AWS - Github-Jenkins Integration Using Docker Container Images

Objective:
Integrate CI/CD tool Jenkins with Github and AWS to automate creation of Cloudformation stack (Infrastructure support tool).

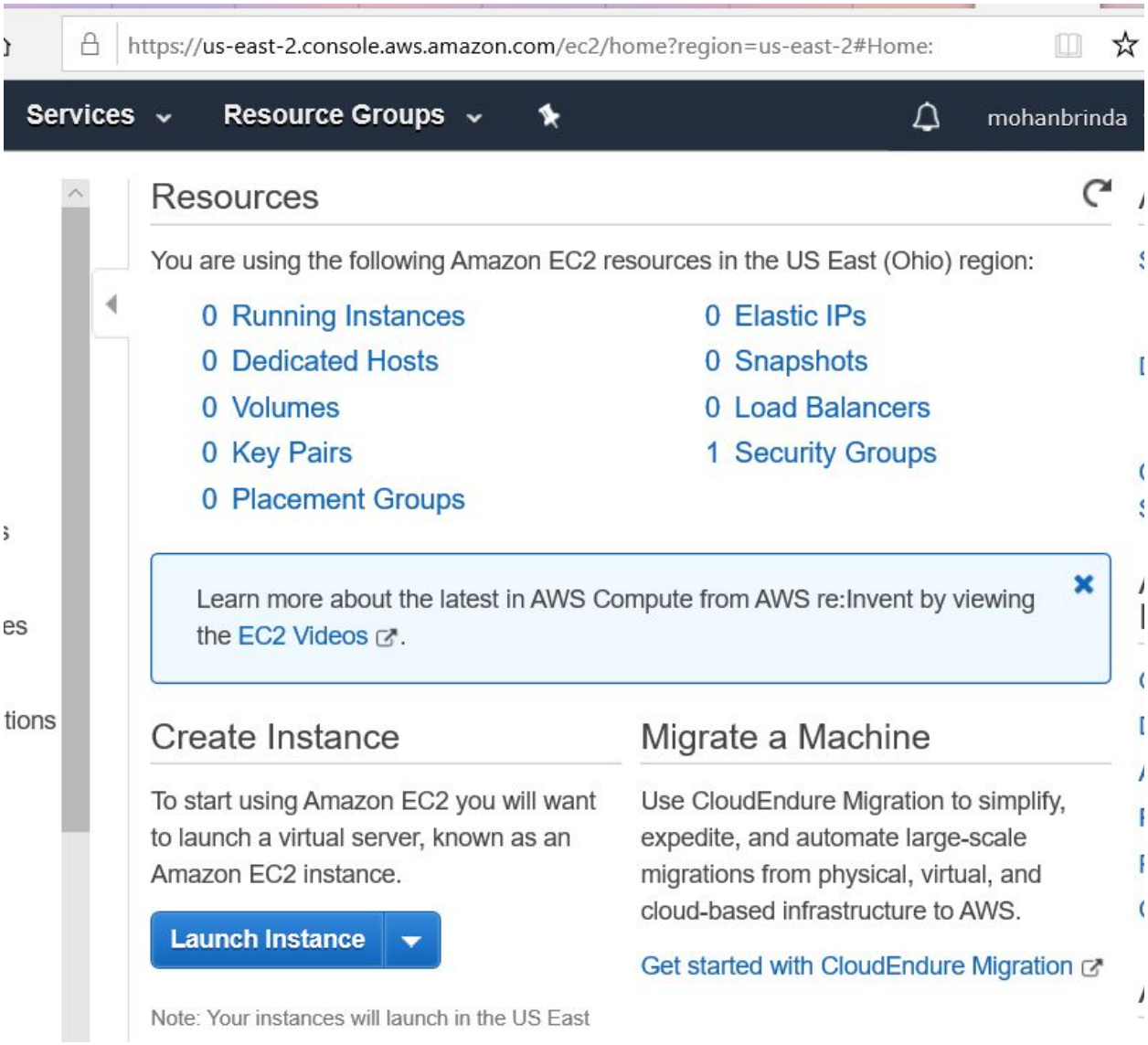
Steps:

1. Create Ec2 instance with CentOS
2. Install Docker engine and Jenkins container image
3. Upload code on github
4. Configure build jobs in Jenkins

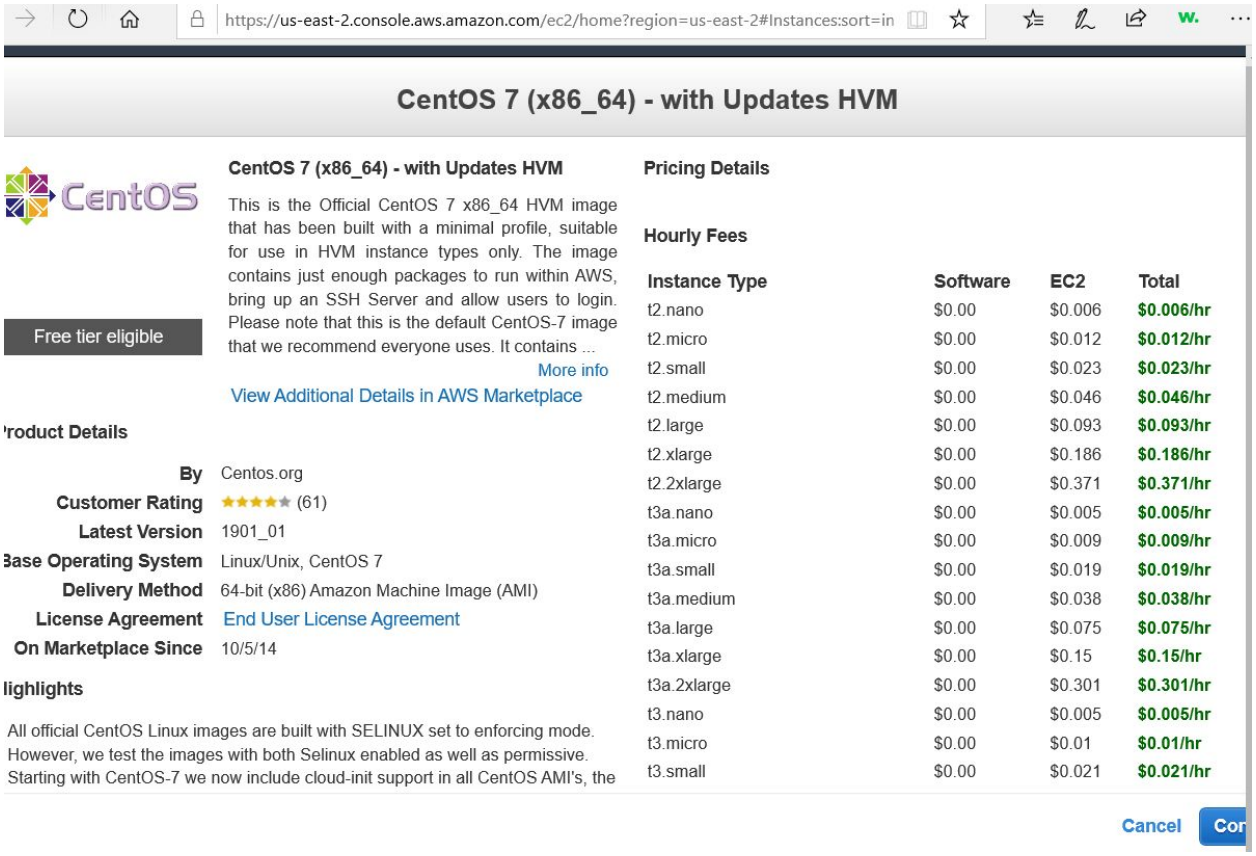
Spin Ec2 instance with CentOS. CentOS version 7 will be used as a host operating system to run Docker engine. Jenkens and Docker images will be pulled. Later setup github by uploading code to create vpc as a resource. Next step is to integrate Jenkins with AWS to create cloudformation stack.

In summary, the user will create and upload code in github. Jenkins will pull the code from github and communicate with cloudformation service in AWS in order to create cloudformation stack. The cloudformation stack will create a resource in the AWS region.

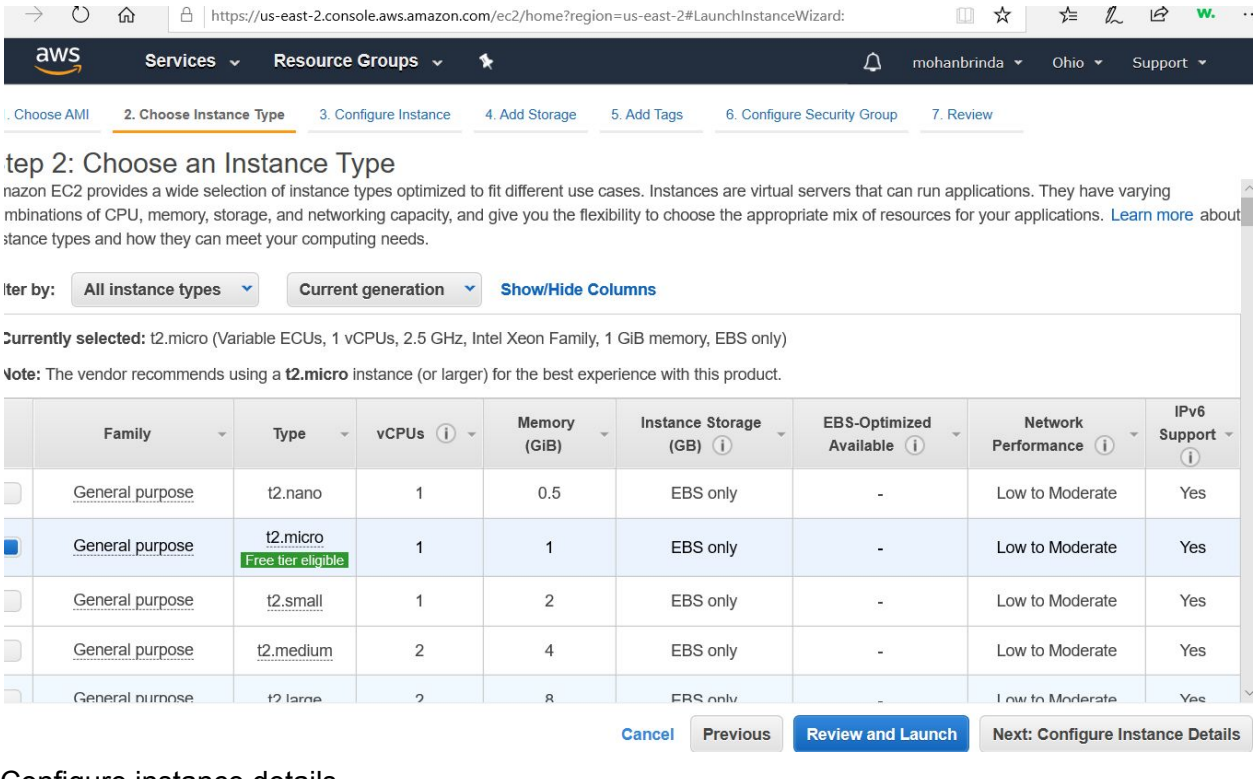
Log in to AWS console:



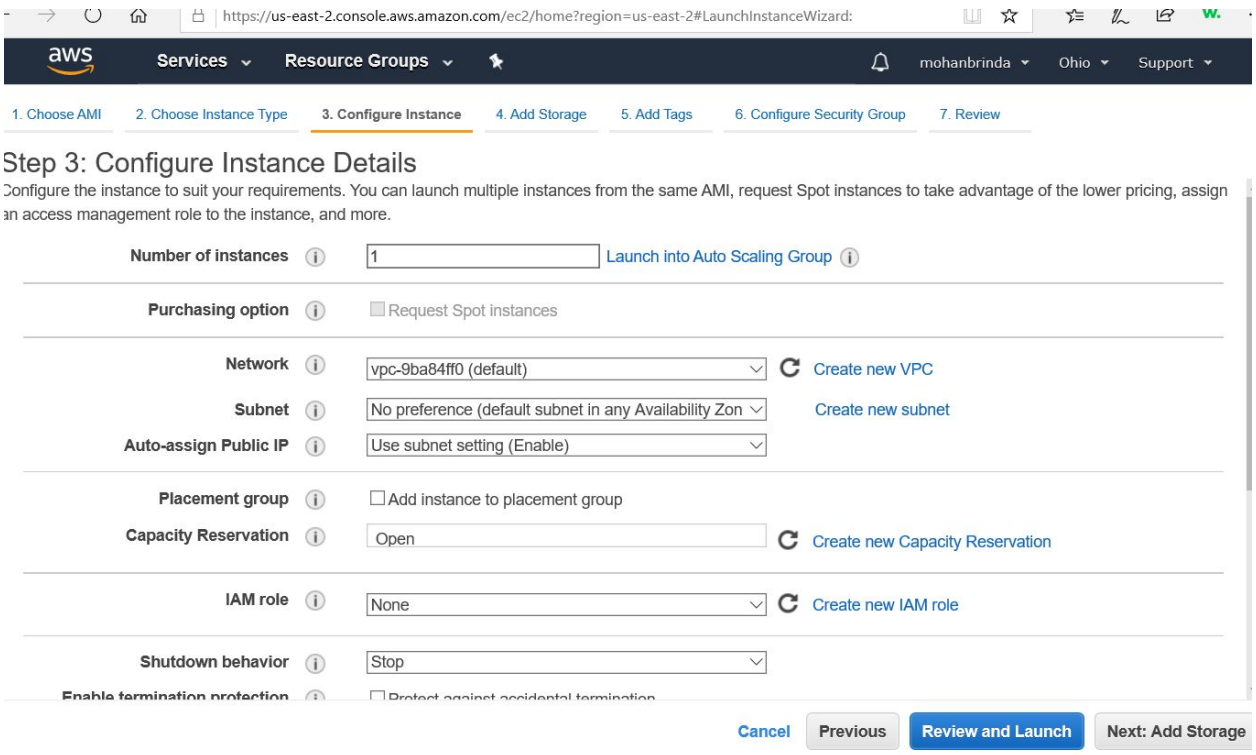
Launch CentOS ec2 instance



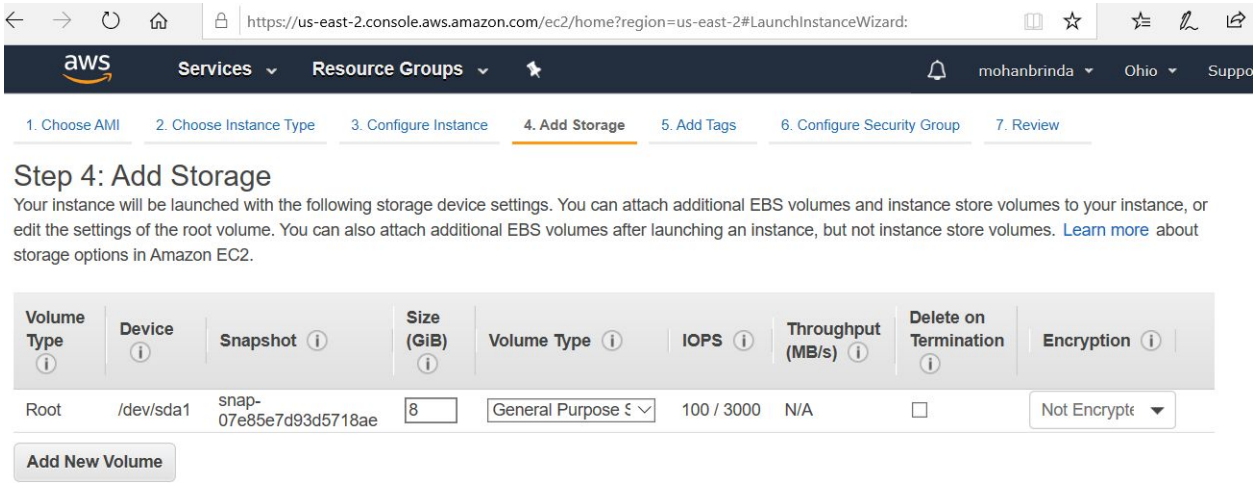
Select eligible t2 micro instances



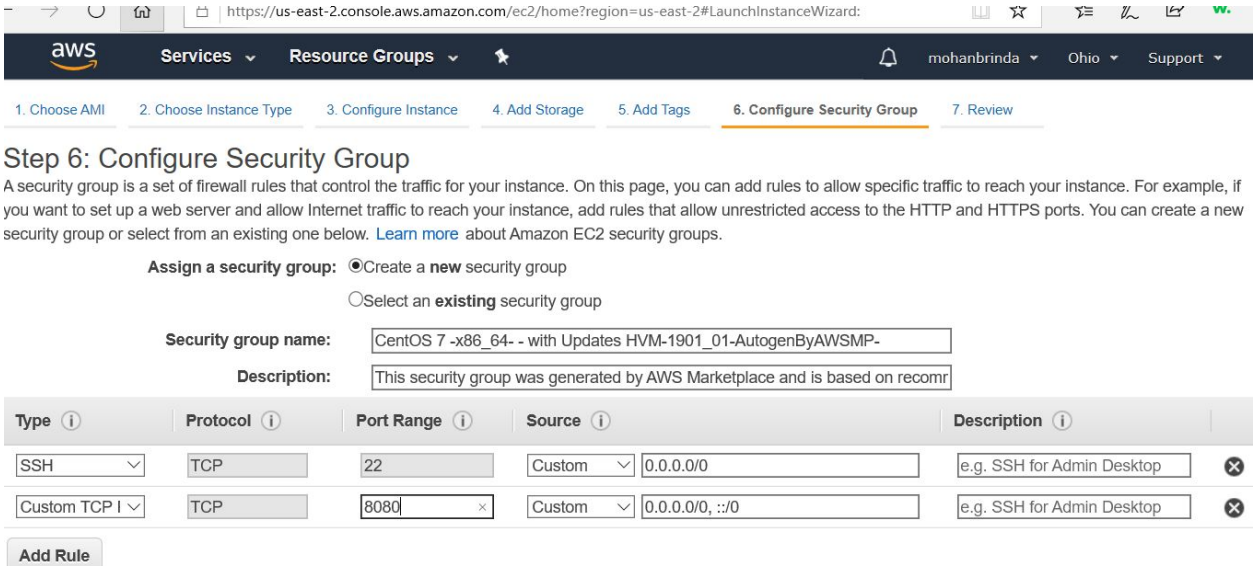
Configure instance details



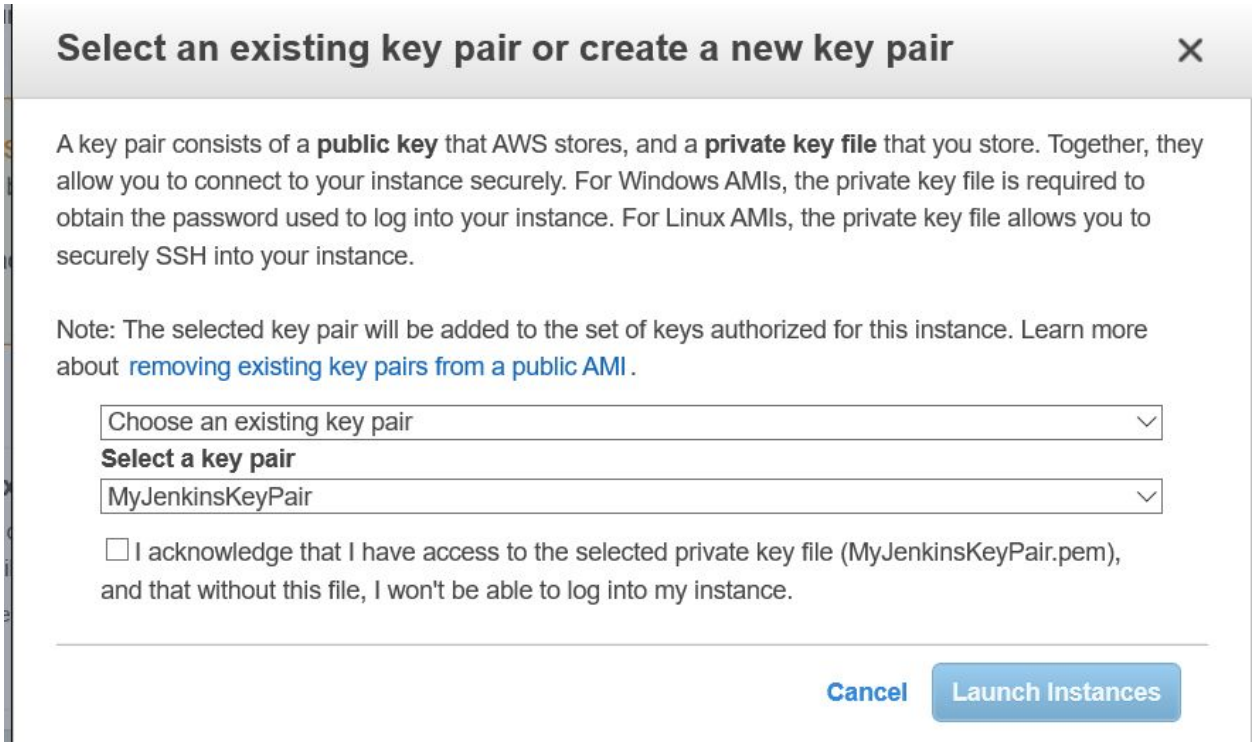
Configure instance storage



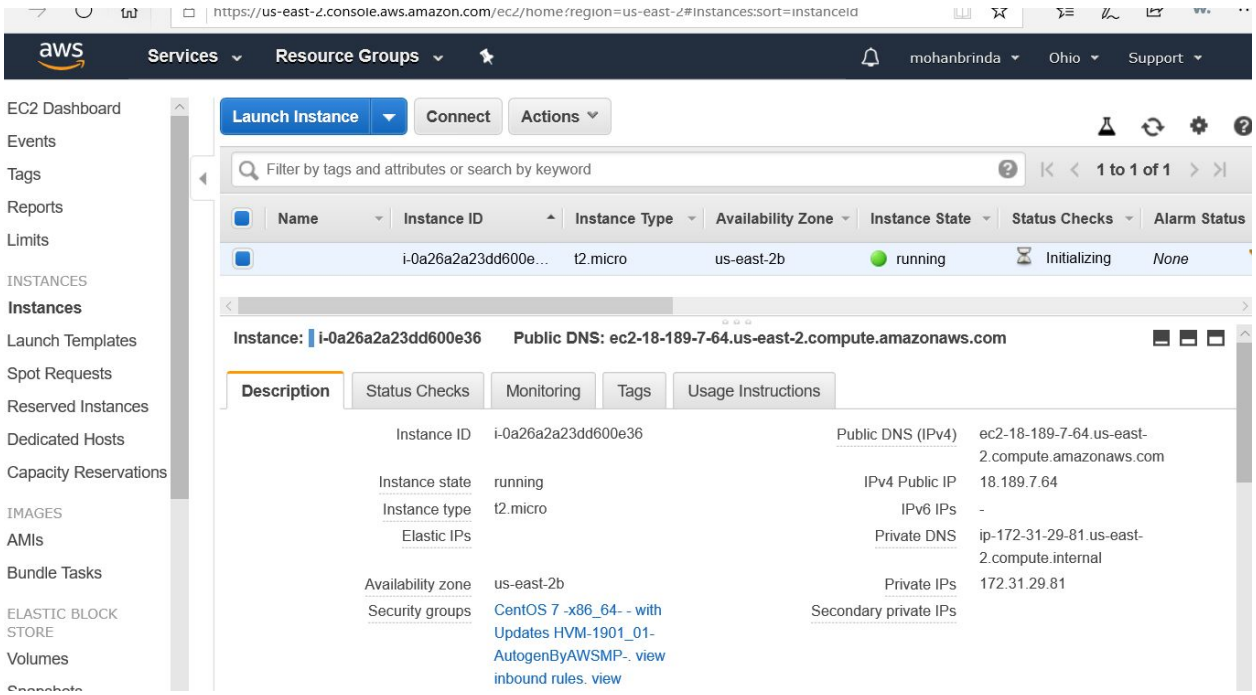
Create security group



Create key pair

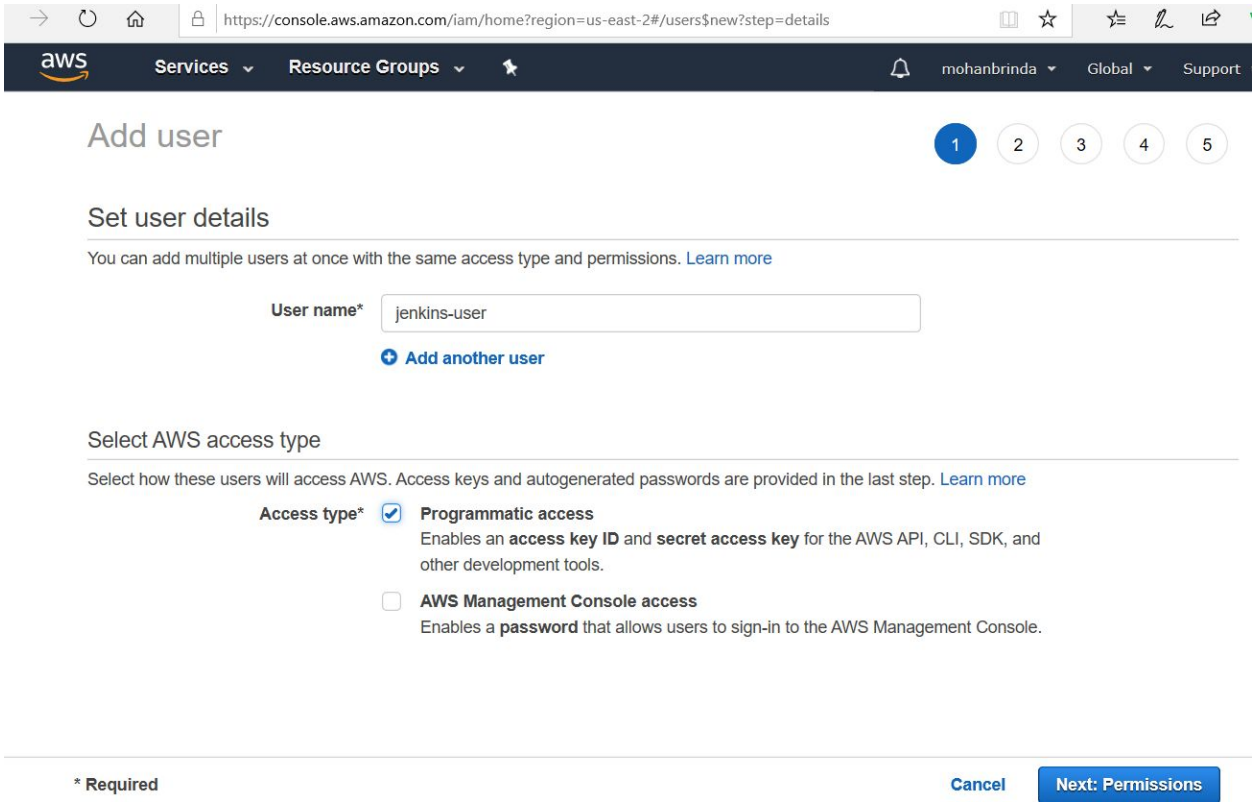


Launch ec2 instance

