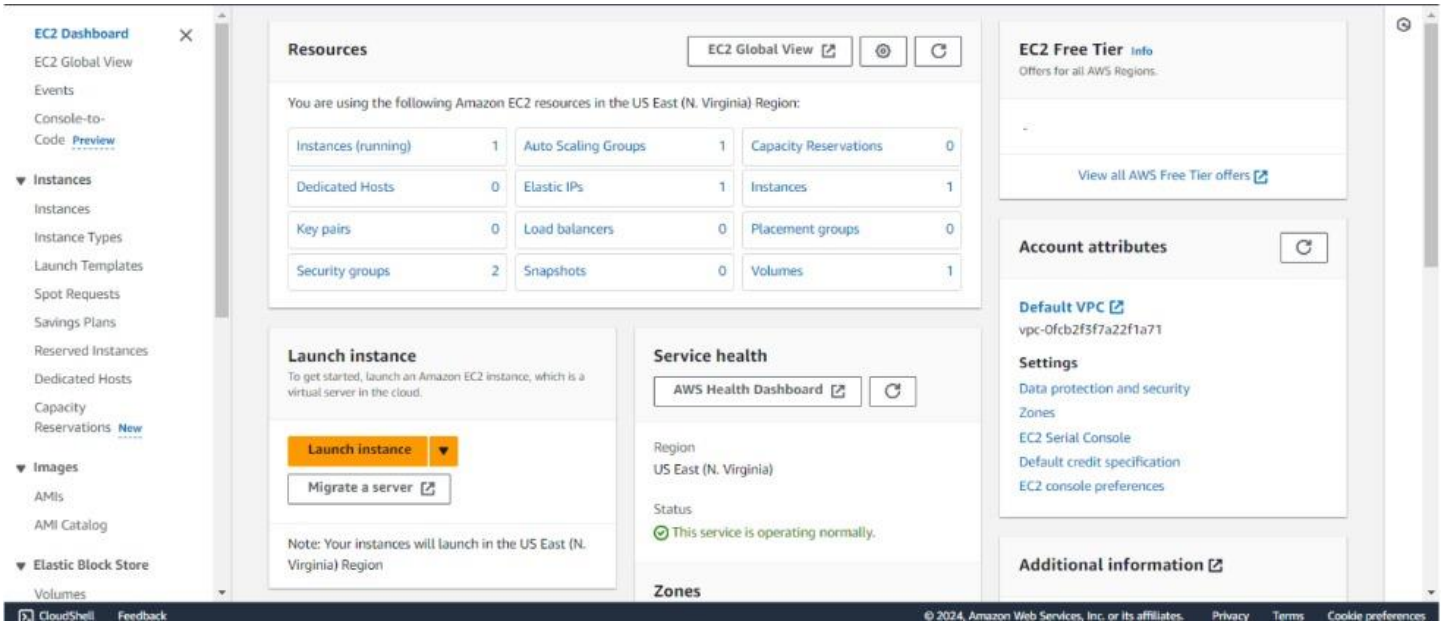
Anuprita Mhapankar **D15A** **29**

Experiment 1

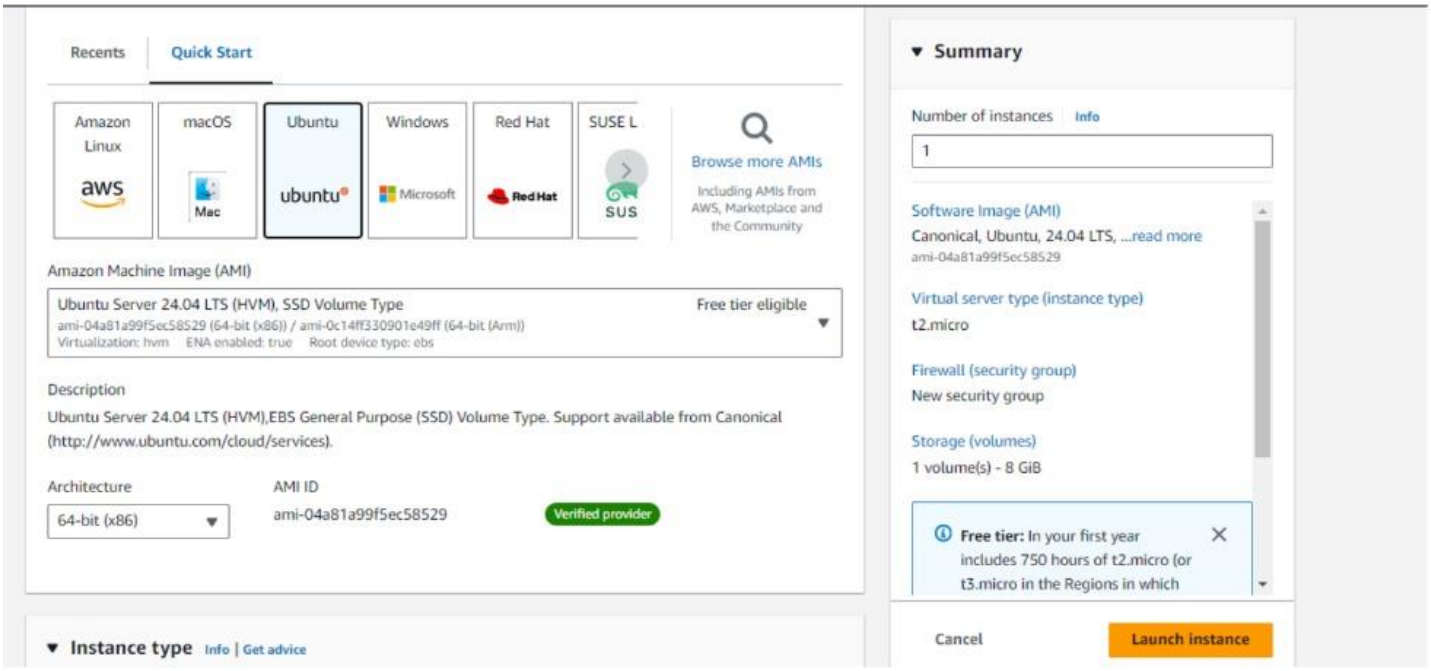
Aim:

To develop a website and host it on your local machine on a VM

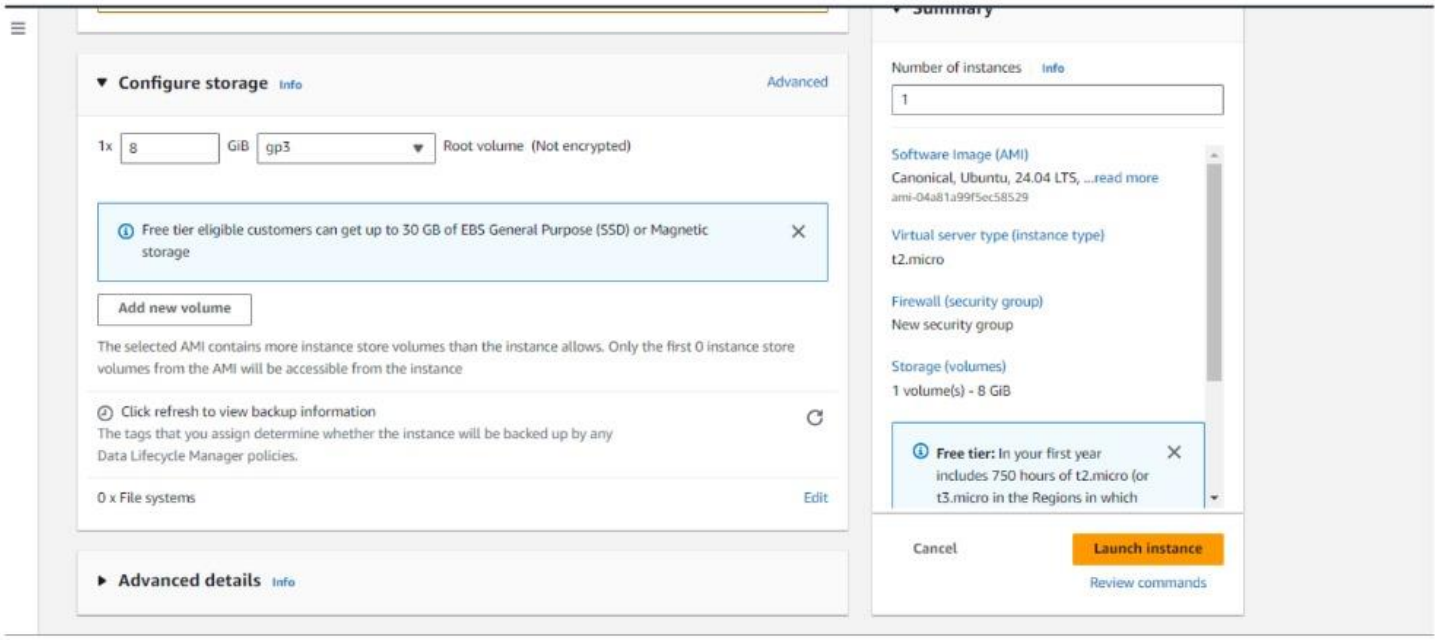
1. Open AWS Academia and select launch instance



2. Select Ubuntu



3. Set the configuration



4. Execute the following commands in the aws console.

<u>Commands :</u>

sudo su

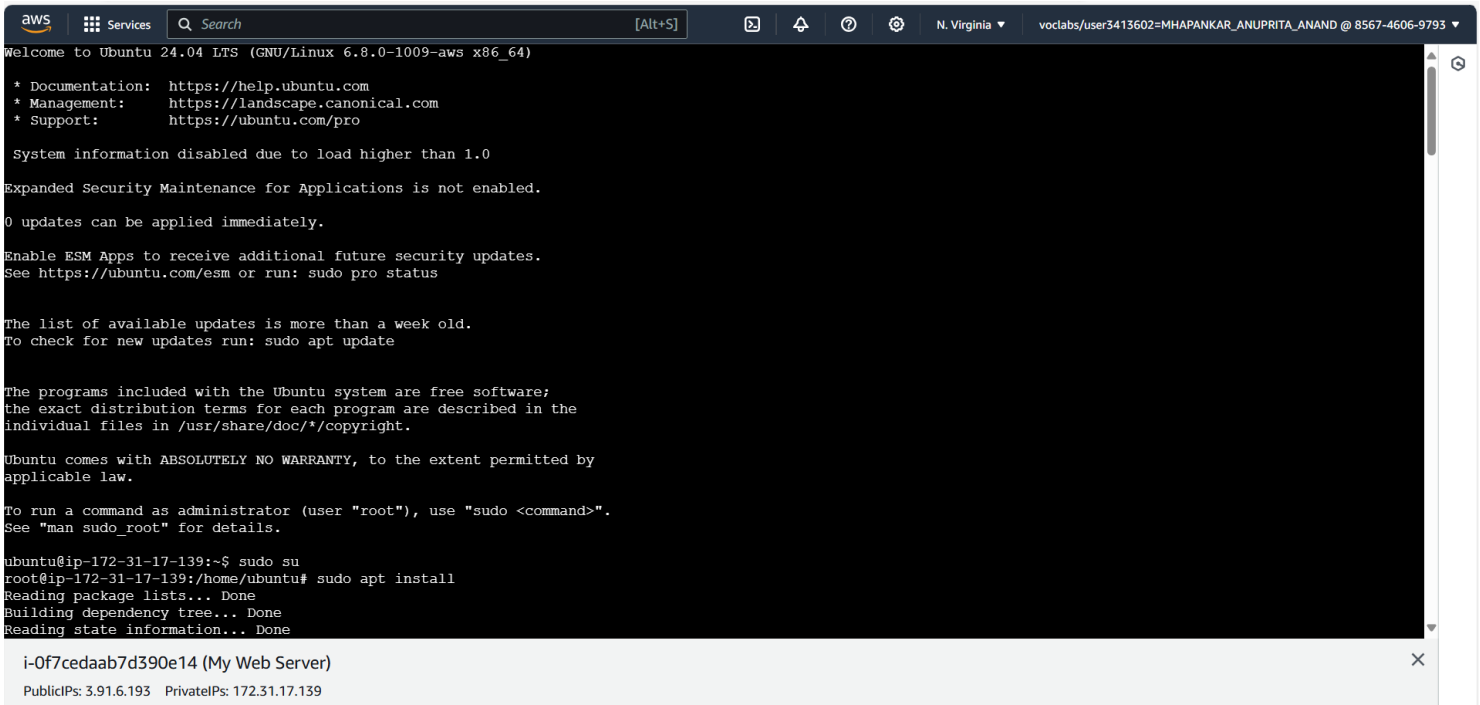
sudo apt install

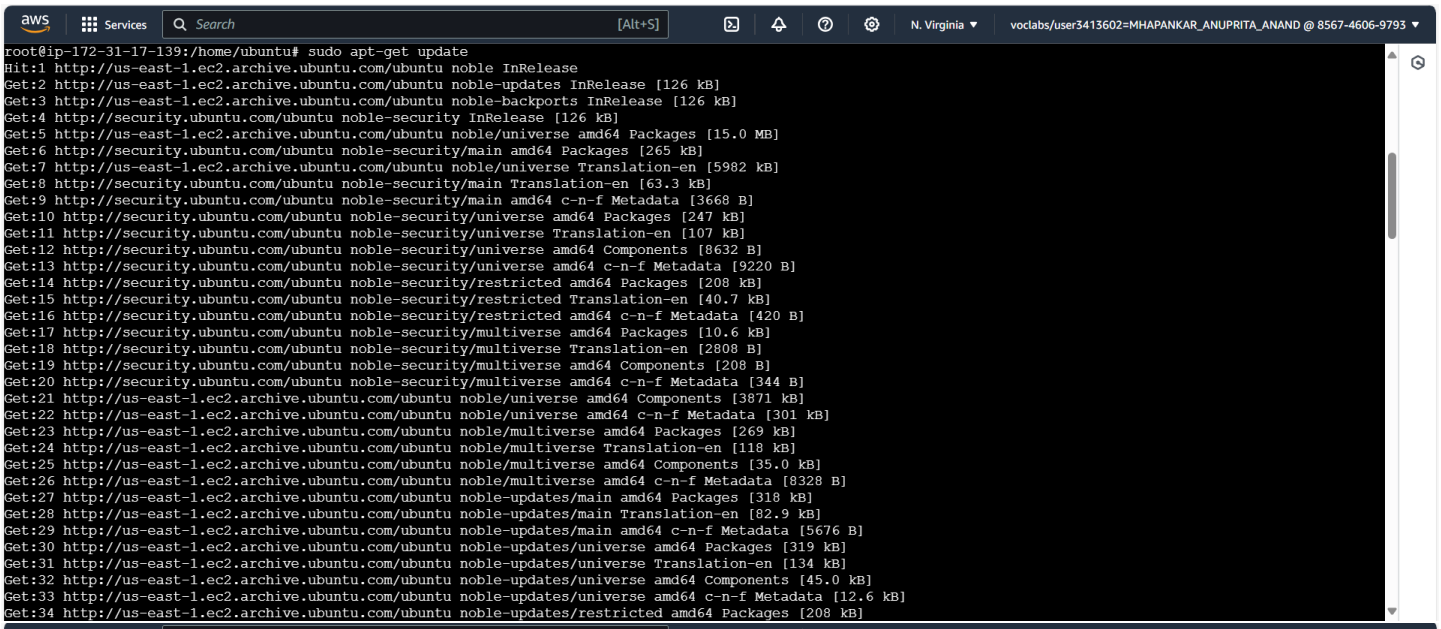
sudo apt-get update

apt install apache2

systemctl status apache2

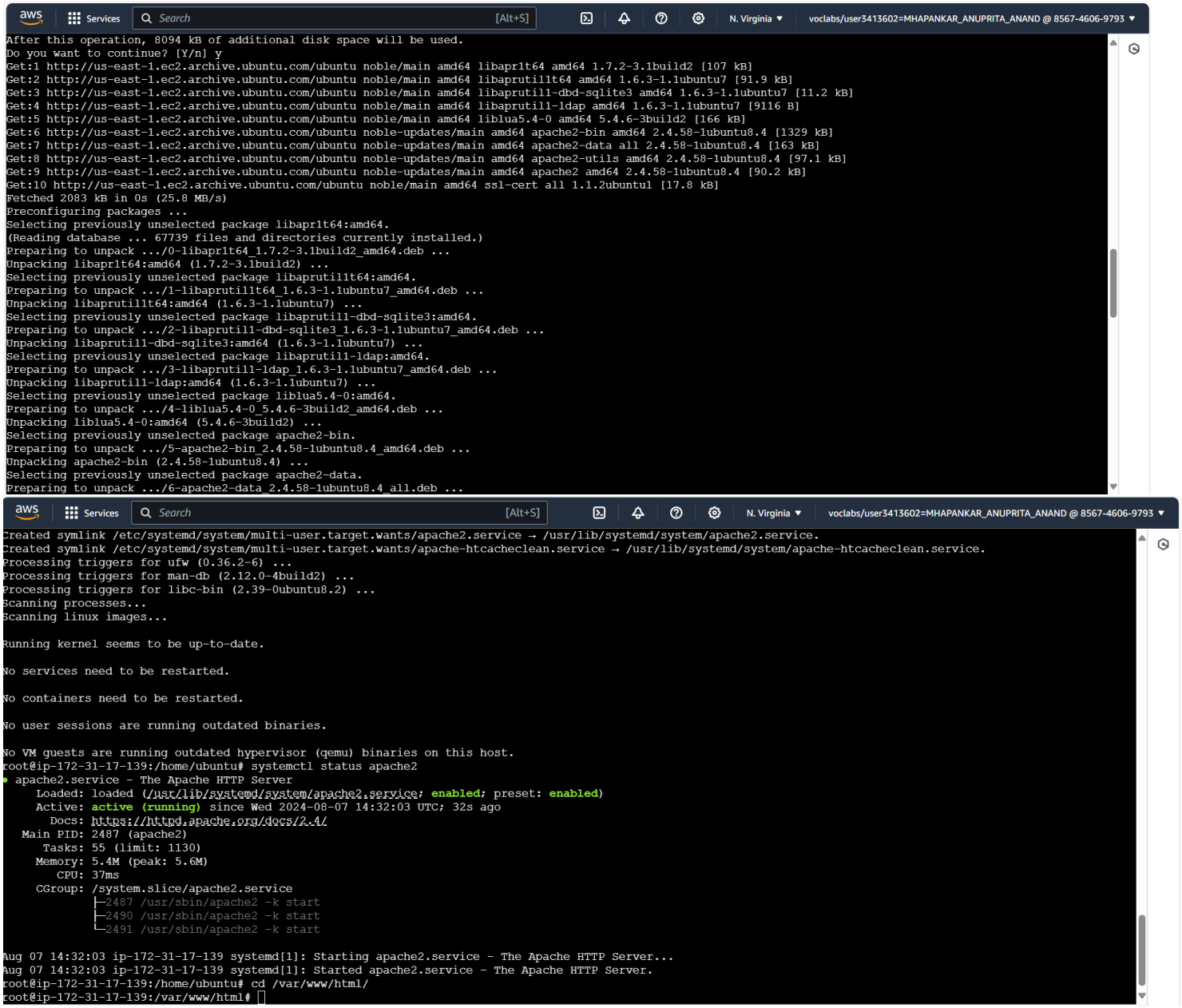
cd /var/www/html/



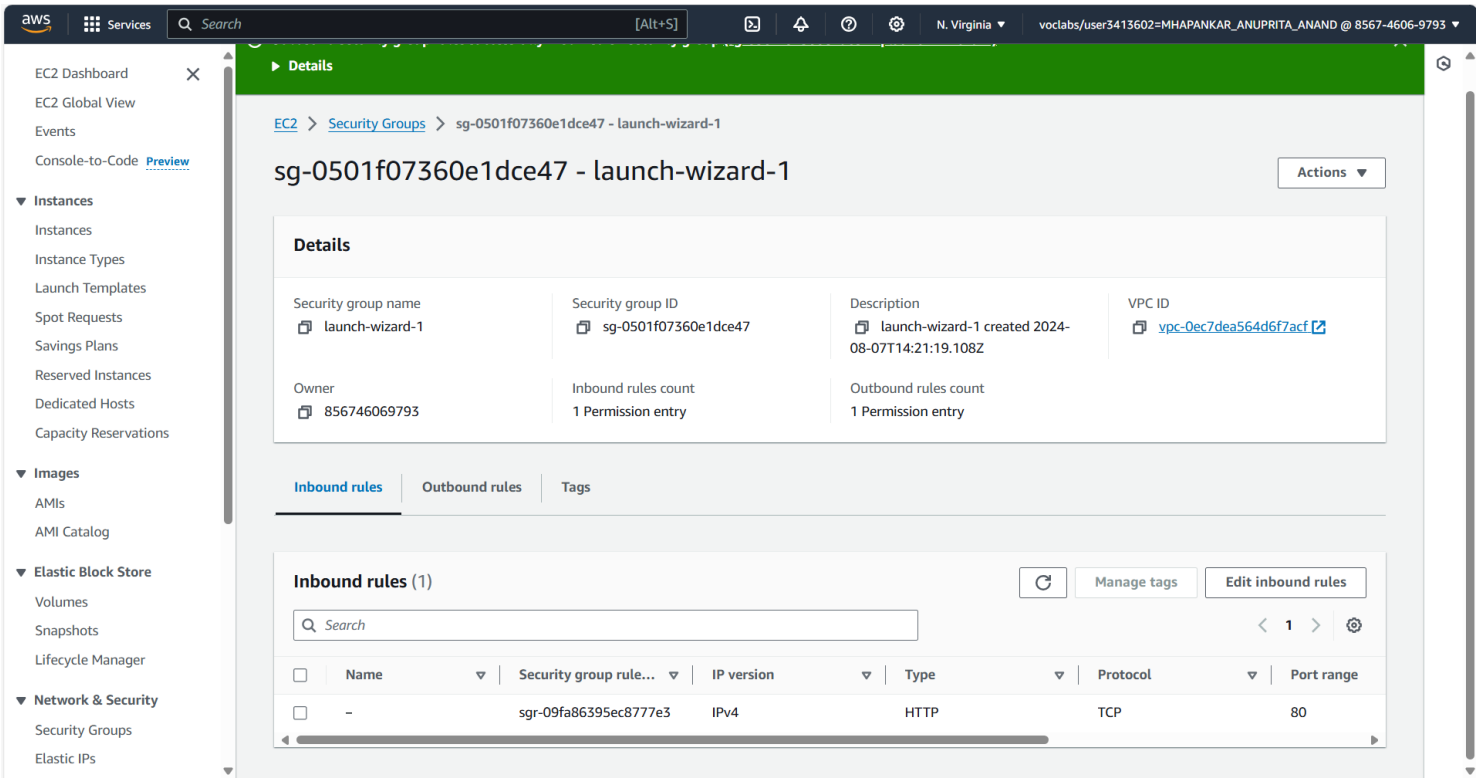


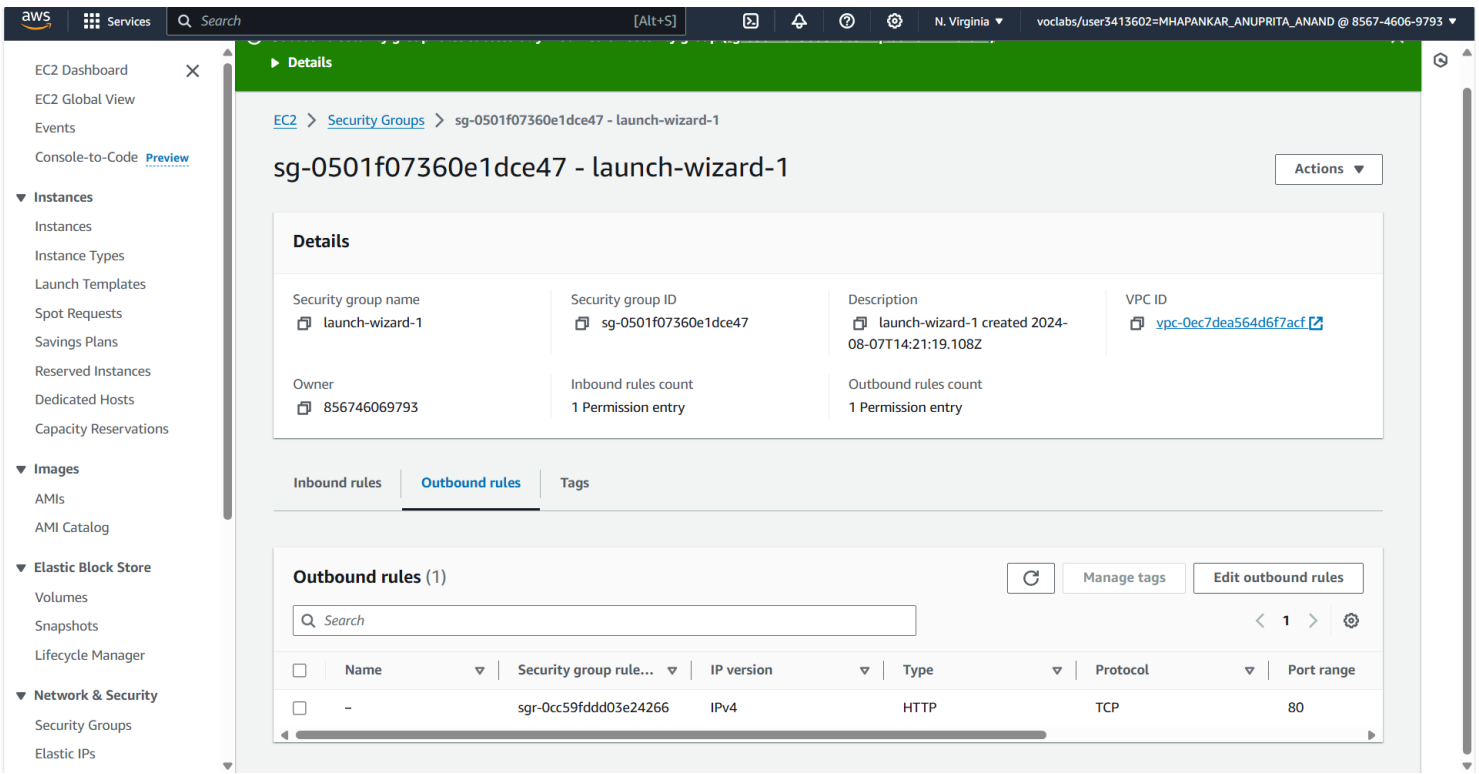

```
root@ip-172-31-17-139:/home/ubuntu# sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [265 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [63.3 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [3668 B]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [247 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [107 kB]
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [8632 B]
Get:13 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [9220 B]
Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [208 kB]
Get:15 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [40.7 kB]
Get:16 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [420 B]
Get:17 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [10.6 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2808 B]
Get:19 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [344 B]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [318 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [82.9 kB]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [5676 B]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [319 kB]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [134 kB]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [45.0 kB]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [12.6 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [208 kB]
```


```
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [208 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [40.7 kB]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 c-n-f Metadata [416 B]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [14.1 kB]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3608 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [212 B]
Get:40 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [532 B]
Get:41 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:42 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:43 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.3 kB]
Get:44 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.5 kB]
Get:45 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [17.6 kB]
Get:46 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1016 B]
Get:47 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:48 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:49 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:50 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Fetched 28.2 MB in 6s (5073 kB/s)
Reading package lists... Done
root@ip-172-31-17-139:/home/ubuntu# apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
0 upgraded, 10 newly installed, 0 to remove and 42 not upgraded.
Need to get 2083 kB of archives.
After this operation, 8094 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libapr1t64 amd64 1.7.2-3.1build2 [107 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1t64 amd64 1.6.3-1.1ubuntu7 [91.9 kB]
```



5. Edit the inbound and outbound rules.

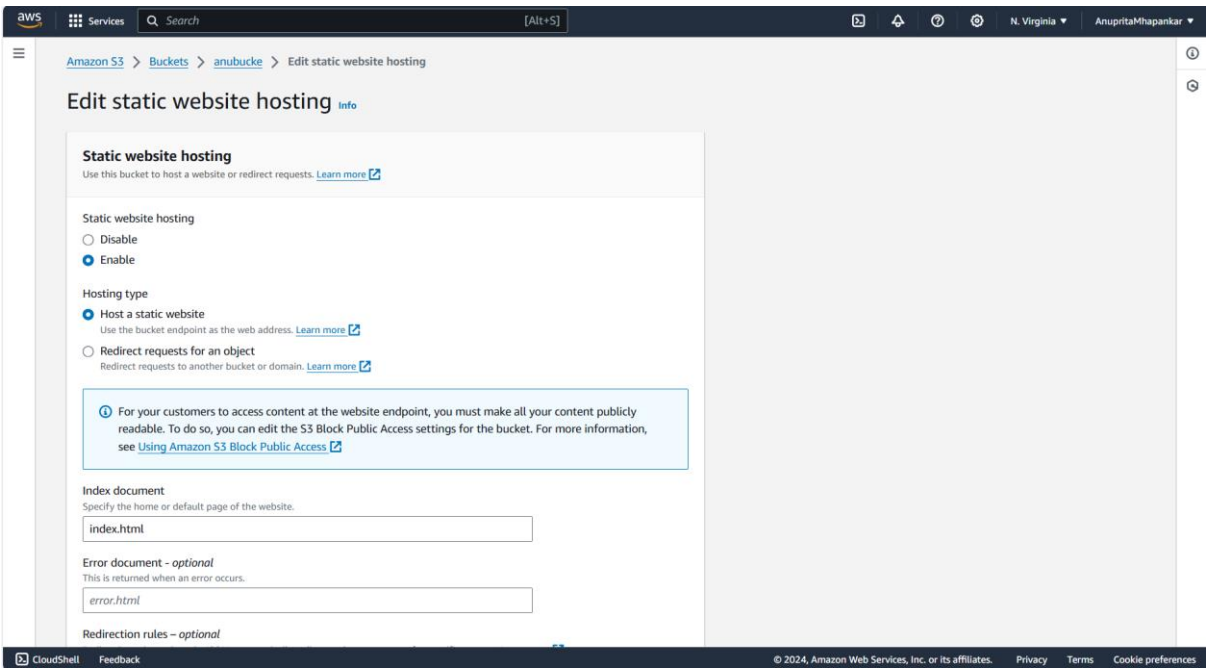




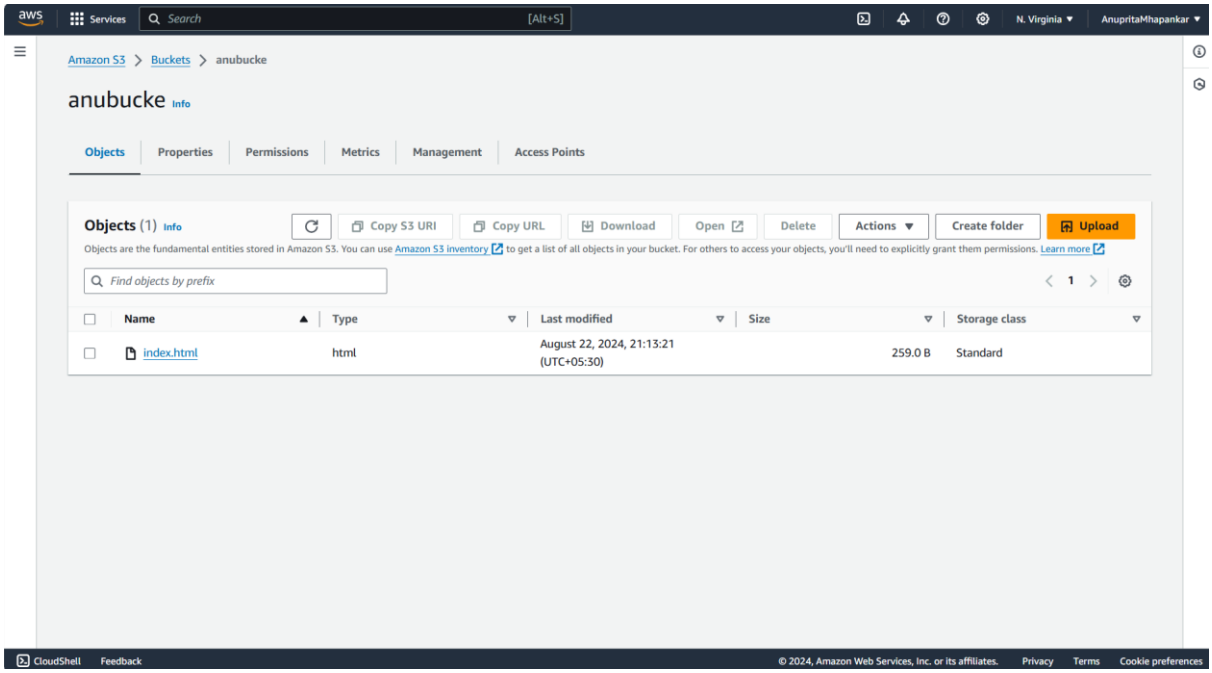
6. This is the hosted Static Website.

Using S3

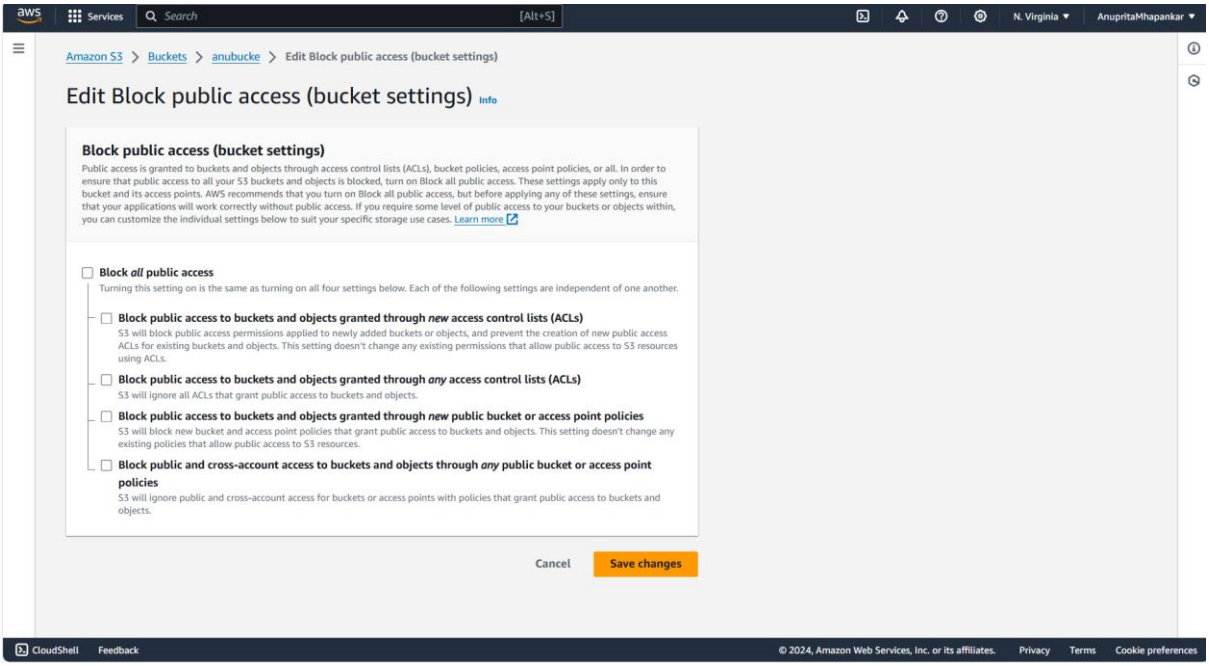
1. Visit S3 under the developer tools and create a Bucket. Click on the Edit Static Website Hosting under the properties tab



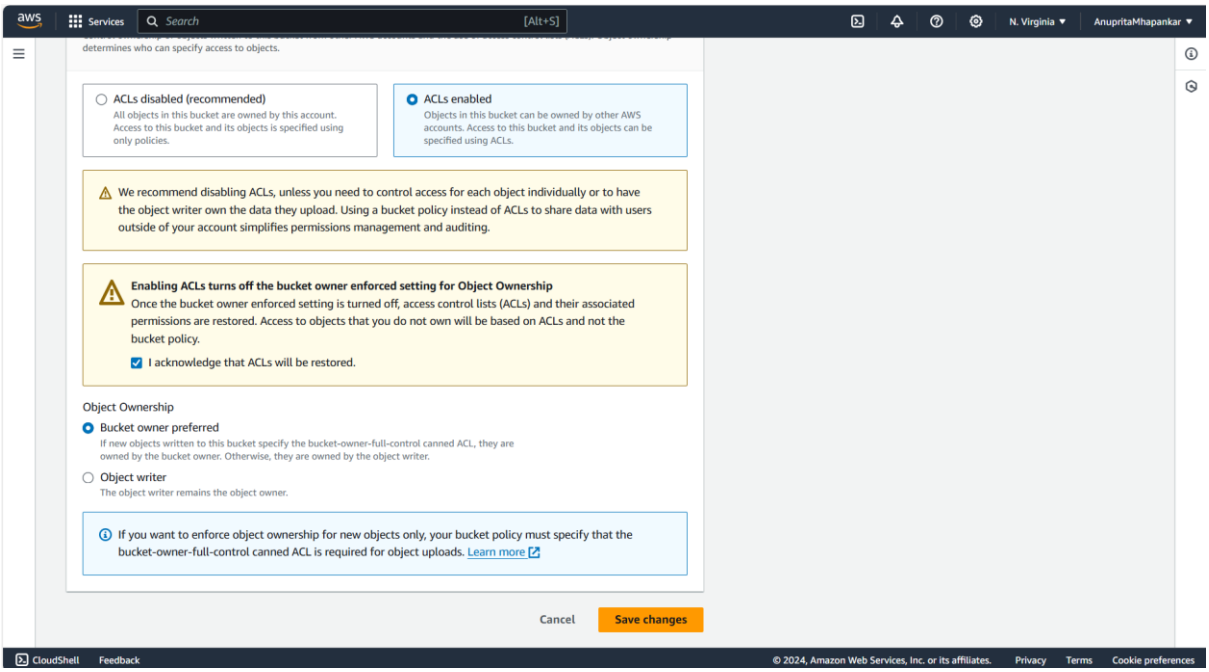
2. Upload a file



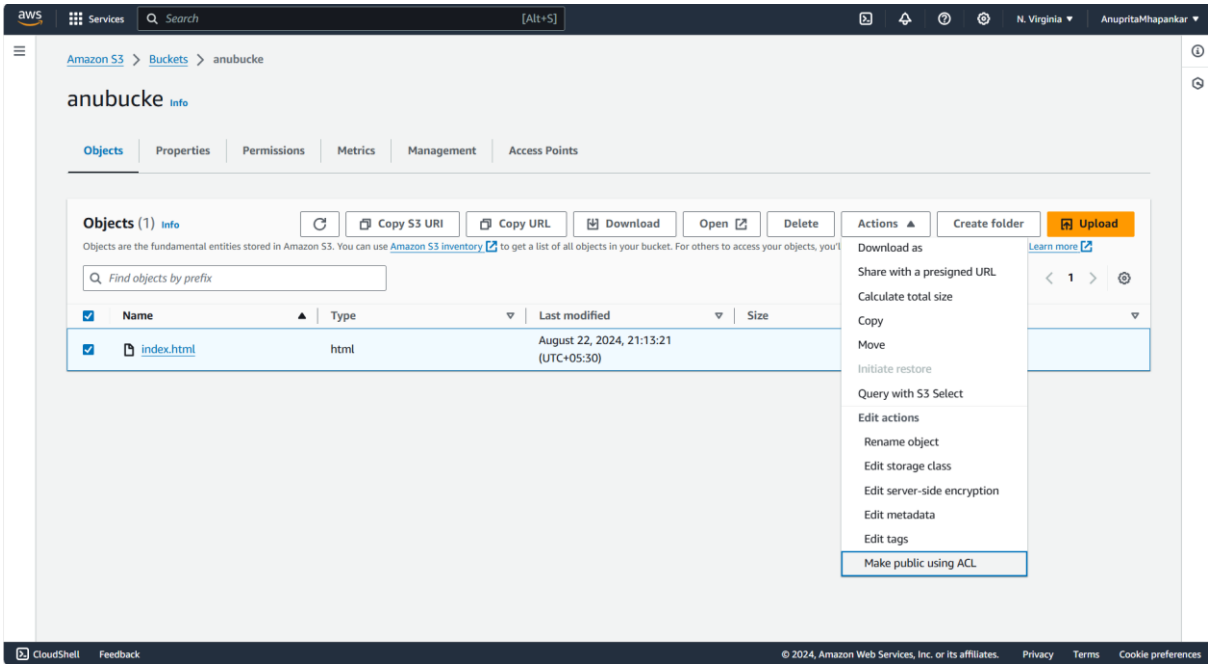
3. Click on the Edit block public access under the Permissions tab



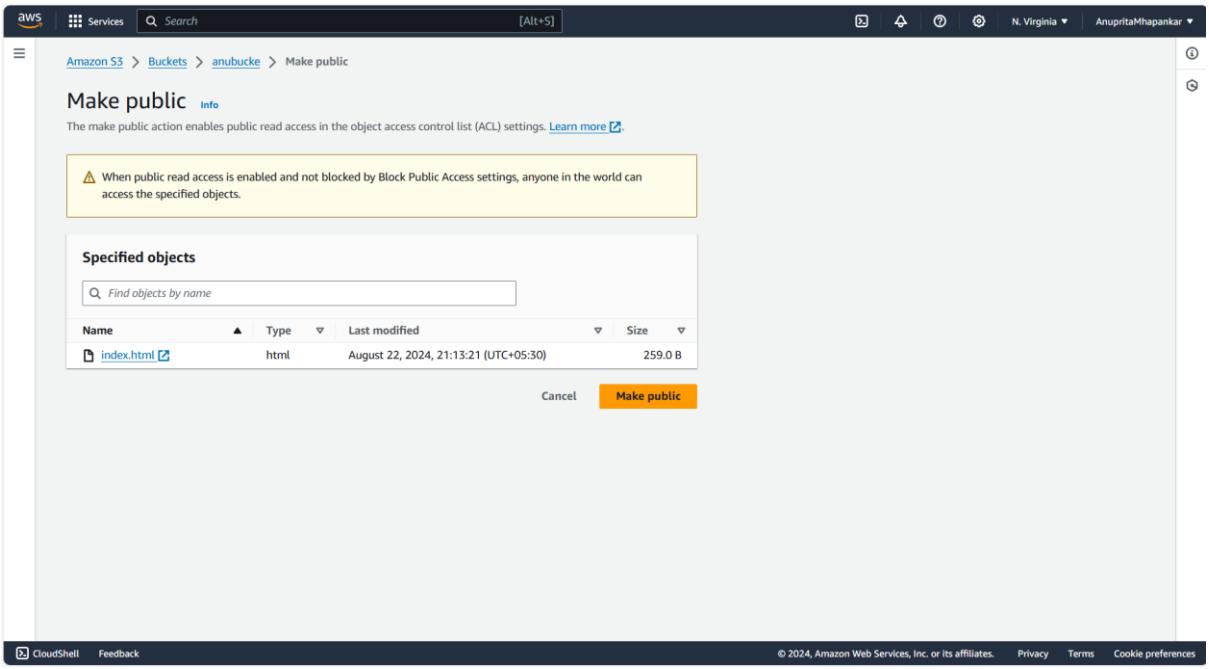
4. Click on Object Ownership under Permission Tab



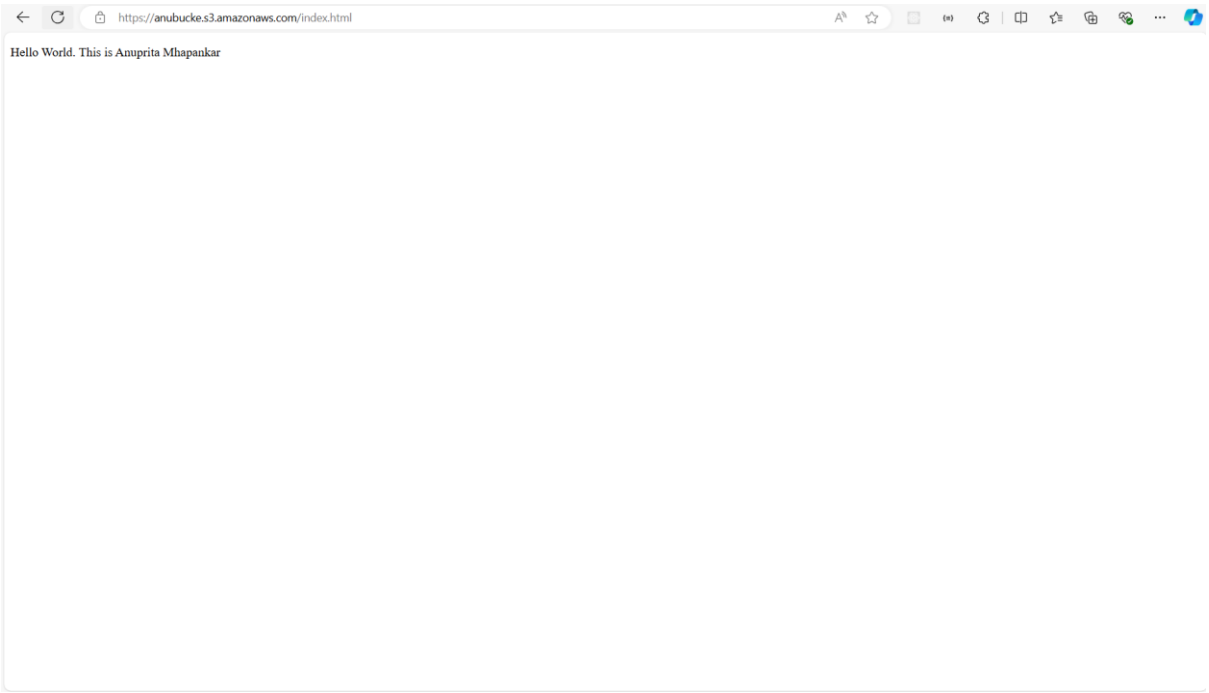
5. Select the file and click on Actions and select the option Make Public using ACL from the dropdown



6. Select on Make Public

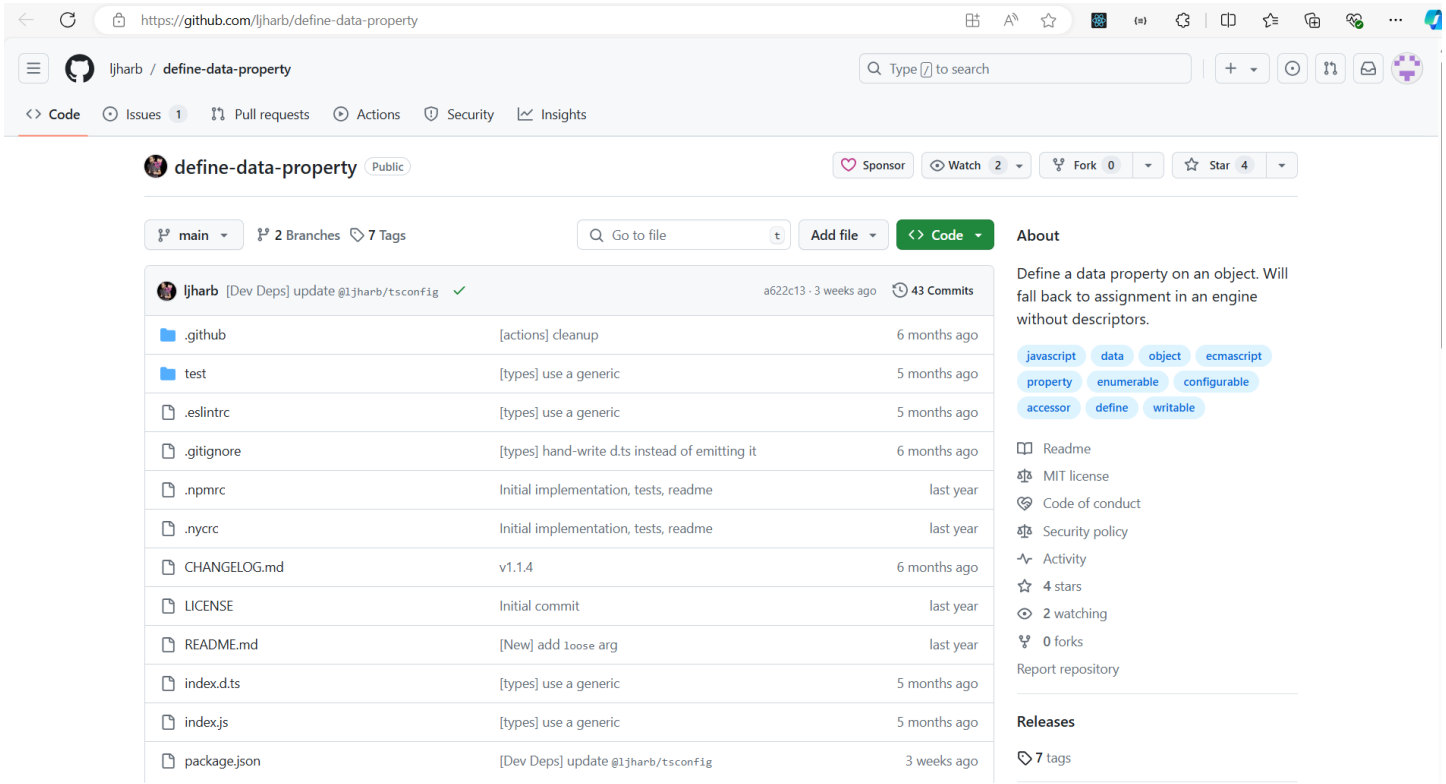


7. Visit the domain and the website hosted.

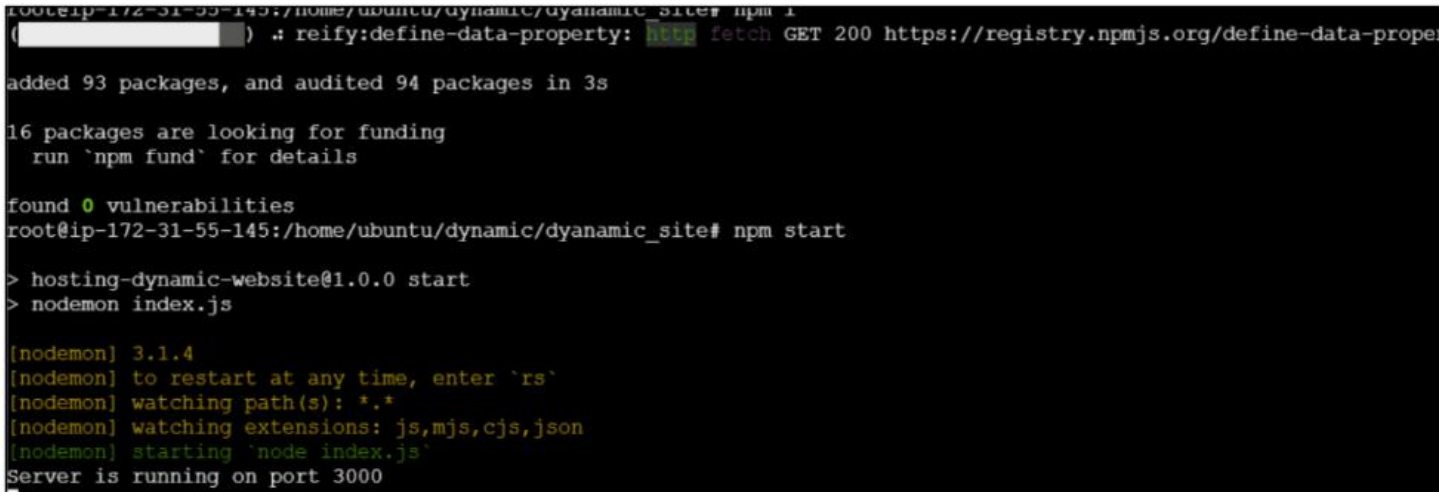


Dynamic Hosting :

Step 1: Clone the following Github repository



Step 2: Open Console and run the following command



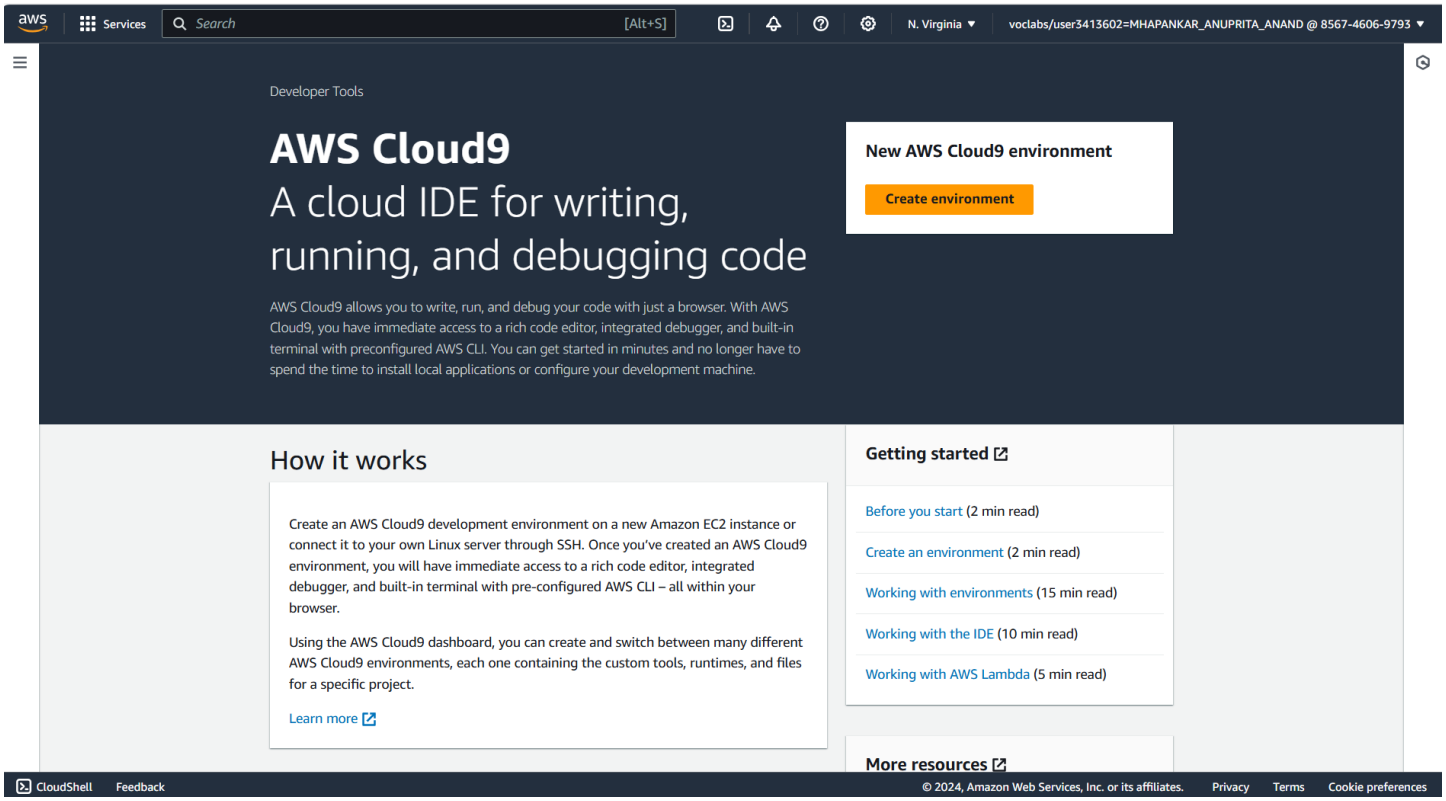
Step 3: Install necessary packages and run the website on port number 3000.

Hey this is Dynamic Website.

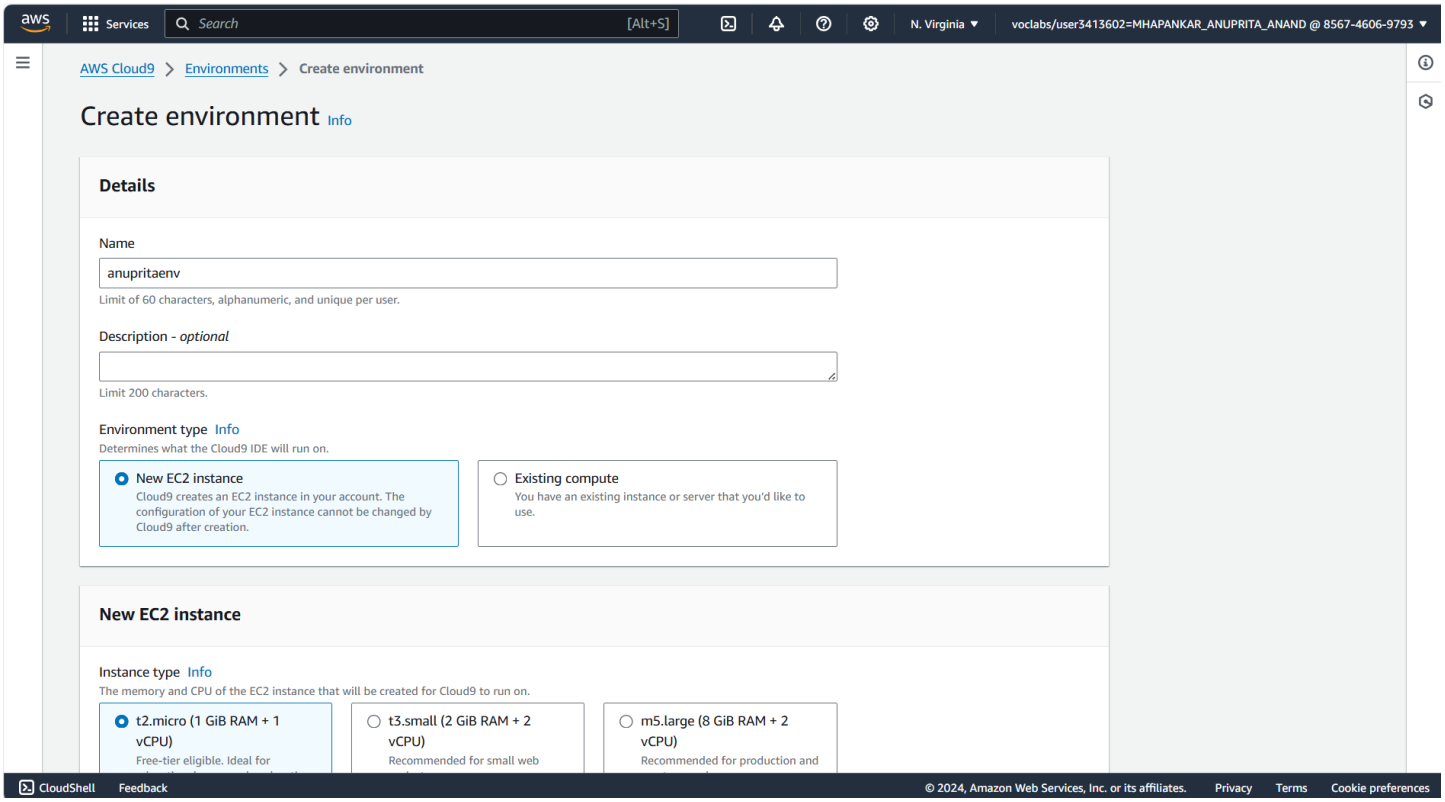
Hey this is about page.

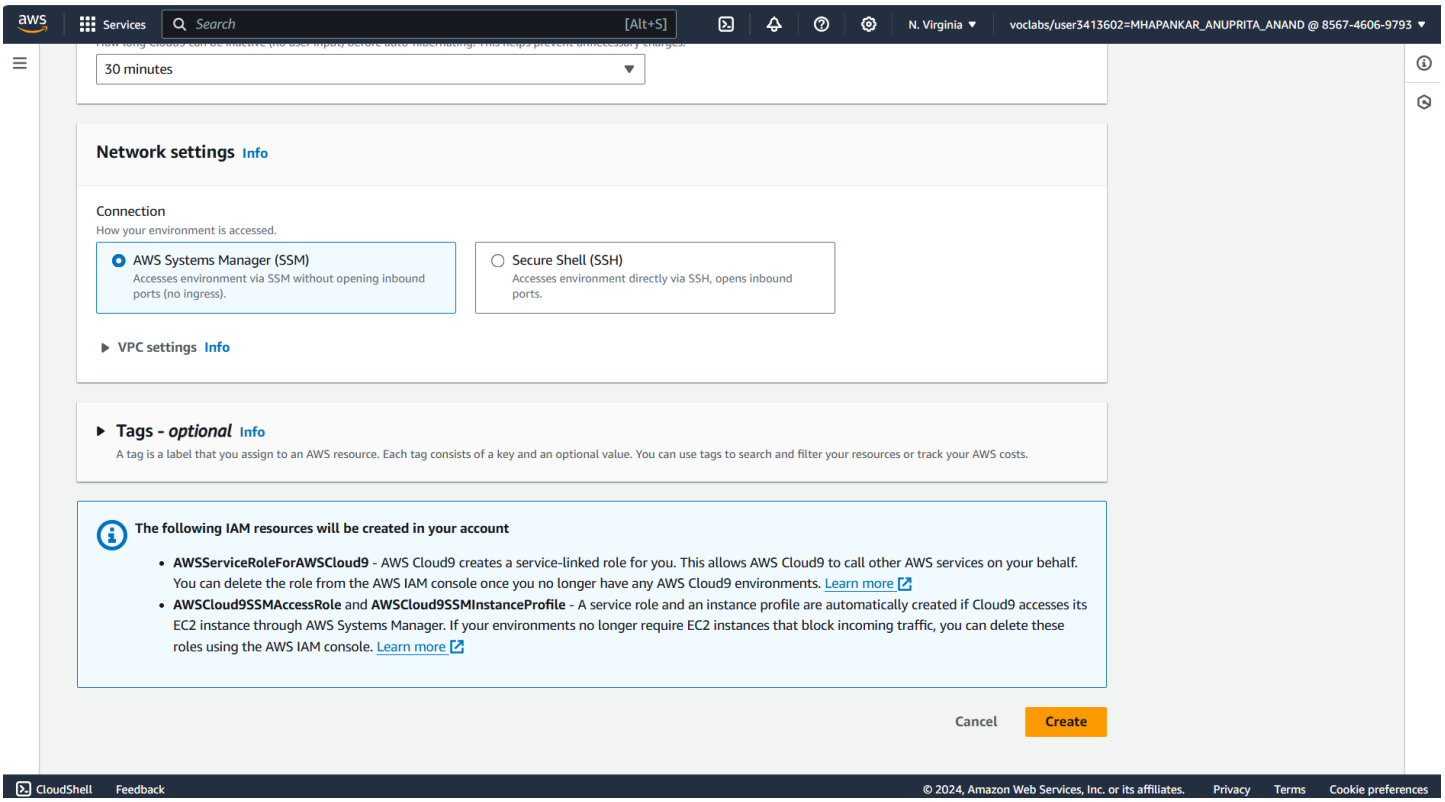
IDE Hosting :

Step 1: Go to AWS Academy and open AWS Cloud9 from developer Tools.



