Step21: Choose **Close**. The index.html file appears in the **Objects** list.

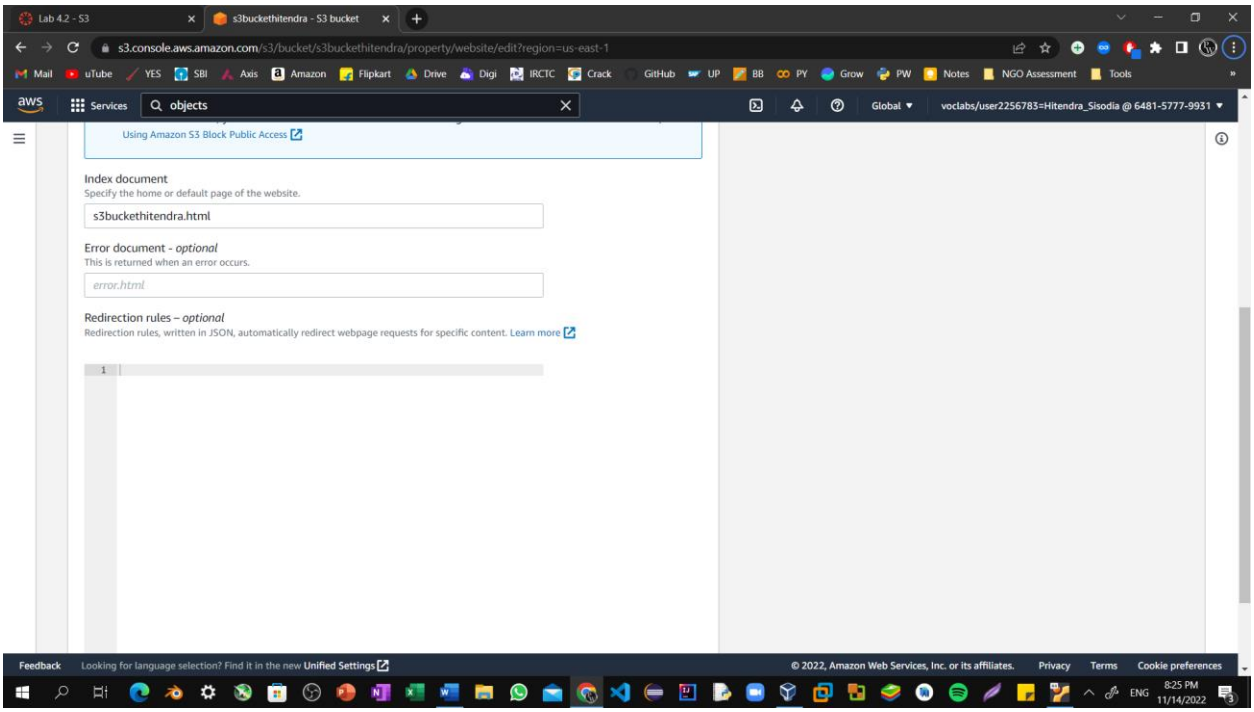


Step22: Select the **Properties** tab, and scroll down to the **Static website hosting** section. Choose Edit, Select Enable

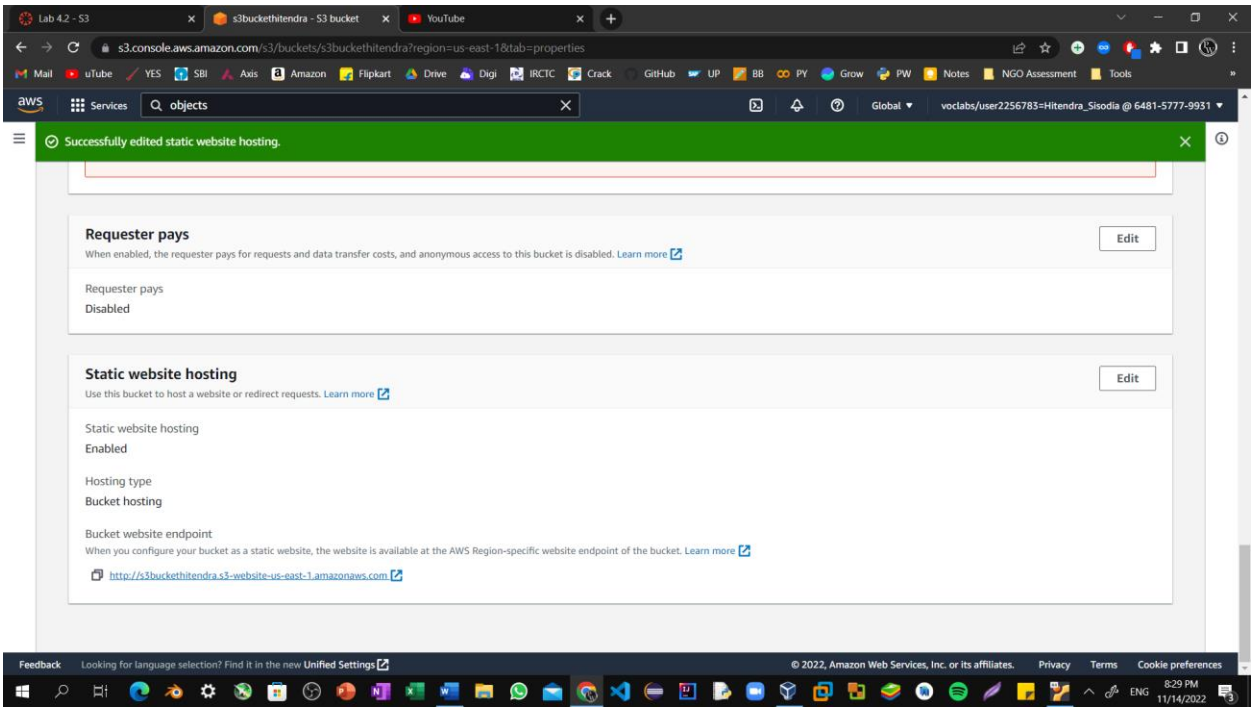


Lab 10.2: Launching an S3 Bucket

Step23: In the **Index document** text box, enter bucket-name.html Select **Save changes**.

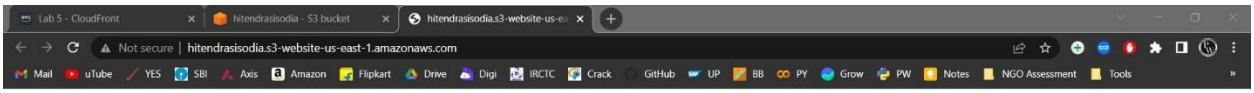


Step24: Scroll down to the **Static website hosting** section again, and copy the **Bucket website endpoint** URL to your clipboard.



Lab 10.2: Launching an S3 Bucket

Step24: Static hosted website with EBS storage.

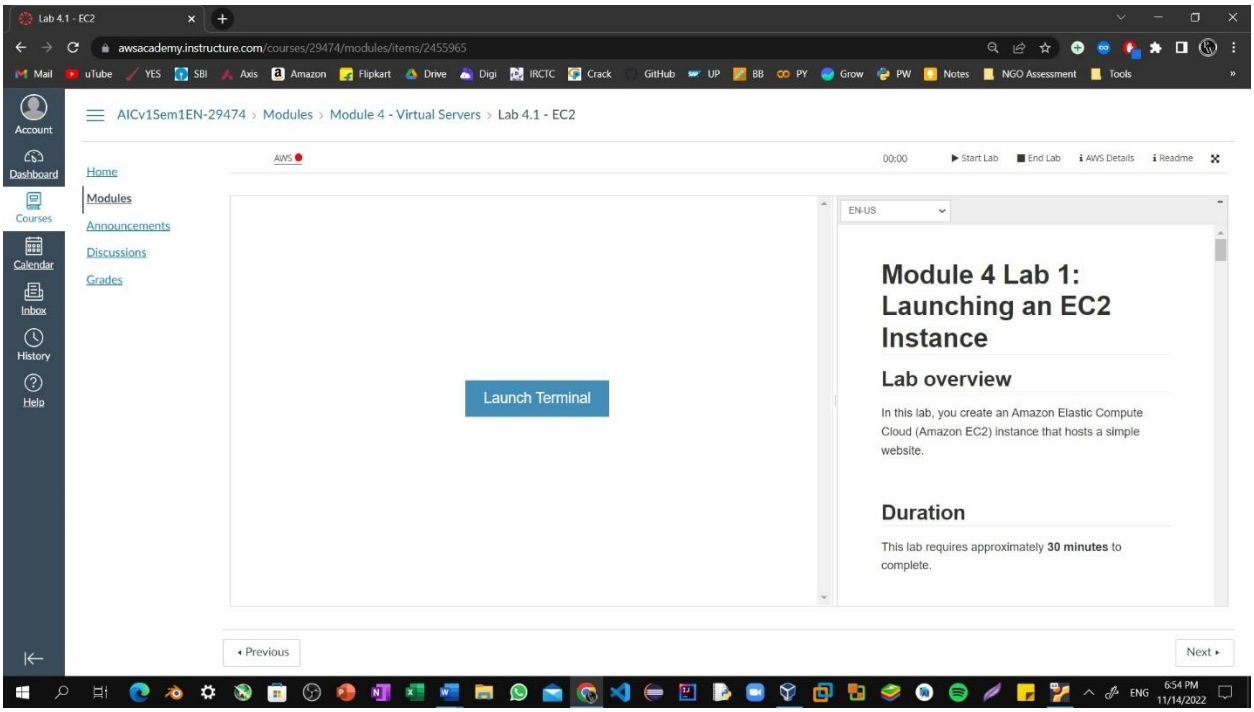


Hello World. Take me to your leader.

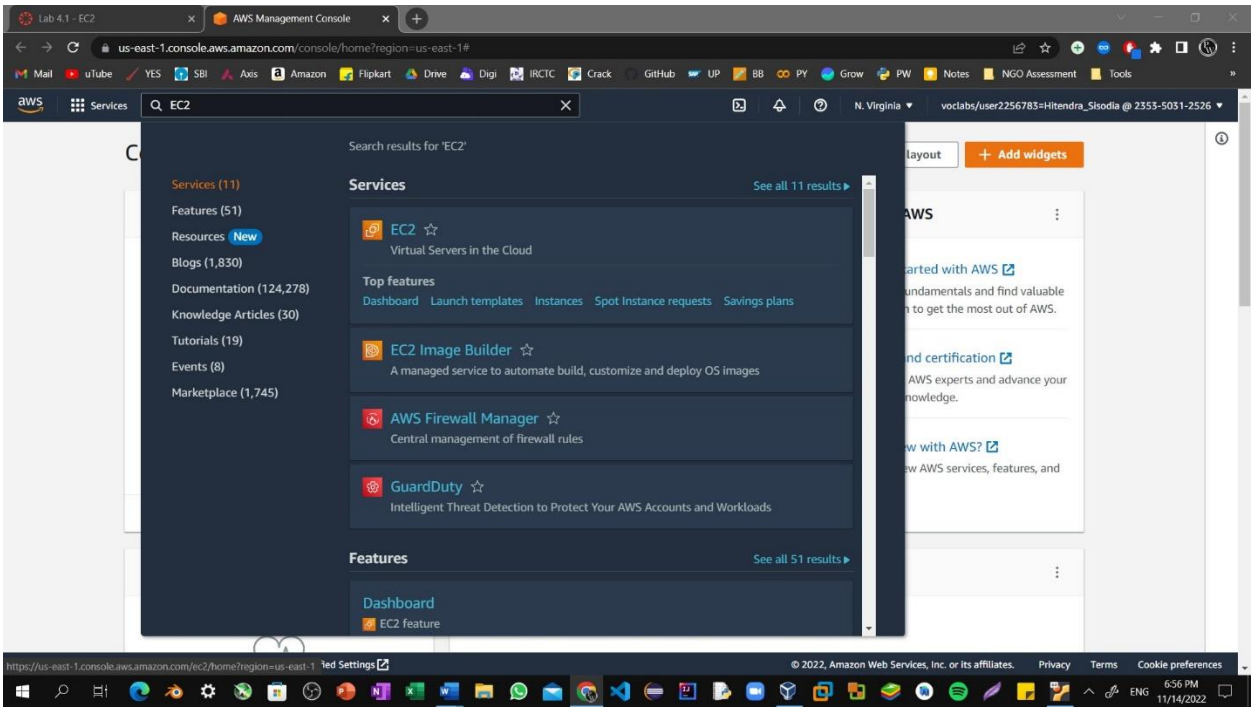
Name: Hitendra Sisodia
Sap id: 500091910

Lab 11: Launching an EC2 Instance With EBS Storage

Step1: To start the lab session, choose **Start Lab** in the upper-right corner of the page.

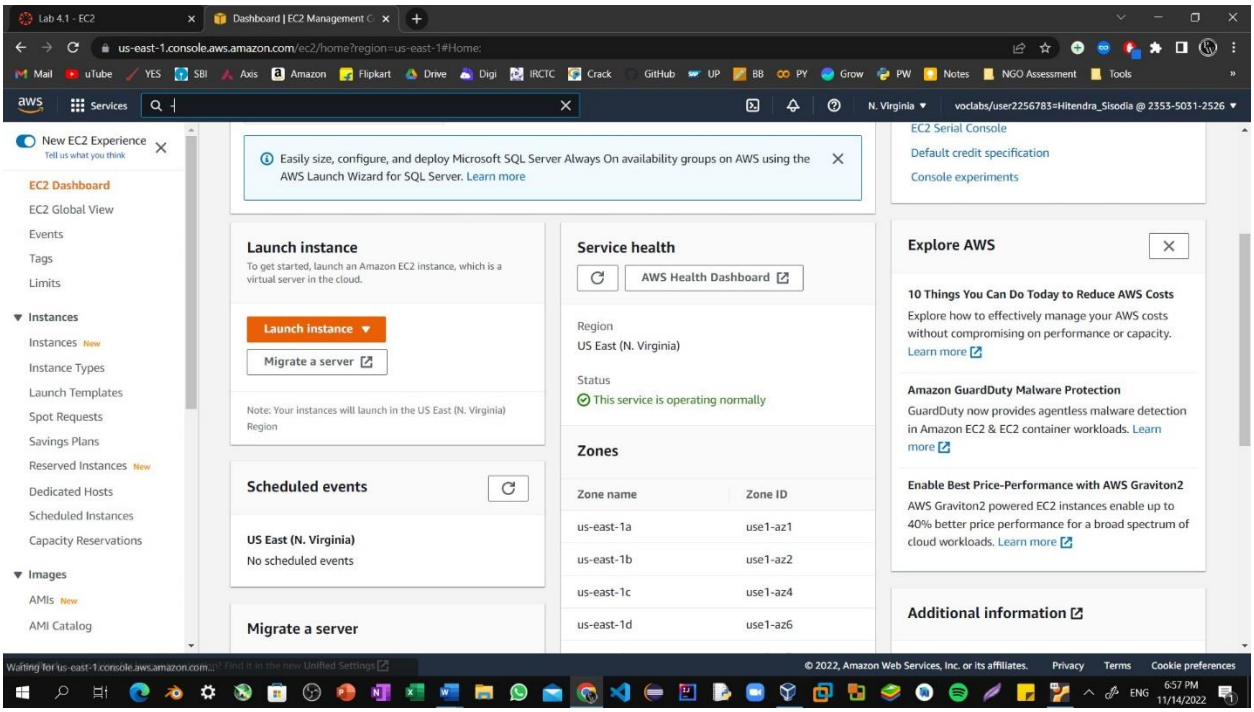


Step2: Choose the **Services** menu, locate the **Compute** services, and select **EC2**.

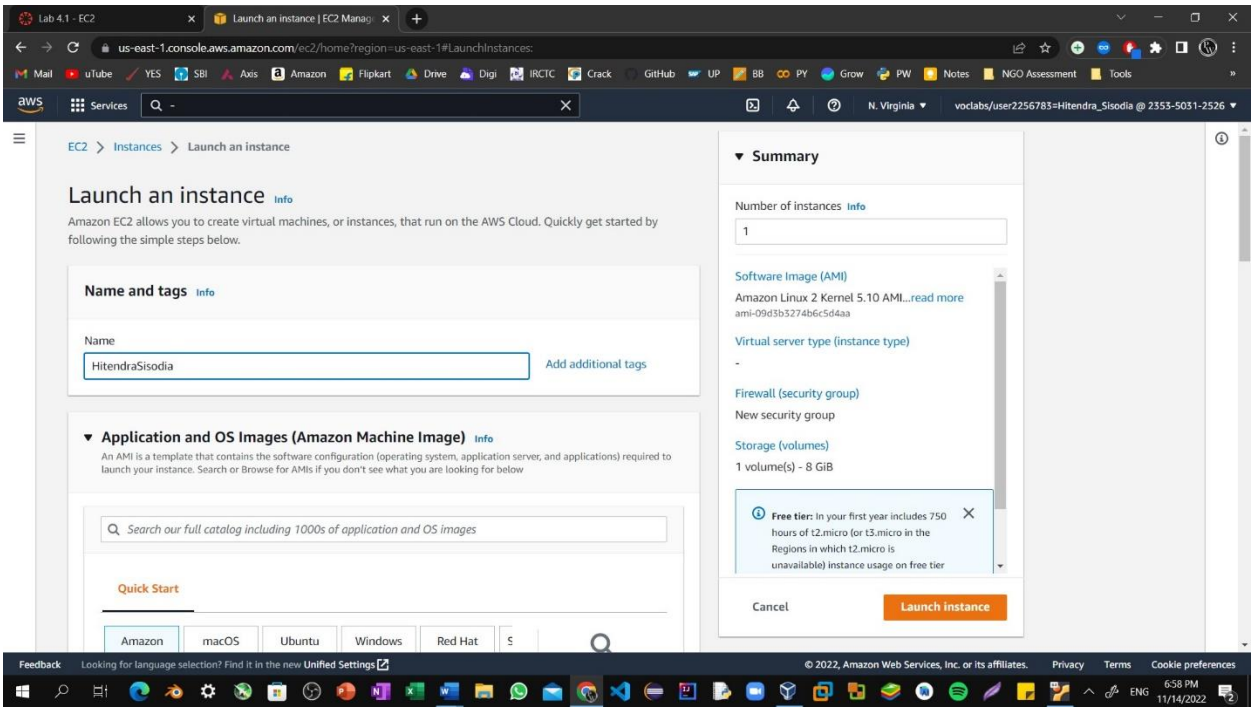


Lab 11: Launching an EC2 Instance With EBS Storage

Step3: Choose the **Launch instance** button in the middle of the page, and then select **Launch instance** from the dropdown menu.

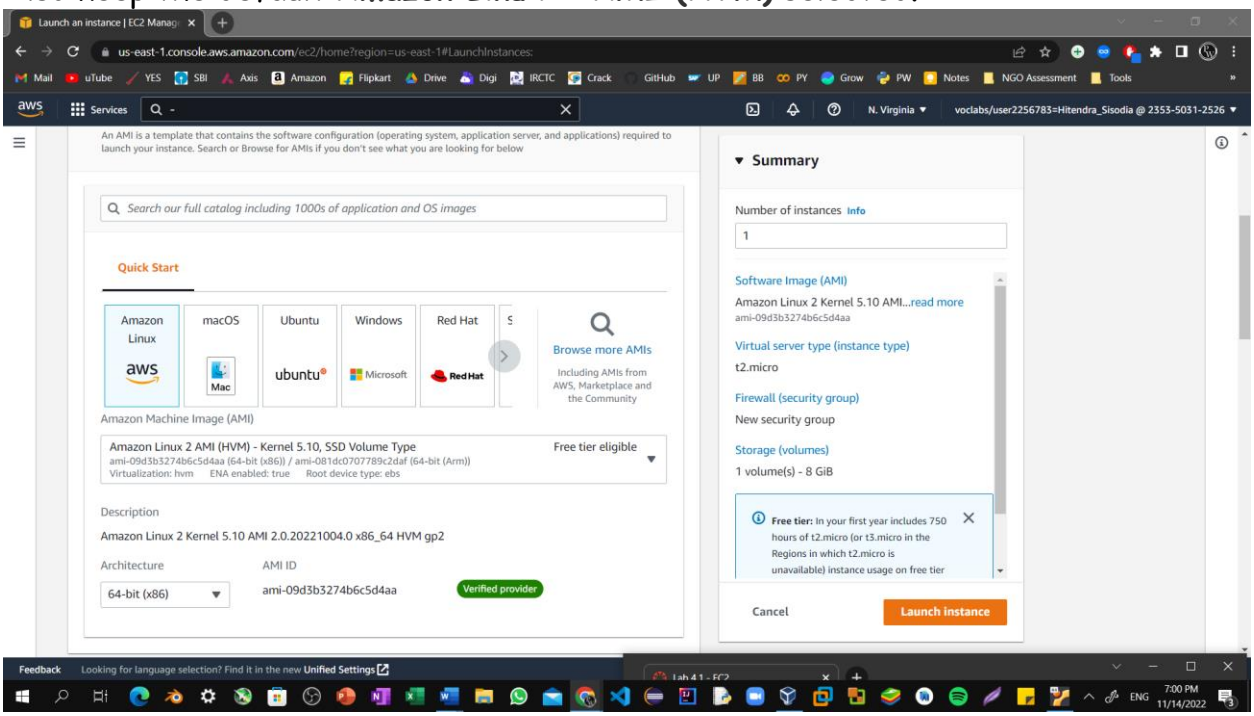


Step4: Name the instance: HitendraSisodia

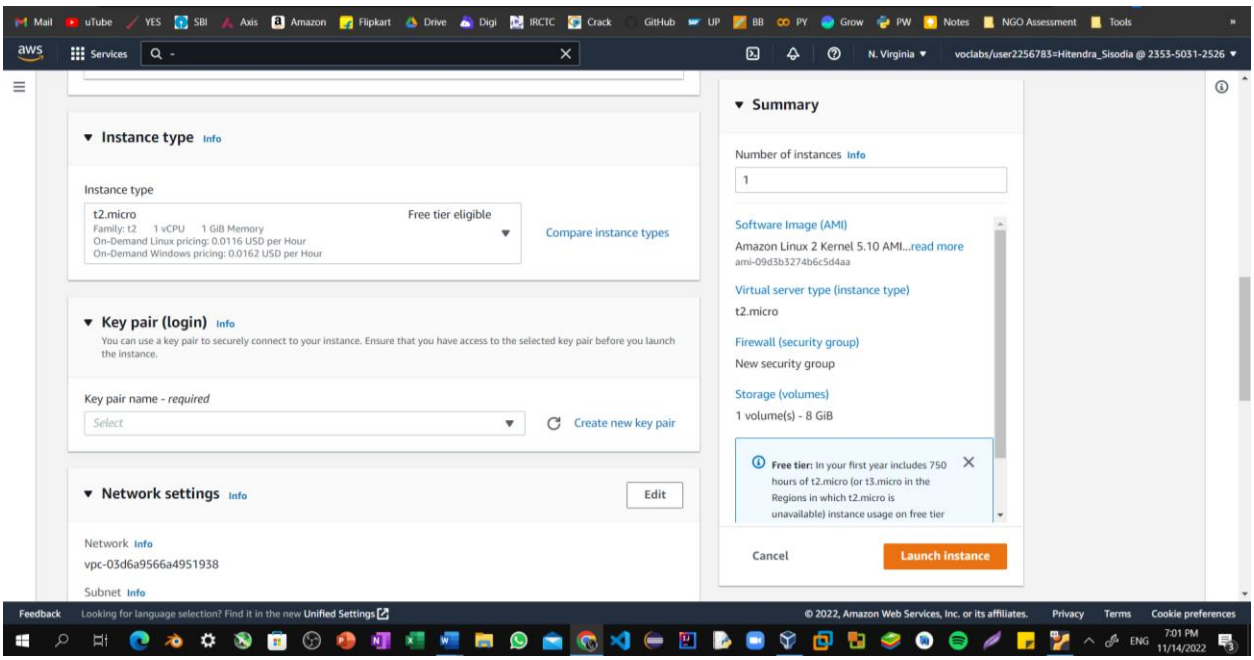


Lab 11: Launching an EC2 Instance With EBS Storage

Step5: Choose an AMI from which to create the instance:
In the list of available *Quick Start* AMIs, keep the default **Amazon Linux** AMI selected.
Also keep the default **Amazon Linux 2 AMI (HVM)** selected.