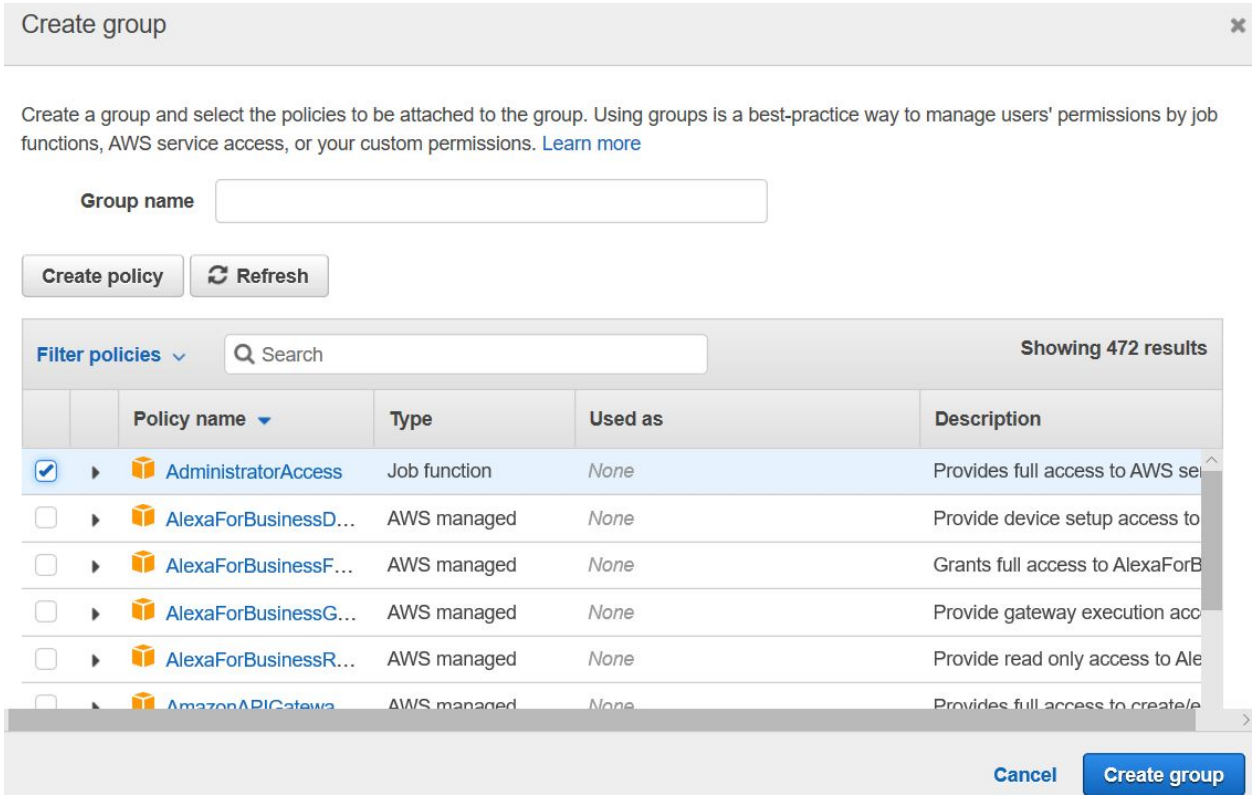


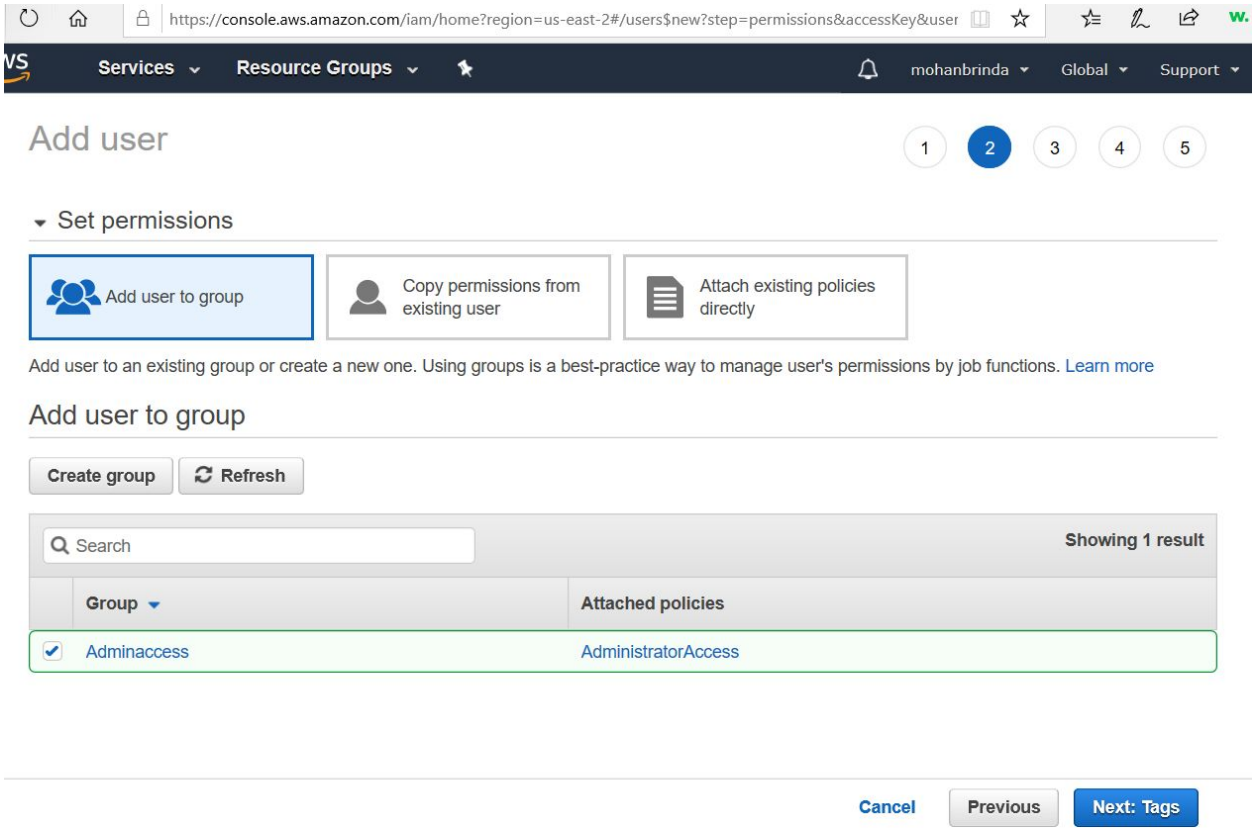
Convert the MyJenkinskeyPair.pem file to MyJenkinskeyPair.ppk using puttygen.
Login to the ec2 instance using putty.

Create IAM user for communication between AWS and Jenkins. The user needs programmatic access and not management console access.

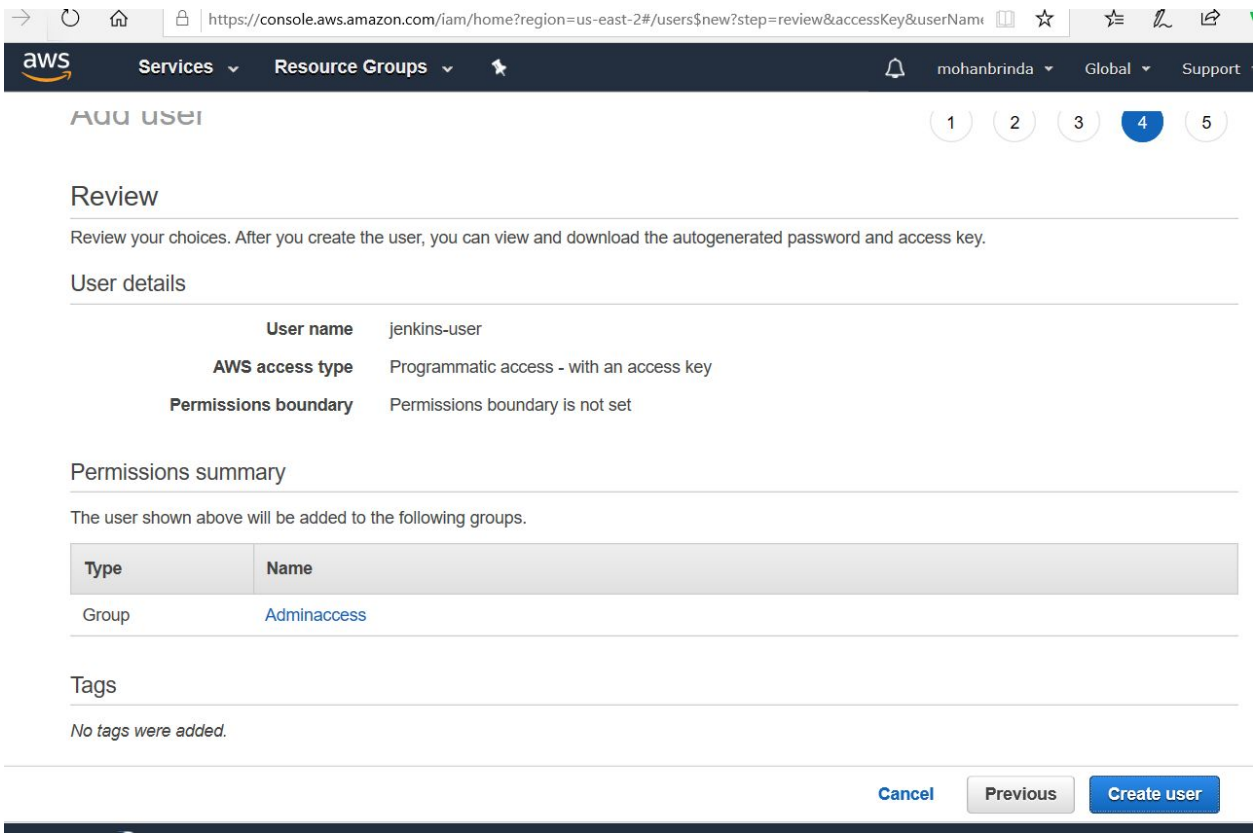


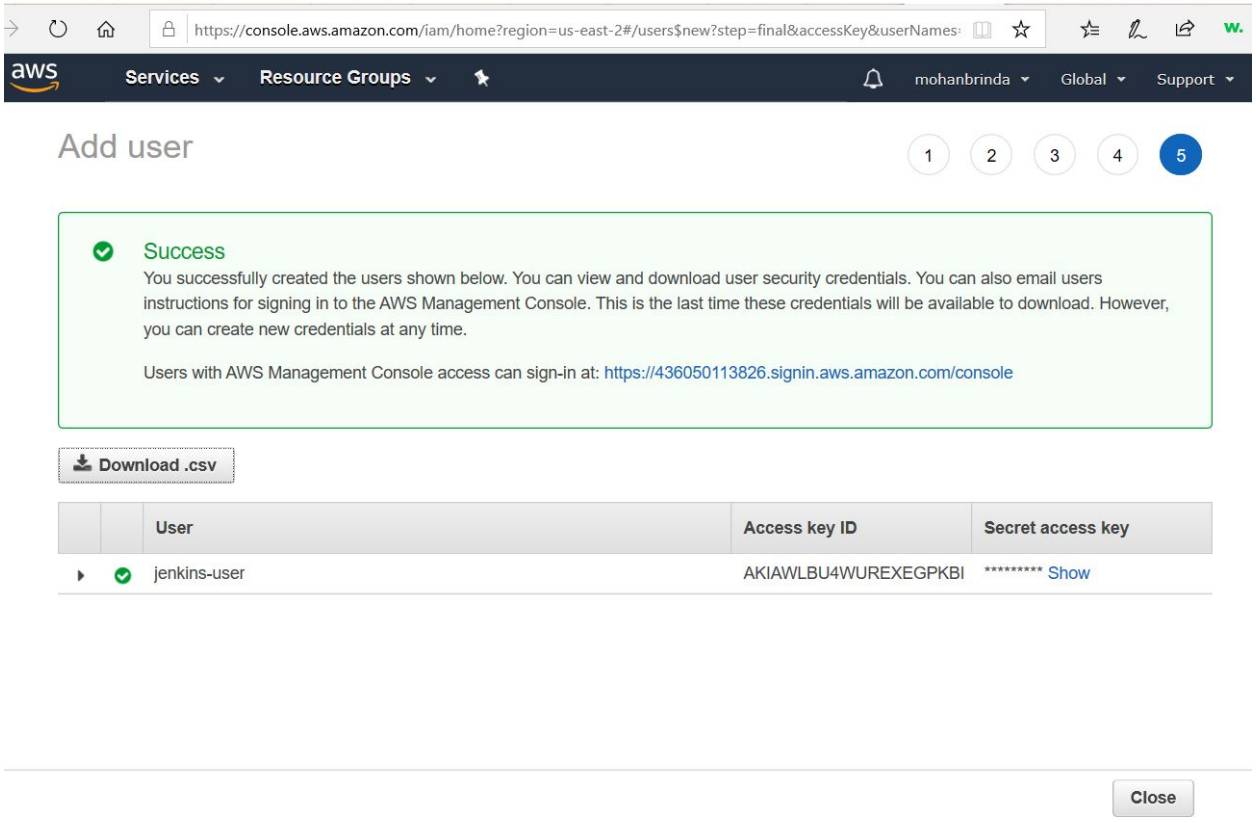
Give Admin access to the user.



