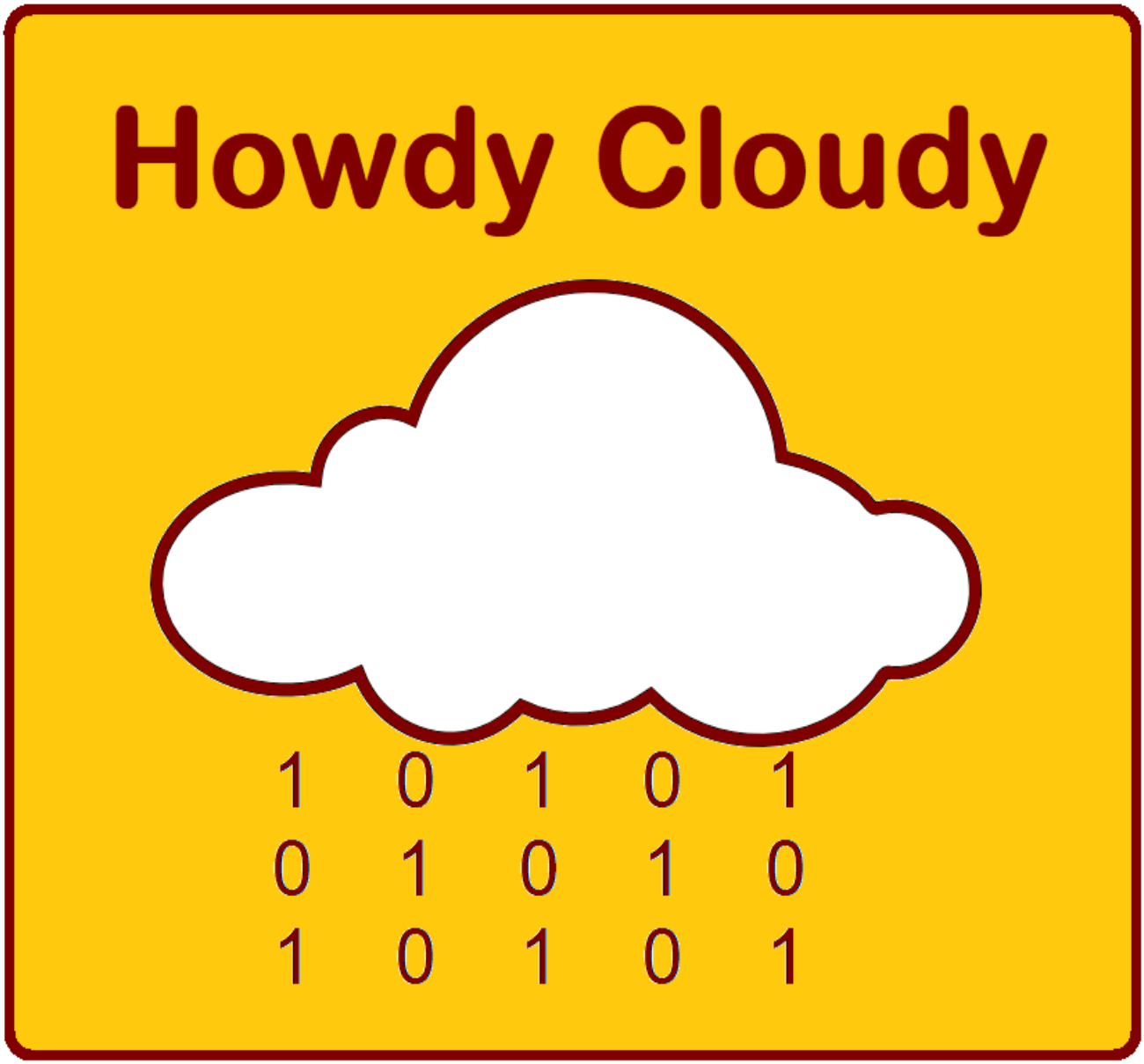
Creating a Cloud Environment

Alexander Hanks



Part 1: Creating a Virtual Machine using Amazon Lightsail

1) By clicking on the link provided below, individuals will be directed to the Amazon Lightsail webpage, which serves as a guiding resource.
https://aws.amazon.com/lightsail/

2) If not yet completed, individuals are advised to create an account using their preferred credentials.

3) Click on Create Instance, which will direct the user to the instance creation page

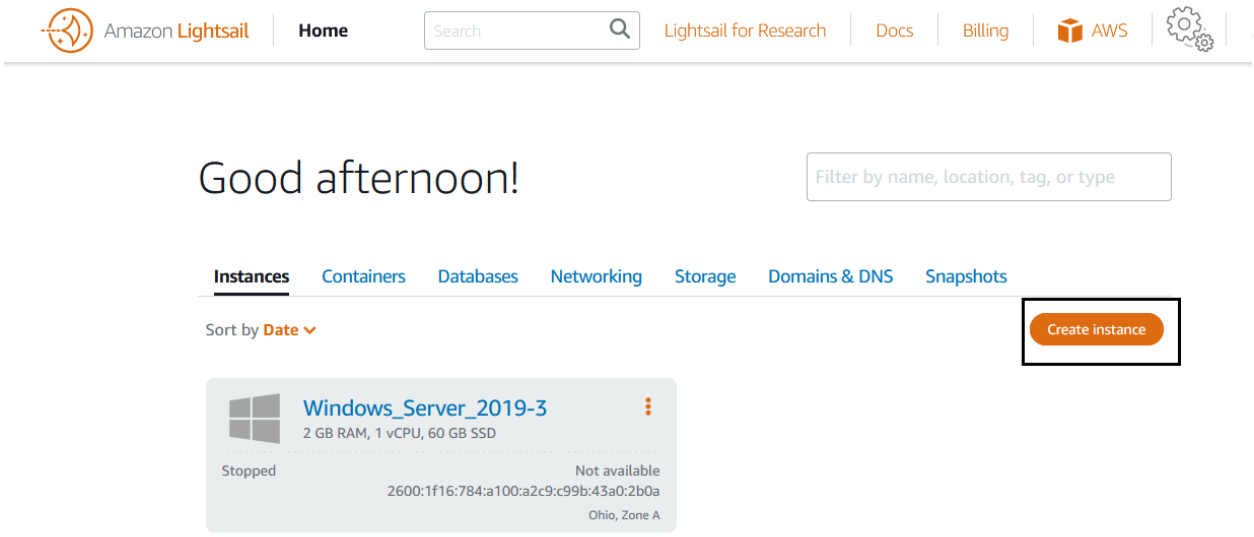


Figure: 1

4) Pick a region that is close to either to the target customers, in this case, select “Ohio us-east-2”

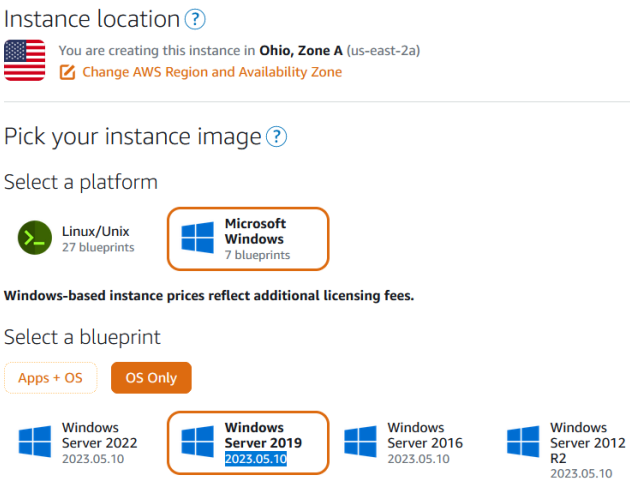


Figure: 2

5) Under the instance image section, select the “Microsoft Windows” tab. Then under the blueprint section, select a Windows operating system. For this tutorial, the latest version we can use is Windows Server 2019. This is to ensure the startup script will run properly. Under the “Optional " select “Launch Script” let's install some crucial software in order. This will only run the very first time the instance is booted up. This will be located under the optional tab