Step 2: Create a environment


Services
Search
[Alt+S]
N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
AWS Cloud9 > Environments > Create environment
Create environment Info
Details
Name
anupritaenv
Limit of 60 characters, alphanumeric, and unique per user.
Description - optional
Limit 200 characters.
Environment type Info
Determines what the Cloud9 IDE will run on.
New EC2 instance
Cloud9 creates an EC2 instance in your account. The configuration of your EC2 instance cannot be changed by Cloud9 after creation.
Existing compute
You have an existing instance or server that you'd like to use.
New EC2 instance
Instance type Info
The memory and CPU of the EC2 instance that will be created for Cloud9 to run on.
t2.micro (1 GiB RAM + 1 vCPU)
Free-tier eligible. Ideal for
t3.small (2 GiB RAM + 2 vCPU)
Recommended for small web
m5.large (8 GiB RAM + 2 vCPU)
Recommended for production and
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


Services
Search
[Alt+S]
N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
30 minutes
Network settings Info
Connection
How your environment is accessed.
AWS Systems Manager (SSM)
Accesses environment via SSM without opening inbound ports (no ingress).
Secure Shell (SSH)
Accesses environment directly via SSH, opens inbound ports.
VPC settings Info
Tags - optional Info
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.
The following IAM resources will be created in your account
AWSServiceRoleForAWSCloud9 - AWS Cloud9 creates a service-linked role for you. This allows AWS Cloud9 to call other AWS services on your behalf. You can delete the role from the AWS IAM console once you no longer have any AWS Cloud9 environments. Learn more
AWSCloud9SSMAccessRole and AWSCloud9SSMInstanceProfile - A service role and an instance profile are automatically created if Cloud9 accesses its EC2 instance through AWS Systems Manager. If your environments no longer require EC2 instances that block incoming traffic, you can delete these roles using the AWS IAM console. Learn more
Cancel
Create
CloudShell
Feedback
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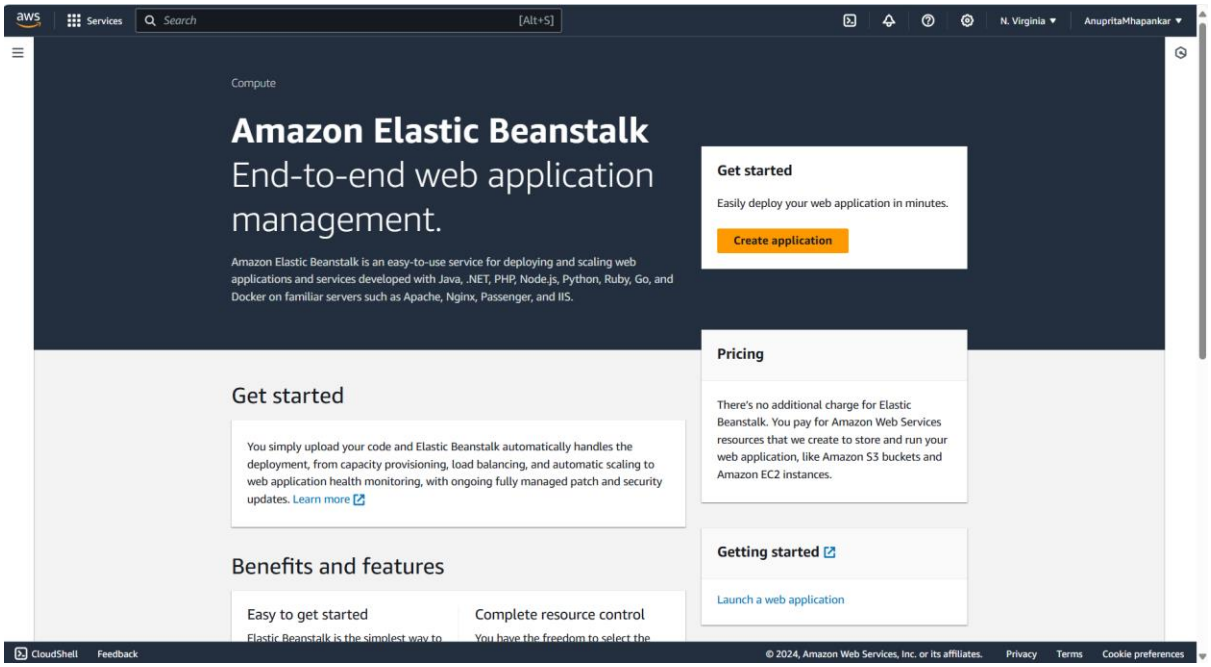
Privacy
Terms
Cookie preferences

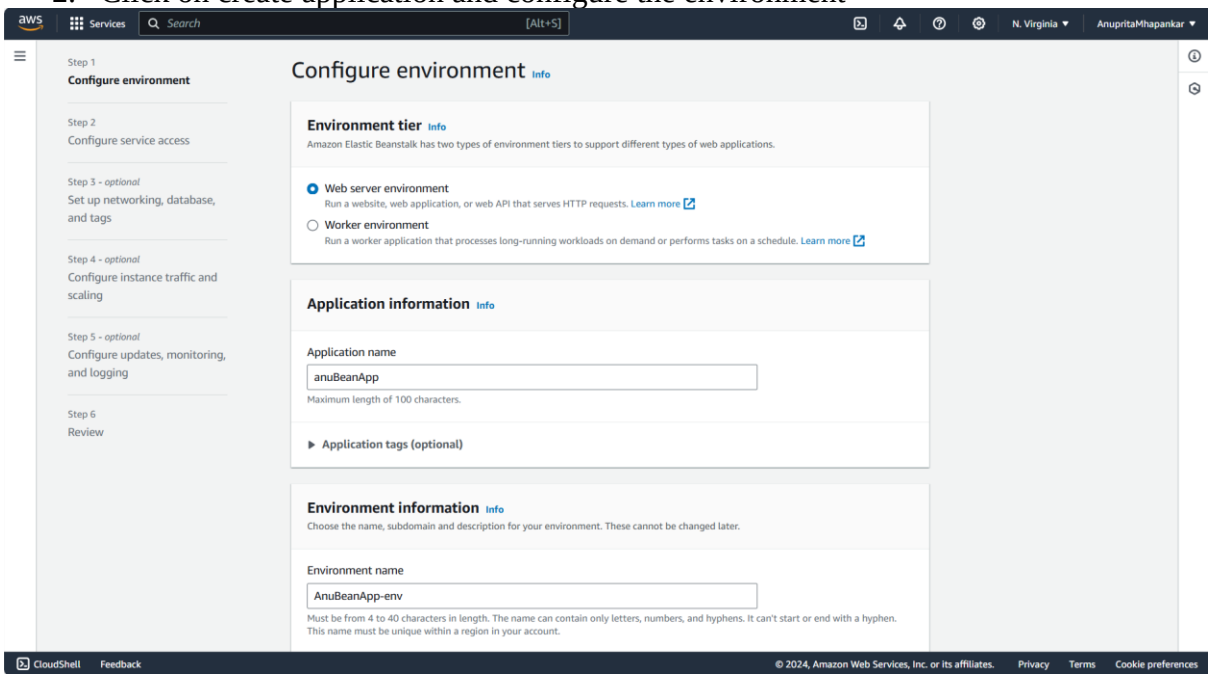
Experiment 2

Using Beanstalk

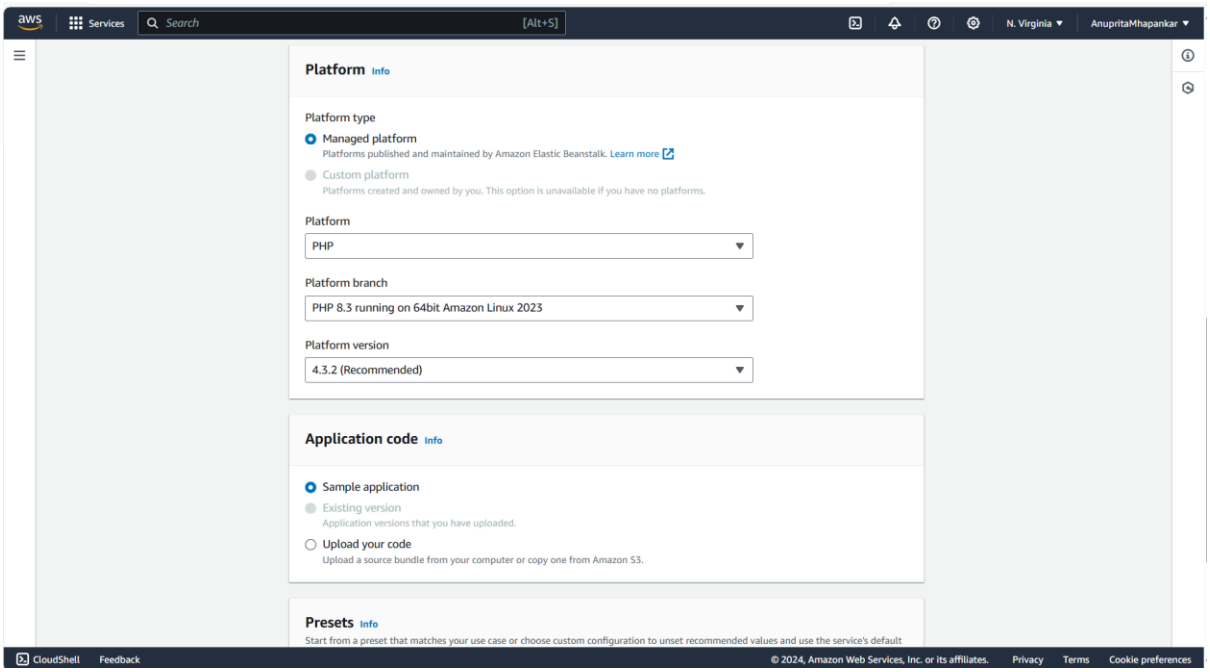
1. Search Elastic Beanstalk from Developer Tools



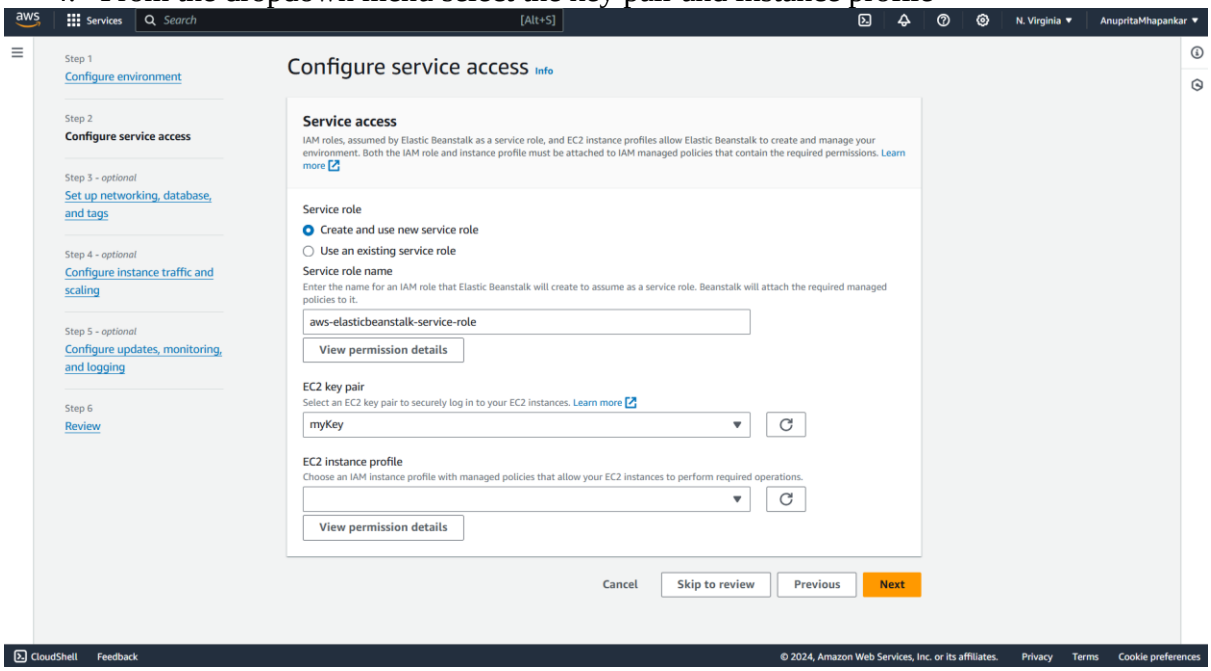
2. Click on create application and configure the environment



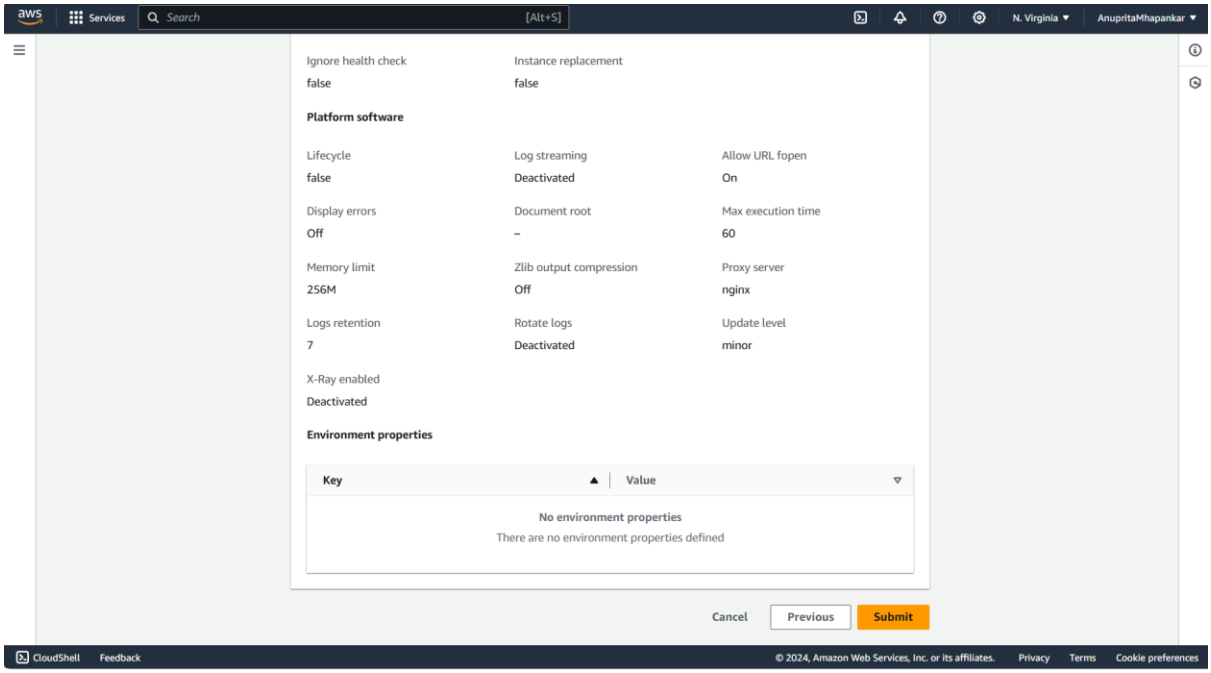
3. Choose PHP from the dropdown menu and click next



4. From the dropdown menu select the key pair and instance profile

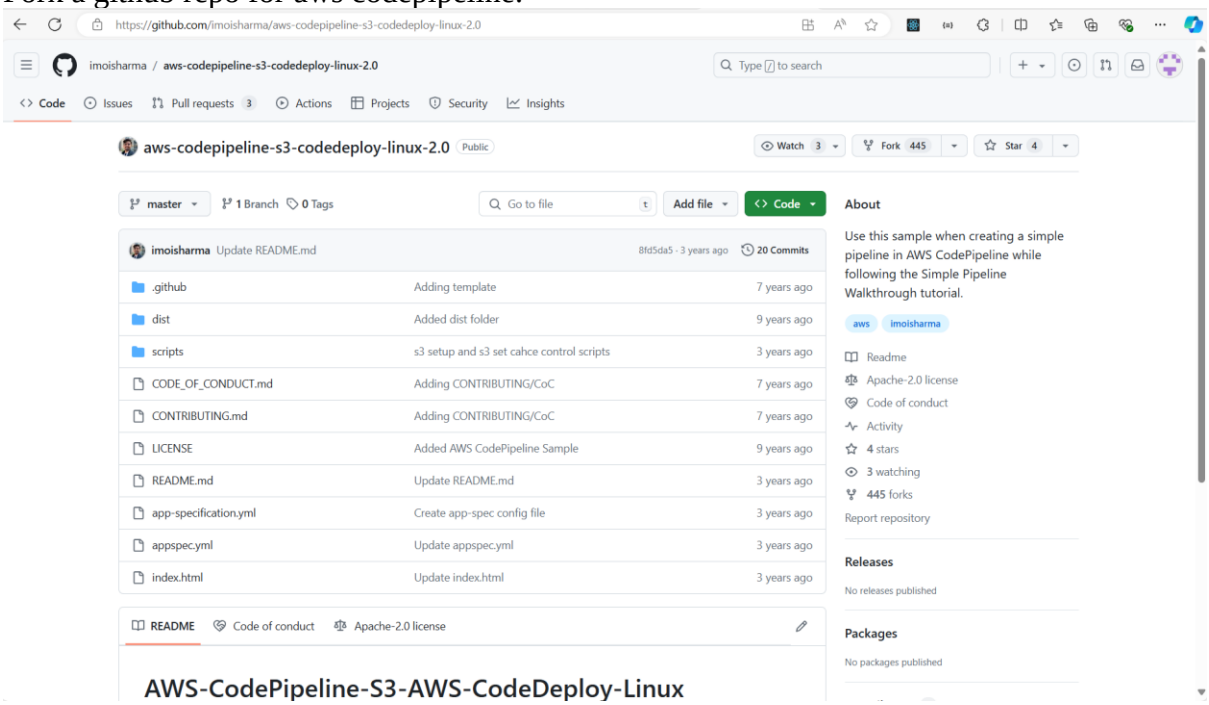


5. Review the changes made and click on Submit

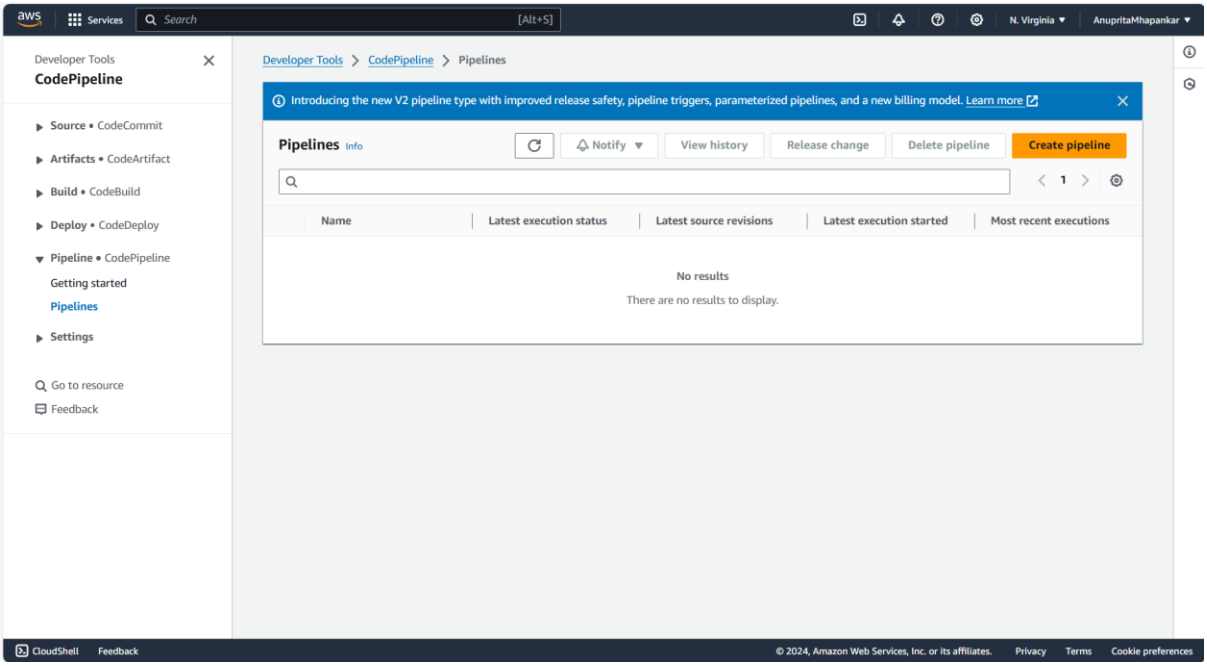


Pipeline Creation :

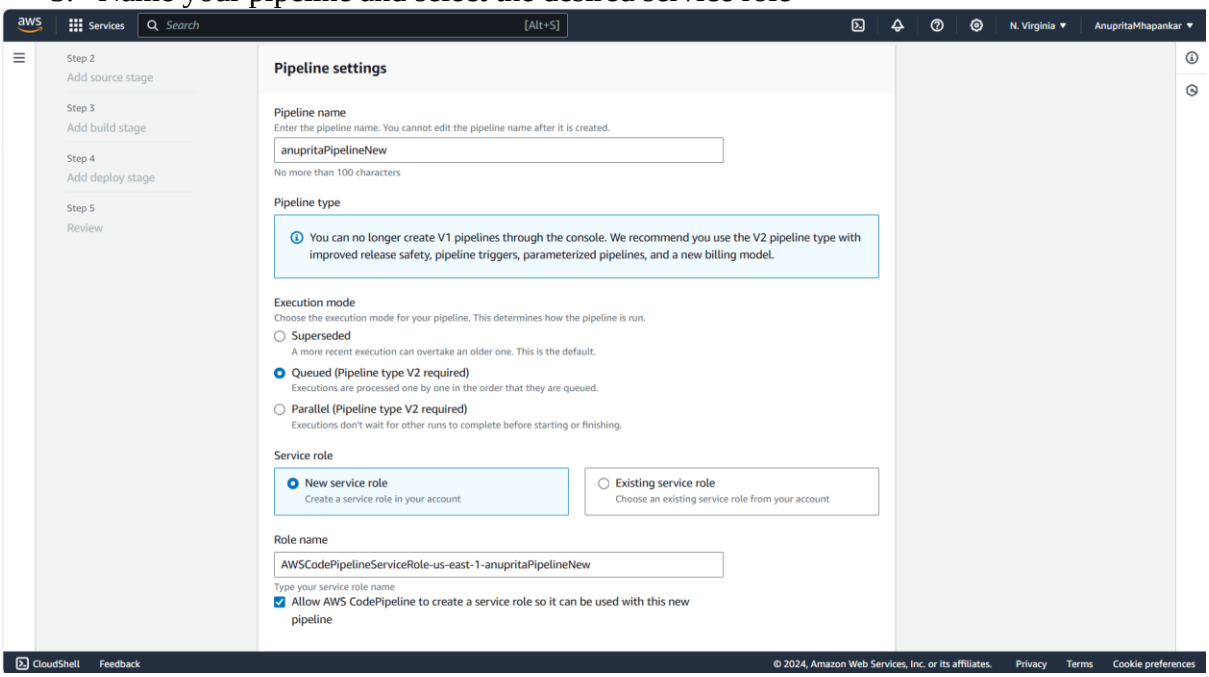
1. Fork a github repo for aws codepipeline.

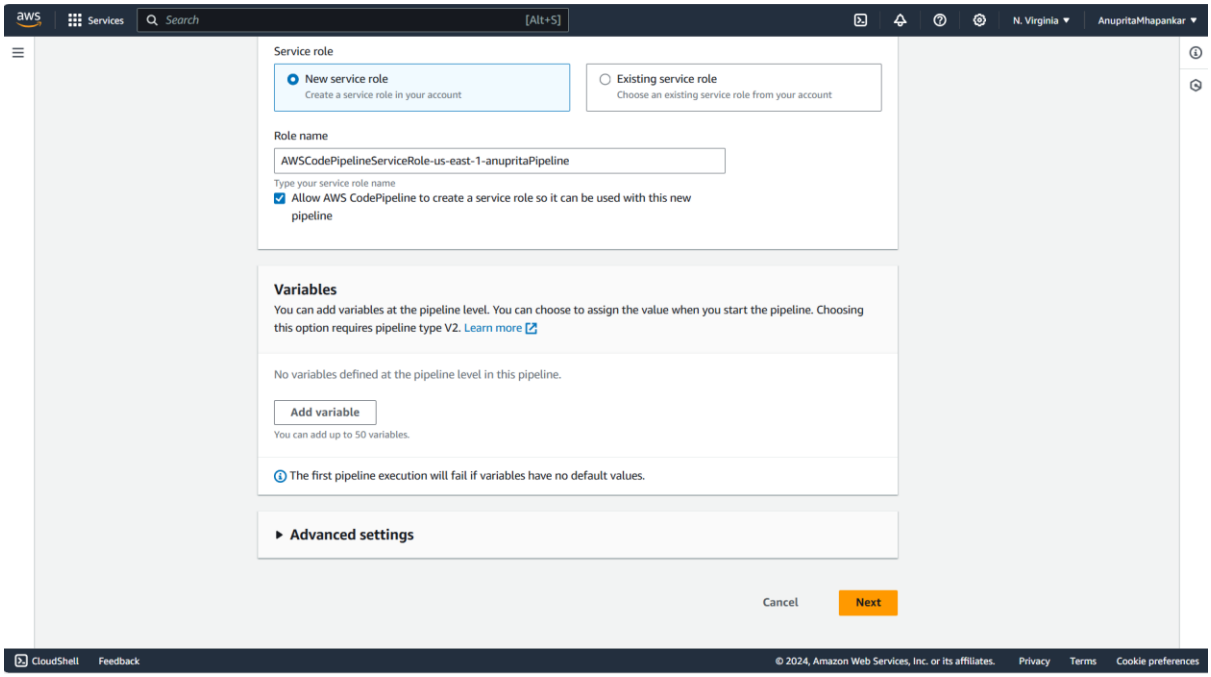


2. Go to developer tools and select CodePipeline and create a new pipeline

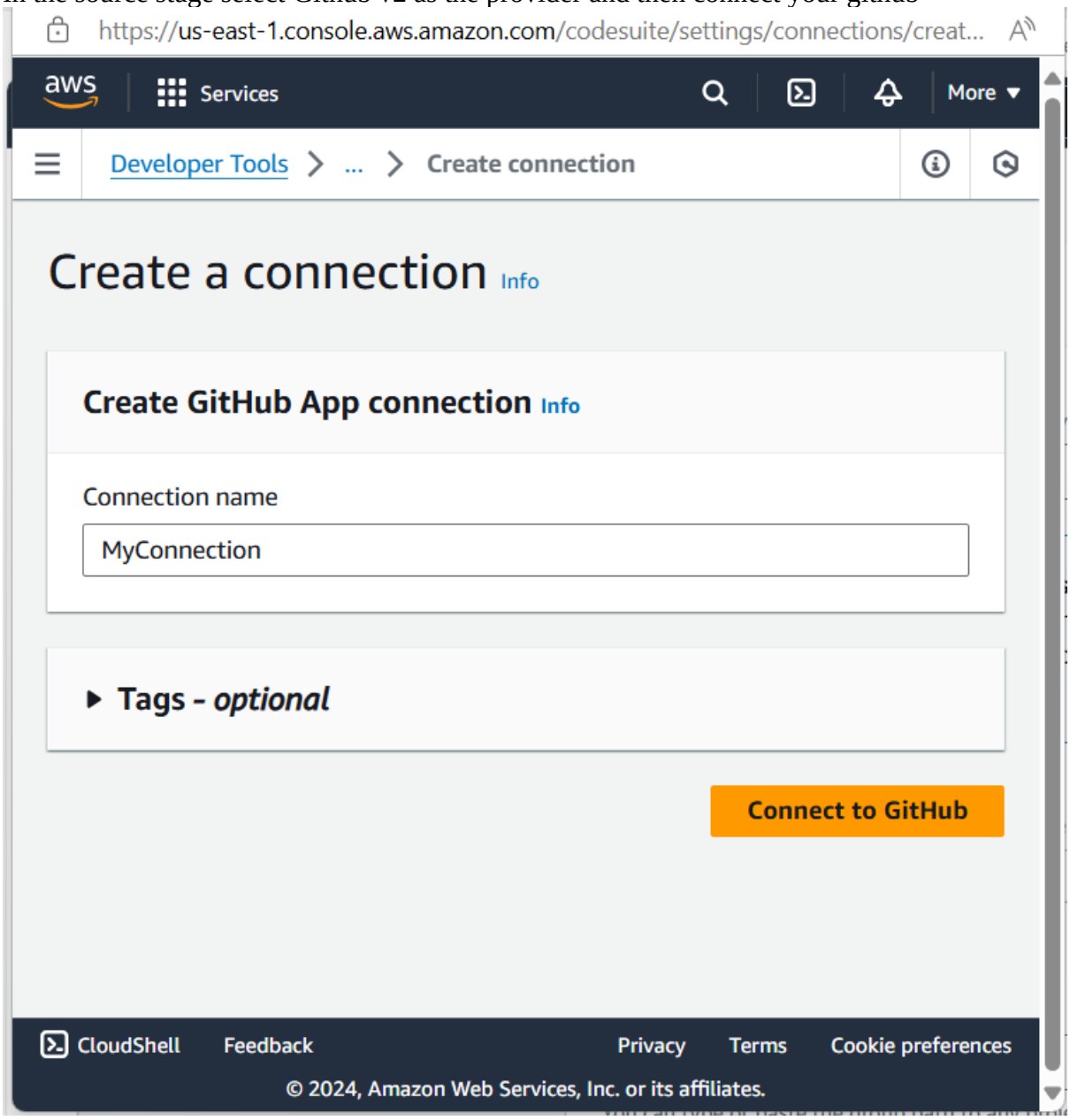


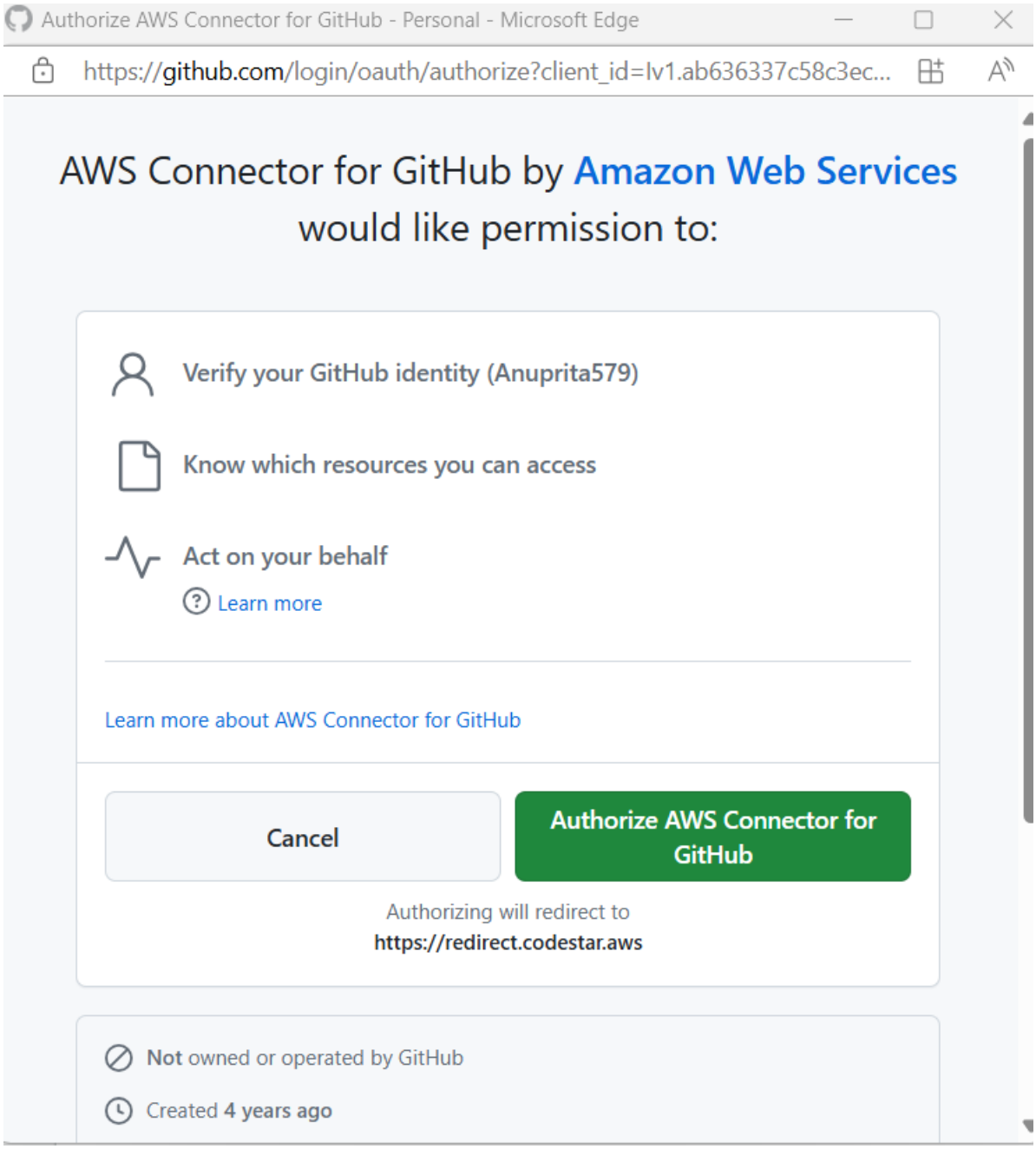
3. Name your pipeline and select the desired service role

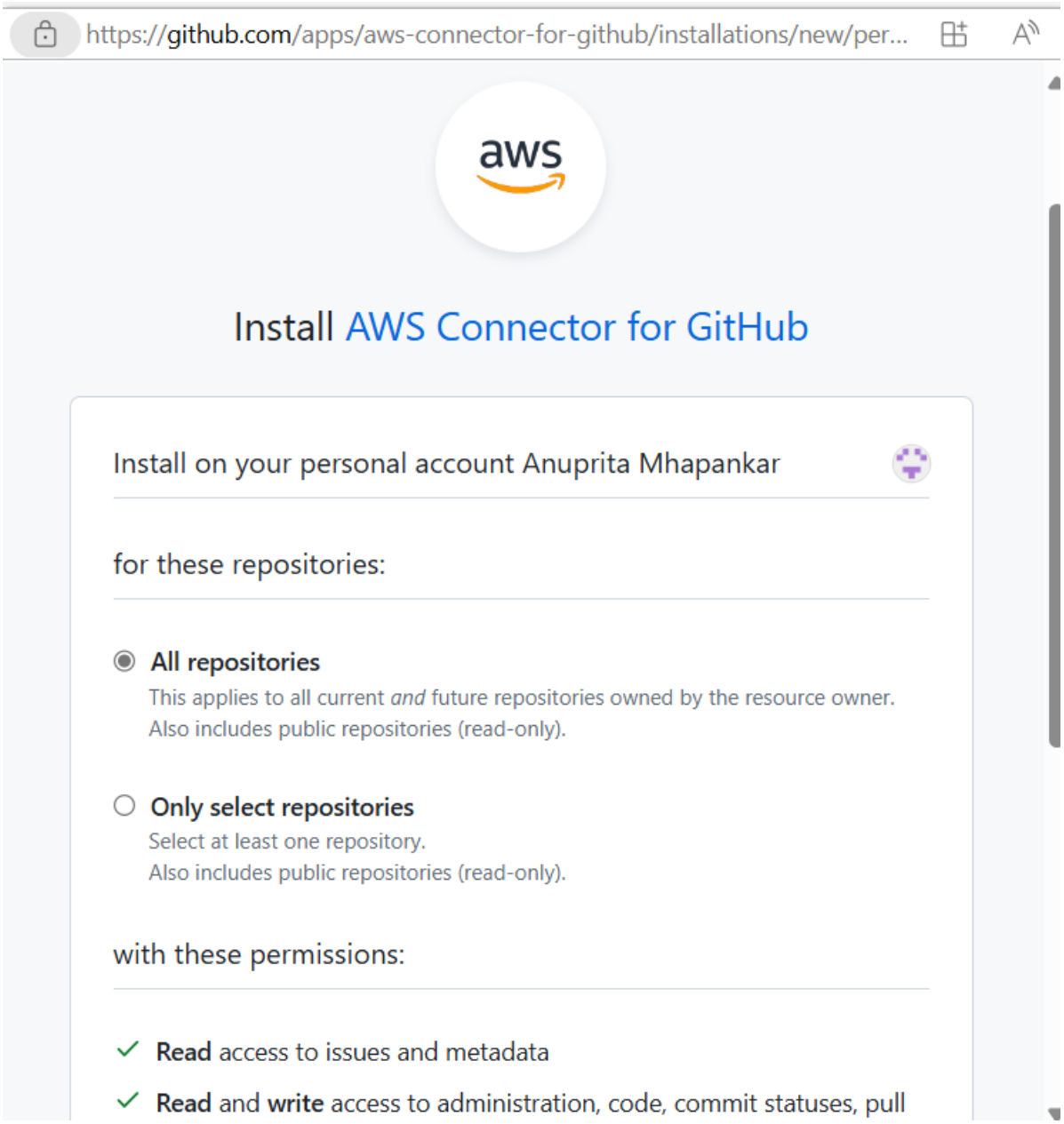



aws
Services
Search
[Alt+S]
N. Virginia
AnupritaMhapankar
Service role
New service role
Create a service role in your account
Existing service role
Choose an existing service role from your account
Role name
AWSCodePipelineServiceRole-us-east-1-anupritaPipeline
Type your service role name
Allow AWS CodePipeline to create a service role so it can be used with this new pipeline
Variables
You can add variables at the pipeline level. You can choose to assign the value when you start the pipeline. Choosing this option requires pipeline type V2. Learn more
No variables defined at the pipeline level in this pipeline.
Add variable
You can add up to 50 variables.
The first pipeline execution will fail if variables have no default values.
Advanced settings
Cancel
Next
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

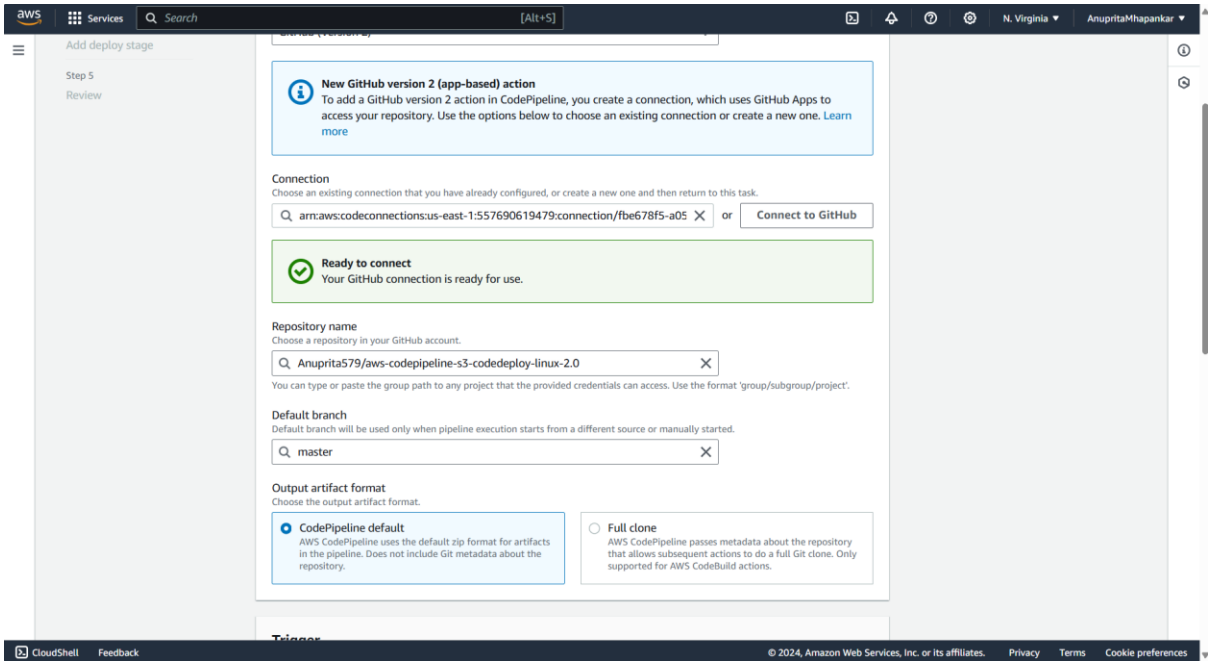
4. In the source stage select Github v2 as the provider and then connect your github



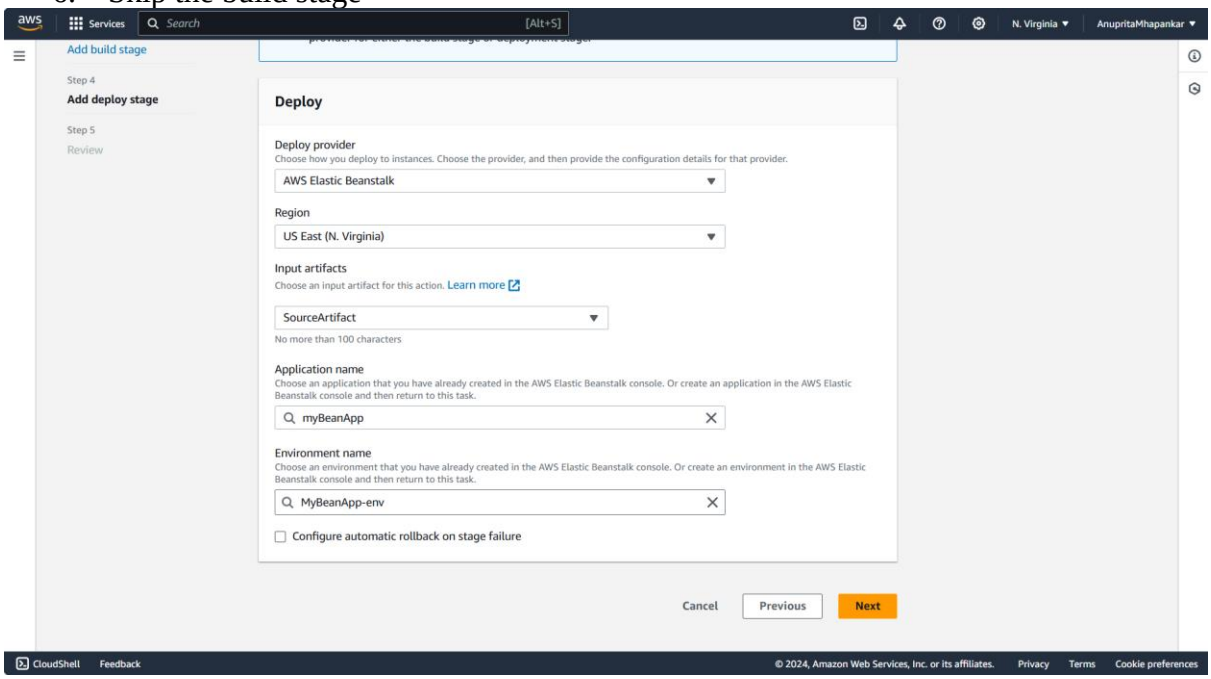

Authorize AWS Connector for GitHub - Personal - Microsoft Edge
https://github.com/login/oauth/authorize?client_id=Iv1.ab636337c58c3ec...
AWS Connector for GitHub by Amazon Web Services would like permission to:
Verify your GitHub identity (Anuprita579)
Know which resources you can access
Act on your behalf
Learn more
Learn more about AWS Connector for GitHub
Cancel
Authorize AWS Connector for GitHub
Authorizing will redirect to
https://redirect.codestar.aws
Not owned or operated by GitHub
Created 4 years ago



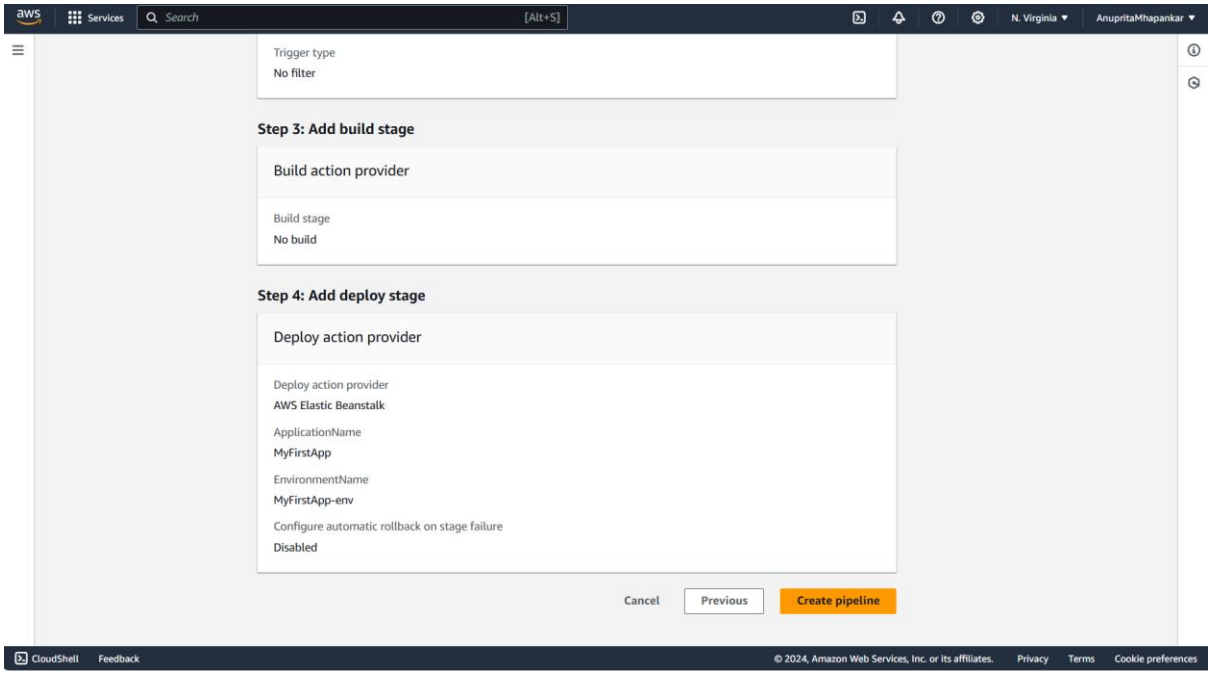
5. Once the connection is established from the drop down menu select the repository and the branch



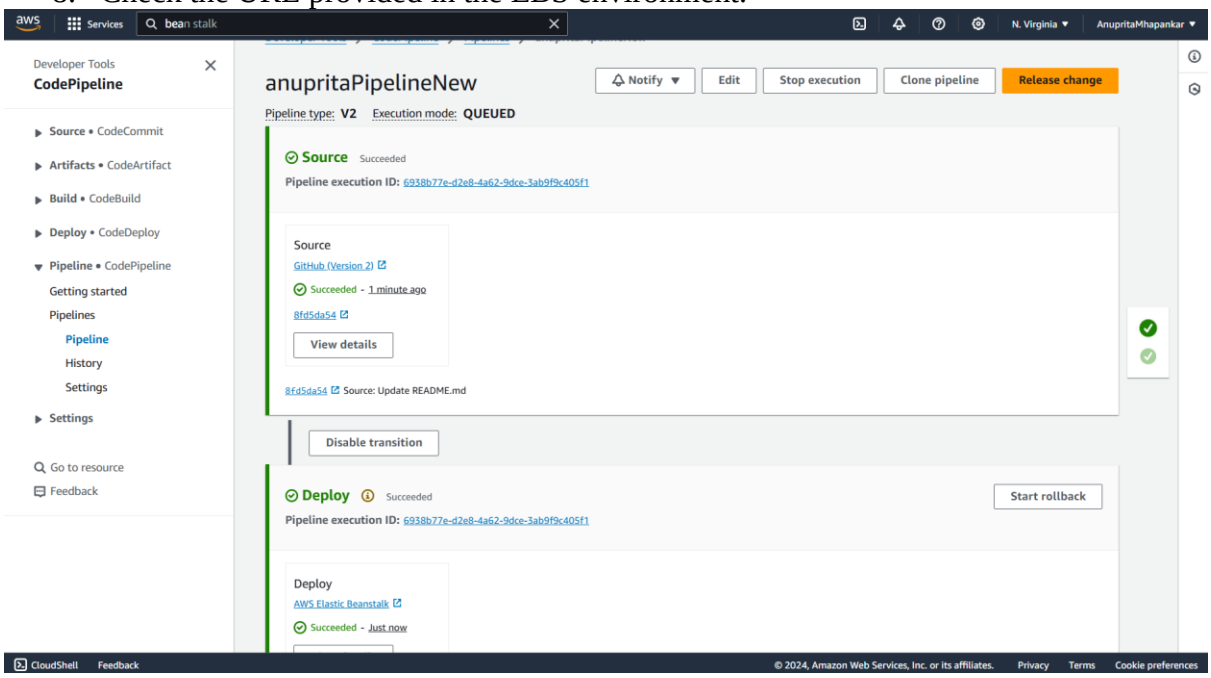
6. Skip the build stage



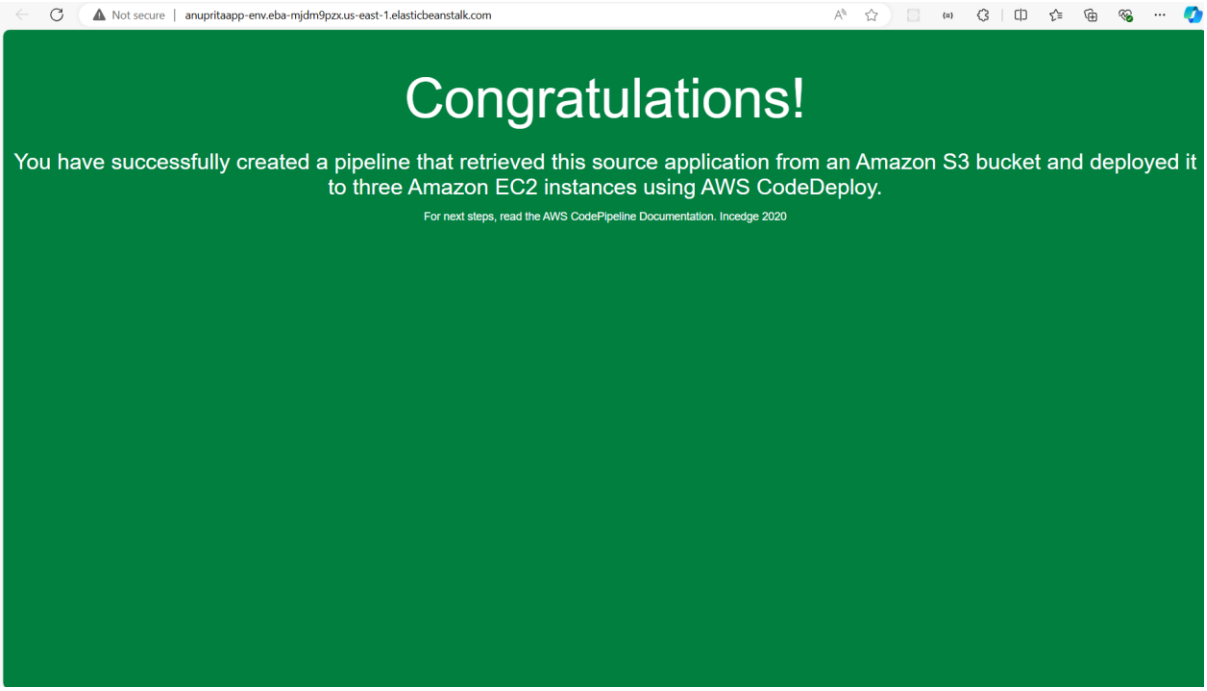
7. Review the settings and click on create pipeline



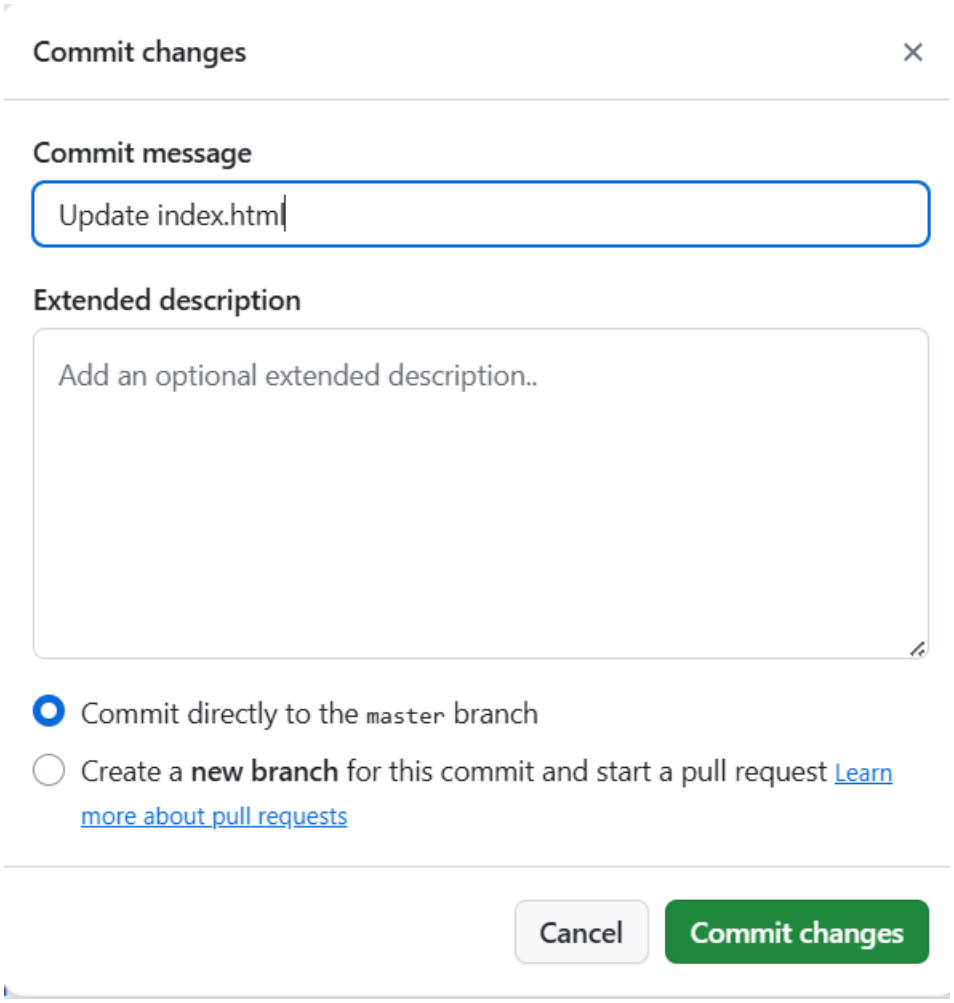
8. Check the URL provided in the EBS environment.



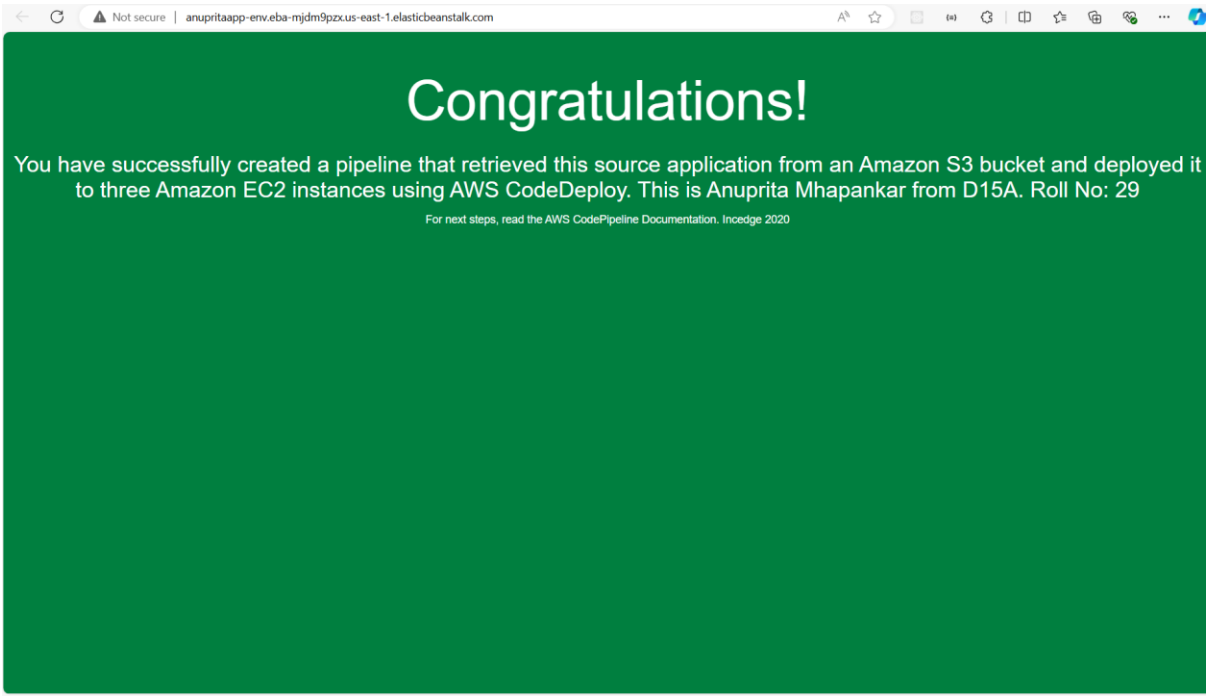
9. The website is hosted from the forked repo in our beanstalk environment



10. Now, Edit index.html file and then commit the changes



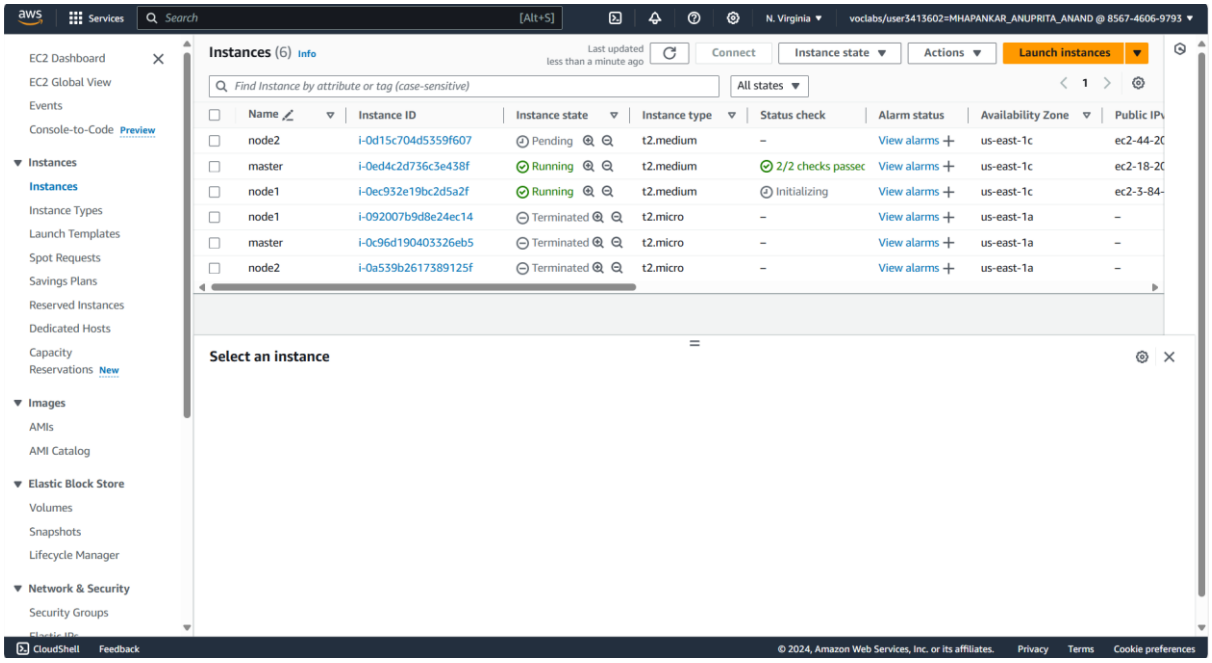
11. Visit the deployed link again, the changes will be reflected in the website.

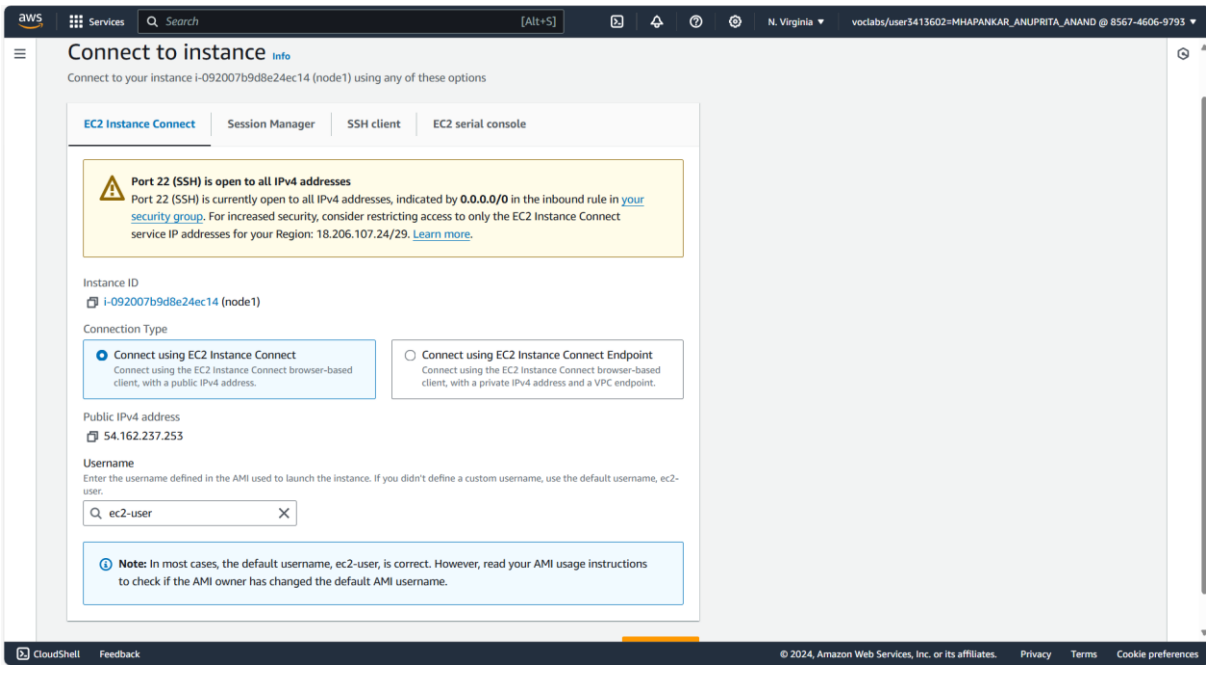

Not secure | anupritaapp-env.eba-mjdm9pzx.us-east-1.elasticbeanstalk.com
Congratulations!
You have successfully created a pipeline that retrieved this source application from an Amazon S3 bucket and deployed it to three Amazon EC2 instances using AWS CodeDeploy. This is Anuprita Mhapankar from D15A. Roll No: 29
For next steps, read the AWS CodePipeline Documentation. Incedge 2020

Advanced DevOps Experiment 3

Aim: To understand the Kubernetes Cluster Architecture, install and Spin Up a Kubernetes Cluster on Linux Machines/Cloud Platforms.

Step 1: Go to AWS Academia in services select EC2 and create 3 instance with instance type t2.medium and names as node1, node2 and master





Step 2: Select and connect each instance and run the following commands inside the console of each instance.