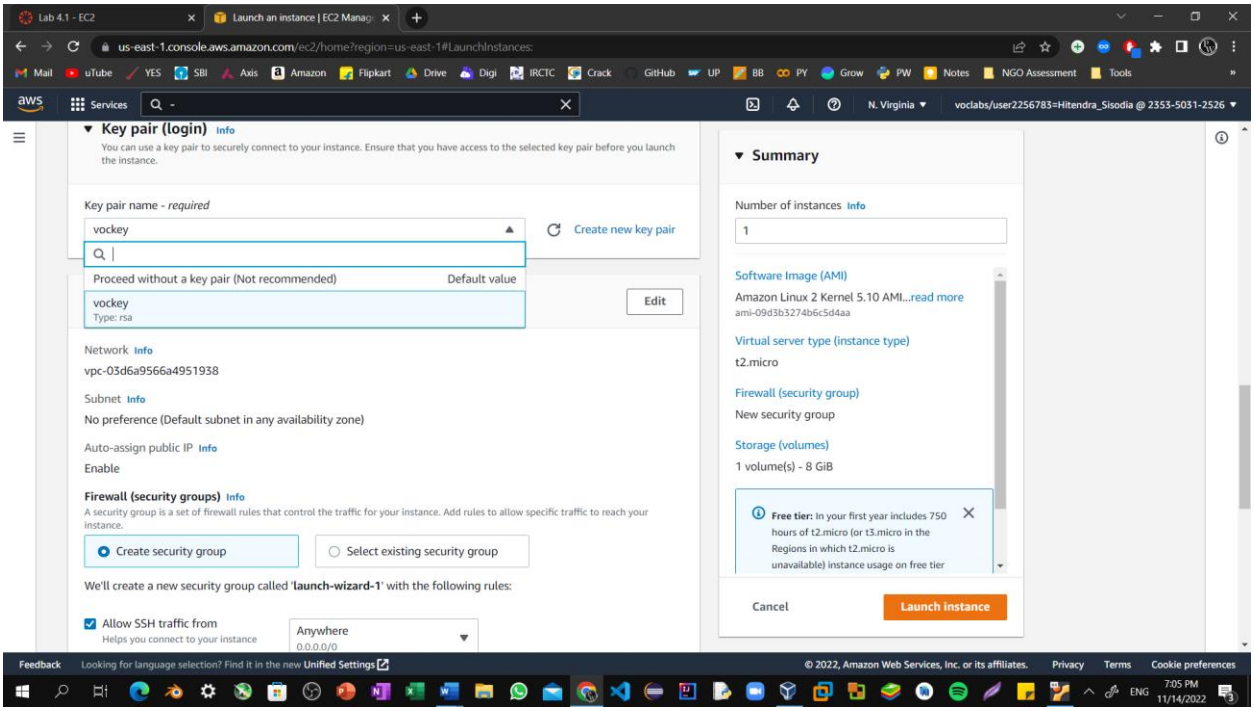


Step6: Specify an Instance type: In the *Instance type* panel, keep the default **t2.micro** selected.

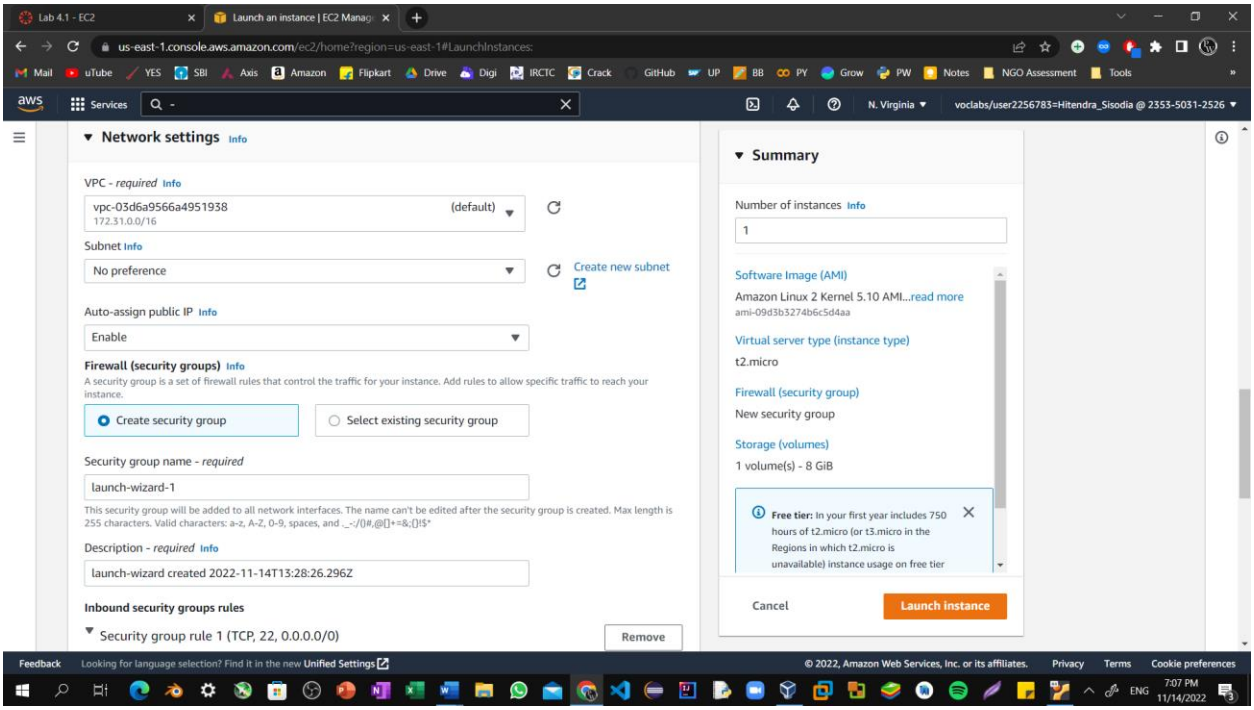


Lab 11: Launching an EC2 Instance With EBS Storage

Step7: Select the key pair to associate with the instance. From the **Key pair name** menu, select **vockey**.

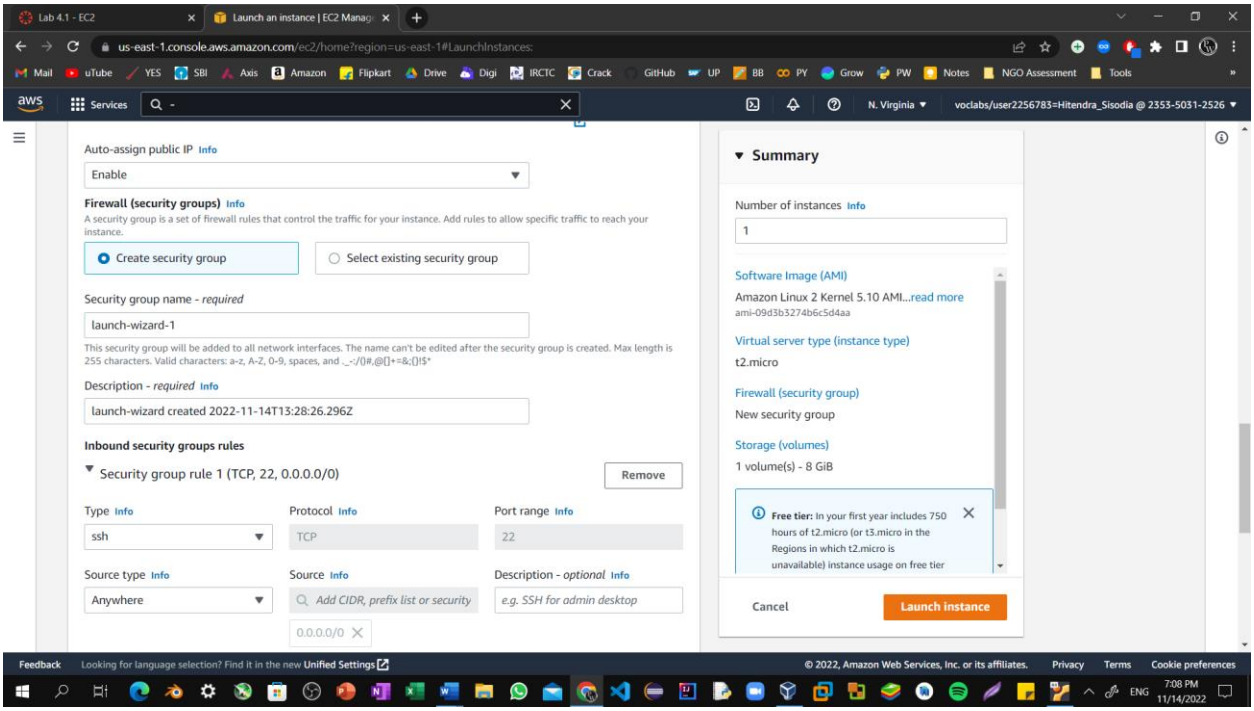


Step8: Next to Network settings, choose **Edit**. Keep the default *VPC* and *subnet* settings. Also keep the **Auto-assign public IP** setting set to **Enable**.



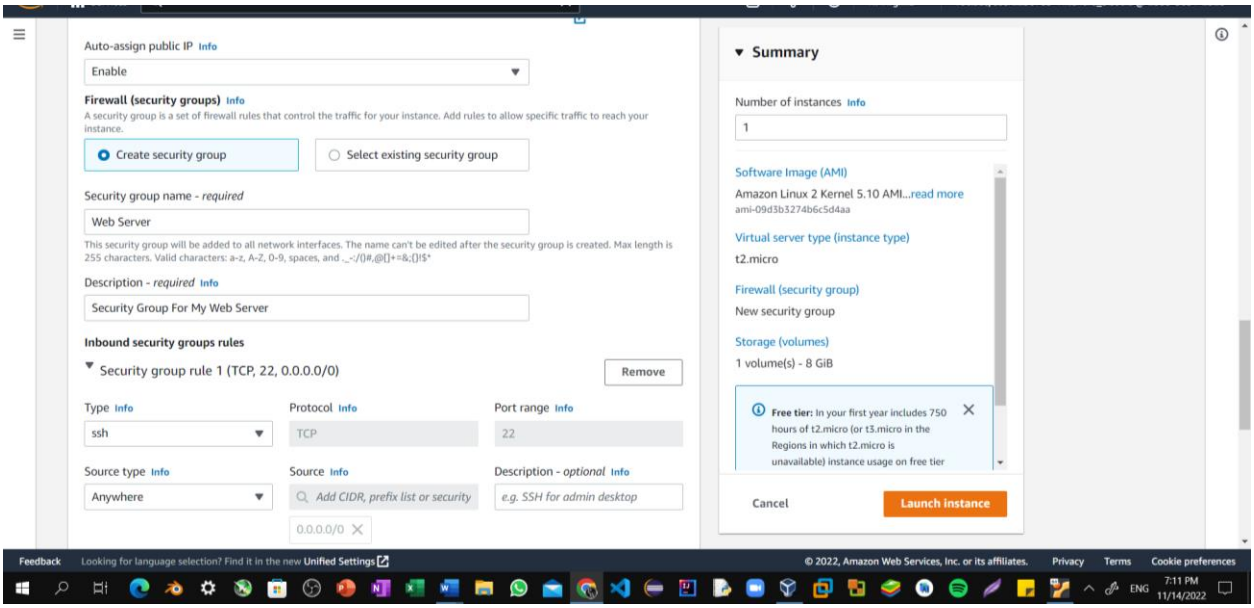
Lab 11: Launching an EC2 Instance With EBS Storage

Step9: Under *Firewall (security groups)*, keep the default **Create security group** option chosen.



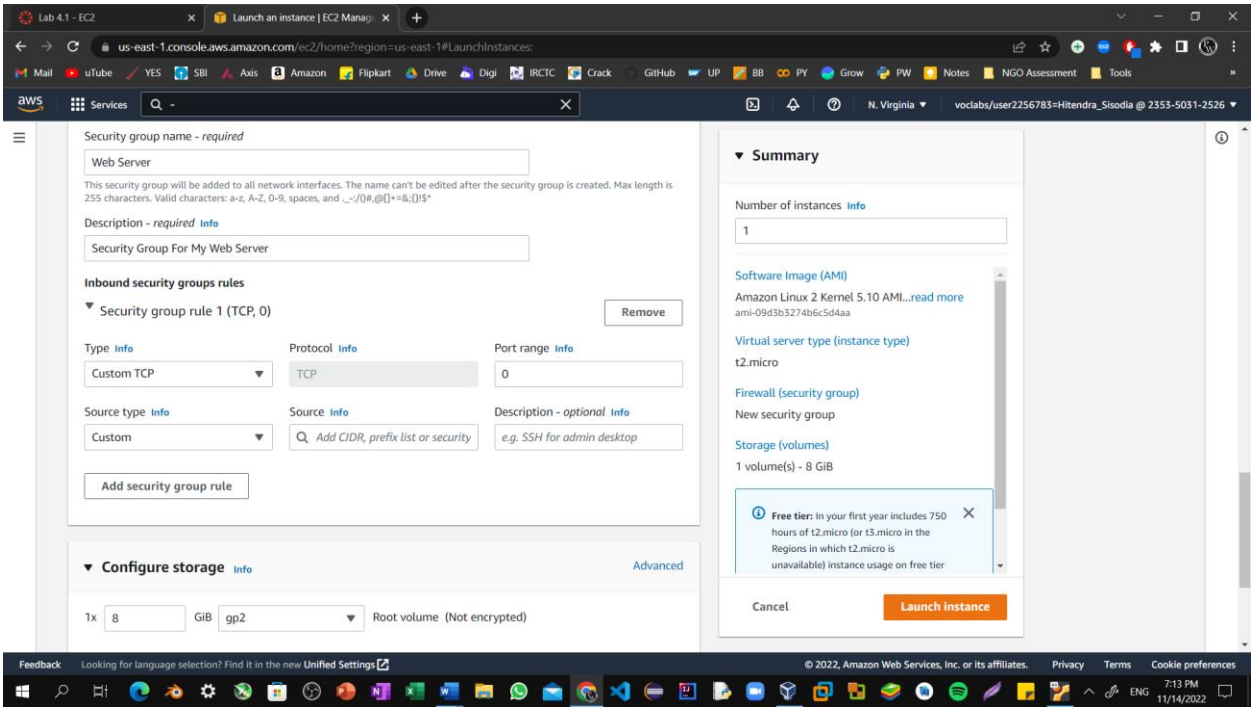
Step10: Configure a new security group:

- Keep the default selection **Create a new security group**.
- **Security group name:** Clear the text and enter `Web Server`
- **Description:** Clear the text and enter `Security group for my web server`

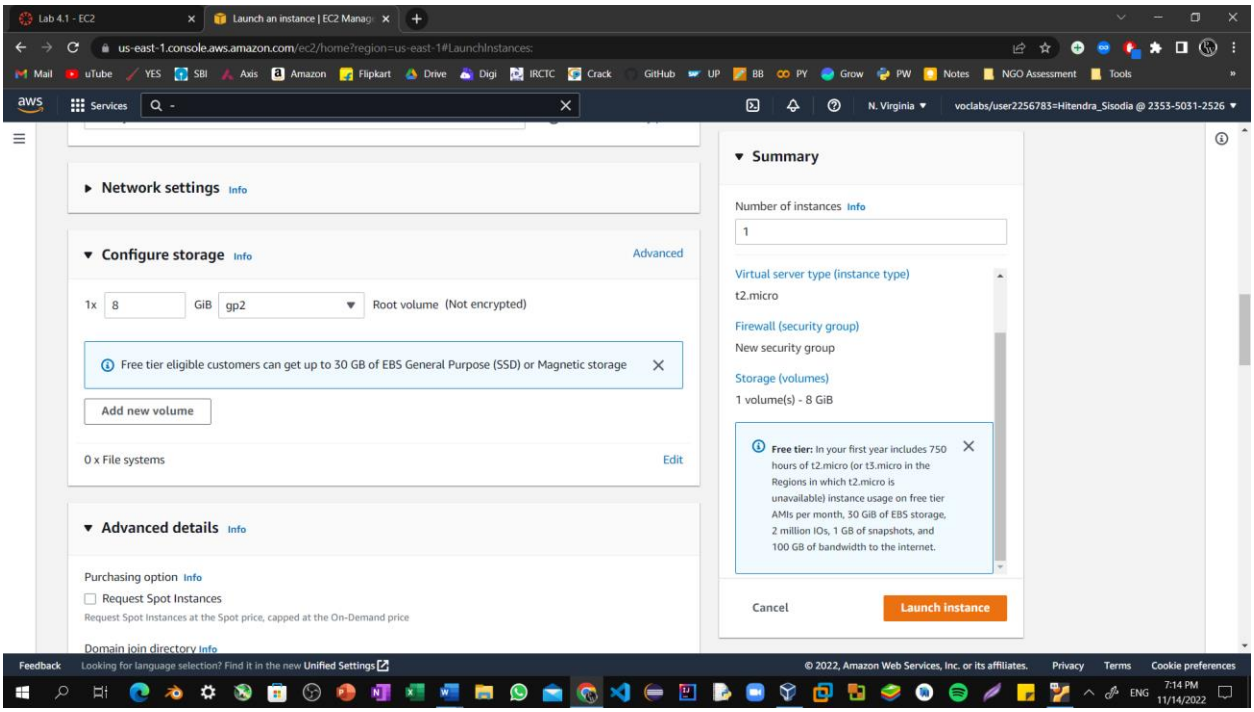


Lab 11: Launching an EC2 Instance With EBS Storage

Step11: Choose **Remove** to remove the default SSH inbound rule.



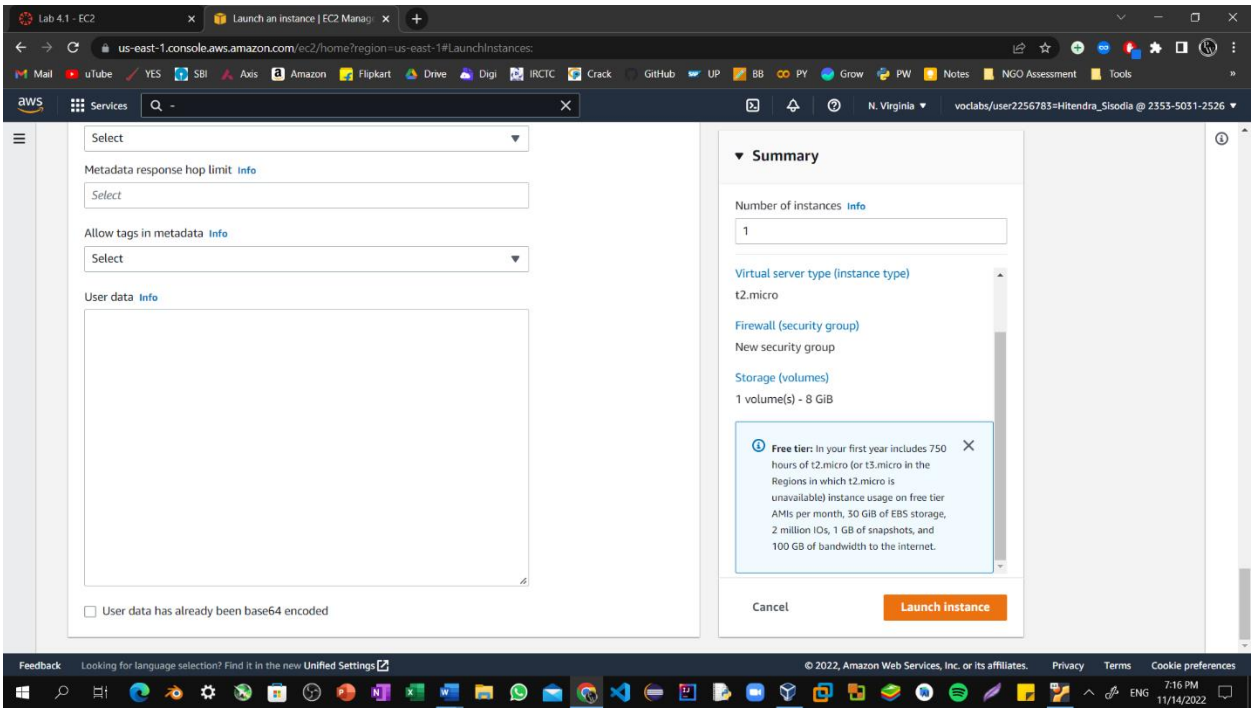
Step12: In the *Configure storage* section, keep the default settings. You will launch the Amazon EC2 instance using a default Elastic Block Store (EBS) disk volume.



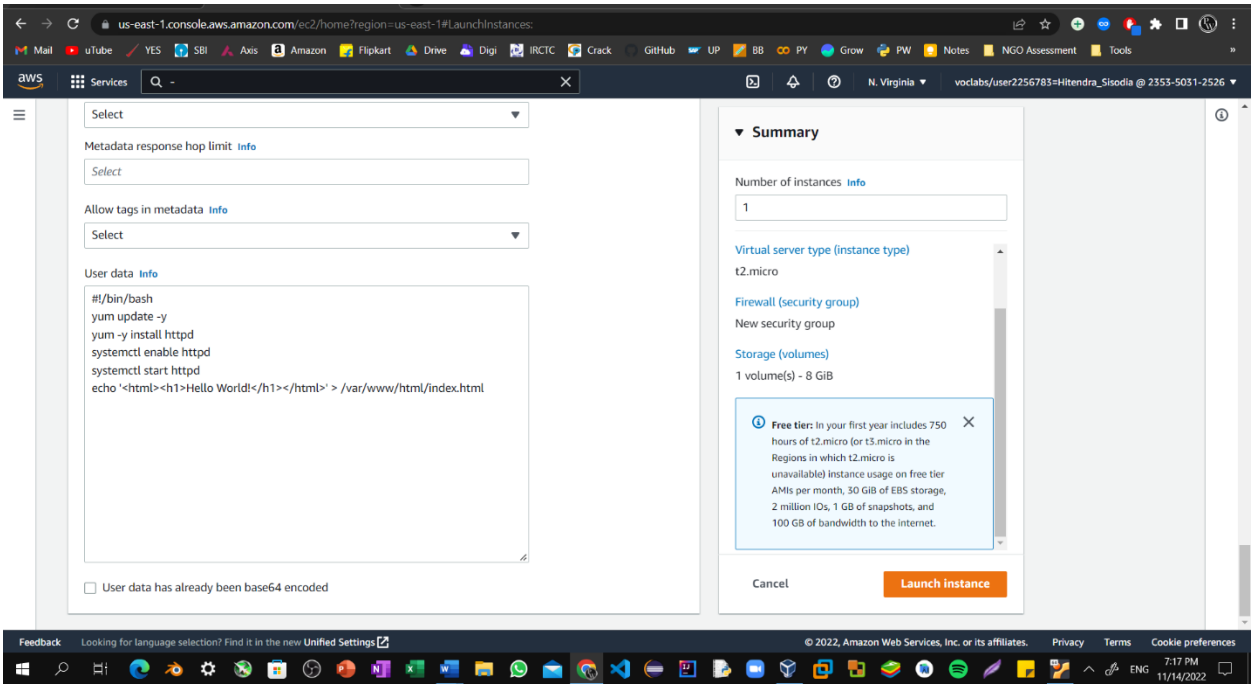
Lab 11: Launching an EC2 Instance With EBS Storage

Step13: Configure a script to run on the instance when it launches:

- Expand the **Advanced details** panel.

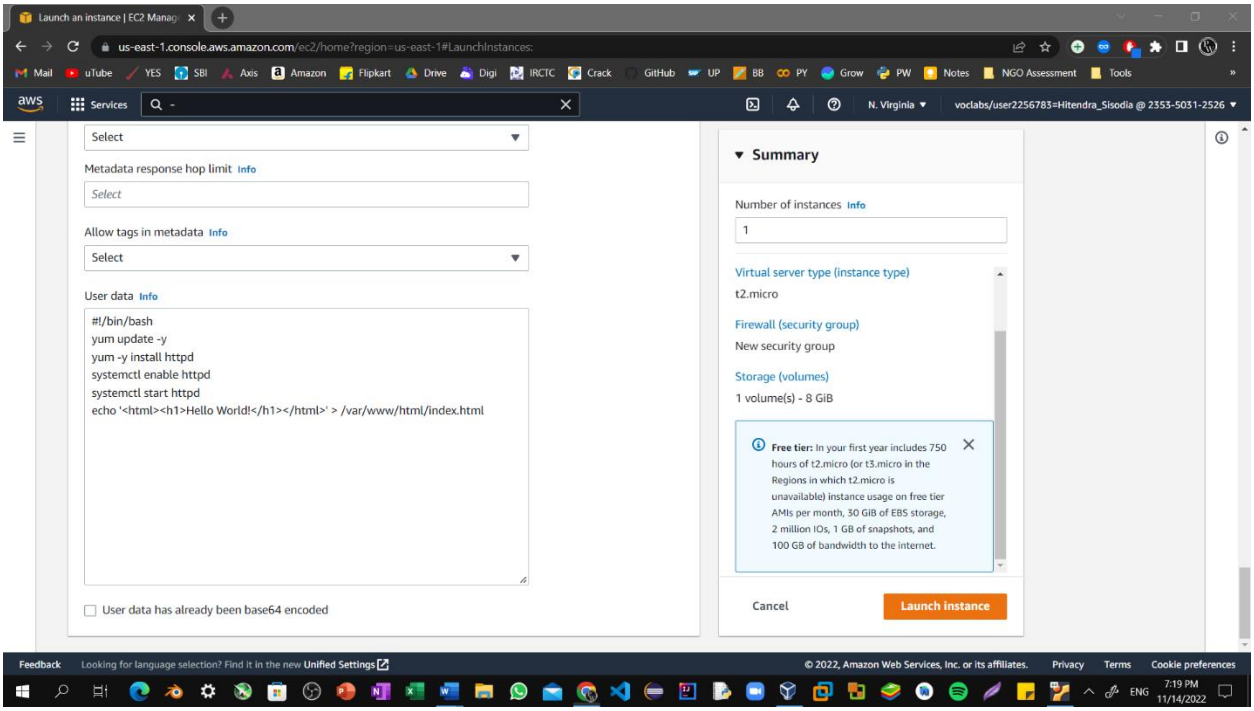


Step14: Scroll to the bottom of the page and then copy and paste the code shown below into the **User data** box.