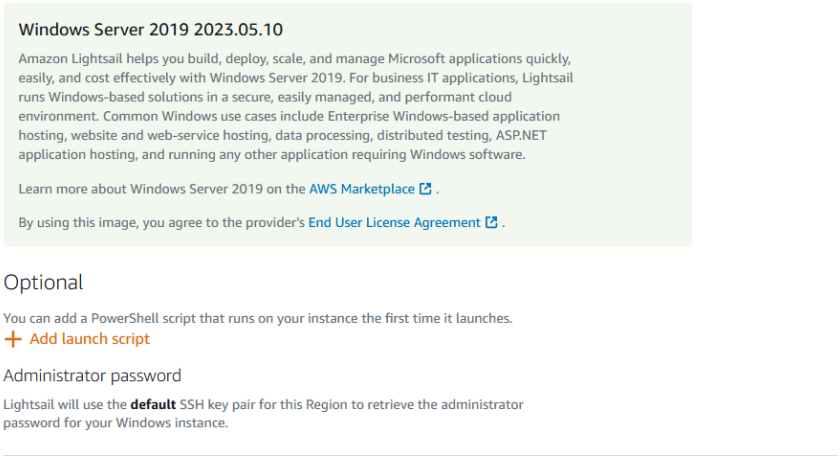


Figure: 3

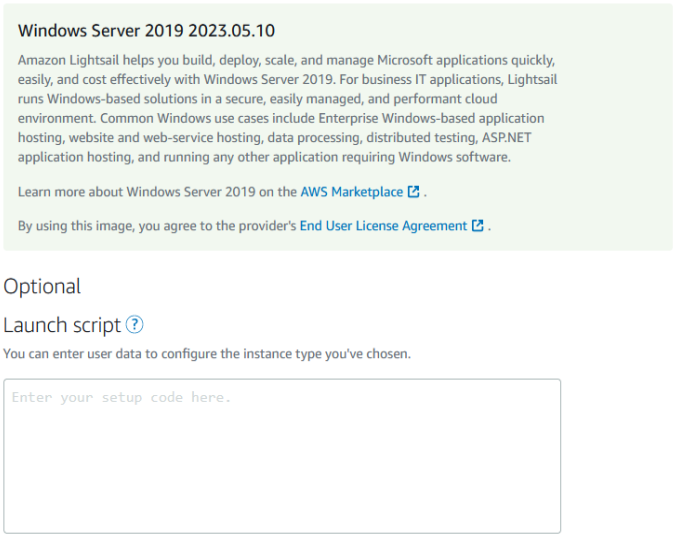


Figure: 4

Please enter the following script into the "Launch Script" text box shown Figure 4

```
<powershell>

#Python IDE
$PythonInstallerUrl =
"https://www.python.org/ftp/python/3.9.5/python-3.9.5-amd64.exe"
$InstallerPath = "$env:TEMP\python_installer.exe"
$InstallDirectory = "C:\Python39"
$Arguments = "/quiet InstallAllUsers=1 PrependPath=1"

# Download the Python installer
Invoke-WebRequest -Uri $PythonInstallerUrl -OutFile $InstallerPath

# Install Python IDLE silently
Start-Process -FilePath $InstallerPath -ArgumentList $Arguments -Wait

#Notepad++ (Code Editor This works!)
$DownloadUrl =
"https://github.com/notepad-plus-plus/notepad-plus-plus/releases/download/v8.1.
1/npp.8.1.1.Installer.exe"
$InstallerPath = "$env:TEMP\npp_installer.exe"
$InstallLocation = "C:\Program Files\Notepad++"

# Download Notepad++ installer
Invoke-WebRequest -Uri $DownloadUrl -OutFile $InstallerPath

# Install Notepad++
Start-Process -FilePath $InstallerPath -ArgumentList "/S" -Wait

#GCC
Set-ExecutionPolicy Bypass -Scope Process -Force;
[System.Net.ServicePointManager]::SecurityProtocol =
[System.Net.ServicePointManager]::SecurityProtocol -bor 3072; iex ((New-Object
System.Net.WebClient).DownloadString('https://chocolatey.org/install.ps1'))

choco install mingw -y --params "'/S /DR=C:\MinGW'"

</powershell>
```

We will finish installing the rest of the software once the image is created

6) Under the “Choose your instance plan” there should be a variety of choices with different amounts of virtual CPUs, RAM, and storage. Choose the 20$ USD option, since the first three months are free and it will guarantee 1 Virtual CPU, 2GB of Memory, and 60 GBs SSD storage.

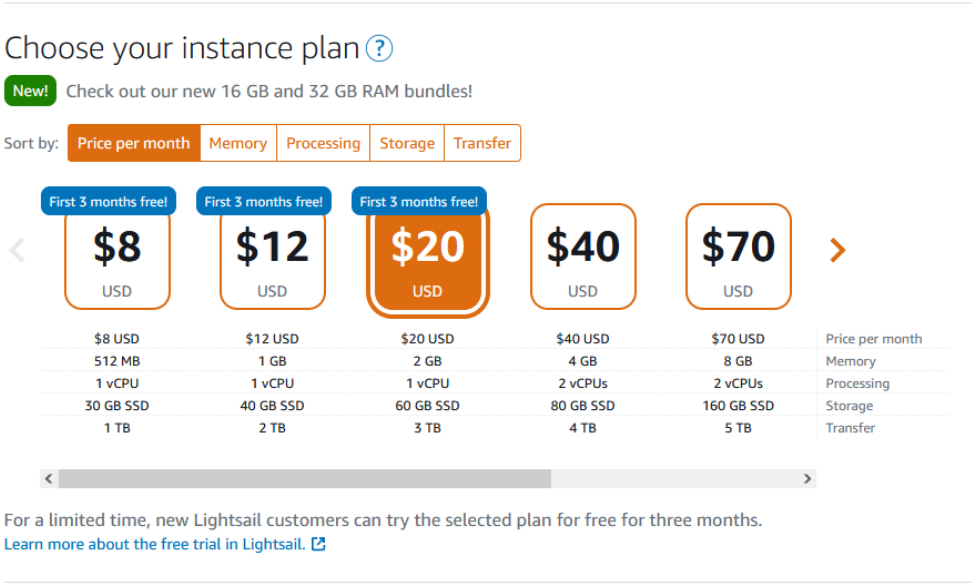


Figure: 5

7) Next, the user should assign a preferred name to the instance. In case there is a need to create similar environments, for multiple machines. It is recommended to use a naming convention that makes everything more organized.

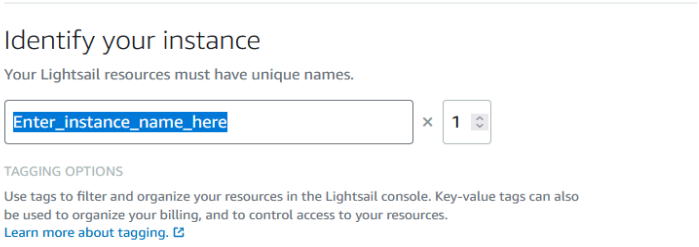


Figure: 6

8) Finally, It would be best to add a tag to sort and organize resources. This would be useful to easily identify all the machines, especially if there is a need to manage multiple environments efficiently.

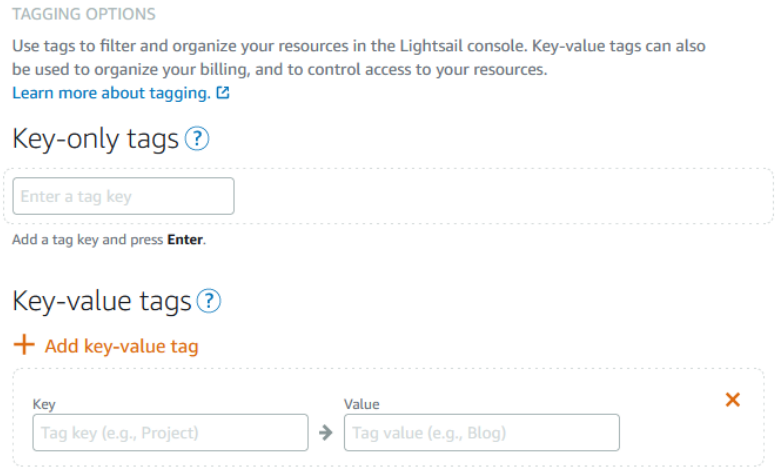


Figure: 7

9) To complete the instance creation, simply click on the "Create instance" button and be prepared for a waiting period, as it may take a couple of minutes to finalize.

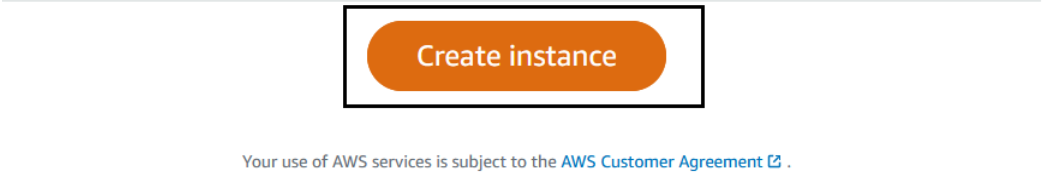


Figure: 8

10) After successfully creating the instance, locate and click on the connection icon resembling a Computer Monitor. By doing so, this will initiate a Remote Desktop Protocol within the browser, granting the user complete control over the Windows instance

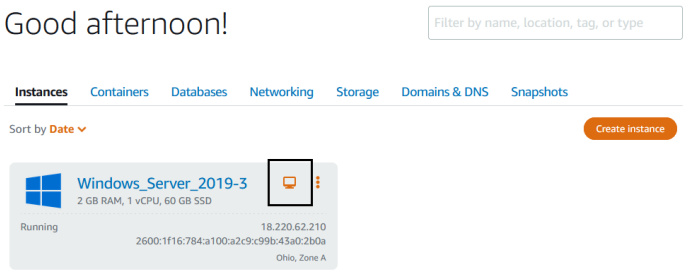


Figure: 9

11) Complete the installation process by installing the remaining software, namely PDF Suite and LibreOffice.

a) Launch Internet Explorer and ensure that downloads are enabled in the browser's security settings.

b) Please install LibreOffice using the provided link and carefully follow the installation instructions provided by the installer.