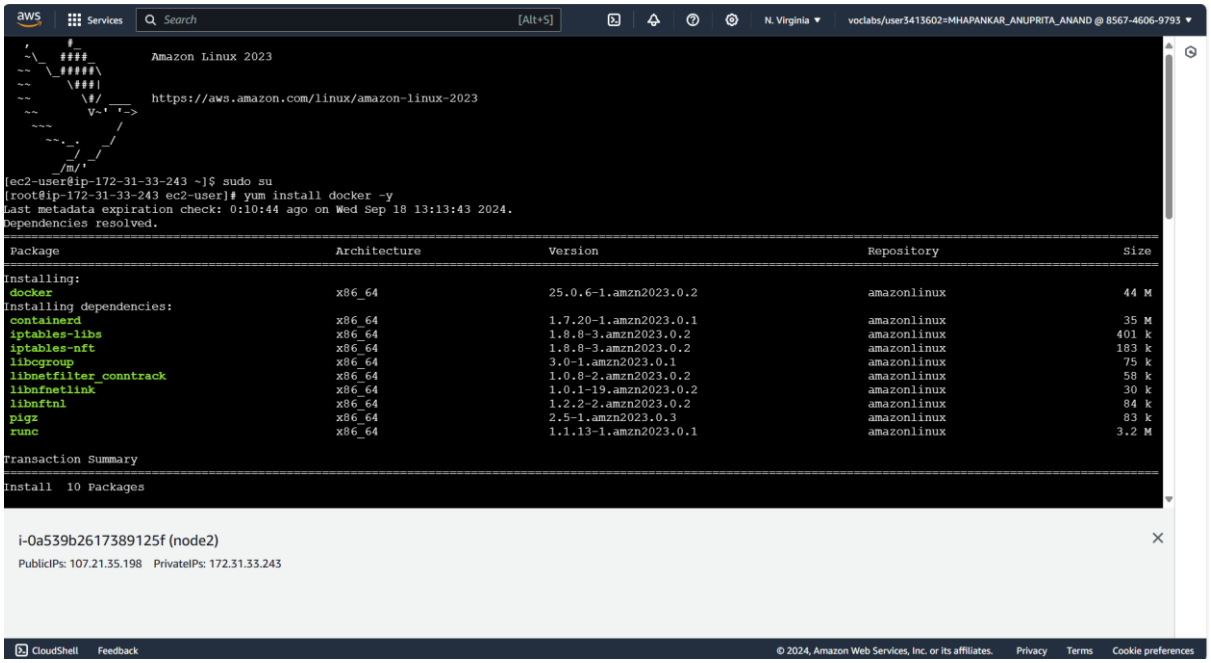
sudo su

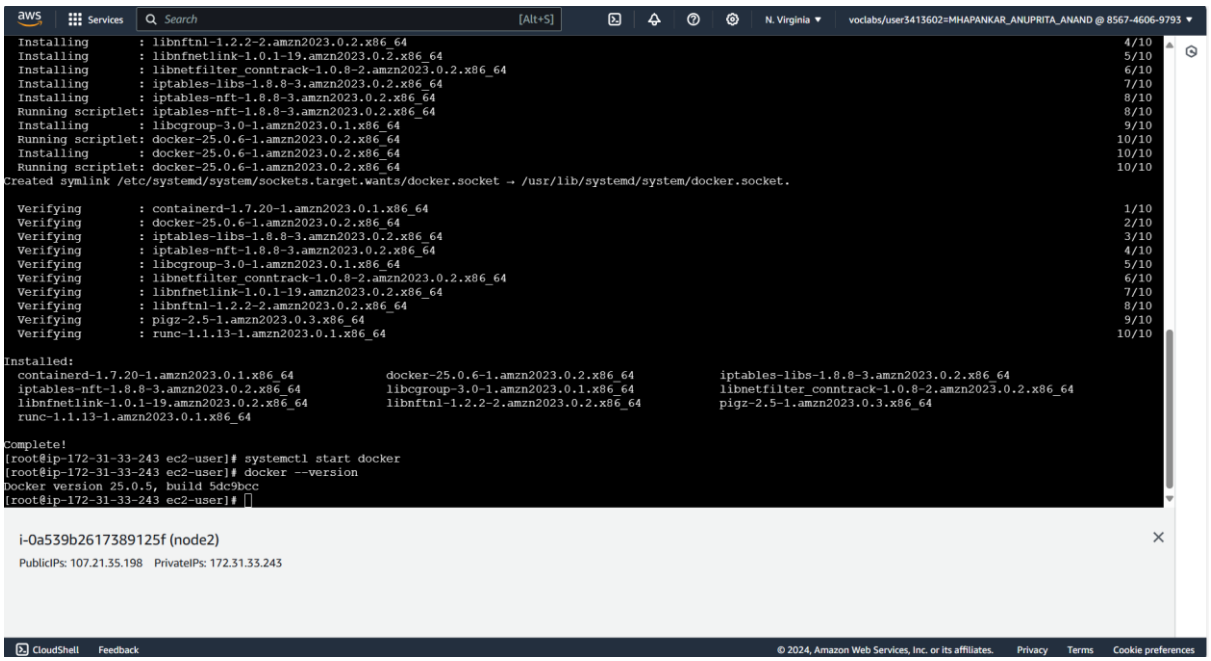
yum install docker -y

systemctl start docker

docker –version

yum repolist





Step 3: Now, go to the following link https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/install-kubeadm/ and scroll down and select Red-Hat based distributions tab copy all the commands on by one in each console of instance.

Debian-based distributions | Red Hat-based distributions

Without a package manager

1. Set SELinux to `permissive` mode:

   These instructions are for Kubernetes 1.31.

```
# Set SELinux in permissive mode (effectively disabling it)
sudo setenforce 0
sudo sed -i 's/^SELINUX=enforcing$/SELINUX=permissive/' /etc/selinux/config
```

Caution:

- Setting SELinux in permissive mode by running `setenforce 0` and `sed ...` effectively disables it. This is required to allow containers to access the host filesystem; for example, some cluster network plugins require that. You have to do this until SELinux support is improved in the kubelet.
- You can leave SELinux enabled if you know how to configure it but it may require settings that are not supported by kubeadm.

2. Add the Kubernetes `yum` repository. The `exclude` parameter in the repository definition ensures that the packages related to Kubernetes are not upgraded upon running `yum update` as there's a special procedure that must be followed for upgrading Kubernetes. Please note that this repository have packages only for Kubernetes 1.31; for other Kubernetes minor versions, you need to change the Kubernetes minor version in the URL to match your desired minor version (you should also check that you are reading the documentation for the version of Kubernetes that you plan to install).


```
[root@ip-172-31-33-243 ec2-user]# yum repolist
repo id                                                    repo name
amazonlinux                                                Amazon Linux 2023 repository
kernel-livepatch                                           Amazon Linux 2023 Kernel Livepatch repository
[root@ip-172-31-33-243 ec2-user]# sudo setenforce 0
sudo sed -i 's/^SELINUX=enforcing$/SELINUX=permissive/' /etc/selinux/config
[root@ip-172-31-33-243 ec2-user]# cat <<EOF | sudo tee /etc/yum.repos.d/kubernetes.repo
[kubernetes]
name=Kubernetes
baseurl=https://pkgs.k8s.io/core:/stable:/v1.31/rpm/
enabled=1
gpgcheck=1
gpgkey=https://pkgs.k8s.io/core:/stable:/v1.31/rpm/repodata/repomd.xml.key
exclude=kubelet kubeadm kubectl cri-tools kubernetes-cni
EOF
[kubernetes]
name=Kubernetes
baseurl=https://pkgs.k8s.io/core:/stable:/v1.31/rpm/
enabled=1
gpgcheck=1
gpgkey=https://pkgs.k8s.io/core:/stable:/v1.31/rpm/repodata/repomd.xml.key
exclude=kubelet kubeadm kubectl cri-tools kubernetes-cni
[root@ip-172-31-33-243 ec2-user]# sudo yum install -y kubelet kubeadm kubectl --disableexcludes=kubernetes
Kubernetes                                                                                    54 kB/s | 9.4 kB     00:00
Dependencies resolved.
================================================================================================================================
 Package                         Architecture          Version                                 Repository                  Size
================================================================================================================================
Installing:
 kubeadm                         x86_64                1.31.1-150500.1.1                       kubernetes                  11 M
 kubectl                         x86_64                1.31.1-150500.1.1                       kubernetes                  11 M
 kubelet                         x86_64                1.31.1-150500.1.1                       kubernetes                  15 M
Installing dependencies:
 conntrack-tools                 x86_64                1.4.6-2.amzn2023.0.2                    amazonlinux                208 k
```

i-0a539b2617389125f (node2)

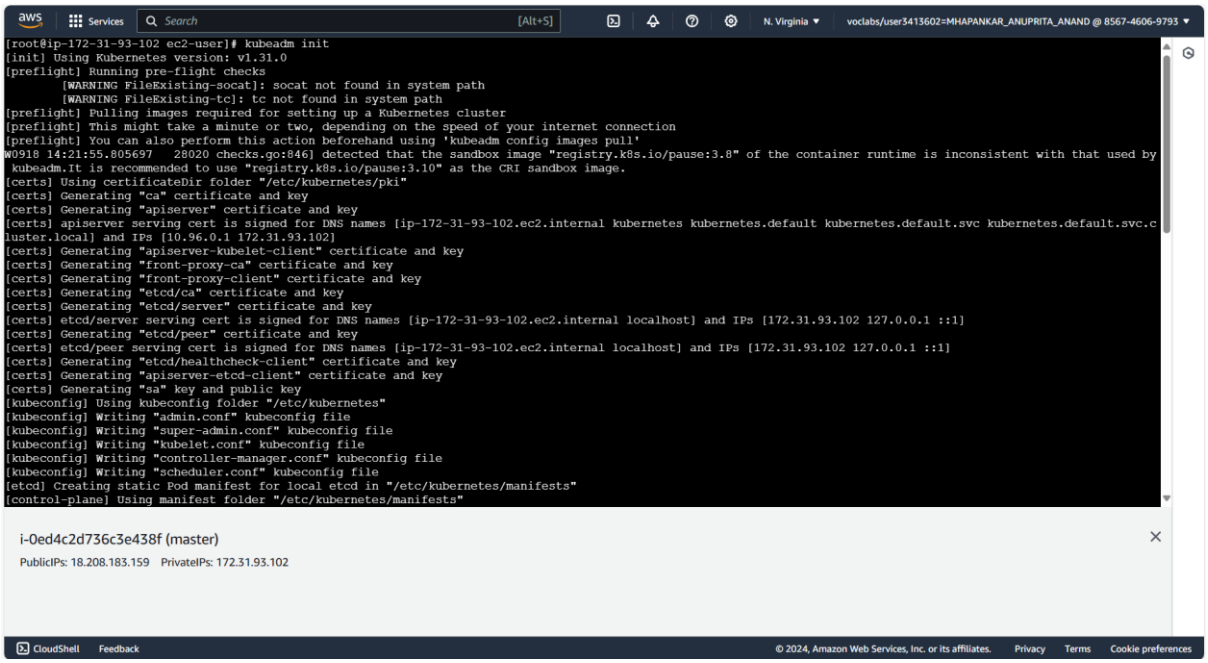
PublicIPs: 107.21.35.198 PrivateIPs: 172.31.33.243


```
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                                       1/1
  Installing       : kubernetes-cni-1.5.1-150500.1.1.x86_64                                                                1/9
  Installing       : cri-tools-1.31.1-150500.1.1.x86_64                                                                    2/9
  Installing       : libnetfilter_queue-1.0.5-2.amzn2023.0.2.x86_64                                                        3/9
  Installing       : libnetfilter_cttimeout-1.0.0-19.amzn2023.0.2.x86_64                                                   4/9
  Installing       : libnetfilter_cthelper-1.0.0-21.amzn2023.0.2.x86_64                                                    5/9
  Installing       : conntrack-tools-1.4.6-2.amzn2023.0.2.x86_64                                                           6/9
  Running scriptlet: conntrack-tools-1.4.6-2.amzn2023.0.2.x86_64                                                           6/9
  Installing       : kubelet-1.31.1-150500.1.1.x86_64                                                                      7/9
  Running scriptlet: kubelet-1.31.1-150500.1.1.x86_64                                                                      7/9
  Installing       : kubeadm-1.31.1-150500.1.1.x86_64                                                                      8/9
  Installing       : kubectl-1.31.1-150500.1.1.x86_64                                                                      9/9
  Running scriptlet: kubectl-1.31.1-150500.1.1.x86_64                                                                      9/9
  Verifying        : conntrack-tools-1.4.6-2.amzn2023.0.2.x86_64                                                           1/9
  Verifying        : libnetfilter_cthelper-1.0.0-21.amzn2023.0.2.x86_64                                                    2/9
  Verifying        : libnetfilter_cttimeout-1.0.0-19.amzn2023.0.2.x86_64                                                   3/9
  Verifying        : libnetfilter_queue-1.0.5-2.amzn2023.0.2.x86_64                                                        4/9
  Verifying        : cri-tools-1.31.1-150500.1.1.x86_64                                                                    5/9
  Verifying        : kubeadm-1.31.1-150500.1.1.x86_64                                                                      6/9
  Verifying        : kubectl-1.31.1-150500.1.1.x86_64                                                                      7/9
  Verifying        : kubelet-1.31.1-150500.1.1.x86_64                                                                      8/9
  Verifying        : kubernetes-cni-1.5.1-150500.1.1.x86_64                                                                9/9

Installed:
  conntrack-tools-1.4.6-2.amzn2023.0.2.x86_64          cri-tools-1.31.1-150500.1.1.x86_64          kubeadm-1.31.1-150500.1.1.x86_64
  kubectl-1.31.1-150500.1.1.x86_64                     kubelet-1.31.1-150500.1.1.x86_64            kubernetes-cni-1.5.1-150500.1.1.x86_64
  libnetfilter_cthelper-1.0.0-21.amzn2023.0.2.x86_64   libnetfilter_cttimeout-1.0.0-19.amzn2023.0.2.x86_64   libnetfilter_queue-1.0.5-2.amzn2023.0.2.x86_64

Complete!
[root@ip-172-31-33-243 ec2-user]# sudo systemctl enable --now kubelet
Created symlink /etc/systemd/system/multi-user.target.wants/kubelet.service → /usr/lib/systemd/system/kubelet.service.
[root@ip-172-31-33-243 ec2-user]#
```

i-0a539b2617389125f (node2)

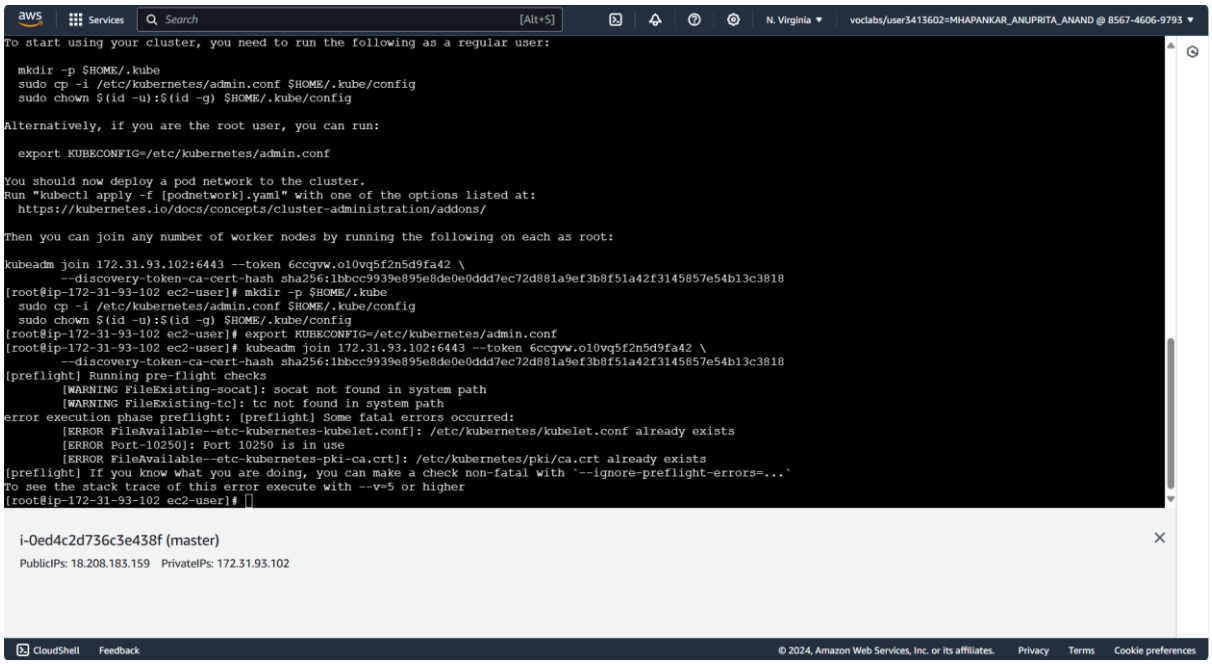
PublicIPs: 107.21.35.198 PrivateIPs: 172.31.33.243

Step 4: Now, run the following command in the mater instance -
kubeadm init

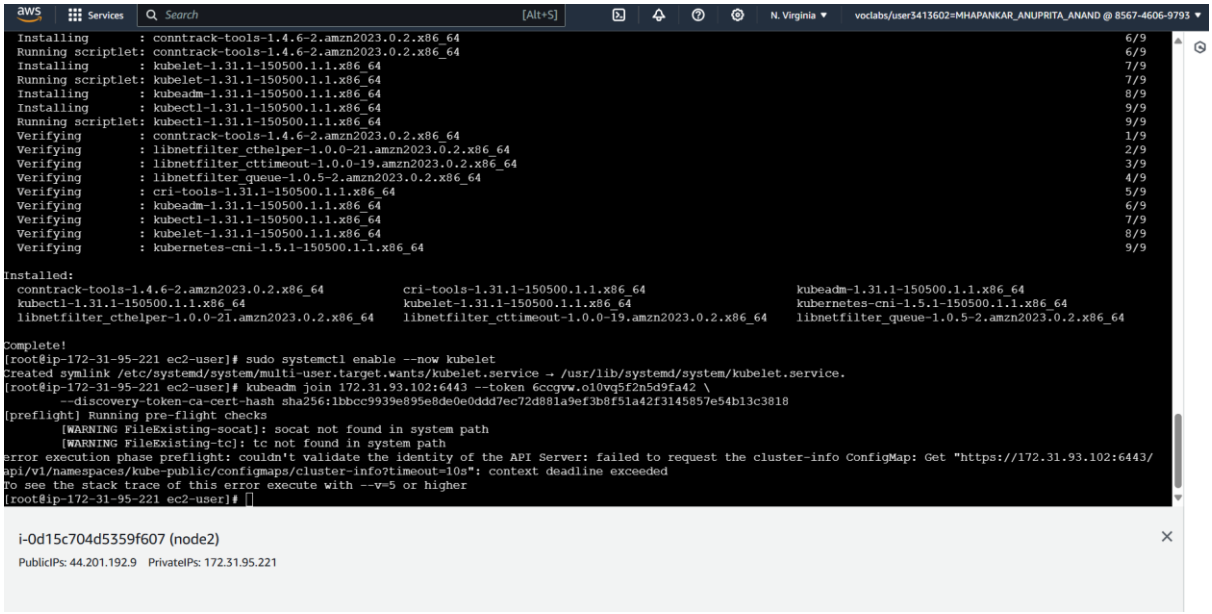


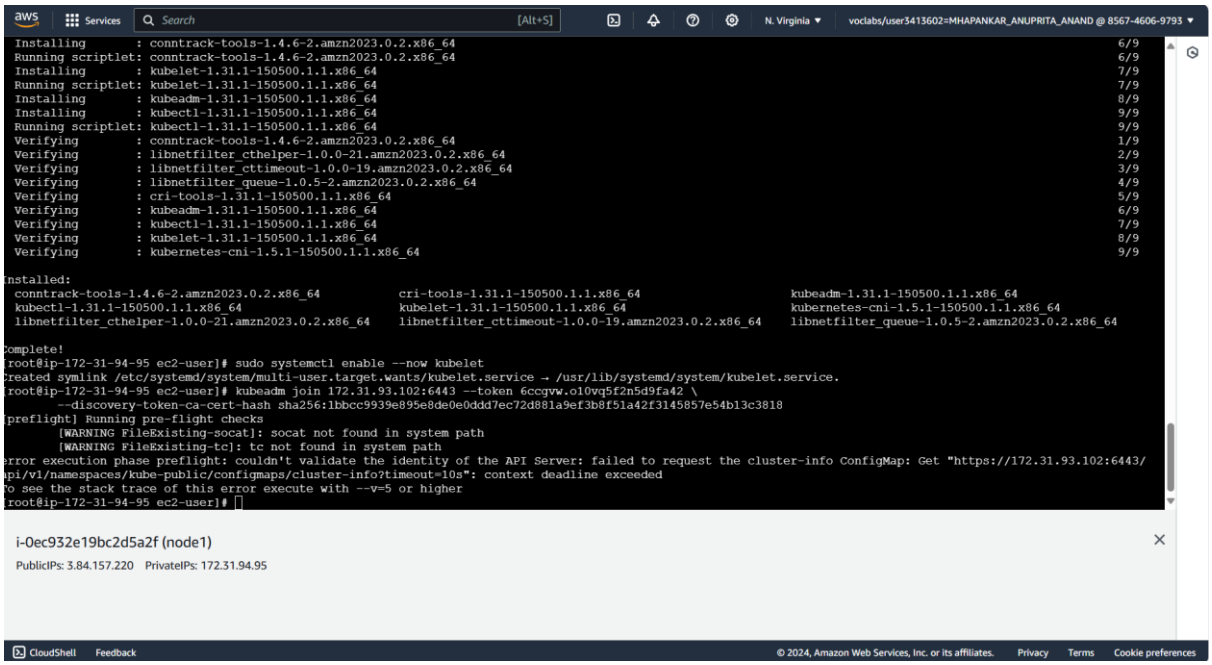
Step 5: Now, run the following commands in master instance's console –

a. mkdir -p $HOME/.kube
   sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
   sudo chown $(id -u):$(id -g) $HOME/.kube/config
b. export KUBECONFIG=/etc/kubernetes/admin.conf
c. kubeadm join 172.31.93.102:6443 --token 6ccgvw.o10vq5f2n5d9fa42 \
   --discovery-token-ca-cert-hash
   sha256:1bbcc9939e895e8de0e0ddd7ec72d881a9ef3b8f51a42f3145857e54b13c3818

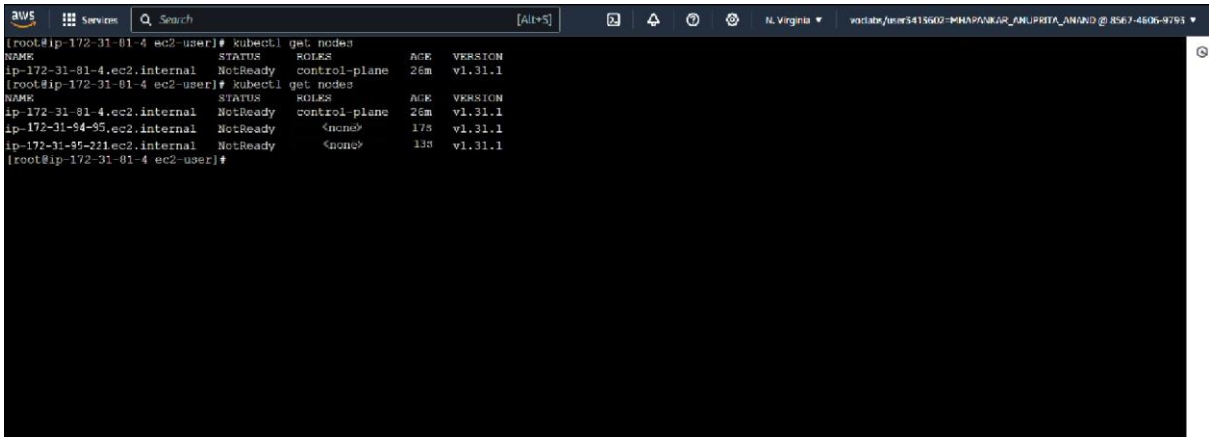


Step 6: Run this command in node1 and node2 -
kubeadm join 172.31.93.102:6443 --token 6ccgvw.o10vq5f2n5d9fa42 \
--discovery-token-ca-cert-hash sha256:1bbcc9939e895e8de0e0ddd7ec72d881a9ef3b8f51a42f3145857e54b13c3818





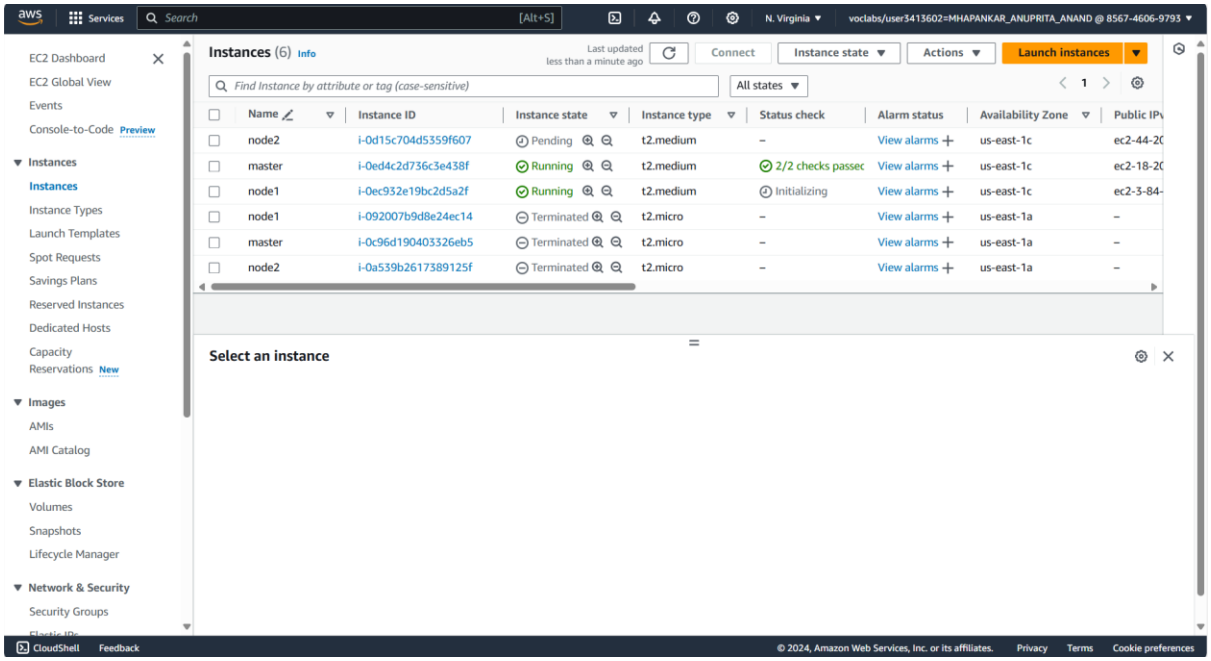
Step 7: Run the following command in master instance console -
kubectl get nodes

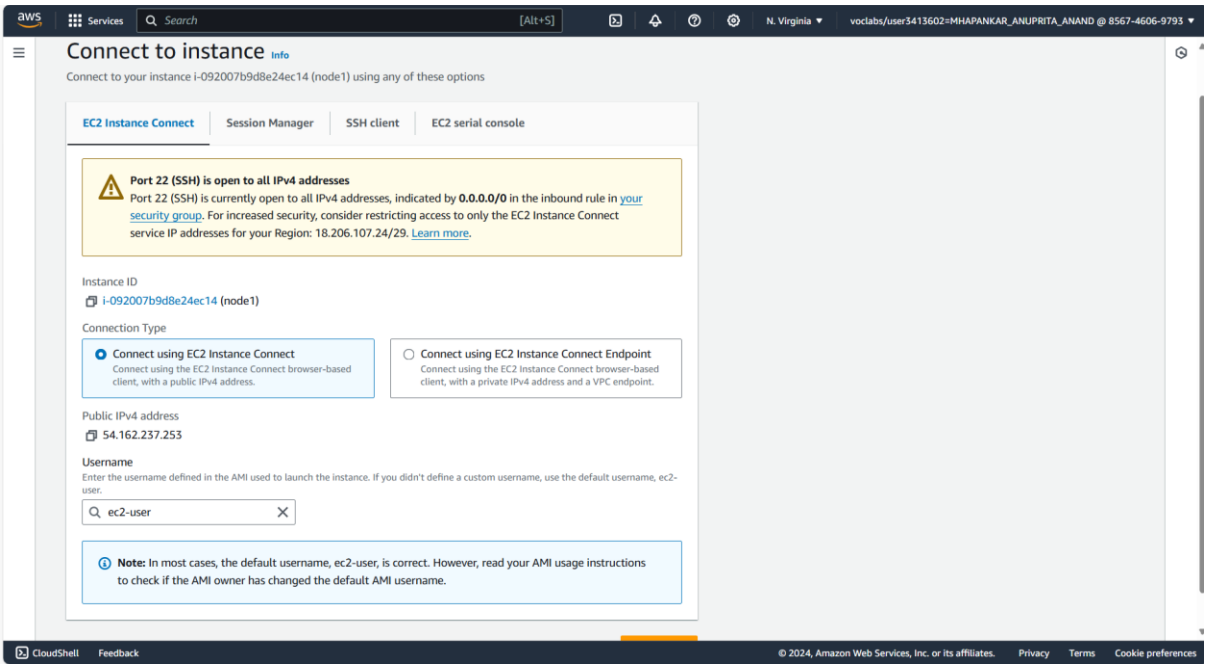


Experiment 4

Aim: To install Kubectl and execute Kubectl commands to manage the Kubernetes cluster and deploy Your First Kubernetes Application.

Step 1: Go to AWS Academia in services select EC2 and create 3 instance with instance type t2.medium and names as node1, node2 and master

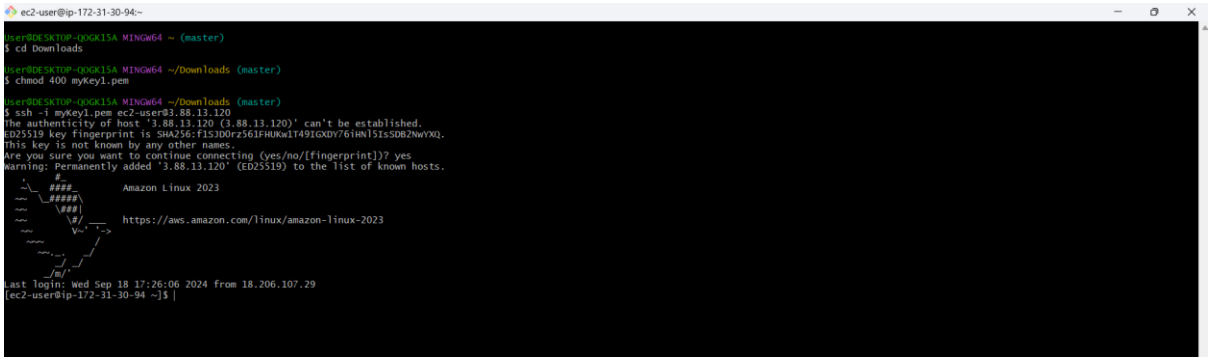




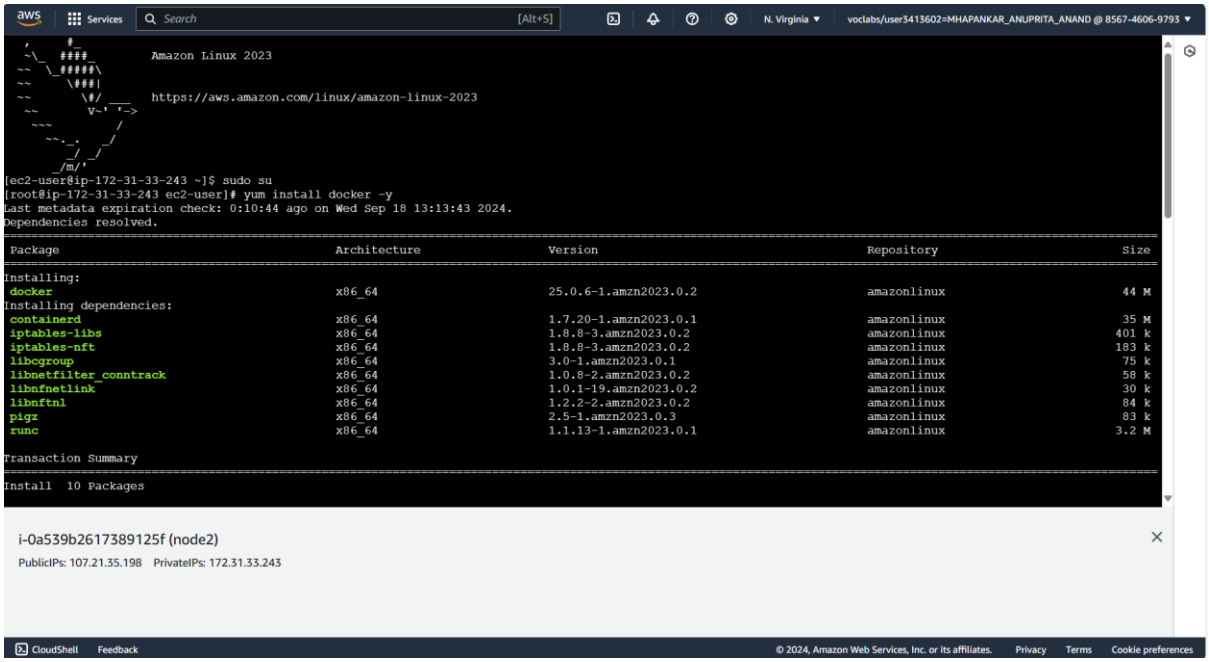
Step 2: Create a new key pair and name it as myKey1 and download as .pem file. Then, open command promt and go to the directory where the key is downloaded and run the following command

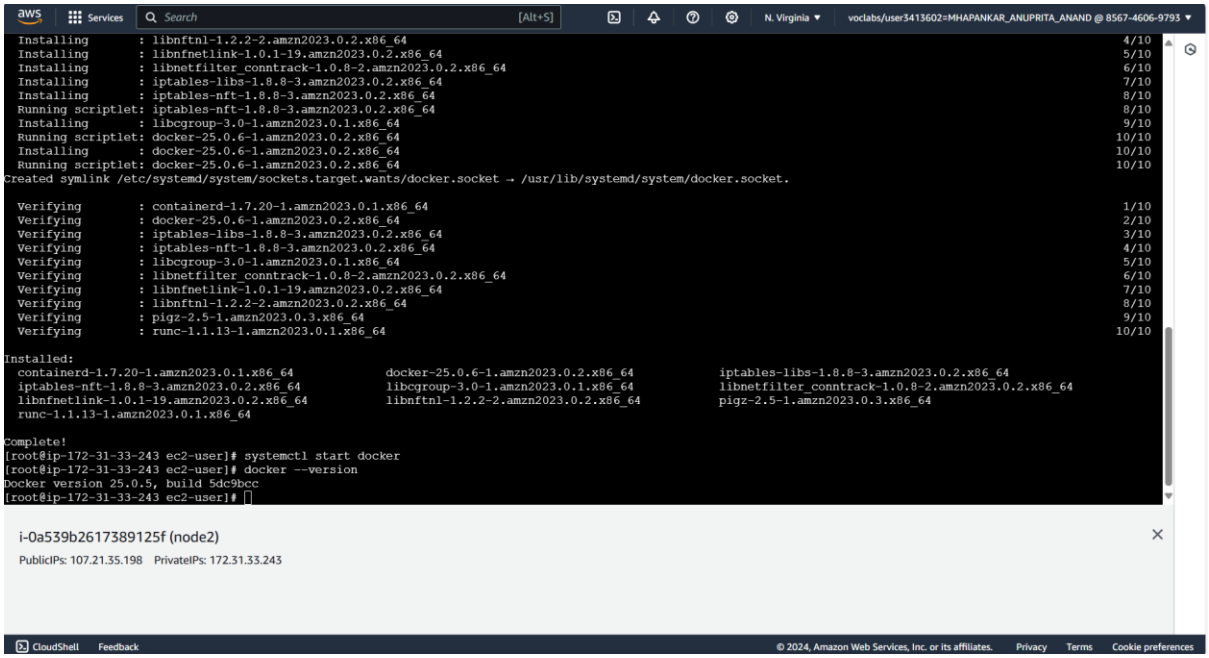
chmod 400 myKey1.pem

ssh -i myKey1.pem ec2-user@3.88.13.120
Repeat the steps for node1, master and node2

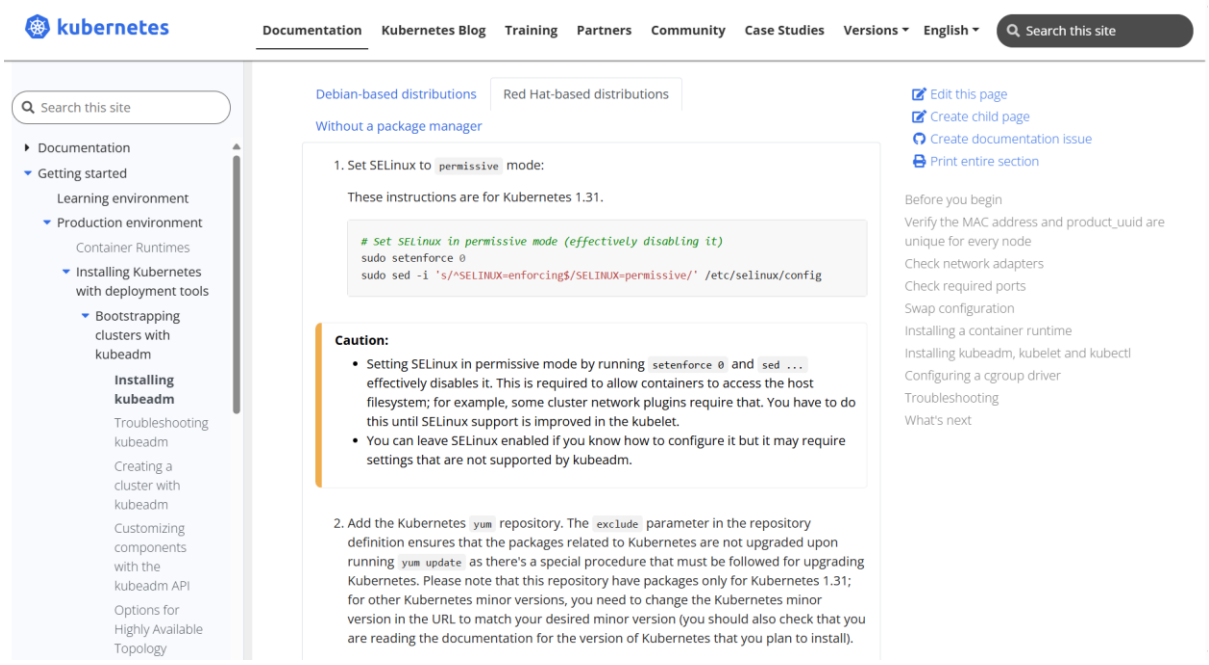


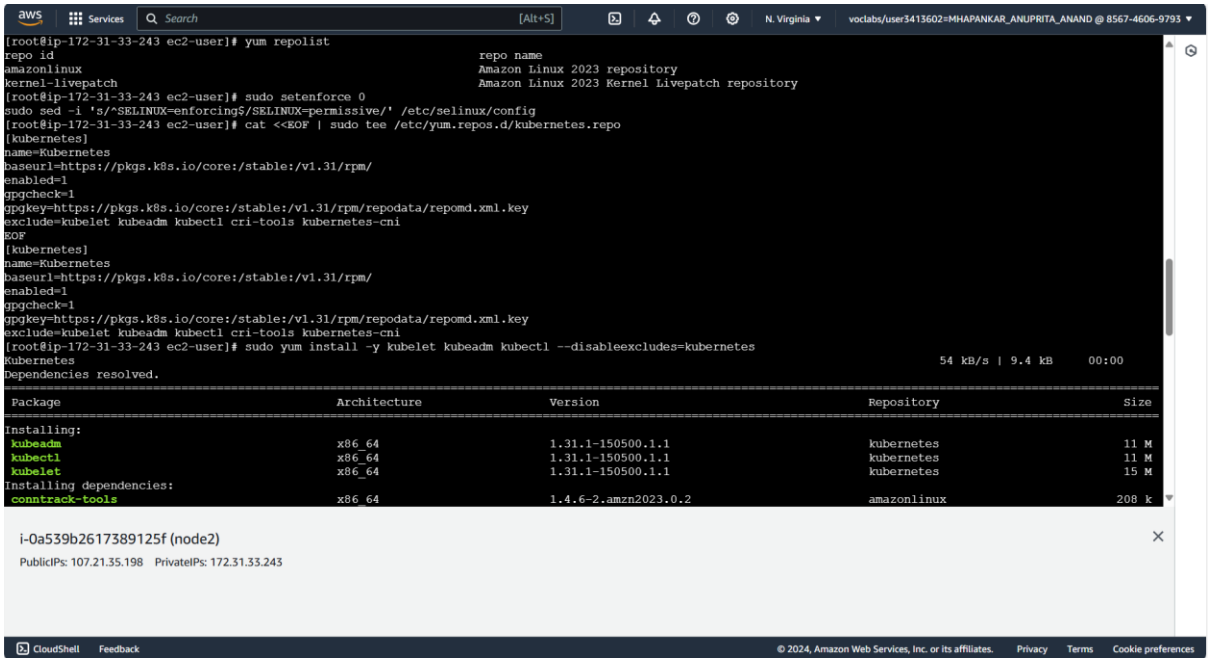
Step 3: Select and connect each instance and run the following commands inside the console of each instance.
sudo su
yum install docker -y
systemctl start docker
docker –version
yum repolist

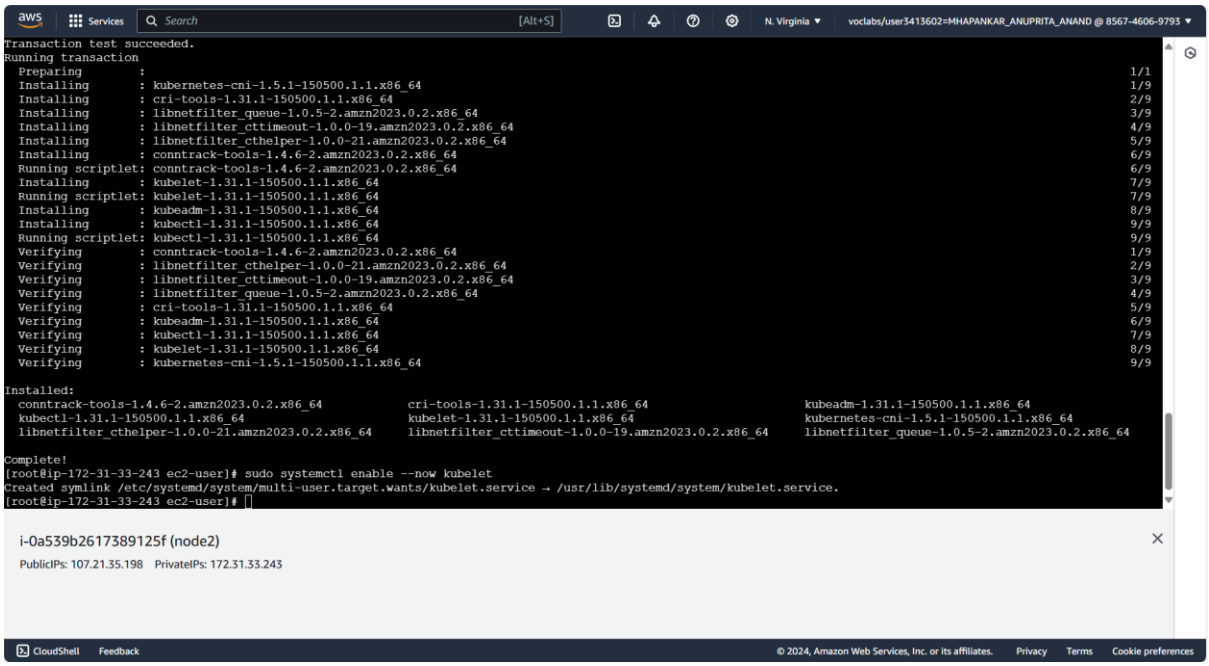




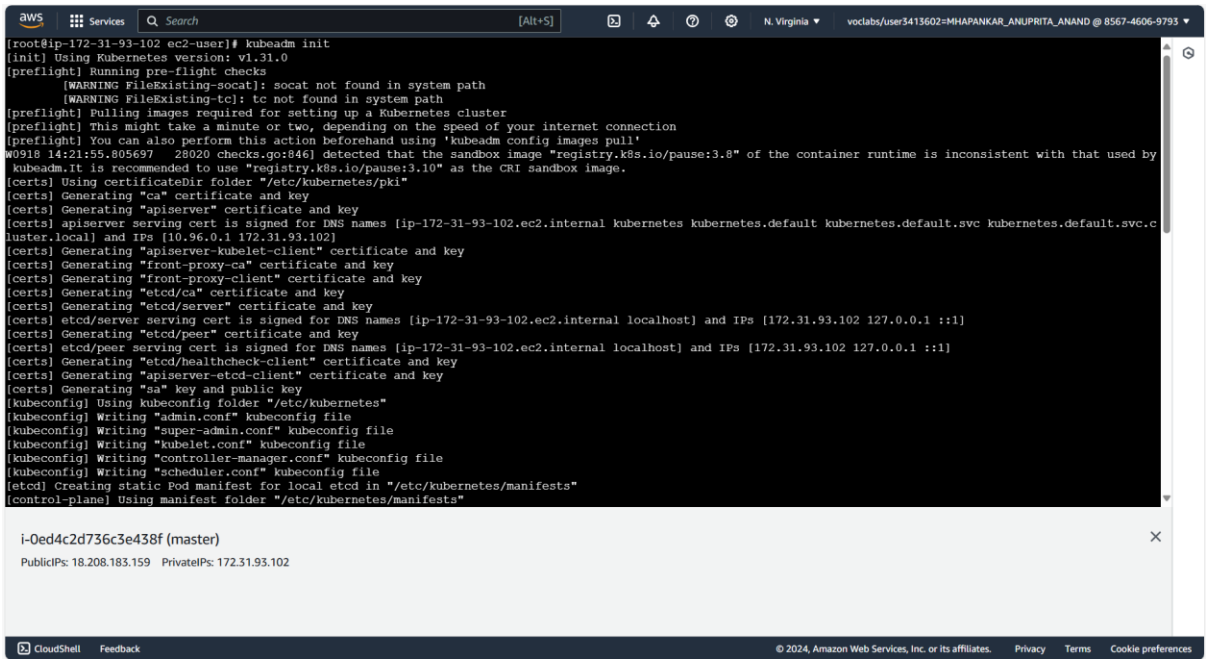
Step 4: Now, go to the following link https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/install-kubeadm/ and scroll down and select Red-Hat based distributions tab copy all the commands on by one in each console of instance.





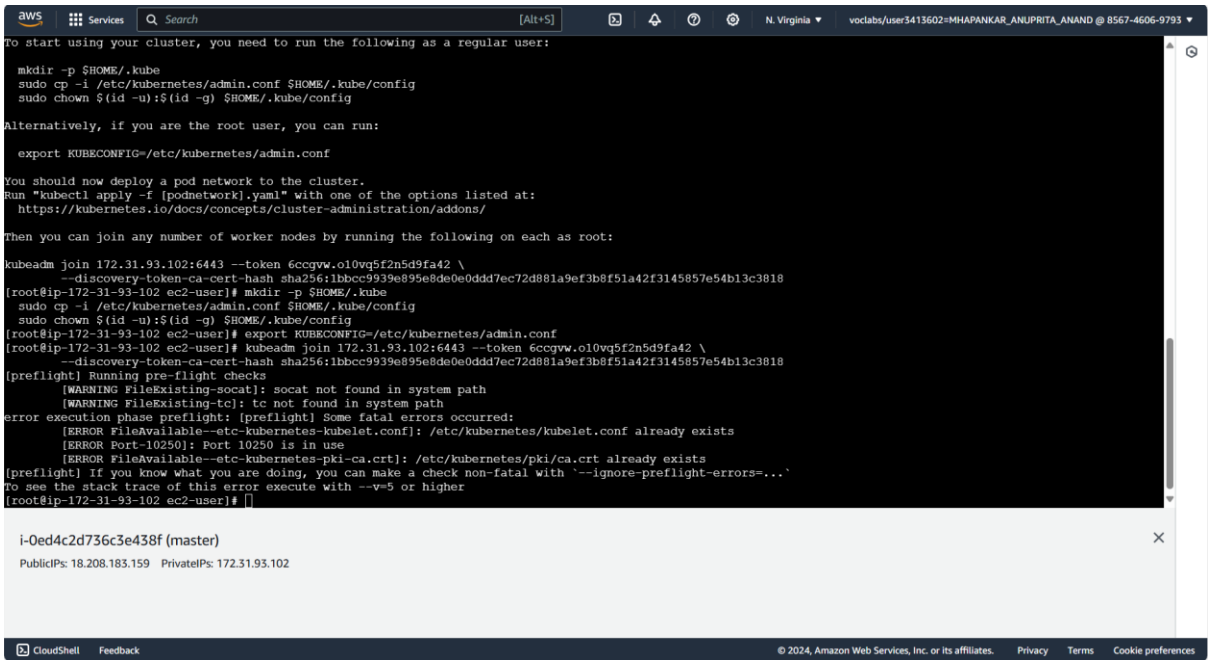


Step 5: Now, run the following command in the mater instance -
kubeadm init



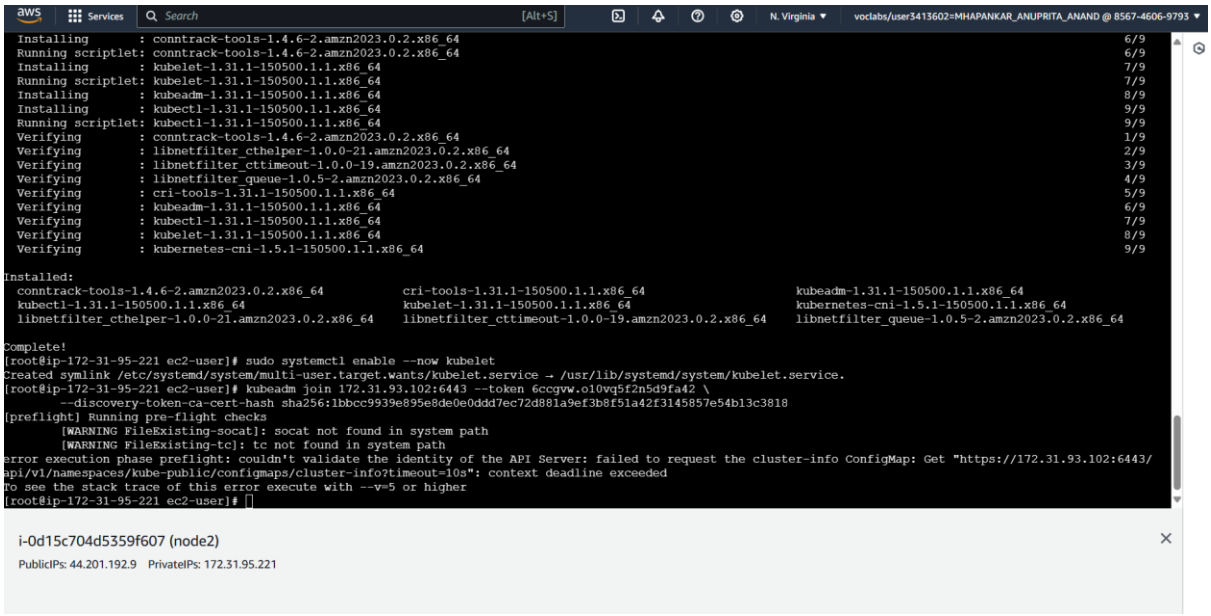
Step 6: Now, run the following commands in master instance's console –

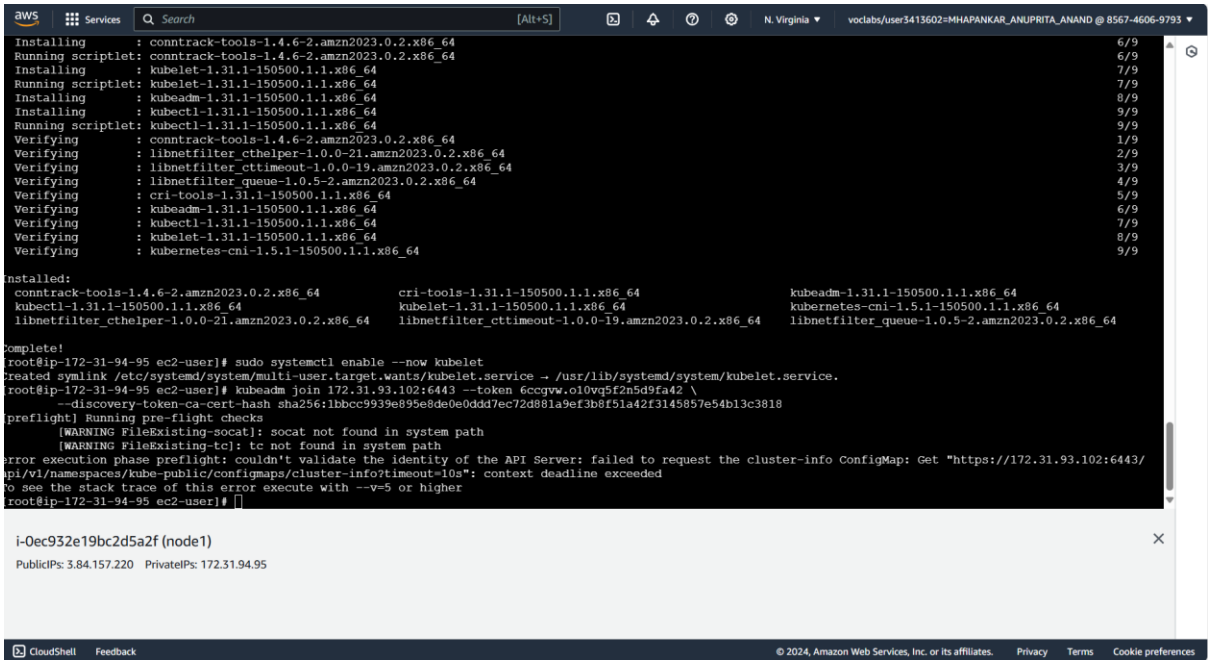
a. mkdir -p $HOME/.kube
   sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
   sudo chown $(id -u):$(id -g) $HOME/.kube/config
b. export KUBECONFIG=/etc/kubernetes/admin.conf
c. kubeadm join 172.31.93.102:6443 --token 6ccgvw.o10vq5f2n5d9fa42 \
   --discovery-token-ca-cert-hash
   sha256:1bbcc9939e895e8de0e0ddd7ec72d881a9ef3b8f51a42f3145857e54b13c3818



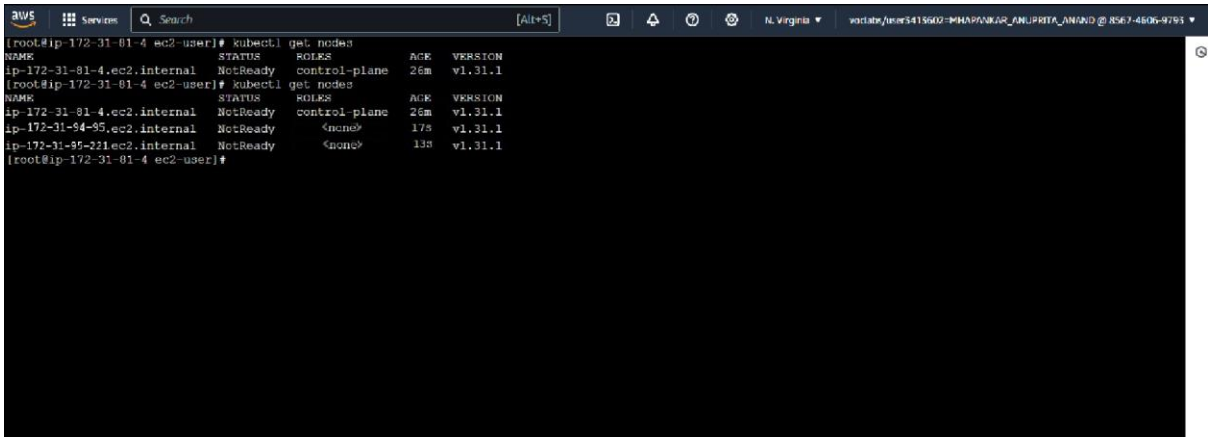
Step 7: Run this command in node1 and node2 -
kubeadm join 172.31.93.102:6443 --token 6ccgvw.o10vq5f2n5d9fa42 \

--discovery-token-ca-cert-hash sha256:1bbcc9939e895e8de0e0ddd7ec72d881a9ef3b8f51a42f3145857e54b13c3818

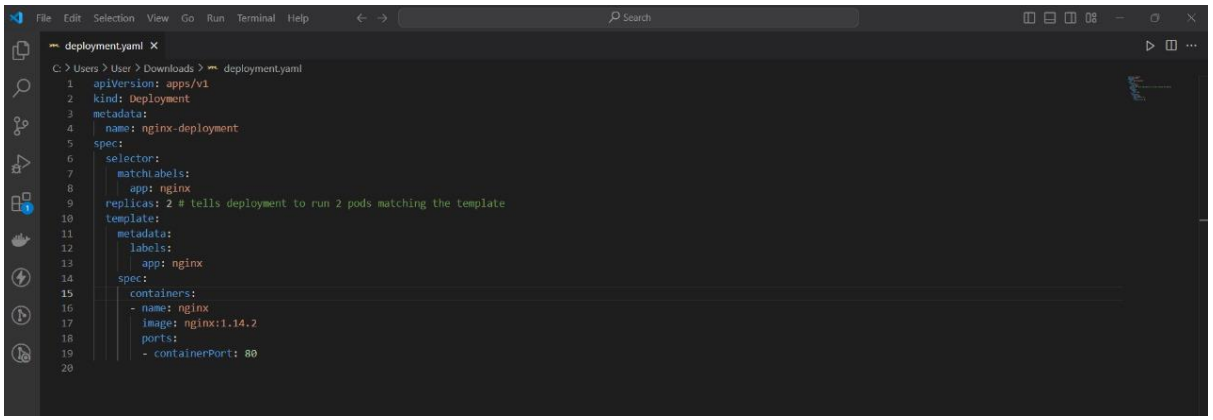




Step 8: Run the following command in master instance console -
kubectl get nodes



Step 9: Once the cluster is set up and running, deploy an Nginx application:
kubectl apply -f https://k8s.io/examples/application/deployment.yaml
Forward the Nginx service to your localhost so that you can access it using the following command
kubectl port-forward deployment/nginx-deployment 8080:80

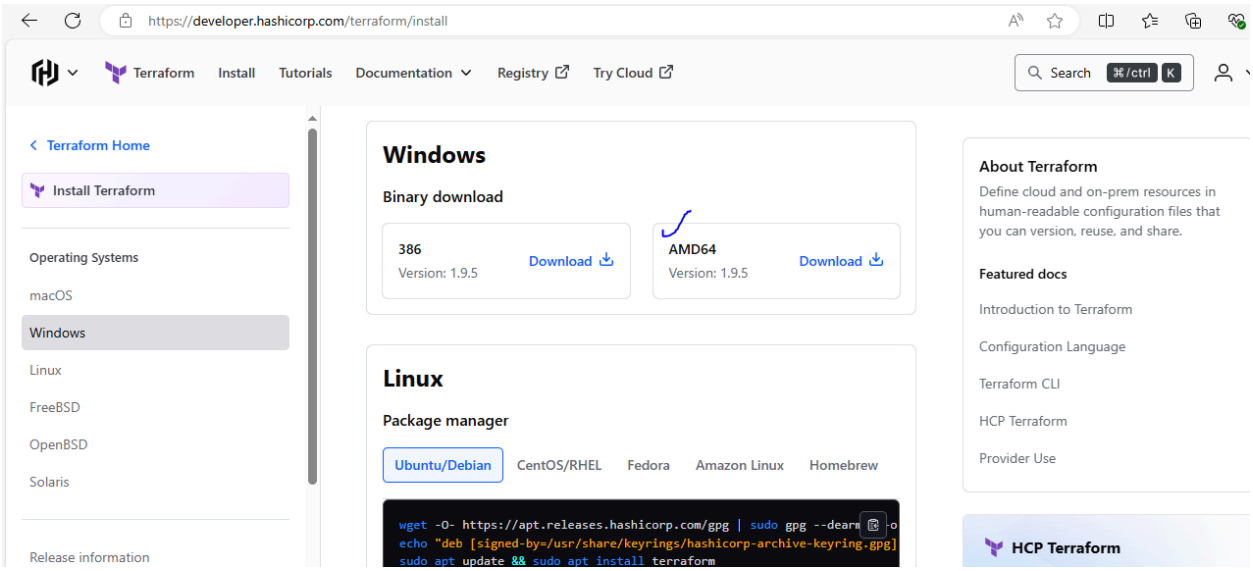


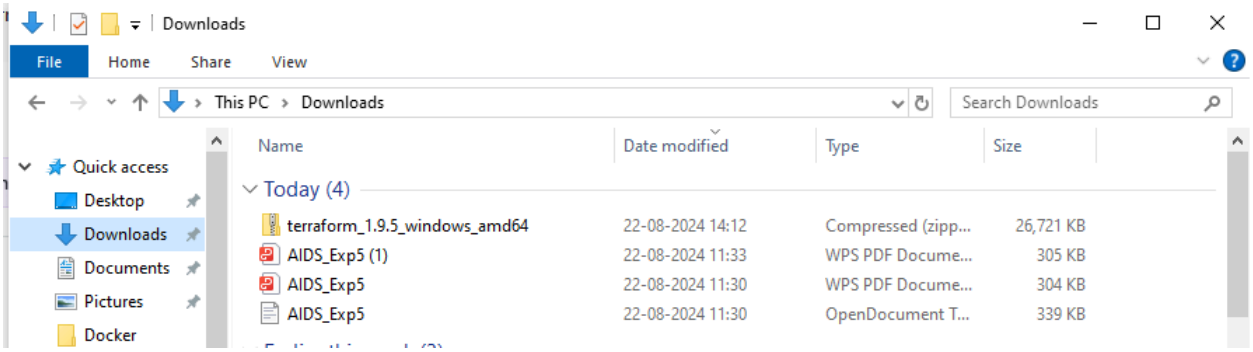
Step 10: In a new terminal of Git Bash, run:
curl --head http://127.0.0.1:8080