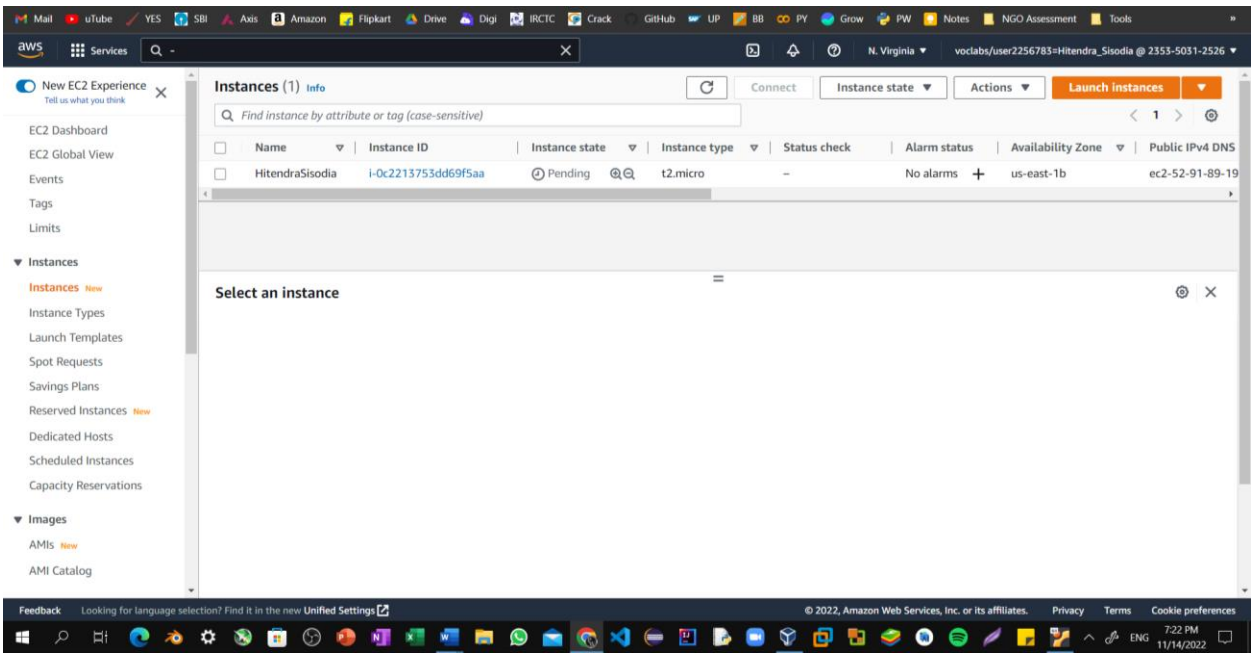


Lab 11: Launching an EC2 Instance With EBS Storage

Step15: At the bottom of the **Summary** panel on the right side of the screen choose Launch Instances. You will see a Success message.

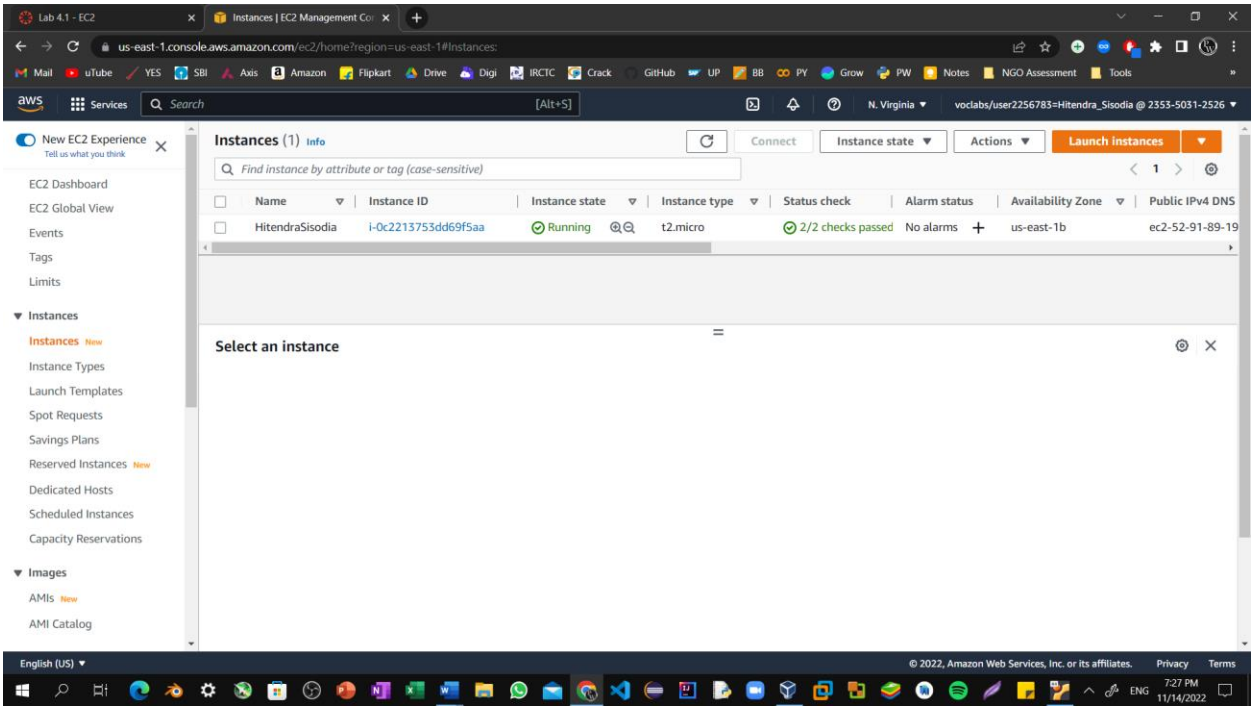


Step16: The instance will first appear in the *Pending* state, which means it is being launched. The state will then change to *Running*, which indicates that the instance has started booting. It takes a few minutes for the instance to boot.

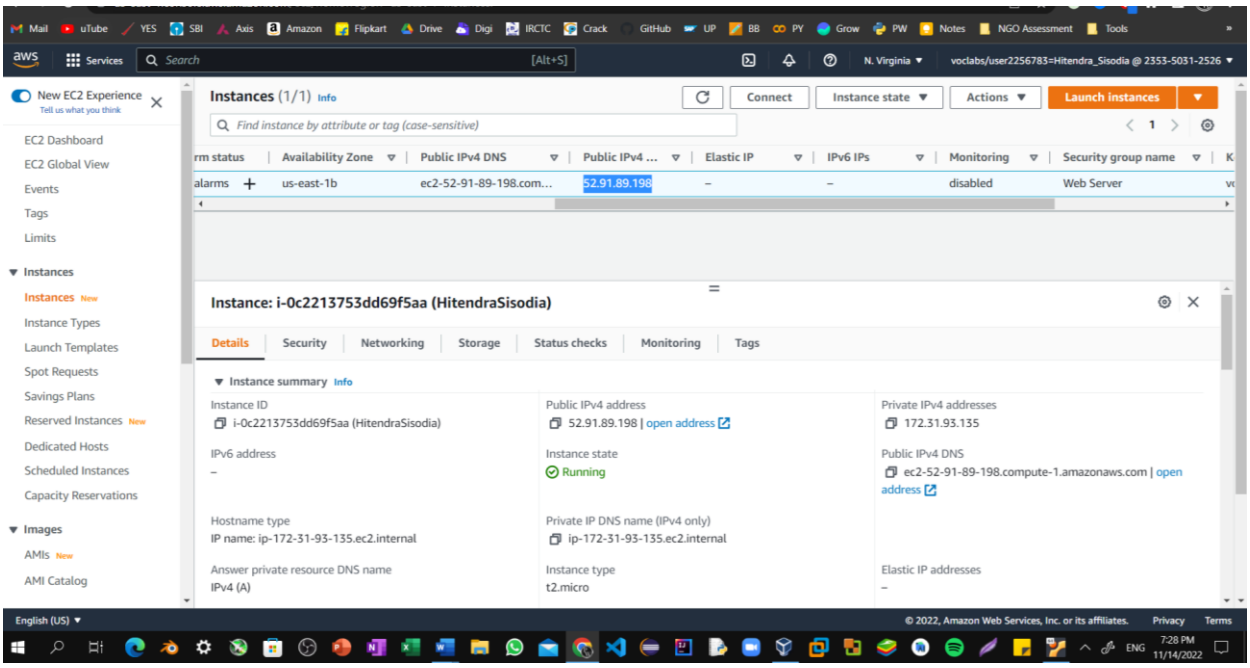


Lab 11: Launching an EC2 Instance With EBS Storage

Step17: Before you continue, wait for your instance to display the following:
Instance state: *Running*
Status check: *2/2 checks passed*

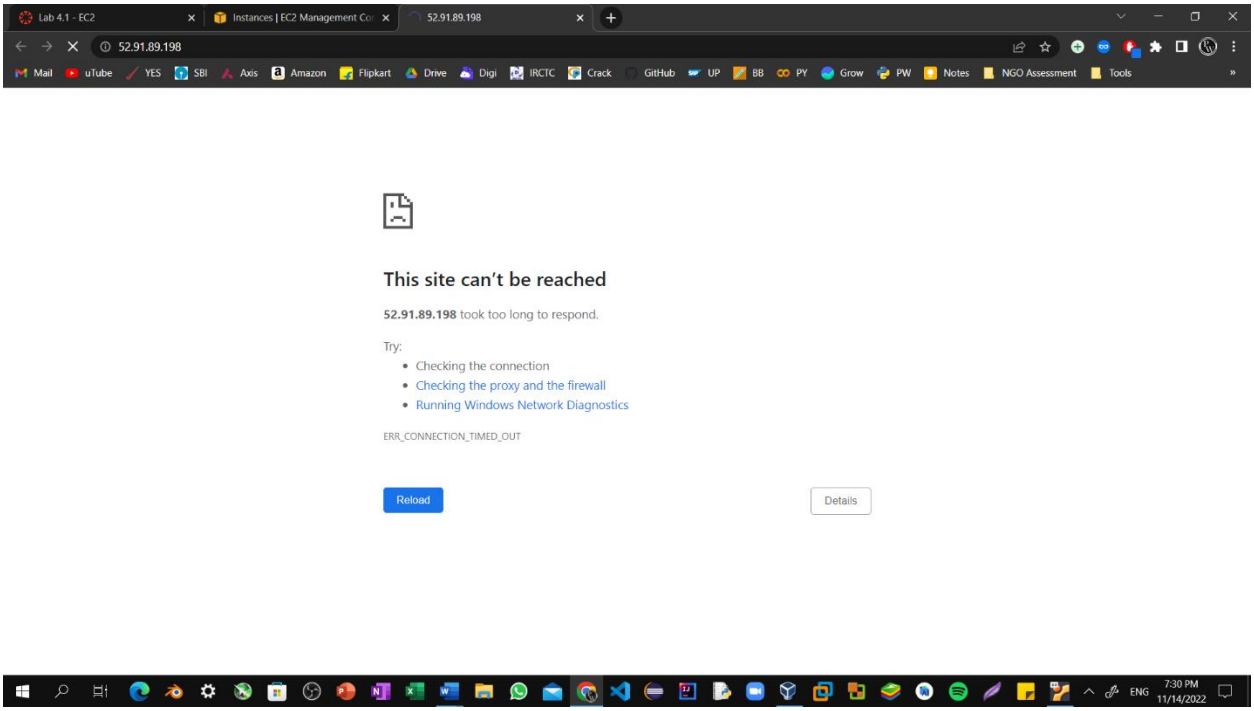


Step18: From the **Details** tab, copy the **Public IPv4 address** value of your instance to your clipboard.

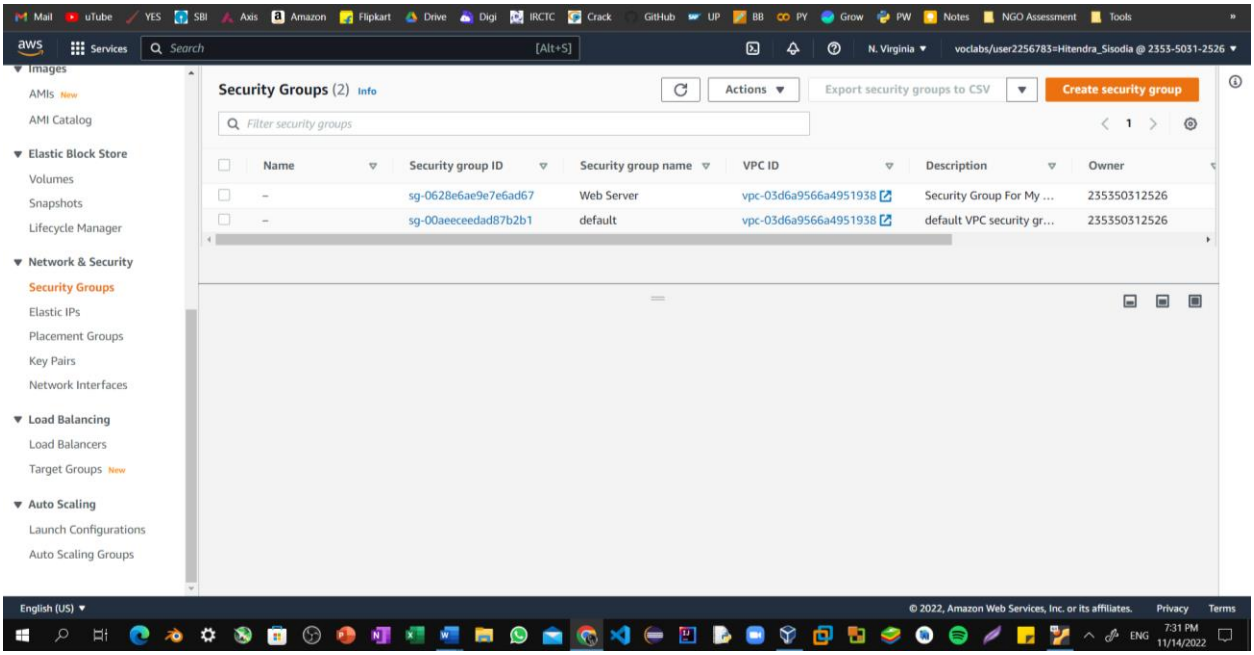


Lab 11: Launching an EC2 Instance With EBS Storage

Step19: Open a new tab in your web browser, paste the public IP address you just copied, and press **Enter**.
The webpage does not load. You must update the security group to be able to access the page.

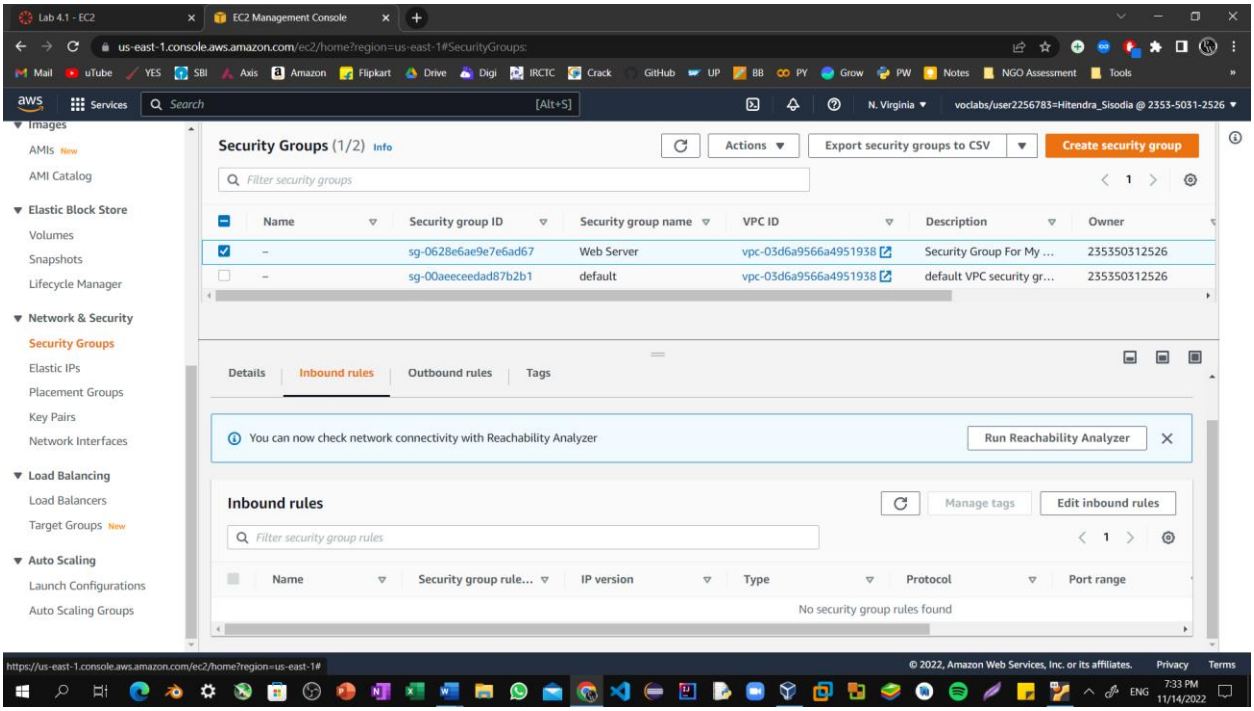


Step20: Return to the **EC2 Management Console** browser tab.
In the left navigation pane, under **Network & Security**, choose **Security Groups**.

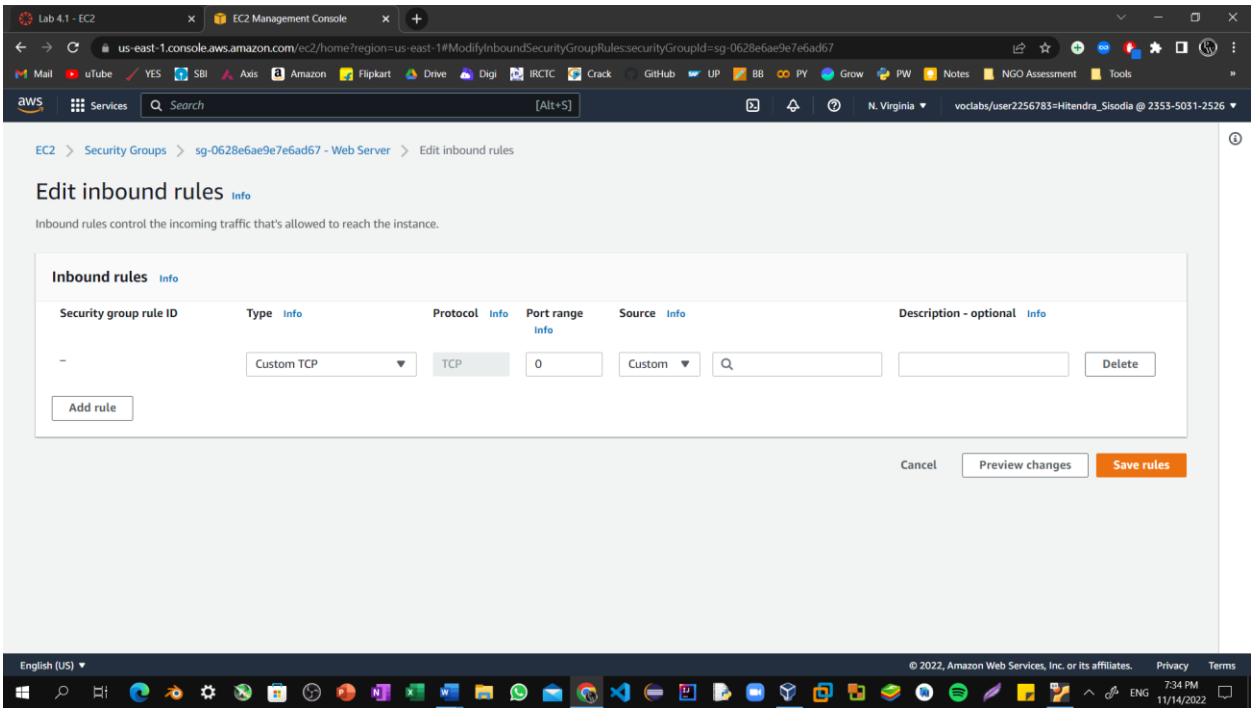


Lab 11: Launching an EC2 Instance With EBS Storage

Step21: Select the **Web Server** security group, which you created when launching your EC2 instance. In the lower pane, choose the **Inbound rules** tab.



Step22: Choose **Edit inbound rules**, and then choose **Add rule**.

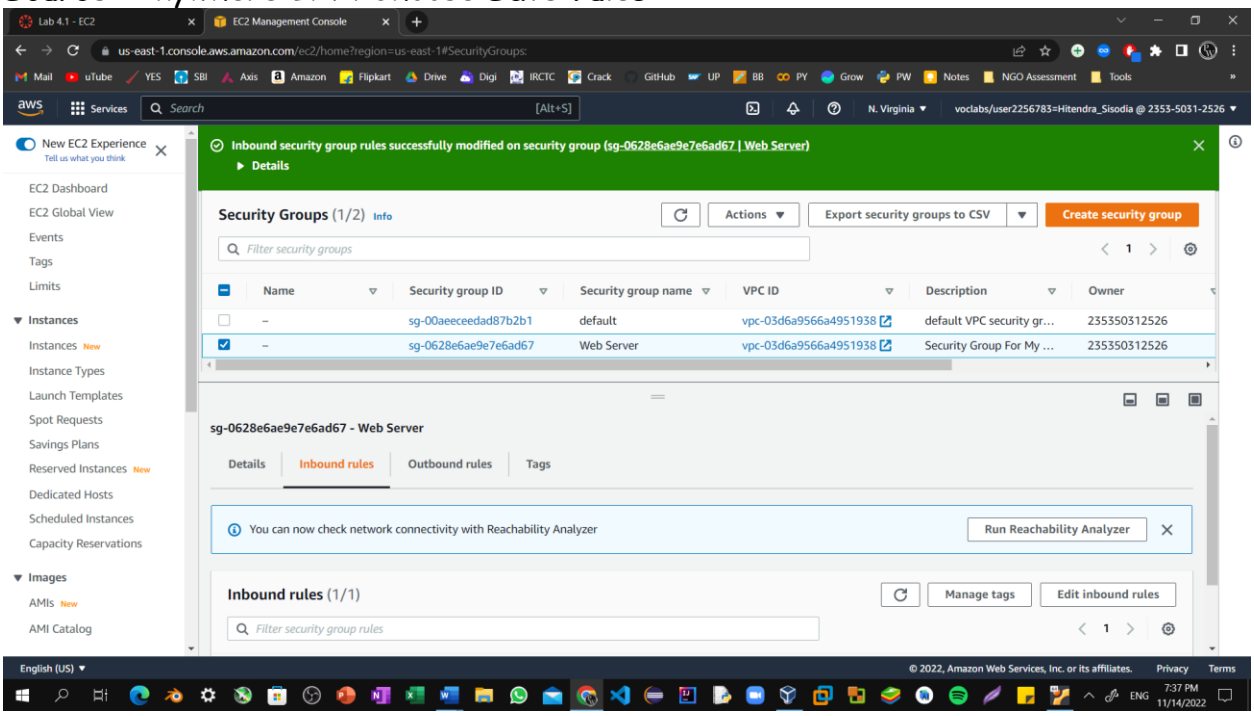


Lab 11: Launching an EC2 Instance With EBS Storage

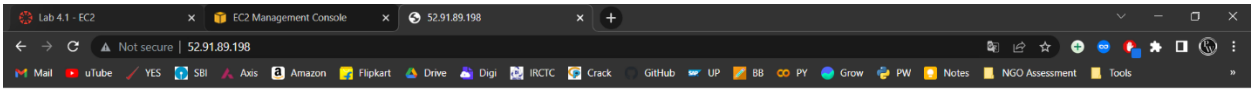
Step23: Configure the following:

Type: HTTP

Source: Anywhere-IPv4 Choose **Save rules**



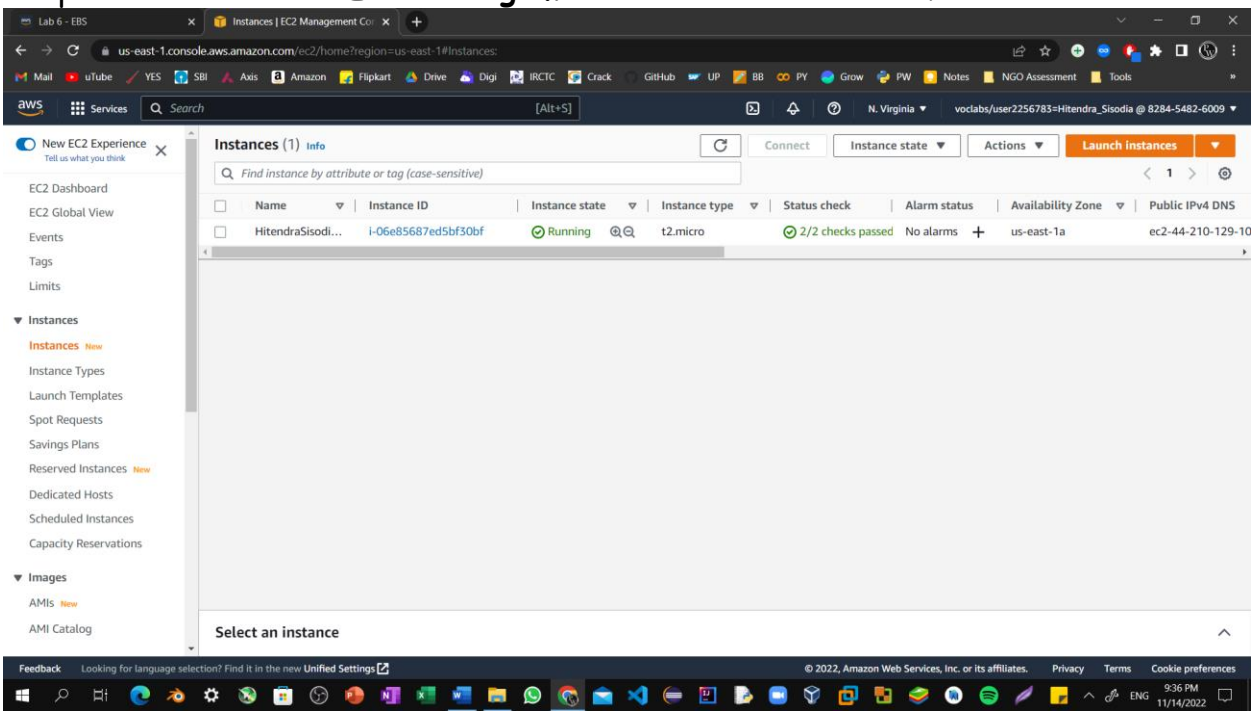
Step24: Return to the tab that you used to try to connect to the web server. The page should display the message *Hitendra Sisodia.*



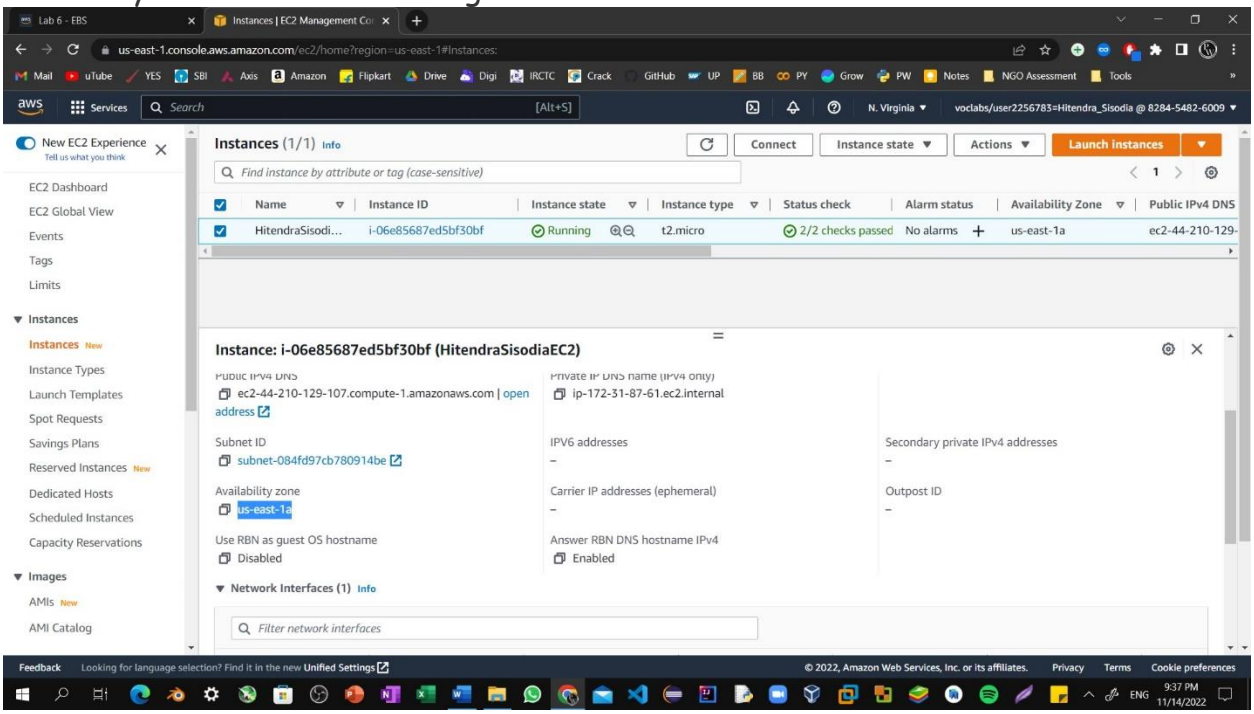
Hitendra Sisodia

Lab 11: Launching an EC2 Instance With EBS Storage

Step25: Return to the **EC2 Management Console** browser tab.

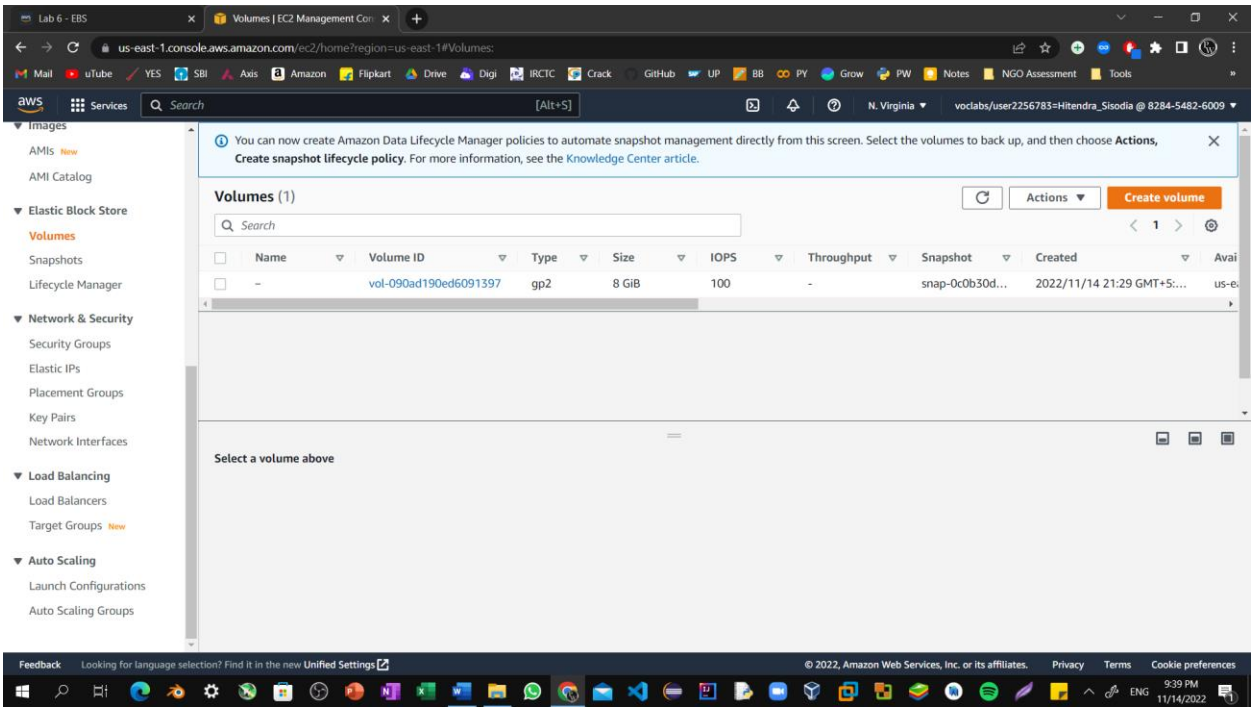


Step26: In the left navigation pane, under **Instances**, choose **Instances**. Select the **Web Server** instance, and in the **Networking** tab below, note the **Availability Zone** in which your instance is running.

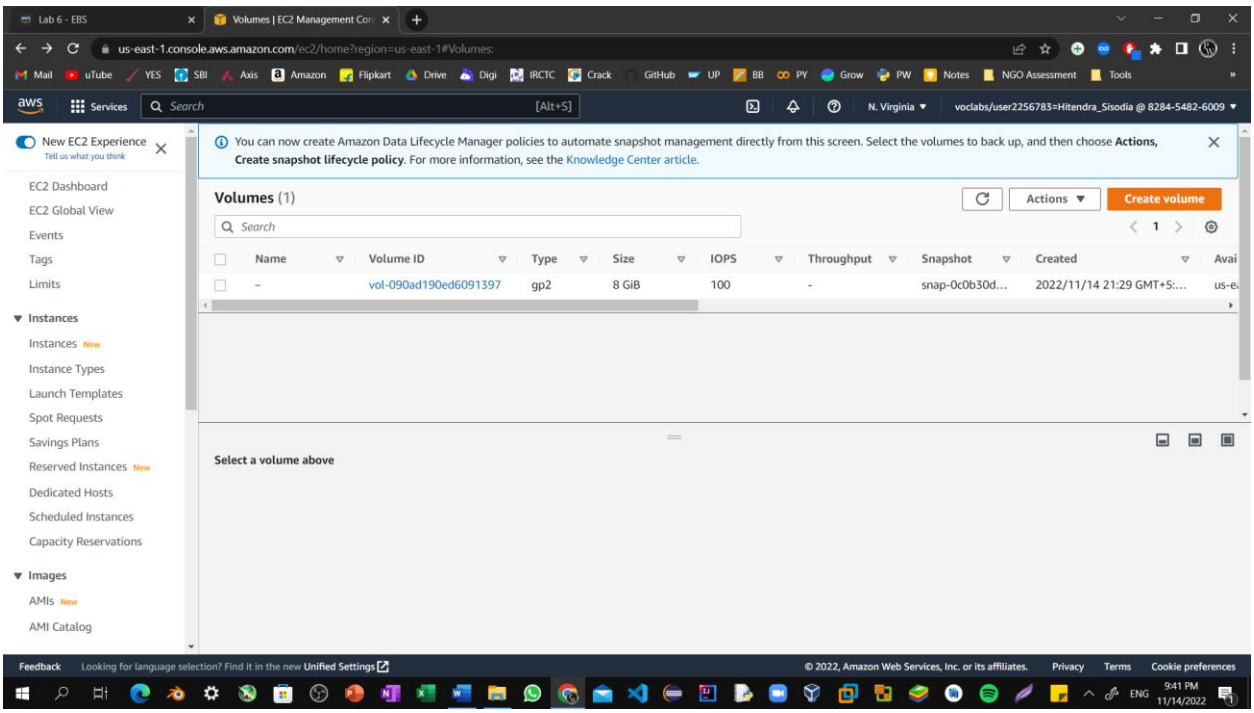


Lab 11: Launching an EC2 Instance With EBS Storage

Step27: In the left navigation pane, under **Elastic Block Store**, select **Volumes**.

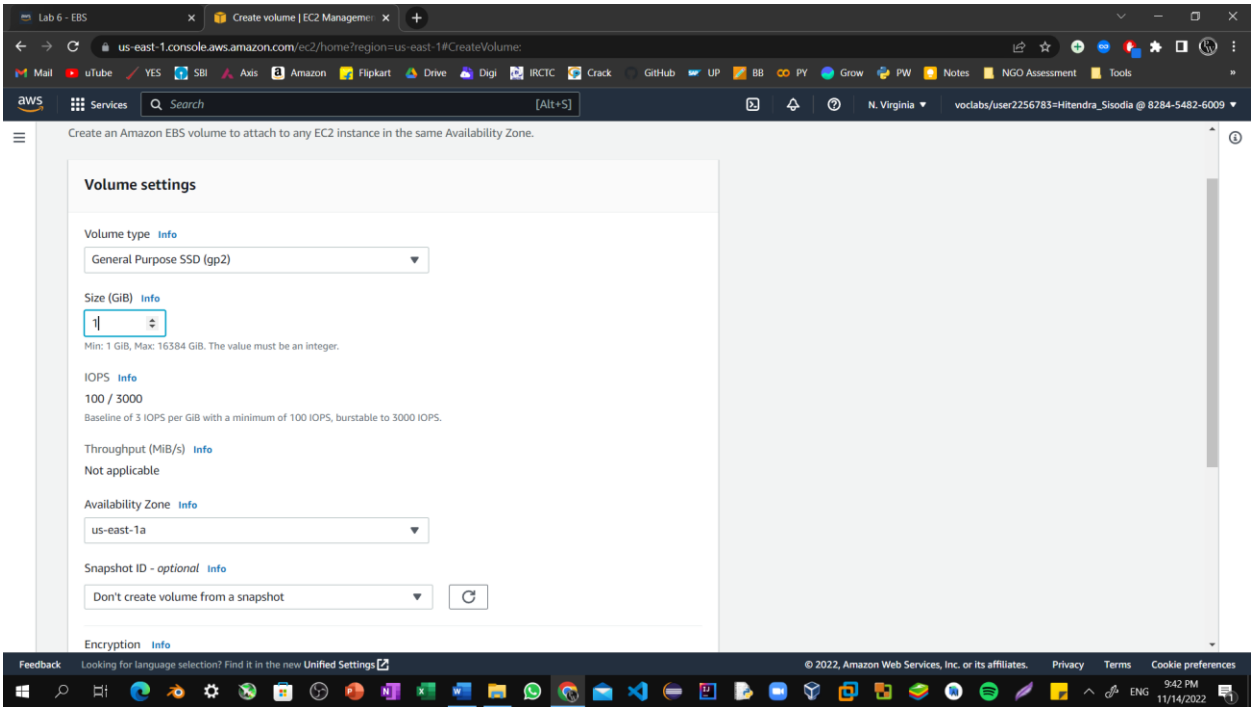


Step28: Select **Create volume**.

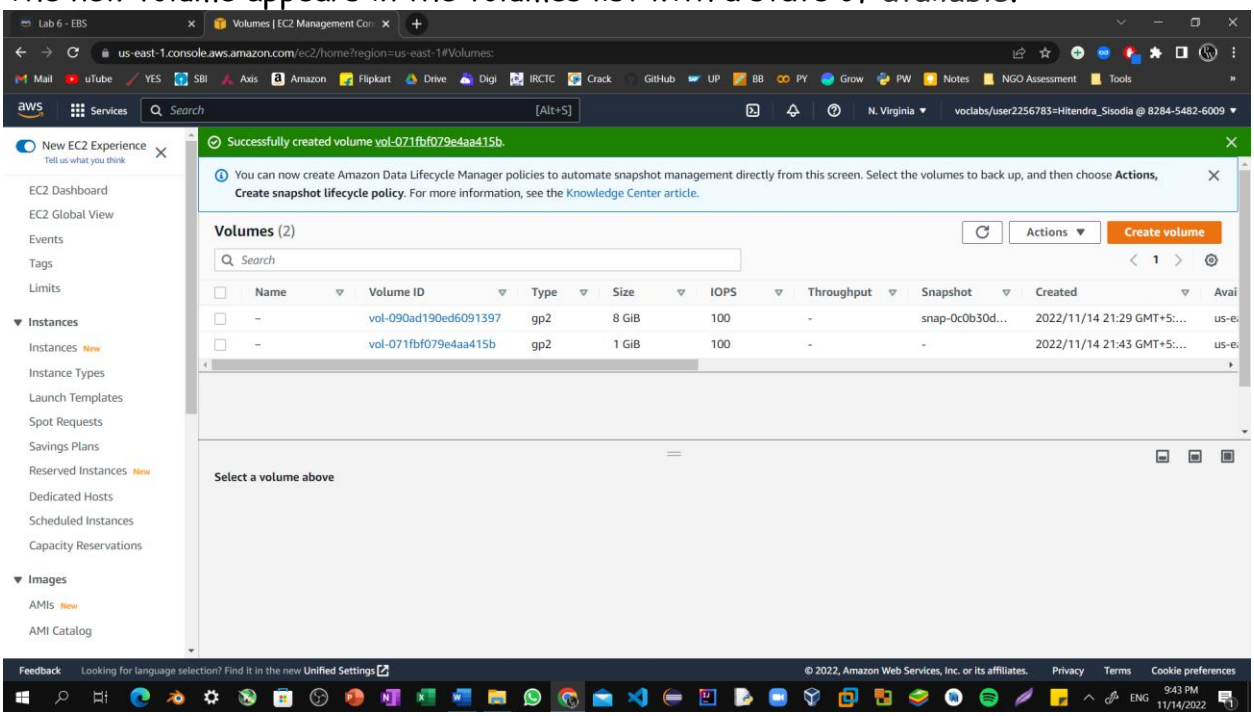


Lab 11: Launching an EC2 Instance With EBS Storage

Step29: For **Size**, enter 1 to create a volume with 1 GiB. For **Availability Zone**, select the same Availability Zone that your EC2 instance is running in.

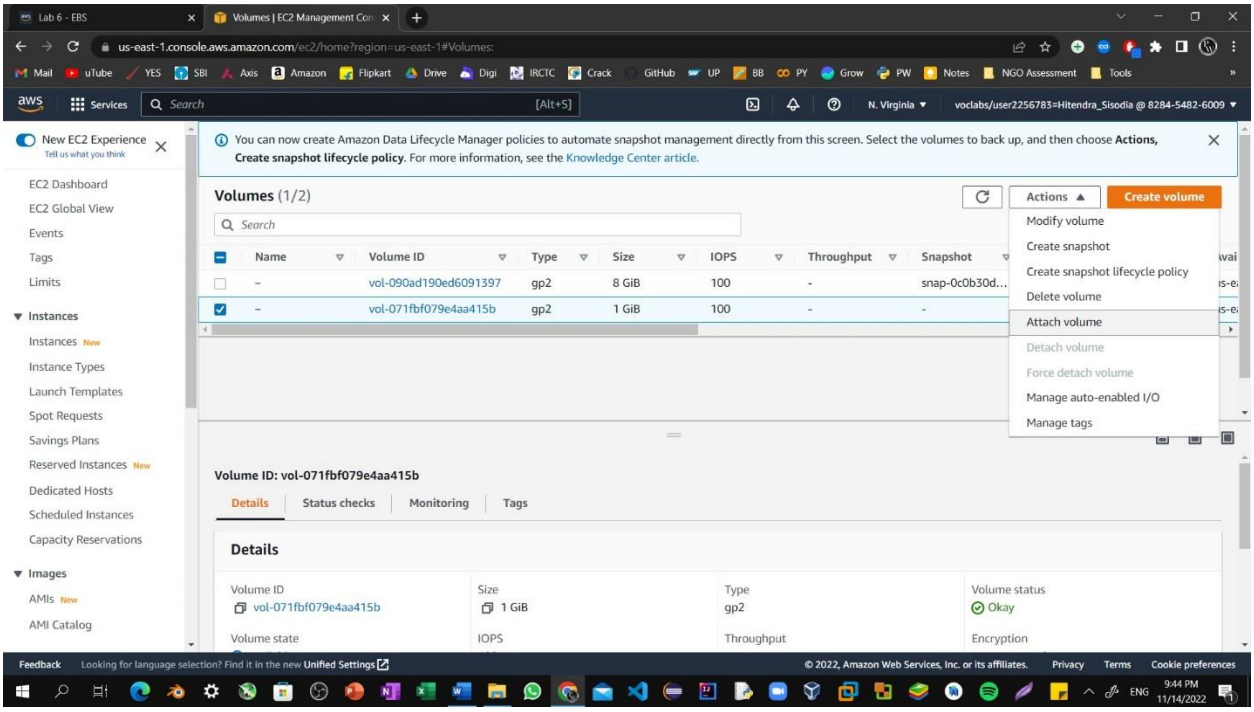


Step30: Scroll down and select **Create volume**.
The new volume appears in the volumes list with a state of *available*.

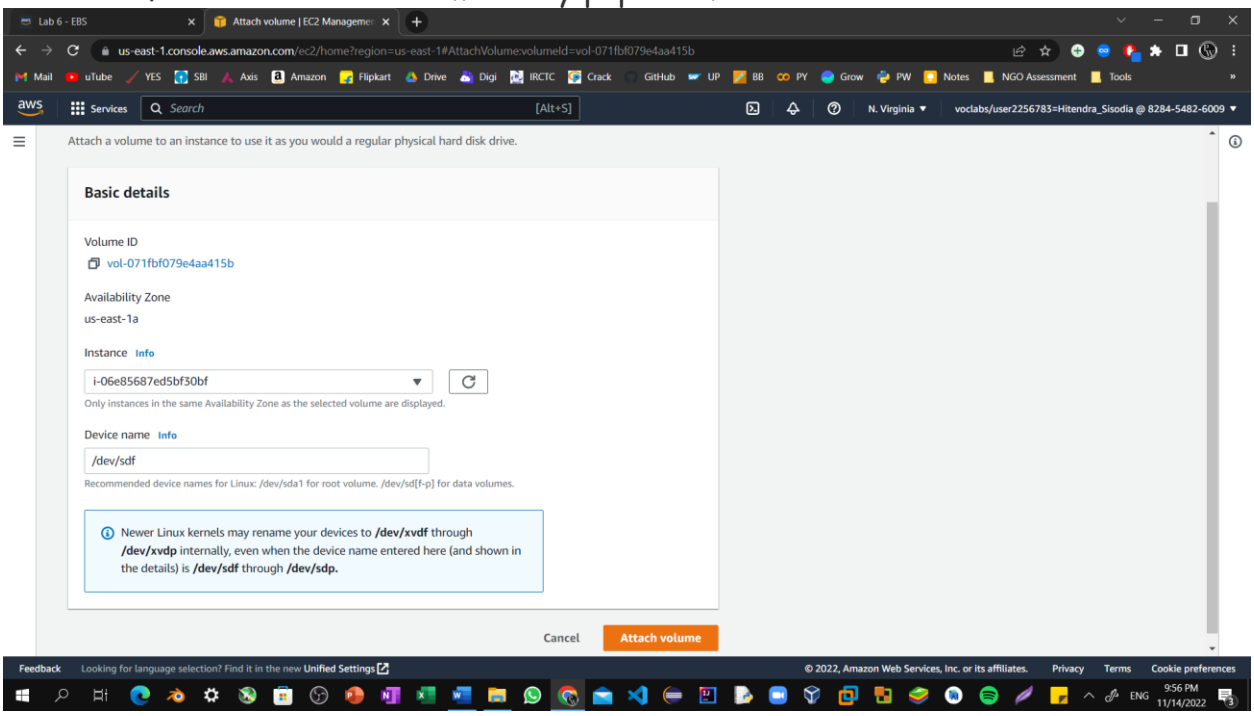


Lab 11: Launching an EC2 Instance With EBS Storage

Step31: Select the new 1 GiB size volume. Then, choose **Actions**, and Select **Attach volume**.



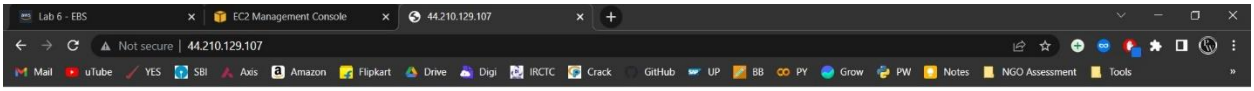
Step32: Select the **Instance** drop-down menu, and then select your EC2 instance. The list of instances will automatically populate.



Lab 11: Launching an EC2 Instance With EBS Storage

Step33: Select **Attach volume**.

The state of the volume changes to *in-use*. The new volume is now attached to your EC2 instance. Refresh The webpage that we created using EC2 instance now updated with EBS Storage.