LibreOffice:
https://www.libreoffice.org/download/download-libreoffice

PDF Suite
https://www.pdf-suite.com/

12) Then go into the control panel and deactivate the Internet access. Go to “Network and Sharing Center”, select “Change adapter settings”. Right-click on any of the adapters, and go to the “Sharing” tab. Finally uncheck “Allow other network users to connect” and repeat this on all network adapters. The following link will contain a tutorial on how to deactivate Internet settings.

https://answers.syr.edu/display/ITHELP/Disable+Internet+Connection+Sharing+in+Windows+10+and+11

This is for security purposes and will ensure that new users will not be able to export any sensitive information from their Virtual Machine.

Part 2: Exporting the Image

1) Within the dashboard, select the Instance name to access the dashboard of the respective instance.

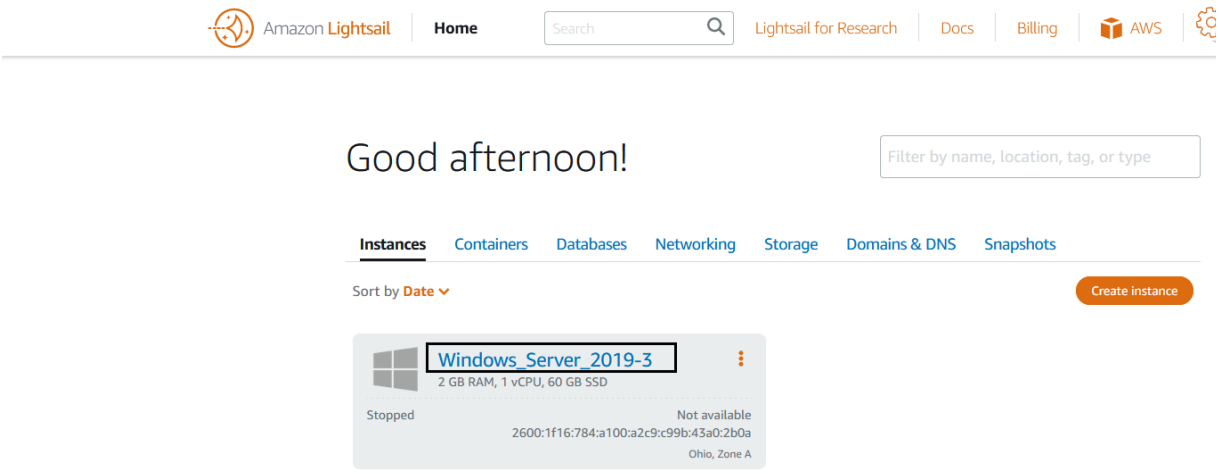


Figure: 10

2) The dashboard provides comprehensive information and functionalities for managing the AWS Lightsail Instance. To create an image for export, navigate to the "Snapshot" tab and click on it.

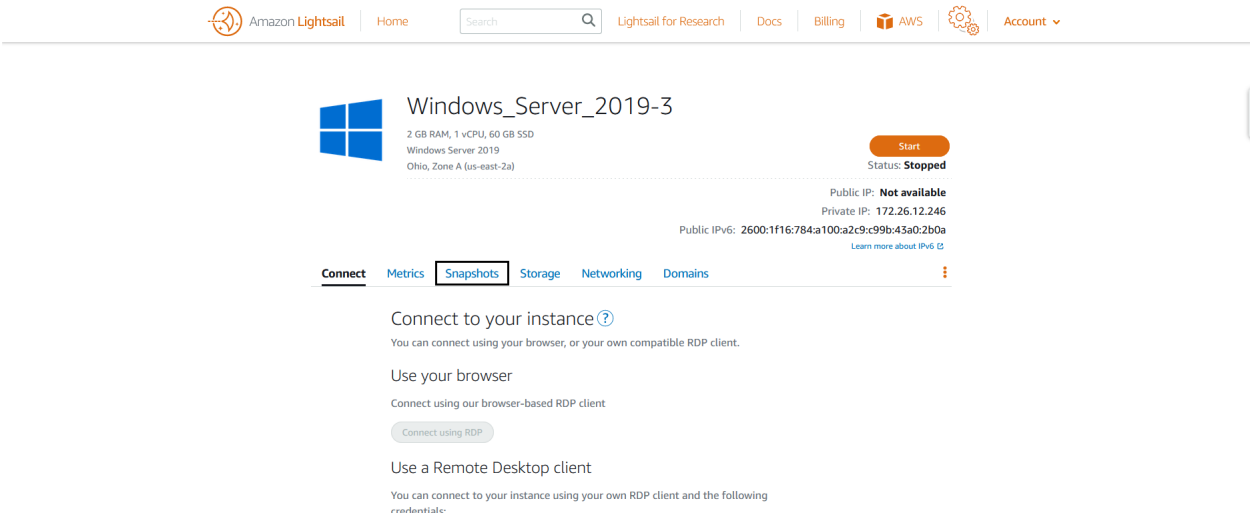


Figure: 11

3) Select “Create Snapshot”. This will create an image that can be export

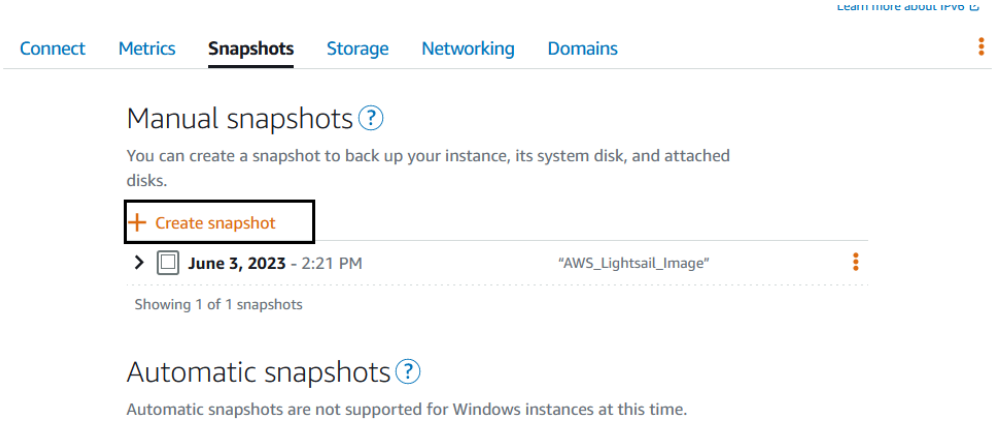


Figure: 12

4) After successfully creating the snapshot, select the option "Export to Amazon E2C."

Part 3: Creating VMs in Mass Quantity with Amazon EC2

Amazon lightsail is a great way to create a Virtual Machine however it can be a little challenging to implement multiple virtual machines. Cloud computing brings numerous advantages by delivering on-demand services to a large user base. This implies that instead of individually installing VMs on each computer, there should be a simpler solution for provisioning these virtual machines. In the case of Amazon Lightsail IT would have to manually start a certain number of instances which isn't feasible for a large scale business operation.

Amazon EC2 is another web service provided by Amazon Web Services, and is a much easier choice to run multiple virtual machine instances. The purpose of this section is to guide the reader through the process of configuring a virtual machine using Amazon EC2. Then the section will demonstrate how to create a significant quantity of virtual machines instances along with removing the virtual machine instances.

DISCLAIMER: IF YOU PLAN TO UTILIZE THESE SERVICES FOR PROFESSIONAL PURPOSES, I STRONGLY RECOMMEND PURCHASING THE APPROPRIATE SERVICE PLANS. THE FREE TIER ADDITIONS COME WITH LIMITED CAPABILITIES AND MAY NOT MEET THE REQUIREMENTS OF PROFESSIONAL USAGE.

1) On the console home page please select the EC2 option. If it is not there, type it in the search bar above.

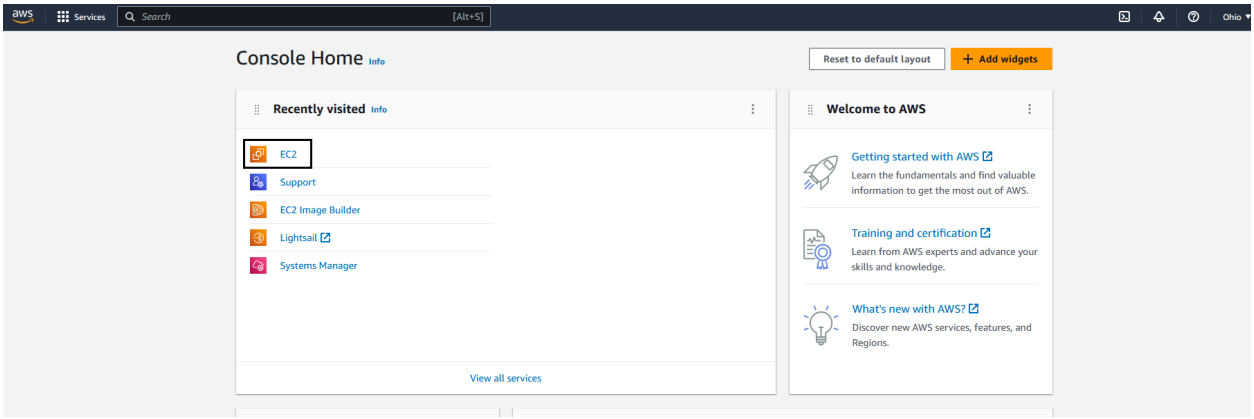


Figure: 13

2) There is a visually appealing homepage for the EC2 featuring a layout that closely resembles Figue 14 below.