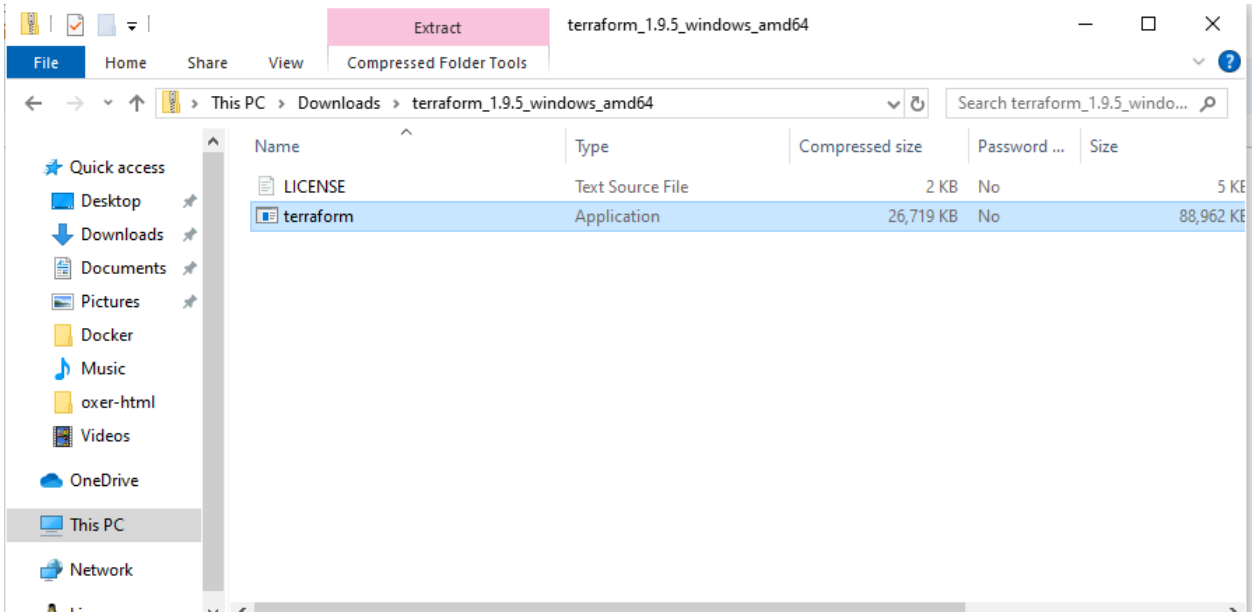
Step 11: The website is live

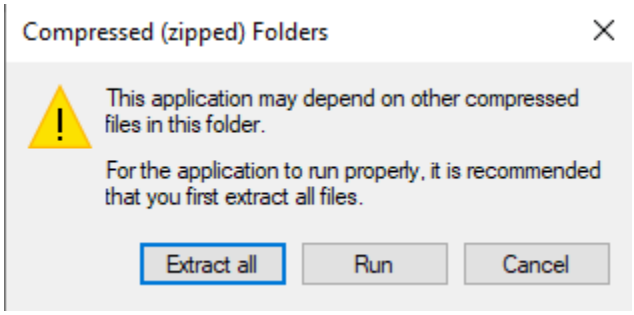
Experiment 5 : Terraform

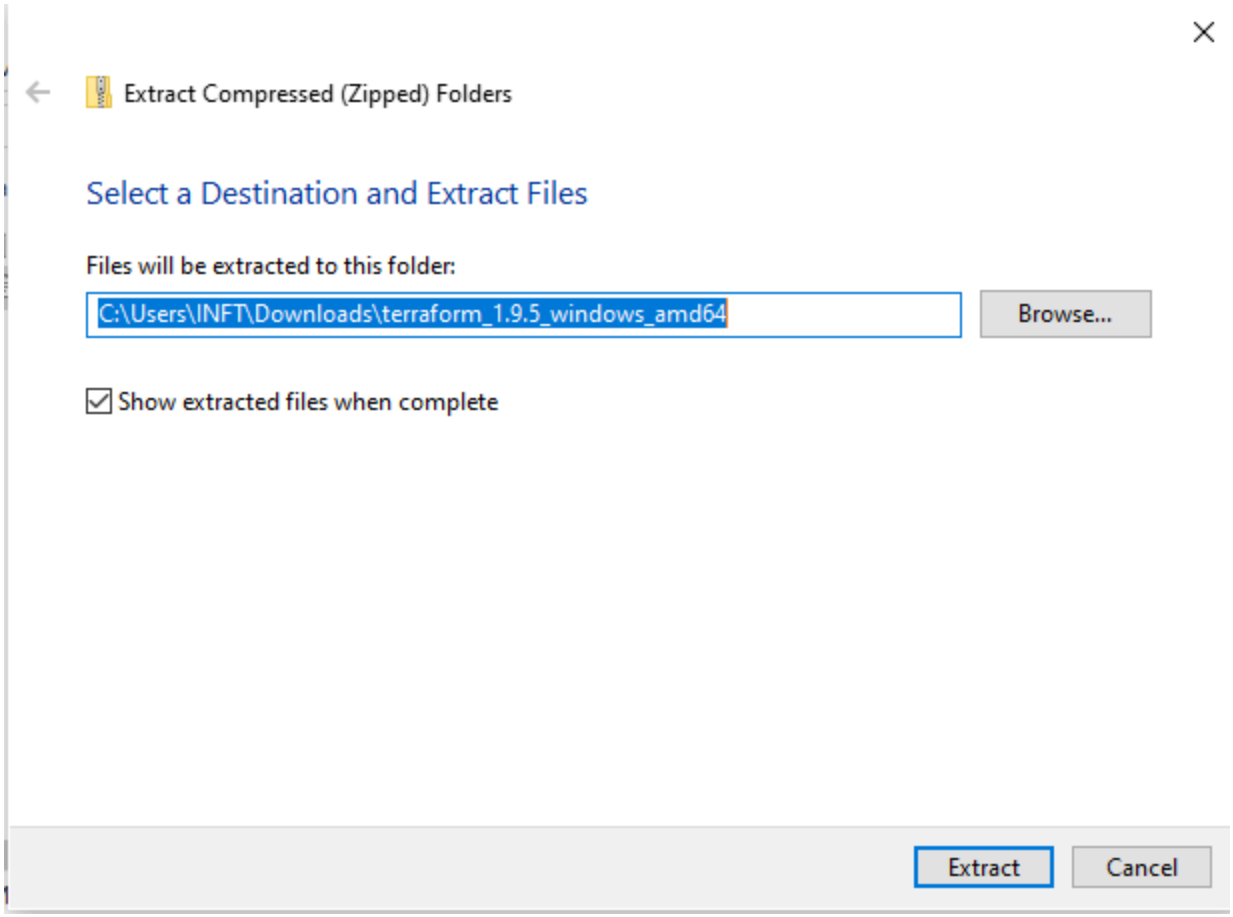
Aim : Installation and Configuration of Terraform in Windows

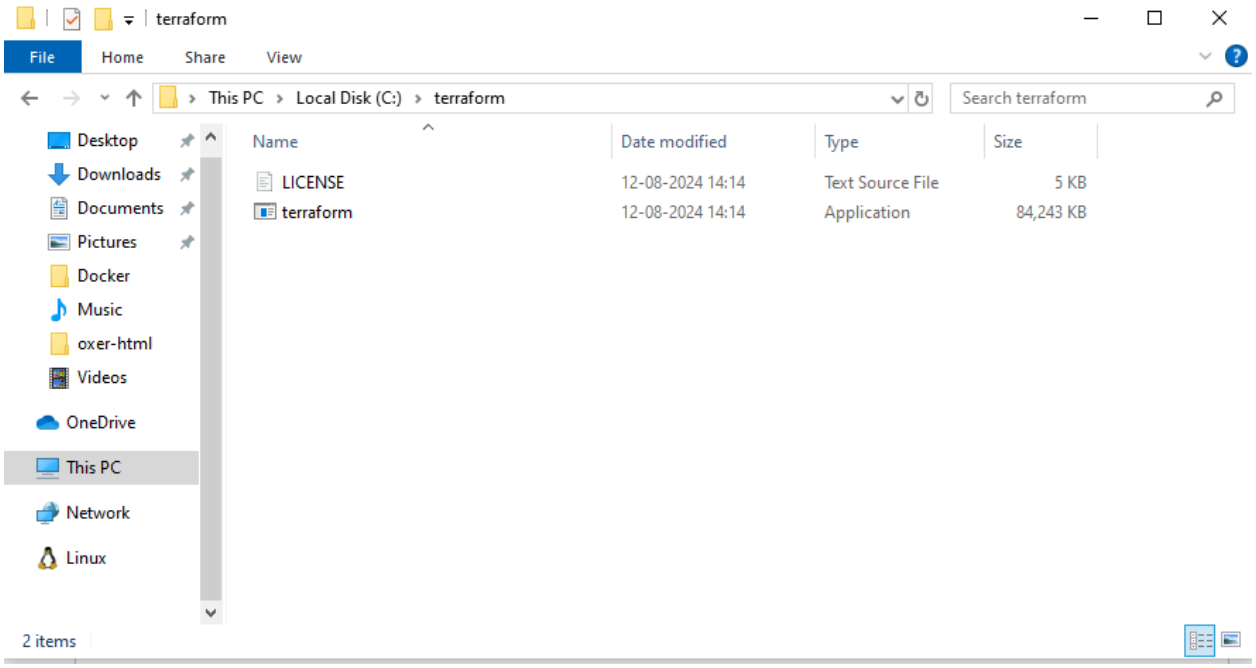


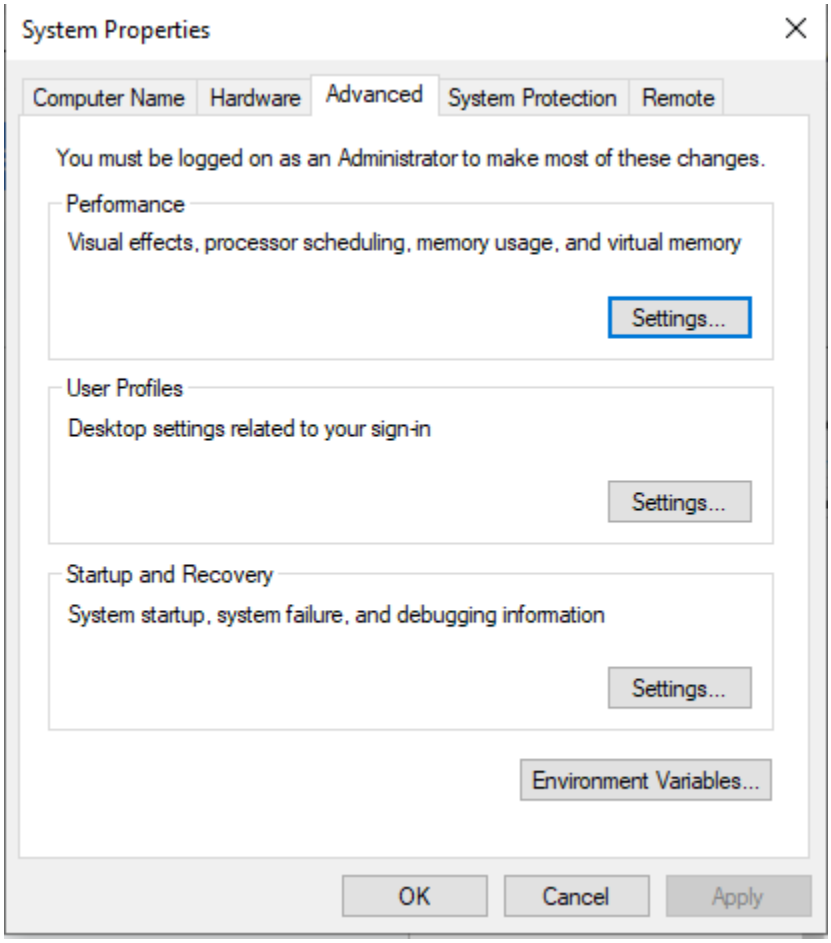


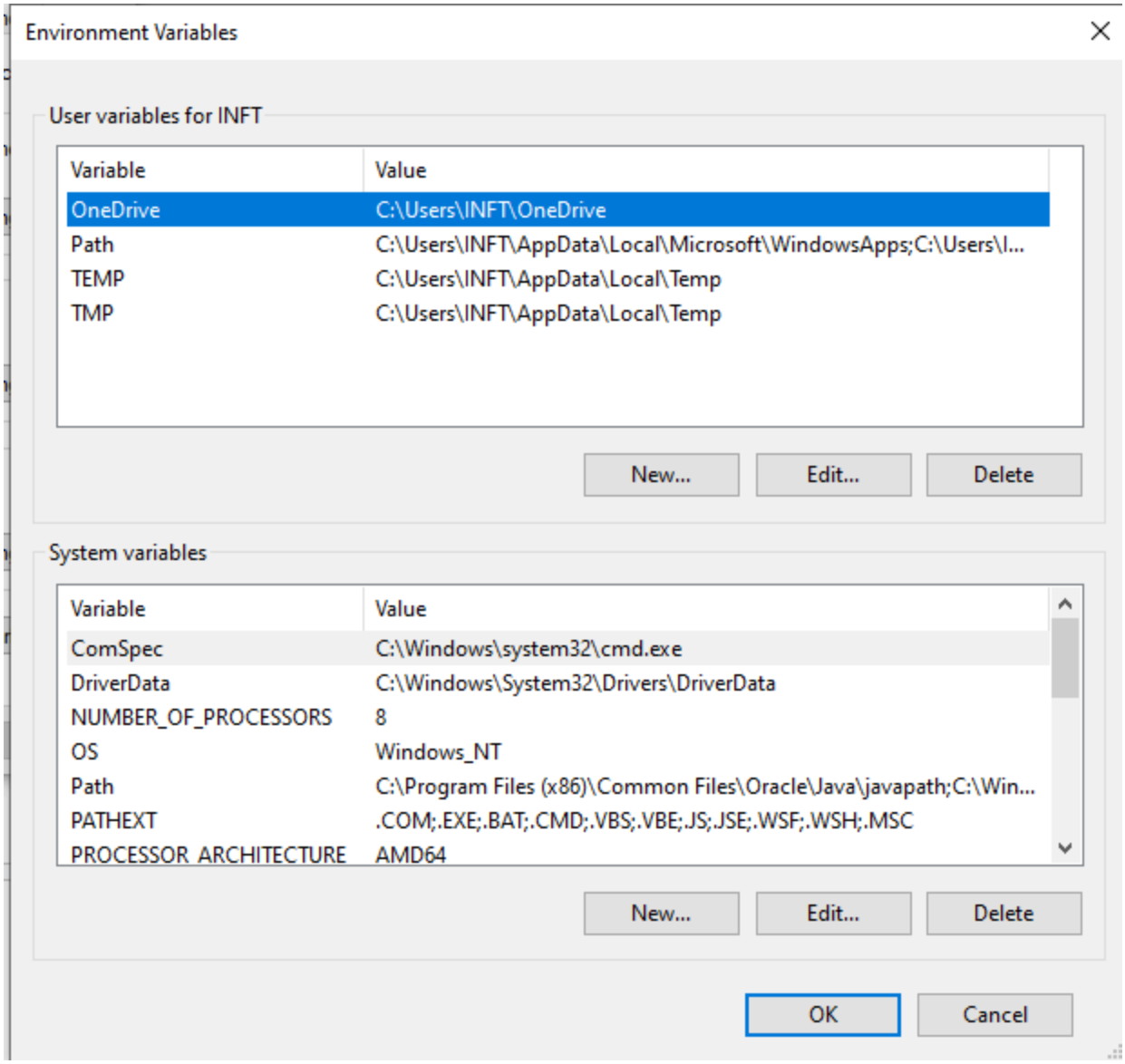

Extract
terraform_1.9.5_windows_amd64
File
Home
Share
View
Compressed Folder Tools
This PC › Downloads › terraform_1.9.5_windows_amd64
Search terraform_1.9.5_windo...
Quick access
Desktop
Downloads
Documents
Pictures
Docker
Music
oxer-html
Videos
OneDrive
This PC
Network
Name
Type
Compressed size
Password ...
Size
LICENSE
Text Source File
2 KB
No
5 KB
terraform
Application
26,719 KB
No
88,962 KB

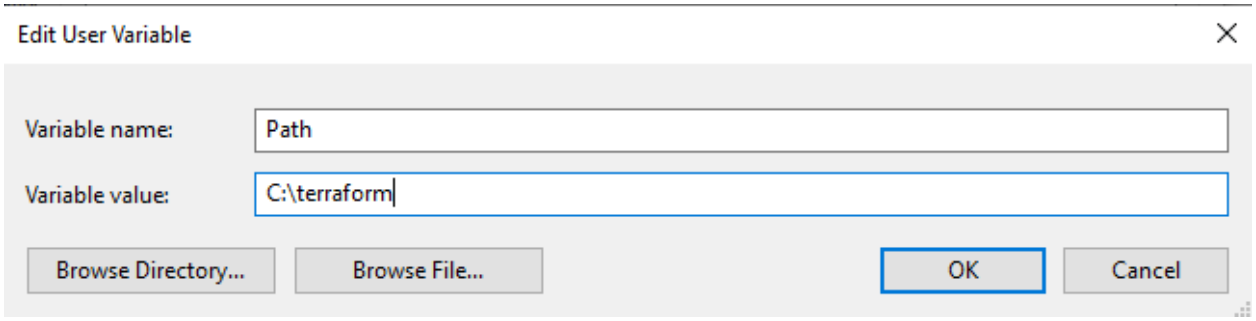

Compressed (zipped) Folders
This application may depend on other compressed files in this folder.
For the application to run properly, it is recommended that you first extract all files.
Extract all
Run
Cancel

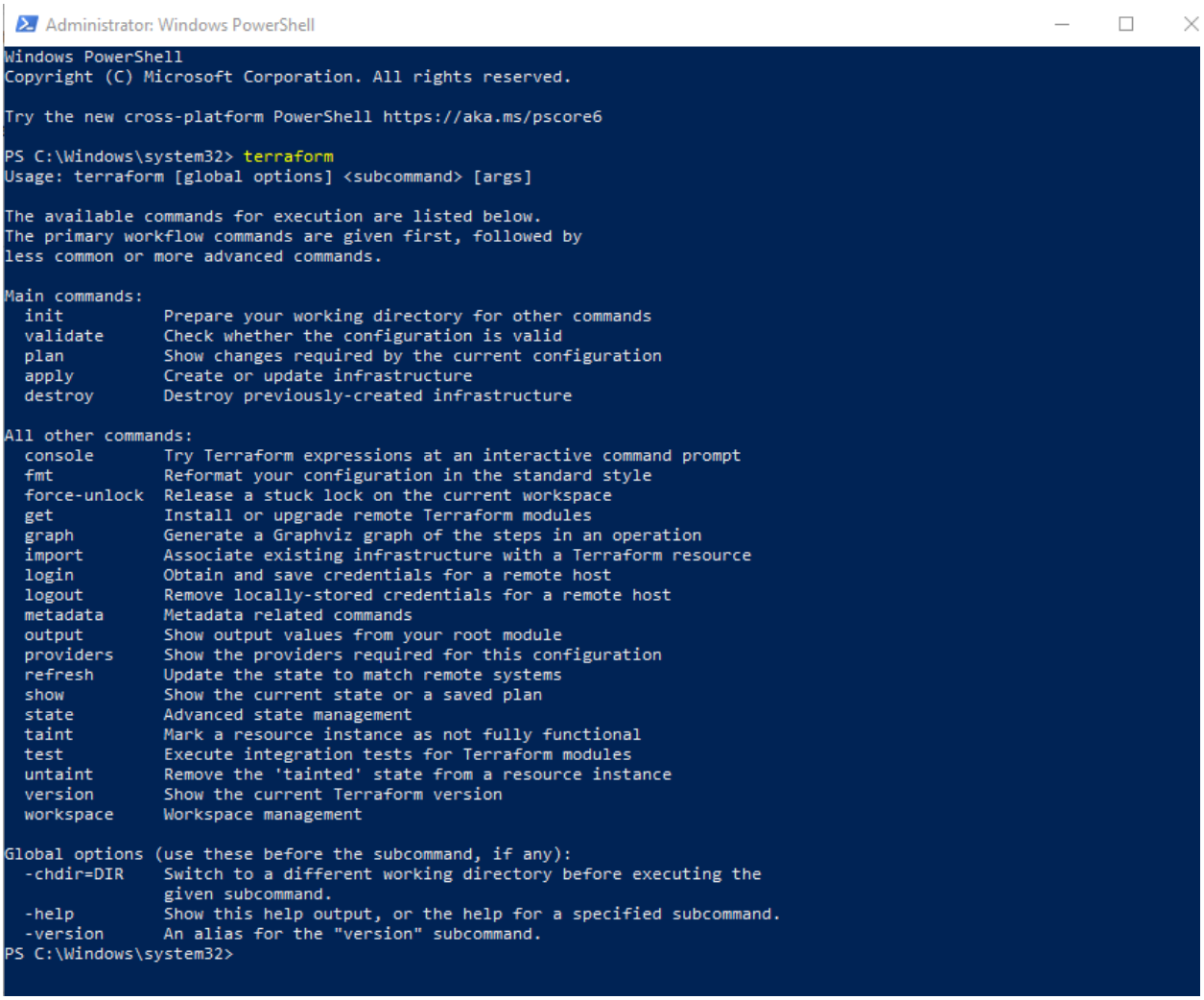

Extract Compressed (Zipped) Folders
Select a Destination and Extract Files
Files will be extracted to this folder:
C:\Users\INFT\Downloads\terraform_1.9.5_windows_amd64
Browse...
Show extracted files when complete
Extract
Cancel


terraform
File
Home
Share
View
This PC › Local Disk (C:) › terraform
Search terraform
Desktop
Downloads
Documents
Pictures
Docker
Music
oxer-html
Videos
OneDrive
This PC
Network
Linux
Name
Date modified
Type
Size
LICENSE
12-08-2024 14:14
Text Source File
5 KB
terraform
12-08-2024 14:14
Application
84,243 KB
2 items


System Properties
Computer Name
Hardware
Advanced
System Protection
Remote
You must be logged on as an Administrator to make most of these changes.
Performance
Visual effects, processor scheduling, memory usage, and virtual memory
Settings...
User Profiles
Desktop settings related to your sign-in
Settings...
Startup and Recovery
System startup, system failure, and debugging information
Settings...
Environment Variables...
OK
Cancel
Apply


Environment Variables
User variables for INFT
Variable
Value
OneDrive
C:\Users\INFT\OneDrive
Path
C:\Users\INFT\AppData\Local\Microsoft\WindowsApps;C:\Users\I...
TEMP
C:\Users\INFT\AppData\Local\Temp
TMP
C:\Users\INFT\AppData\Local\Temp
New...
Edit...
Delete
System variables
Variable
Value
ComSpec
C:\Windows\system32\cmd.exe
DriverData
C:\Windows\System32\Drivers\DriverData
NUMBER_OF_PROCESSORS
8
OS
Windows_NT
Path
C:\Program Files (x86)\Common Files\Oracle\Java\javapath;C:\Win...
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
PROCESSOR_ARCHITECTURE
AMD64
New...
Edit...
Delete
OK
Cancel


Edit User Variable
Variable name:
Path
Variable value:
C:\terraform
Browse Directory...
Browse File...
OK
Cancel

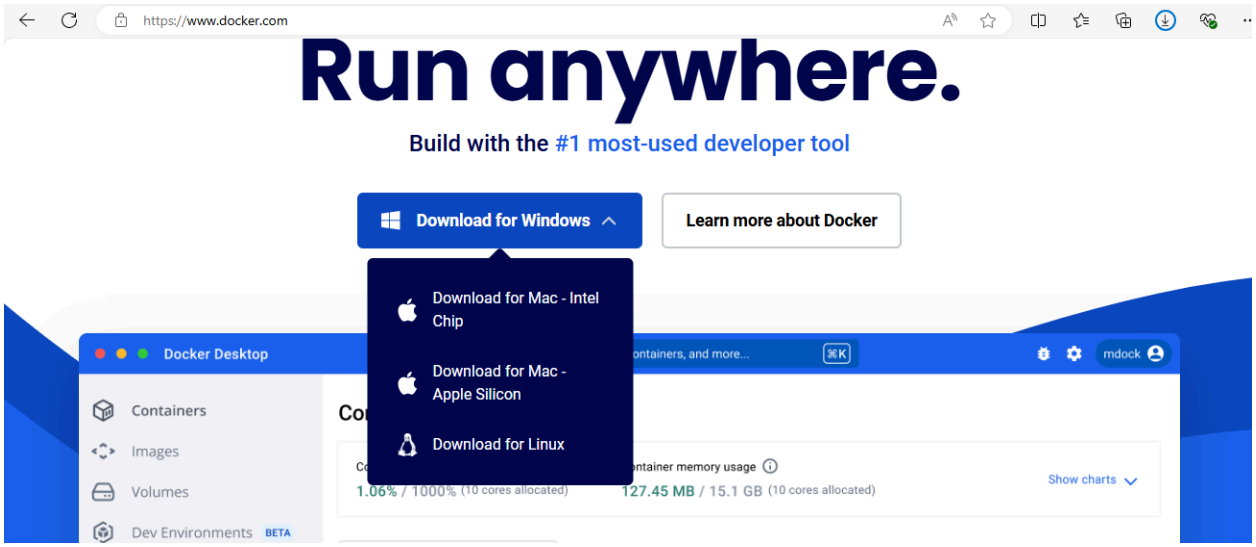

Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Try the new cross-platform PowerShell https://aka.ms/pscore6
PS C:\Windows\system32> terraform
Usage: terraform [global options] <subcommand> [args]
The available commands for execution are listed below.
The primary workflow commands are given first, followed by
less common or more advanced commands.
Main commands:
init Prepare your working directory for other commands
validate Check whether the configuration is valid
plan Show changes required by the current configuration
apply Create or update infrastructure
destroy Destroy previously-created infrastructure
All other commands:
console Try Terraform expressions at an interactive command prompt
fmt Reformat your configuration in the standard style
force-unlock Release a stuck lock on the current workspace
get Install or upgrade remote Terraform modules
graph Generate a Graphviz graph of the steps in an operation
import Associate existing infrastructure with a Terraform resource
login Obtain and save credentials for a remote host
logout Remove locally-stored credentials for a remote host
metadata Metadata related commands
output Show output values from your root module
providers Show the providers required for this configuration
refresh Update the state to match remote systems
show Show the current state or a saved plan
state Advanced state management
taint Mark a resource instance as not fully functional
test Execute integration tests for Terraform modules
untaint Remove the 'tainted' state from a resource instance
version Show the current Terraform version
workspace Workspace management
Global options (use these before the subcommand, if any):
-chdir=DIR Switch to a different working directory before executing the
given subcommand.
-help Show this help output, or the help for a specified subcommand.
-version An alias for the "version" subcommand.
PS C:\Windows\system32>

Anuprita Mhapankar **D15A** **29**

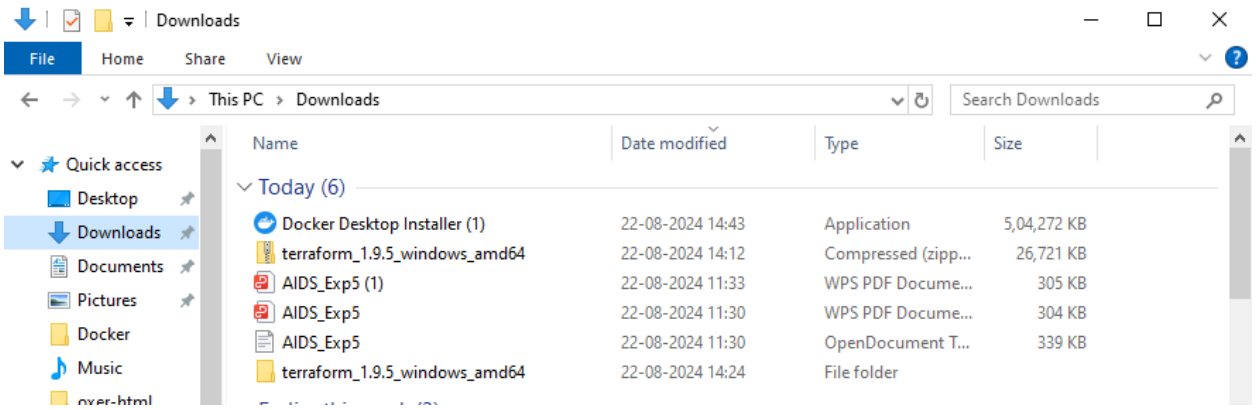
Experiment 6

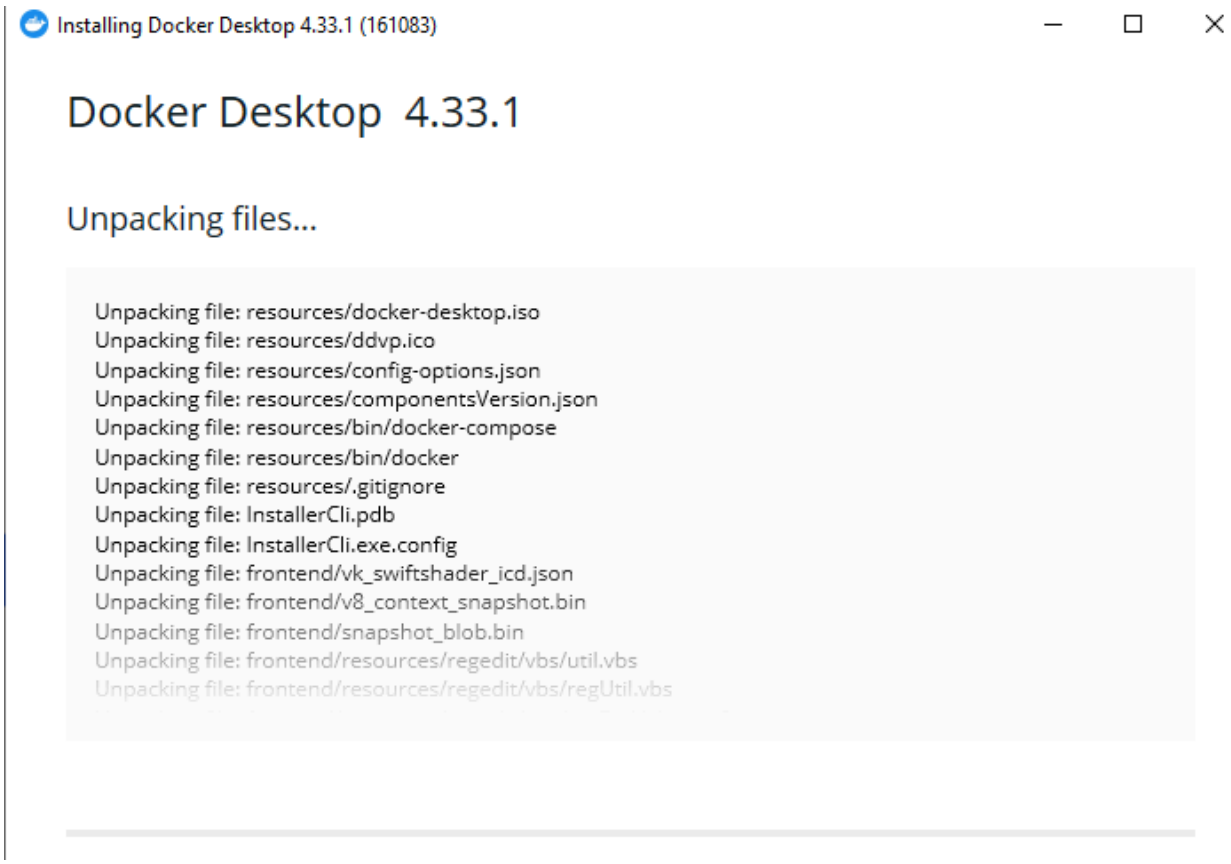
Aim:
To Build, change, and destroy AWS / GCP /Microsoft Azure/ DigitalOcean infrastructure Using Terraform.(S3 bucket or Docker)

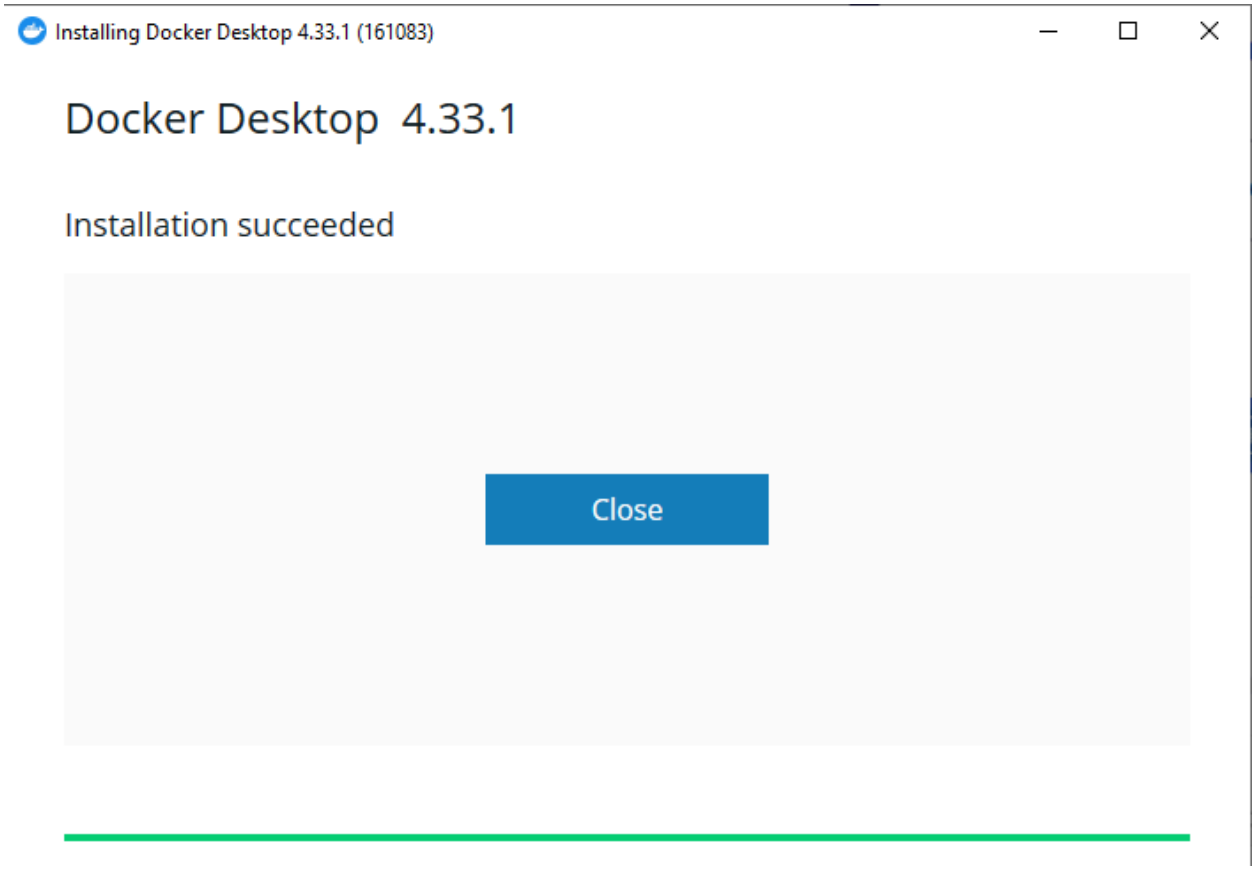
Step 1: Download Docker form www.docker.com



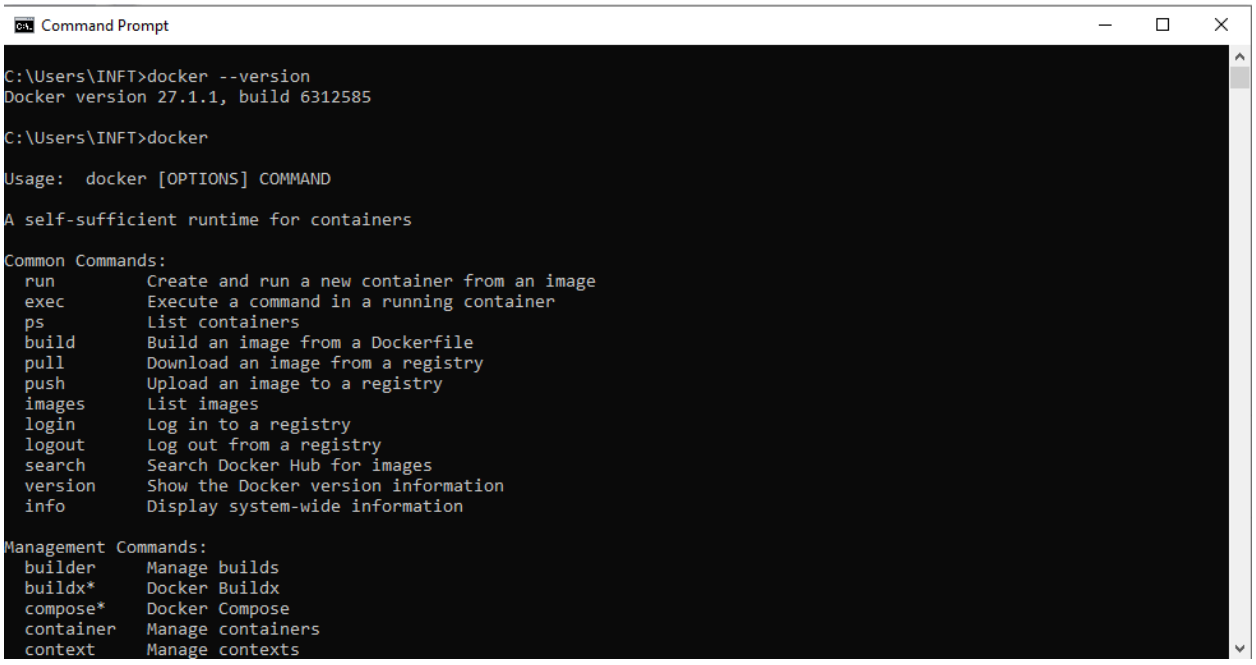
Step 2: The Docker is successfully downloaded. Now, run the docker installer and complete the installation.



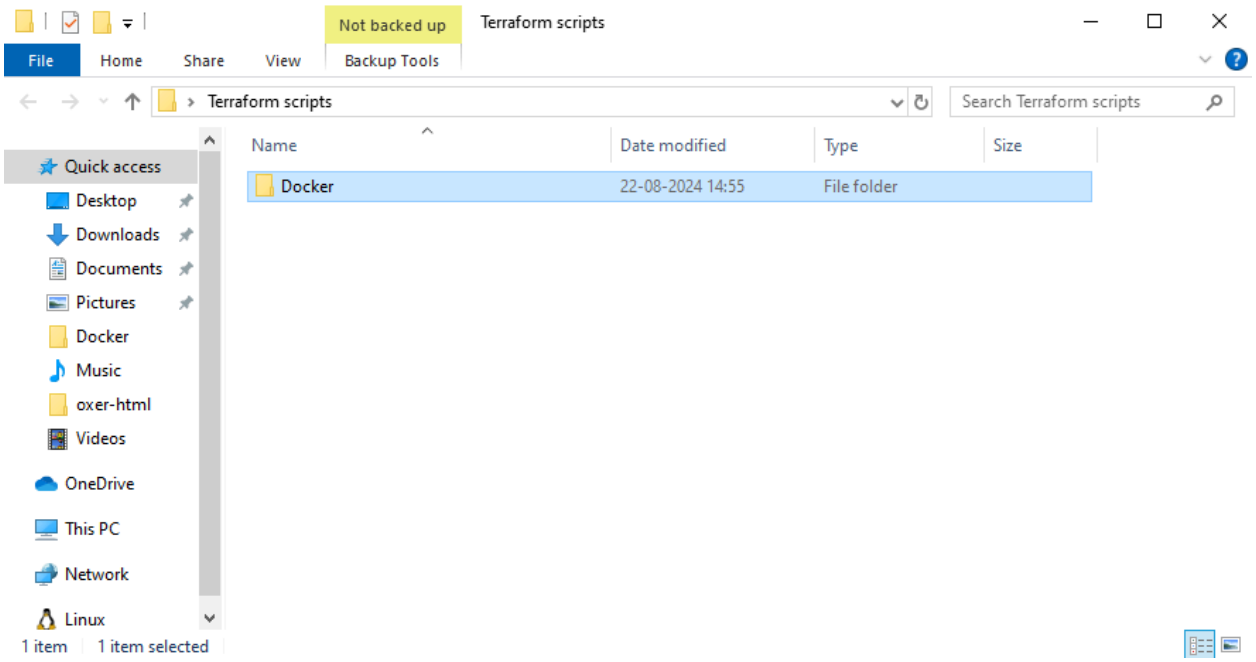

Installing Docker Desktop 4.33.1 (161083)
Docker Desktop 4.33.1
Unpacking files...
Unpacking file: resources/docker-desktop.iso
Unpacking file: resources/ddvp.ico
Unpacking file: resources/config-options.json
Unpacking file: resources/componentsVersion.json
Unpacking file: resources/bin/docker-compose
Unpacking file: resources/bin/docker
Unpacking file: resources/.gitignore
Unpacking file: InstallerCli.pdb
Unpacking file: InstallerCli.exe.config
Unpacking file: frontend/vk_swiftshader_icd.json
Unpacking file: frontend/v8_context_snapshot.bin
Unpacking file: frontend/snapshot_blob.bin
Unpacking file: frontend/resources/regedit/vbs/util.vbs
Unpacking file: frontend/resources/regedit/vbs/regUtil.vbs



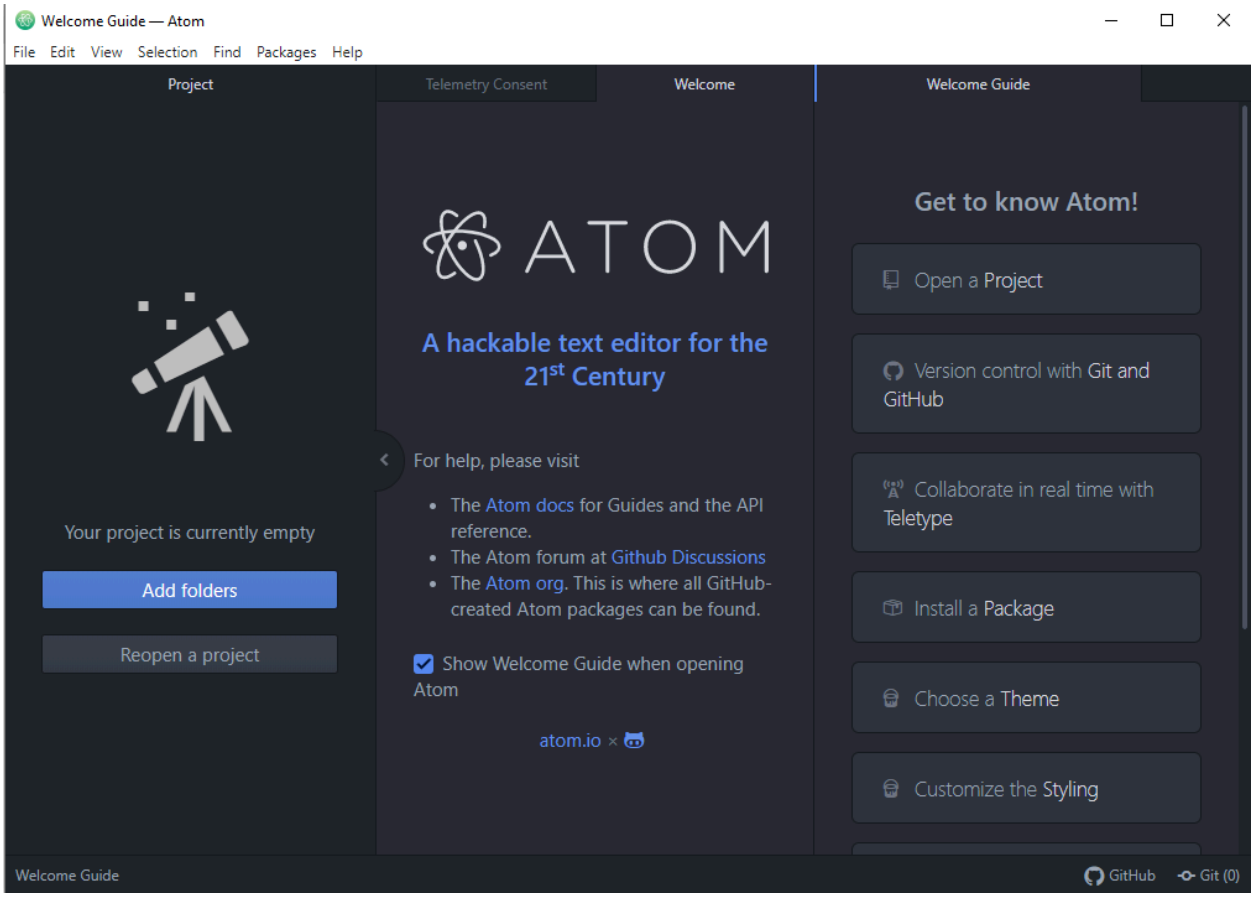
Step 3: Open Command Prompt and run as administrator. Enter the command docker –version, to check whether the docker is successfully installed.



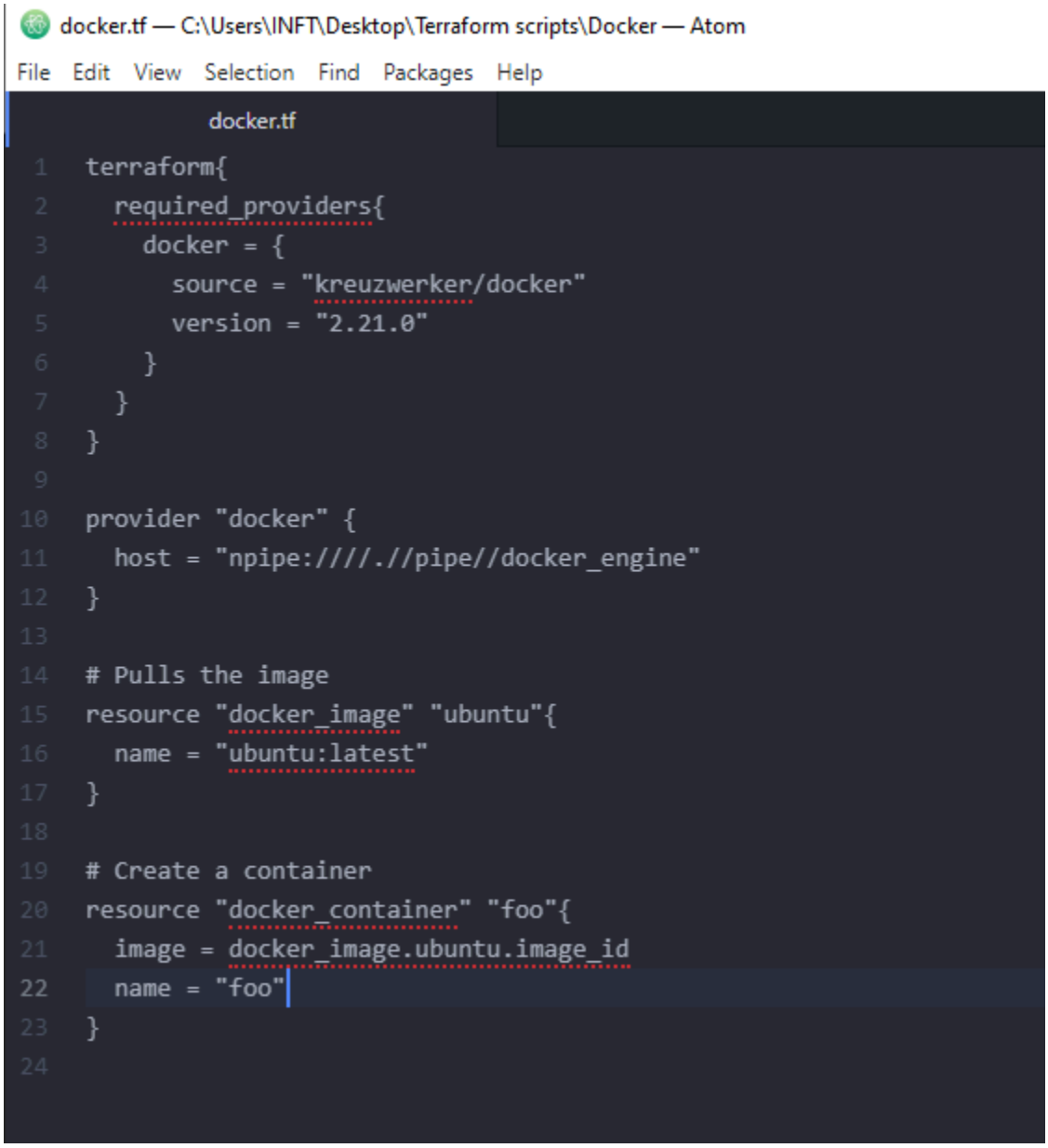
Step 4: Create a folder Terraform_scripts and inside it create a folder named Docker.



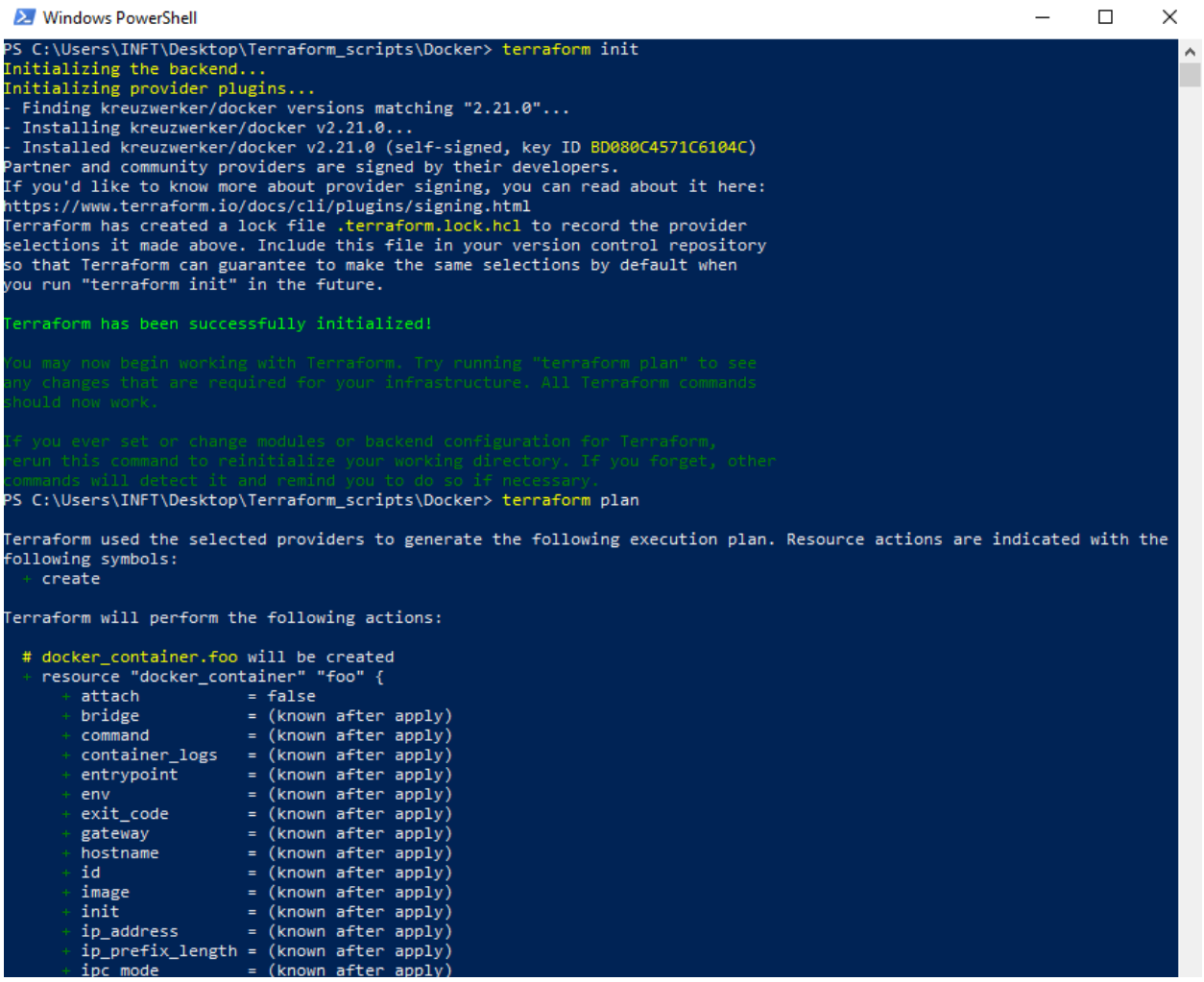
Step 5: Download Atom Editor.

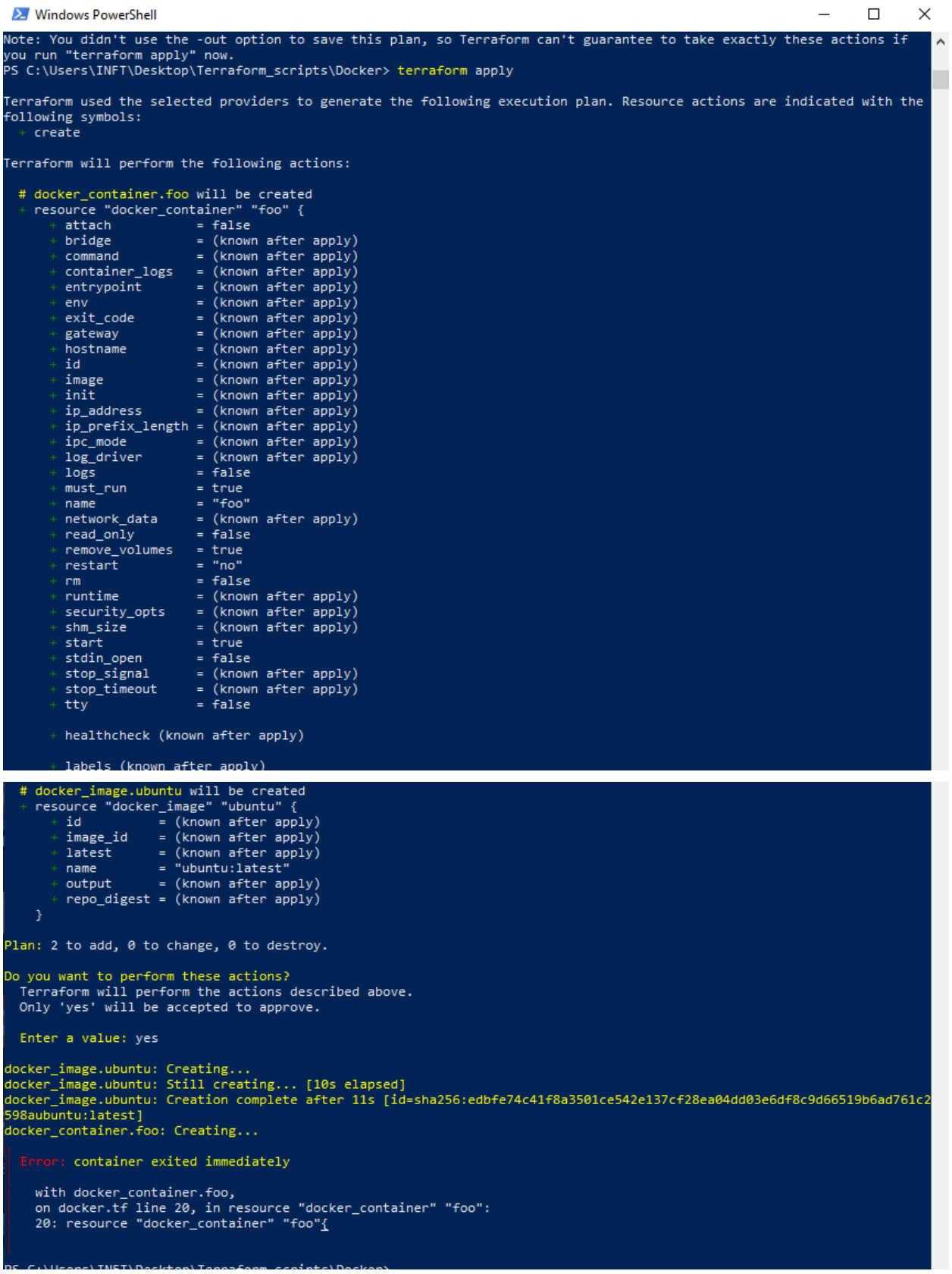


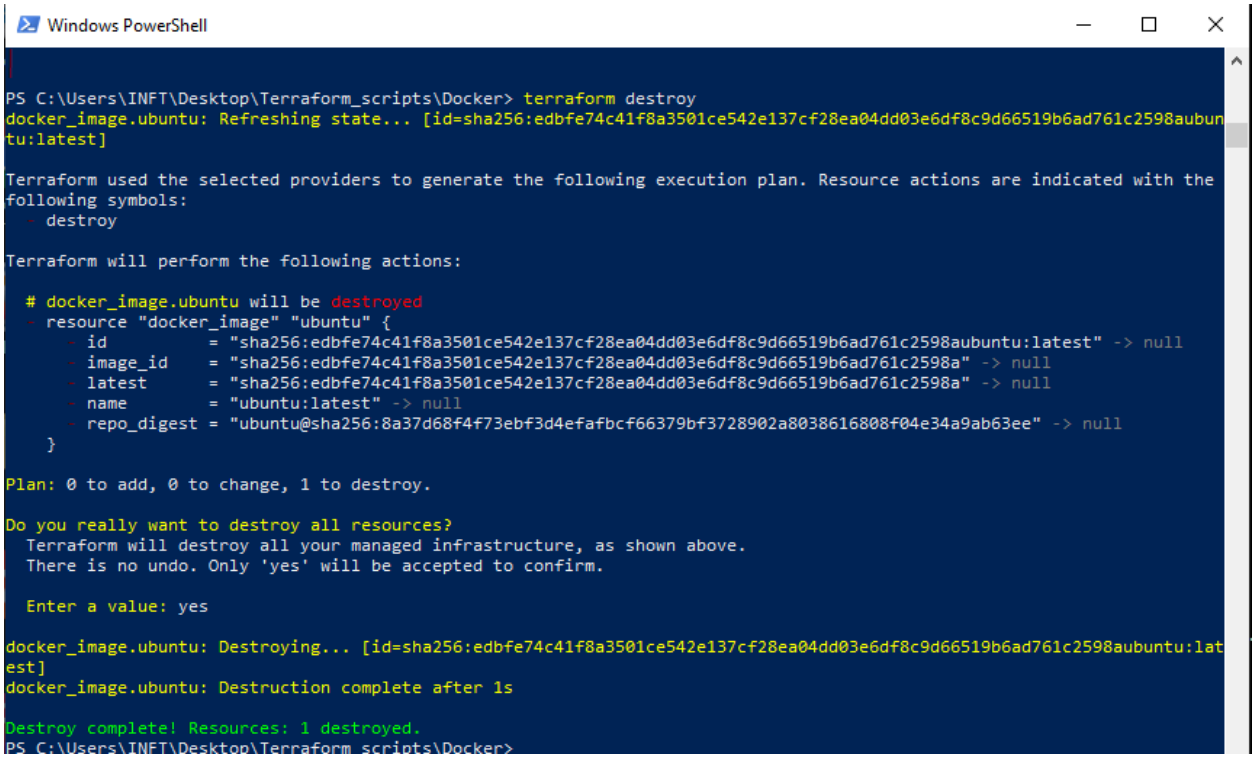
Step 6: Run the following script in the Atom Editor

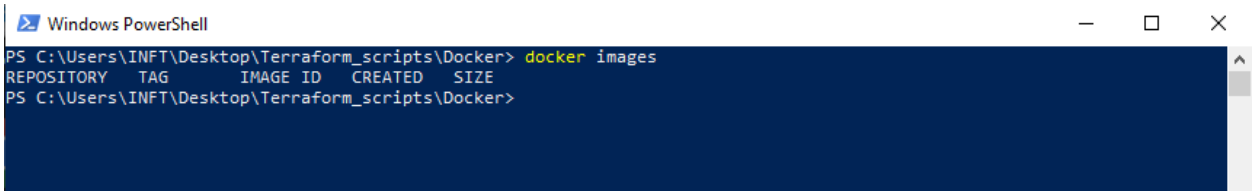


Step 7: Open Windows Explorer and run the following command terraform init, terraform plan, terraform apply, terraform destroy and docker images.


Windows PowerShell
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker> terraform init
Initializing the backend...
Initializing provider plugins...
- Finding kreuzwerker/docker versions matching "2.21.0"...
- Installing kreuzwerker/docker v2.21.0...
- Installed kreuzwerker/docker v2.21.0 (self-signed, key ID BD080C4571C6104C)
Partner and community providers are signed by their developers.
If you'd like to know more about provider signing, you can read about it here:
https://www.terraform.io/docs/cli/plugins/signing.html
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.
Terraform has been successfully initialized!
You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.
If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker> terraform plan
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the
following symbols:
+ create
Terraform will perform the following actions:
# docker_container.foo will be created
+ resource "docker_container" "foo" {
+ attach = false
+ bridge = (known after apply)
+ command = (known after apply)
+ container_logs = (known after apply)
+ entrypoint = (known after apply)
+ env = (known after apply)
+ exit_code = (known after apply)
+ gateway = (known after apply)
+ hostname = (known after apply)
+ id = (known after apply)
+ image = (known after apply)
+ init = (known after apply)
+ ip_address = (known after apply)
+ ip_prefix_length = (known after apply)
+ ipc_mode = (known after apply)


Windows PowerShell
Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions if you run "terraform apply" now.
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker> terraform apply
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create
Terraform will perform the following actions:
# docker_container.foo will be created
+ resource "docker_container" "foo" {
+ attach = false
+ bridge = (known after apply)
+ command = (known after apply)
+ container_logs = (known after apply)
+ entrypoint = (known after apply)
+ env = (known after apply)
+ exit_code = (known after apply)
+ gateway = (known after apply)
+ hostname = (known after apply)
+ id = (known after apply)
+ image = (known after apply)
+ init = (known after apply)
+ ip_address = (known after apply)
+ ip_prefix_length = (known after apply)
+ ipc_mode = (known after apply)
+ log_driver = (known after apply)
+ logs = false
+ must_run = true
+ name = "foo"
+ network_data = (known after apply)
+ read_only = false
+ remove_volumes = true
+ restart = "no"
+ rm = false
+ runtime = (known after apply)
+ security_opts = (known after apply)
+ shm_size = (known after apply)
+ start = true
+ stdin_open = false
+ stop_signal = (known after apply)
+ stop_timeout = (known after apply)
+ tty = false
+ healthcheck (known after apply)
+ labels (known after apply)
# docker_image.ubuntu will be created
+ resource "docker_image" "ubuntu" {
+ id = (known after apply)
+ image_id = (known after apply)
+ latest = (known after apply)
+ name = "ubuntu:latest"
+ output = (known after apply)
+ repo_digest = (known after apply)
}
Plan: 2 to add, 0 to change, 0 to destroy.
Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.
Enter a value: yes
docker_image.ubuntu: Creating...
docker_image.ubuntu: Still creating... [10s elapsed]
docker_image.ubuntu: Creation complete after 11s [id=sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598aubuntu:latest]
docker_container.foo: Creating...
Error: container exited immediately
with docker_container.foo,
on docker.tf line 20, in resource "docker_container" "foo":
20: resource "docker_container" "foo"{

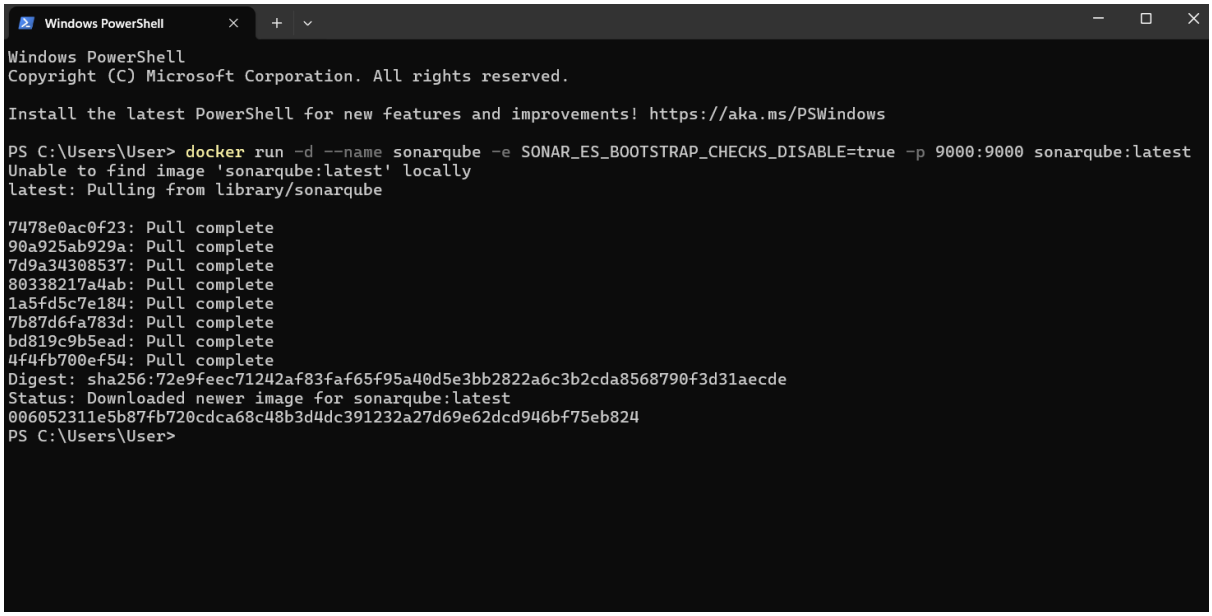

Windows PowerShell
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker> terraform destroy
docker_image.ubuntu: Refreshing state... [id=sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598aubuntu:latest]
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
- destroy
Terraform will perform the following actions:
# docker_image.ubuntu will be destroyed
- resource "docker_image" "ubuntu" {
- id = "sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598aubuntu:latest" -> null
- image_id = "sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598a" -> null
- latest = "sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598a" -> null
- name = "ubuntu:latest" -> null
- repo_digest = "ubuntu@sha256:8a37d68f4f73ebf3d4efafbcf66379bf3728902a8038616808f04e34a9ab63ee" -> null
}
Plan: 0 to add, 0 to change, 1 to destroy.
Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.
Enter a value: yes
docker_image.ubuntu: Destroying... [id=sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598aubuntu:latest]
docker_image.ubuntu: Destruction complete after 1s
Destroy complete! Resources: 1 destroyed.
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker>


Windows PowerShell
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker> docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
PS C:\Users\INFT\Desktop\Terraform_scripts\Docker>

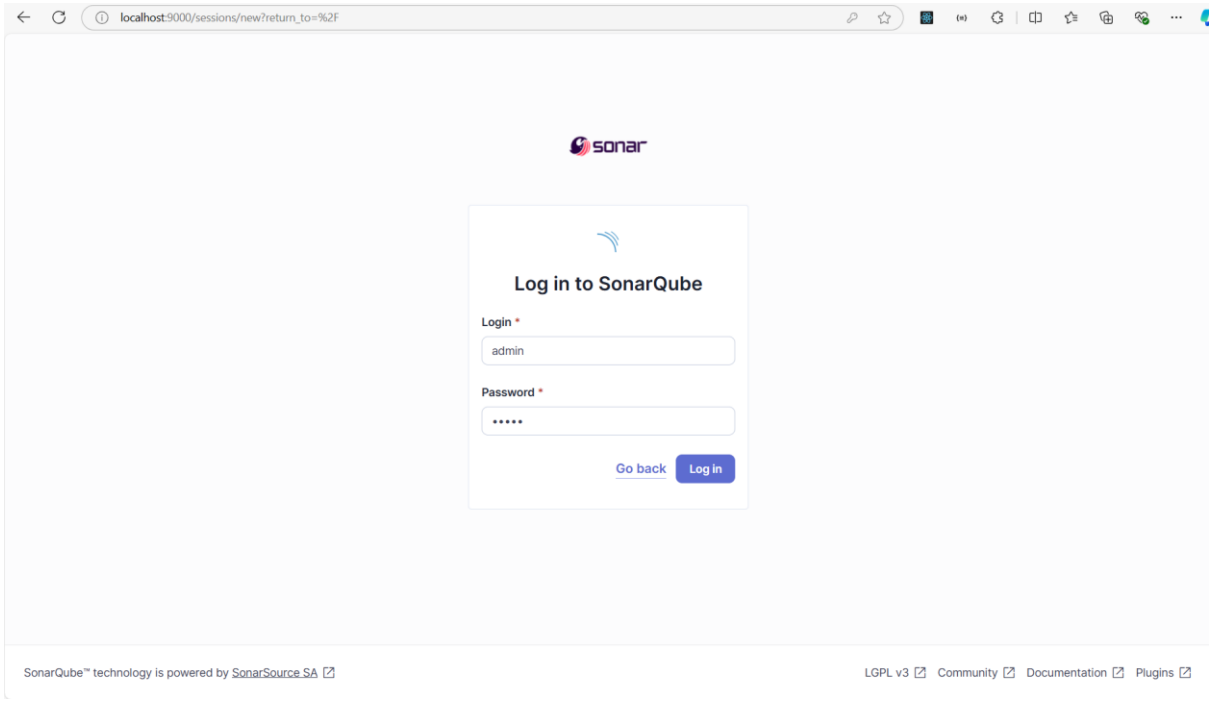
EXPERIMENT 7

Aim: To understand Static Analysis SAST process and learn to integrate Jenkins SAST to SonarQube/GitLab.