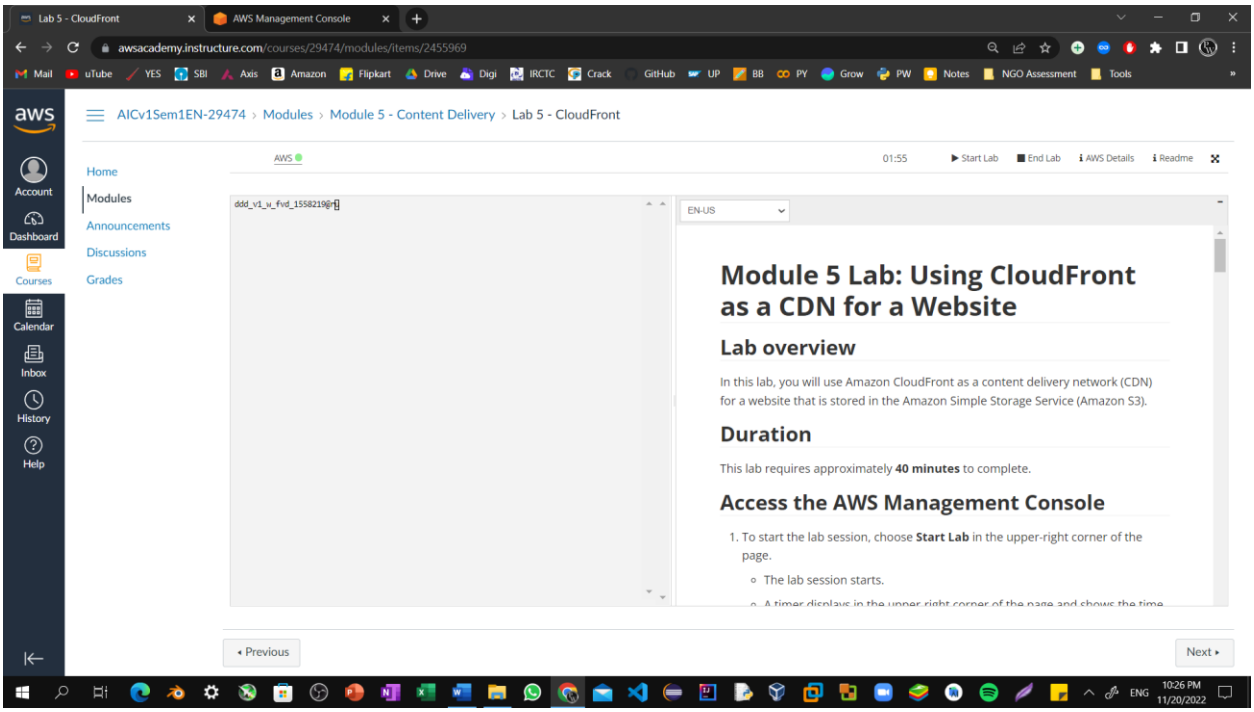


Hitendra Sisodia EC2 Instance With EBS Storage

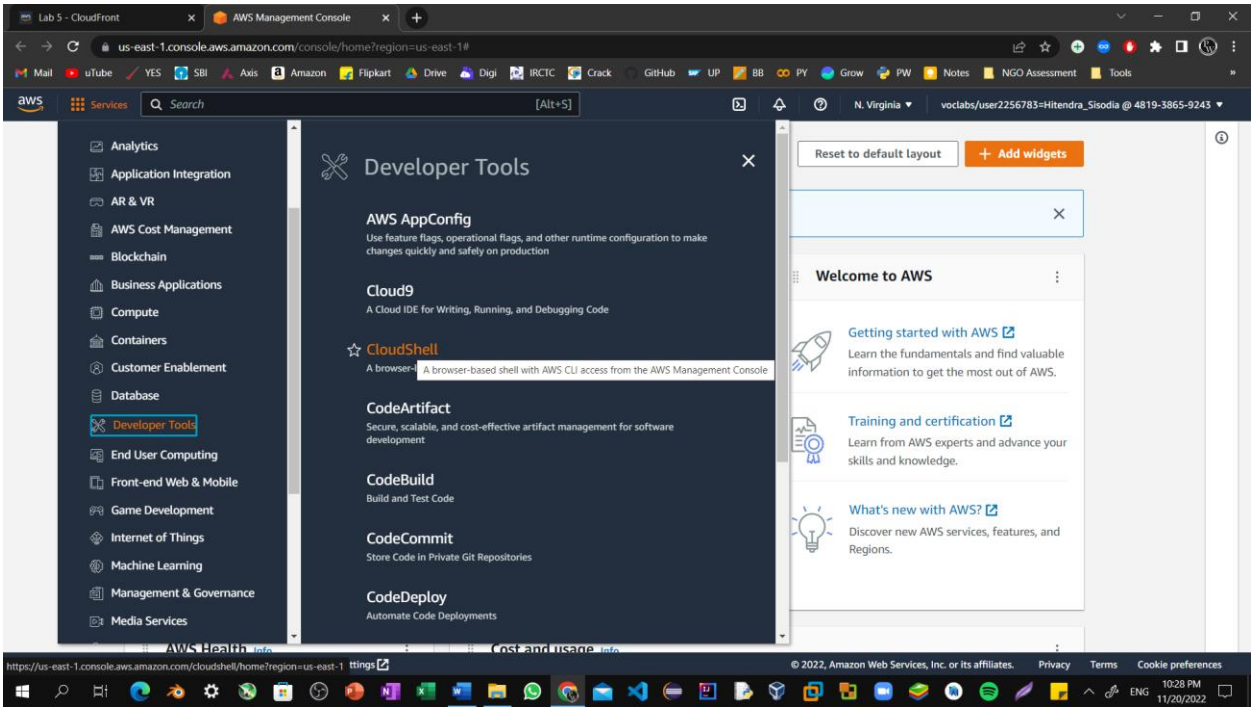
Name: Hitendra Sisodia
Sap id: 500091910

Lab 12: Using CloudFront As a CDN For A Website

Step1: To start the lab session, choose **Start Lab** in the upper-right corner of the page.

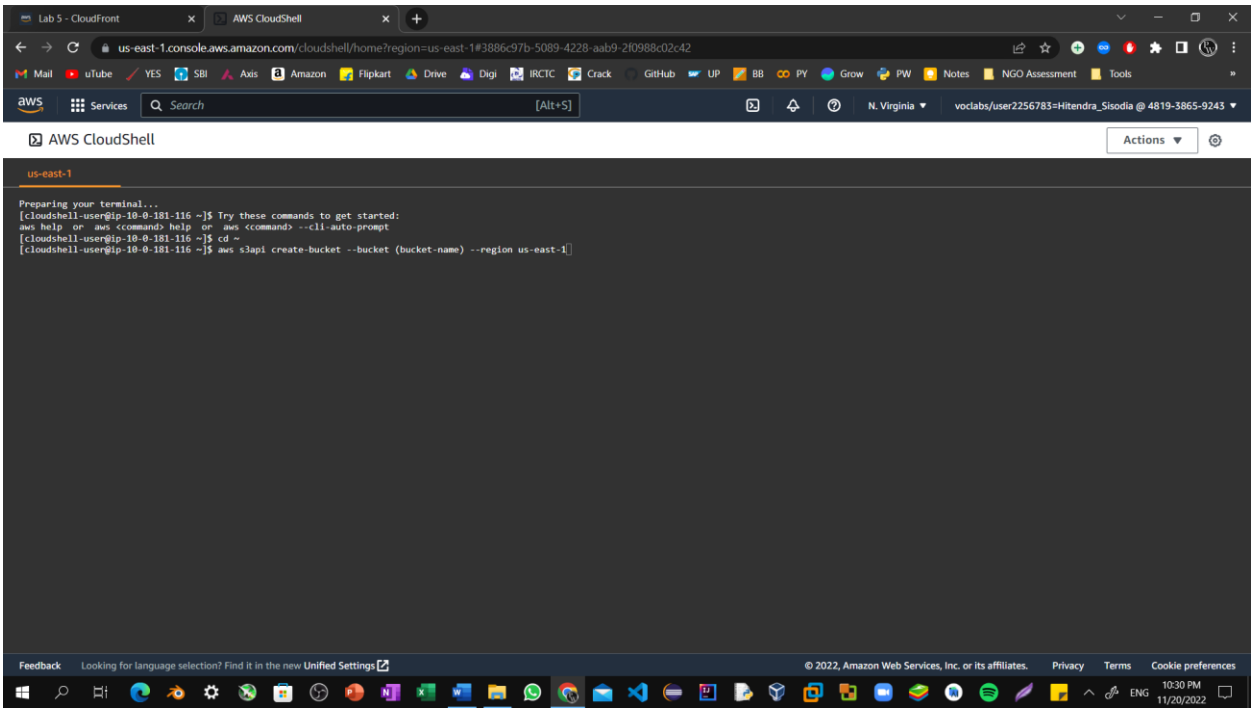


Step2: Choose the **Services** menu, locate the **Developer Tools** services, and select **CloudShell**. If a welcome pop-up window appears, choose **Close**.

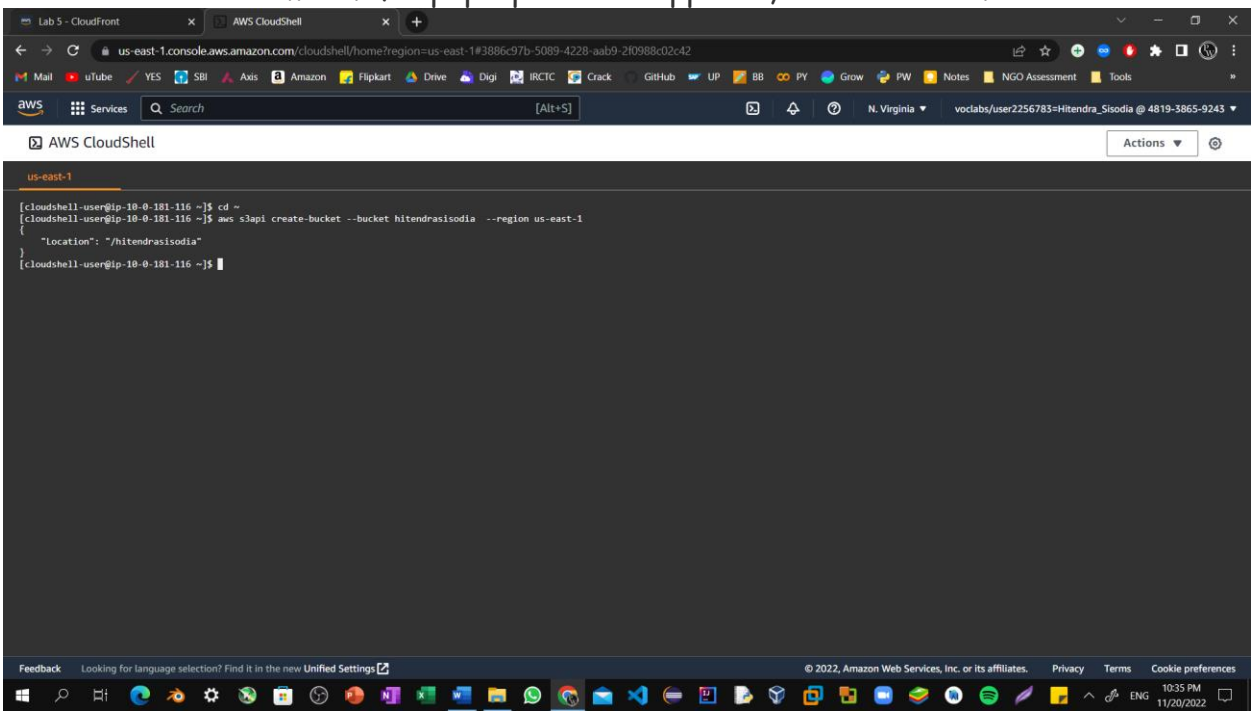


Lab 12: Using CloudFront As a CDN For A Website

Step3: Copy and paste the following code into a text editor



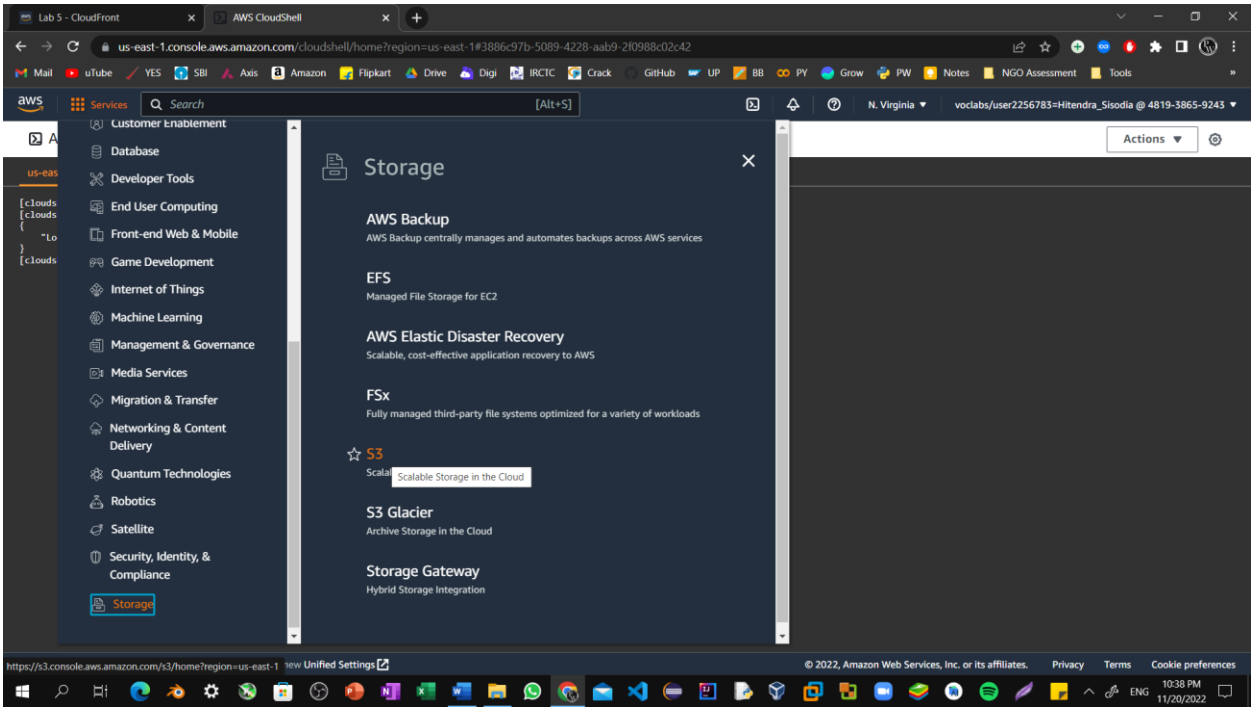
Step4: In the code that you copied, replace **(bucket-name)** with a unique Domain Name System (DNS)-compliant name for your new bucket. Run the updated code in the CloudShell terminal.If a pop-up window appears, choose **Paste**.



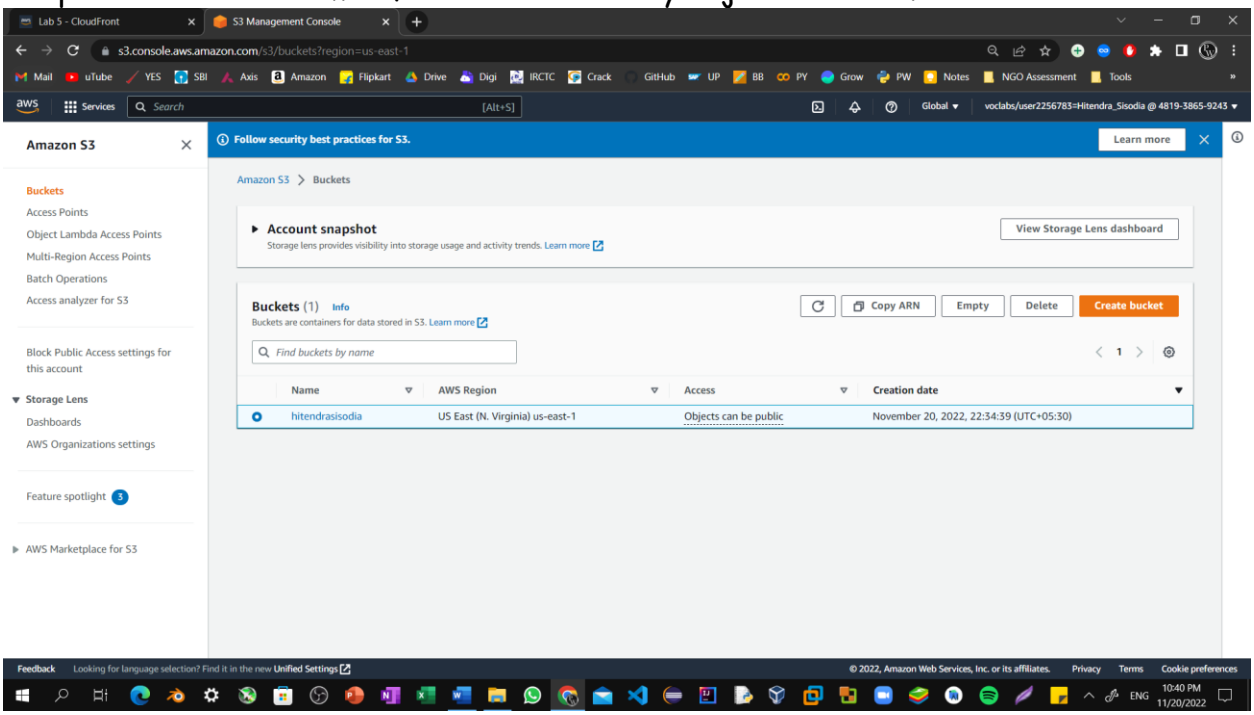
Name: Hitendra Sisodia
Sap id: 500091910

Lab 12: Using CloudFront As a CDN For A Website

Step5: In the console, choose the **Services** menu, locate the **Storage** section, and choose **S3**.

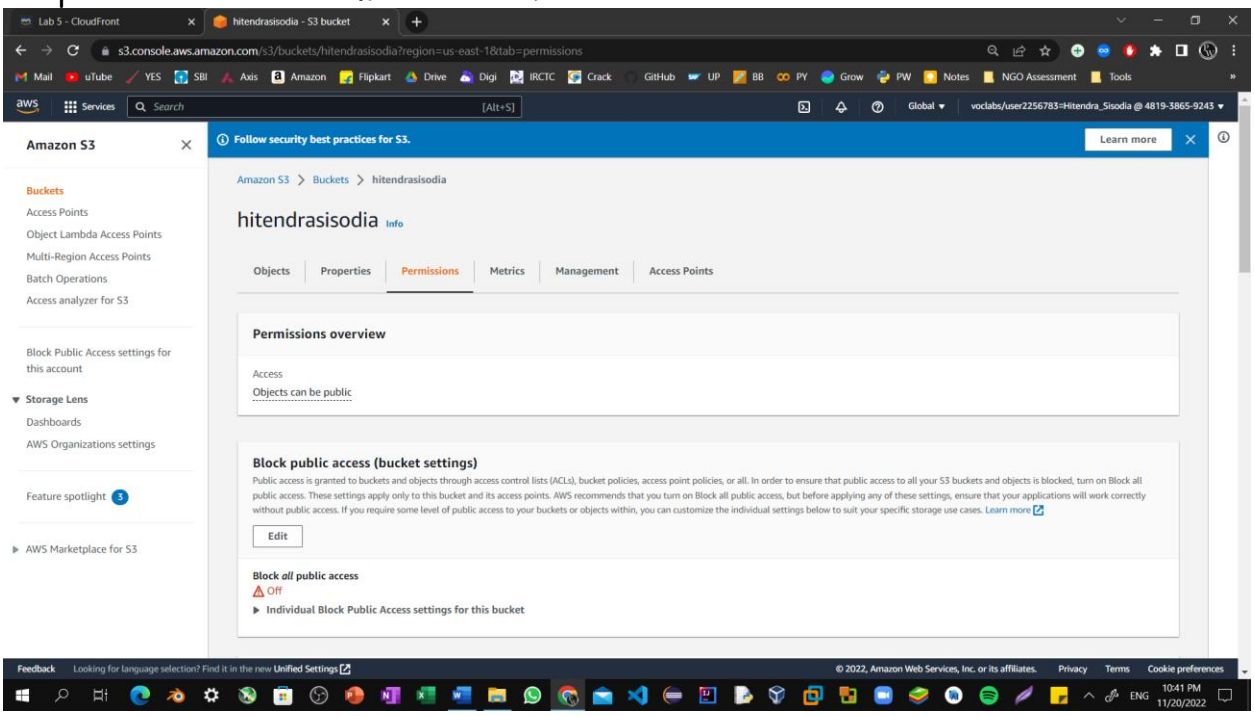


Step6: Choose the name of the bucket that you just created.

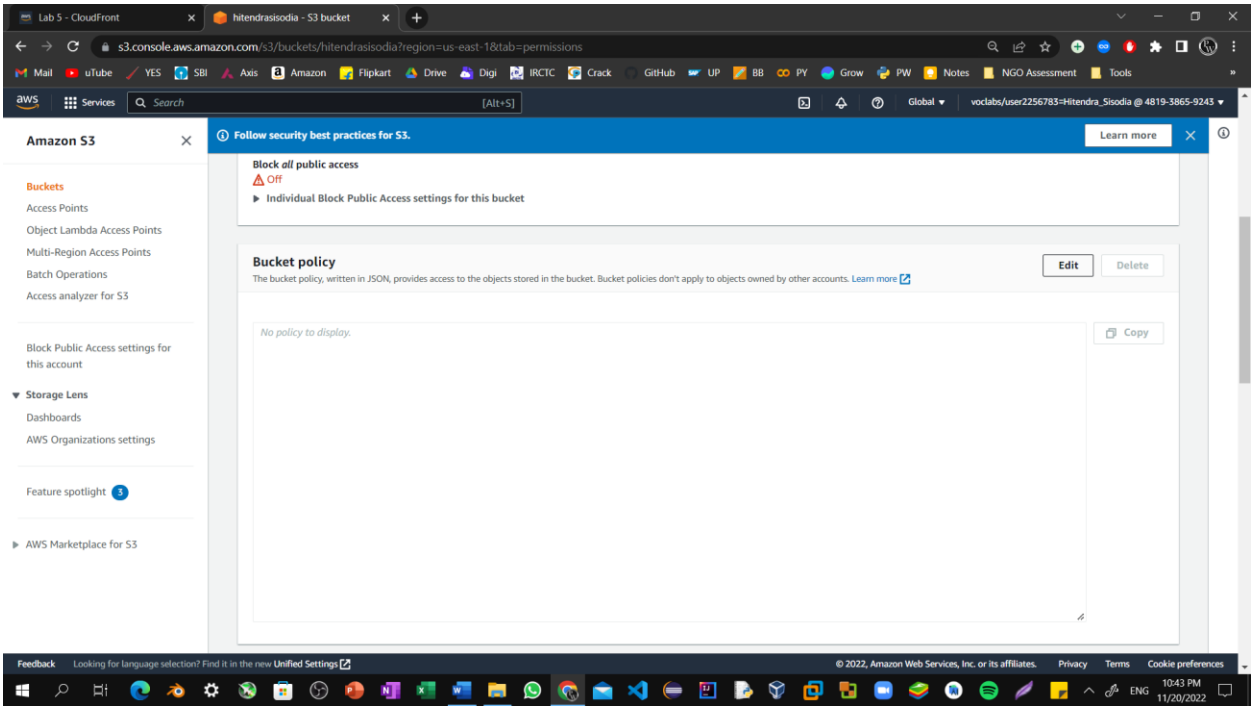


Lab 12: Using CloudFront As a CDN For A Website

Step7: Choose the **Permissions** tab.

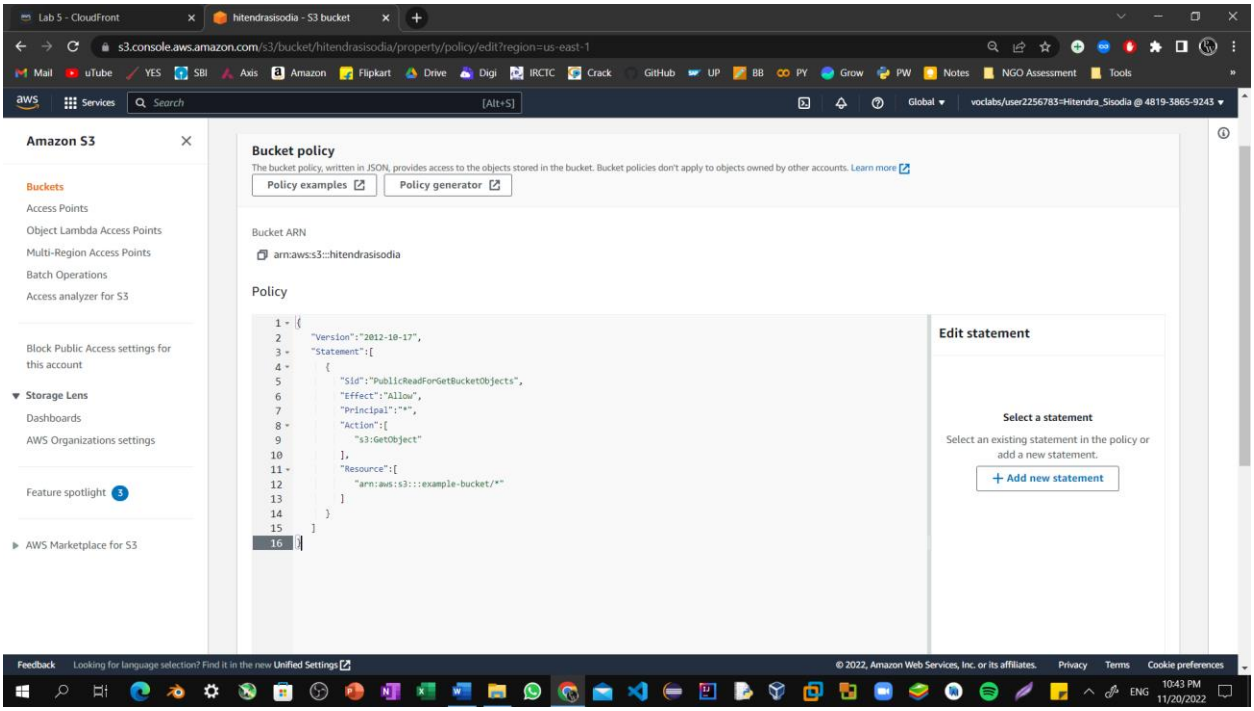


Step8: In the **Bucket policy** section, choose **Edit**.