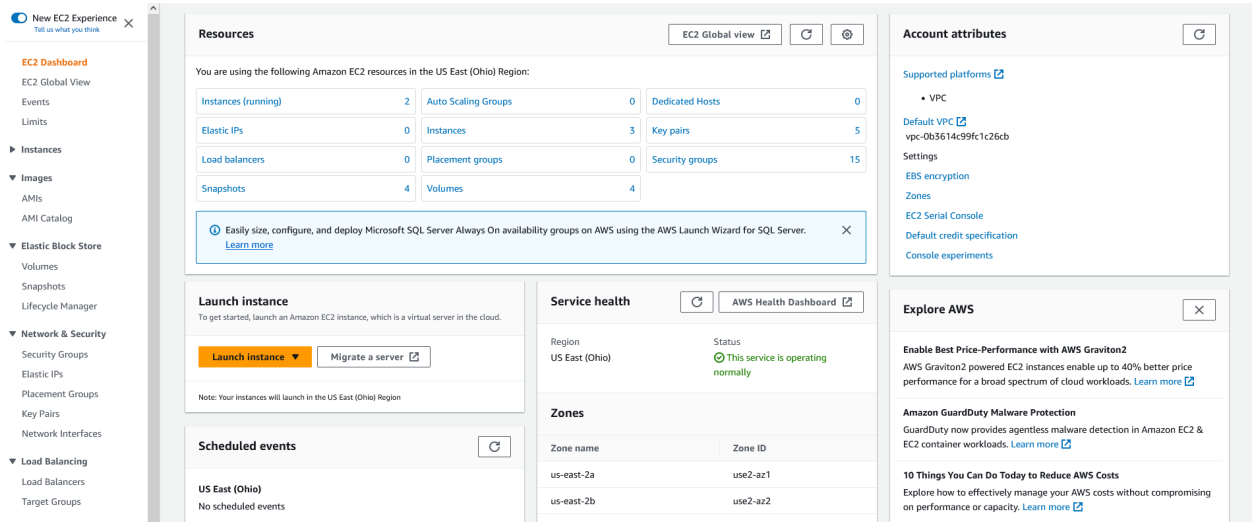


Figure: 14

3) Amazon EC2 offers a multitude of robust features and provides various methods for efficiently managing a cloud environment. This gives the IT staff a lot of flexibility to run their operations. In the first part of this document I demonstrated how to create a Virtual Machine using Amazon Lightsail and export the AWS Image to EC2.We can use this image file as a basis to run our instance if we desire, however EC2 provides us with more options than AWS Lightsail. I recommend creating a new Virtual Machine image in EC2, as it will provide us with a broader range of available options.

4) to create the image select the “Launch Instance” tab highlighted in the Figure 15

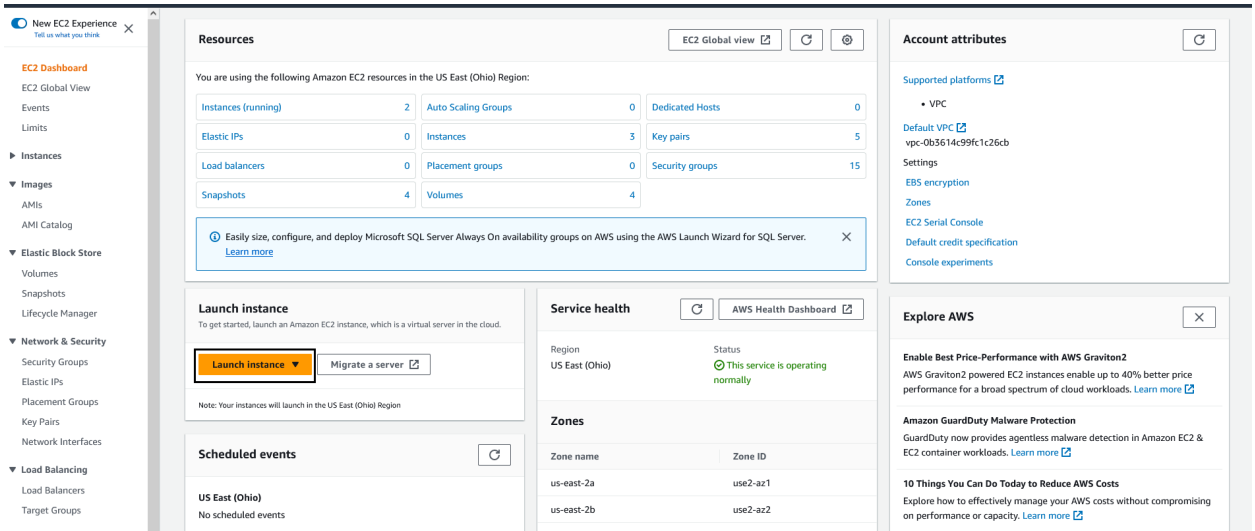


Figure 15

5) Once you have clicked the tab, It will take you to a configuration page for the instance image. Make sure to name the instance appropriately and make sure to only create one instance.

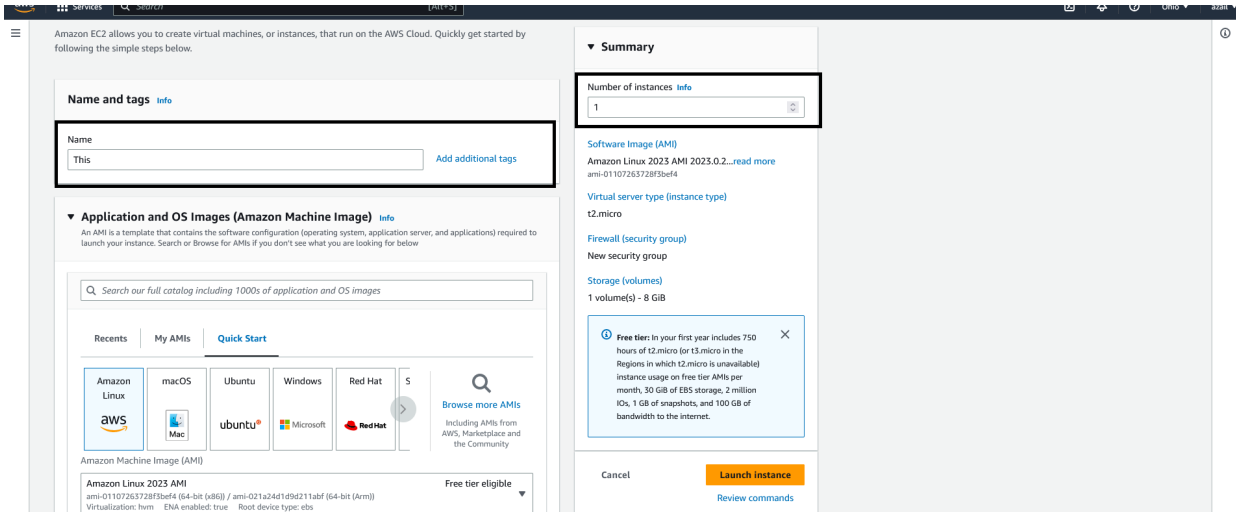


Figure: 16

6) Under the “Application and OS Images (Amazon Machine Image) you will have a variety of options to choose from in regards to operating systems. You can even load AWS Lightsail Image, but in order to do so you must convert it into an AMI (Amazon Machine Image) format. Since Windows Server 2019 was chosen as the operating system in the document , it is recommended to maintain consistency by selecting the same operating system.

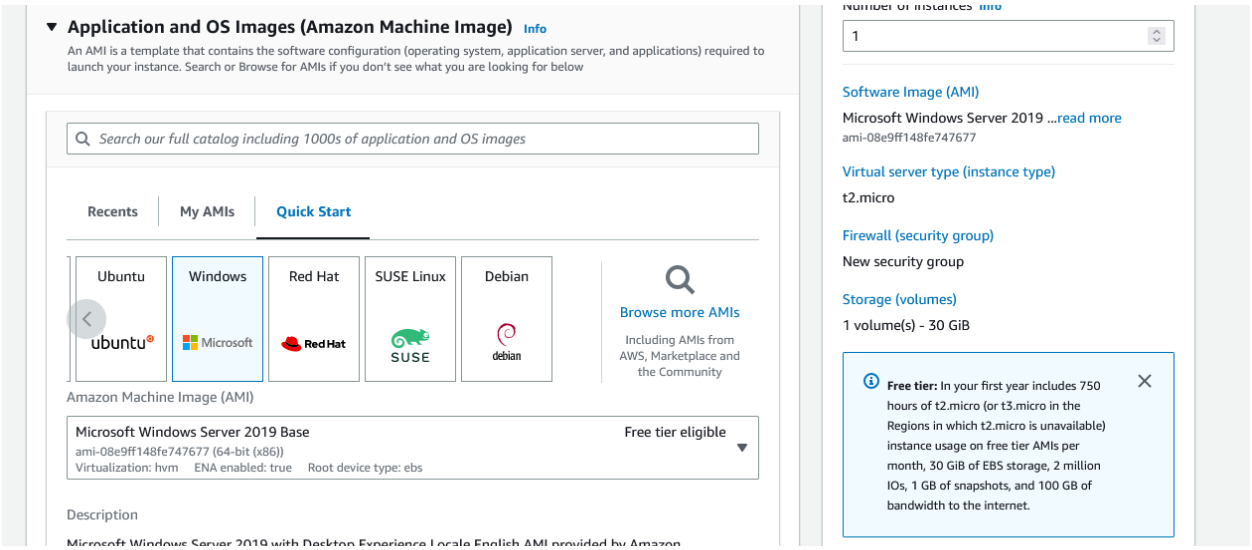


Figure: 17

7) For Instance Type, select the “t2.micro Free Tier eligible” option since this will give us the most resources from the list of free tiers. Then under the “Key pair (login)” tab, select the “create a new key pair” link. This will open a pop up window that will look similar to Figure 19. Name the key pair name appropriately and select RSA for the Key pair type. The select .pem for the file format. After creating the key pair, a securely encrypted file will be downloaded. It is crucial to save this file in a safe and protected location as it will be necessary for future use.