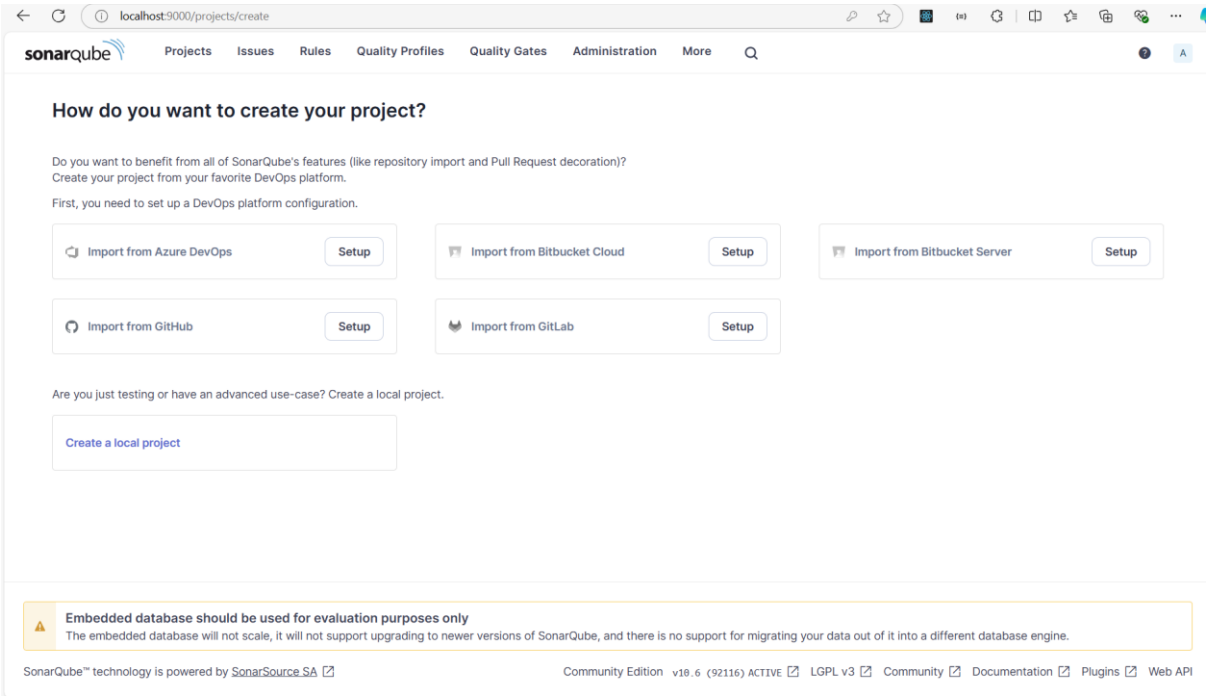
Step 1: Open Windows PowerShell and run the following command –
docker run -d --name sonarqube -e SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true -p 9000:9000 sonarqube:latest
WARNING: Run the following command only once

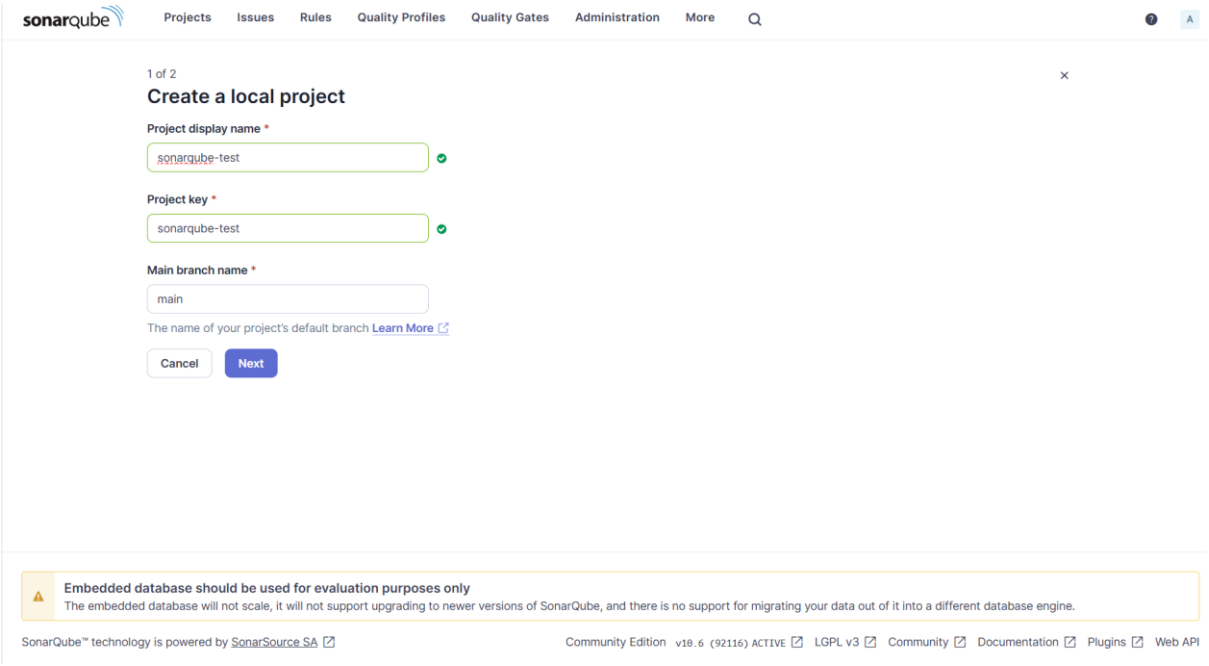


Step 2: Visit http://localhost:9000/ to open SonarQube. Login with username: admin and password: admin.



Step 3: Click on create a local project and name the project as sonarqube-test and key as sonarqube-test and click on the next button. In the next step select the “Use the global setting” option and click on create project.


localhost:9000/projects/create
sonarqube
Projects
Issues
Rules
Quality Profiles
Quality Gates
Administration
More
How do you want to create your project?
Do you want to benefit from all of SonarQube's features (like repository import and Pull Request decoration)?
Create your project from your favorite DevOps platform.
First, you need to set up a DevOps platform configuration.
Import from Azure DevOps
Setup
Import from Bitbucket Cloud
Setup
Import from Bitbucket Server
Setup
Import from GitHub
Setup
Import from GitLab
Setup
Are you just testing or have an advanced use-case? Create a local project.
Create a local project
Embedded database should be used for evaluation purposes only
The embedded database will not scale, it will not support upgrading to newer versions of SonarQube, and there is no support for migrating your data out of it into a different database engine.
SonarQube™ technology is powered by SonarSource SA
Community Edition v10.6 (92116) ACTIVE
LGPL v3
Community
Documentation
Plugins
Web API


sonarqube
Projects
Issues
Rules
Quality Profiles
Quality Gates
Administration
More
1 of 2
Create a local project
Project display name *
sonarqube-test
Project key *
sonarqube-test
Main branch name *
main
The name of your project's default branch Learn More
Cancel
Next
Embedded database should be used for evaluation purposes only
The embedded database will not scale, it will not support upgrading to newer versions of SonarQube, and there is no support for migrating your data out of it into a different database engine.
SonarQube™ technology is powered by SonarSource SA
Community Edition v10.6 (92116) ACTIVE
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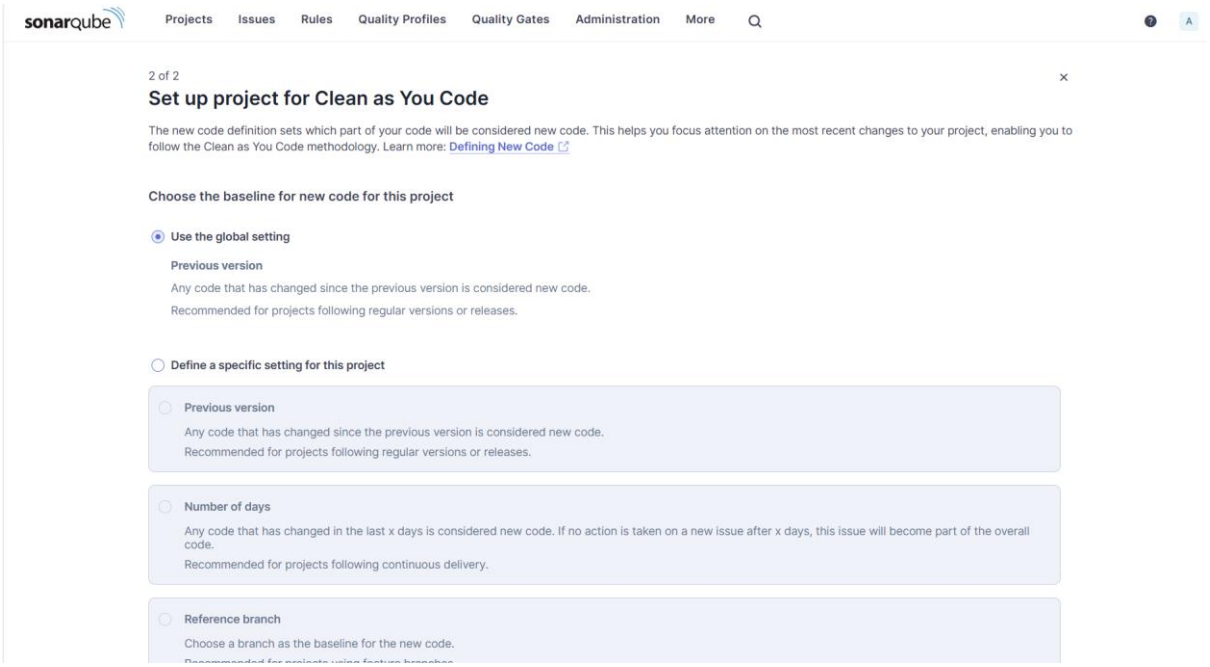
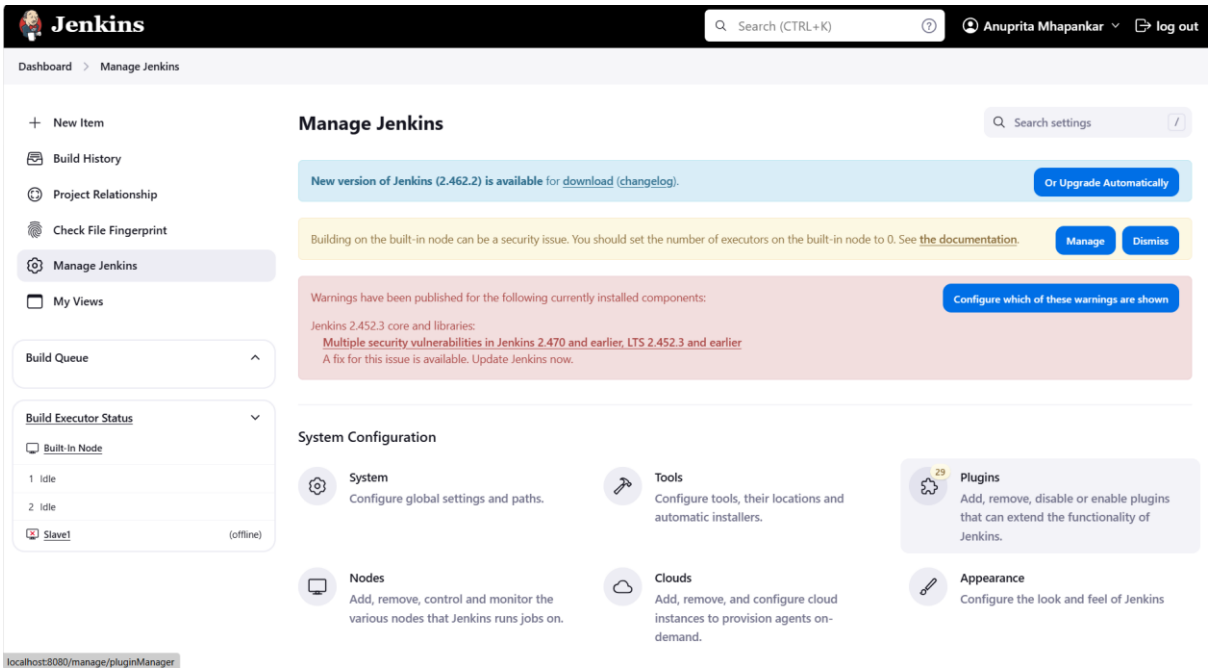
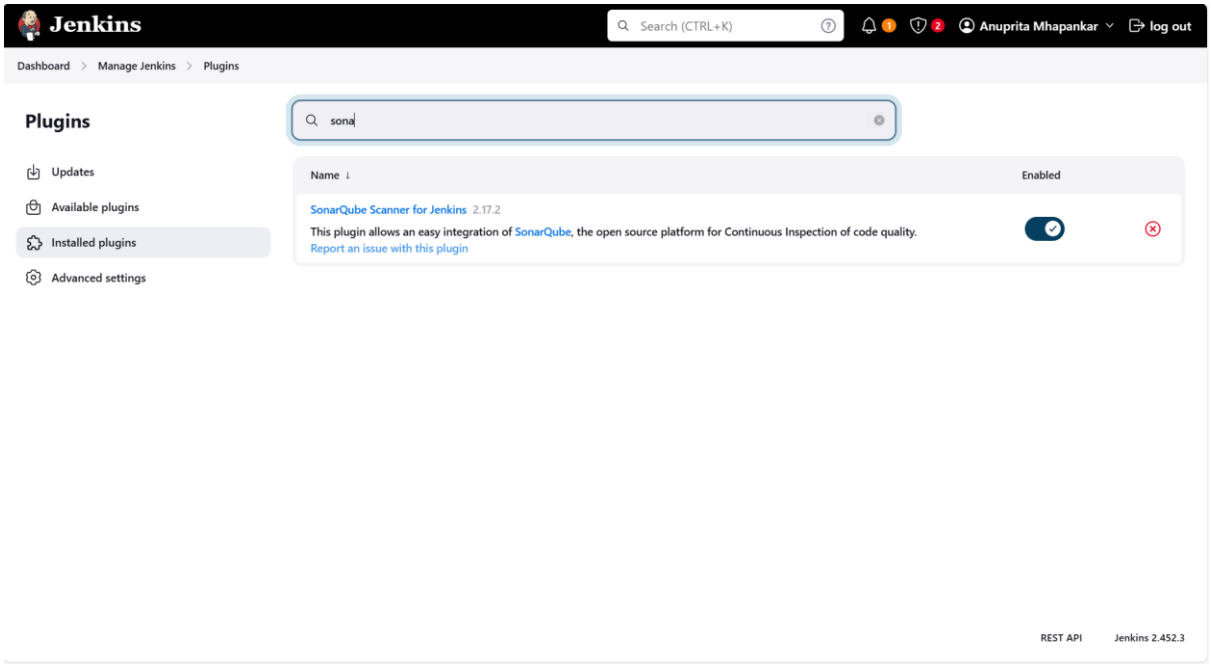
Community
Documentation
Plugins
Web API

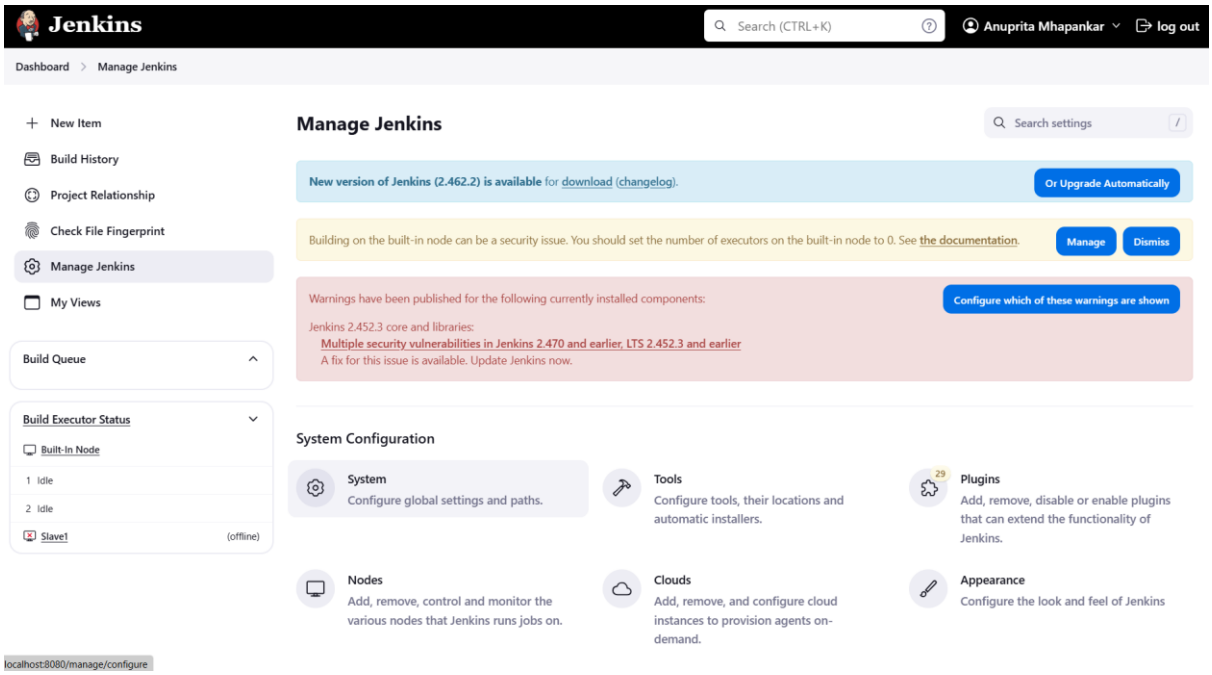


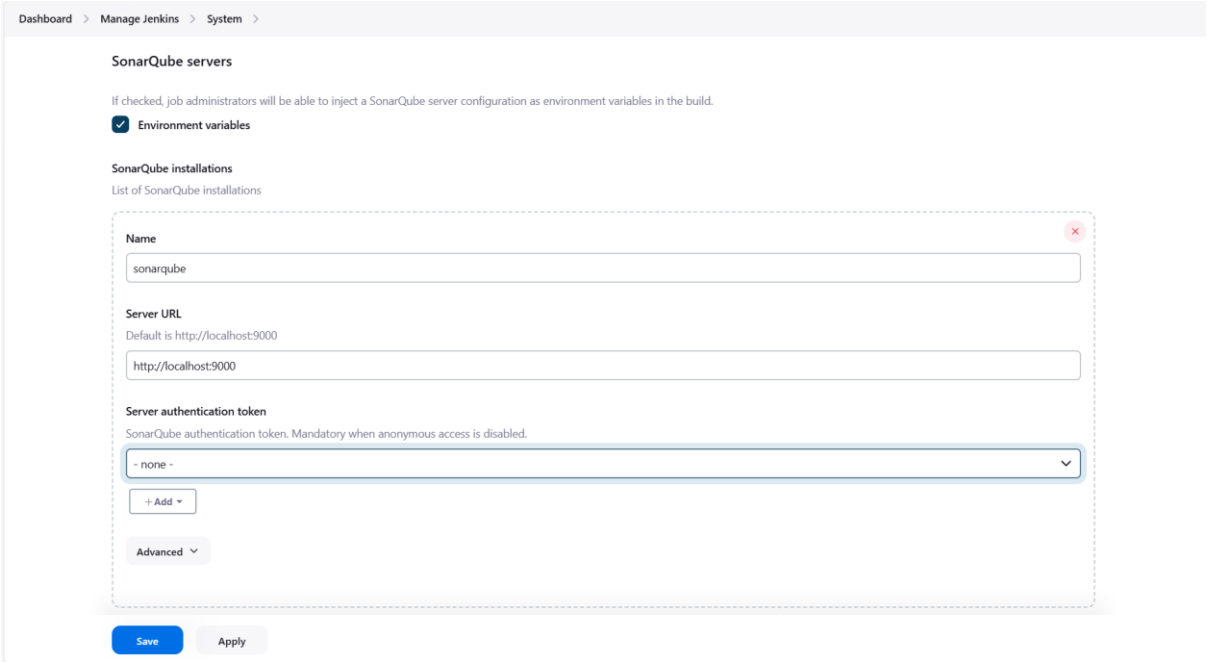
Step 4: Open Jenkins using http://localhost:8080/ and select Manage Jenkins, then select the Plugins and select available plugins from sidebar and search for SonarQube Scanner and install it. Once installed you can view the installed plugin in installed plugins section in sidebar.



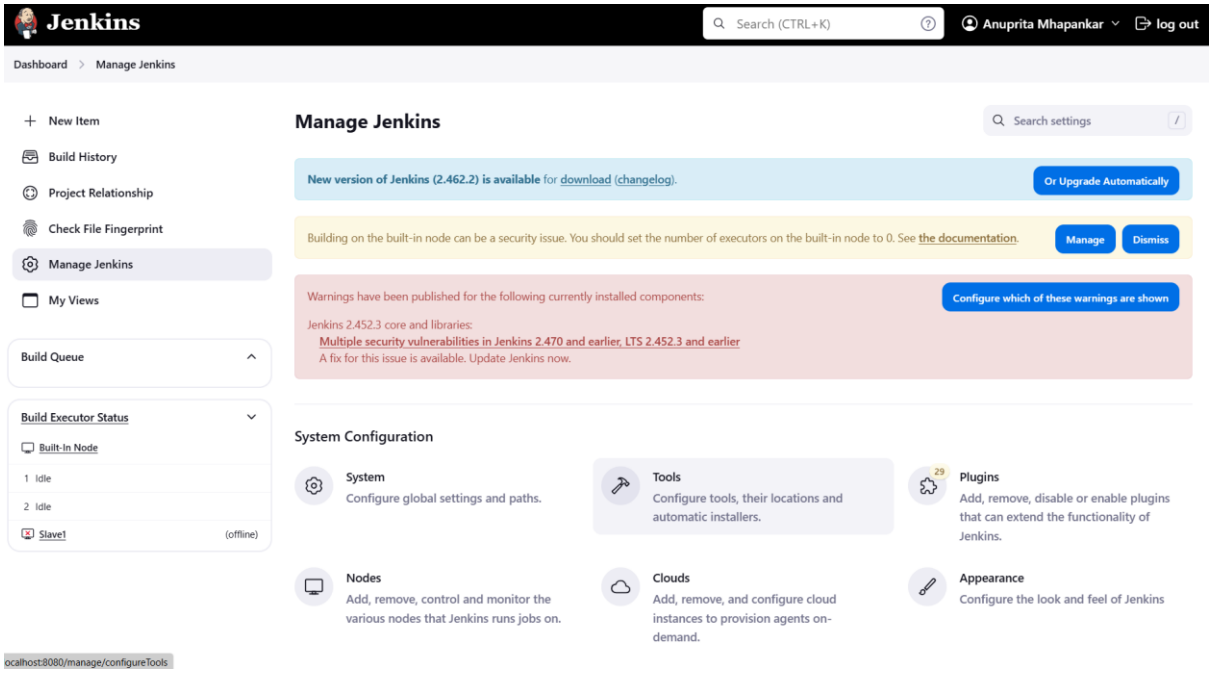


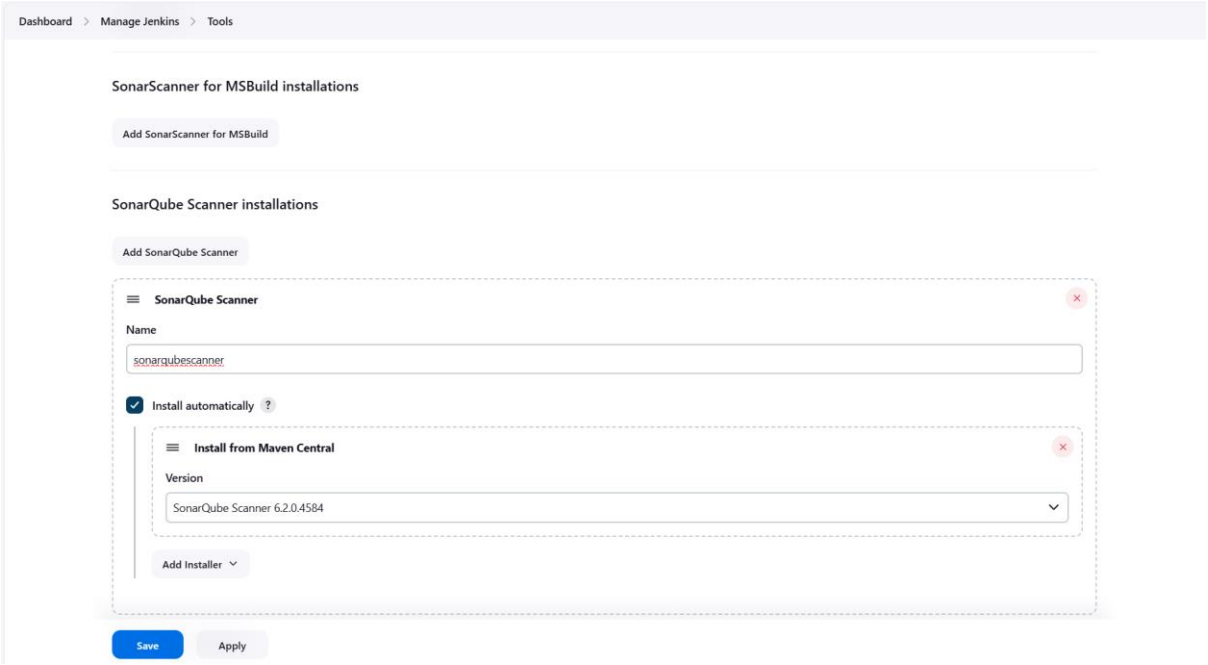
Step 5: Select Manage Jenkins, then select the System and then scroll down to SonarQube Server. Name the server as sonarqube and set the server url as http://localhost:9000/ then click on save.



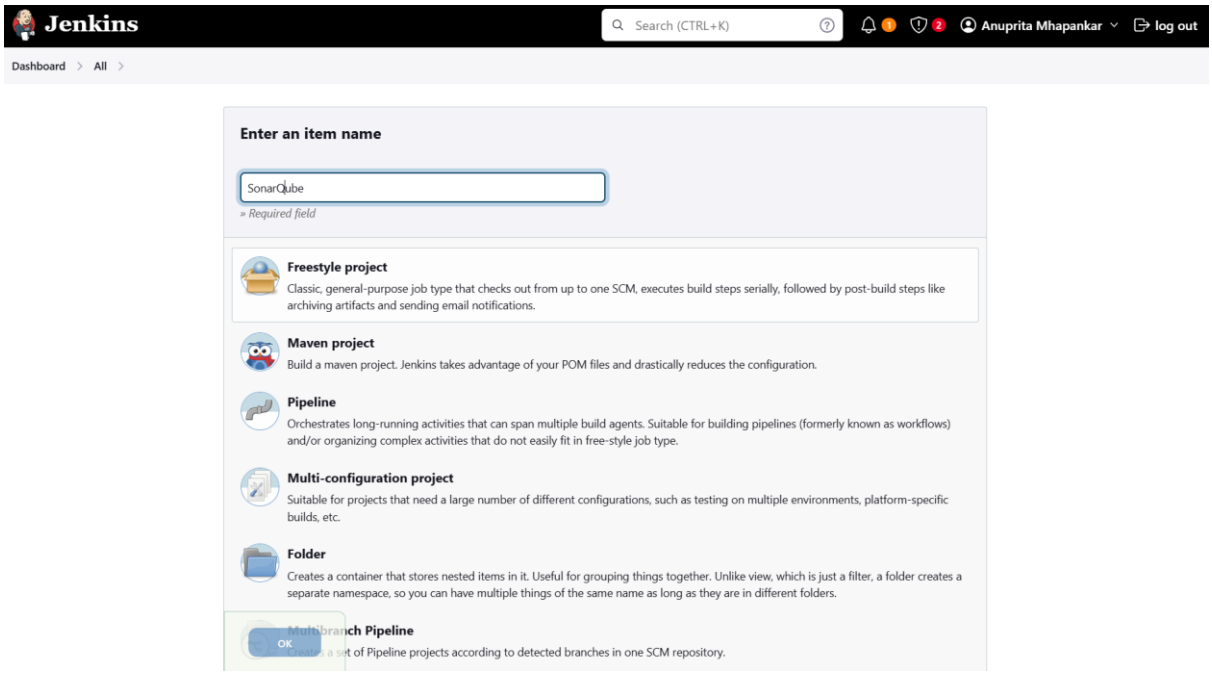


Step 6: Go to Jenkins Dashboard and select Manage Jenkins, then select the Tools and then scroll down to SonarQube Scanner installations. Name the sonarqube scanner as sonarqubescanner and select install automatically then click on save.

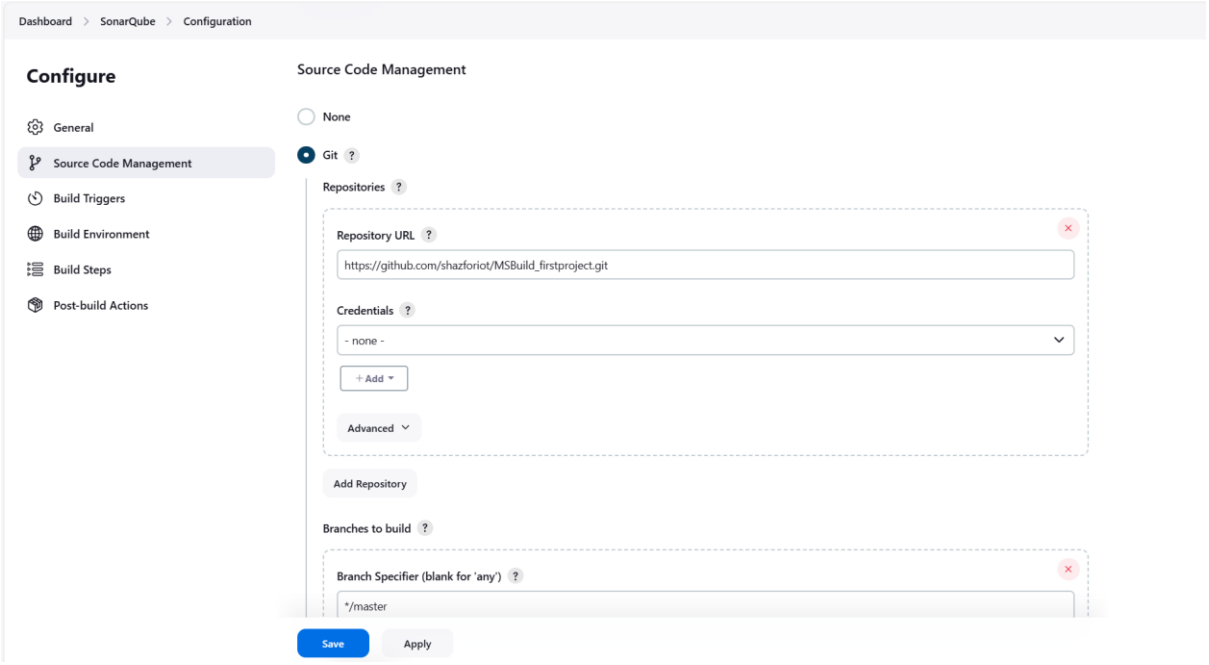




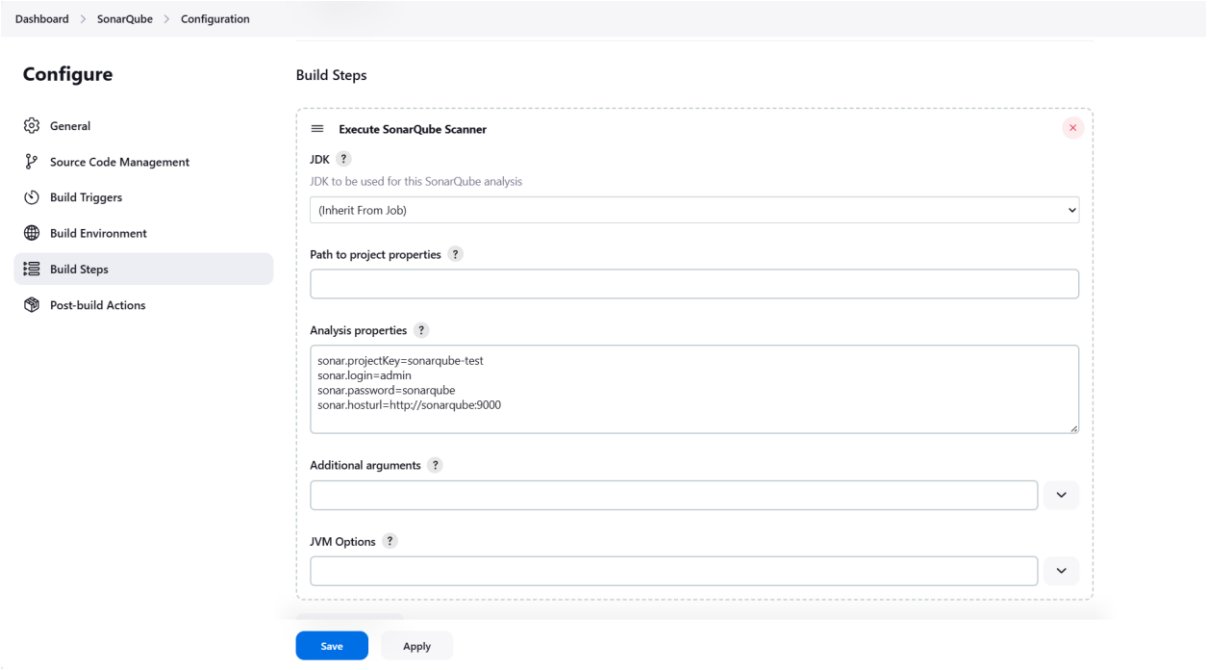
Step 7: Go to Jenkins dashboard and click on New Item and select Freestyle project and name it as SonarQube and then click on ok.

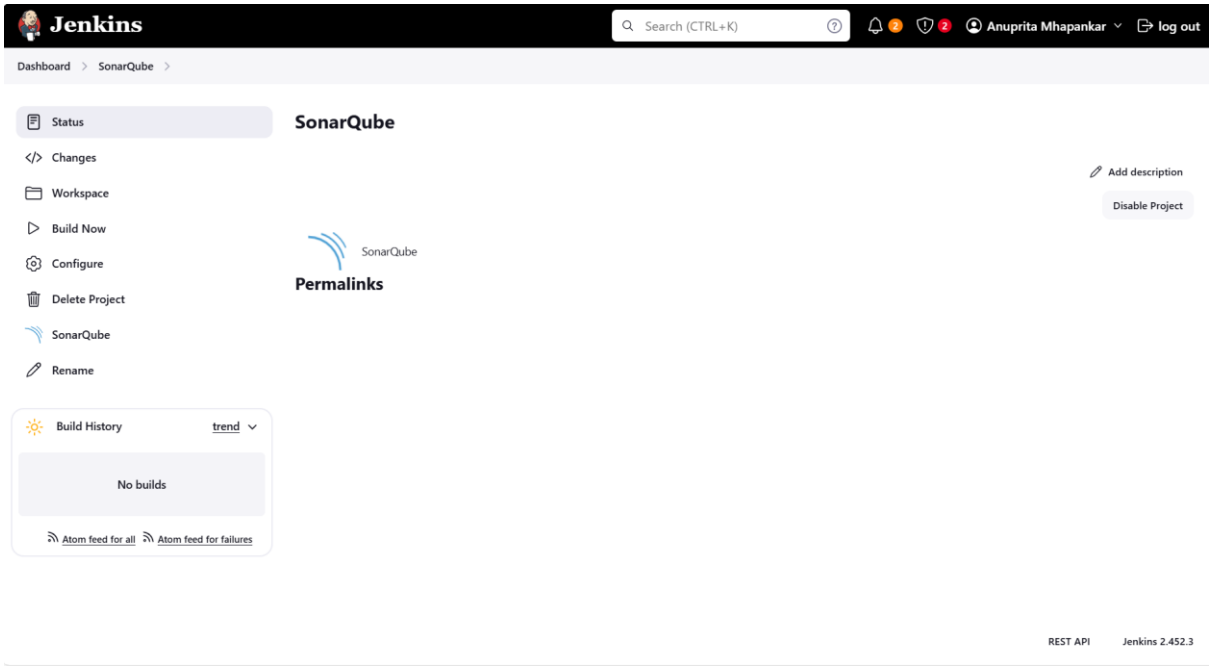


Step 8: For configuration, Select git and paste the following git repository in the repository url.
https://github.com/shazforiot/MSBuild_firstproject
This is a simple Hello world project

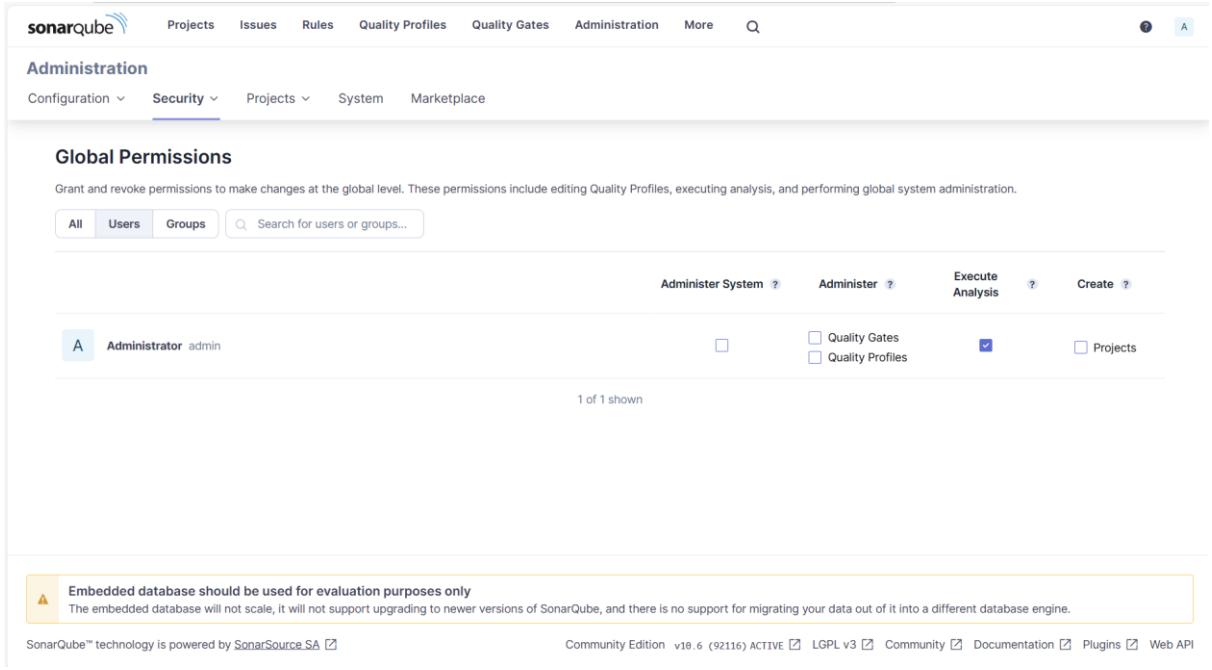


Step 9: Under the Build steps select “Execute SonarQube Scanner” option and under Analysis Properties write the following -
sonar.projectKey=sonarqube-test
sonar.login=admin
sonar.password=sonarqube
sonar.hosturl=http://sonarqube:9000
Then click on the save button.

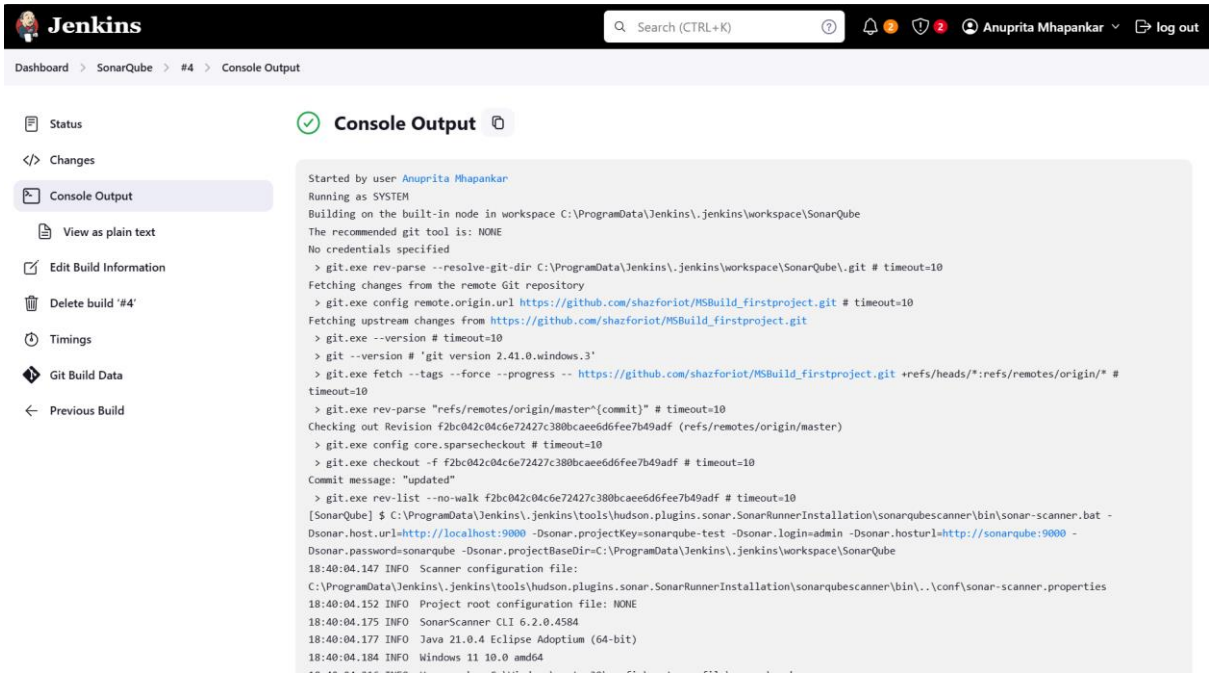


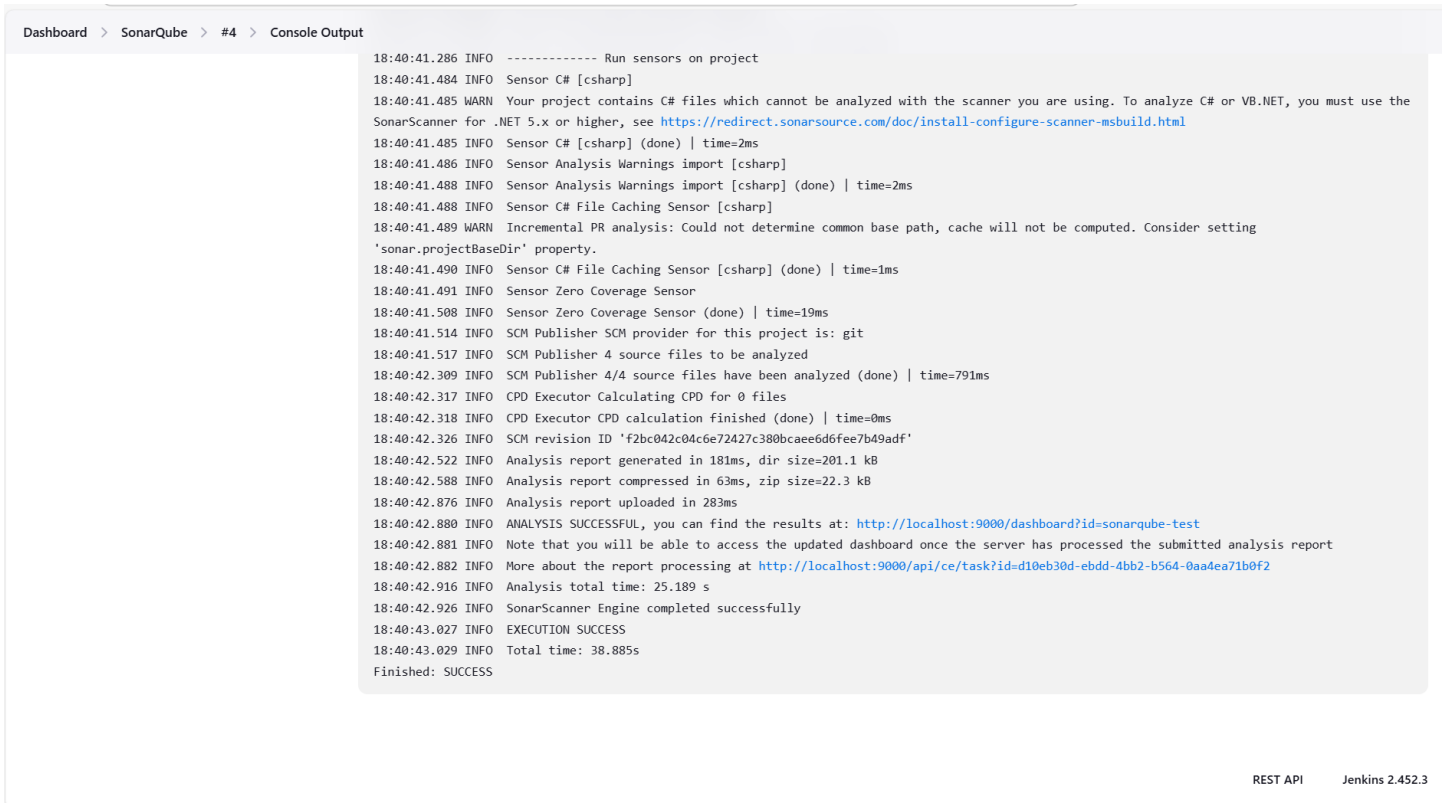


Step 10: Visit http://localhost:9000/admin/permissions and select the Users tab and for Administrator select the checkbox Execute Analysis.

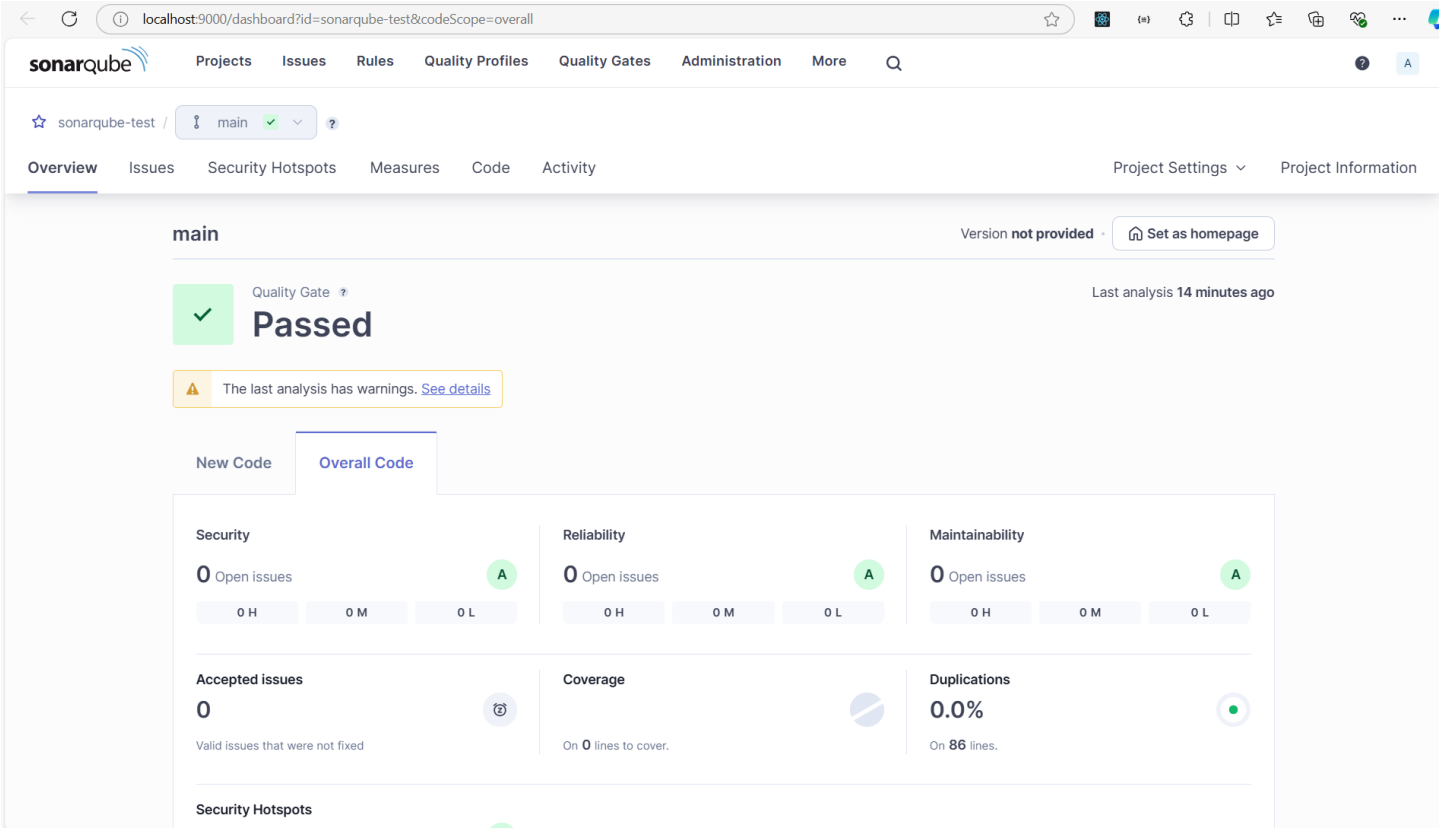


Step 11: Now, come back to Jenkins and click on Build Now. The build is success.





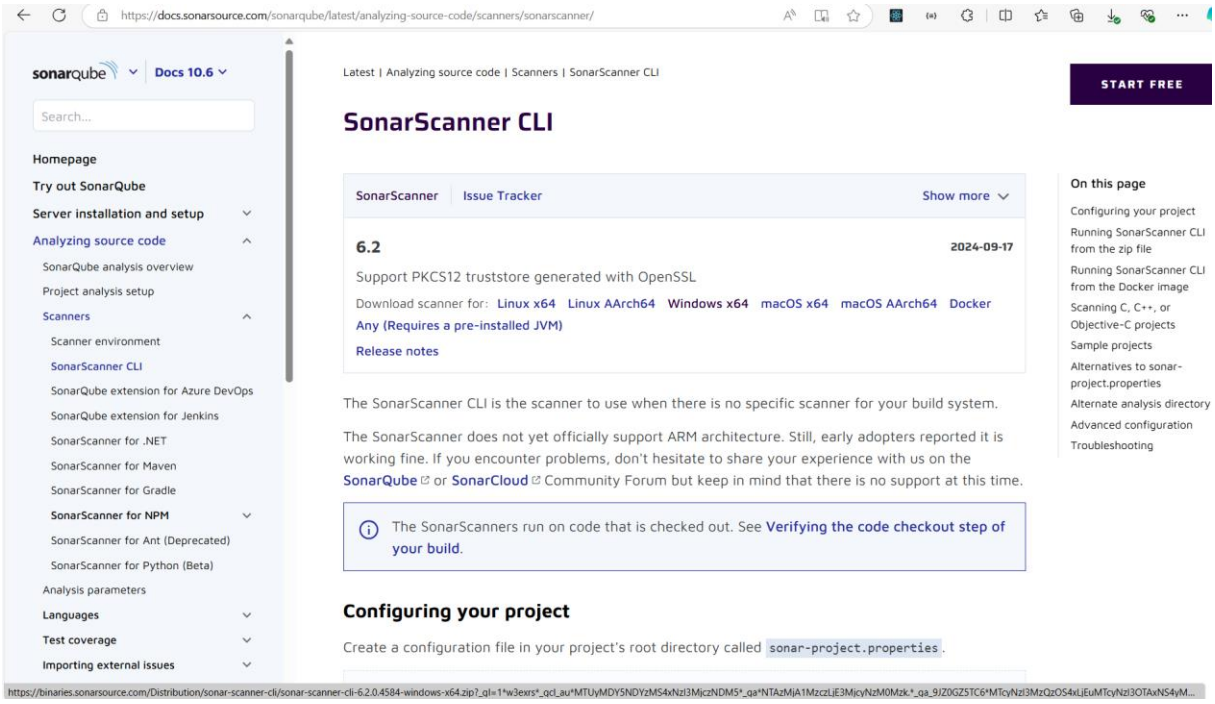
Step 12: Visit the following URL to see the result - http://localhost:9000/dashboard?id=sonarqube-test&codeScope=overall


localhost:9000/dashboard?id=sonarqube-test&codeScope=overall
sonarqube
Projects
Issues
Rules
Quality Profiles
Quality Gates
Administration
More
sonarqube-test / main
Overview
Issues
Security Hotspots
Measures
Code
Activity
Project Settings
Project Information
main
Version not provided
Set as homepage
Quality Gate
Passed
Last analysis 14 minutes ago
The last analysis has warnings. See details
New Code
Overall Code
Security
0 Open issues
A
0 H
0 M
0 L
Reliability
0 Open issues
A
0 H
0 M
0 L
Maintainability
0 Open issues
A
0 H
0 M
0 L
Accepted issues
0
Valid issues that were not fixed
Coverage
On 0 lines to cover.
Duplications
0.0%
On 86 lines.
Security Hotspots

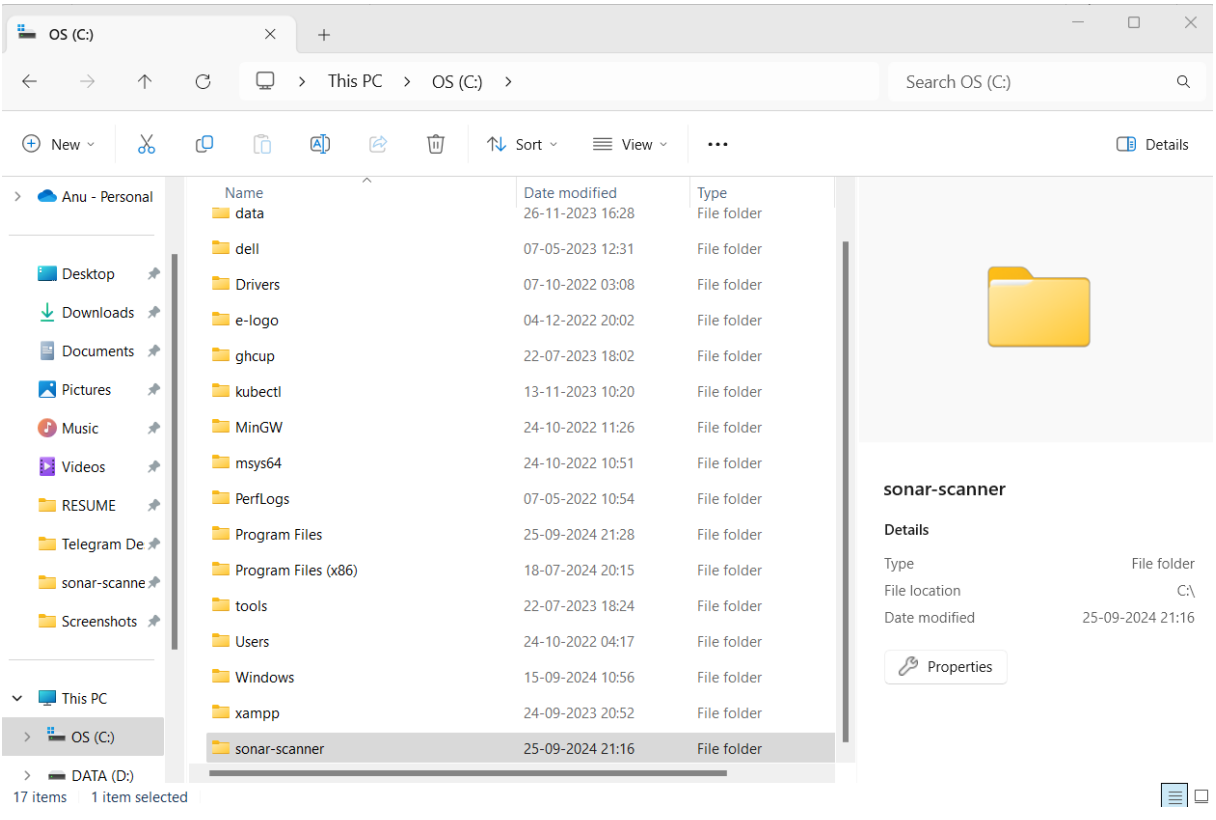
Experiment 8

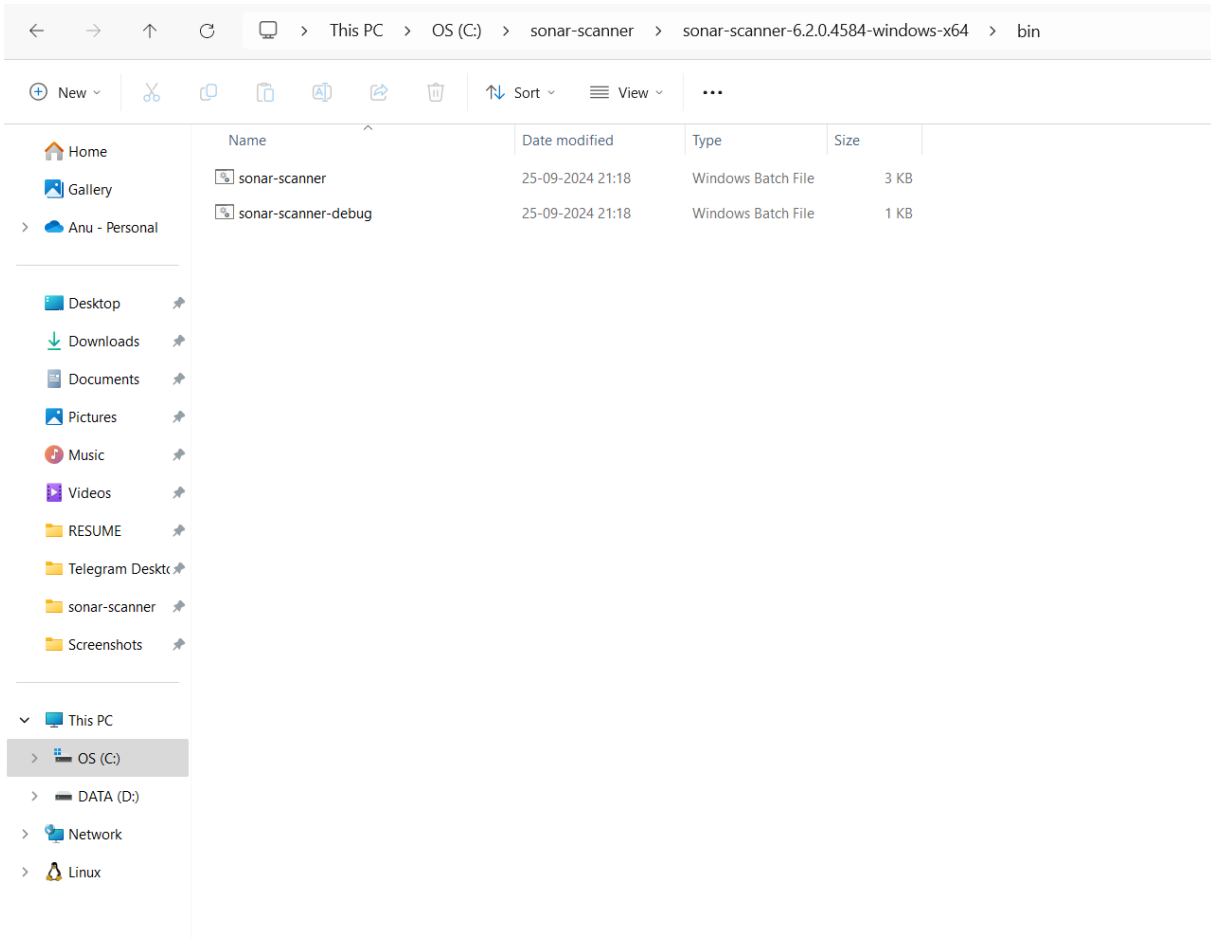
Aim: Create a Jenkins CICD Pipeline with SonarQube / GitLab Integration to perform a static analysis of the code to detect bugs, code smells, and security vulnerabilities on a sample Web /Java / Python application.