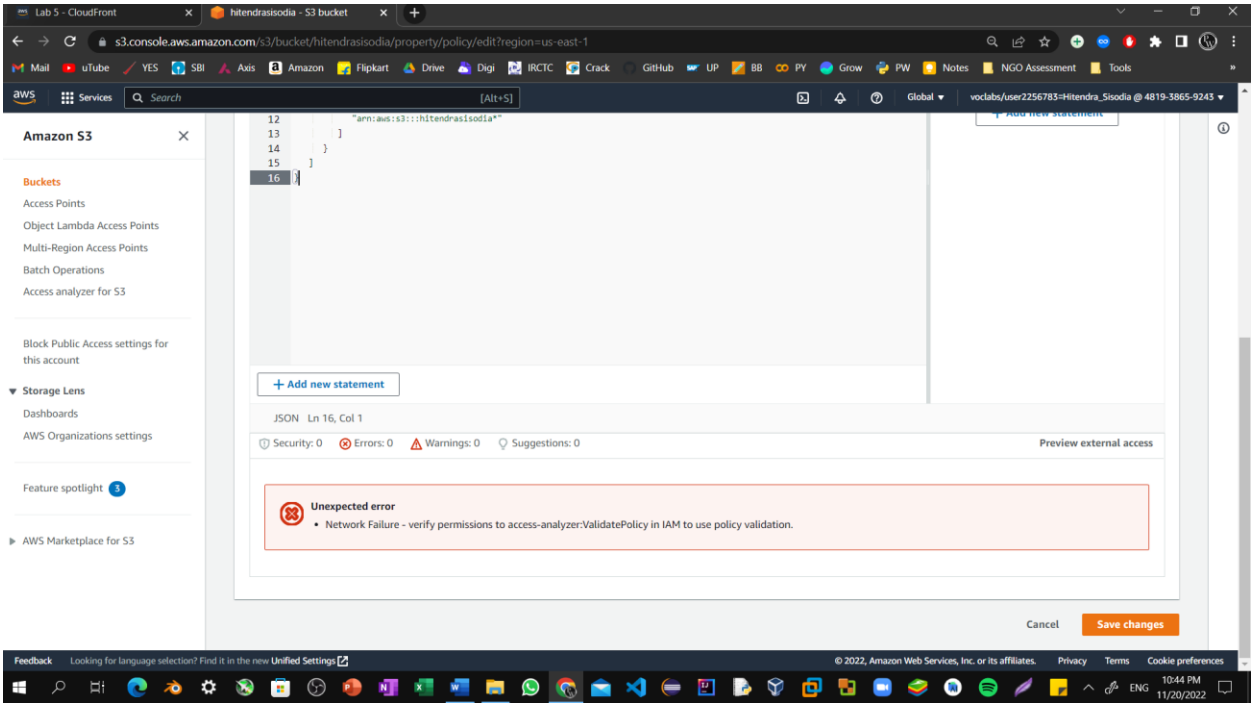


Lab 12: Using CloudFront As a CDN For A Website

Step9: To grant public read access for your website, copy and paste the following bucket policy into the policy editor.

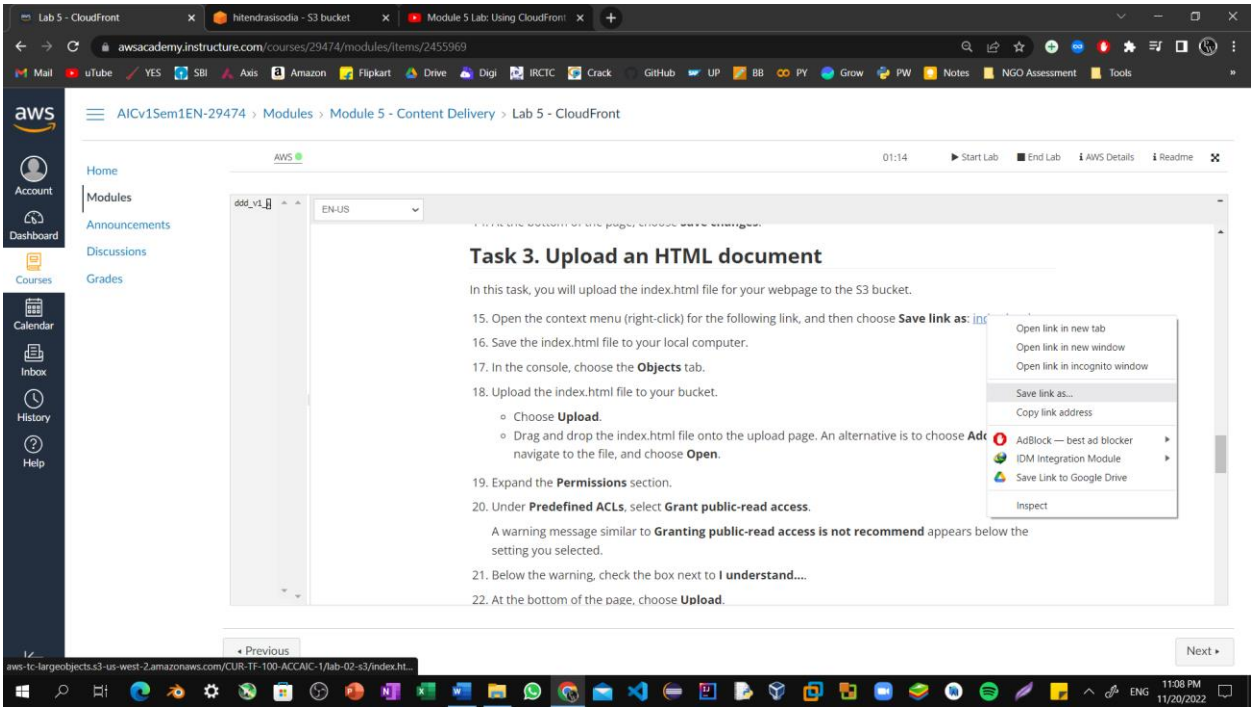


Step10: In the policy, replace **example-bucket** with the name of your bucket. At the bottom of the page, choose **Save changes**.

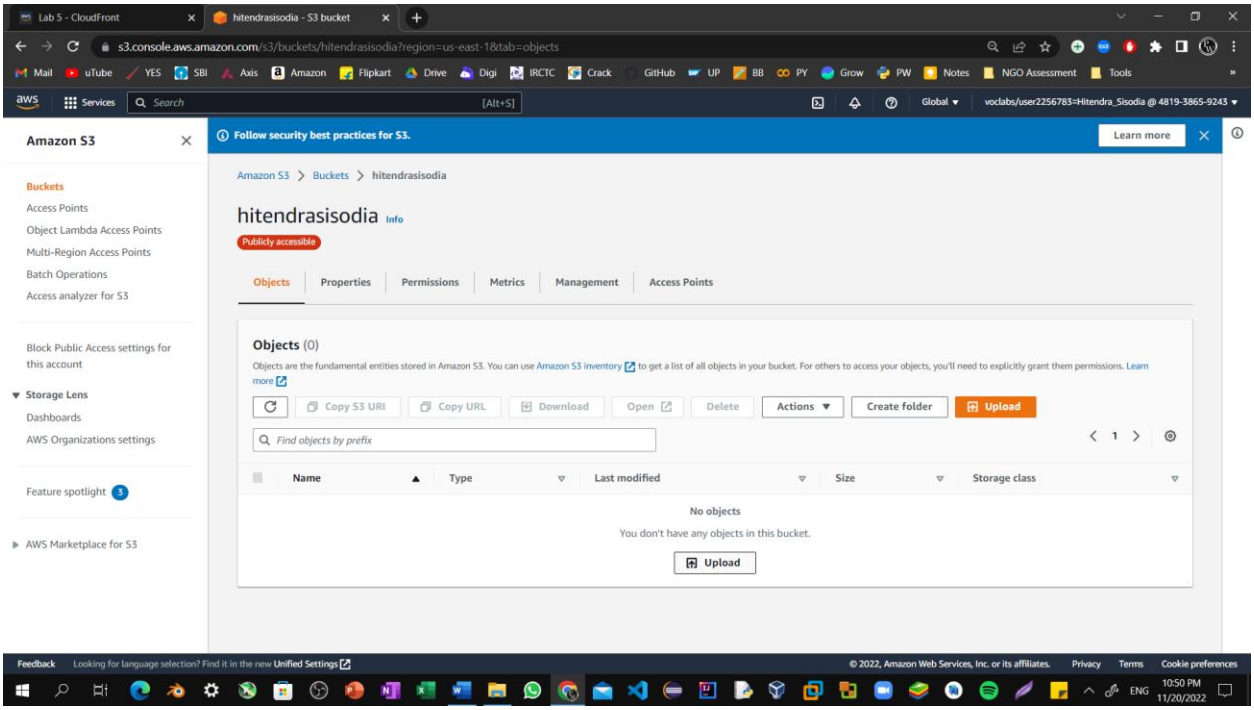


Lab 12: Using CloudFront As a CDN For A Website

Step10: Open the context menu (right-click) for the following link, and then choose **Save link as**: index.html. Save the index.html file to your local computer.

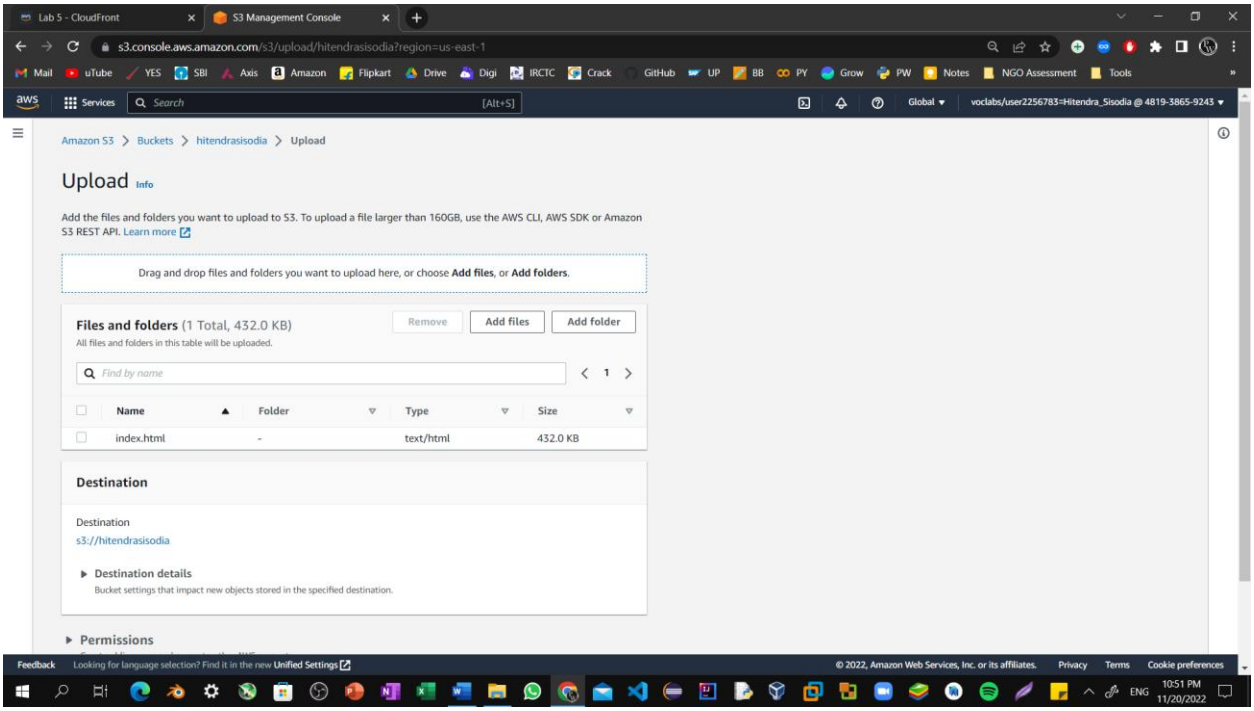


Step11: In the console, choose the **Objects** tab. Upload the index.html file to your bucket. Choose **Upload**. Drag and drop the index.html file onto the upload page.

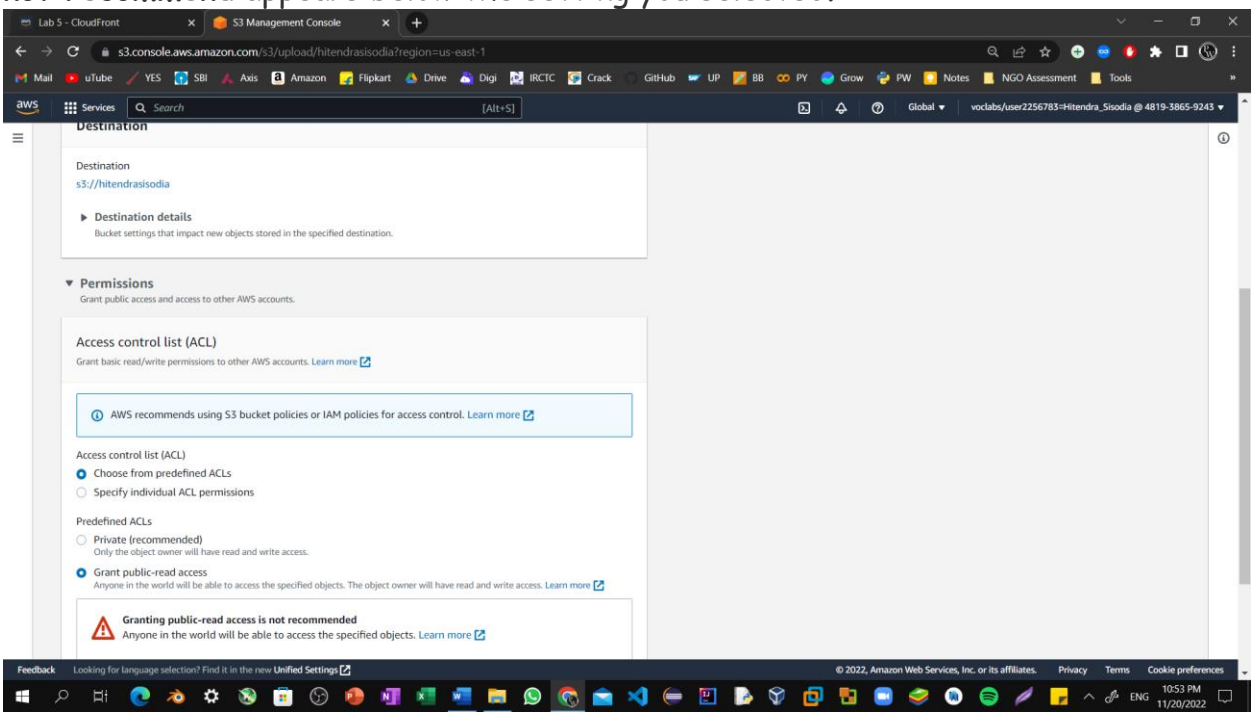


Lab 12: Using CloudFront As a CDN For A Website

Step12: An alternative is to choose **Add files**, navigate to the file, and choose **Open**.

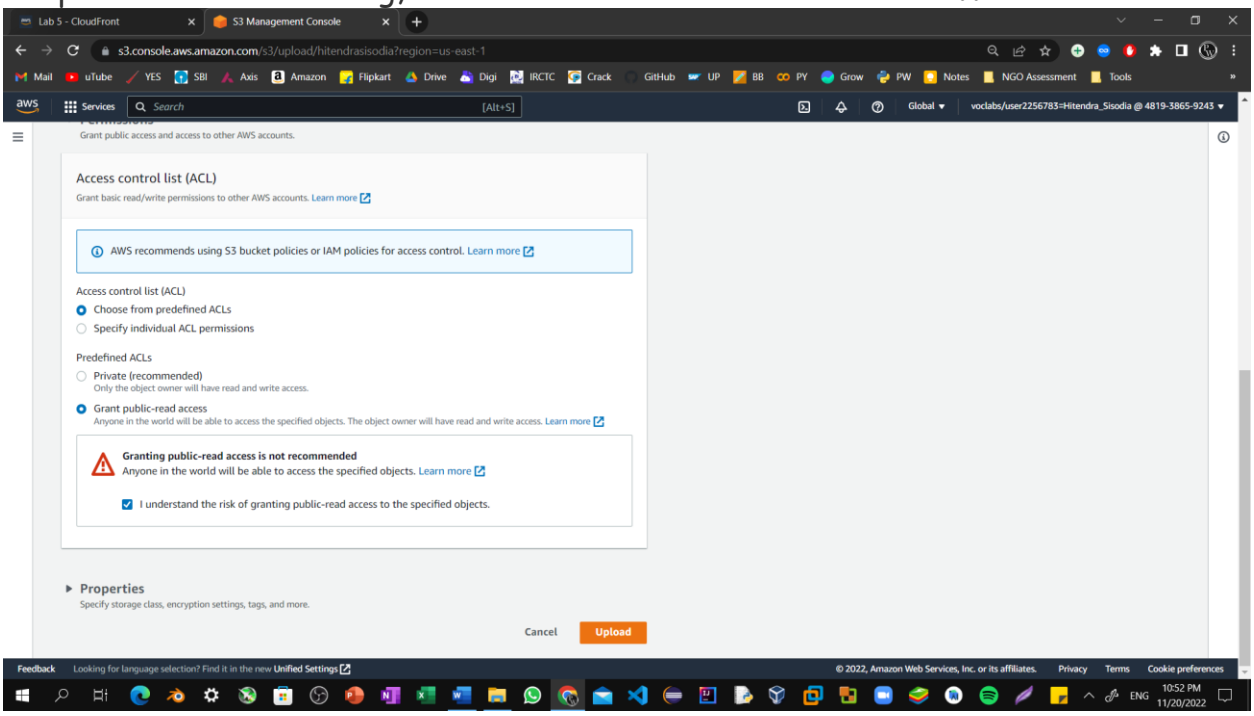


Step13: Expand the **Permissions** section. Under **Predefined ACLs**, select **Grant public-read access**. A warning message similar to **Granting public-read access is not recommend** appears below the setting you selected.

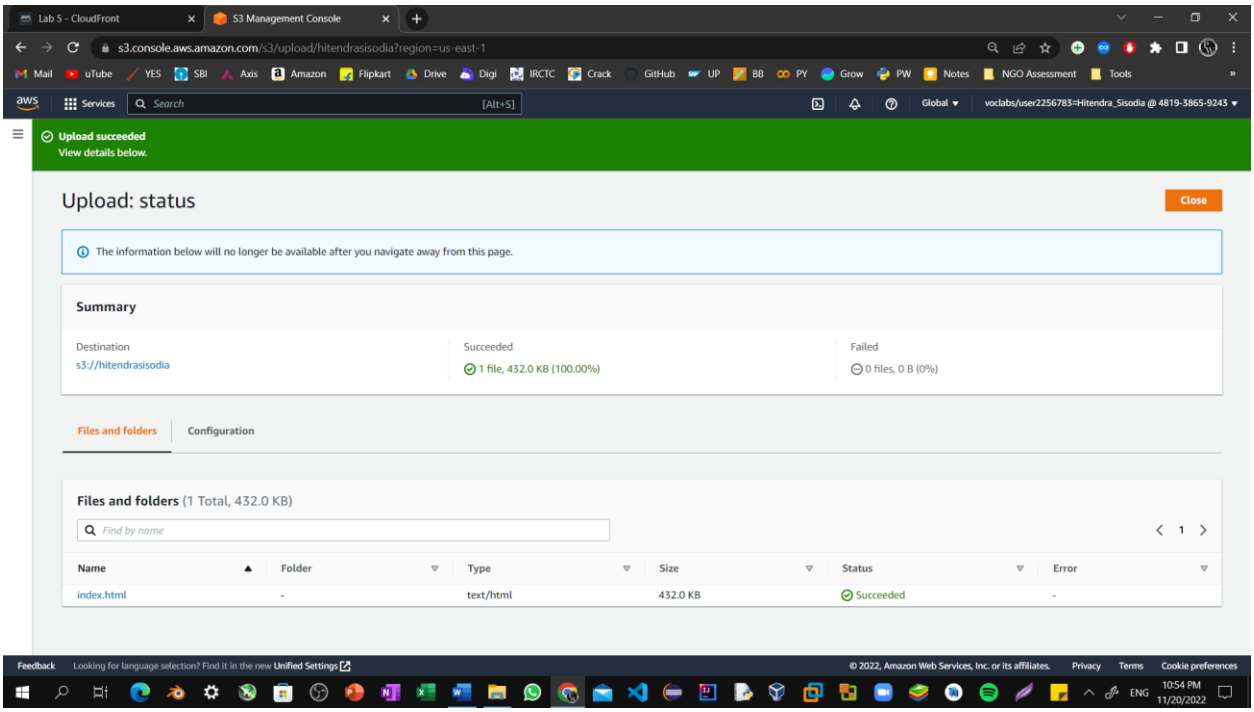


Lab 12: Using CloudFront As a CDN For A Website

Step14: Below the warning, check the box next to **I understand**..

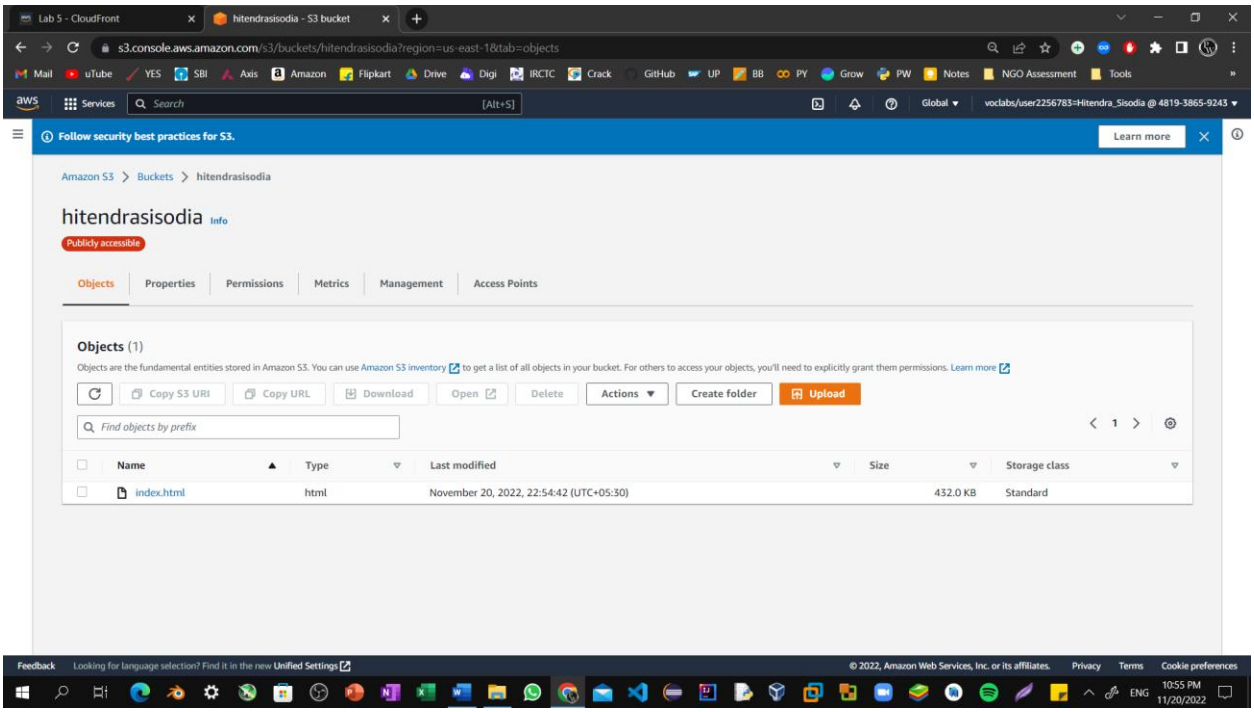


Step15: At the bottom of the page, choose **Upload**. Choose **Close**.