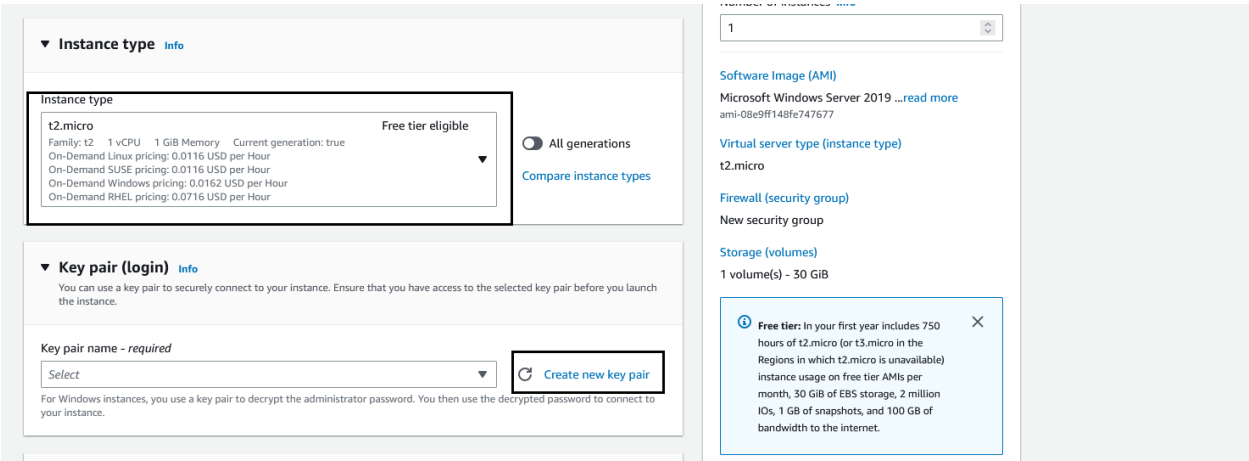


Figure: 18

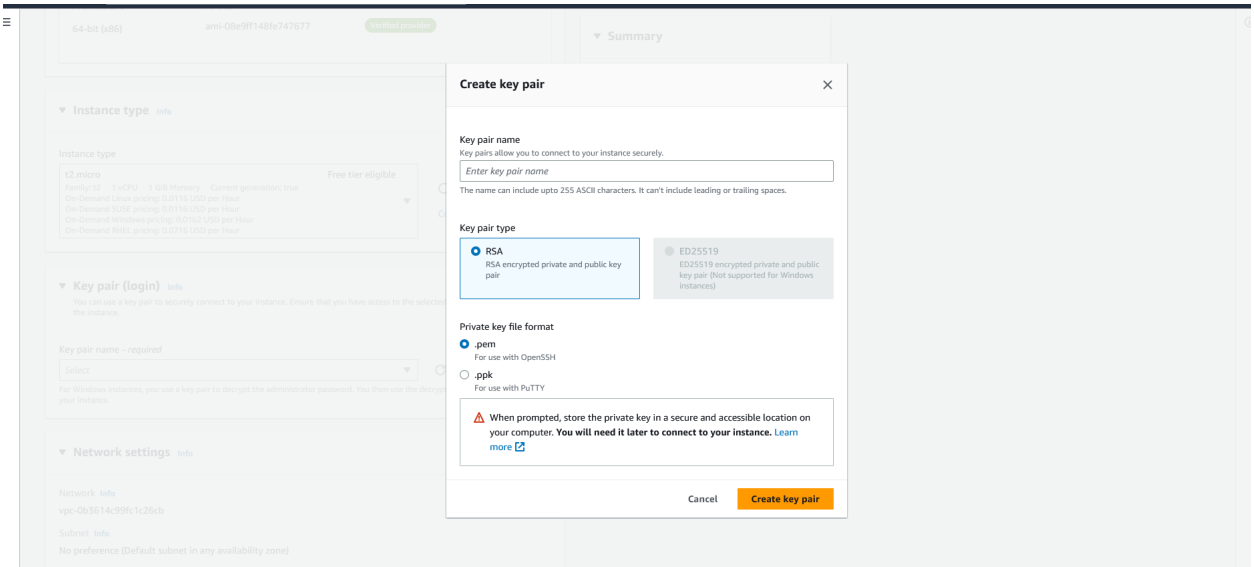


Figure: 19

8) Under the “Network Settings” tab, select both “create security groups tab” and “Allow RDP traffic form” since this is how the user will connect to the instance.

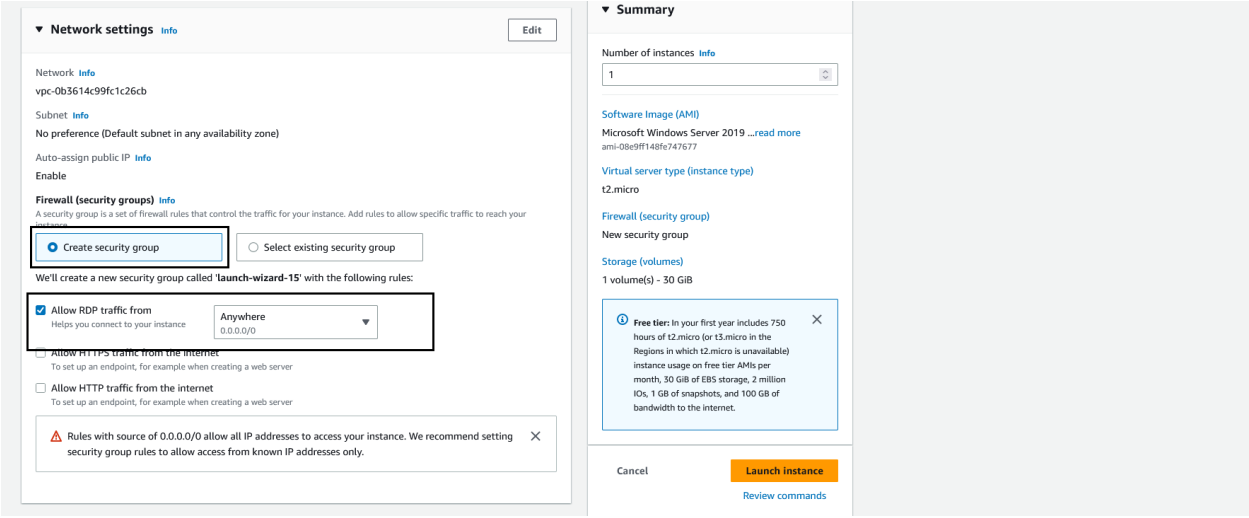


Figure: 20

9) Leave all of the remaining settings on their default and select the “Launch Instance” tab

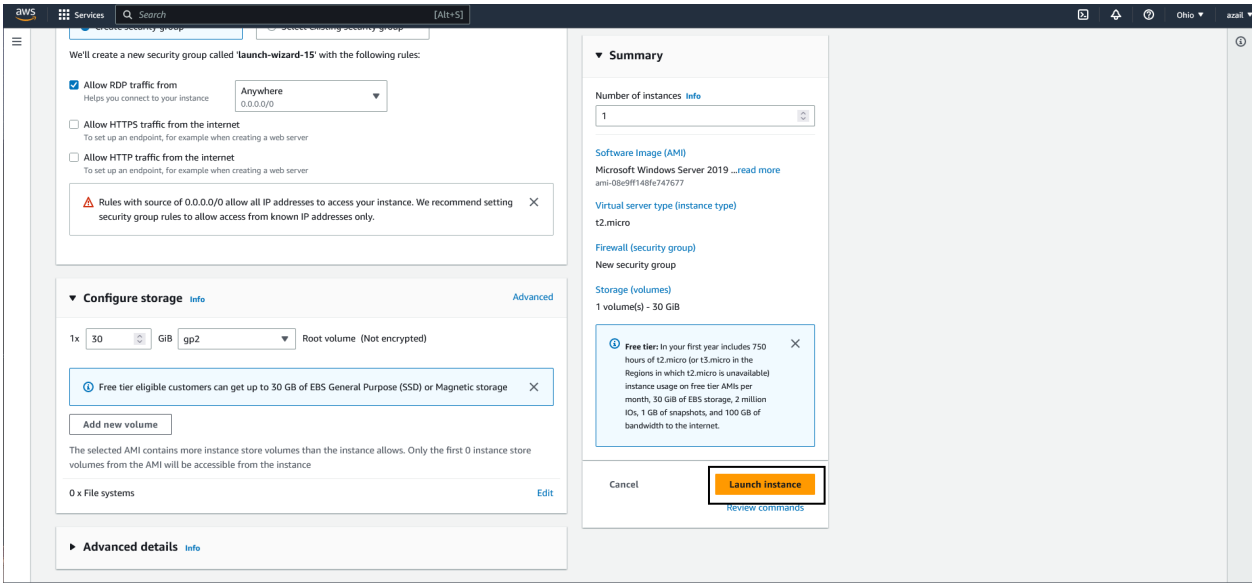


Figure: 21

10) Once the instance is launching, go back to the dashboard and select the instance tab as shown in Figure 22. This will open up the instance dashboard, which will show all of the operations regarding the instance shown in Figure 23. After creating the instance, it will undergo a setup process and require some time to become operational. During this period, the instance status will be displayed as "pending." Once the setup is complete, the status will change to "running," indicating that the instance is ready. Additionally, the instance will perform necessary status checks to ensure its optimal functionality.