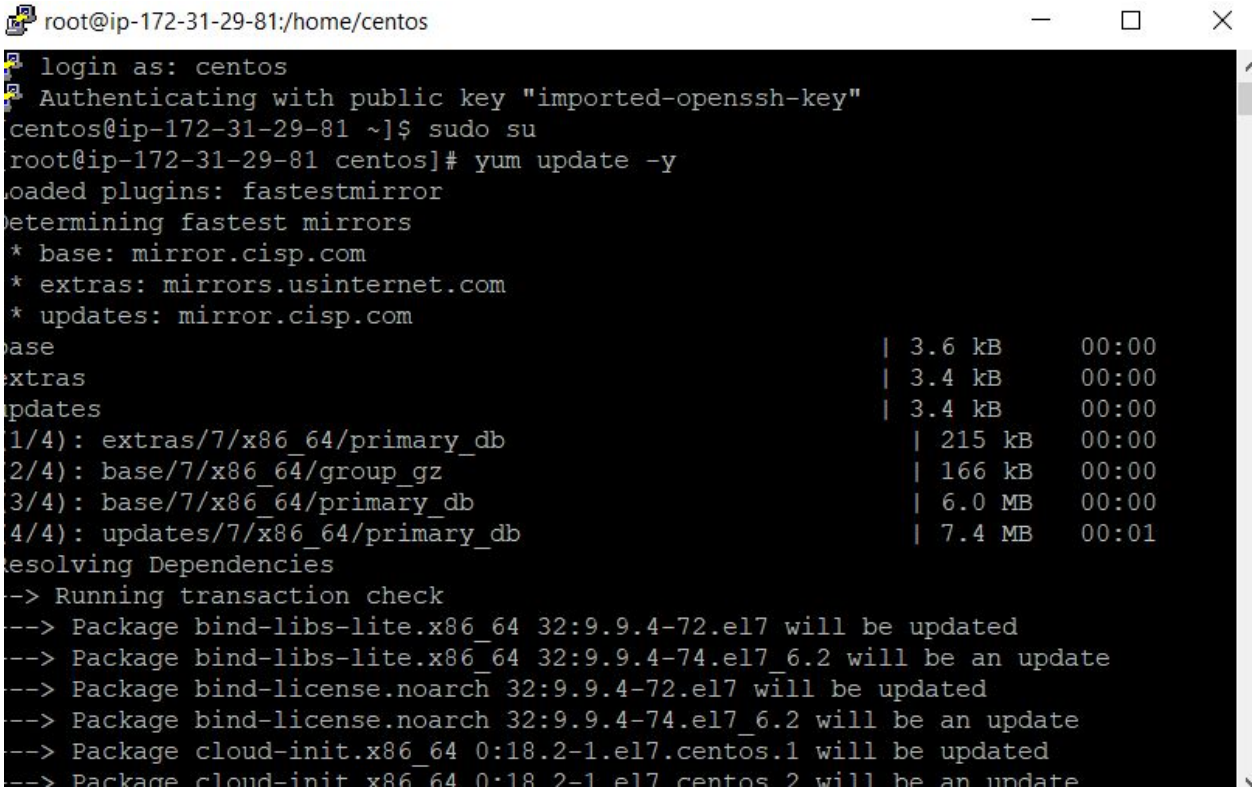


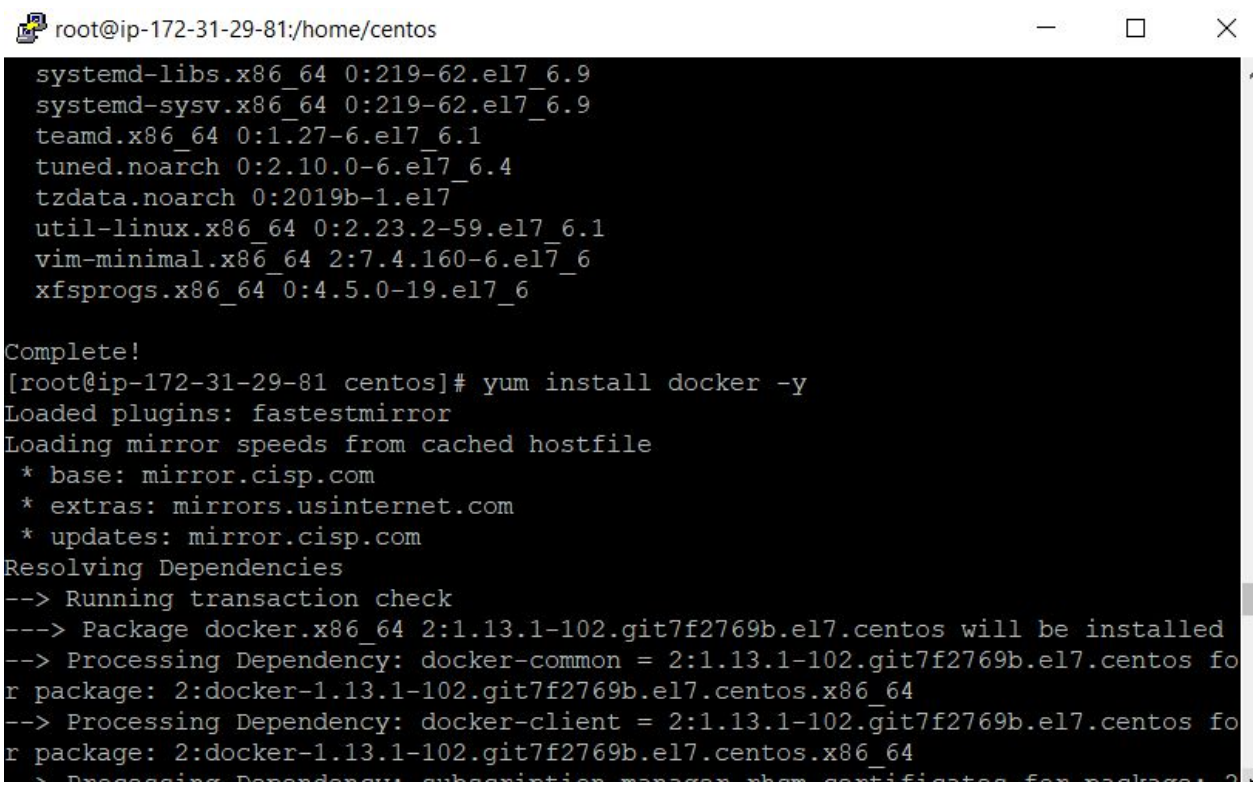
Review create user and download access and secret access key.


https://console.aws.amazon.com/iam/home?region=us-east-2#/users$new?step=review&accessKey&userNam
aws
Services
Resource Groups
mohanbrinda
Global
Support
Add user
1 2 3 4 5
Review
Review your choices. After you create the user, you can view and download the autogenerated password and access key.
User details
User name jenkins-user
AWS access type Programmatic access - with an access key
Permissions boundary Permissions boundary is not set
Permissions summary
The user shown above will be added to the following groups.
Type
Name
Group
Adminaccess
Tags
No tags were added.
Cancel
Previous
Create user

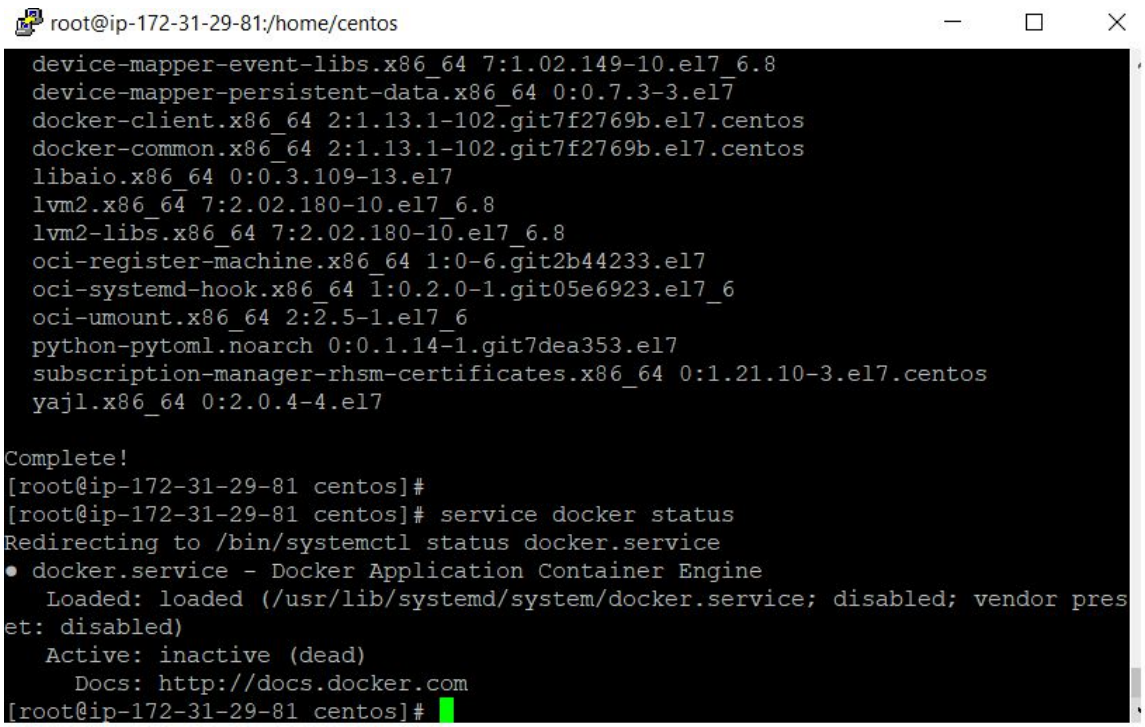

https://console.aws.amazon.com/iam/home?region=us-east-2#/users$new?step=final&accessKey&userNames
aws
Services
Resource Groups
mohanbrinda
Global
Support
Add user
1 2 3 4 5
Success
You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.
Users with AWS Management Console access can sign-in at: https://436050113826.signin.aws.amazon.com/console
Download .csv
User
Access key ID
Secret access key
jenkins-user
AKIAWLBU4WUREXEGPKBI
********* Show
Close