Step 1 : Visit the following link to download the SonarScanner CLI - https://docs.sonarsource.com/sonarqube/latest/analyzing-source-code/scanners/sonarscanner/ and then click on Windows x-64 to download the zip file.

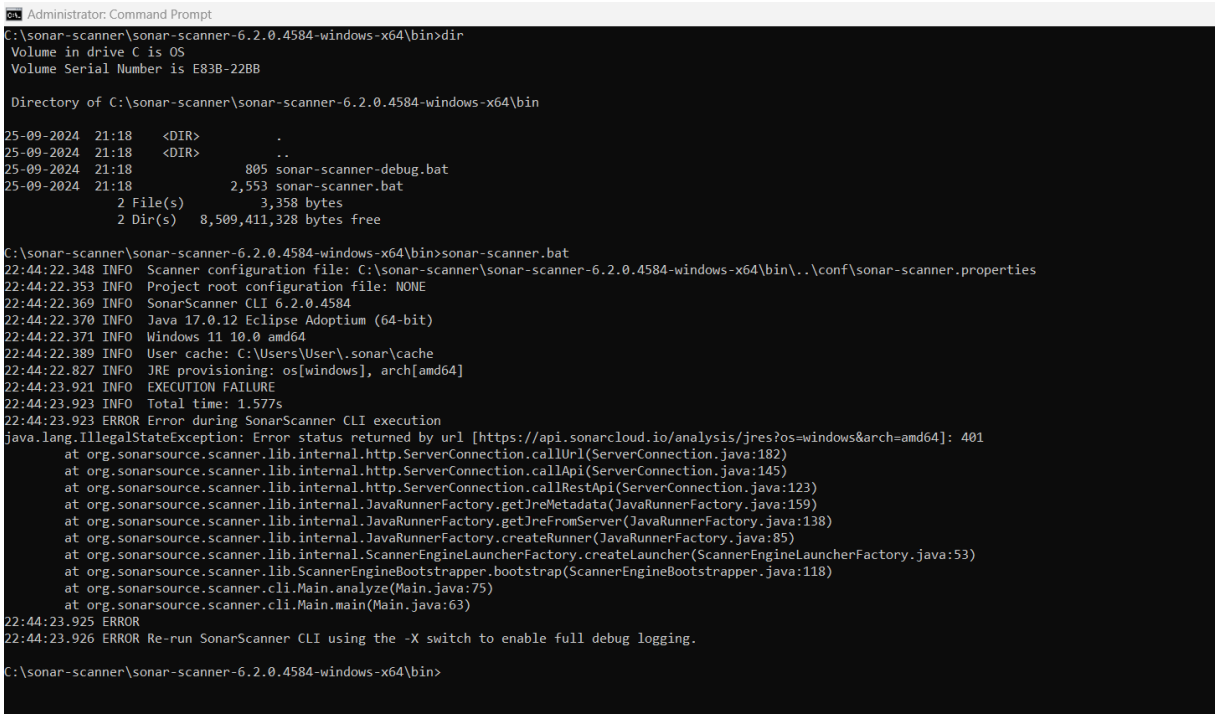


Step 2: Extract the content in C drive and name the folder sonar-scanner

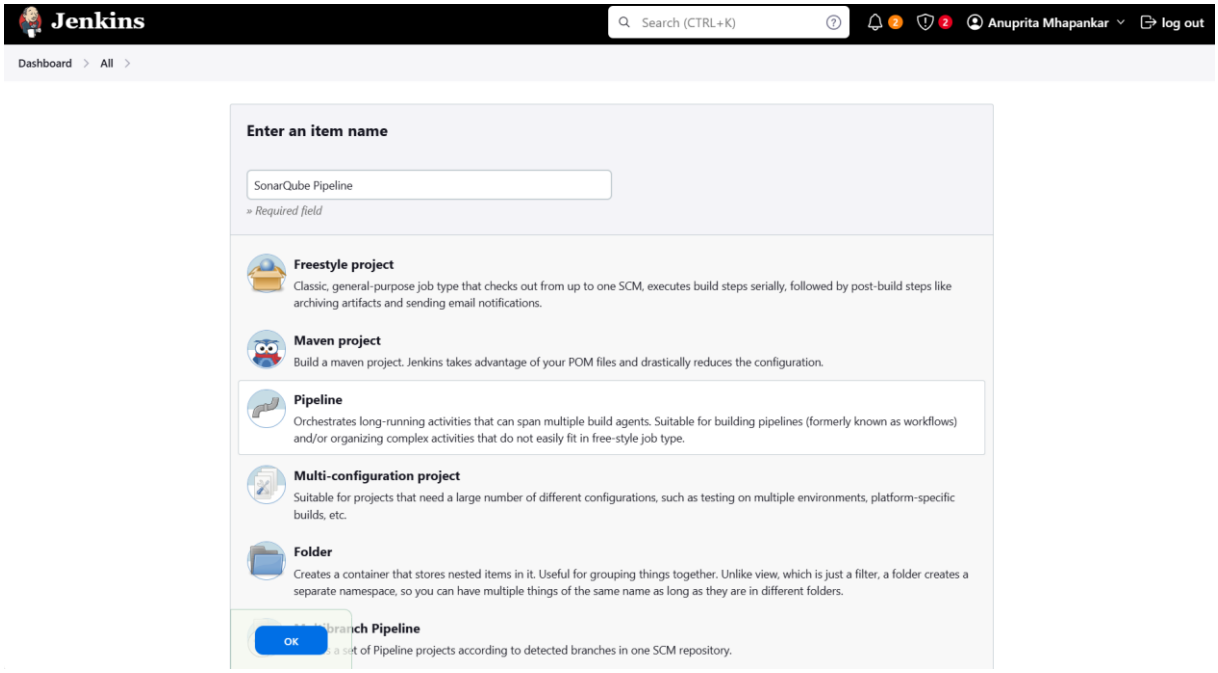




Step 3: Open Command Prompt and run as administrator and run the following commands –
cd C:\sonar-scanner\sonar-scanner-6.2.0.4584-windows-x64\bin
dir
sonar-scanner.bat



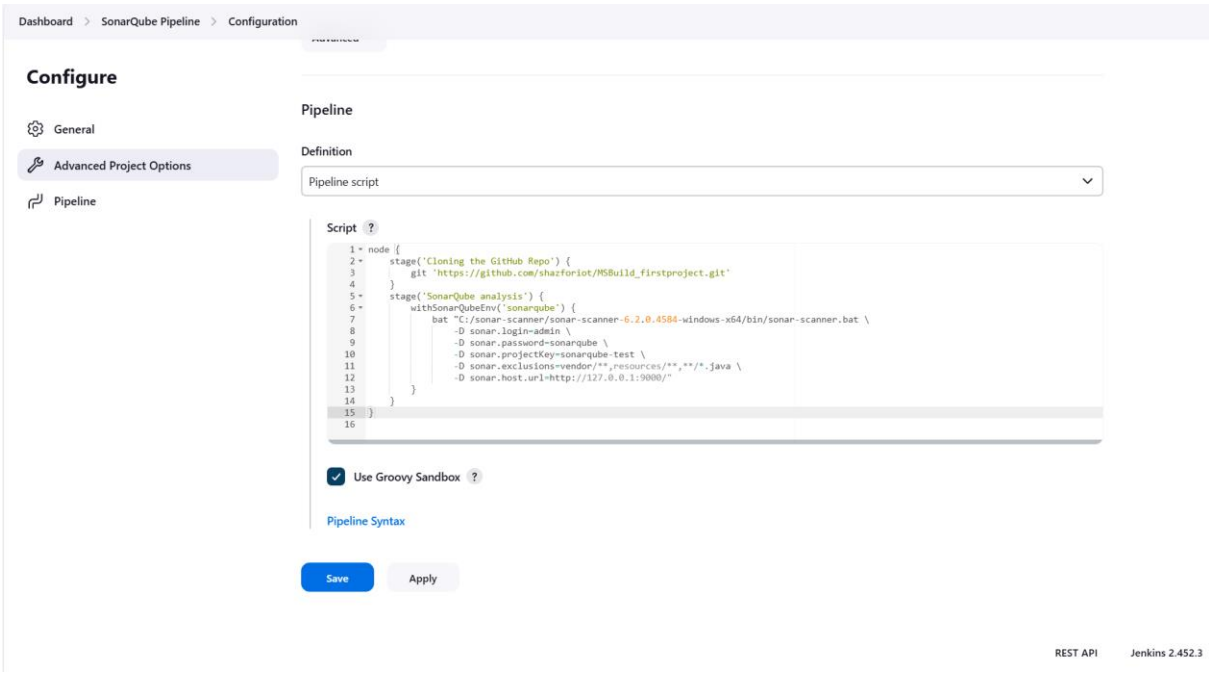
Step 4: Open Jenkins and create a pipeline and name the pipeline SonarQube Pipeline and then click on okay.



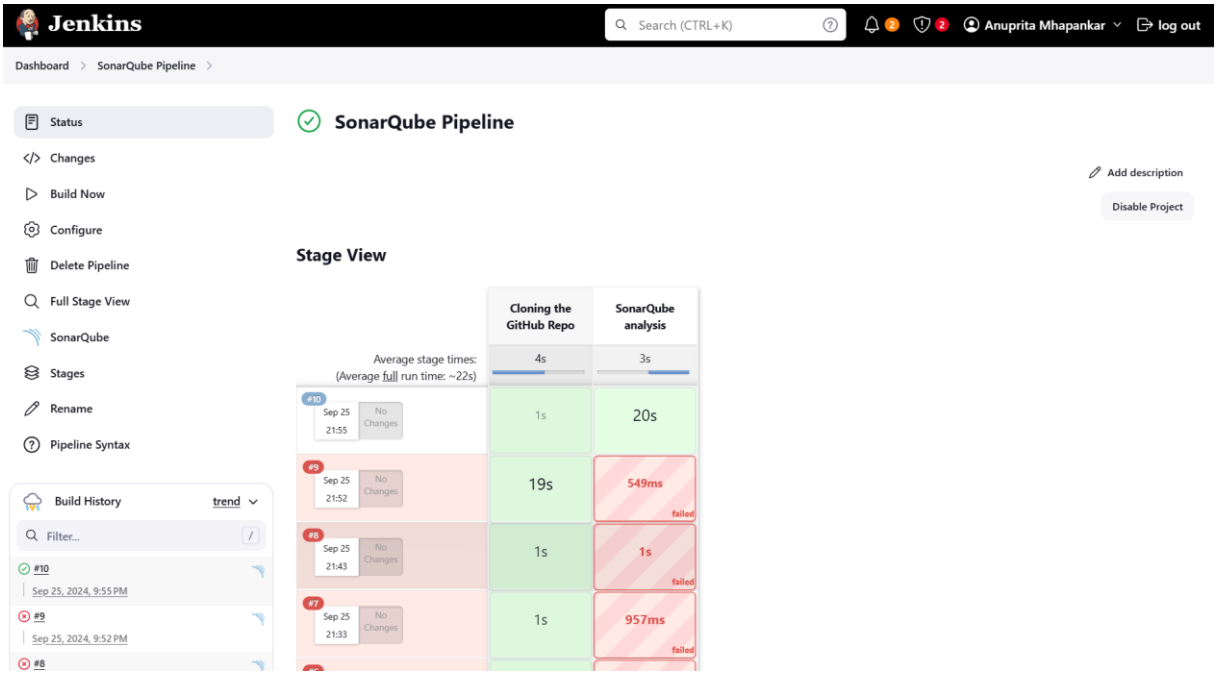
Step 5: In the configuration, under the Pipeline Section write the following Pipeline Script -

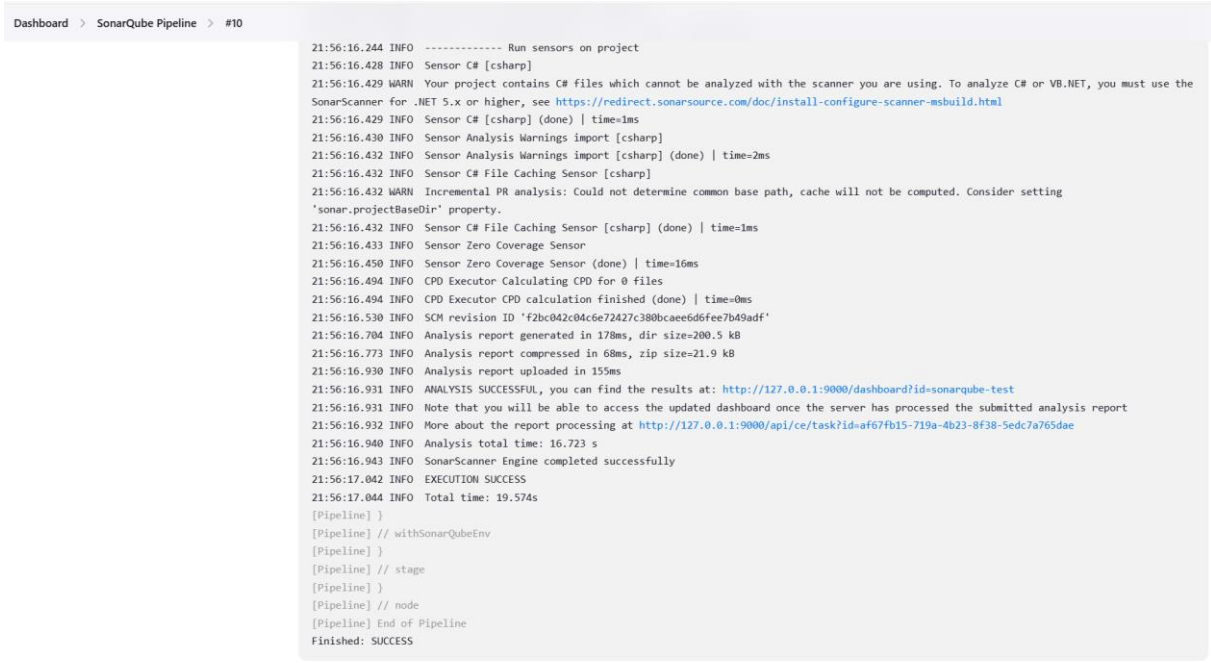
```
node {
   stage('Cloning the GitHub Repo') {
      git 'https://github.com/shazforiot/MSBuild_firstproject.git'
   }
   stage('SonarQube analysis') {
      withSonarQubeEnv('sonarqube') {
         bat "C:/sonar-scanner/sonar-scanner-6.2.0.4584-windows-x64/bin/sonar-scanner.bat \
            -D sonar.login=admin \
            -D sonar.password=sonarqube \
            -D sonar.projectKey=sonarqube-test \
            -D sonar.exclusions=vendor/**,resources/**,**/*.java \
            -D sonar.host.url=http://127.0.0.1:9000/"
      }
   }
}
```

Then click on the save button.

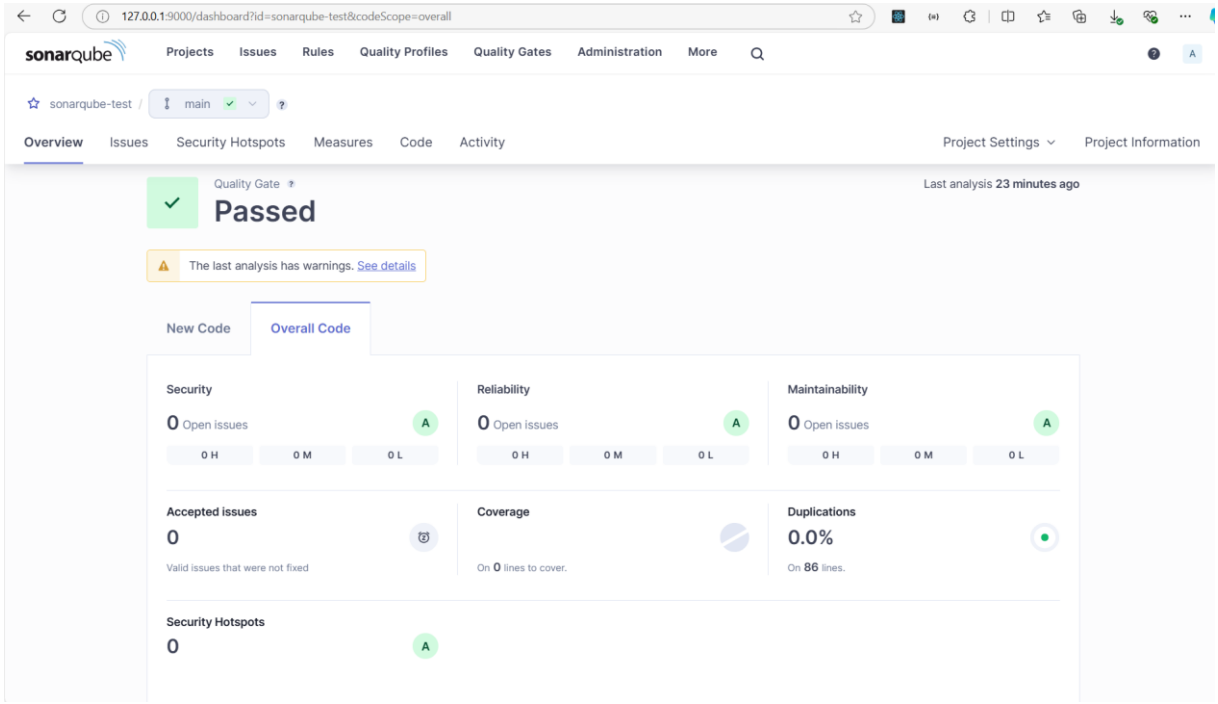


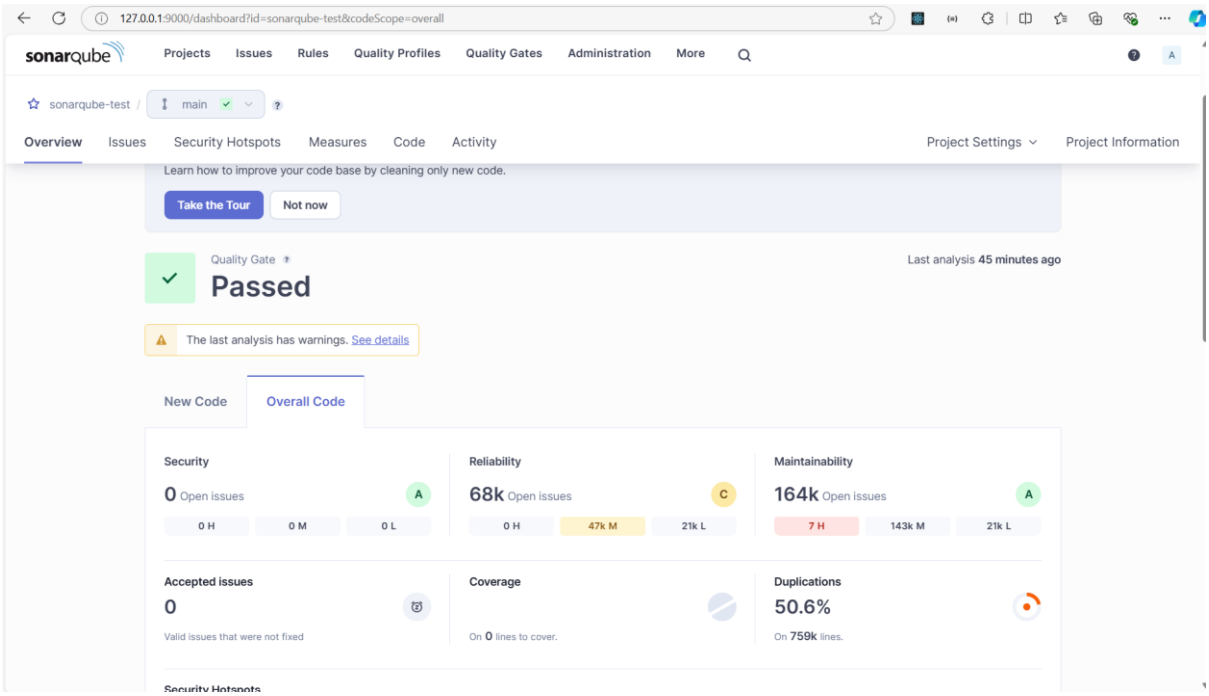
Step 6: Now, click on Build Now and the build is successful.





Step 7: Now, visit http://127.0.0.1:9000/dashboard?id=sonarqube-test to see the result.

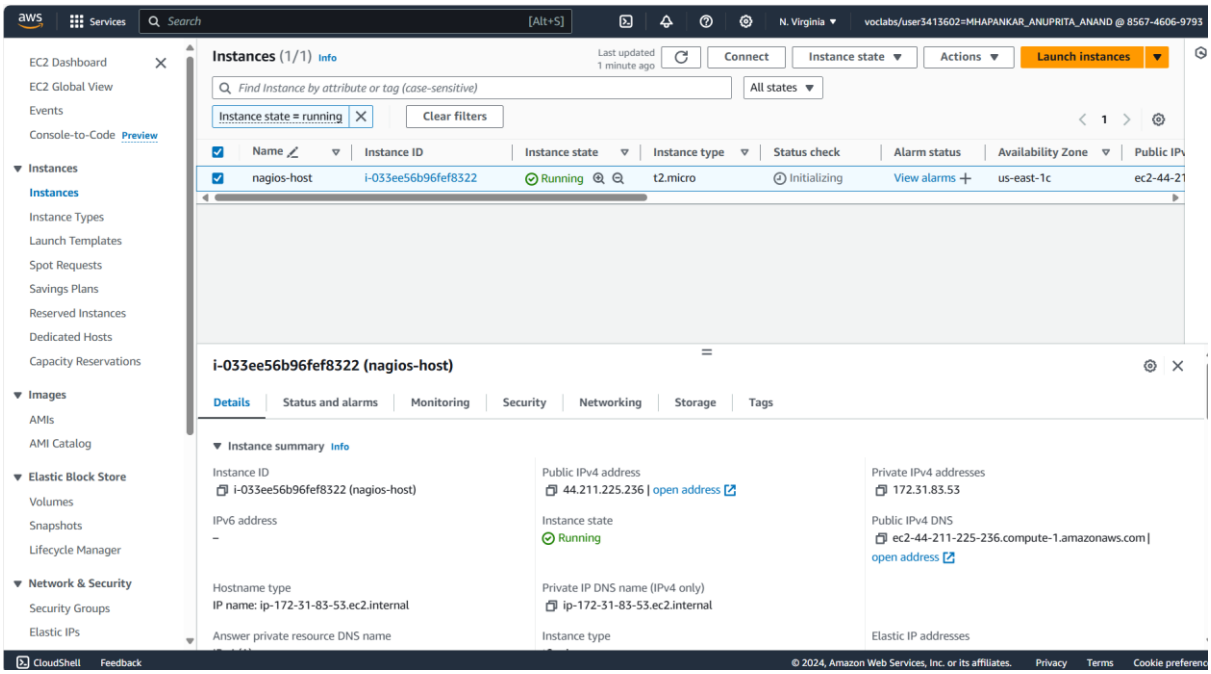



127.0.0.1:9000/dashboard?id=sonarqube-test&codeScope=overall
sonarqube
Projects
Issues
Rules
Quality Profiles
Quality Gates
Administration
More
sonarqube-test
main
Overview
Issues
Security Hotspots
Measures
Code
Activity
Project Settings
Project Information
Learn how to improve your code base by cleaning only new code.
Take the Tour
Not now
Quality Gate
Passed
Last analysis 45 minutes ago
The last analysis has warnings. See details
New Code
Overall Code
Security
0 Open issues
A
0 H
0 M
0 L
Reliability
68k Open issues
C
0 H
47k M
21k L
Maintainability
164k Open issues
A
7 H
143k M
21k L
Accepted issues
0
Valid issues that were not fixed
Coverage
On 0 lines to cover.
Duplications
50.6%
On 759k lines.
Security Hotspots

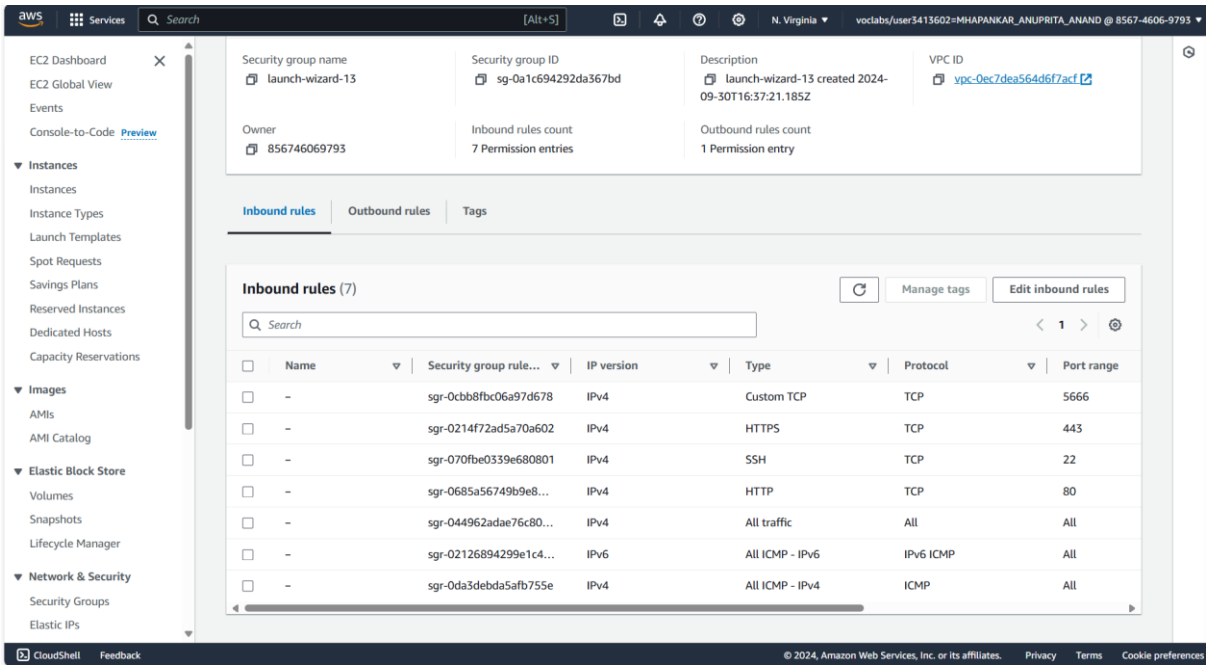
Experiment 9

Aim: To Understand Continuous monitoring and Installation and configuration of Nagios Core, Nagios Plugins and NRPE (Nagios Remote Plugin Executor) on Linux Machine.

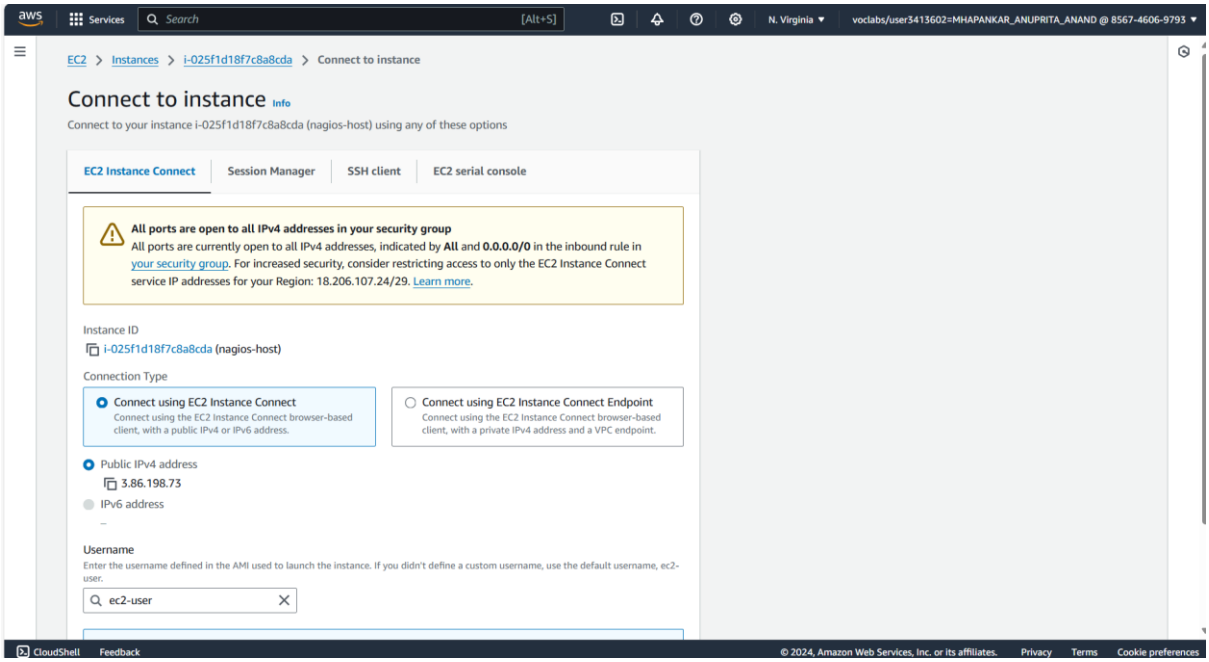
Step 1: Create an EC2 Instance and name it as nagios-host



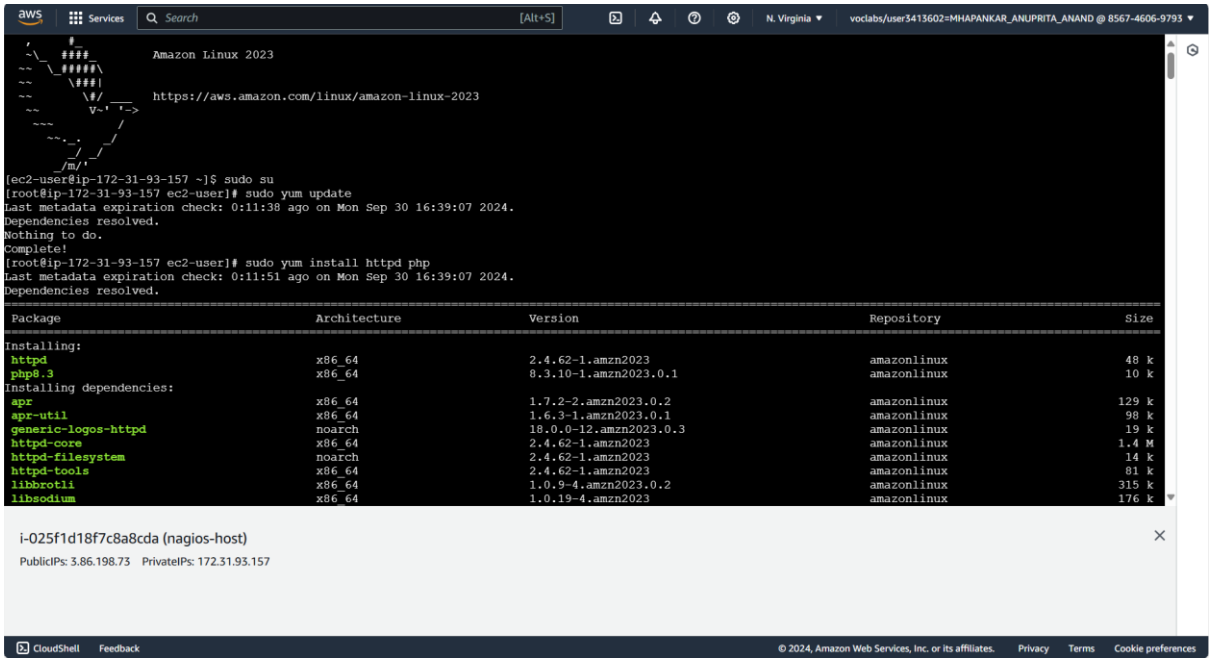
Step 2: Under the security groups, click on edit inbound rules and set as shown in the figure below

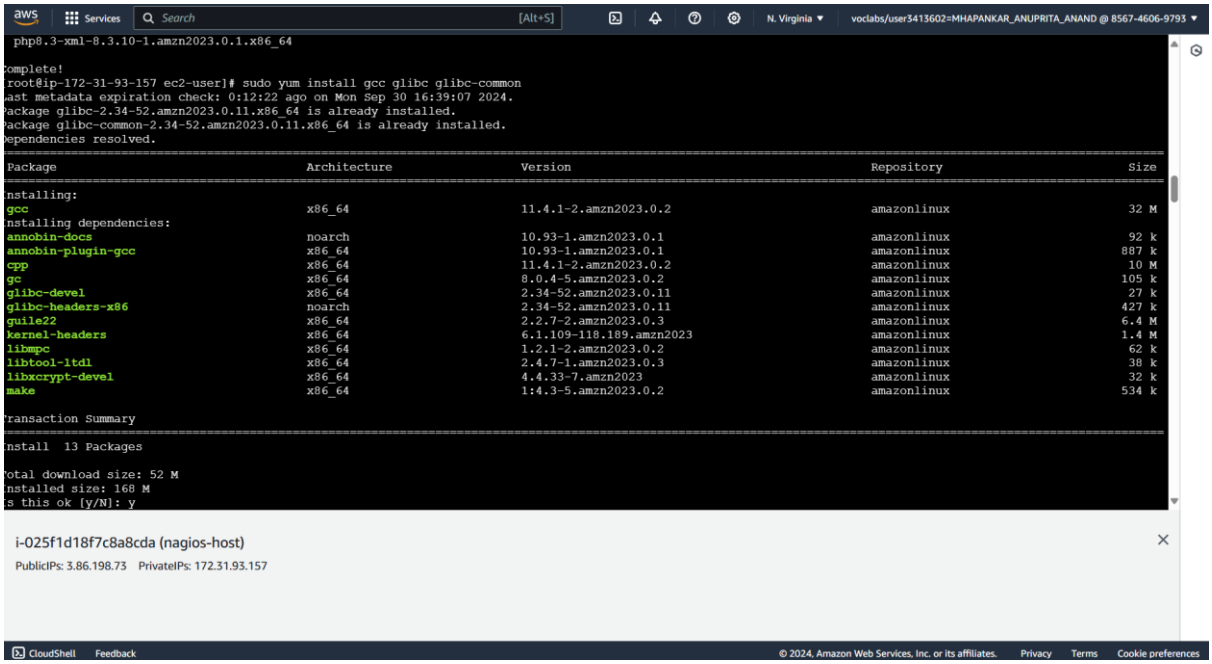


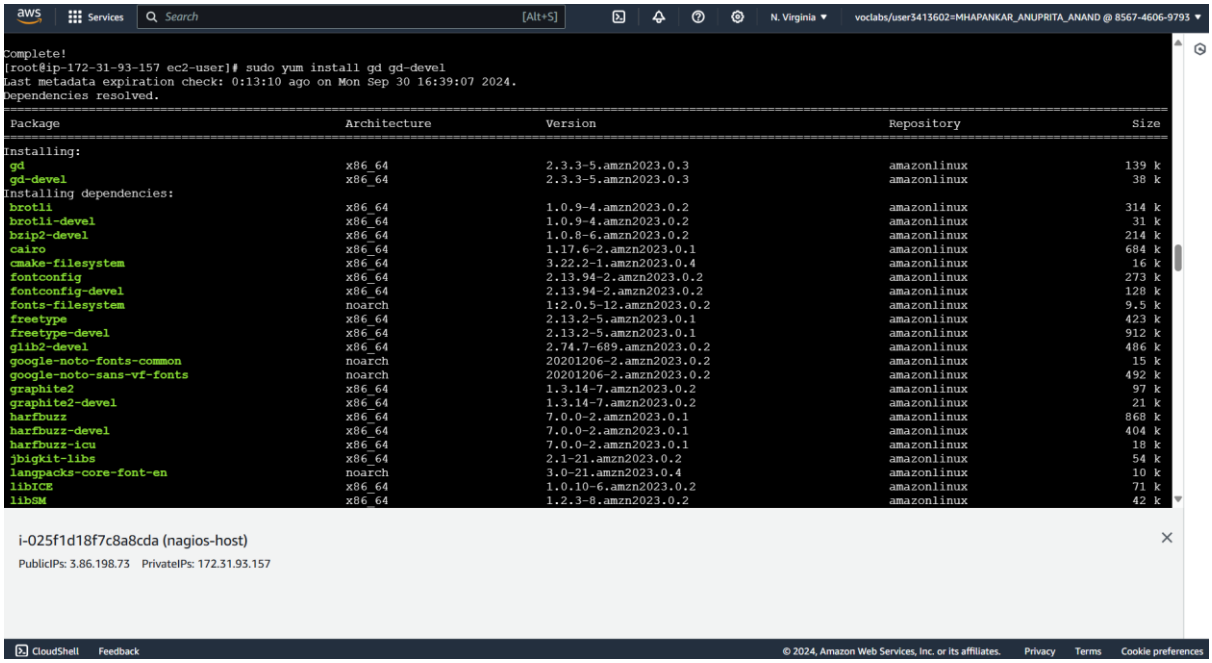
Step 3: Then select the instance nagios-host and then connect the instance.



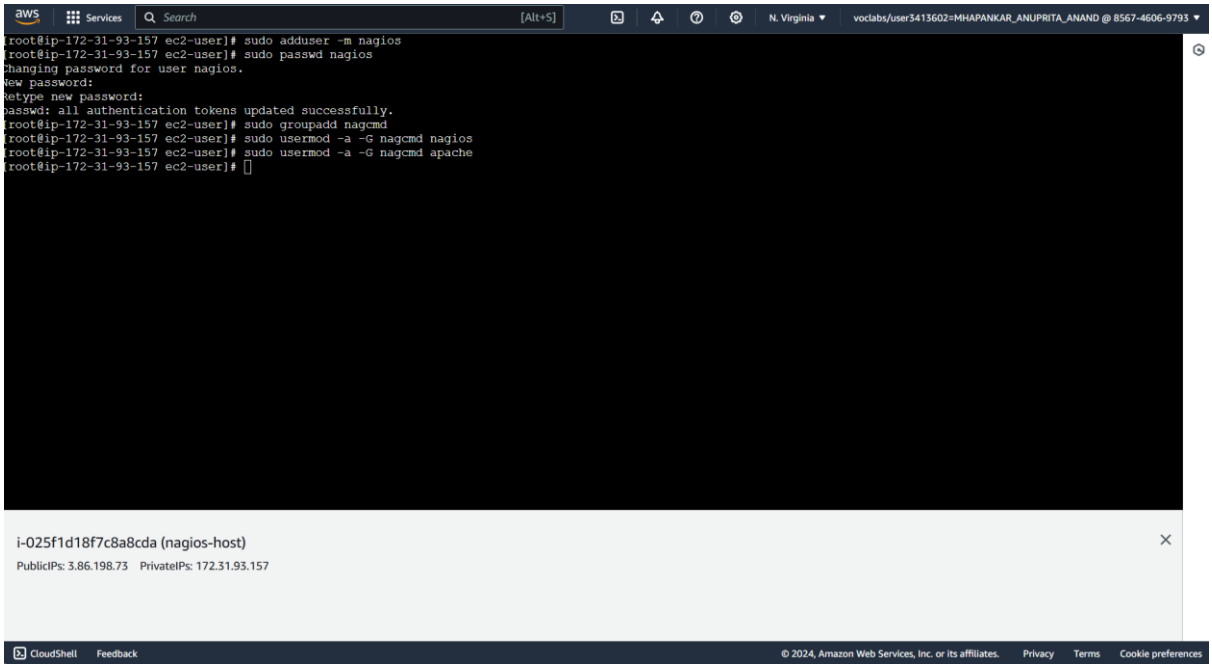
Step 3: Now, run the following commands -
sudo su
sudo yum update
sudo yum install httpd php
sudo yum install gcc glibc glibc-common
sudo yum install gd gd-devel



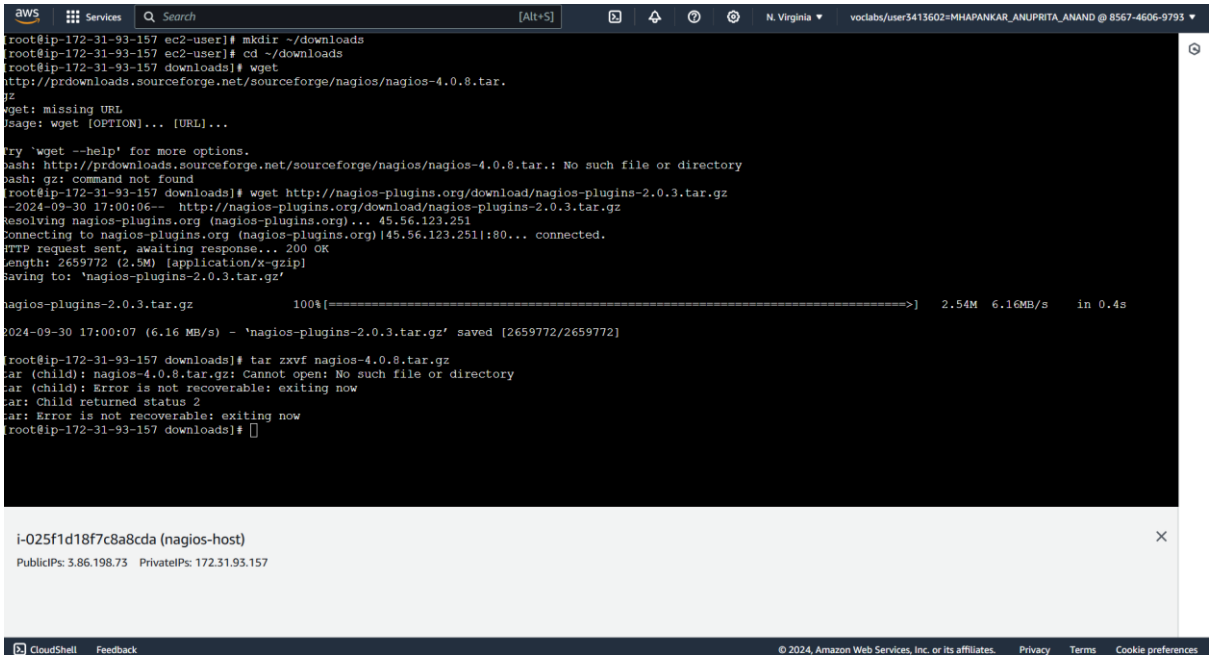




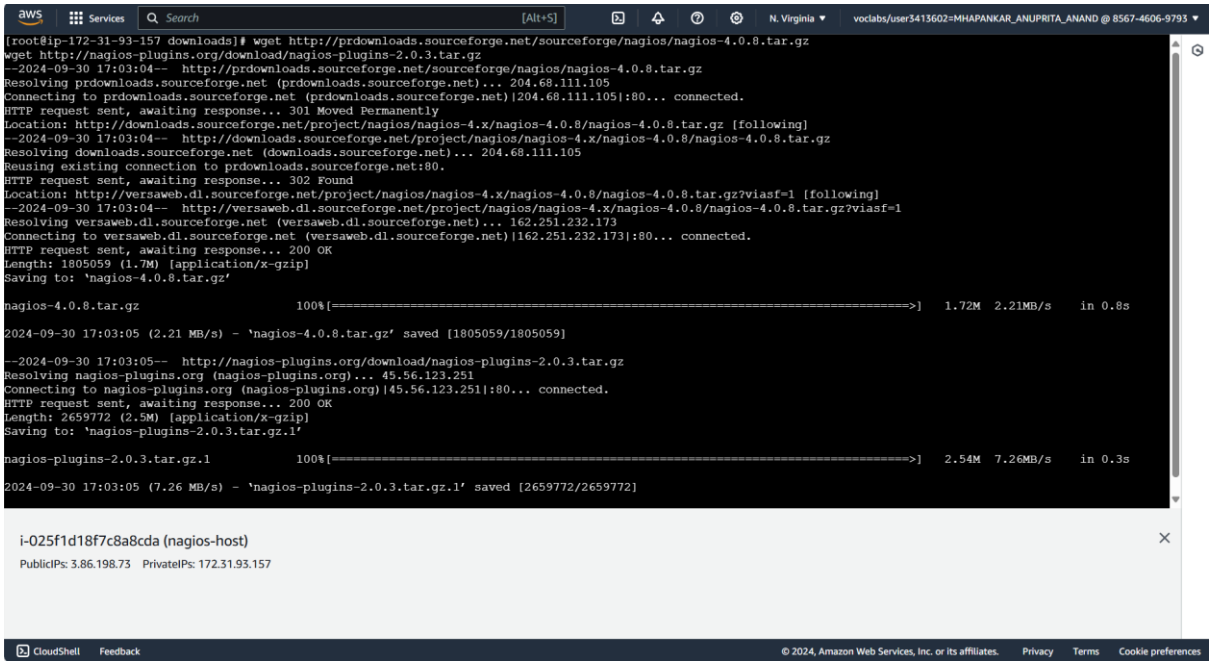
Step 4: Create a new nagios user with its password.
sudo adduser -m nagios
sudo passwd nagios
sudo groupadd nagcmd
sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache



Step 5: Now, run the following commands -
mkdir ~/downloads
cd ~/downloads
wget http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
wget http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz
tar zxvf nagios-4.0.8.tar.gz



To resolve the error run the following commands -
wget http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
wget http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz
tar zxvf nagios-4.0.8.tar.gz
tar zxvf nagios-plugins-2.0.3.tar.gz
cd nagios-4.0.8


aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
[root@ip-172-31-93-157 downloads]# wget http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
wget http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz
--2024-09-30 17:03:04-- http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
Resolving prdownloads.sourceforge.net (prdownloads.sourceforge.net)... 204.68.111.105
Connecting to prdownloads.sourceforge.net (prdownloads.sourceforge.net)|204.68.111.105|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: http://downloads.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz [following]
--2024-09-30 17:03:04-- http://downloads.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz
Resolving downloads.sourceforge.net (downloads.sourceforge.net)... 204.68.111.105
Reusing existing connection to prdownloads.sourceforge.net:80.
HTTP request sent, awaiting response... 302 Found
Location: http://versaweb.dl.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz?viasf=1 [following]
--2024-09-30 17:03:04-- http://versaweb.dl.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz?viasf=1
Resolving versaweb.dl.sourceforge.net (versaweb.dl.sourceforge.net)... 162.251.232.173
Connecting to versaweb.dl.sourceforge.net (versaweb.dl.sourceforge.net)|162.251.232.173|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1805059 (1.7M) [application/x-gzip]
Saving to: 'nagios-4.0.8.tar.gz'
nagios-4.0.8.tar.gz 100%[=>] 1.72M 2.21MB/s in 0.8s
2024-09-30 17:03:05 (2.21 MB/s) - 'nagios-4.0.8.tar.gz' saved [1805059/1805059]
--2024-09-30 17:03:05-- http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz
Resolving nagios-plugins.org (nagios-plugins.org)... 45.56.123.251
Connecting to nagios-plugins.org (nagios-plugins.org)|45.56.123.251|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2659772 (2.5M) [application/x-gzip]
Saving to: 'nagios-plugins-2.0.3.tar.gz.1'
nagios-plugins-2.0.3.tar.gz.1 100%[=>] 2.54M 7.26MB/s in 0.3s
2024-09-30 17:03:05 (7.26 MB/s) - 'nagios-plugins-2.0.3.tar.gz.1' saved [2659772/2659772]
i-025f1d18f7c8a8cda (nagios-host)
PublicIPs: 3.86.198.73 PrivateIPs: 172.31.93.157
CloudShell
Feedback
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Privacy
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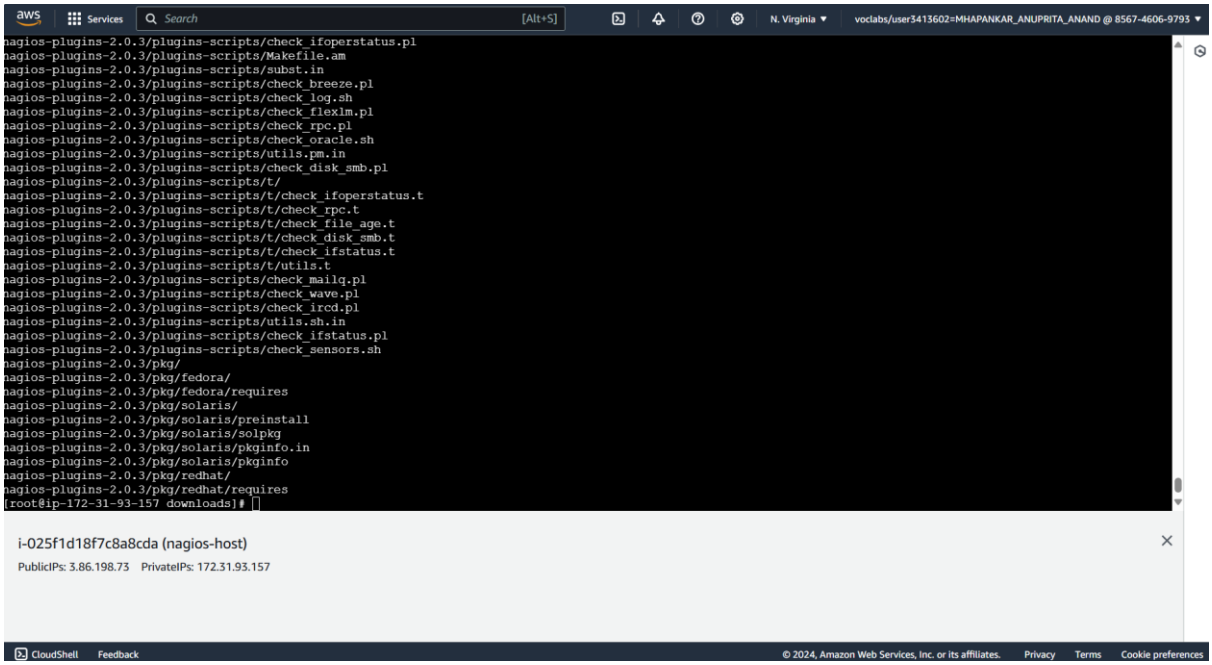
Cookie preferences


aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
nagios-plugins-2.0.3/plugins-scripts/check_ifoperstatus.pl
nagios-plugins-2.0.3/plugins-scripts/Makefile.am
nagios-plugins-2.0.3/plugins-scripts/subst.in
nagios-plugins-2.0.3/plugins-scripts/check_breeze.pl
nagios-plugins-2.0.3/plugins-scripts/check_log.sh
nagios-plugins-2.0.3/plugins-scripts/check_flexlm.pl
nagios-plugins-2.0.3/plugins-scripts/check_rpc.pl
nagios-plugins-2.0.3/plugins-scripts/check_oracle.sh
nagios-plugins-2.0.3/plugins-scripts/utils.pm.in
nagios-plugins-2.0.3/plugins-scripts/check_disk_smb.pl
nagios-plugins-2.0.3/plugins-scripts/t/
nagios-plugins-2.0.3/plugins-scripts/t/check_ifoperstatus.t
nagios-plugins-2.0.3/plugins-scripts/t/check_rpc.t
nagios-plugins-2.0.3/plugins-scripts/t/check_file_age.t
nagios-plugins-2.0.3/plugins-scripts/t/check_disk_smb.t
nagios-plugins-2.0.3/plugins-scripts/t/check_ifstatus.t
nagios-plugins-2.0.3/plugins-scripts/t/utils.t
nagios-plugins-2.0.3/plugins-scripts/check_mailq.pl
nagios-plugins-2.0.3/plugins-scripts/check_wave.pl
nagios-plugins-2.0.3/plugins-scripts/check_ircd.pl
nagios-plugins-2.0.3/plugins-scripts/utils.sh.in
nagios-plugins-2.0.3/plugins-scripts/check_ifstatus.pl
nagios-plugins-2.0.3/plugins-scripts/check_sensors.sh
nagios-plugins-2.0.3/pkg/
nagios-plugins-2.0.3/pkg/fedora/
nagios-plugins-2.0.3/pkg/fedora/requires
nagios-plugins-2.0.3/pkg/solaris/
nagios-plugins-2.0.3/pkg/solaris/preinstall
nagios-plugins-2.0.3/pkg/solaris/solpkg
nagios-plugins-2.0.3/pkg/solaris/pkginfo.in
nagios-plugins-2.0.3/pkg/solaris/pkginfo
nagios-plugins-2.0.3/pkg/redhat/
nagios-plugins-2.0.3/pkg/redhat/requires
[root@ip-172-31-93-157 downloads]#
i-025f1d18f7c8a8cda (nagios-host)
PublicIPs: 3.86.198.73 PrivateIPs: 172.31.93.157
CloudShell
Feedback
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Privacy
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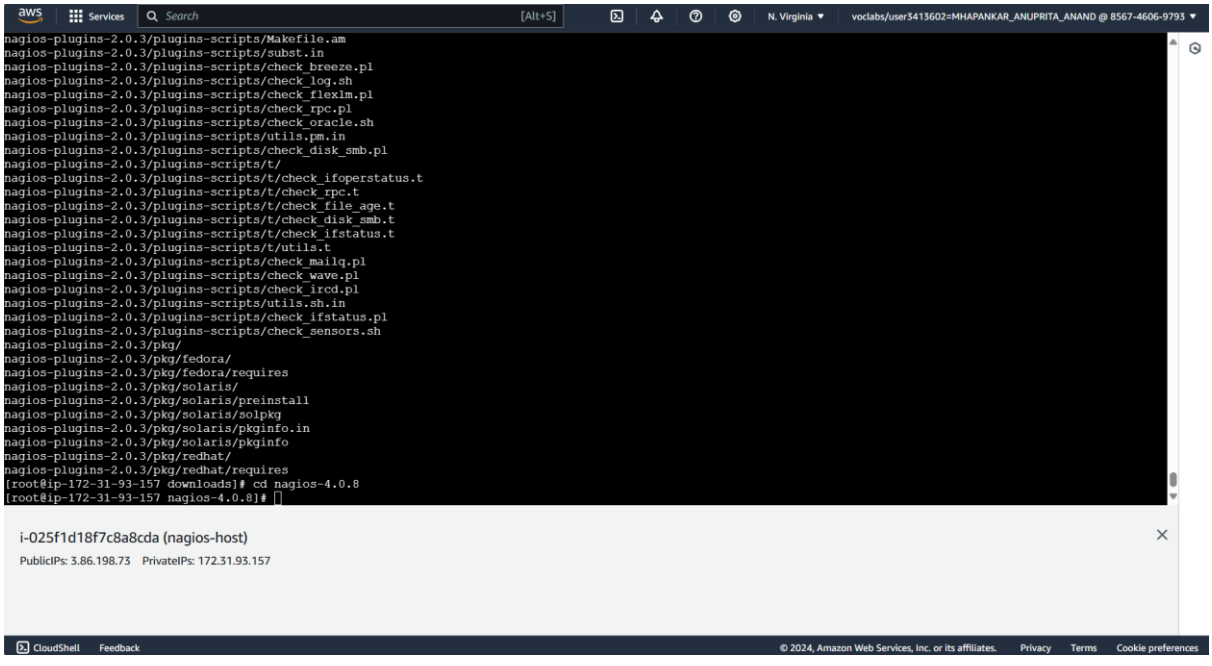
Cookie preferences


aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
nagios-plugins-2.0.3/plugins-scripts/Makefile.am
nagios-plugins-2.0.3/plugins-scripts/subst.in
nagios-plugins-2.0.3/plugins-scripts/check_breeze.pl
nagios-plugins-2.0.3/plugins-scripts/check_log.sh
nagios-plugins-2.0.3/plugins-scripts/check_flexlm.pl
nagios-plugins-2.0.3/plugins-scripts/check_rpc.pl
nagios-plugins-2.0.3/plugins-scripts/check_oracle.sh
nagios-plugins-2.0.3/plugins-scripts/utils.pm.in
nagios-plugins-2.0.3/plugins-scripts/check_disk_smb.pl
nagios-plugins-2.0.3/plugins-scripts/t/
nagios-plugins-2.0.3/plugins-scripts/t/check_ifoperstatus.t
nagios-plugins-2.0.3/plugins-scripts/t/check_rpc.t
nagios-plugins-2.0.3/plugins-scripts/t/check_file_age.t
nagios-plugins-2.0.3/plugins-scripts/t/check_disk_smb.t
nagios-plugins-2.0.3/plugins-scripts/t/check_ifstatus.t
nagios-plugins-2.0.3/plugins-scripts/t/utils.t
nagios-plugins-2.0.3/plugins-scripts/check_mailq.pl
nagios-plugins-2.0.3/plugins-scripts/check_wave.pl
nagios-plugins-2.0.3/plugins-scripts/check_ircd.pl
nagios-plugins-2.0.3/plugins-scripts/utils.sh.in
nagios-plugins-2.0.3/plugins-scripts/check_ifstatus.pl
nagios-plugins-2.0.3/plugins-scripts/check_sensors.sh
nagios-plugins-2.0.3/pkg/
nagios-plugins-2.0.3/pkg/fedora/
nagios-plugins-2.0.3/pkg/fedora/requires
nagios-plugins-2.0.3/pkg/solaris/
nagios-plugins-2.0.3/pkg/solaris/preinstall
nagios-plugins-2.0.3/pkg/solaris/solpkg
nagios-plugins-2.0.3/pkg/solaris/pkginfo.in
nagios-plugins-2.0.3/pkg/solaris/pkginfo
nagios-plugins-2.0.3/pkg/redhat/
nagios-plugins-2.0.3/pkg/redhat/requires
[root@ip-172-31-93-157 downloads]# cd nagios-4.0.8
[root@ip-172-31-93-157 nagios-4.0.8]#
i-025f1d18f7c8a8cda (nagios-host)
PublicIPs: 3.86.198.73 PrivateIPs: 172.31.93.157
CloudShell
Feedback
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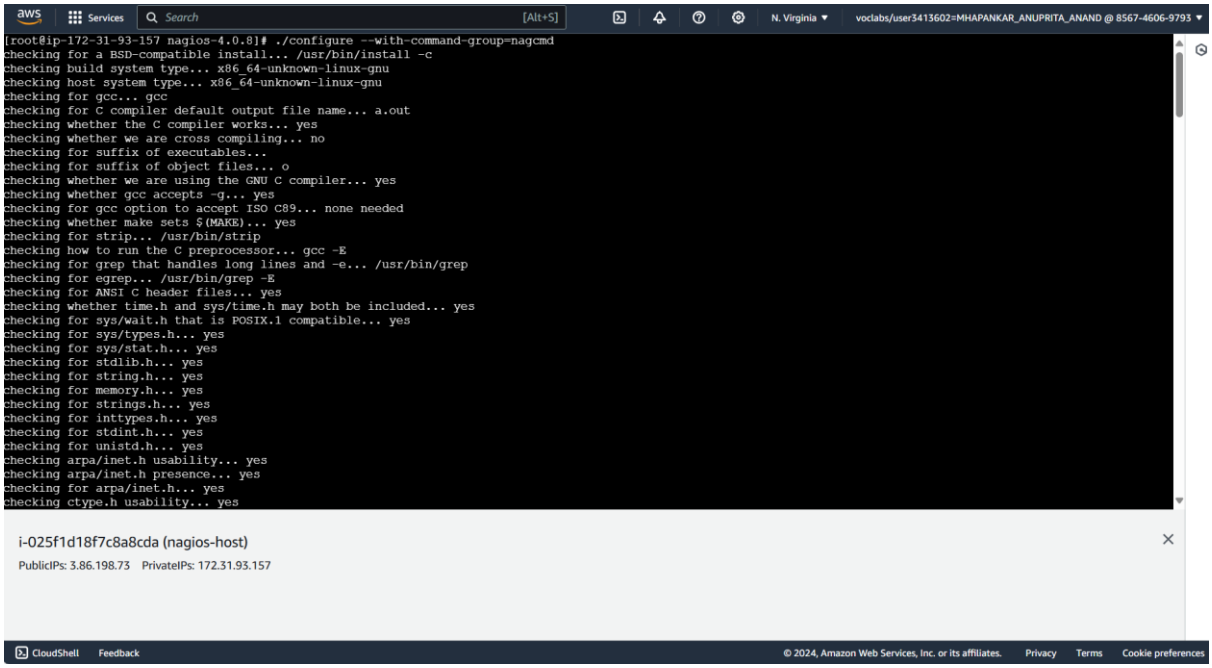
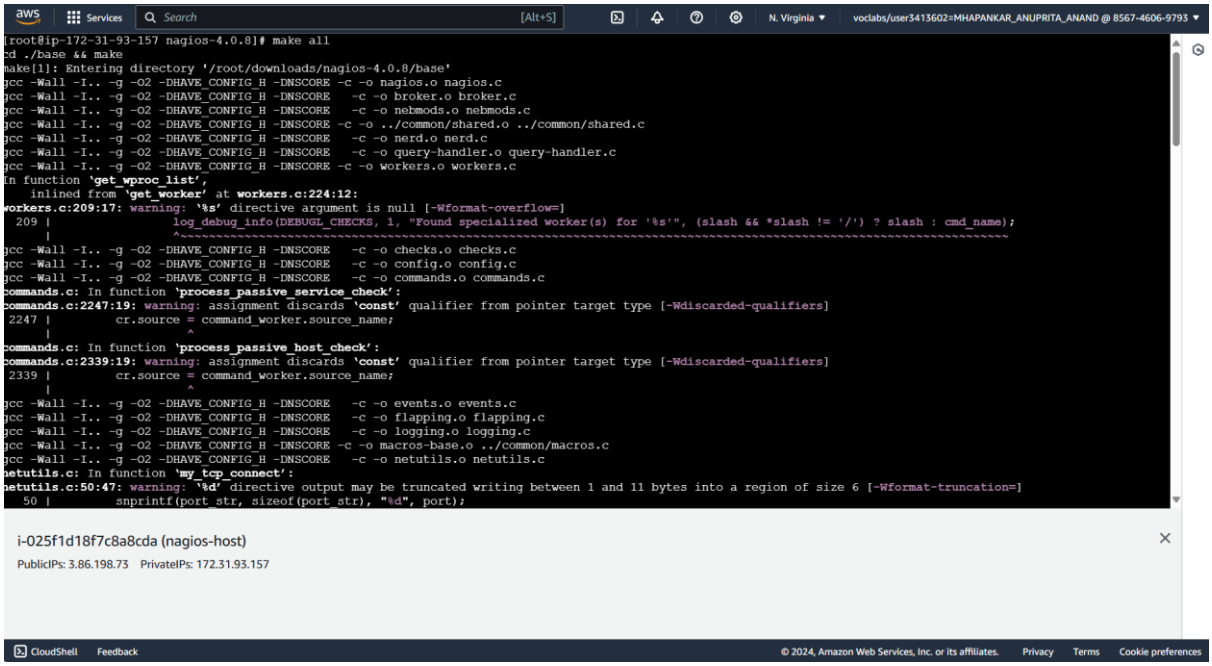
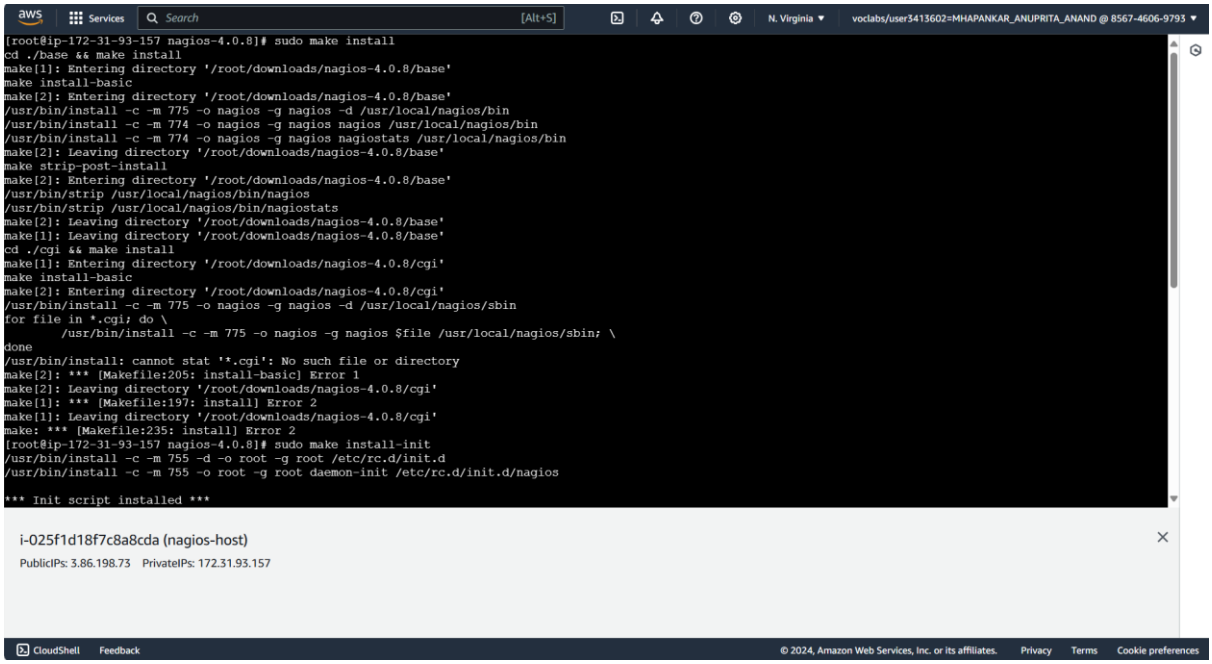
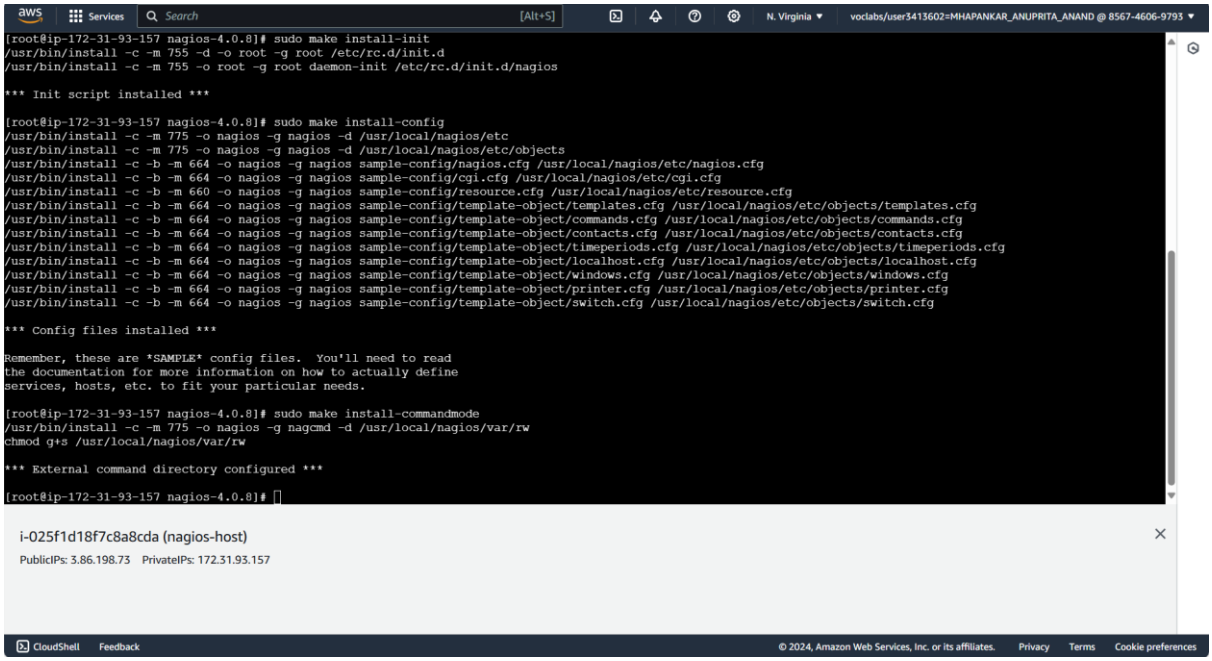
Step 6: Now to run the configuration script run the following command.
./configure --with-command-group=nagcmd