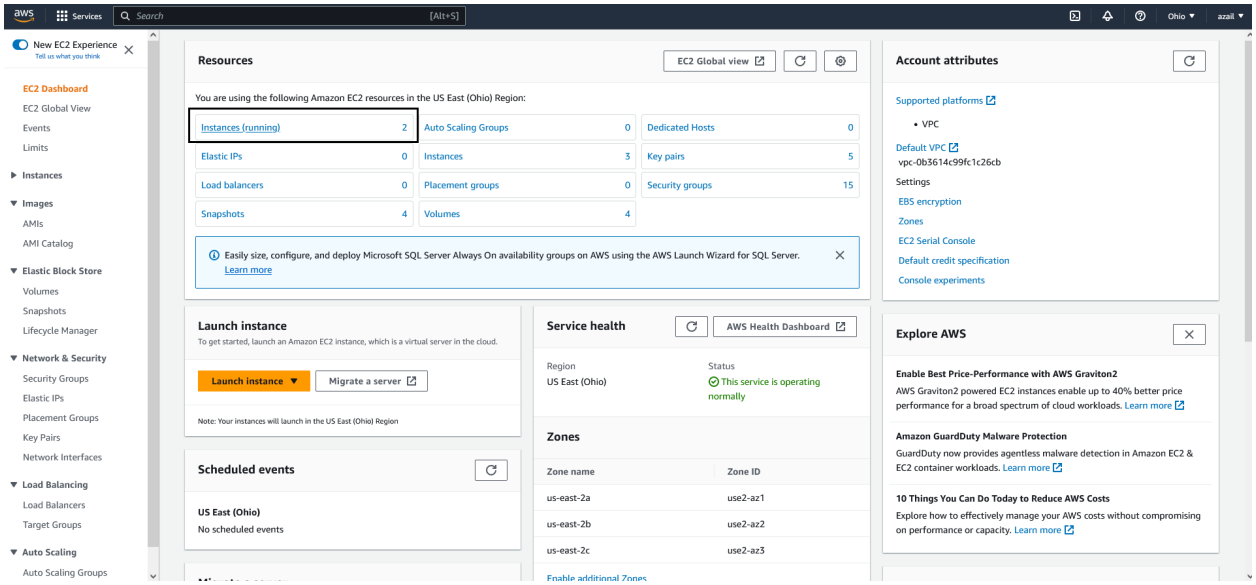


Figure: 22

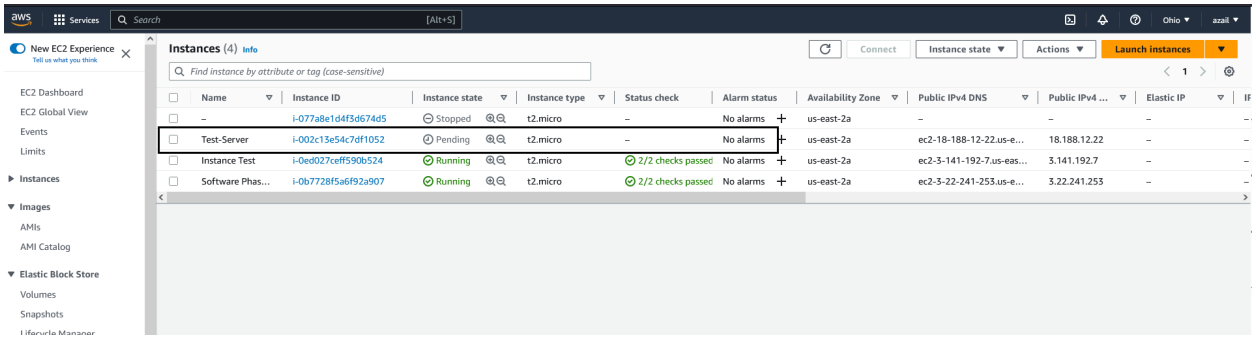


Figure: 23

11) After the instance reaches the "running" status, navigate to the "Actions" tab, located in the top menu. Clicking on it will reveal a dropdown menu. From the dropdown menu, choose "Security," and then select "Get Windows Password."

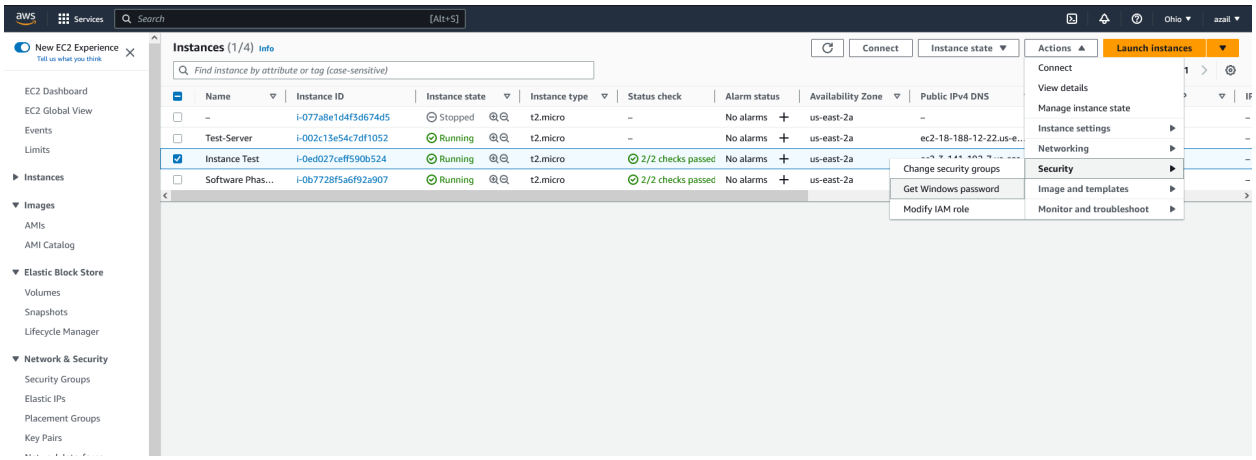


Figure: 24

A pop up window will appear, which will ask the user to upload their .pem file to decrypt their password. After the instance has been running for 4 minutes, this action can be performed.

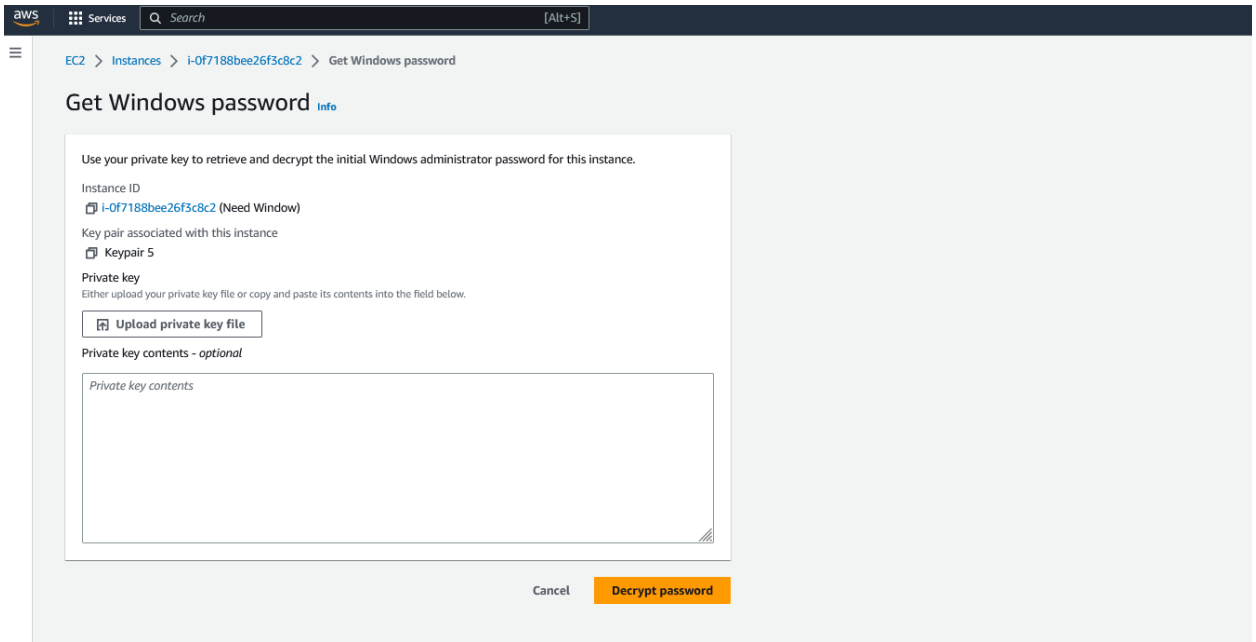


Figure: 25

13) Click on the “connect” tab and select the “RDP Client” option. Make sure the connection type is “connect using RDP client”. Next, choose the option "Download remote desktop file," as this will provide the user with a remote desktop file, serving as a gateway to connect to the instance. Then enter the credentials to the RDP client to connect to an instance.