Loginto the instance using putty and install docker after performing yum updates

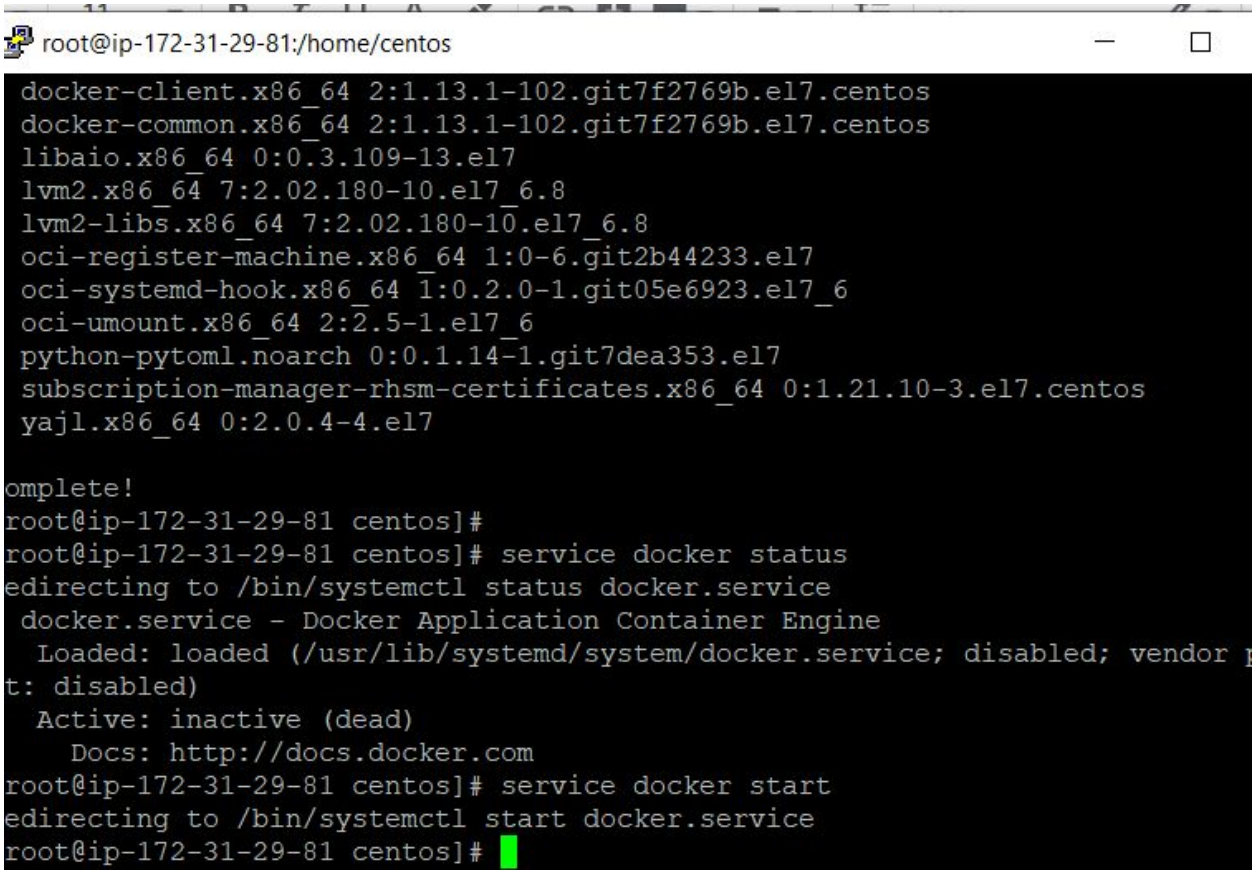




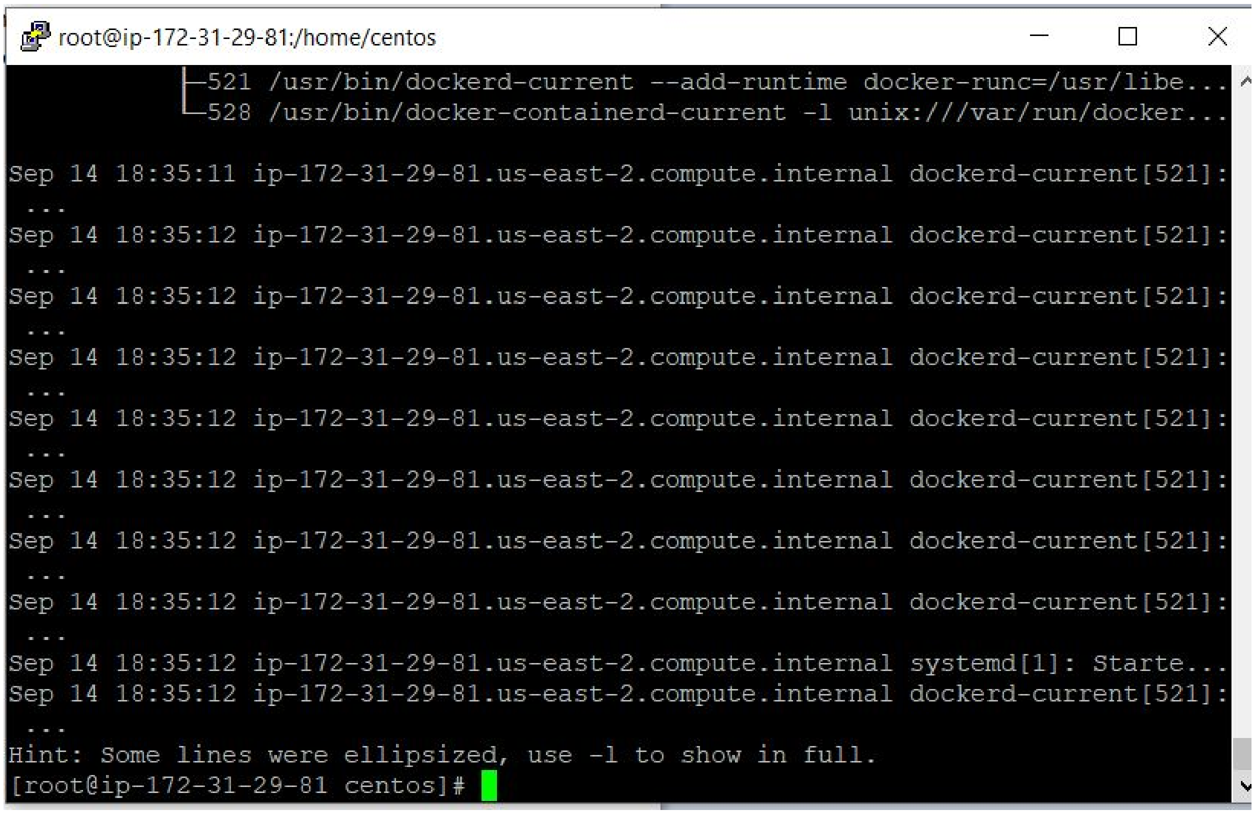
Check docker status and start service



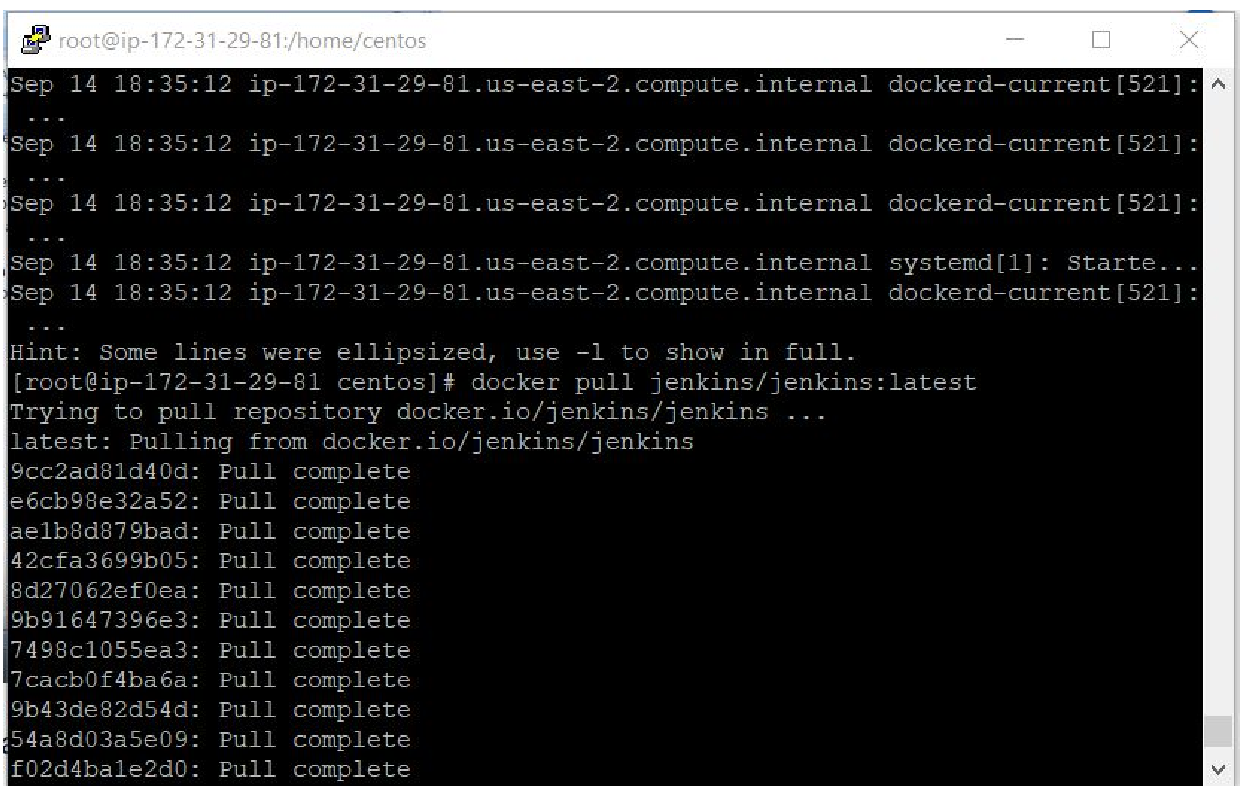
Create a new project in github and upload the json code to create vpc later

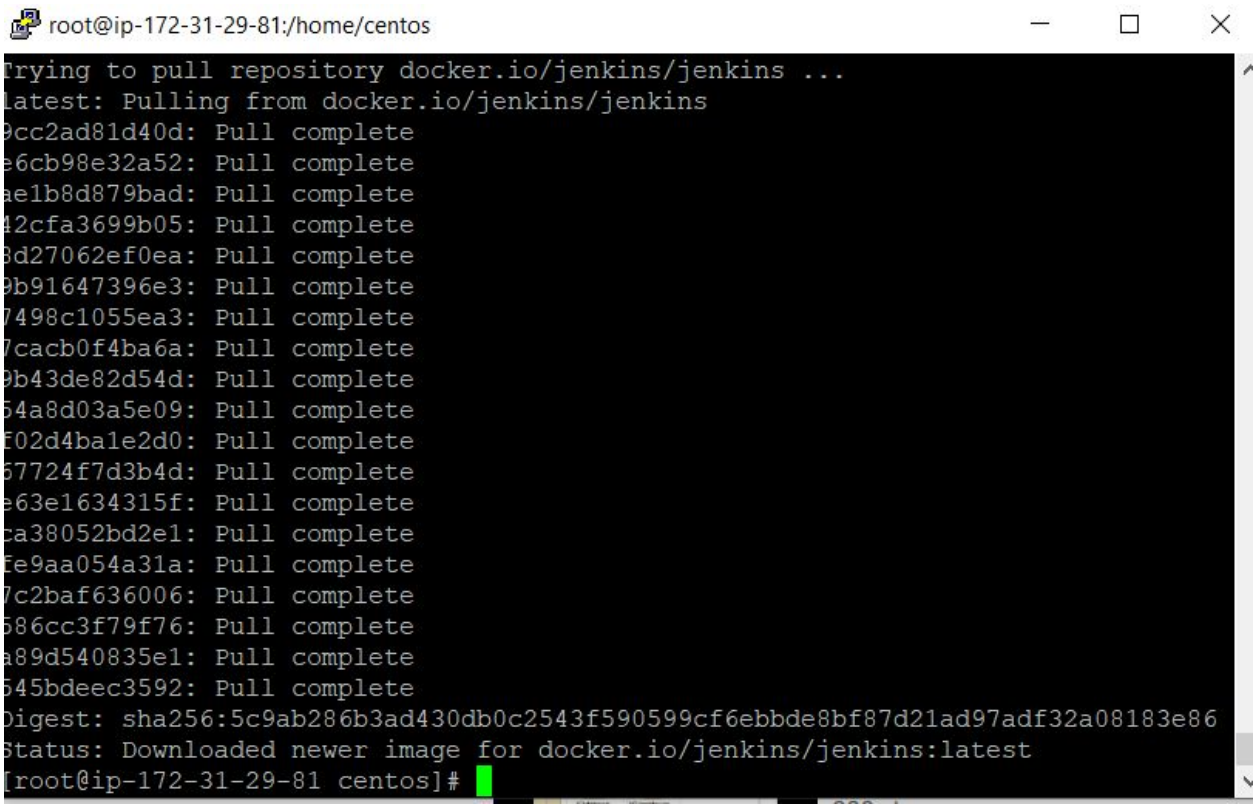


Check the status again

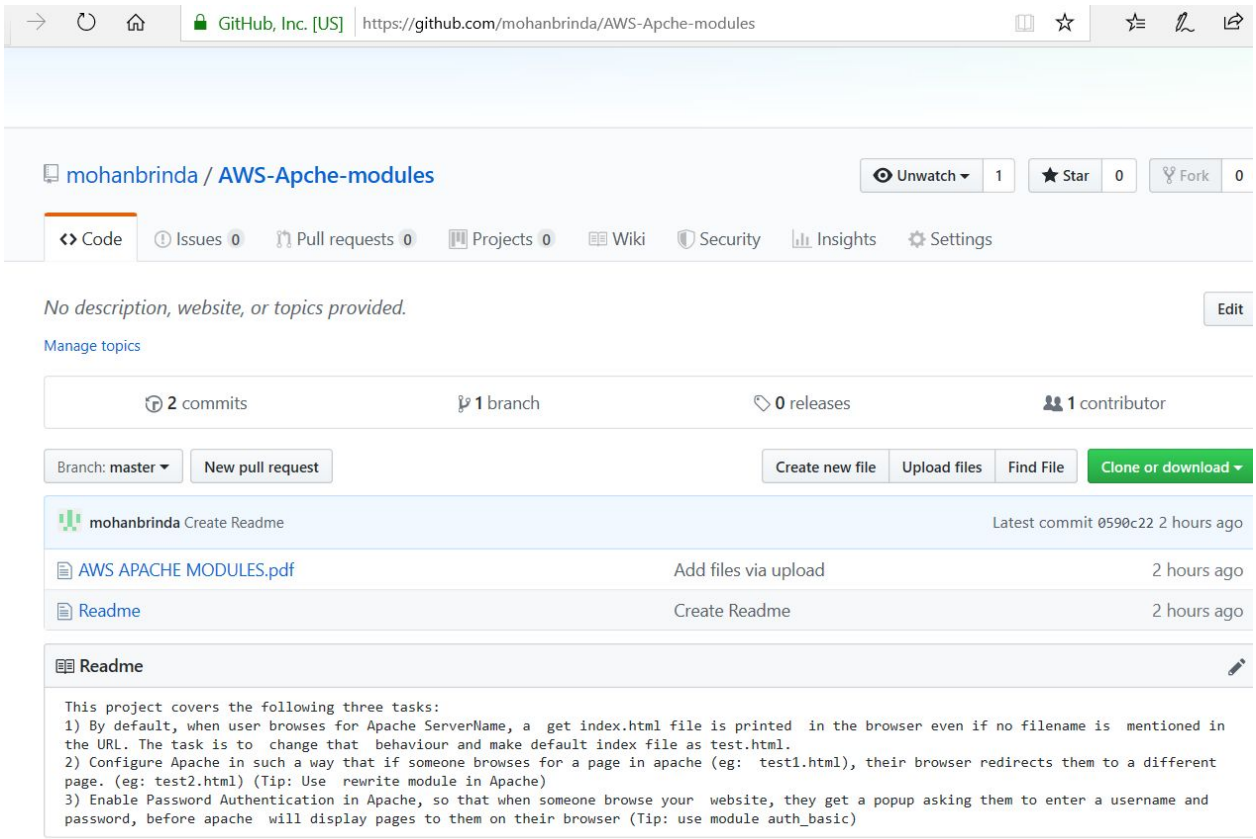


Next step is to pull jenkins docker container image





Create a repository in github and upload the code to create the vpc



Run the docker image. Host jenkins application on port 8080
Docker run -p 8080:8080 -p 50000:50000 jenkins:latest

```
[root@ip-172-31-29-81 bin]# docker run -p 8080:8080 -p 50000:50000 jenkins:lates
t
Unable to find image 'jenkins:latest' locally
Trying to pull repository docker.io/library/jenkins ...
latest: Pulling from docker.io/library/jenkins
55cbf04beb70: Pull complete
1607093a898c: Pull complete
9a8ea045c926: Pull complete
d4eee24d4dac: Pull complete
c58988e753d7: Pull complete
794a04897db9: Pull complete
70fcfa476f73: Pull complete
0539c80a02be: Pull complete
```