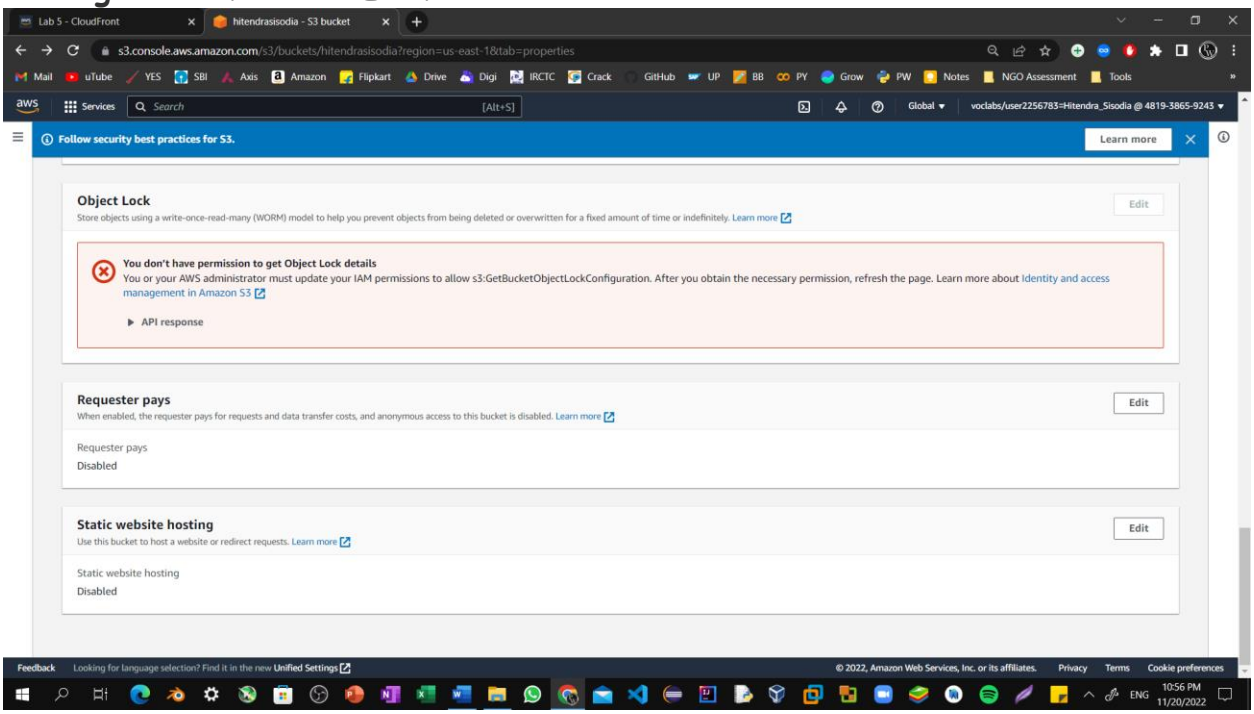


Lab 12: Using CloudFront As a CDN For A Website

Step16: The index.html file appears in the **Objects** list.

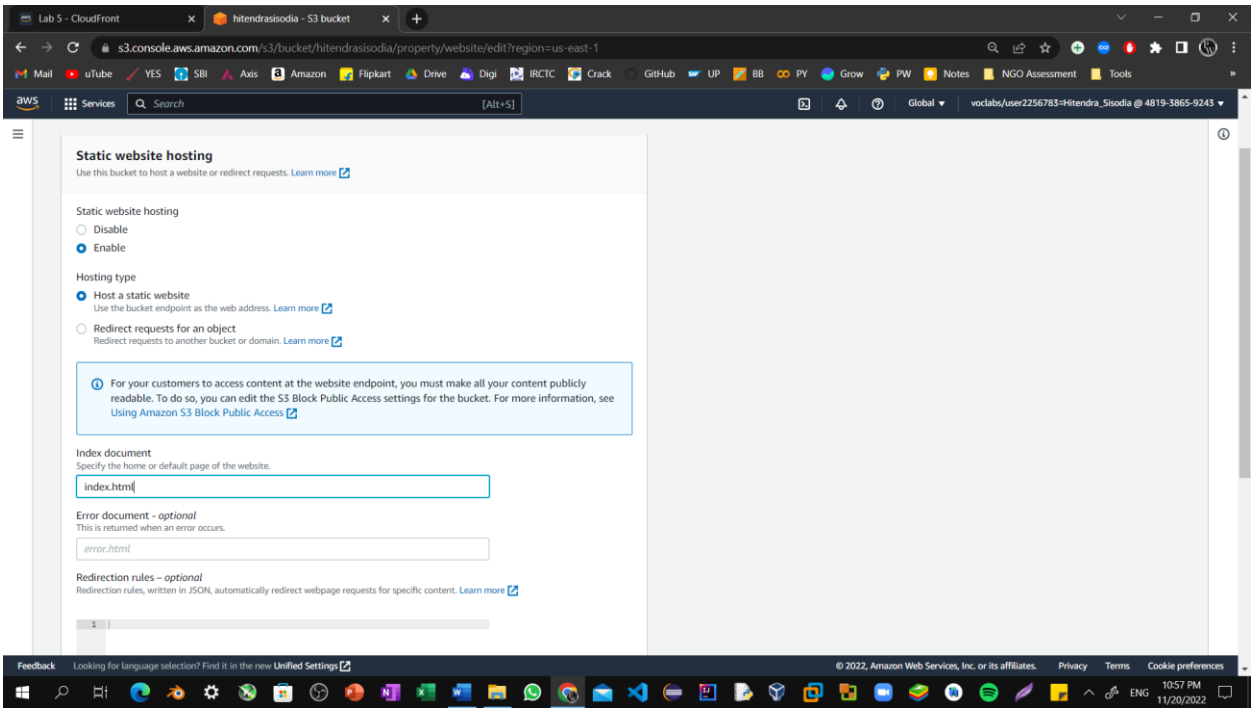


Step17: Select the **Properties** tab, and scroll down to the **Static website hosting** section. Choose **Edit**.

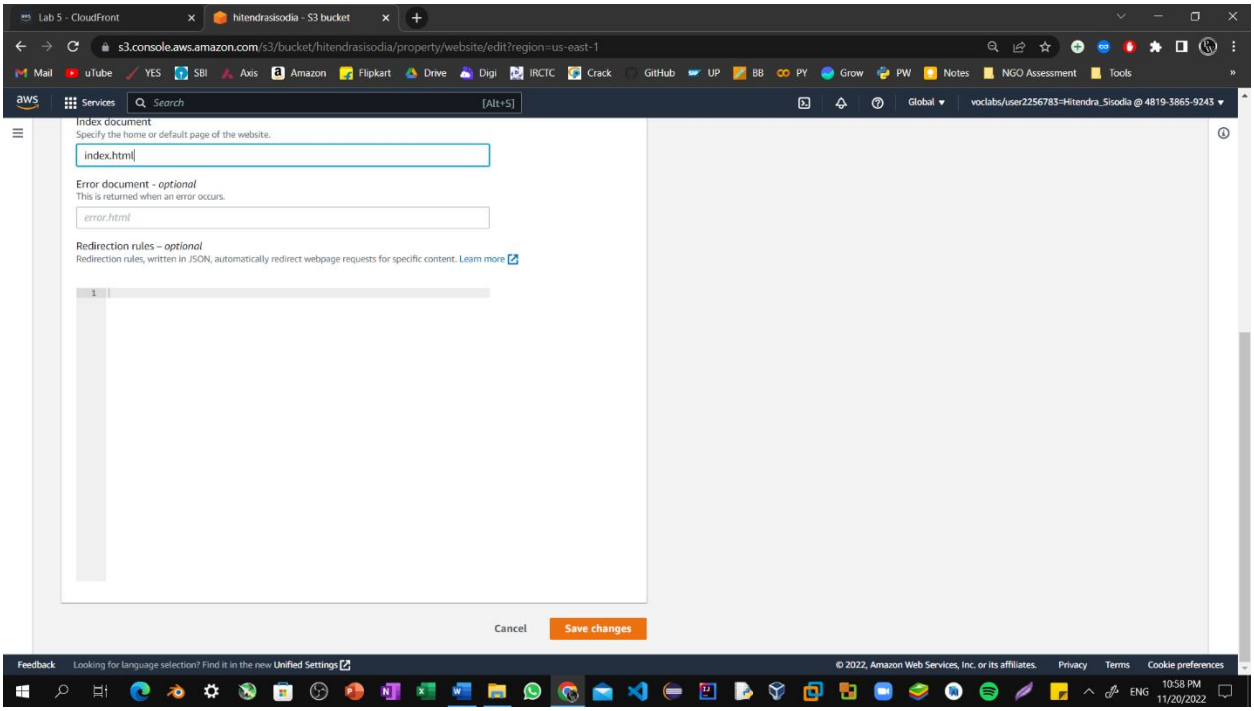


Lab 12: Using CloudFront As a CDN For A Website

Step18: Select **Enable**. In the **Index document** text box, enter index.html

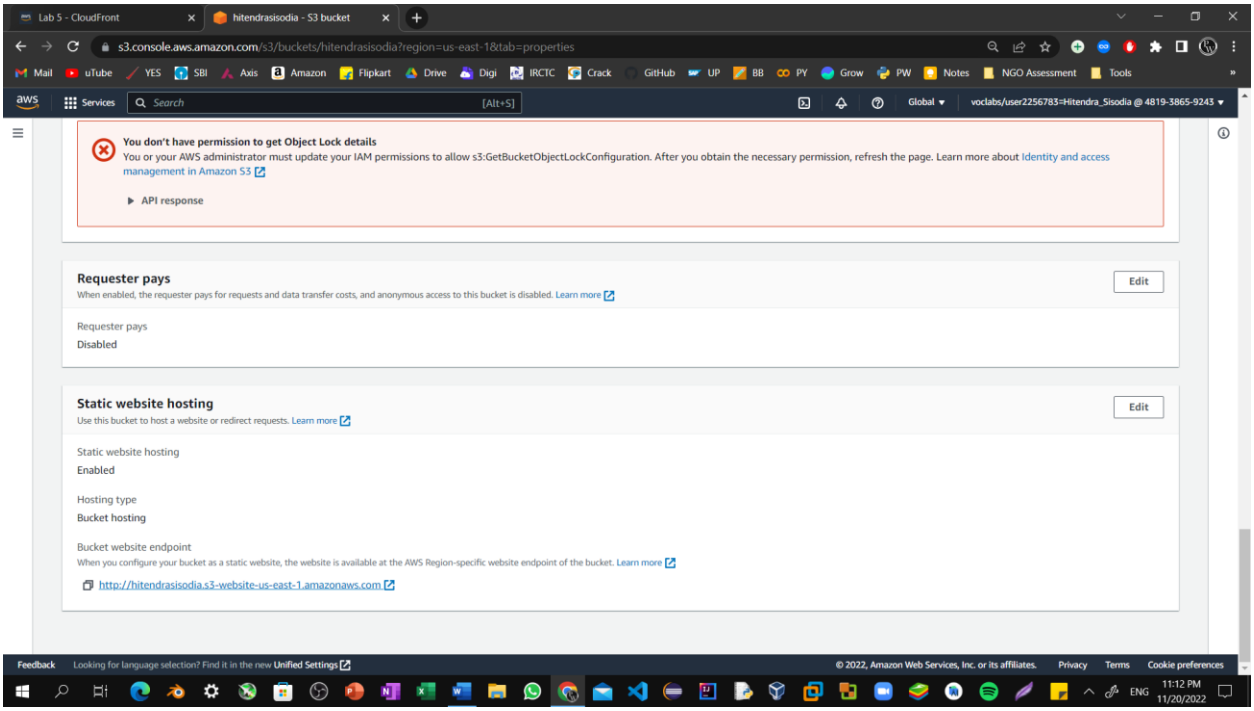


Step19: Select **Save changes**.

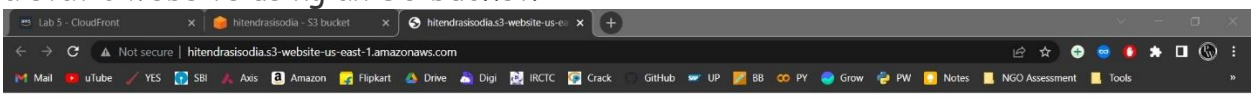


Lab 12: Using CloudFront As a CDN For A Website

Step20: Scroll down to the **Static website hosting** section again, and copy the **Bucket website endpoint** URL to your clipboard.



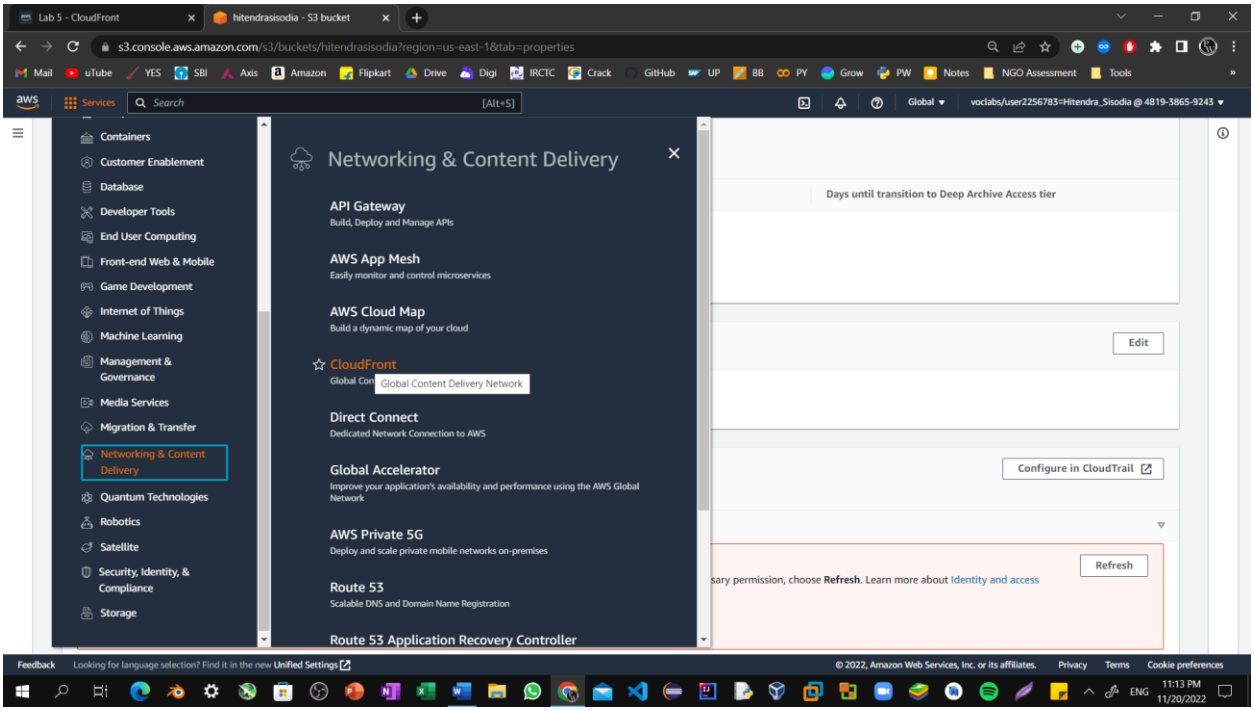
Step21: Open a new tab in your web browser, paste the URL you just copied, and press **Enter**. The **Hello World** webpage should display. You have successfully hosted a static website using an S3 bucket!



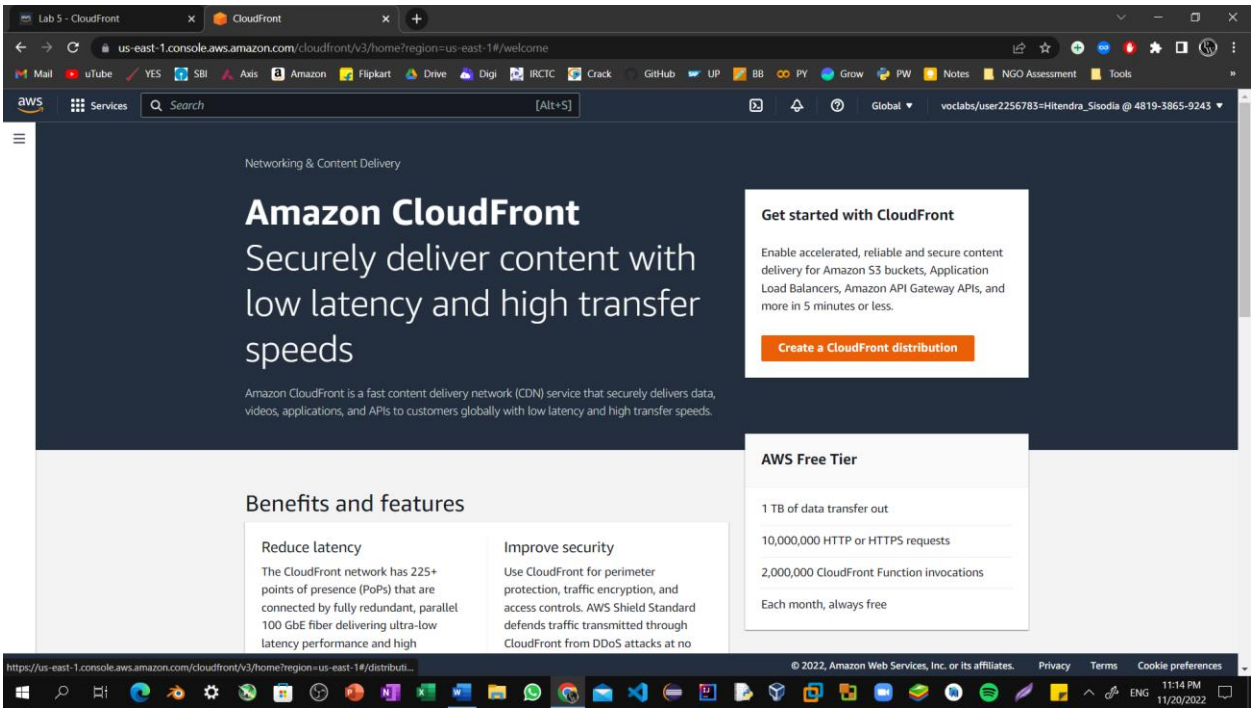
Hello World. Take me to your leader.

Lab 12: Using CloudFront As a CDN For A Website

Step22: Choose the **Services** menu, locate the **Networking & Content Delivery** section, and choose **CloudFront**.

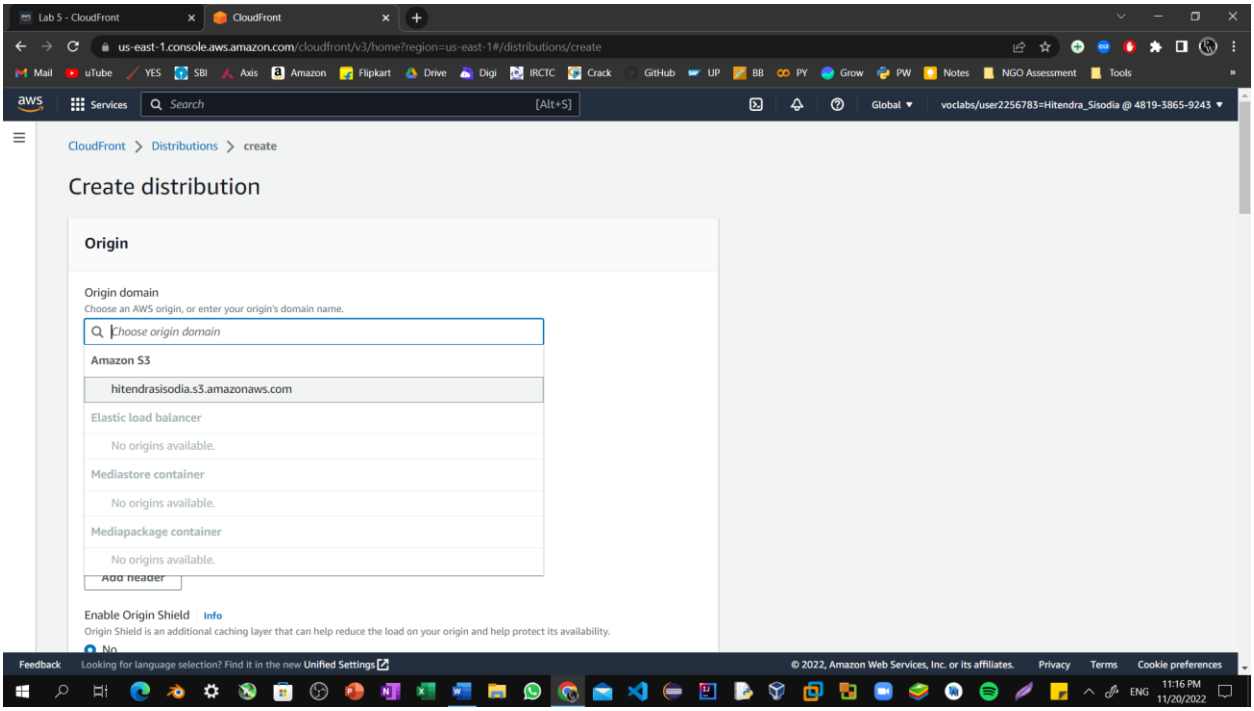


Step23: Choose **Create Distribution**.

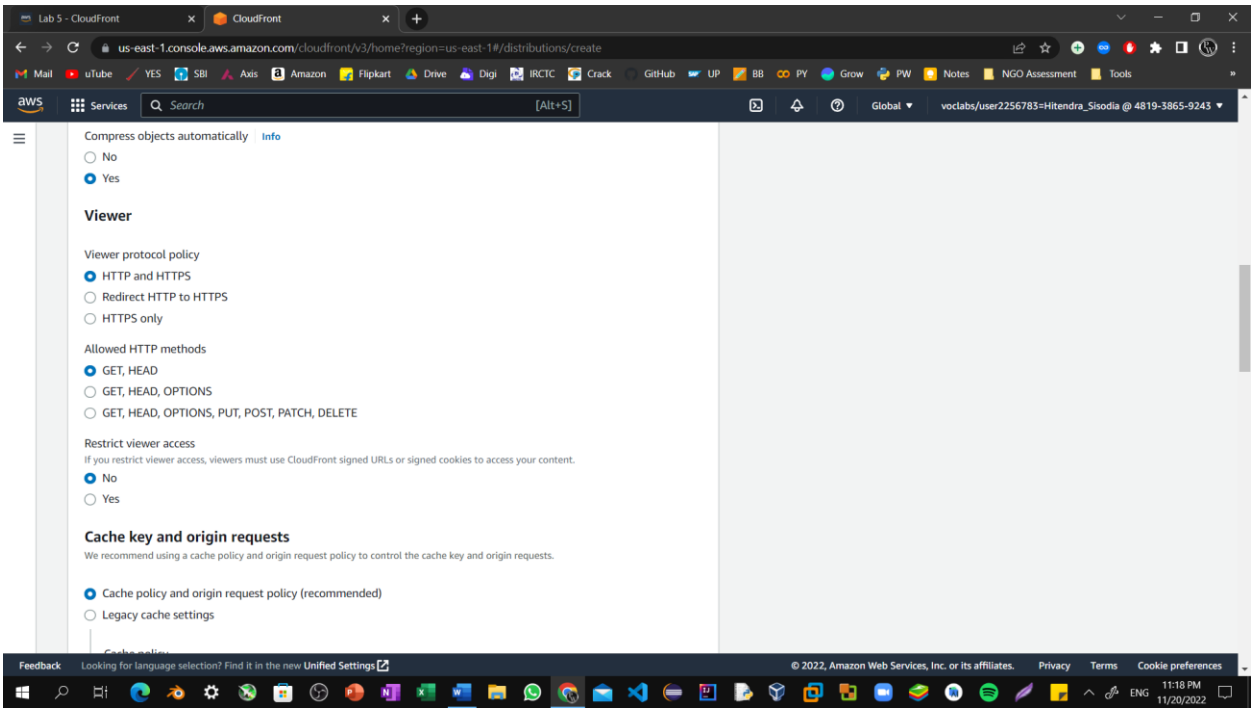


Lab 12: Using CloudFront As a CDN For A Website

Step24: Choose the text box next to **Origin Domain Name** and select the endpoint from your S3 bucket.

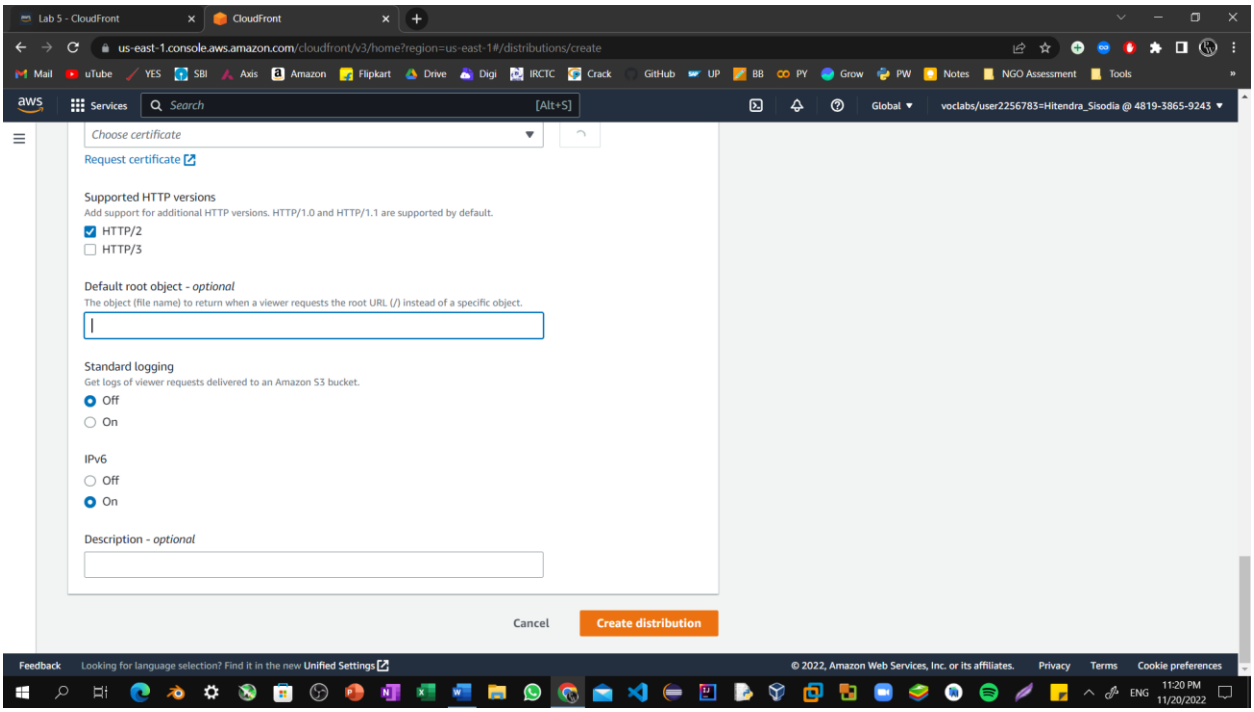


Step25: For **Viewer Protocol Policy**, ensure that **HTTP and HTTPS** is selected.