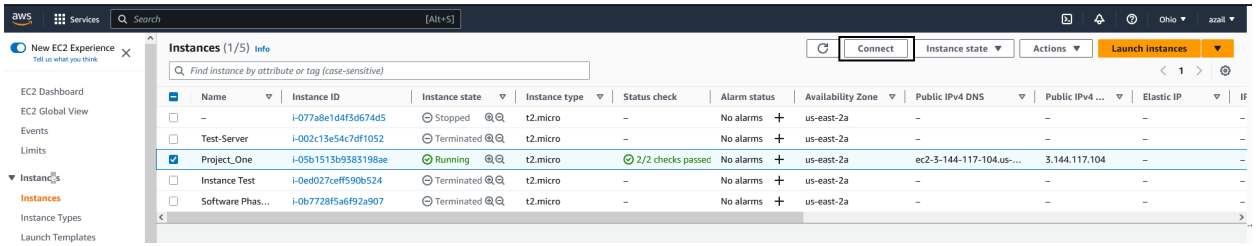


Figure: 26

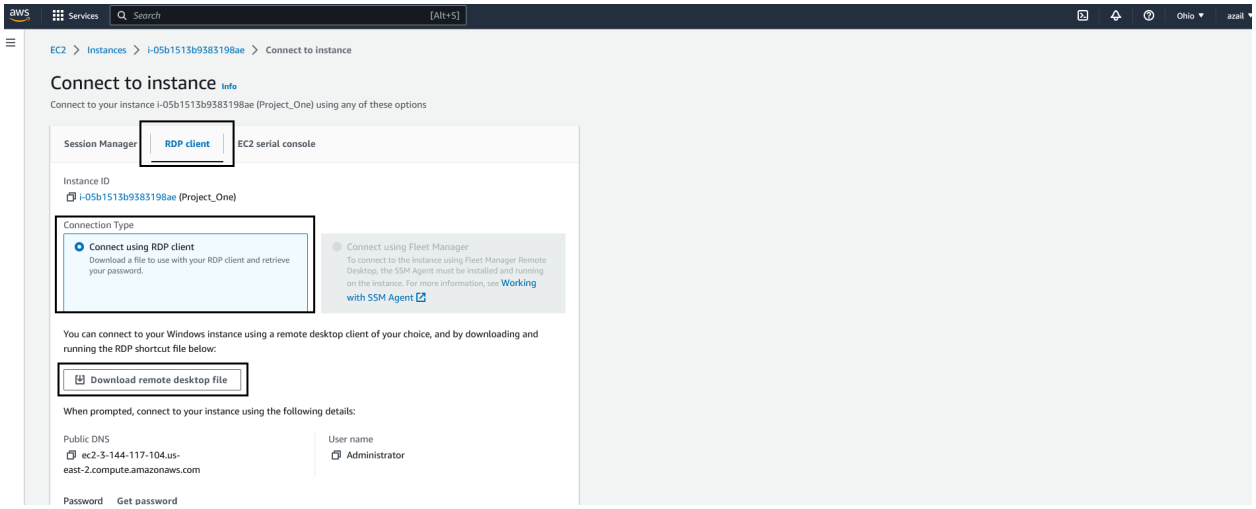


Figure: 27

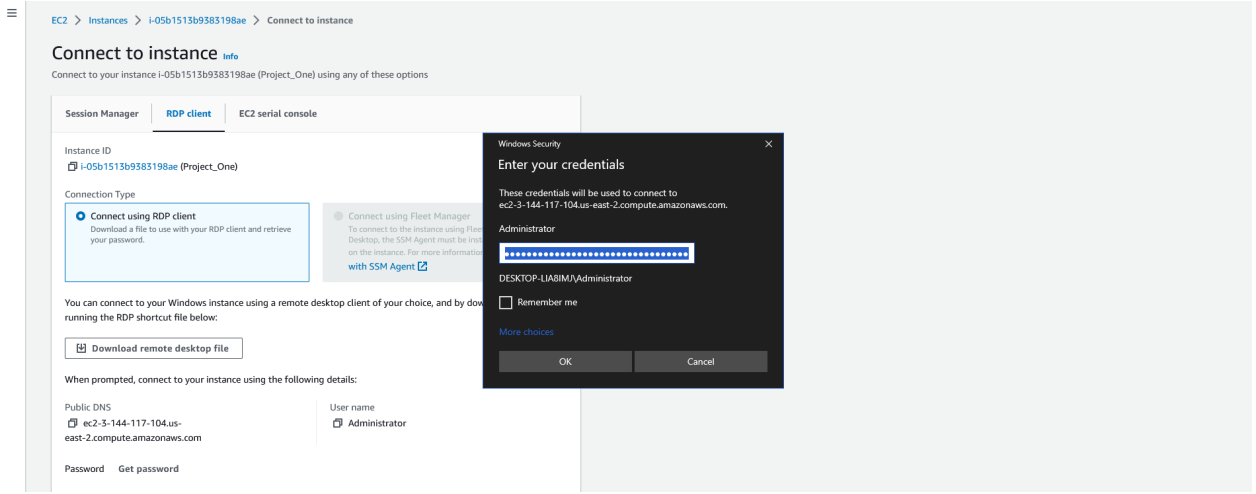


Figure: 28

14) The user should be able to log into their virtual machine and should be able to make the following configurations. This will be the base image that will be used to clone multiple virtual machines. To install the necessary software, open a PowerShell terminal and execute the script provided in Part 1, Step 5. After the script execution is complete, proceed to repeat Part 1, Step 11 to finalize the installation of the remaining software components.Once the Image is configured properly, exit out of the image and return to the Instance Dashboard.

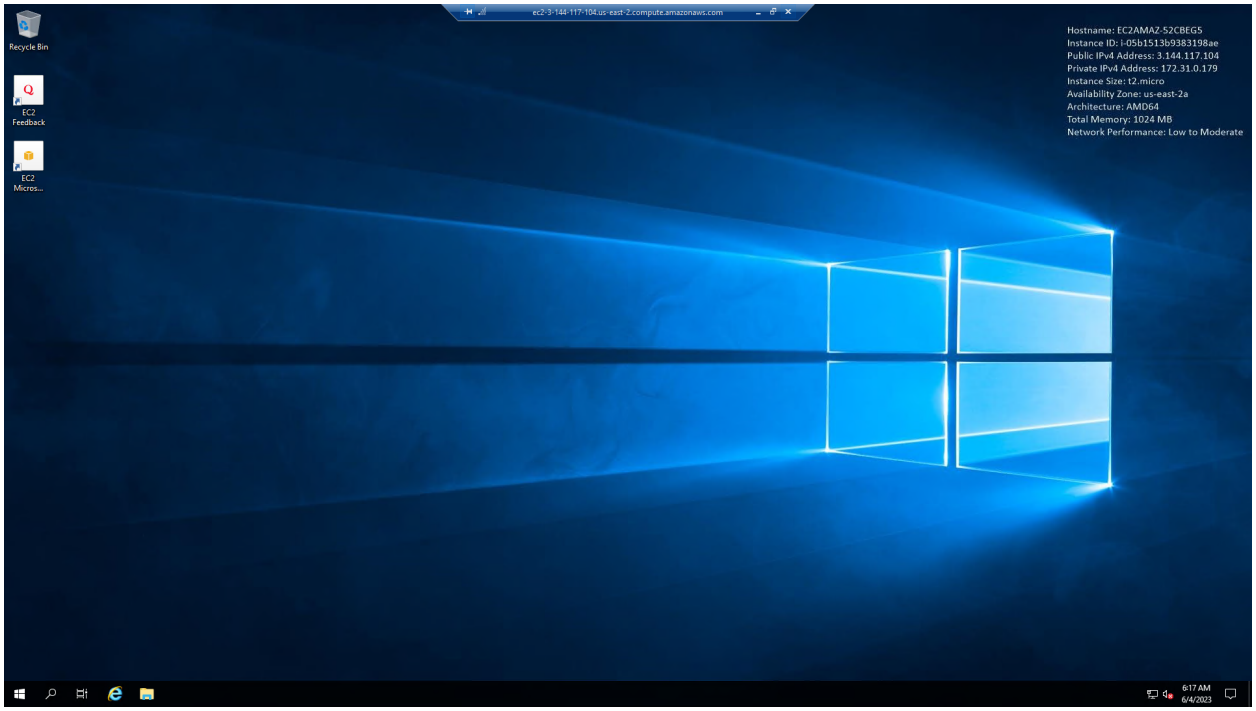


Figure: 29

15) At the Instance dashboard webpage, select the instance and then select the “Actions” tab. This will then create a drop down menu which will give “Create Image” as an option. Click on this tab and provide a name and description for it. Then, navigate to the "Create image" tab. The Image will appear under the AMI link under “Images”