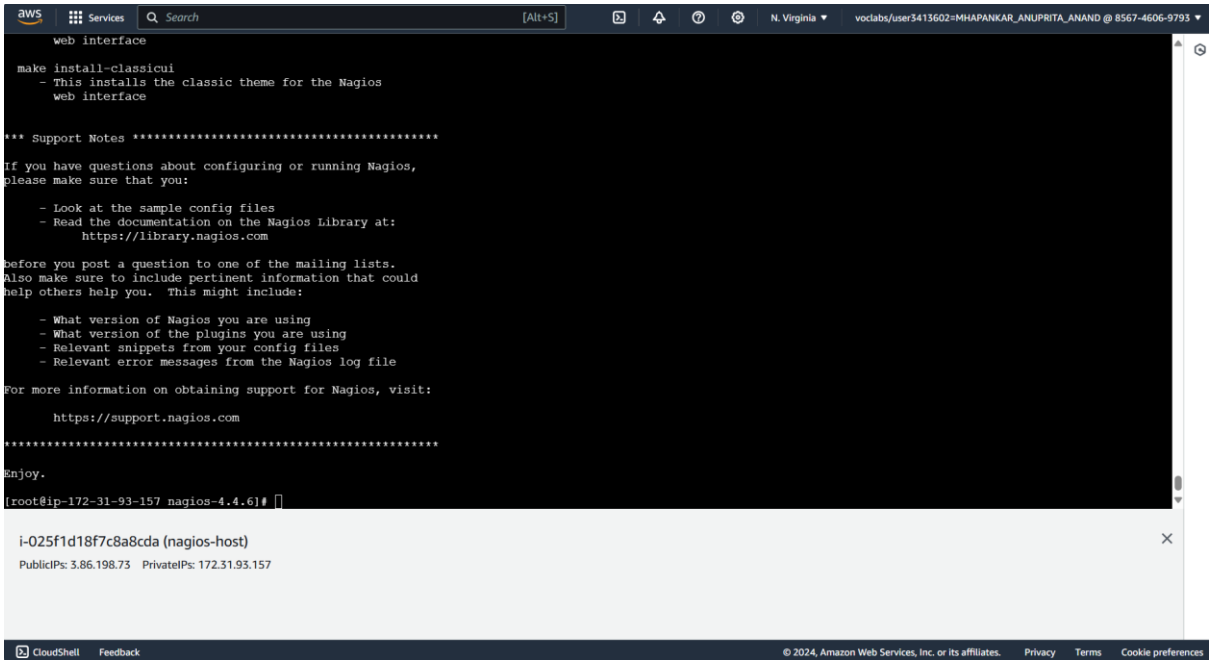
Step 7: Now, to compile the source code run the following command -
make all



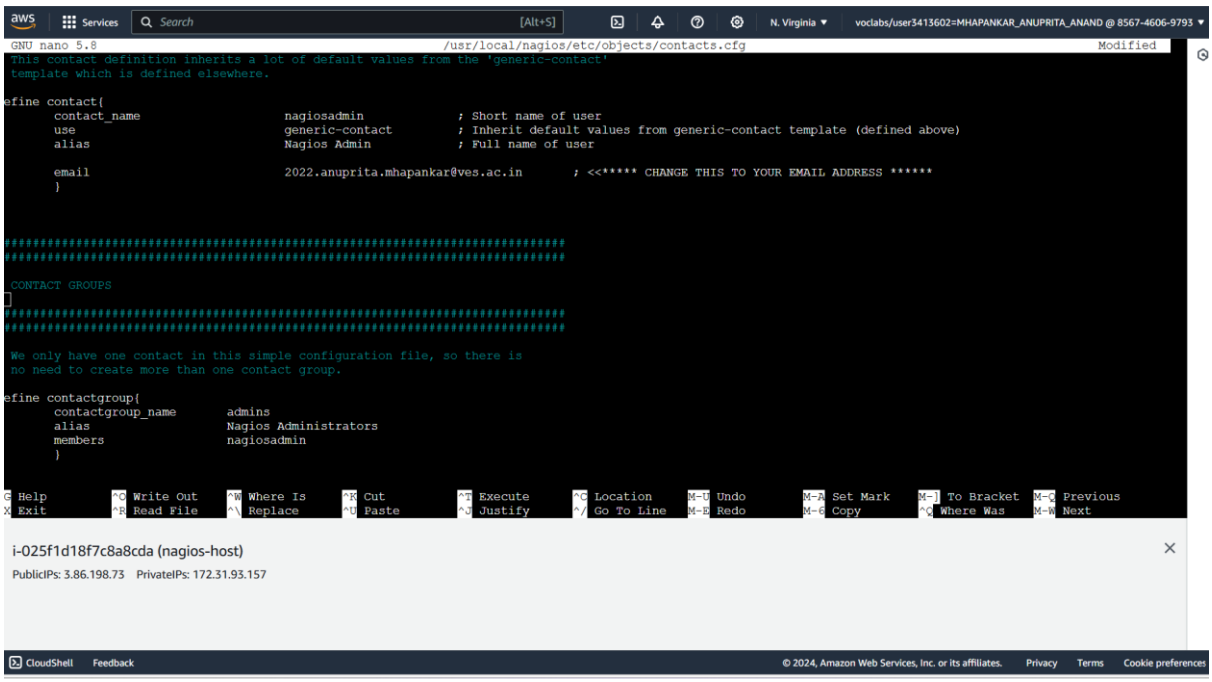




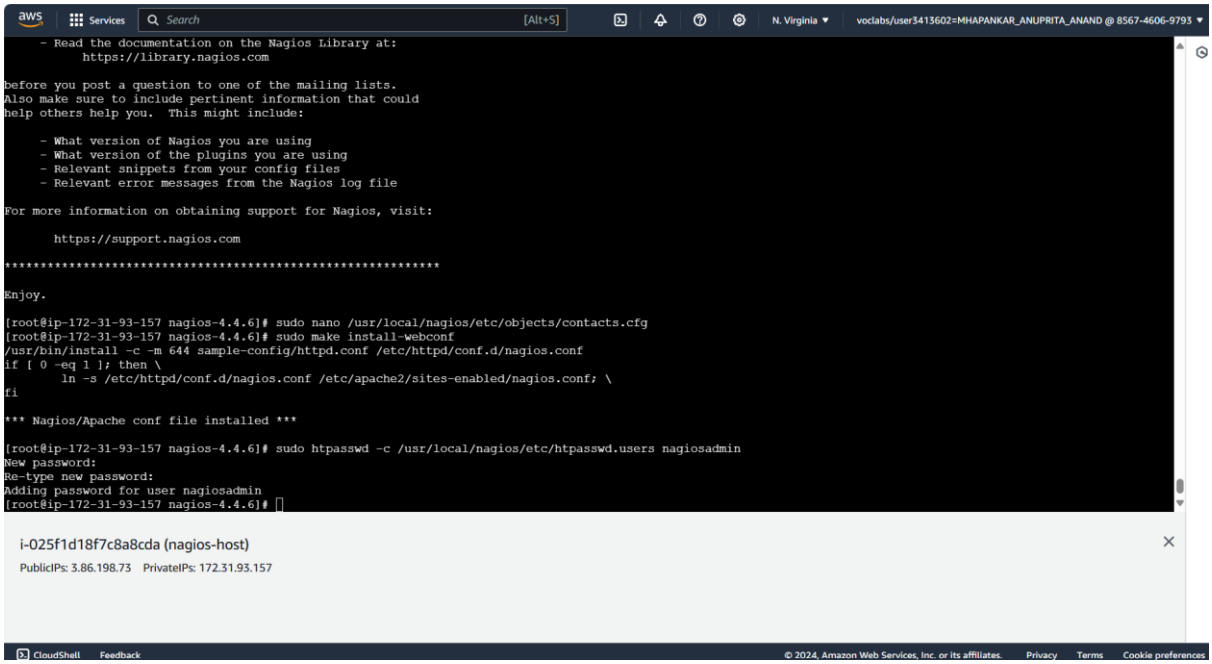
To resolve the errors run the following commands -
sudo yum install -y gcc glibc glibc-common gd gd-devel make net-snmp openssl-devel
rm -rf nagios-4.0.8
cd ~/downloads/nagios-4.4.6
./configure --with-command-group=nagcmd
make all
sudo make install

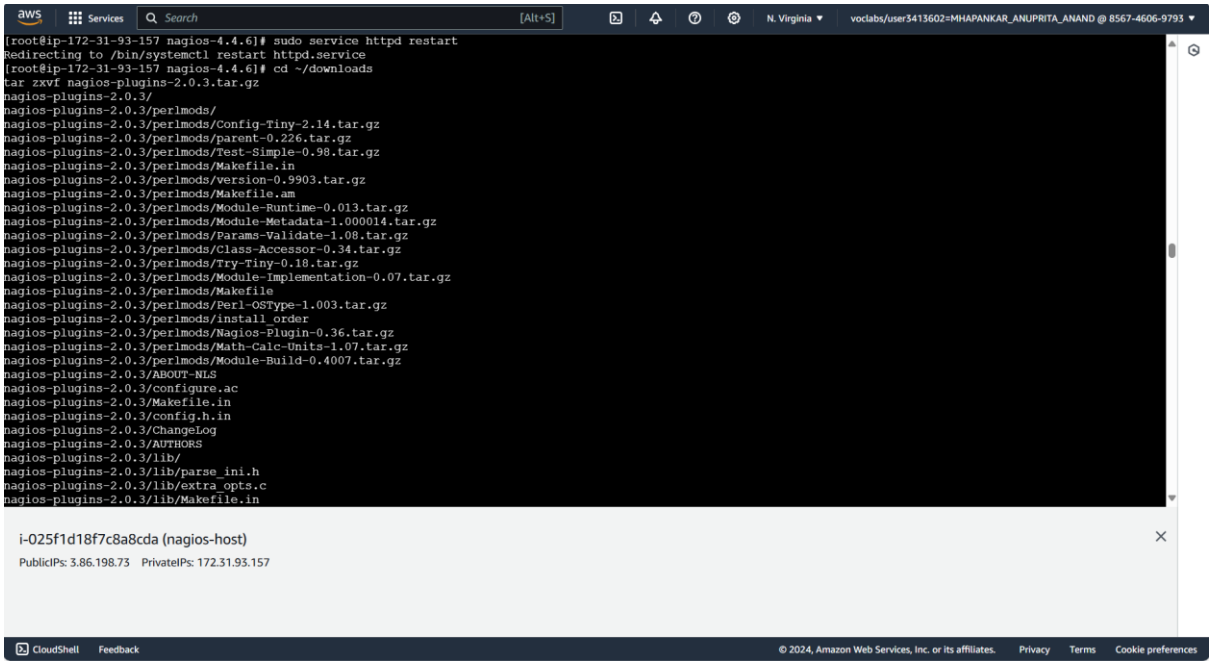


Step 8: Edit the config file and change the email address.
sudo nano /usr/local/nagios/etc/objects/contacts.cfg

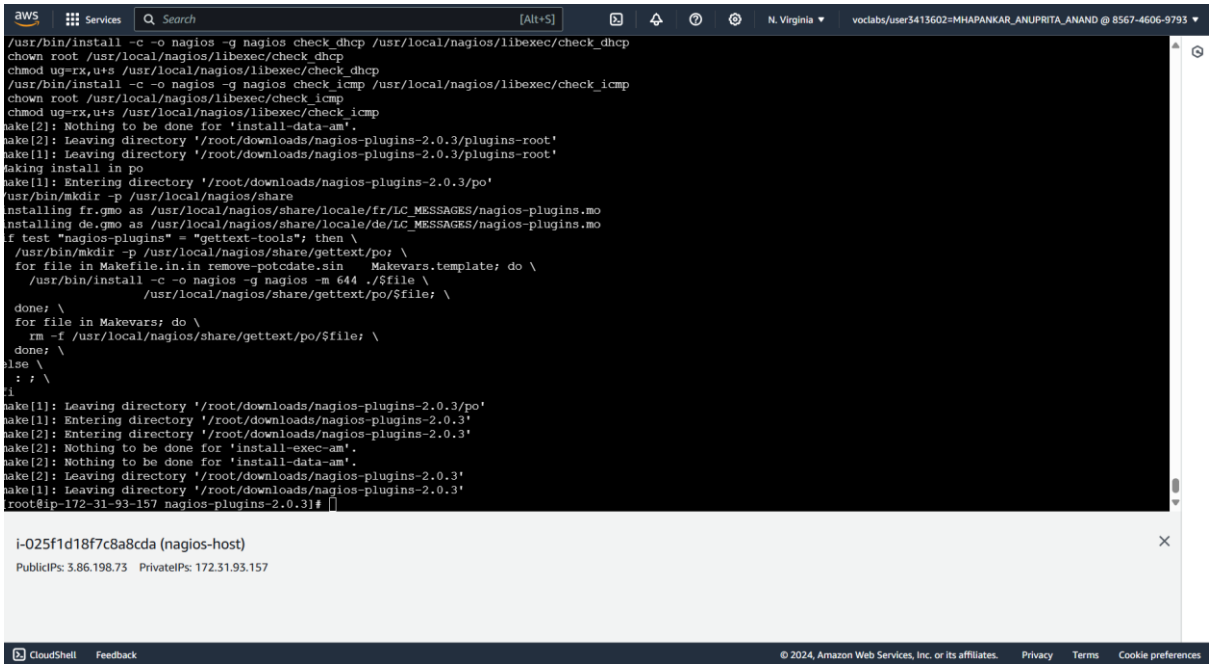


Step 9: Now run the following commands –
sudo make install-webconf
sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
sudo service httpd restart
cd ~/downloads
tar zxvf nagios-plugins-2.0.3.tar.gz





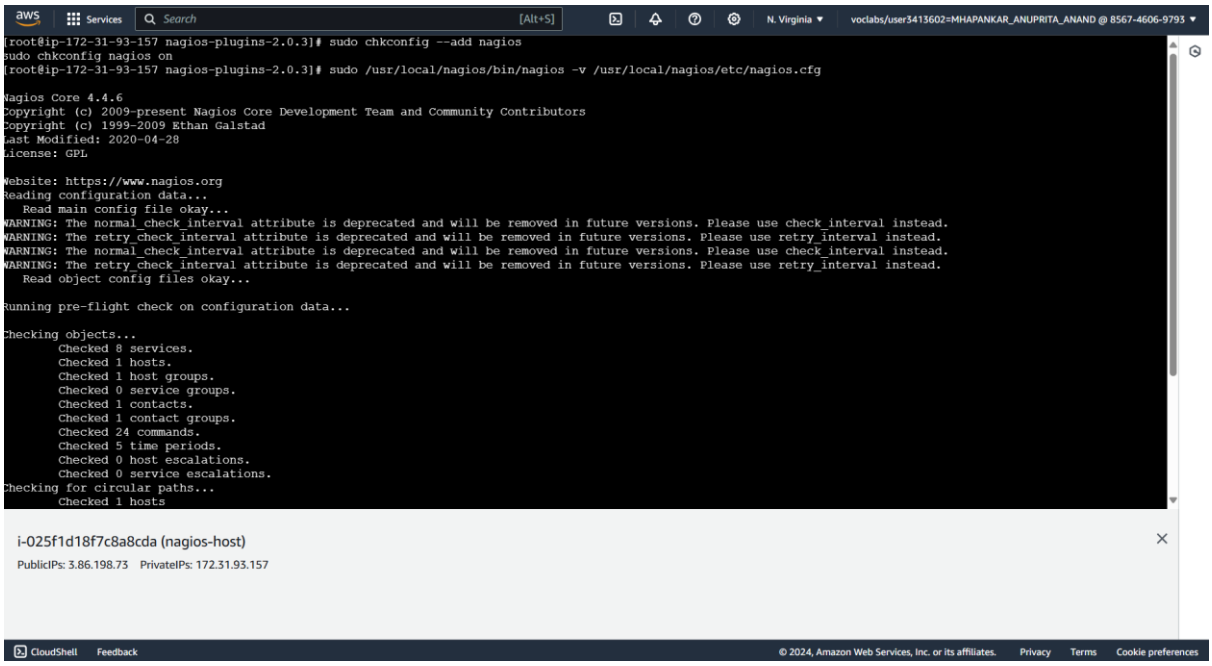
Step 10: Compile and install plugins
cd nagios-plugins-2.0.3
./configure --with-nagios-user=nagios --with-nagios-group=nagios
make
sudo make install



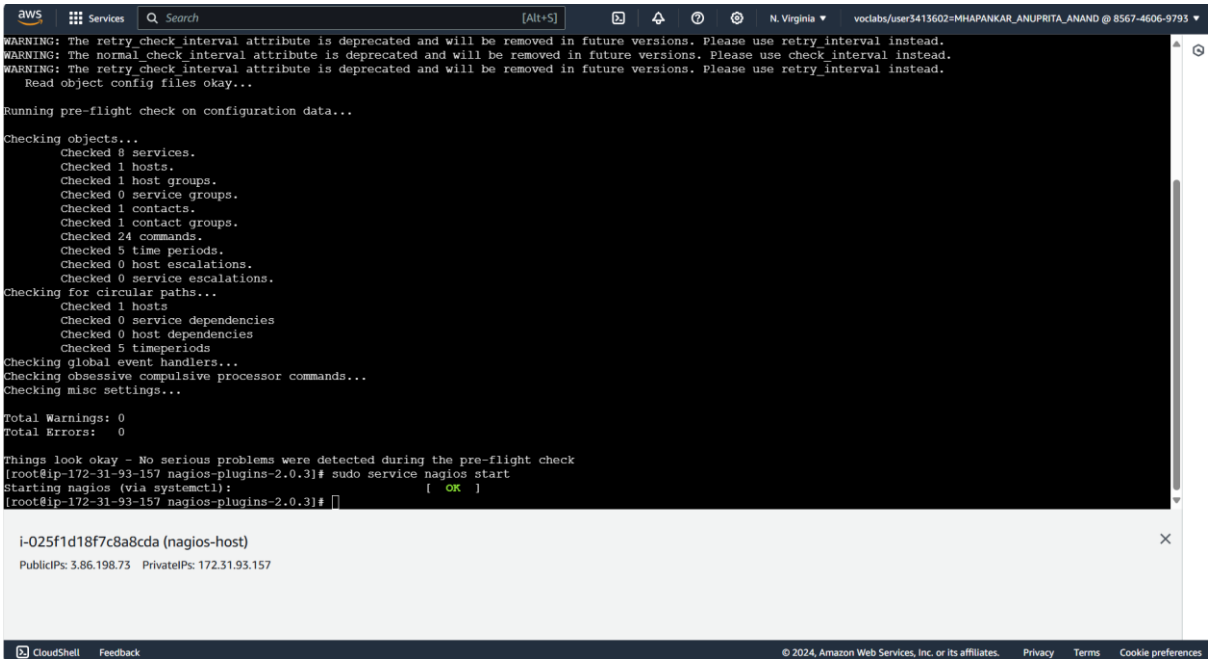
Step 11: To start nagios run the following commands –
sudo chkconfig --add nagios

sudo chkconfig nagios on

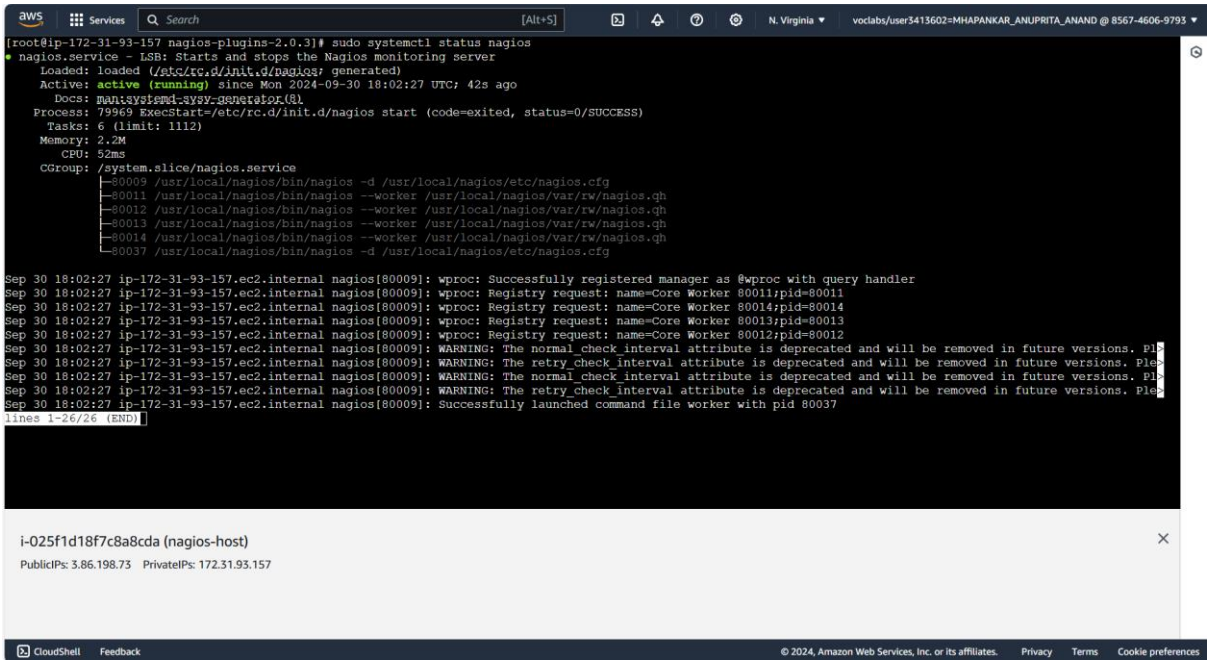
Verify using the following command -
sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg



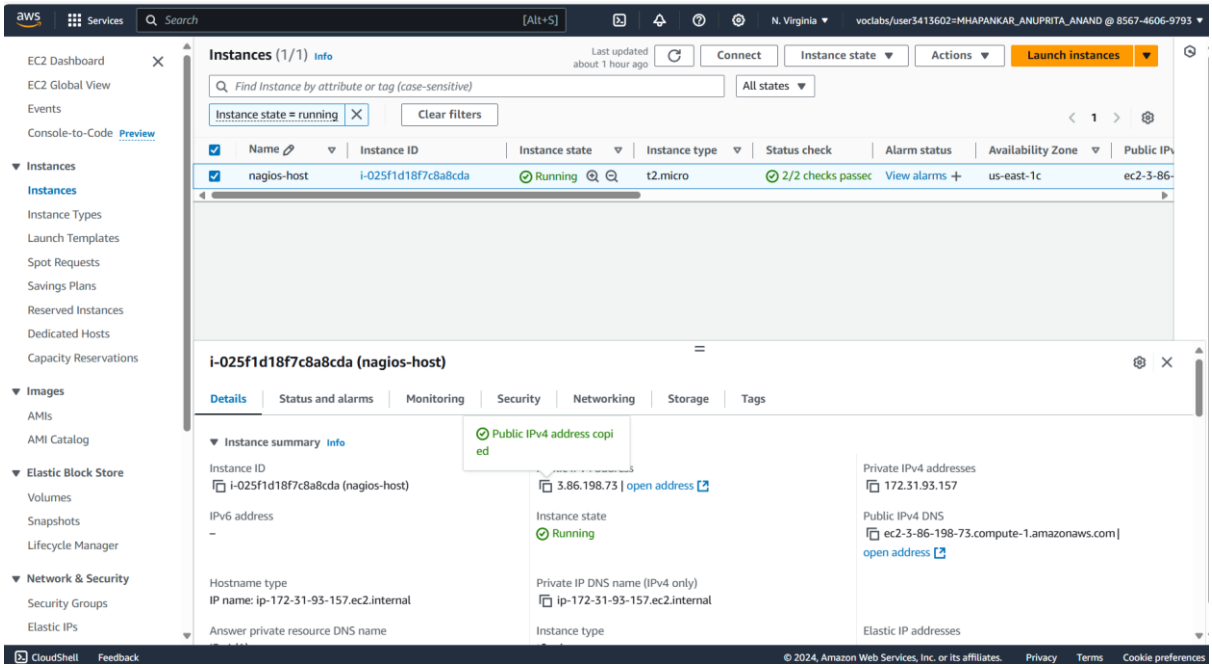
If there are no errors run the following command –
sudo service nagios start



Check status using the following command -
sudo systemctl status nagios



Step 12: Go to EC2 instance and copy the public IP address of the instance

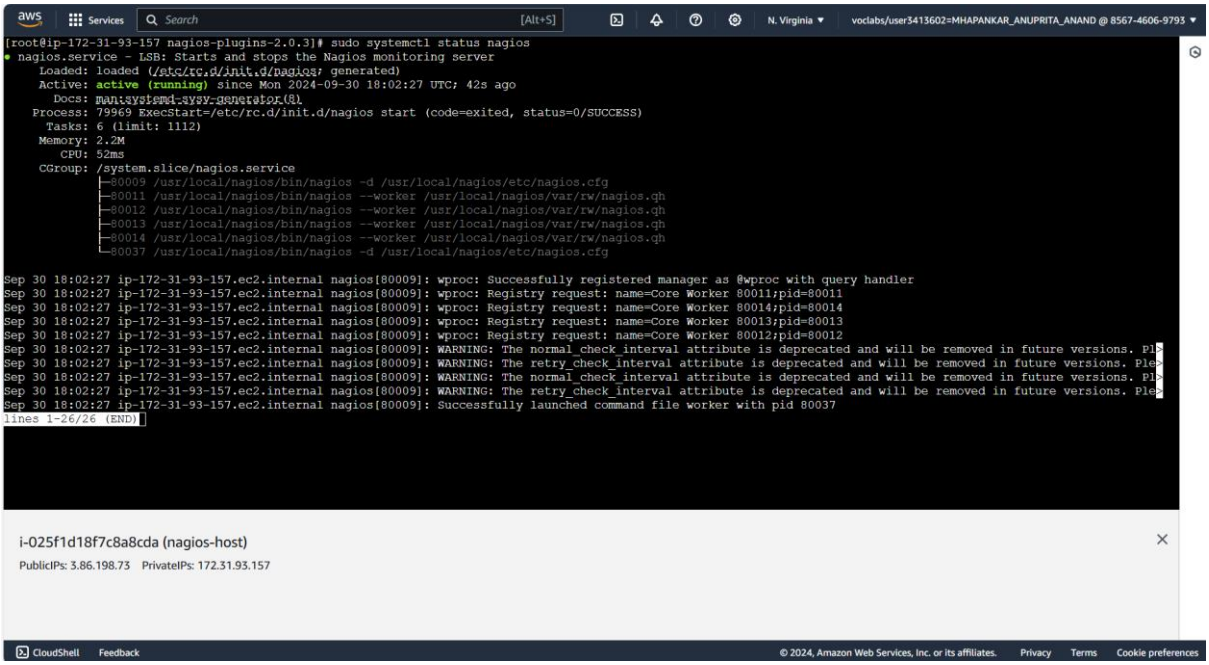


Step 13: Now visit http://<your_public_ip_address>/nagios Enter correct credentials and then you will see this page.

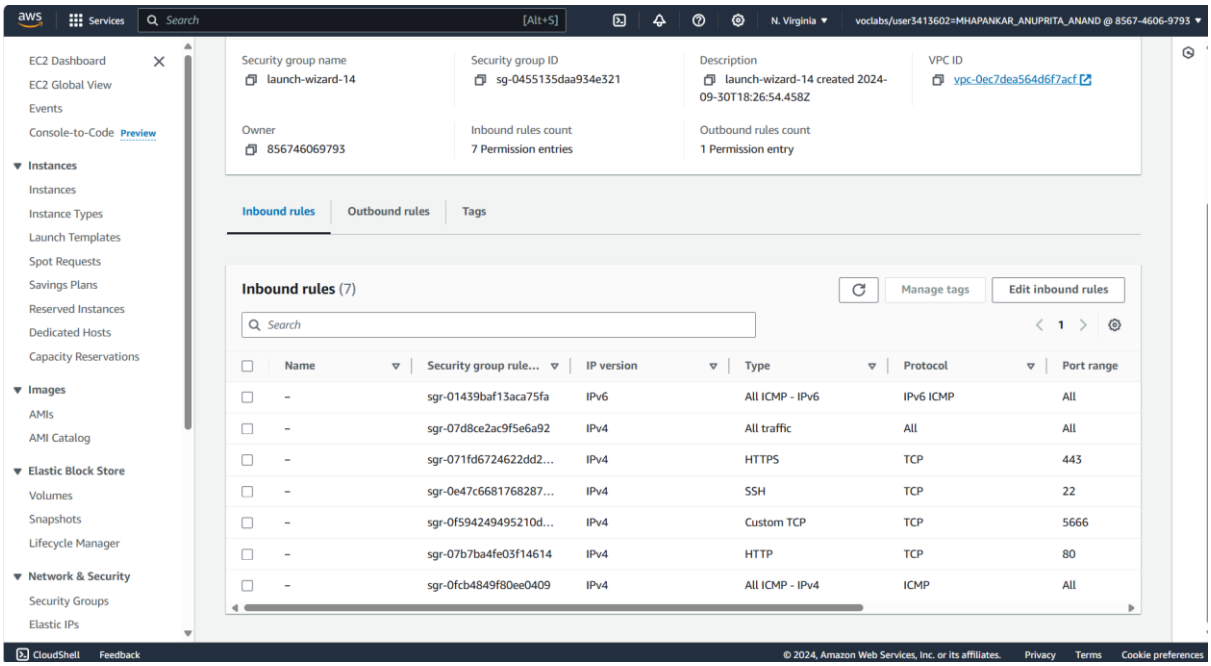
Experiment 10

Aim: To perform Port, Service monitoring, Windows/Linux server monitoring using Nagios.

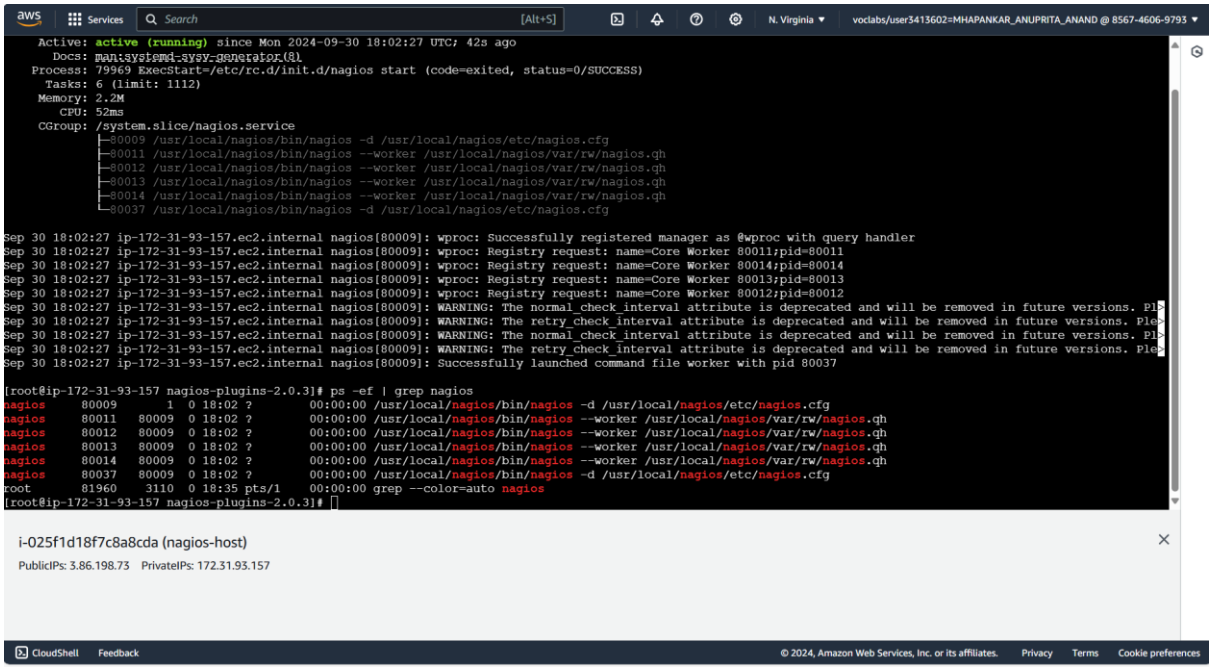
Step 1: Initially confirm that Nagios is running on the server side. For this run the following command -
sudo systemctl status nagios
on the nagios-host instance.



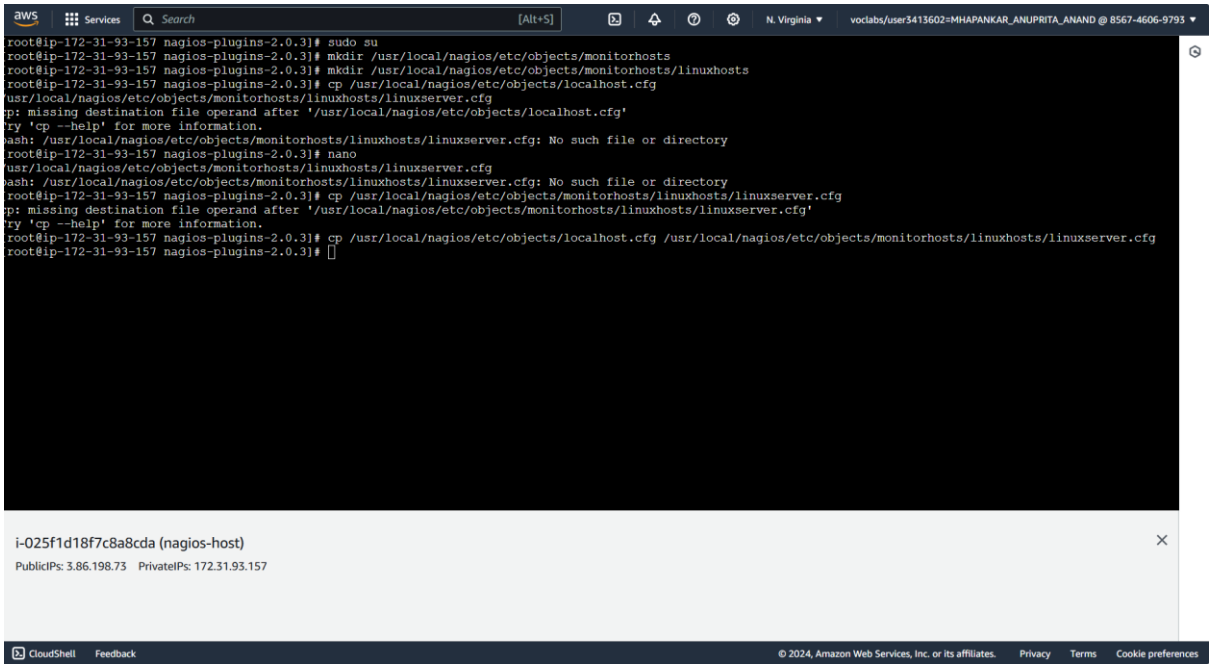
Step 2: Once confirmed, make another instance with the same security group as that of nagios-host.
For now, leave this machine as it is, and go back to your nagios-host machine.



Step 3: Now run the following command -
ps -ef | grep nagios

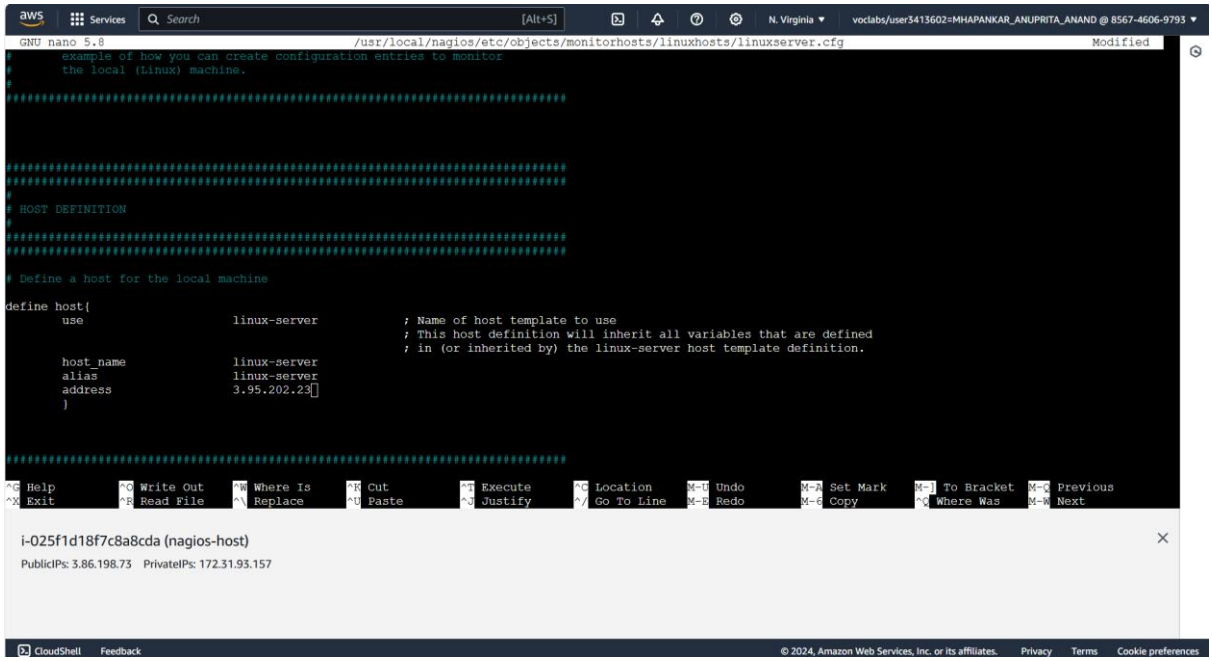


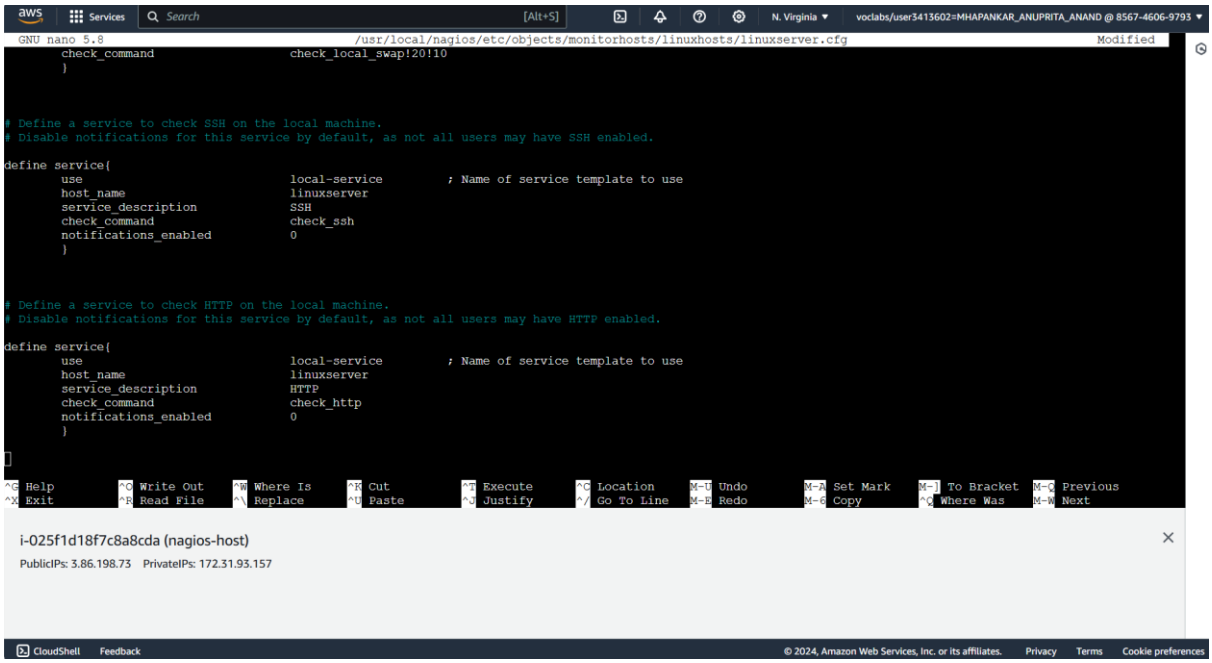
Step 4: Now, run the following commands -
sudo su
mkdir /usr/local/nagios/etc/objects/monitorhosts
mkdir /usr/local/nagios/etc/objects/monitorhosts/linuxhosts
cp/usr/local/nagios/etc/objects/localhost.cfg/usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg



Step 5: Open linuxserver.cfg using the the following command -
nano /usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg

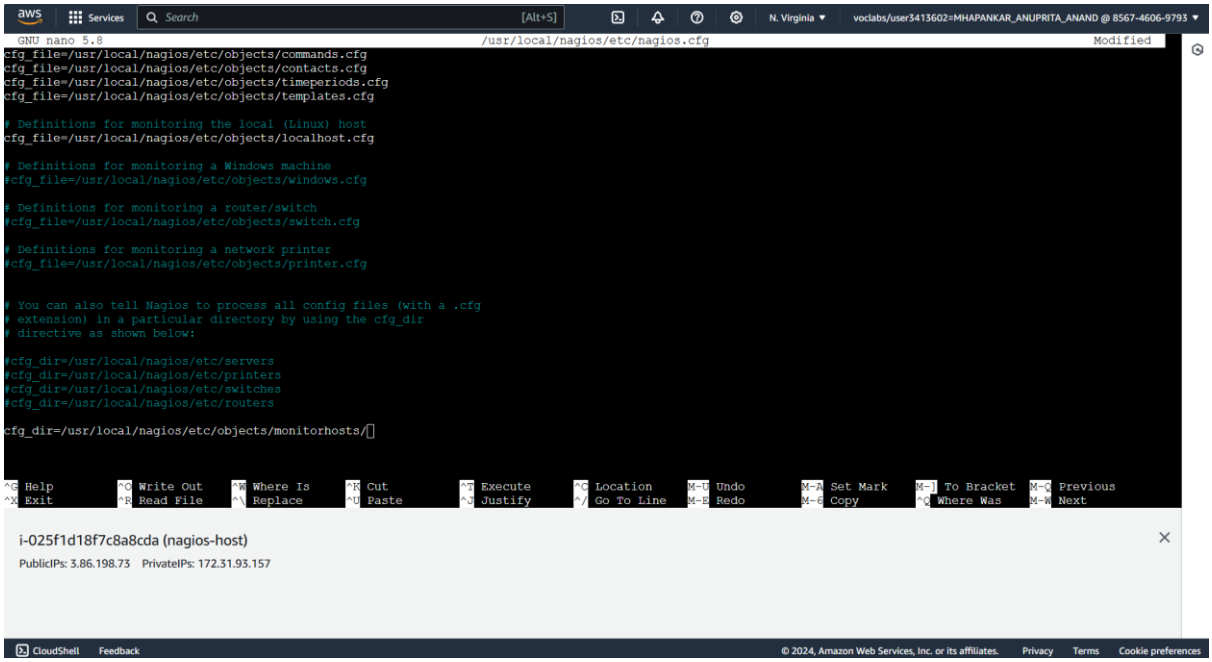
Change the hostname to linuxserver (EVERYWHERE ON THE FILE)
Change address to the public IP address of your LINUX CLIENT.
Change hostgroup_name under hostgroup to linux-servers1





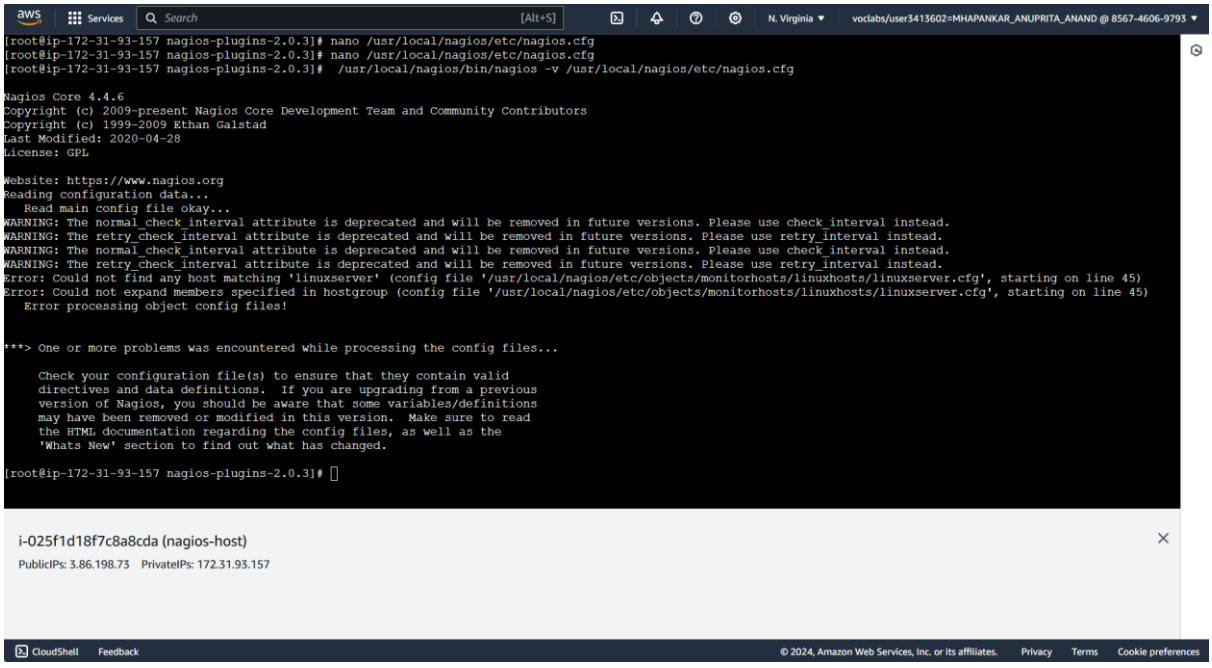
Step 6: Open Nagios config file and add the following line -
nano /usr/local/nagios/etc/nagios.cfg

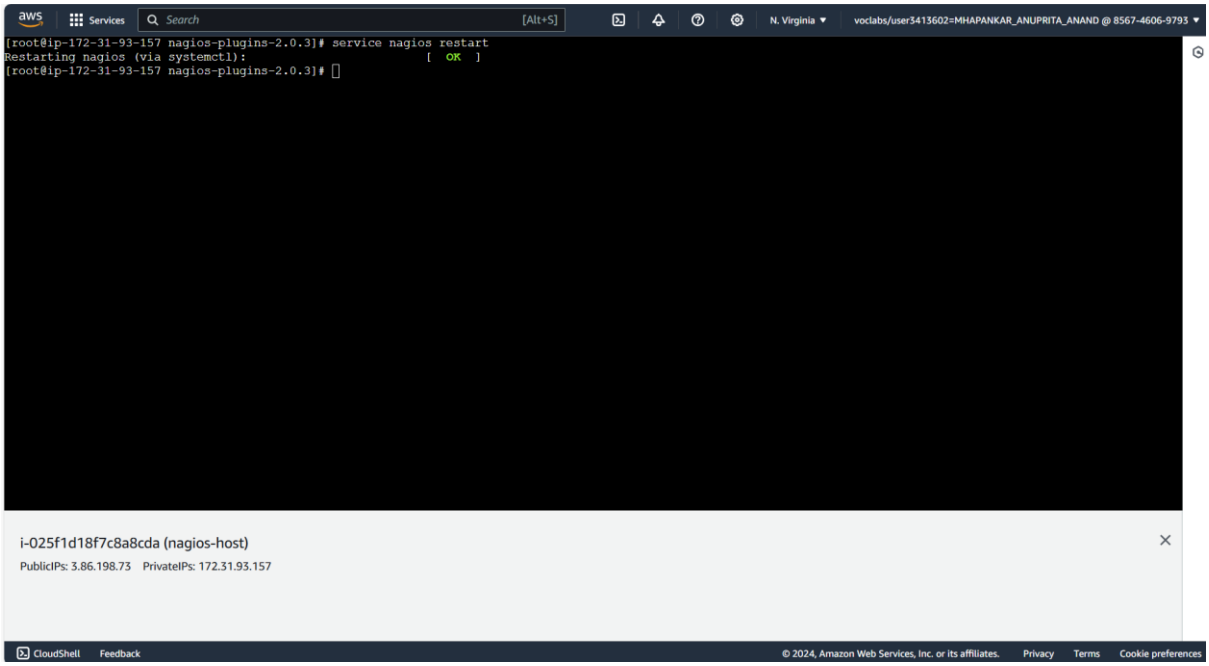
Then add this line -
cfg_dir=/usr/local/nagios/etc/objects/monitorhosts/



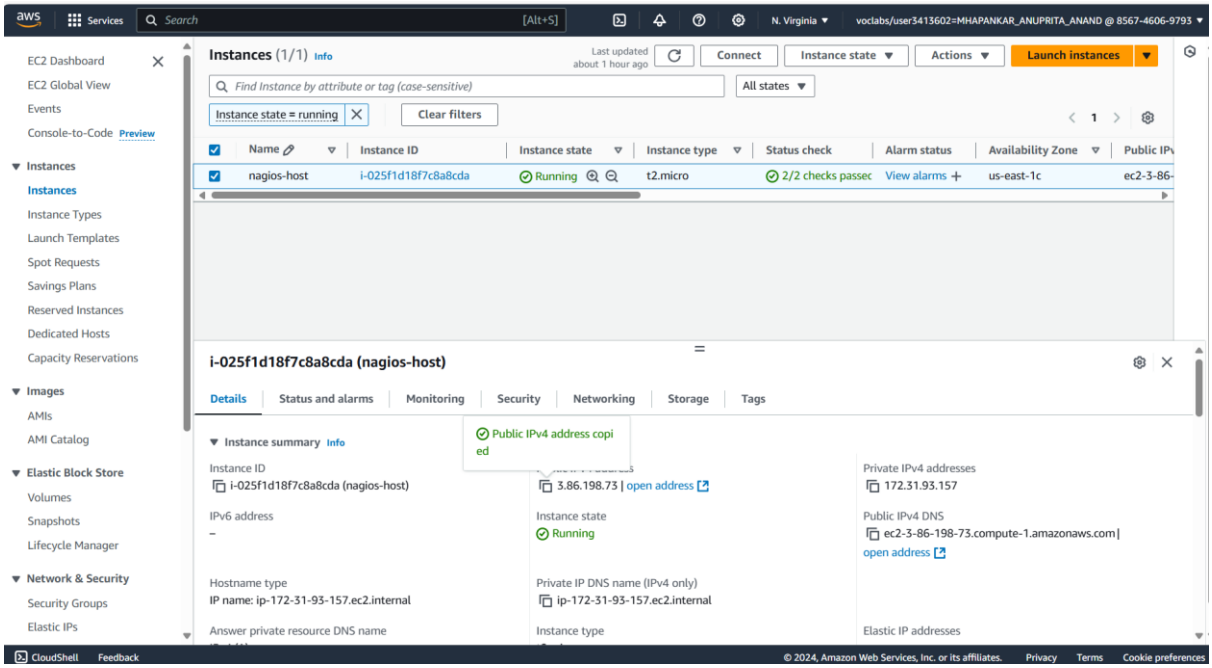
Step 8: Verify configuration files using the following command -
sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

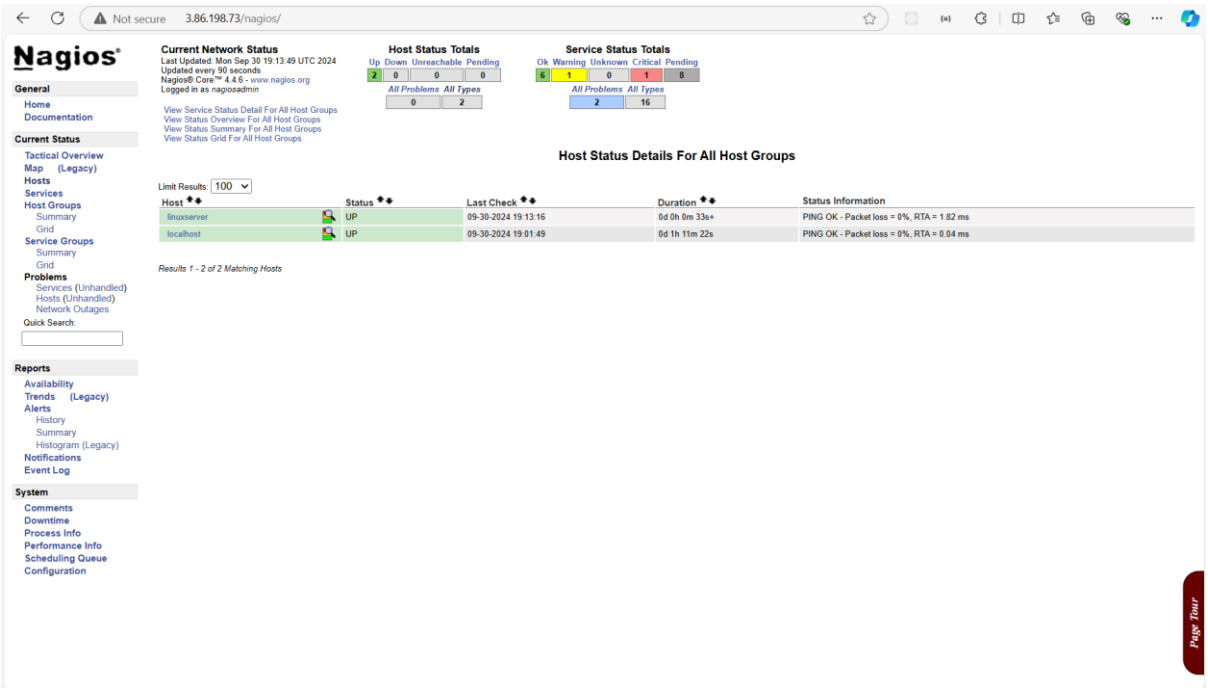
If there are no errors, run the following command -
sudo service nagios start





Step 9: After entering the correct credentials, you will see this page.

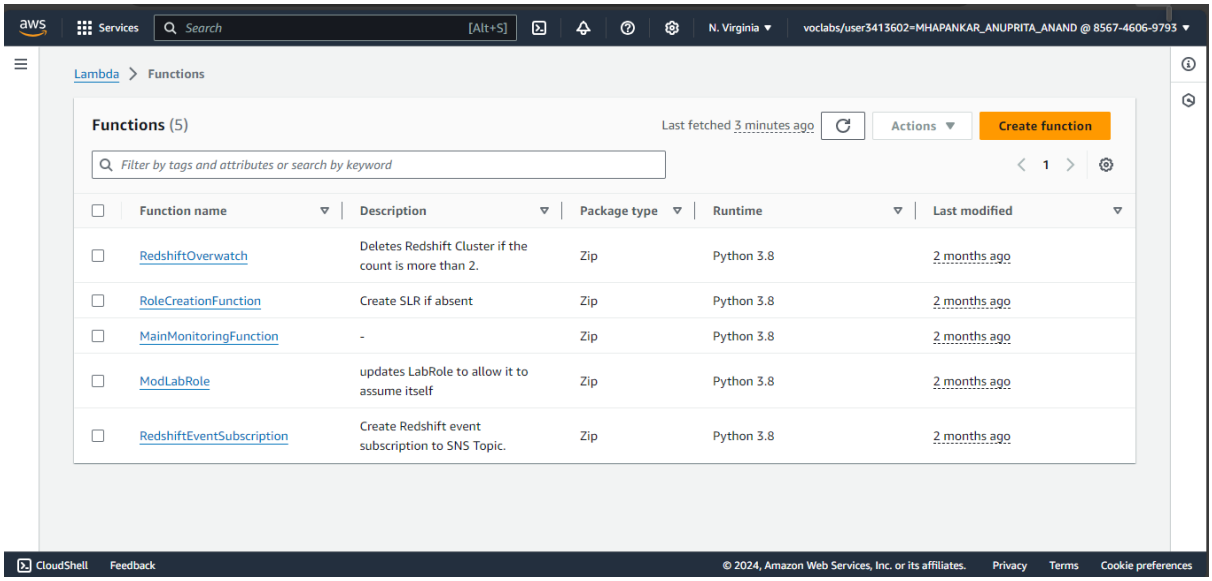



Not secure 3.86.198.73/nagios/
Nagios
General
Home
Documentation
Current Status
Tactical Overview
Map (Legacy)
Hosts
Services
Host Groups
Summary
Grid
Service Groups
Summary
Grid
Problems
Services (Unhandled)
Hosts (Unhandled)
Network Outages
Quick Search:
Reports
Availability
Trends (Legacy)
Alerts
History
Summary
Histogram (Legacy)
Notifications
Event Log
System
Comments
Downtime
Process Info
Performance Info
Scheduling Queue
Configuration
Current Network Status
Last Updated: Mon Sep 30 19:13:49 UTC 2024
Updated every 90 seconds
Nagios® Core™ 4.4.6 - www.nagios.org
Logged in as nagiosadmin
View Service Status Detail For All Host Groups
View Status Overview For All Host Groups
View Status Summary For All Host Groups
View Status Grid For All Host Groups
Host Status Totals
Up Down Unreachable Pending
2 0 0 0
All Problems All Types
0 2
Service Status Totals
Ok Warning Unknown Critical Pending
6 1 0 1 8
All Problems All Types
2 16
Host Status Details For All Host Groups
Limit Results: 100
Host
Status
Last Check
Duration
Status Information
linuxserver UP 09-30-2024 19:13:16 0d 0h 0m 33s+ PING OK - Packet loss = 0%, RTA = 1.82 ms
localhost UP 09-30-2024 19:01:49 0d 1h 11m 22s PING OK - Packet loss = 0%, RTA = 0.04 ms
Results 1 - 2 of 2 Matching Hosts
Page Tour

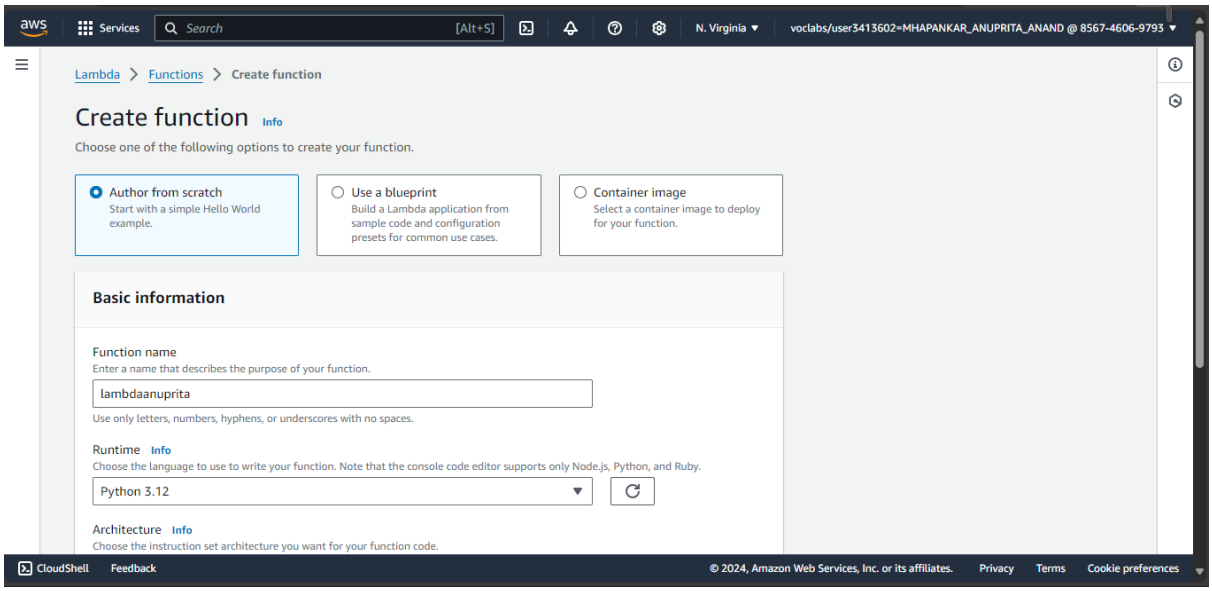
Experiment 11

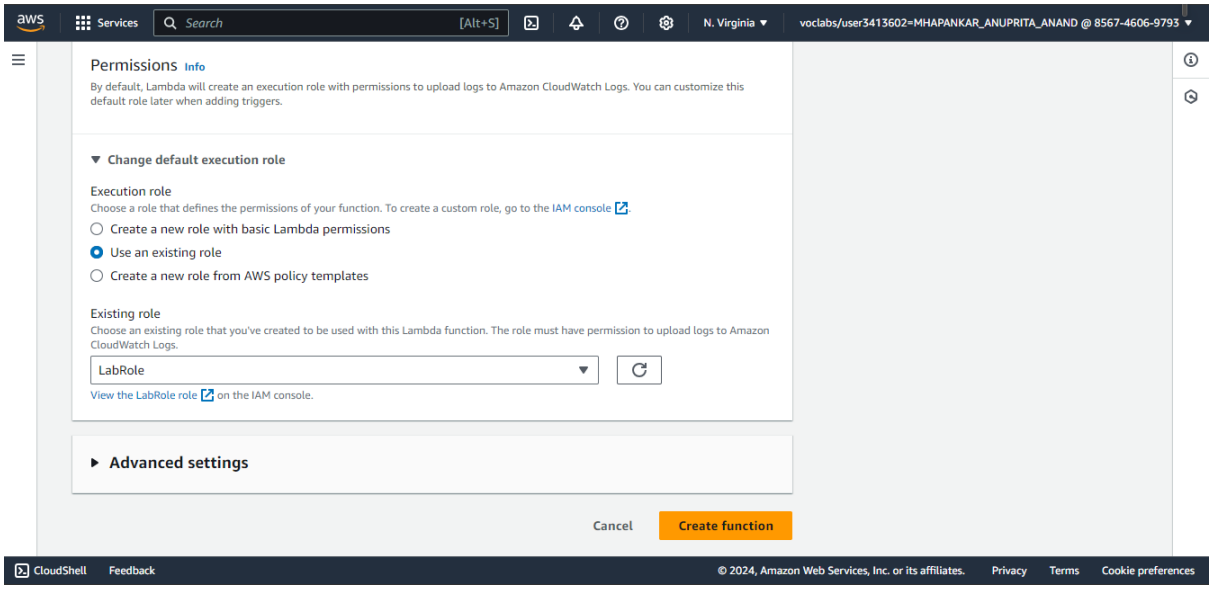
Aim: To understand AWS Lambda, its workflow, various functions and create your first Lambda functions using Python / Java / Nodejs.