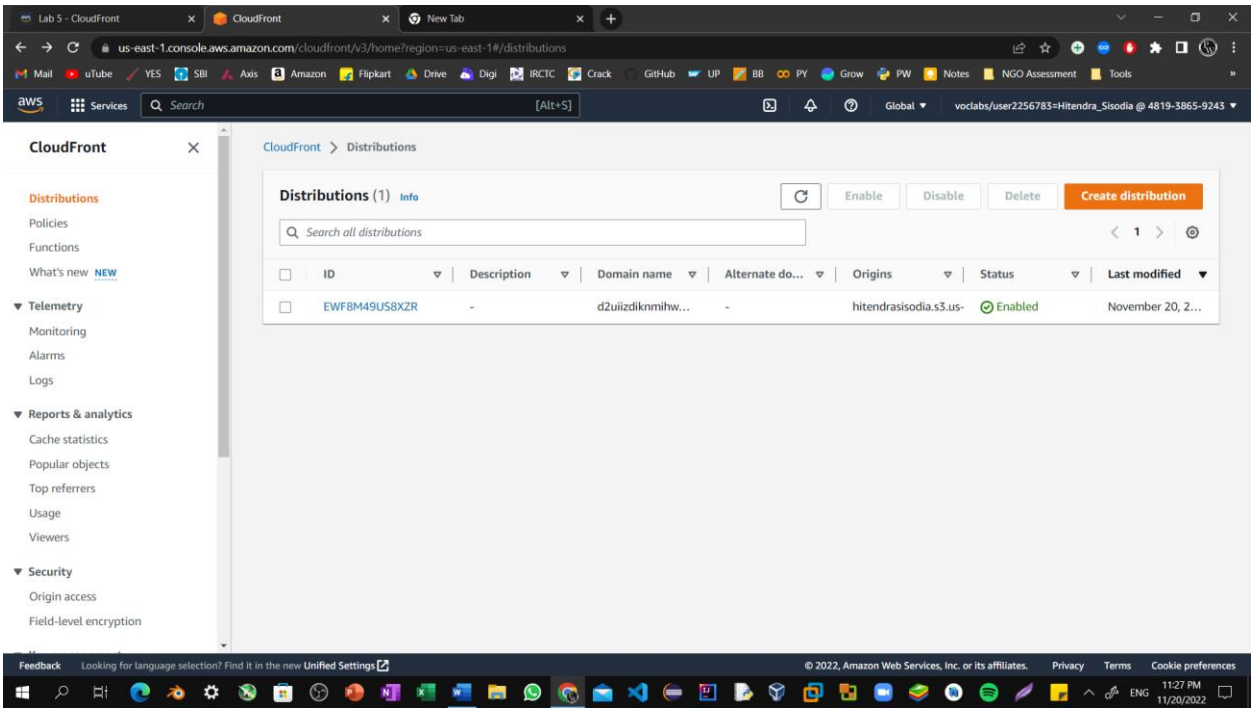


Lab 12: Using CloudFront As a CDN For A Website

Step26: Scroll to the bottom of the page and select **Create Distribution**.

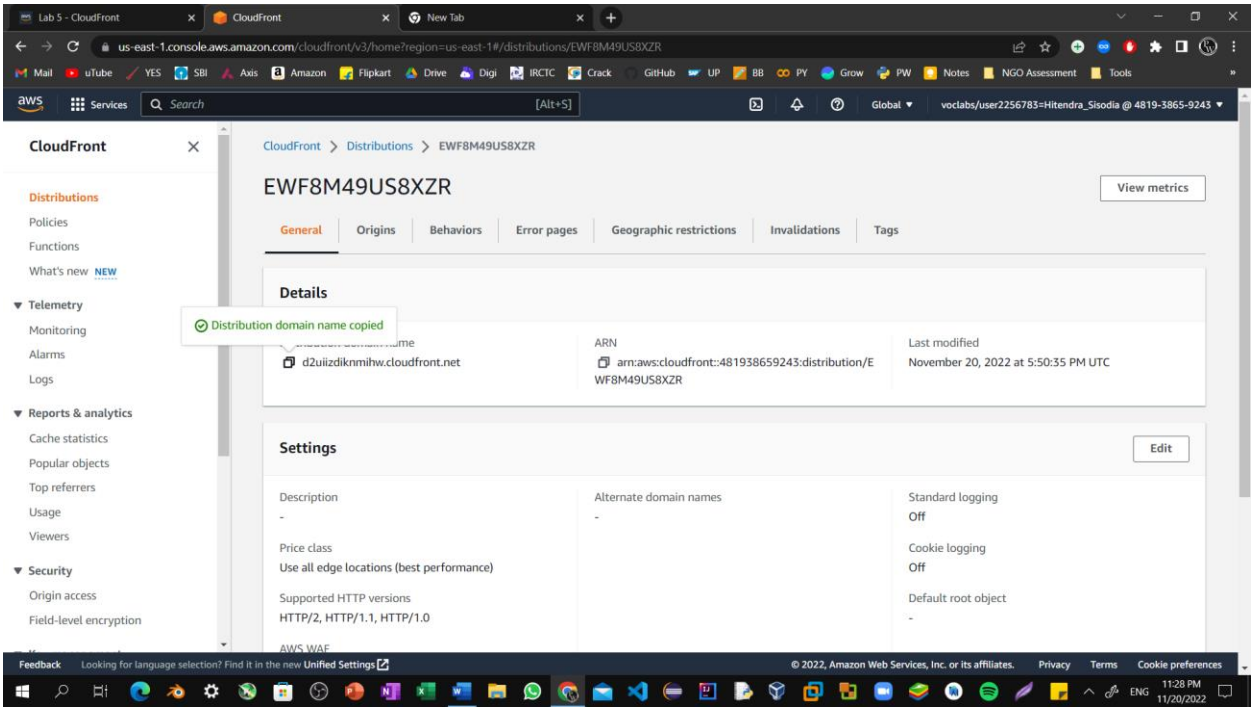


Step27: A new CloudFront distribution displays in the distributions list.
The **Status** will say *In Progress* until your website has been distributed. This may take up to 20 minutes. When the **Status** says *Deployed*, you can test your distribution.

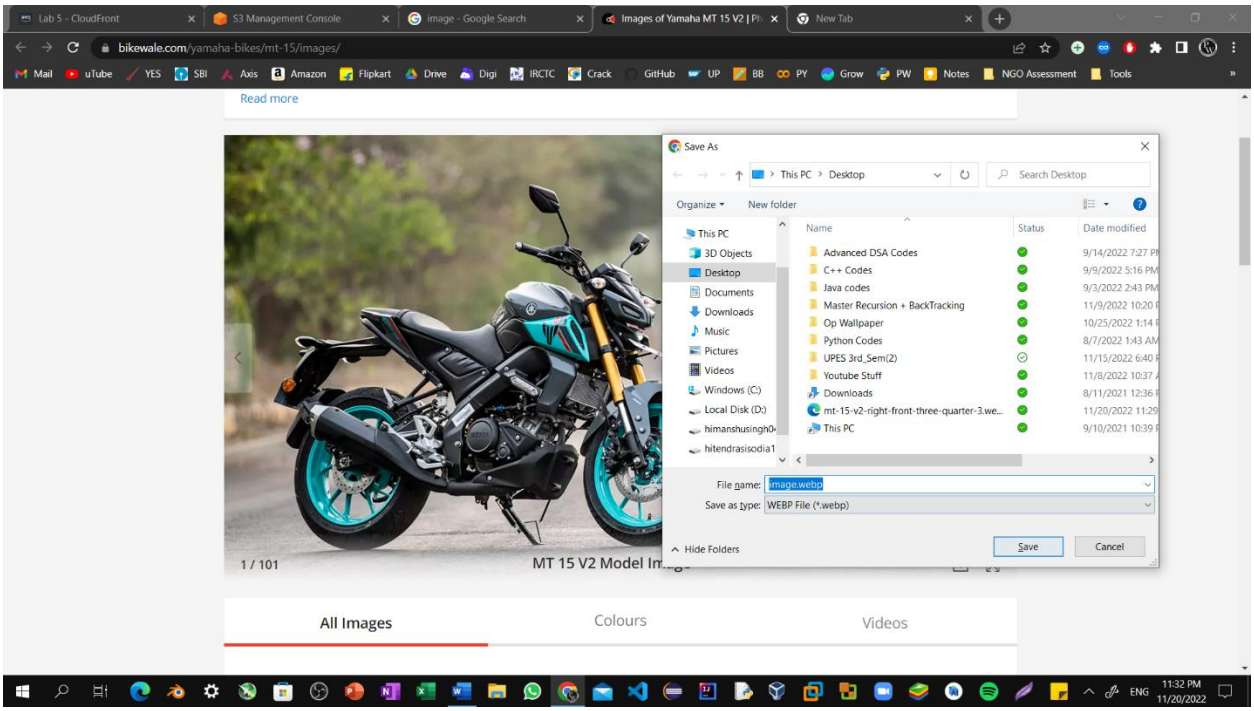


Lab 12: Using CloudFront As a CDN For A Website

Step28: Copy the **Domain Name** value for your distribution and save it to a text editor to use in a later step.

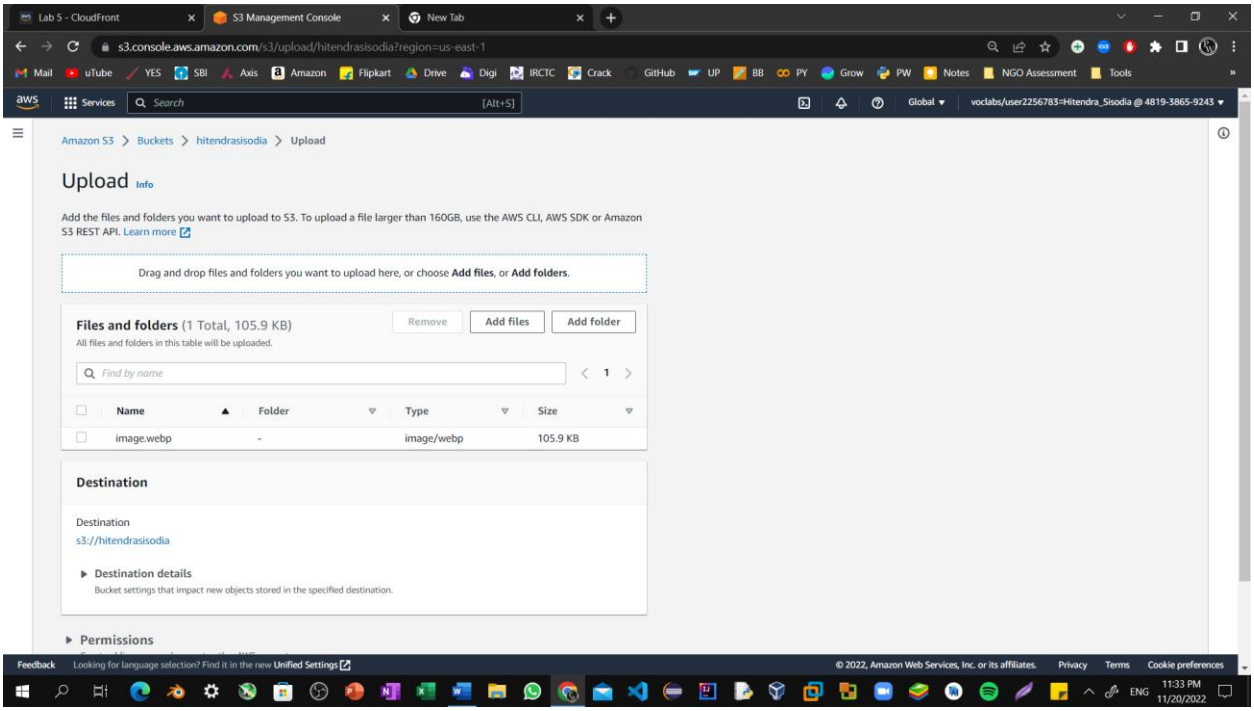


Step29: Create a new HTML file to test the distribution. Find and download an image from the internet.

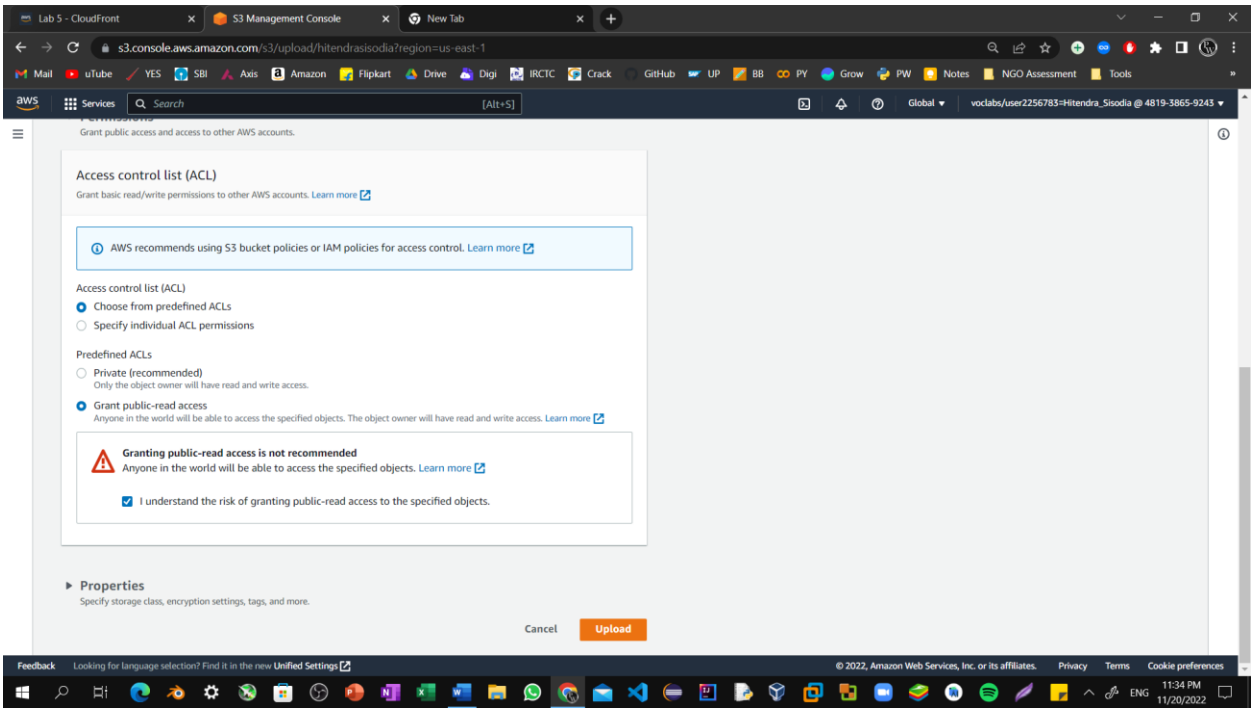


Lab 12: Using CloudFront As a CDN For A Website

Step30: Navigate to your S3 bucket and upload the image file to it.

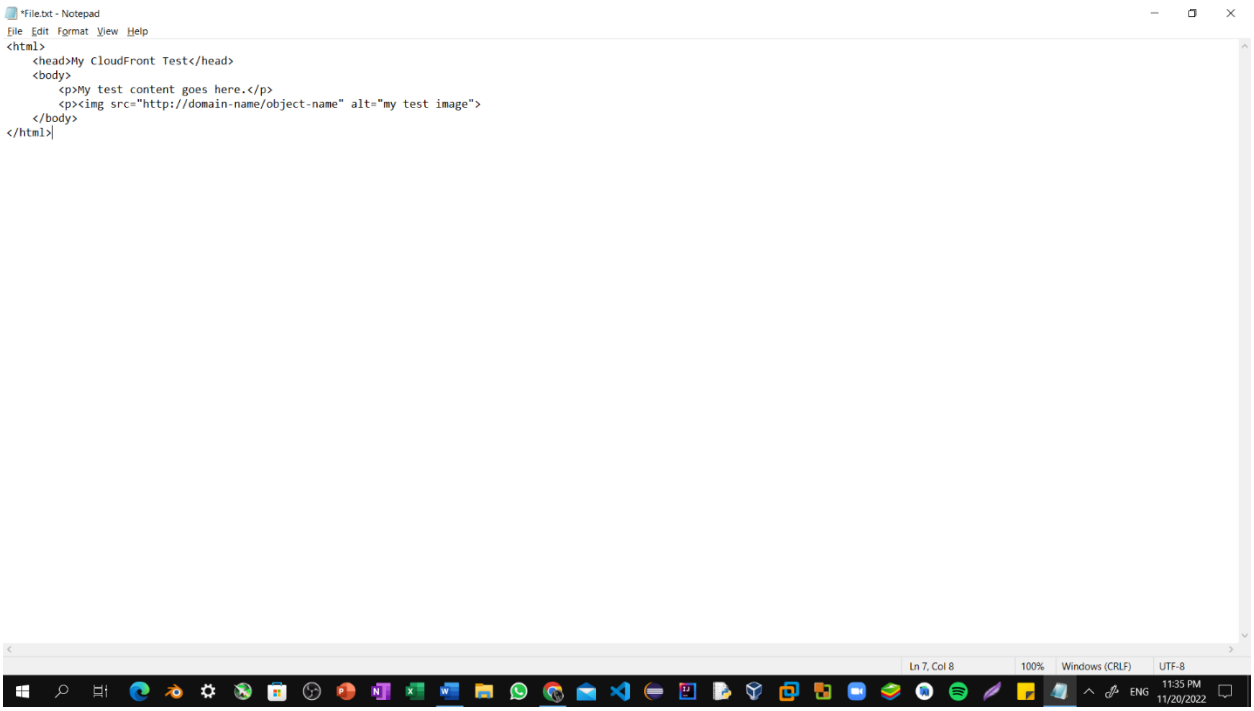


Step31: Making sure to grant public access as you did when uploading the HTML file earlier in this lab.

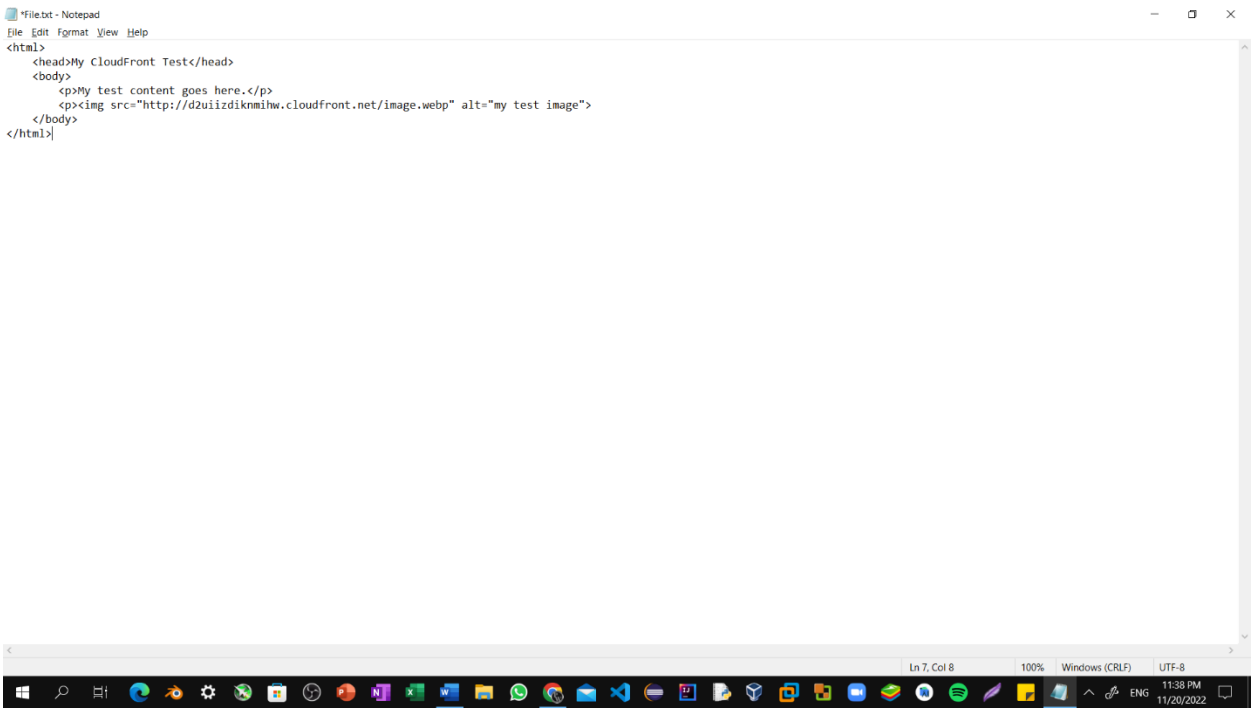


Lab 12: Using CloudFront As a CDN For A Website

Step32: Create a new text file using Notepad and copy the following text into it.

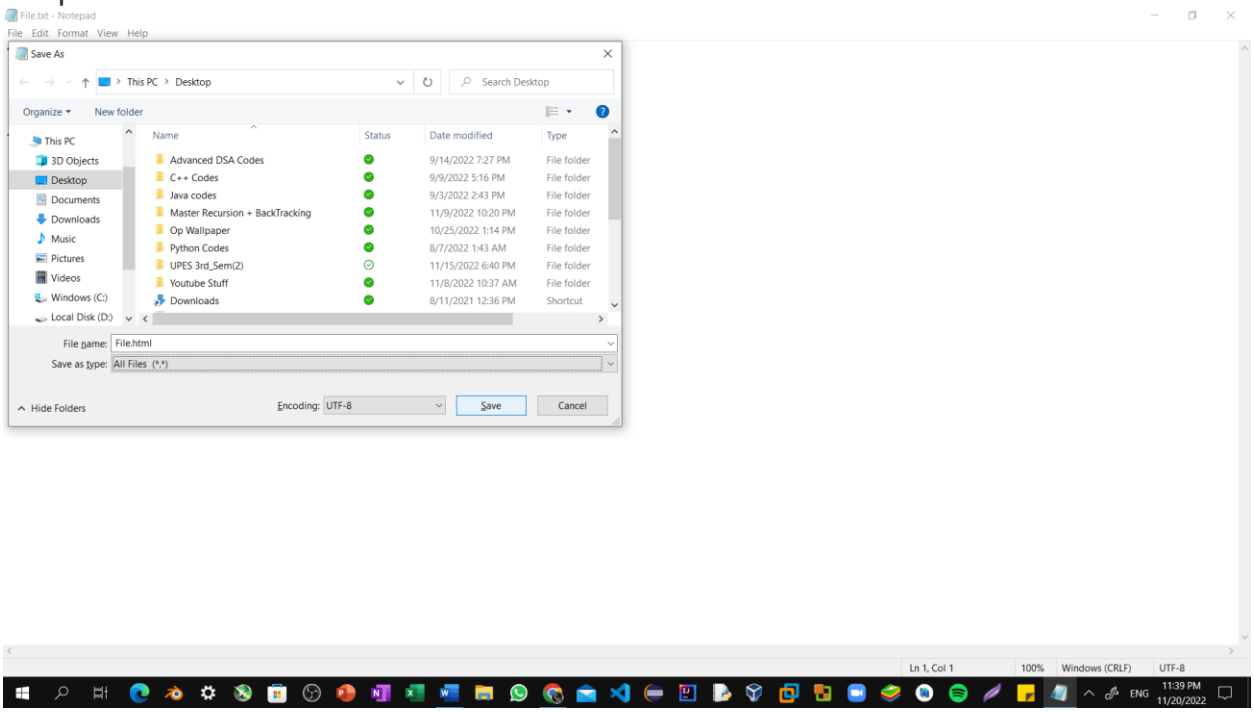


Step33: Replace **domain-name** with the domain name that you copied earlier for your CloudFront distribution. Replace **object-name** with the file name of the picture file that you uploaded to your S3 bucket.



Lab 12: Using CloudFront As a CDN For A Website

Step34: Save the text file with an HTML extension.



Step35: Use an internet browser to open the HTML file that you just created. If the image that you uploaded shows, your CloudFront distribution was successful. If not, repeat the lab.