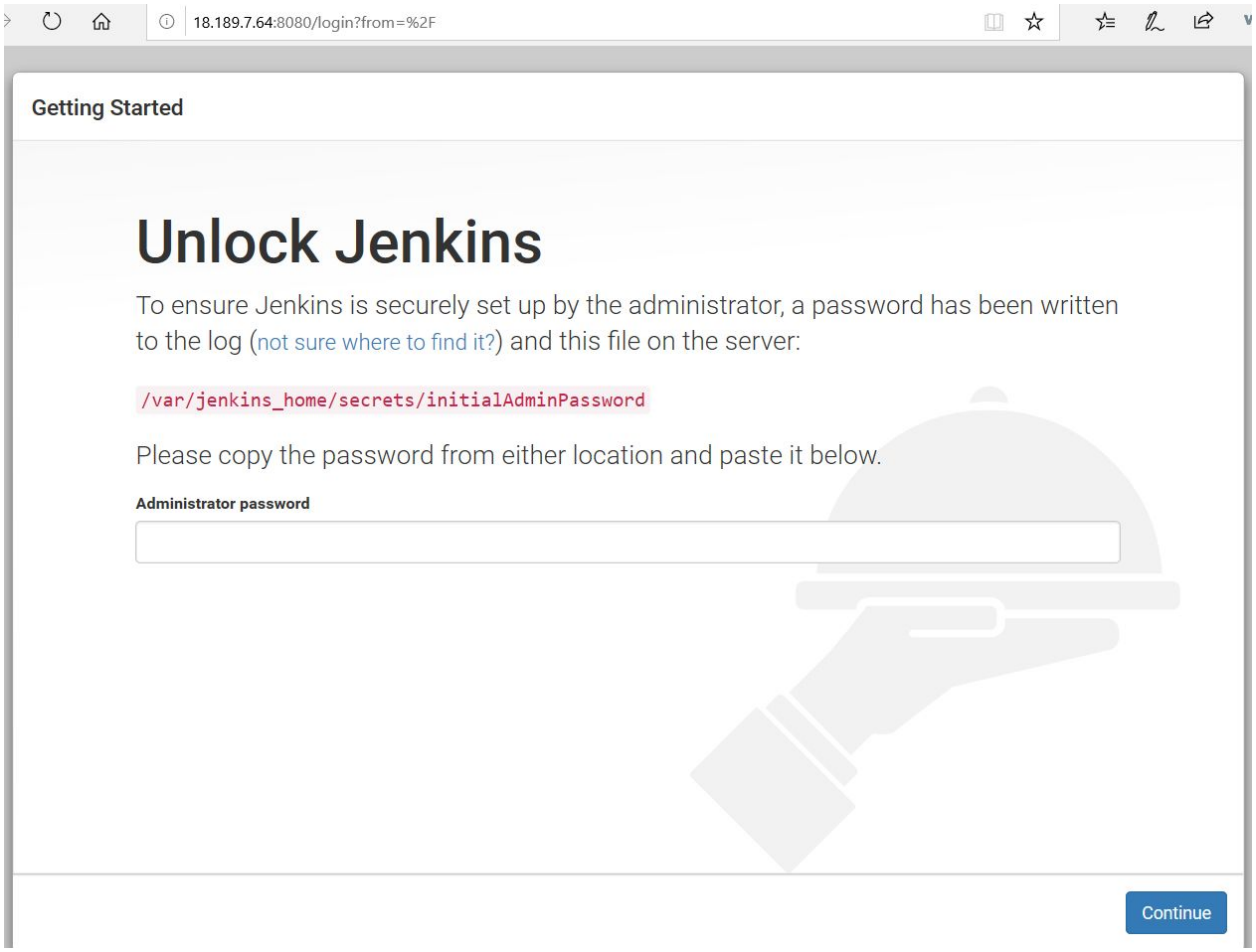
```
*************************************************************
*************************************************************

ep 14, 2019 8:41:24 PM hudson.model.UpdateSite updateData
NFO: Obtained the latest update center data file for UpdateSource default
ep 14, 2019 8:41:24 PM hudson.model.DownloadService$Downloadable load
NFO: Obtained the updated data file for hudson.tasks.Maven.MavenInstaller
ep 14, 2019 8:41:25 PM hudson.model.DownloadService$Downloadable load
NFO: Obtained the updated data file for hudson.tools.JDKInstaller
ep 14, 2019 8:41:25 PM hudson.model.AsyncPeriodicWork$1 run
NFO: Finished Download metadata. 8,759 ms
-> setting agent port for jnlp
-> setting agent port for jnlp... done
ep 14, 2019 8:41:29 PM hudson.model.UpdateSite updateData
NFO: Obtained the latest update center data file for UpdateSource default
ep 14, 2019 8:41:29 PM hudson.WebAppMain$3 run
NFO: Jenkins is fully up and running
```

Check the docker status

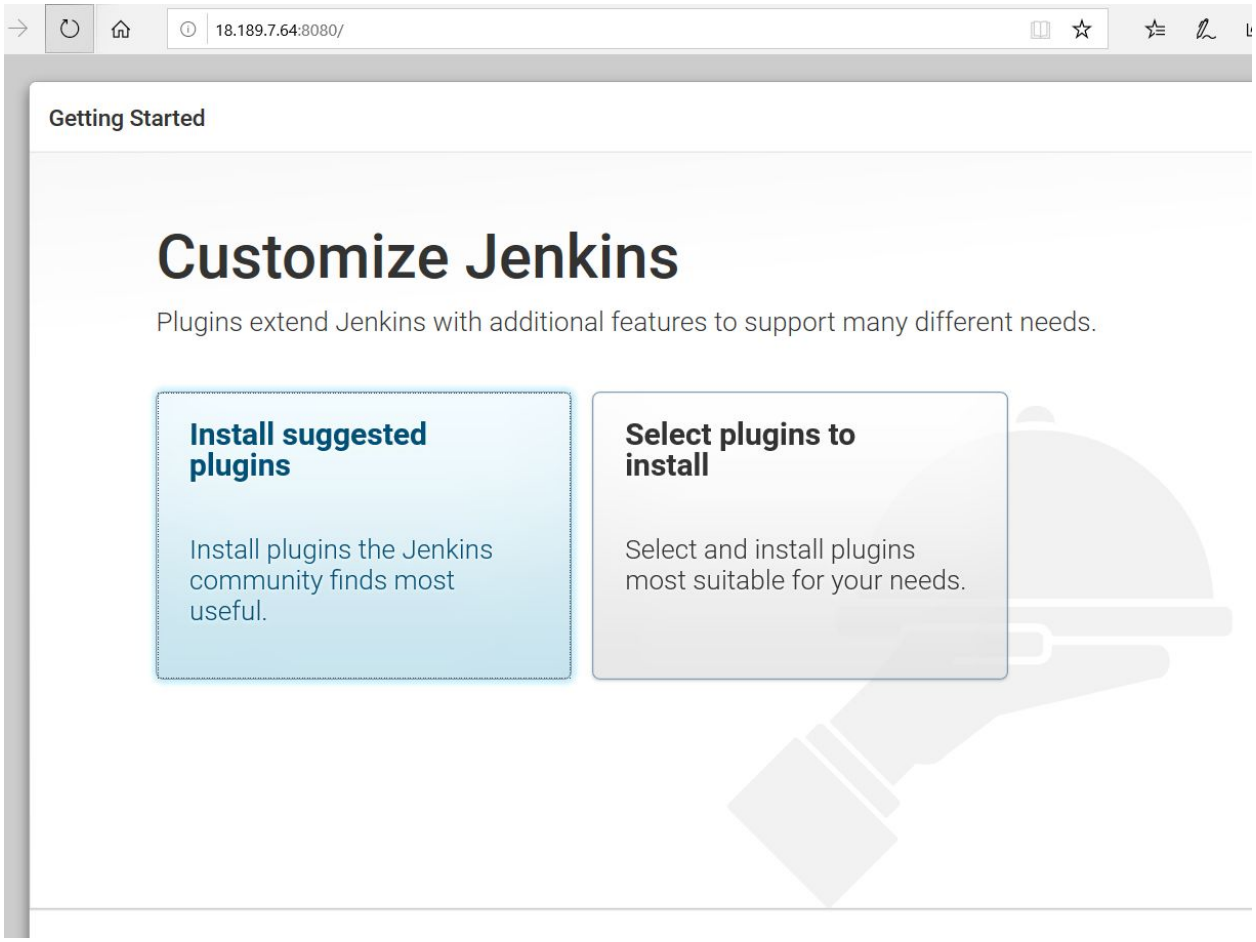
```
root@ip-172-31-29-81:/home/centos
 login as: centos
 Authenticating with public key "imported-openssh-key"
ast login: Sat Sep 14 18:06:04 2019 from pool-96-225-59-182.nwrknj.fios.verizon
net
centos@ip-172-31-29-81 ~]$ sudo su
[root@ip-172-31-29-81 centos]# docker ps
ONTAINER ID        IMAGE               COMMAND             CREATED
TATUS              PORTS               NAMES
root@ip-172-31-29-81 centos]# docker ps
ONTAINER ID        IMAGE               COMMAND                  CREATED
    STATUS              PORTS                                              NAME
S
eac24af7eb8        jenkins:latest      "/bin/tini -- /usr..."   7 minutes ago
    Up 7 minutes        0.0.0.0:8080->8080/tcp, 0.0.0.0:50000->50000/tcp   sill
_wozniak
root@ip-172-31-29-81 centos]#
```

Loginto the console after copying the ip address of the ec2 instance from the console