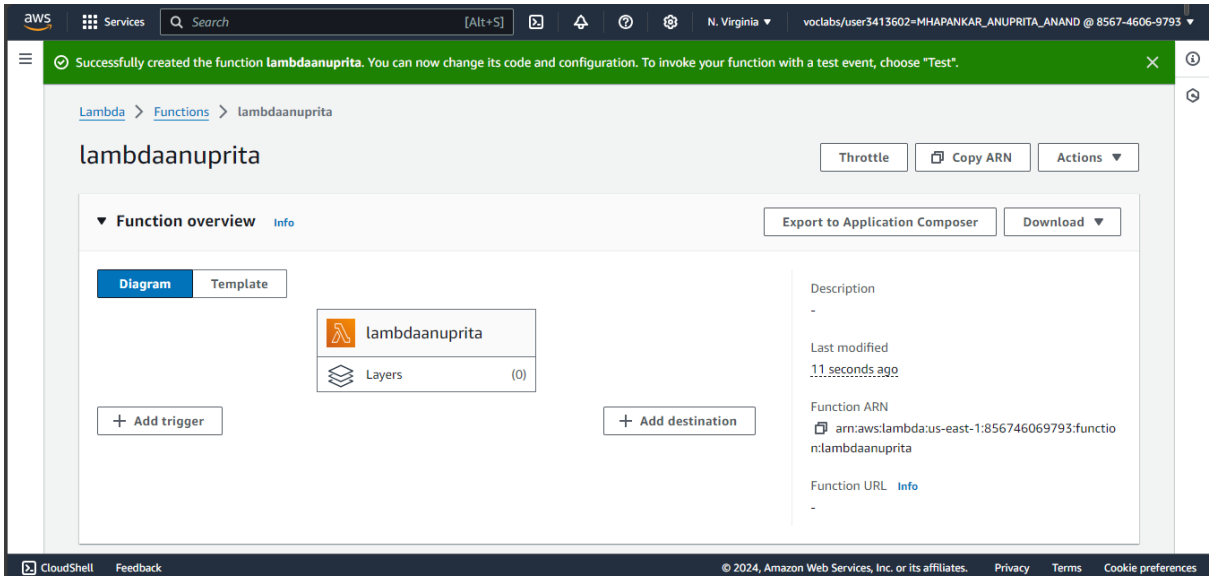
Step1: Open up the Lambda Console and click on the Create button.



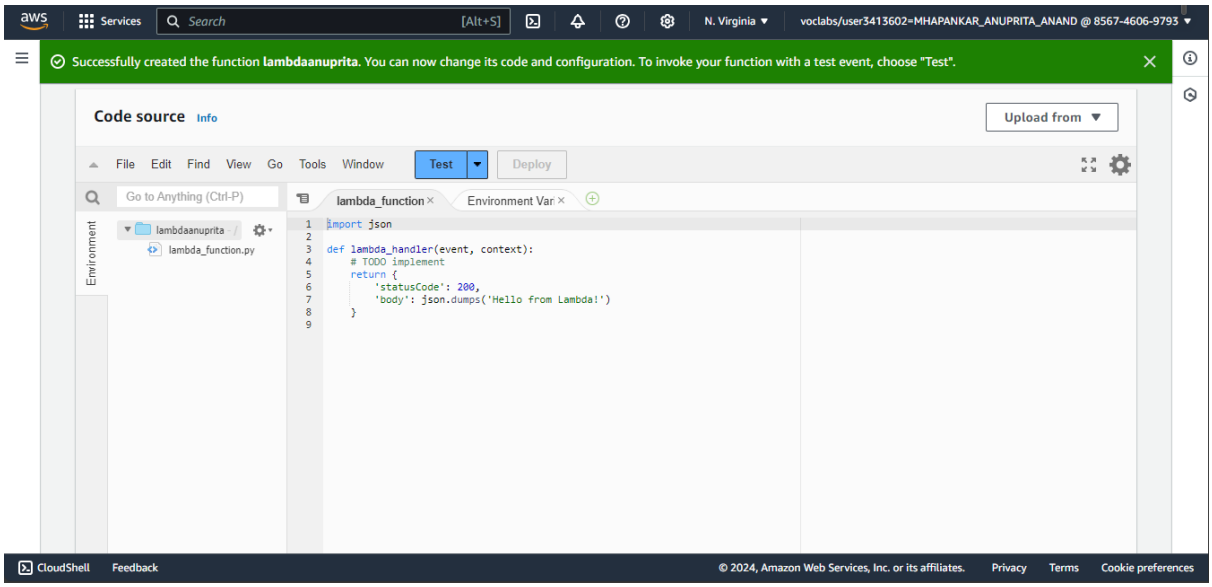
Step 2: Create a function and name it and select the runtime environment as Python 3.12 and for the role select the existing role LabRole.

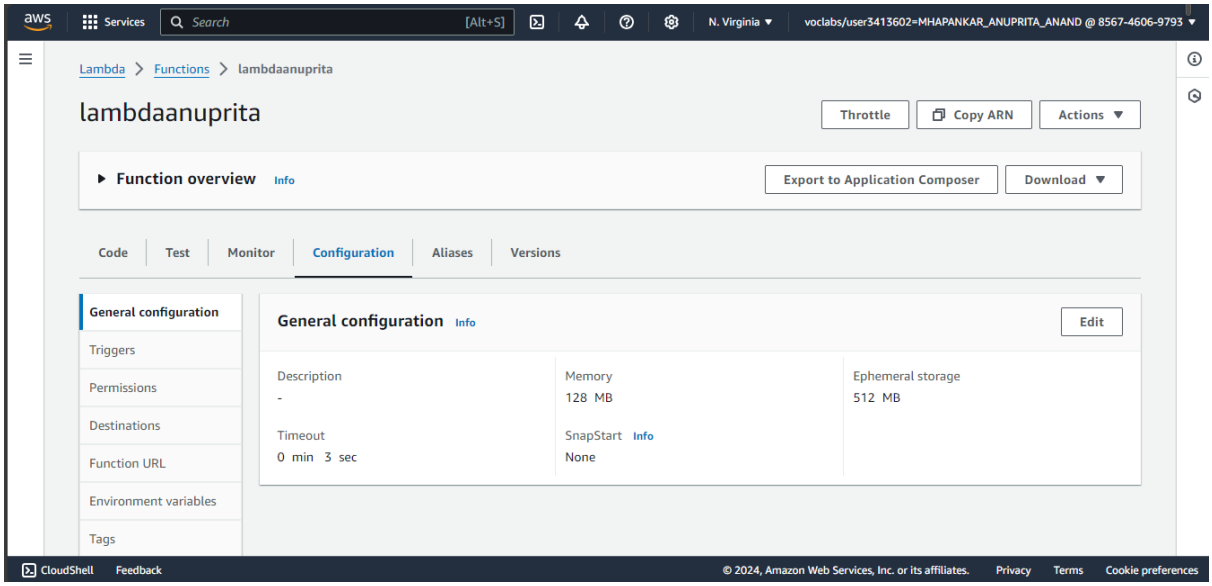




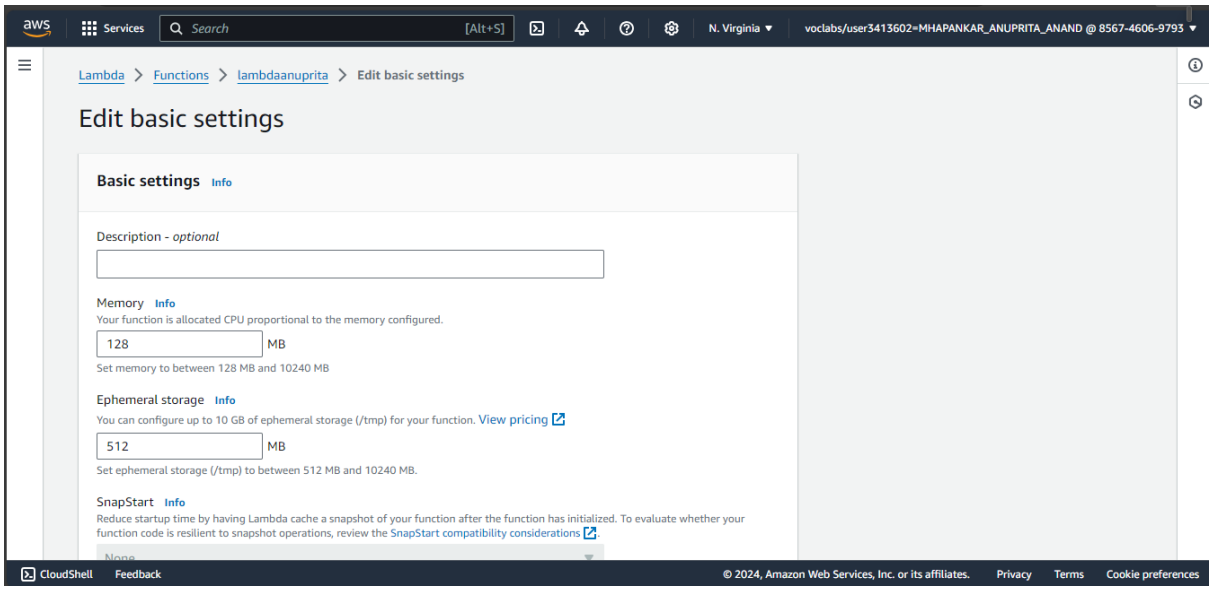


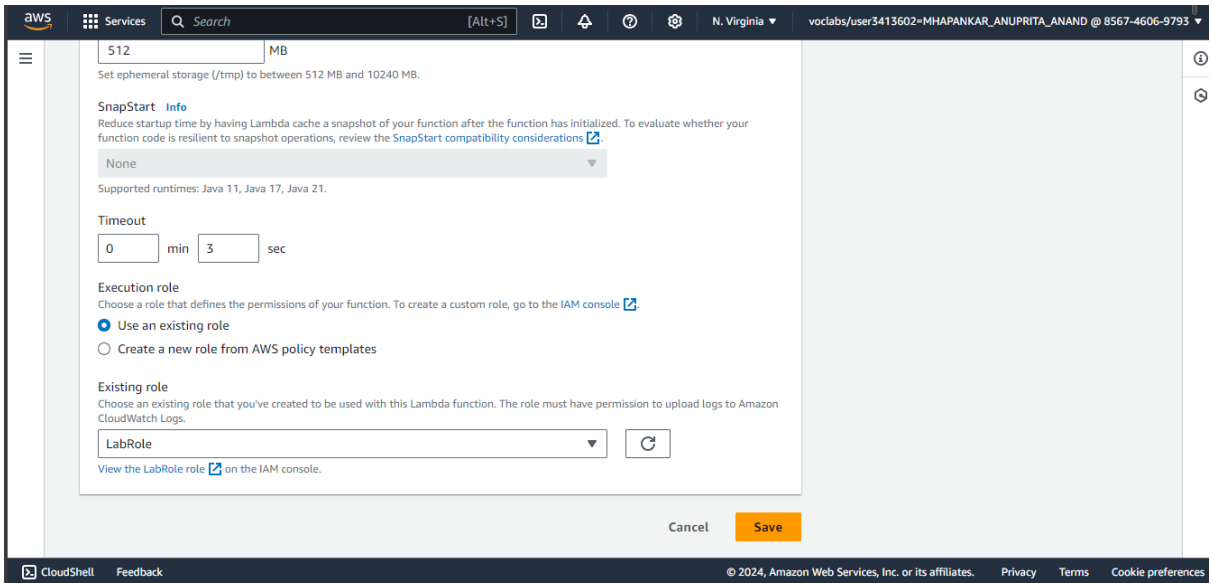
Step 3: Scroll down to the code source section and then visit Configuration section and click on edit.



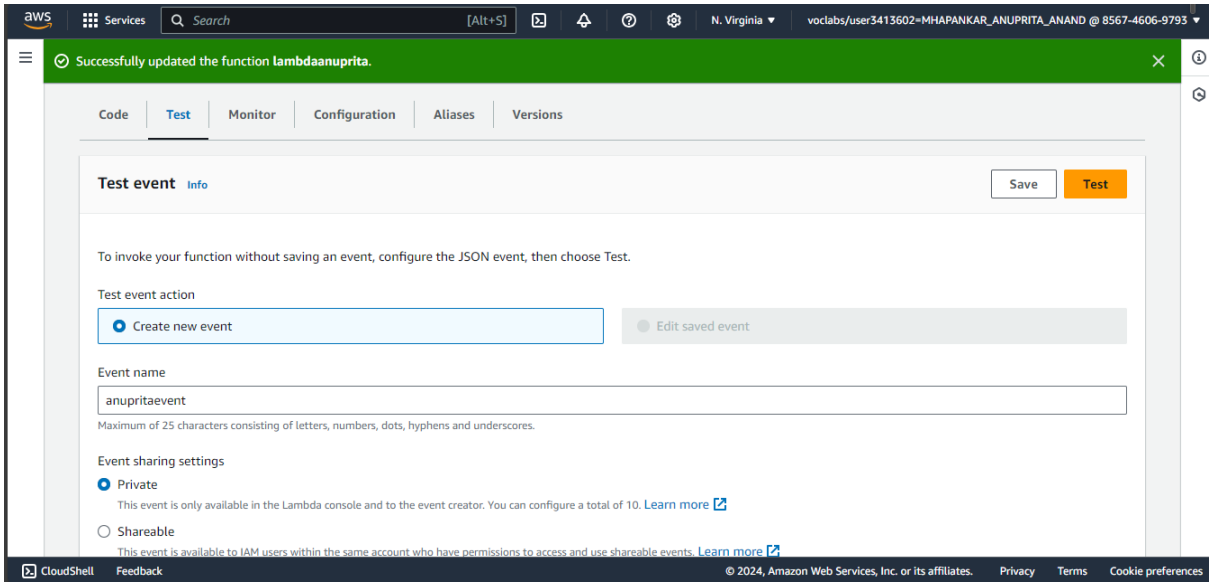


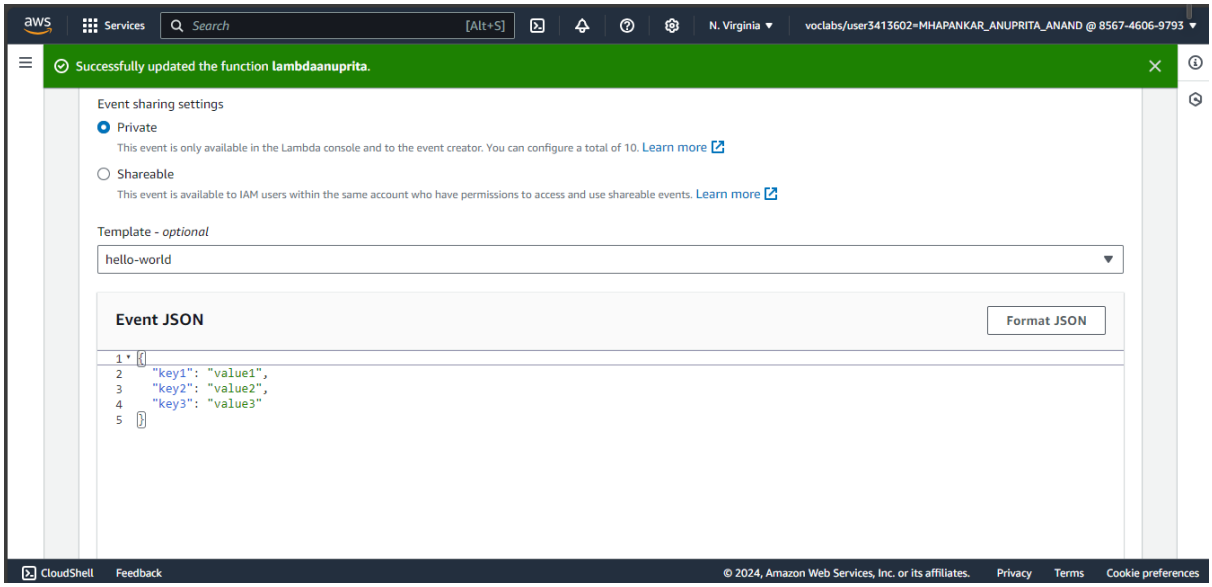
Step 4: Make the following changes and then click on the save button.



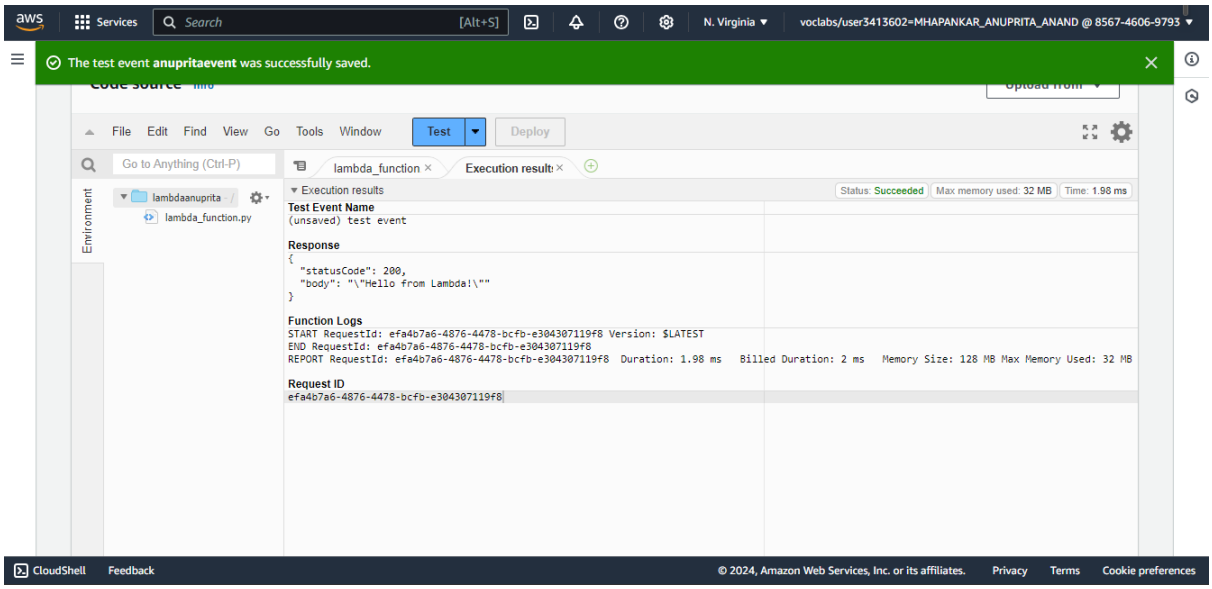


Step 5: Scroll down to the code source section and then visit Test section. Create a new event and then name the event. Now, click on Test.





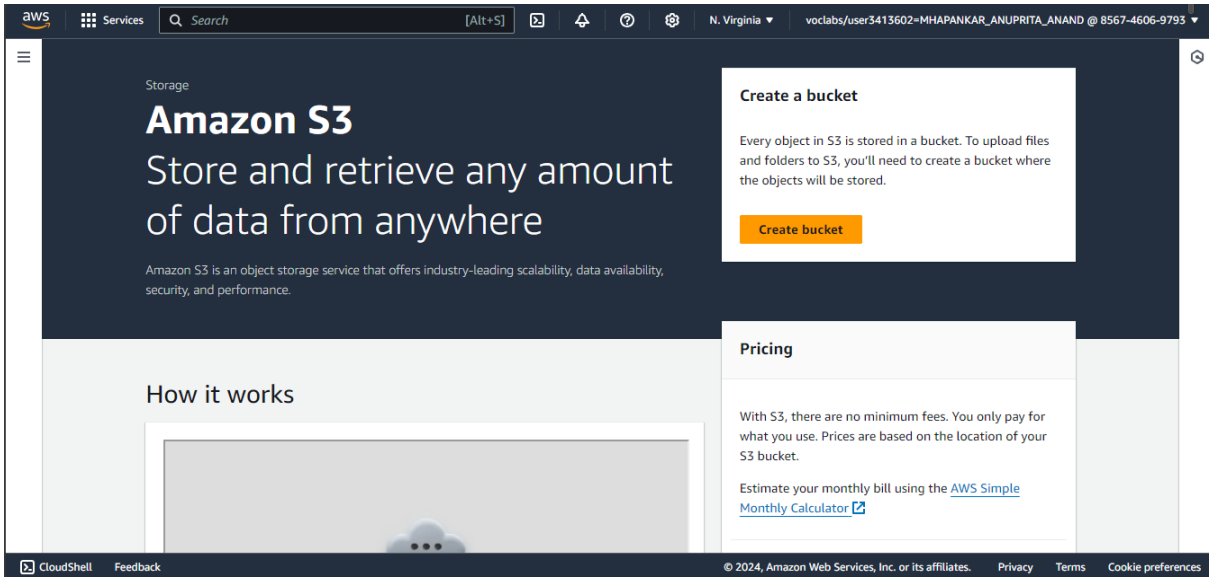
Step 6: The test results are as shown below.

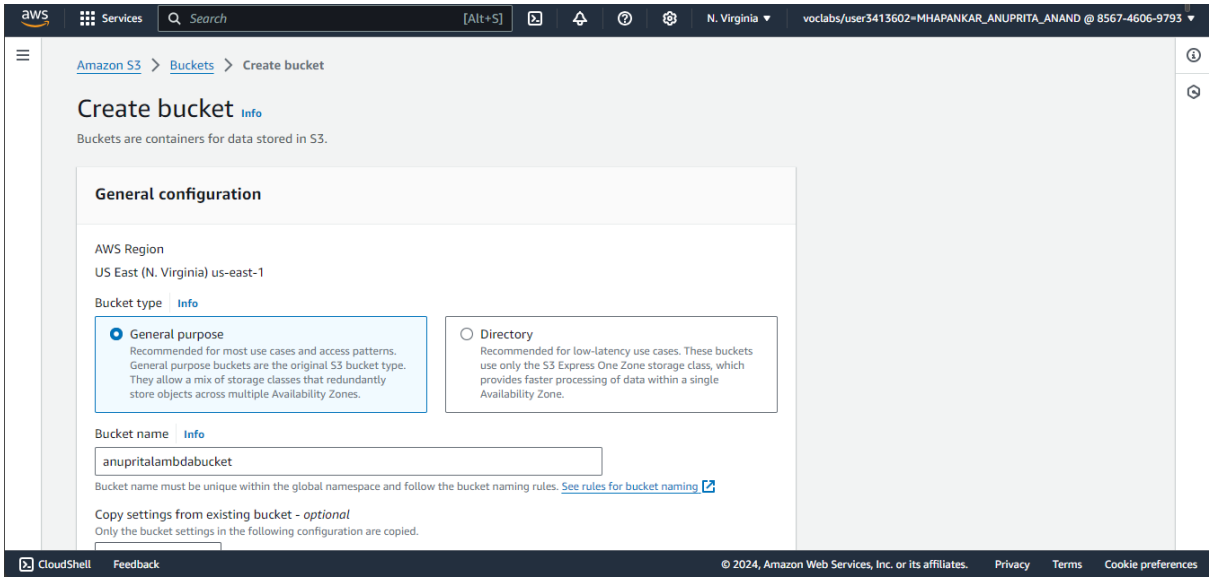


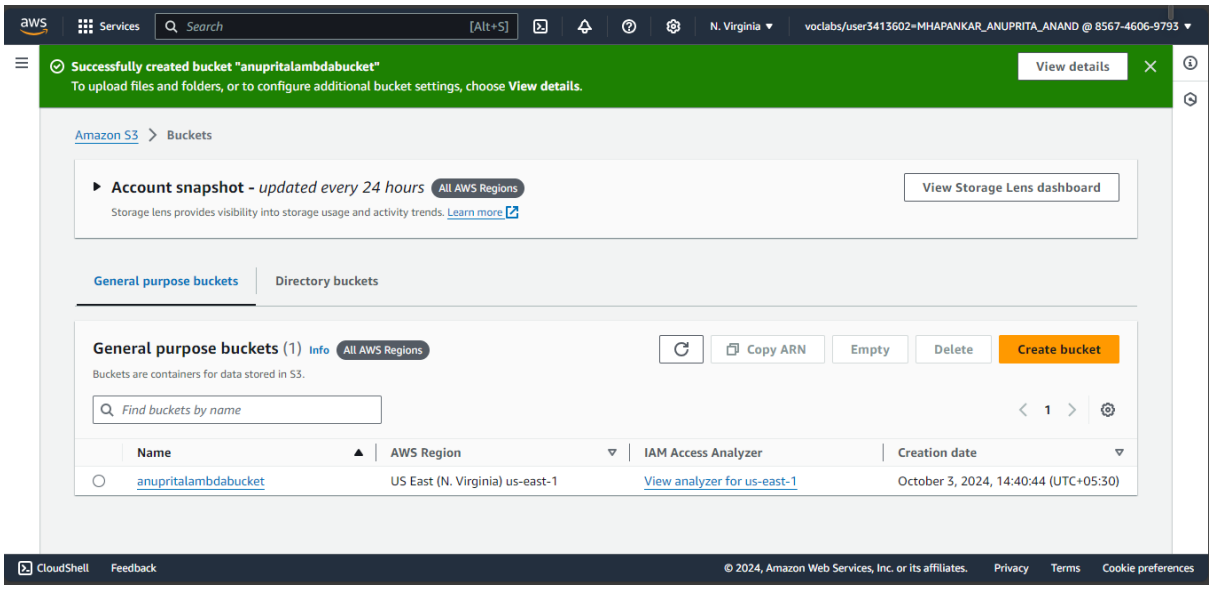
Experiment 12

Aim: To create a Lambda function which will log “An Image has been added” once you add an object to a specific bucket in S3

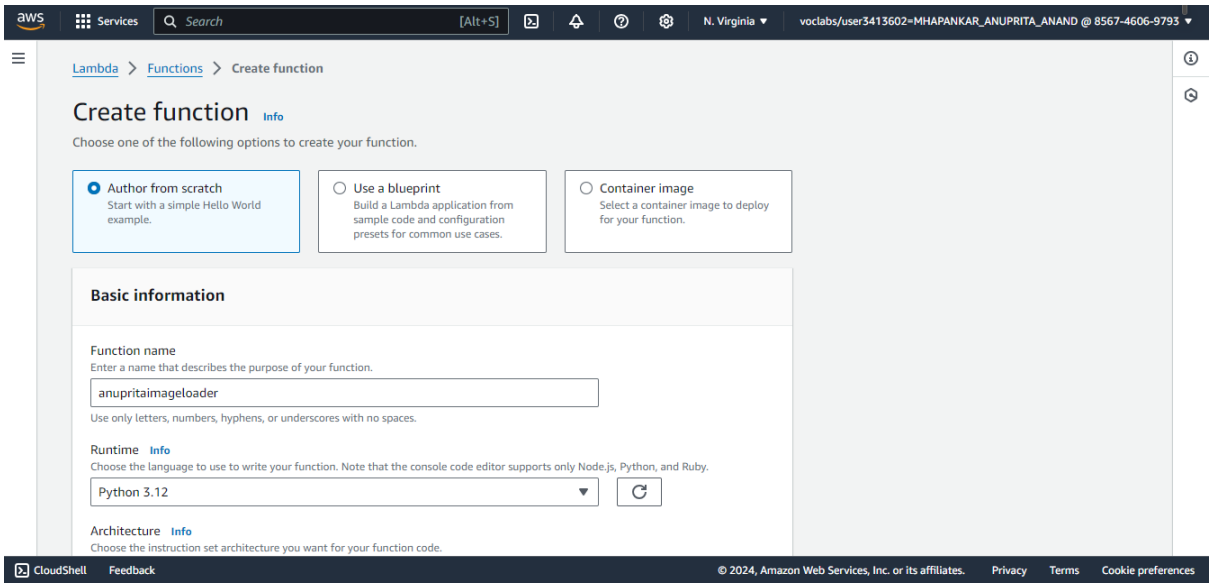
Step 1: Create a S3 bucket that will store the objects and will act as the trigger source for the Lambda function.

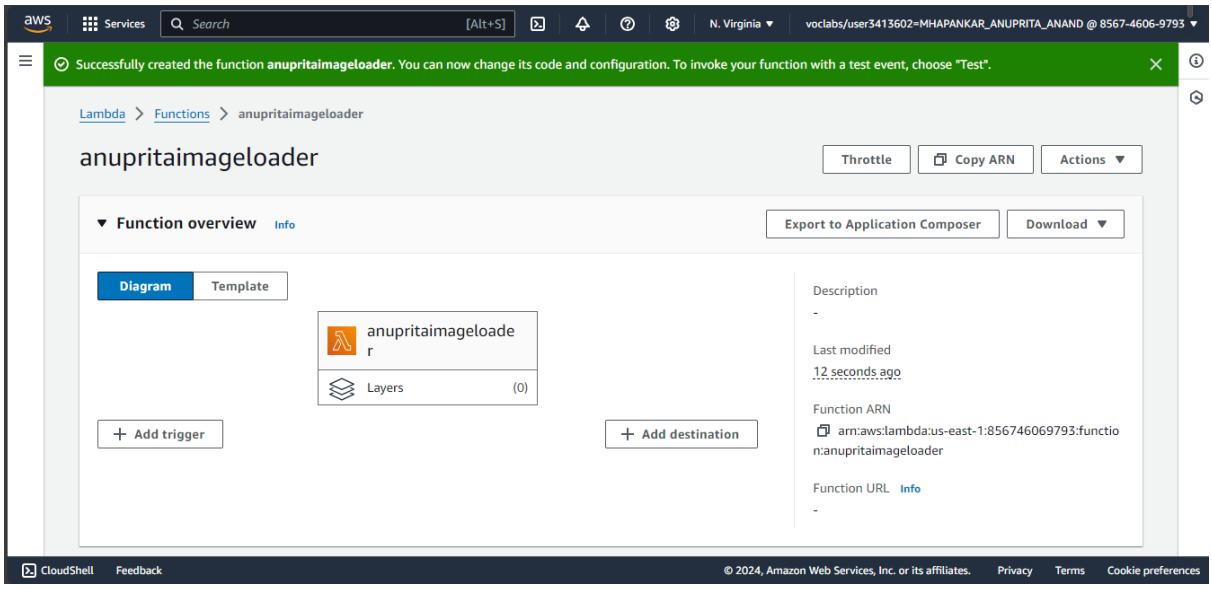




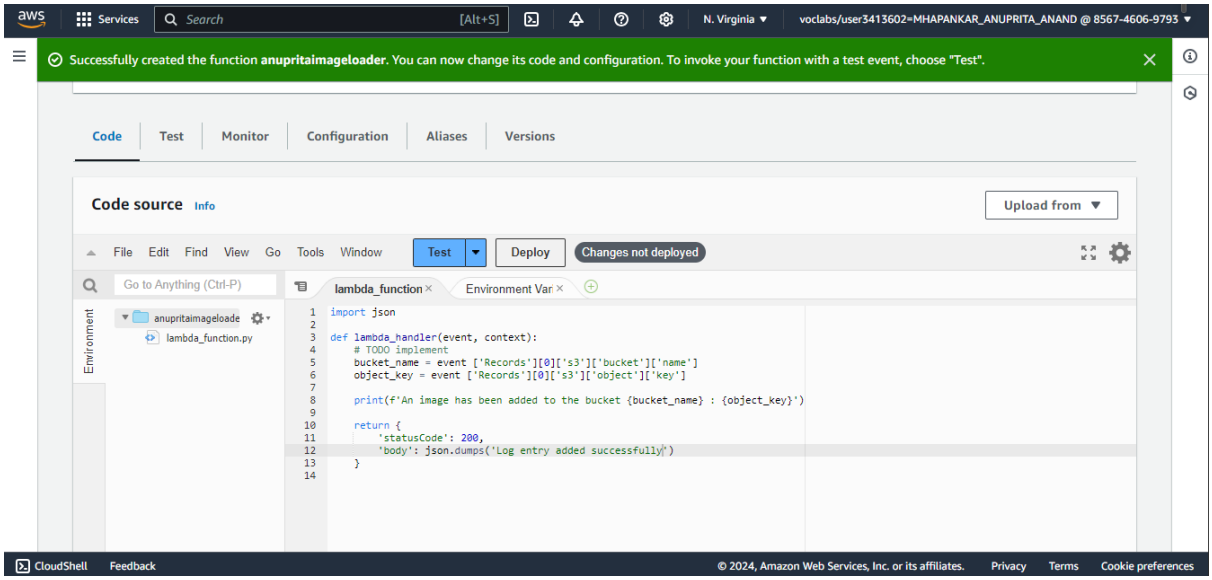


Step 2: Now, create a Lambda function using AWS Lambda's console and choose the runtime environment as Python.

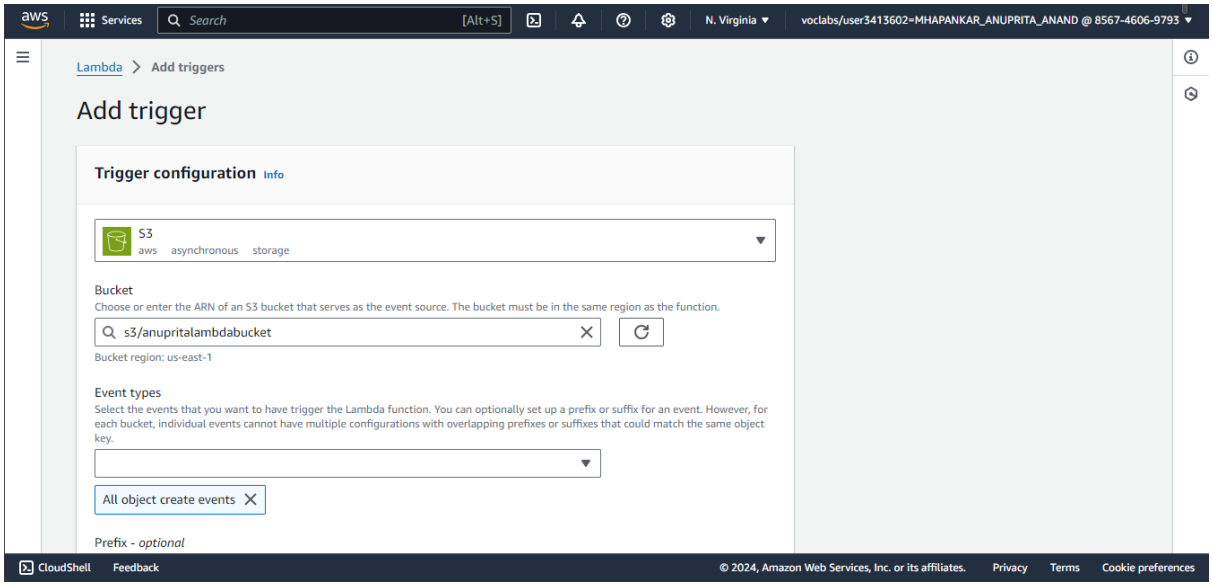




Step 3: Add the following code to set up the trigger.



Step 4: Link the S3 bucket to the Lambda function by setting up a trigger.


Services
Search
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N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
Lambda > Add triggers
Add trigger
Trigger configuration Info
S3
aws asynchronous storage
Bucket
Choose or enter the ARN of an S3 bucket that serves as the event source. The bucket must be in the same region as the function.
s3/anupritalambdabucket
Bucket region: us-east-1
Event types
Select the events that you want to have trigger the Lambda function. You can optionally set up a prefix or suffix for an event. However, for each bucket, individual events cannot have multiple configurations with overlapping prefixes or suffixes that could match the same object key.
All object create events
Prefix - optional
CloudShell
Feedback
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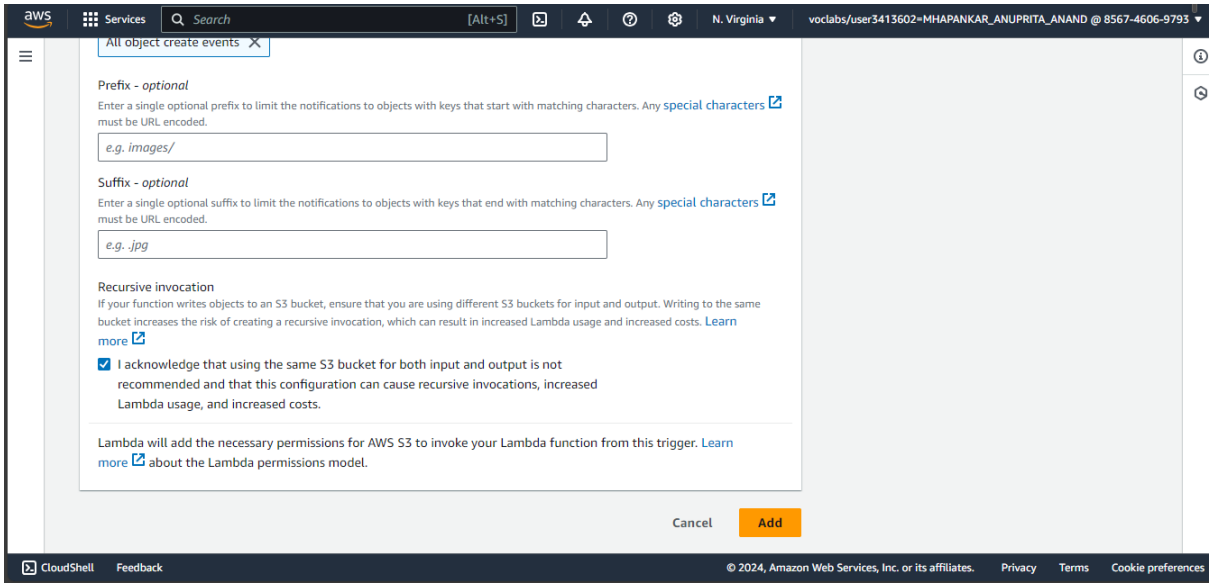
Services
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voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
All object create events
Prefix - optional
Enter a single optional prefix to limit the notifications to objects with keys that start with matching characters. Any special characters must be URL encoded.
e.g. images/
Suffix - optional
Enter a single optional suffix to limit the notifications to objects with keys that end with matching characters. Any special characters must be URL encoded.
e.g. .jpg
Recursive invocation
If your function writes objects to an S3 bucket, ensure that you are using different S3 buckets for input and output. Writing to the same bucket increases the risk of creating a recursive invocation, which can result in increased Lambda usage and increased costs. Learn more
I acknowledge that using the same S3 bucket for both input and output is not recommended and that this configuration can cause recursive invocations, increased Lambda usage, and increased costs.
Lambda will add the necessary permissions for AWS S3 to invoke your Lambda function from this trigger. Learn more about the Lambda permissions model.
Cancel
Add
CloudShell
Feedback
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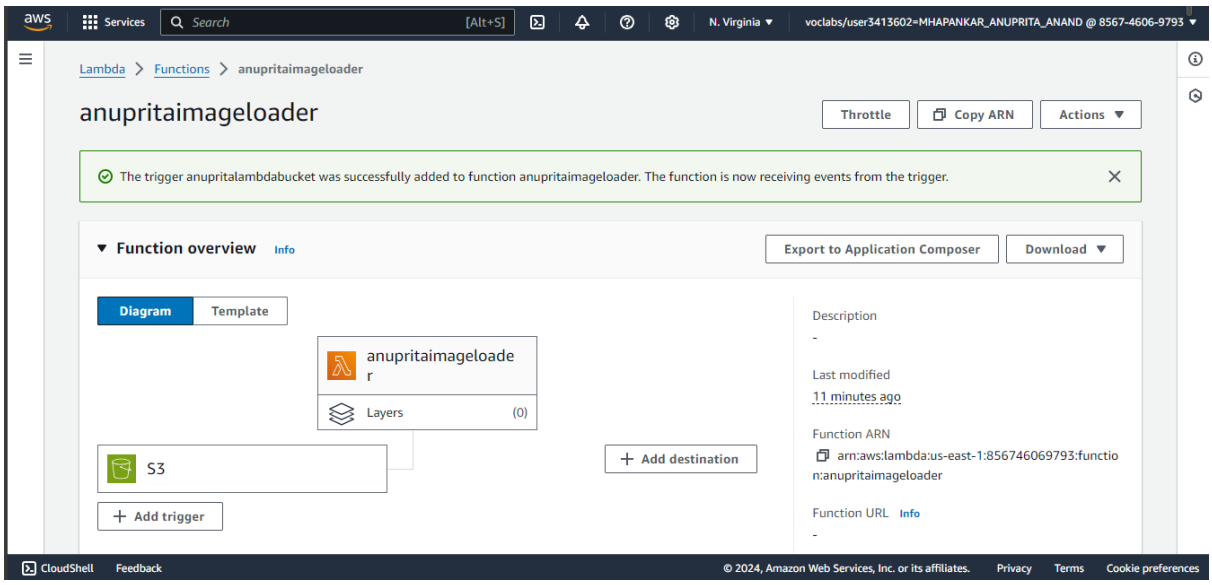
Services
Search
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N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
Lambda > Functions > anupritaimageloader
anupritaimageloader
Throttle
Copy ARN
Actions
The trigger anupritalambdabucket was successfully added to function anupritaimageloader. The function is now receiving events from the trigger.
Function overview Info
Export to Application Composer
Download
Diagram
Template
anupritaimageloader
Layers (0)
S3
Add destination
Add trigger
Description
-
Last modified
11 minutes ago
Function ARN
arn:aws:lambda:us-east-1:856746069793:function:anupritaimageloader
Function URL Info
-
CloudShell
Feedback
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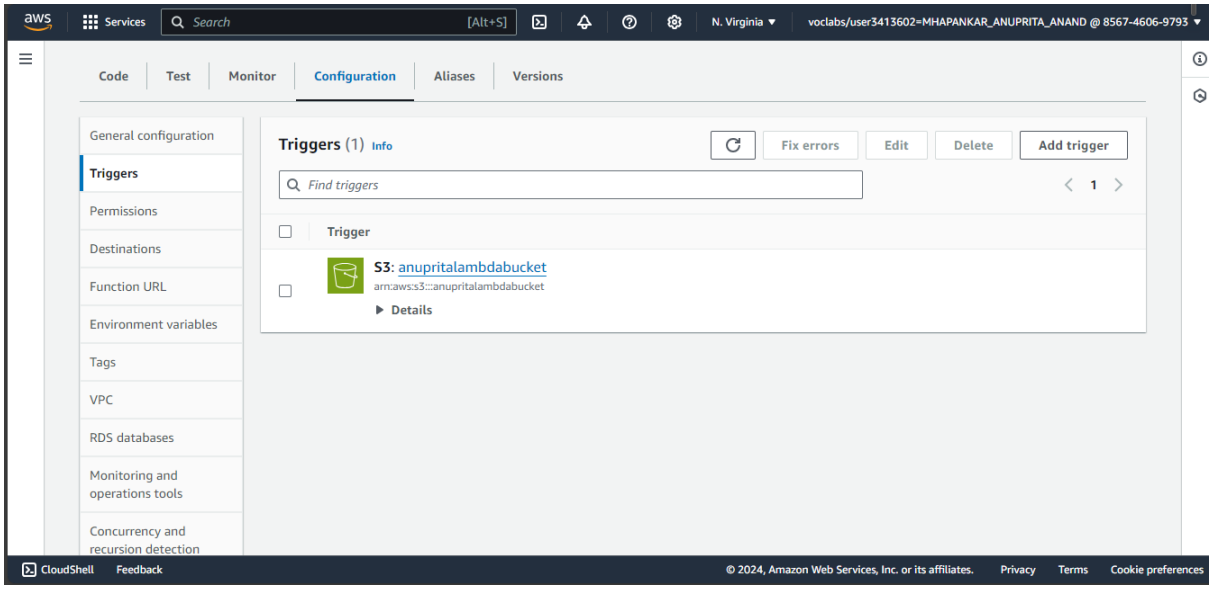
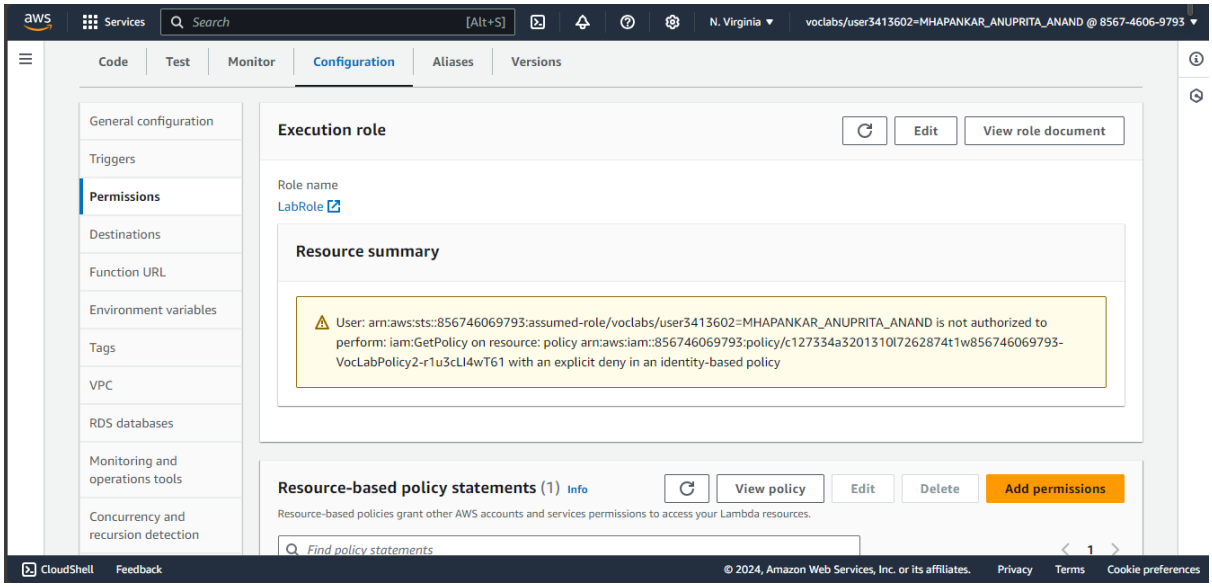
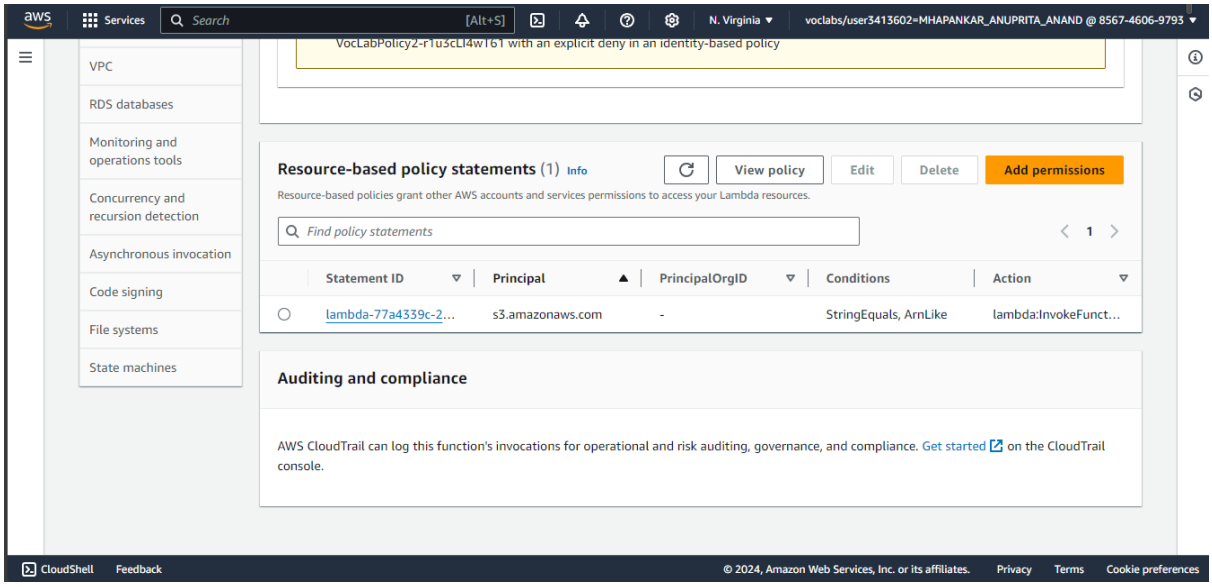
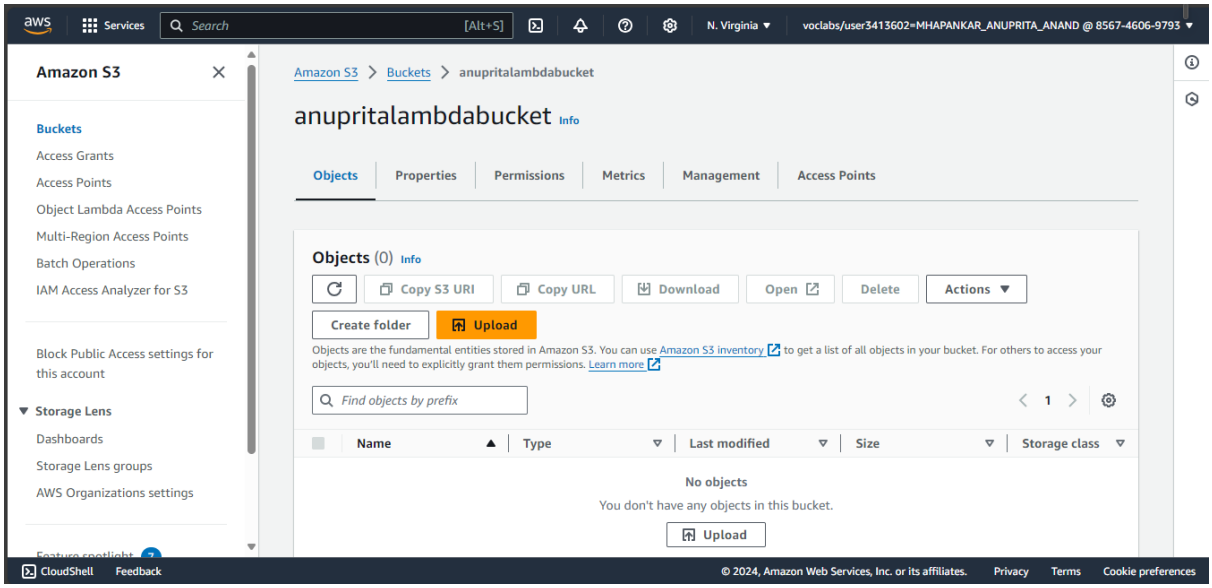


Step 5: Setup the required permissions.





Step 6: Upload an object (e.g., an image) to the S3 bucket to test the trigger. The Lambda function should execute and log the message “An Image has been added” in AWS CloudWatch Logs.


Services
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Amazon S3
Buckets
Access Grants
Access Points
Object Lambda Access Points
Multi-Region Access Points
Batch Operations
IAM Access Analyzer for S3
Block Public Access settings for this account
Storage Lens
Dashboards
Storage Lens groups
AWS Organizations settings
Amazon S3 > Buckets > anupritalambdabucket
anupritalambdabucket Info
Objects
Properties
Permissions
Metrics
Management
Access Points
Objects (0) Info
Copy S3 URI
Copy URL
Download
Open
Delete
Actions
Create folder
Upload
Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more
Find objects by prefix
Name
Type
Last modified
Size
Storage class
No objects
You don't have any objects in this bucket.
Upload
CloudShell
Feedback
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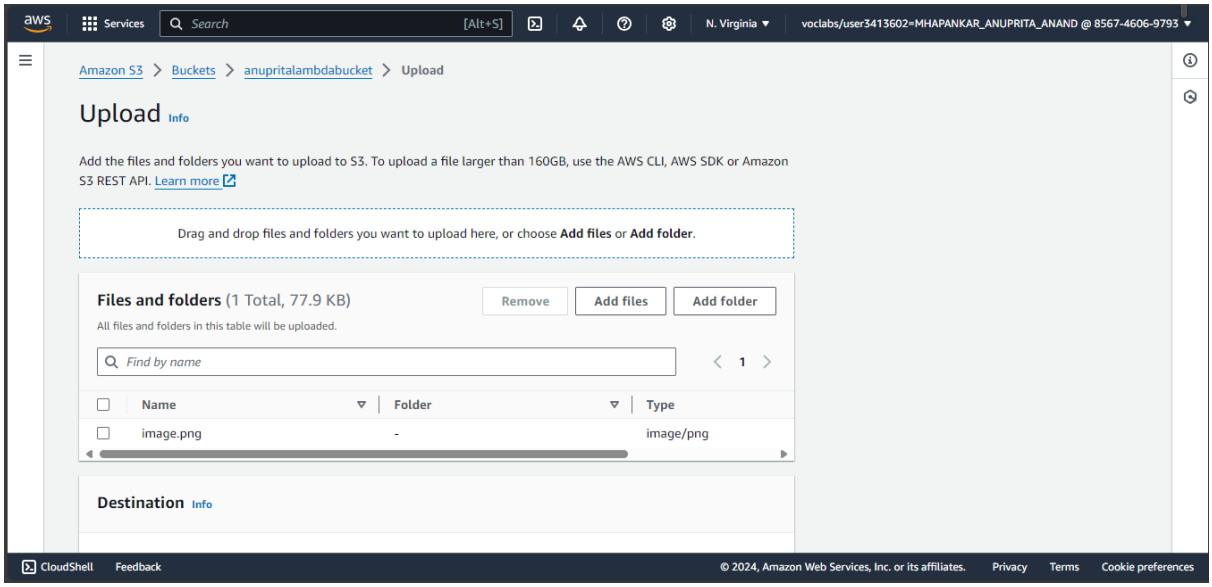
Services
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voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
Amazon S3 > Buckets > anupritalambdabucket > Upload
Upload Info
Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. Learn more
Drag and drop files and folders you want to upload here, or choose Add files or Add folder.
Files and folders (1 Total, 77.9 KB)
Remove
Add files
Add folder
All files and folders in this table will be uploaded.
Find by name
Name
Folder
Type
image.png
-
image/png
Destination Info
CloudShell
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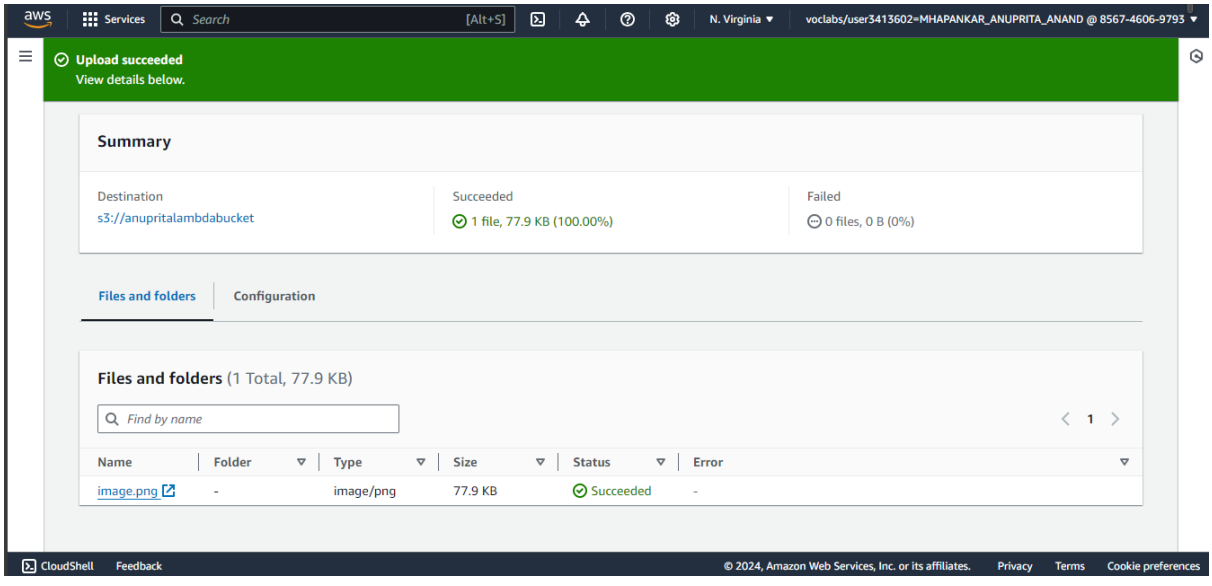
Services
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[Alt+S]
N. Virginia
voclabs/user3413602=MHAPANKAR_ANUPRITA_ANAND @ 8567-4606-9793
Upload succeeded
View details below.
Summary
Destination
s3://anupritalambdabucket
Succeeded
1 file, 77.9 KB (100.00%)
Failed
0 files, 0 B (0%)
Files and folders
Configuration
Files and folders (1 Total, 77.9 KB)
Find by name
Name
Folder
Type
Size
Status
Error
image.png
-
image/png
77.9 KB
Succeeded
-
CloudShell
Feedback
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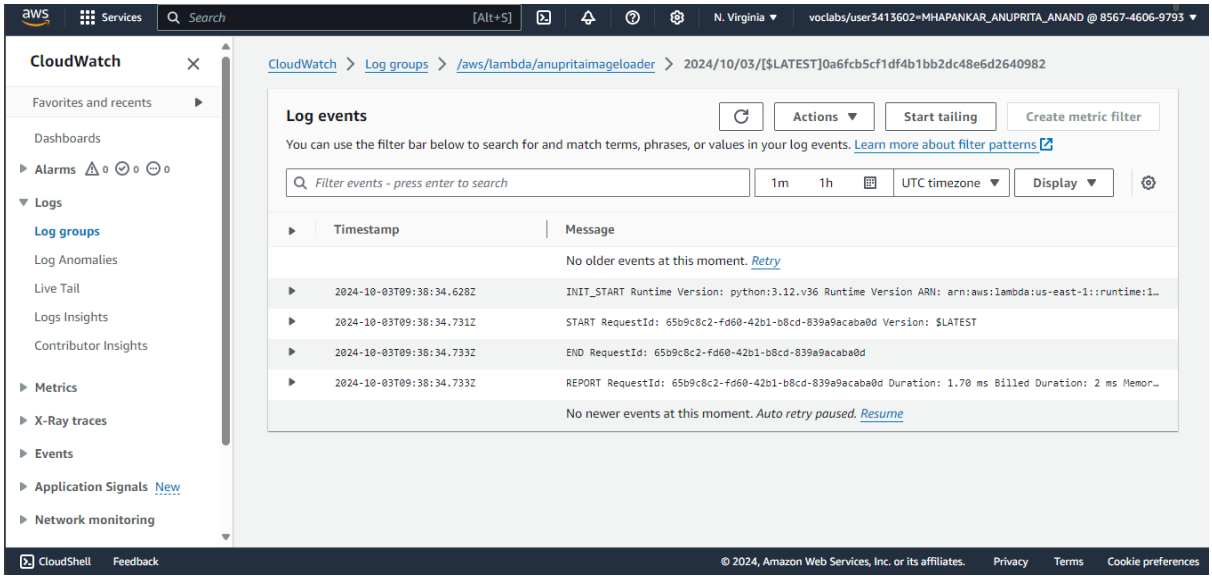
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CloudWatch
Favorites and recents
Dashboards
Alarms 0 0 0
Logs
Log groups
Log Anomalies
Live Tail
Logs Insights
Contributor Insights
Metrics
X-Ray traces
Events
Application Signals New
Network monitoring
CloudWatch > Log groups > /aws/lambda/anupritaimageloader > 2024/10/03/[$LATEST]0a6fcb5cf1df4b1bb2dc48e6d2640982
Log events
Actions
Start tailing
Create metric filter
You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns
Filter events - press enter to search
1m
1h
UTC timezone
Display
Timestamp
Message
No older events at this moment. Retry
2024-10-03T09:38:34.628Z
INIT_START Runtime Version: python:3.12.v36 Runtime Version ARN: arn:aws:lambda:us-east-1::runtime:1…
2024-10-03T09:38:34.731Z
START RequestId: 65b9c8c2-fd60-42b1-b8cd-839a9acaba0d Version: $LATEST
2024-10-03T09:38:34.733Z
END RequestId: 65b9c8c2-fd60-42b1-b8cd-839a9acaba0d
2024-10-03T09:38:34.733Z
REPORT RequestId: 65b9c8c2-fd60-42b1-b8cd-839a9acaba0d Duration: 1.70 ms Billed Duration: 2 ms Memor…
No newer events at this moment. Auto retry paused. Resume
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