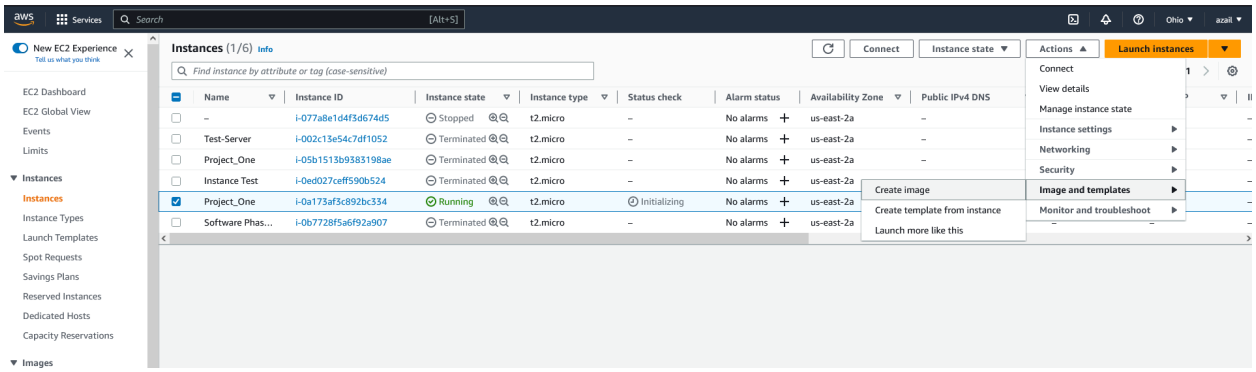


Figure: 30

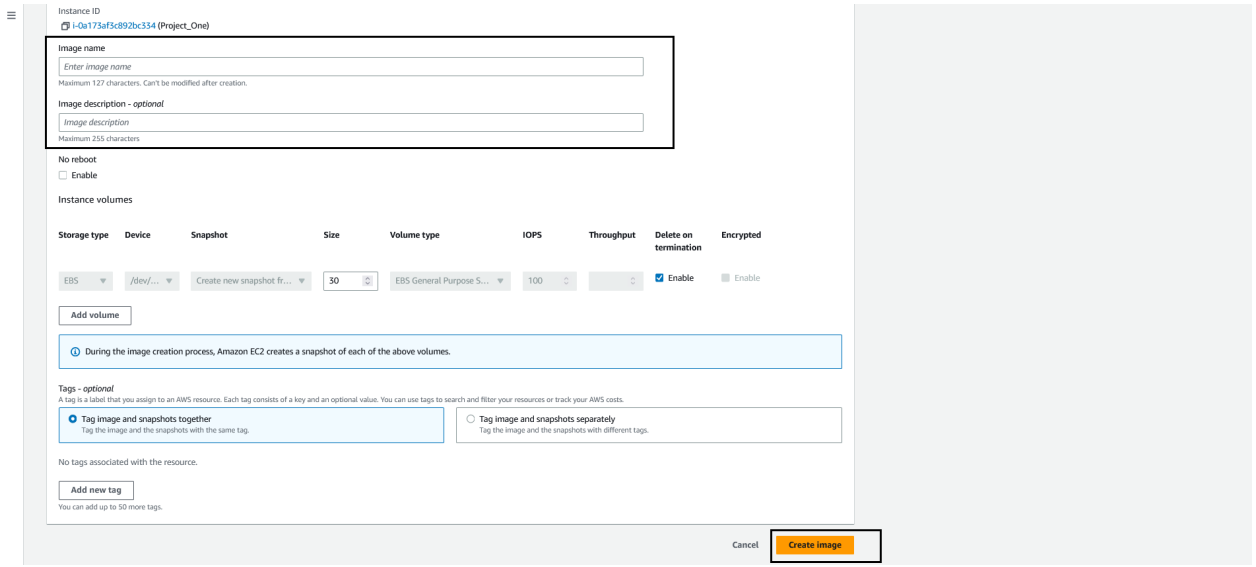


Figure: 31

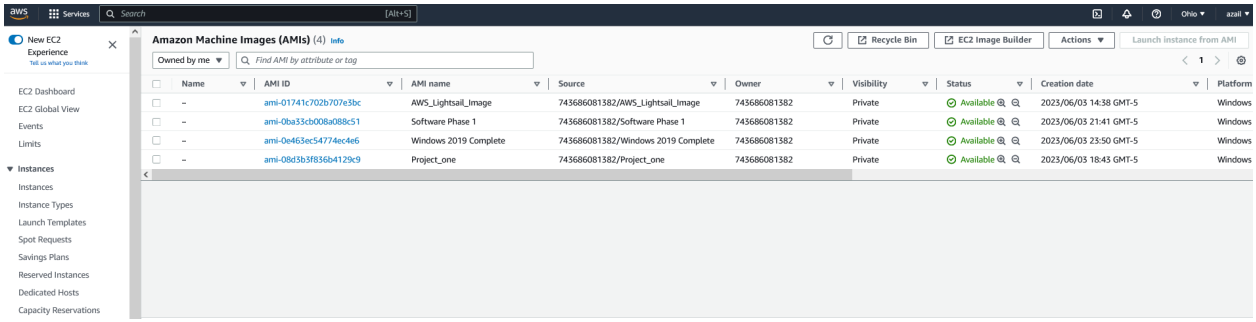


Figure: 32

16) After creating the base image, one can proceed to clone a range of images for the end-users by selecting the "Launch instances" tab. Under the Tab “Number of Instances” put as many instances the user desires. Then Repeat Part 3 Step 5 through 10. If done correctly there should be multiple instances displayed under the instance dashboard shown in Figure 32.

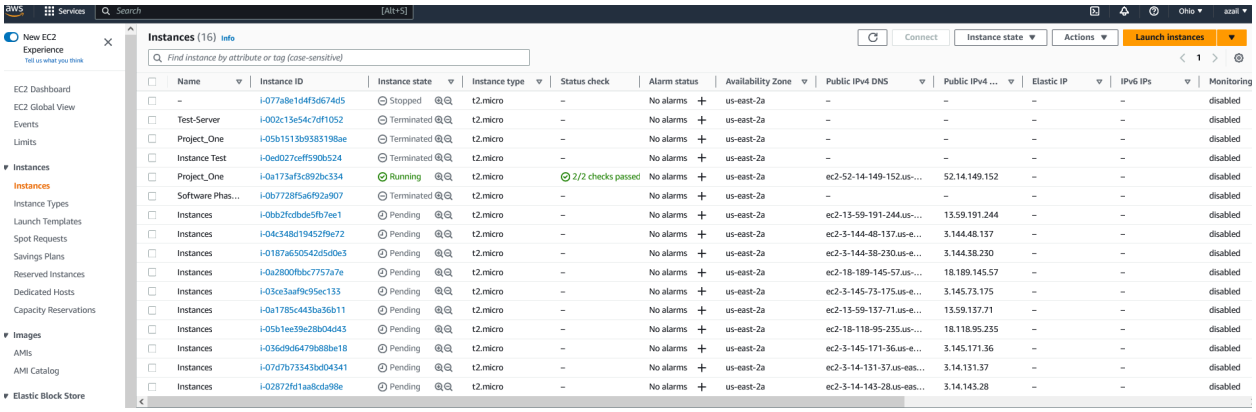


Figure: 33

17) If the user would like to stop an instance, select the following instance. Then select the “Instance state” tab and a drop down window should appear. Then select the “terminate instance” shown in Figure 33.

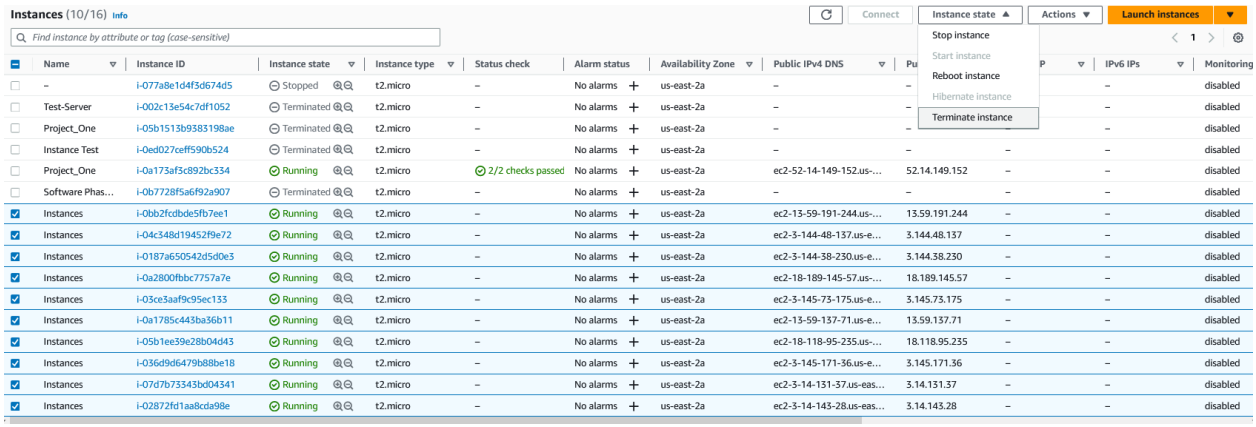


Figure: 34