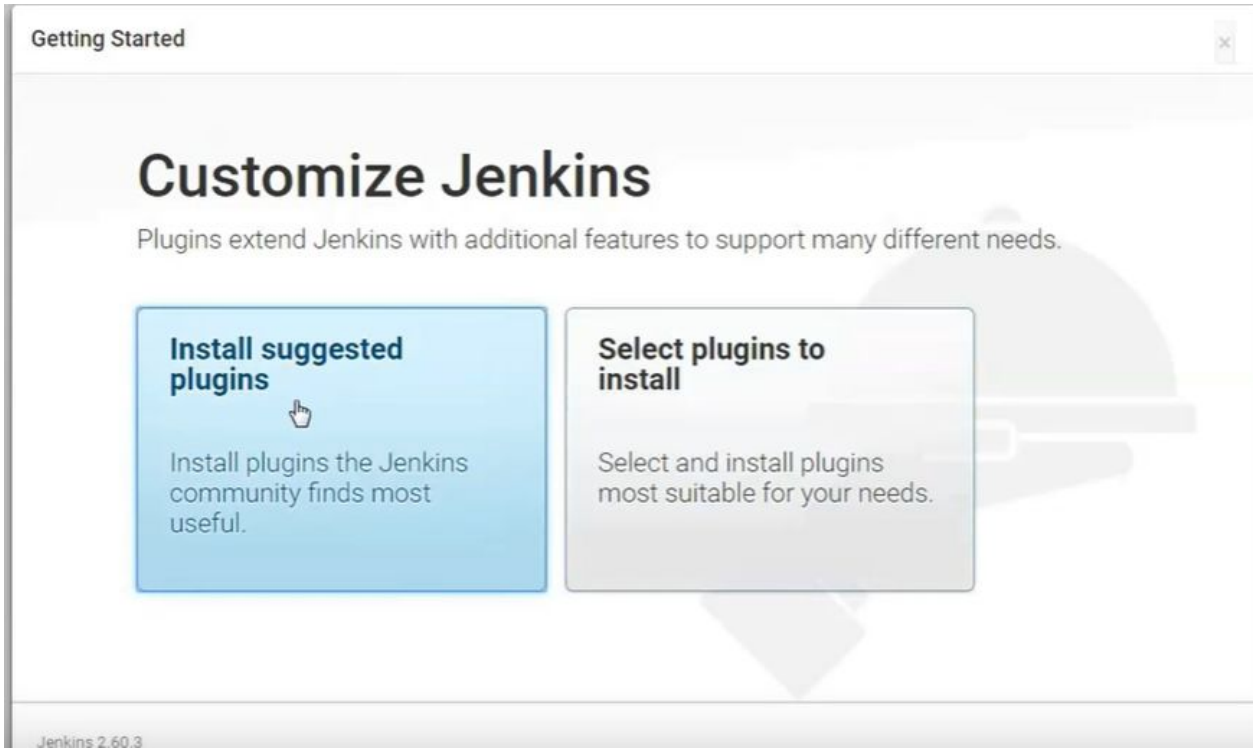
Enter the jenkins installation password

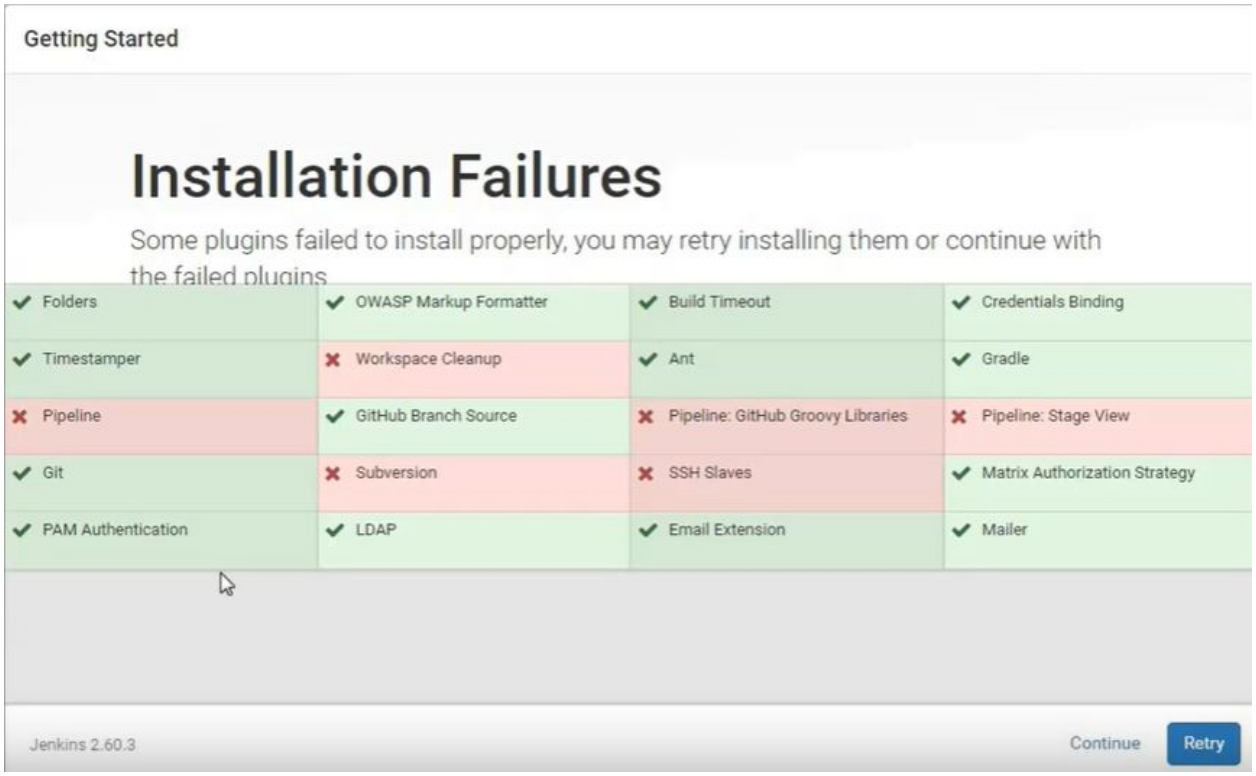


Continue the instructions provided

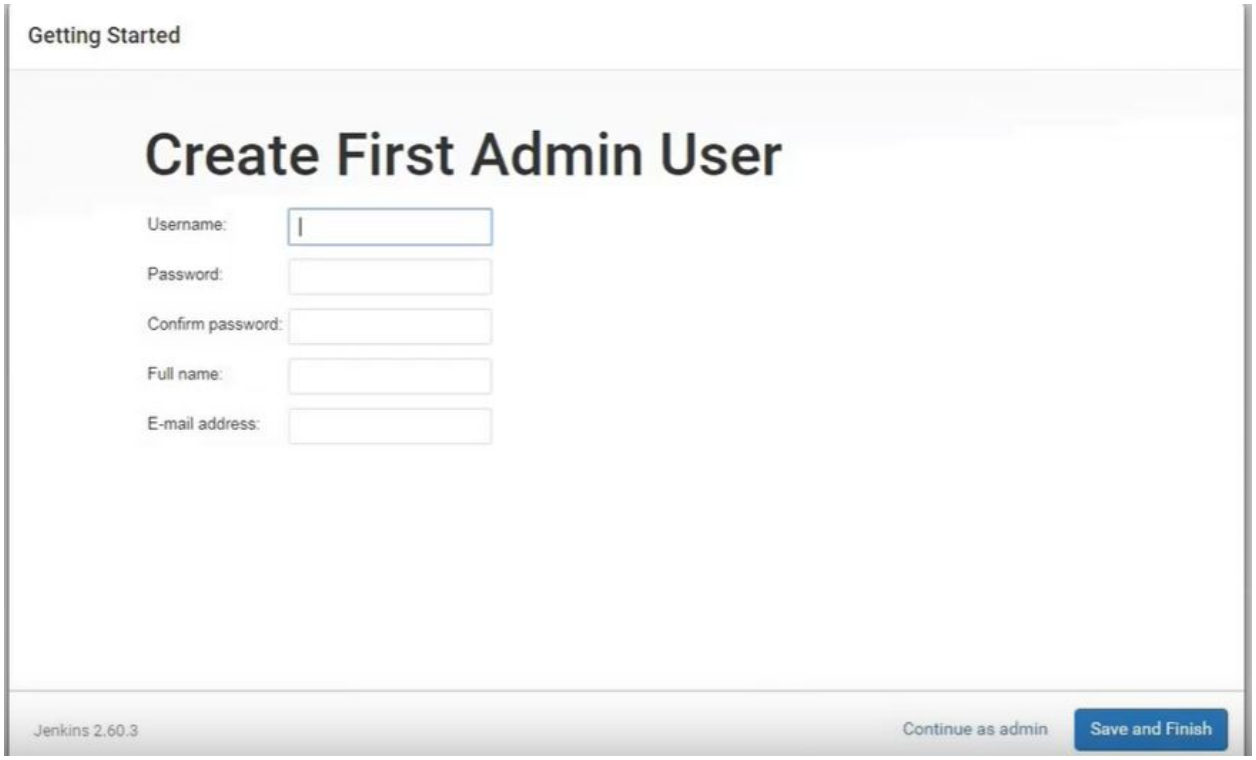


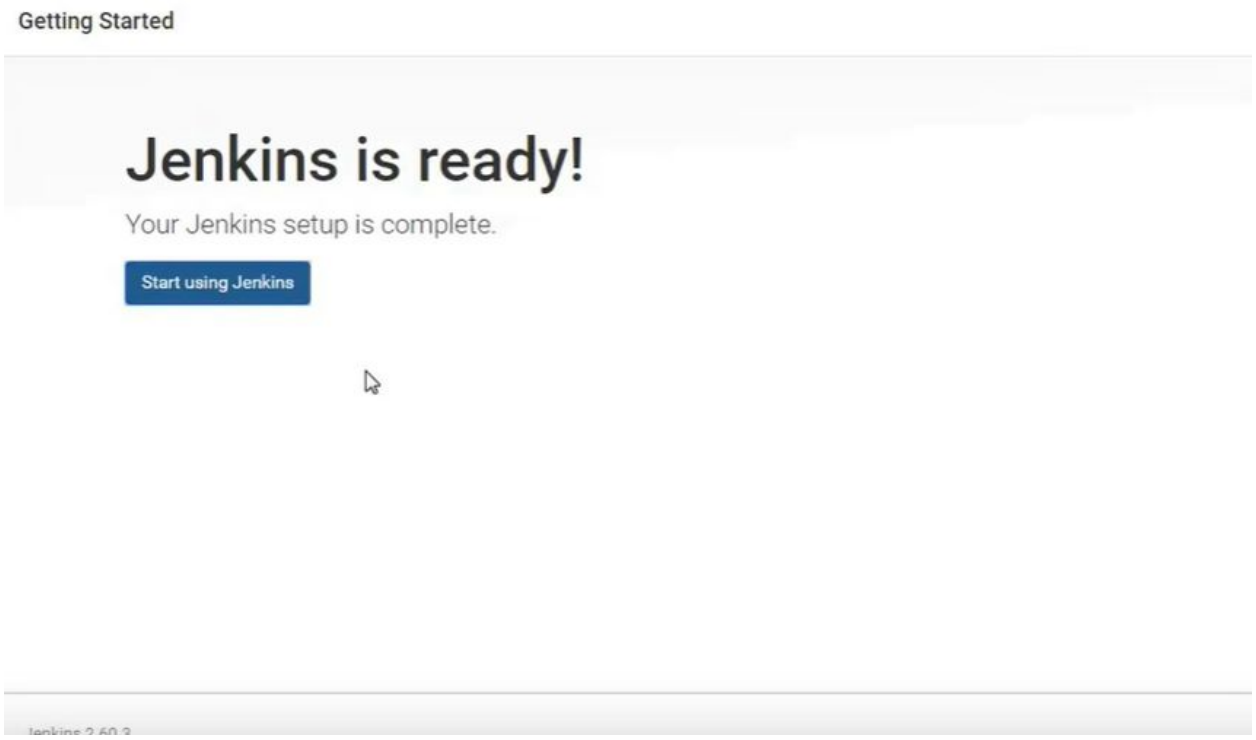
Select Install suggested plugins

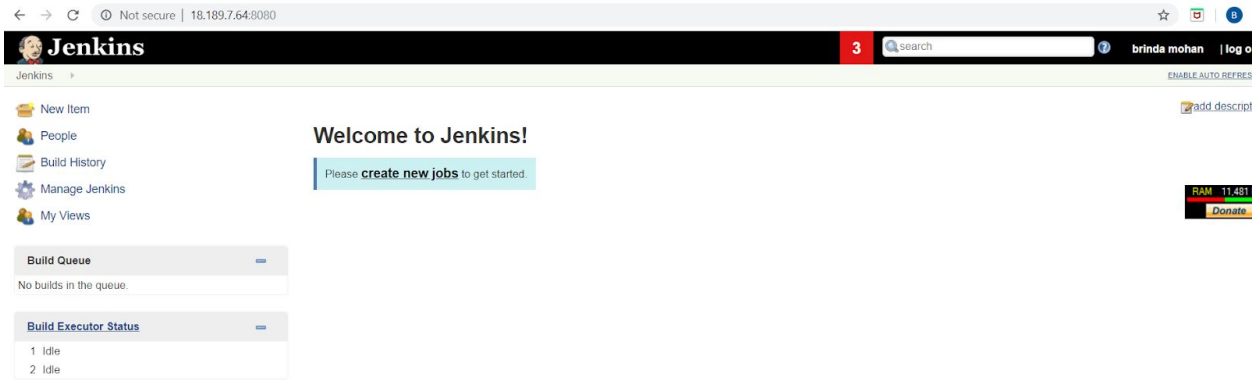




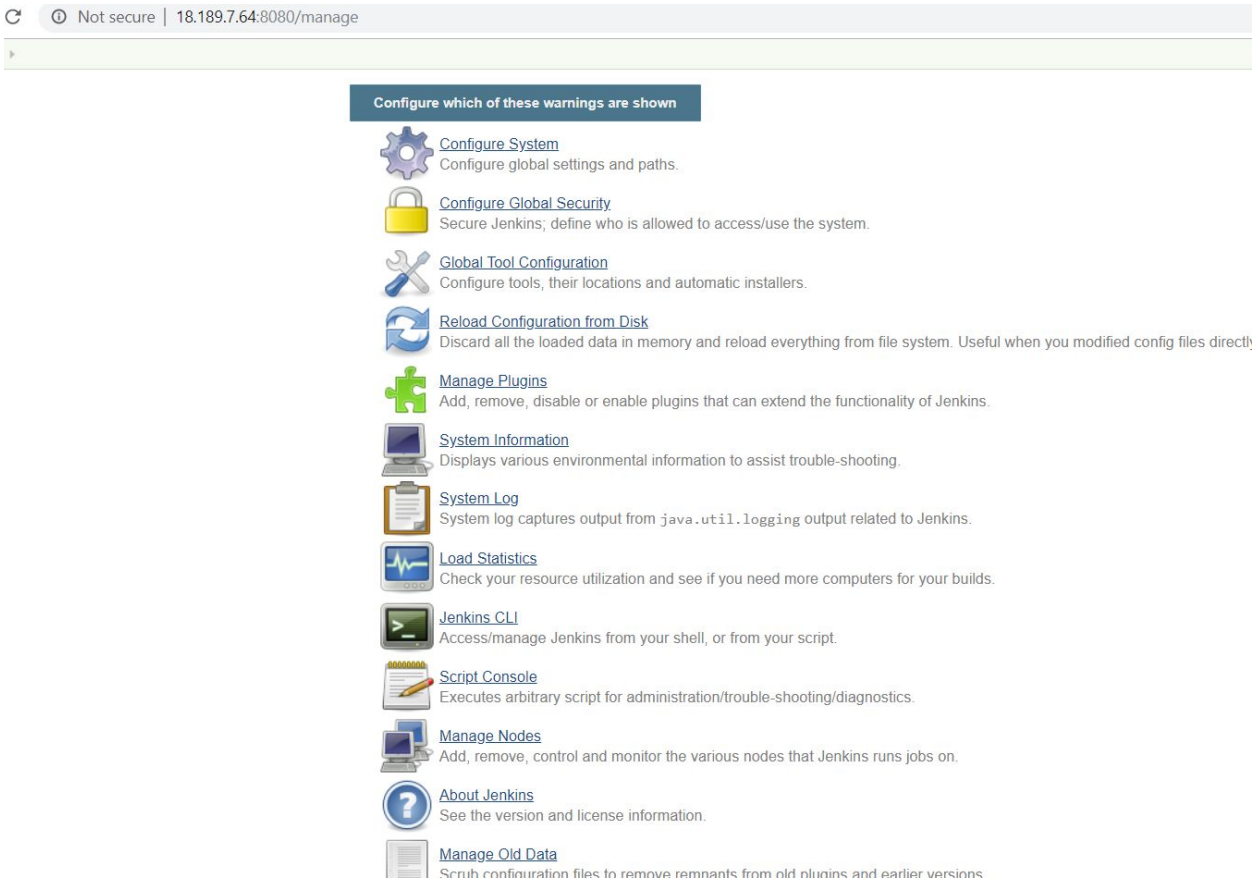
Continue Installing Jenkins with failed plugins, then create the user and complete the installation steps


Getting Started
Create First Admin User
Username:
Password:
Confirm password:
Full name:
E-mail address:
Jenkins 2.60.3
Continue as admin
Save and Finish

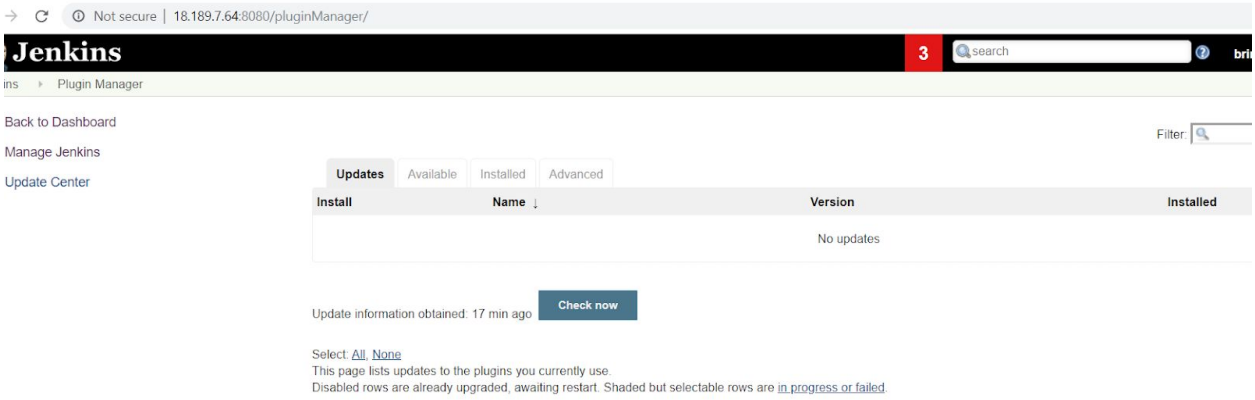

Getting Started
Jenkins is ready!
Your Jenkins setup is complete.
Start using Jenkins



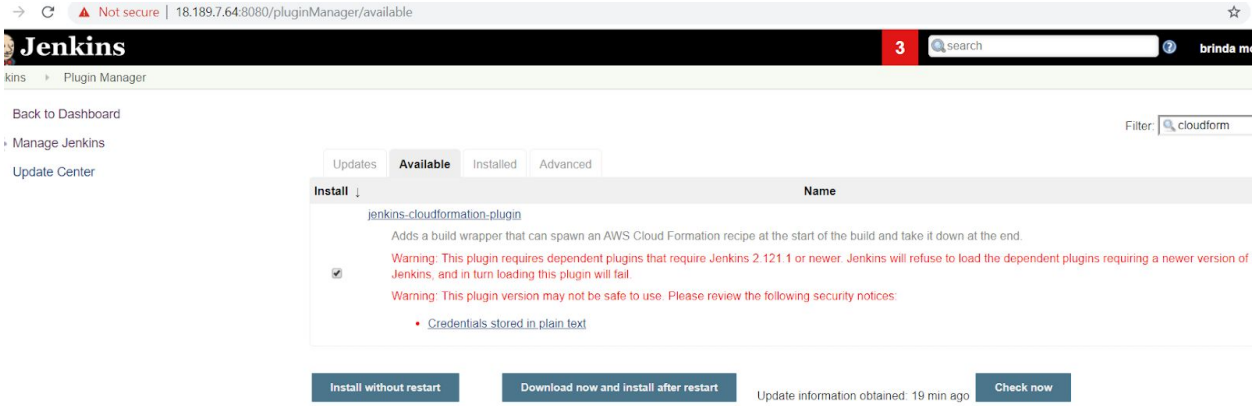
Select Manage plugins



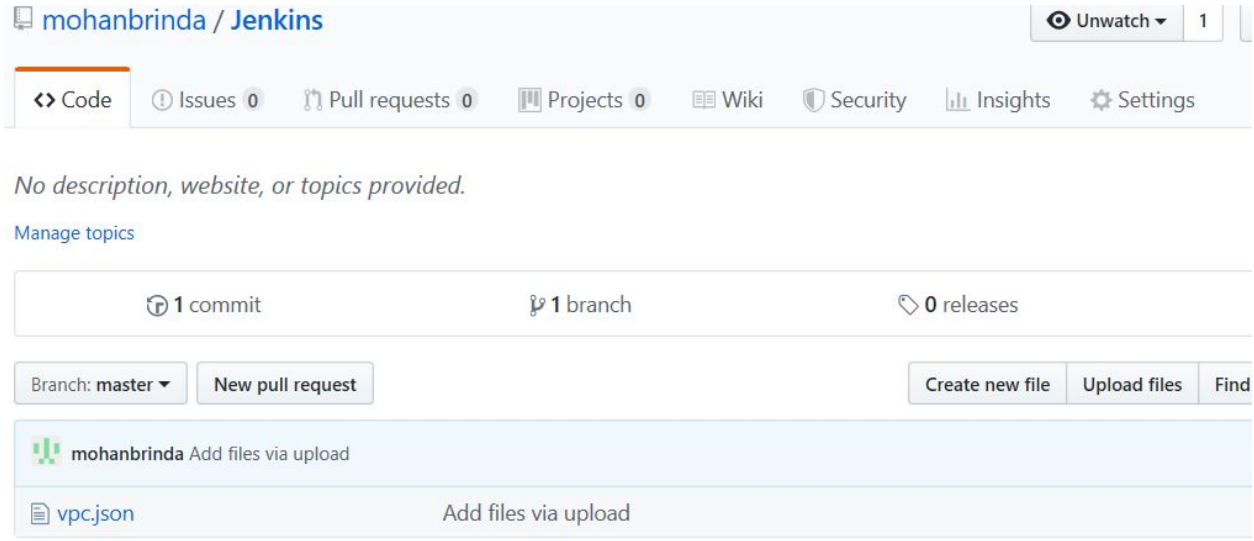
Will display the Manage plugins page



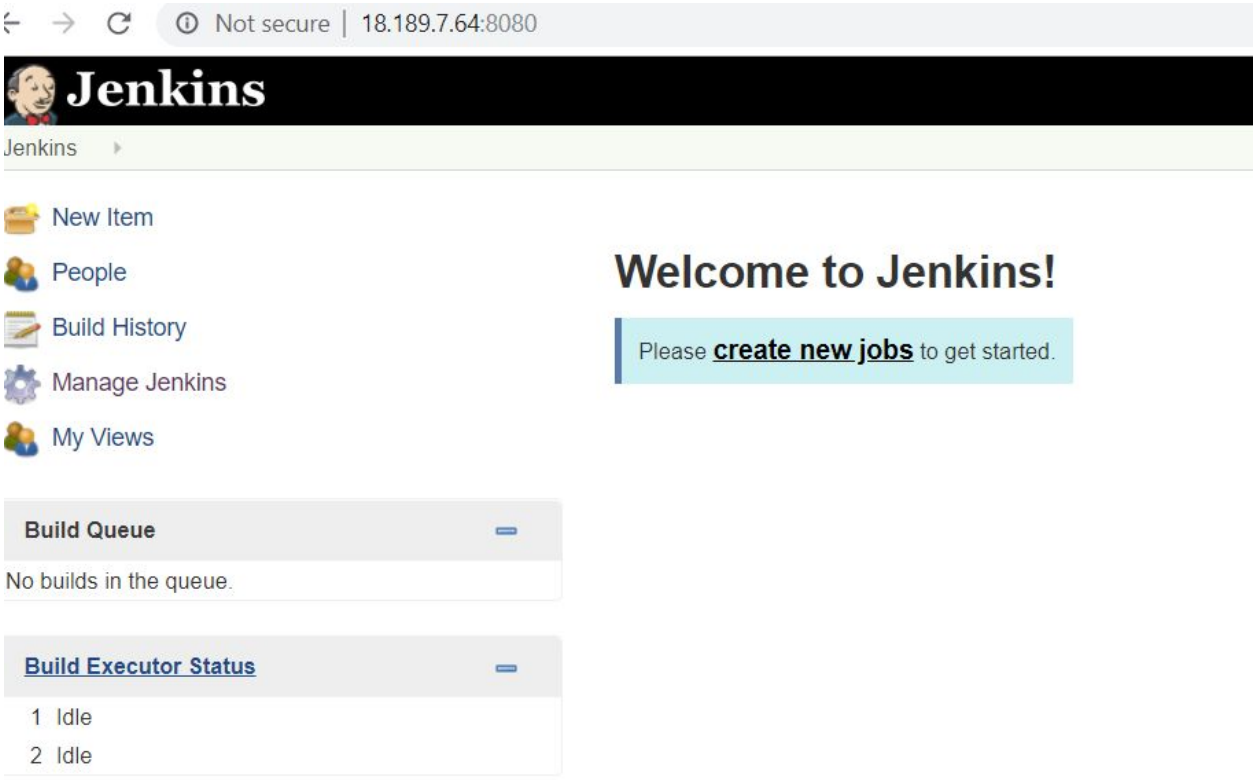
Search for cloudformation and select install without restart



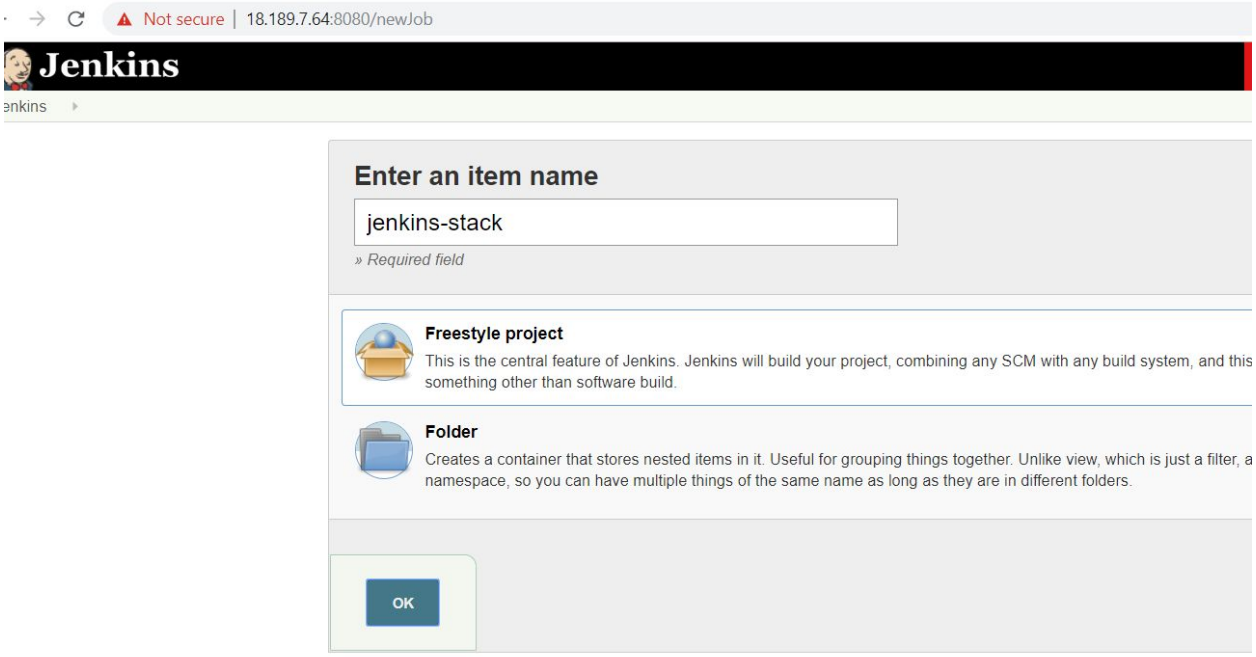
Next upload code(json file) to create vpc in aws to github



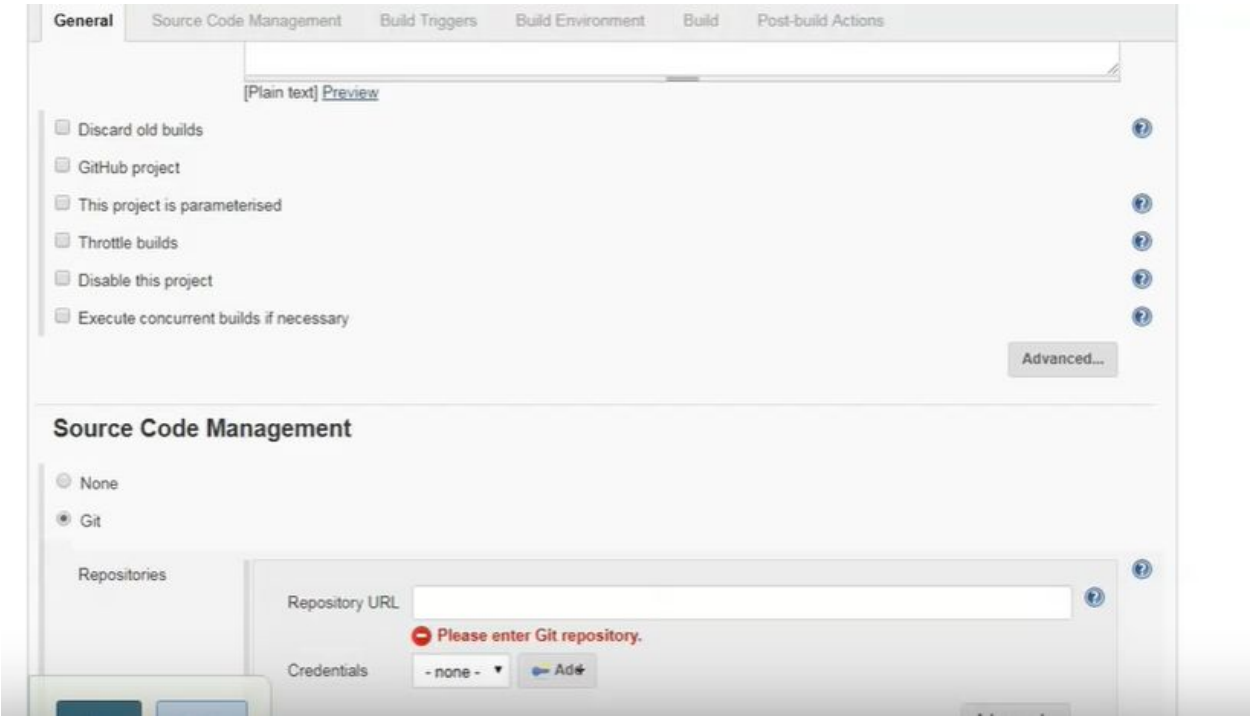
Go to the jenkins dashboard and create new job



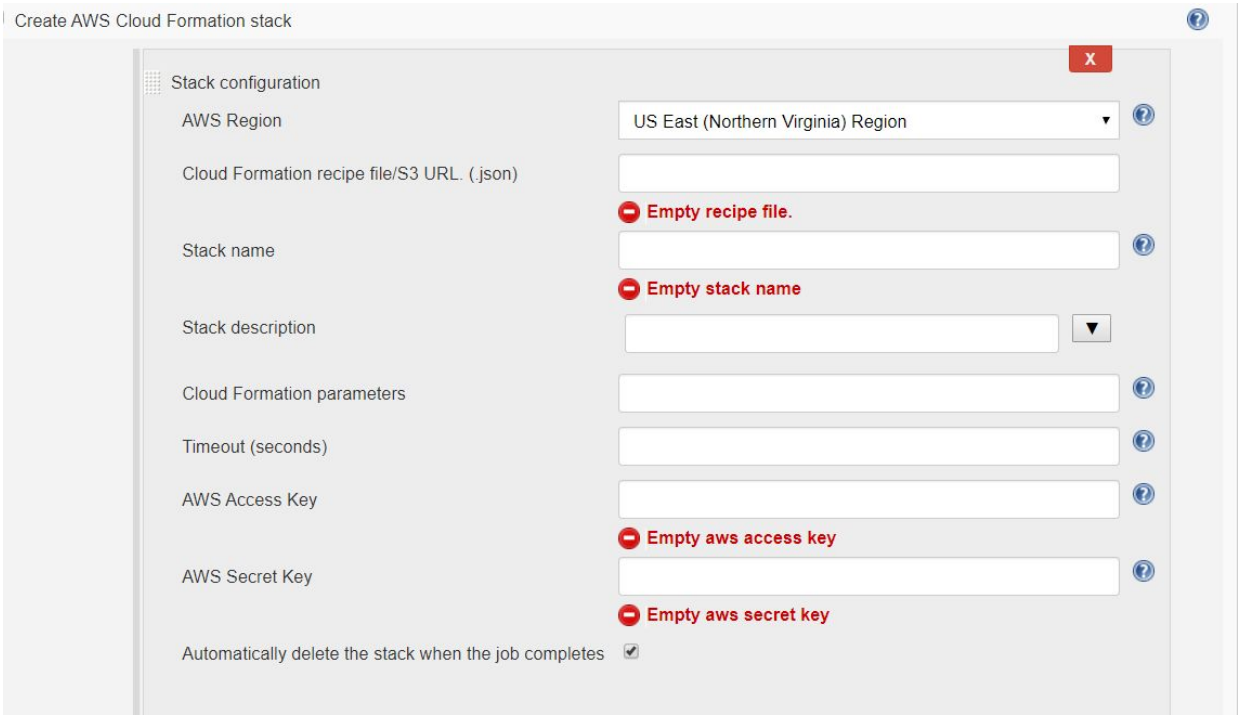
Ener the name, select freestyle project and click ok



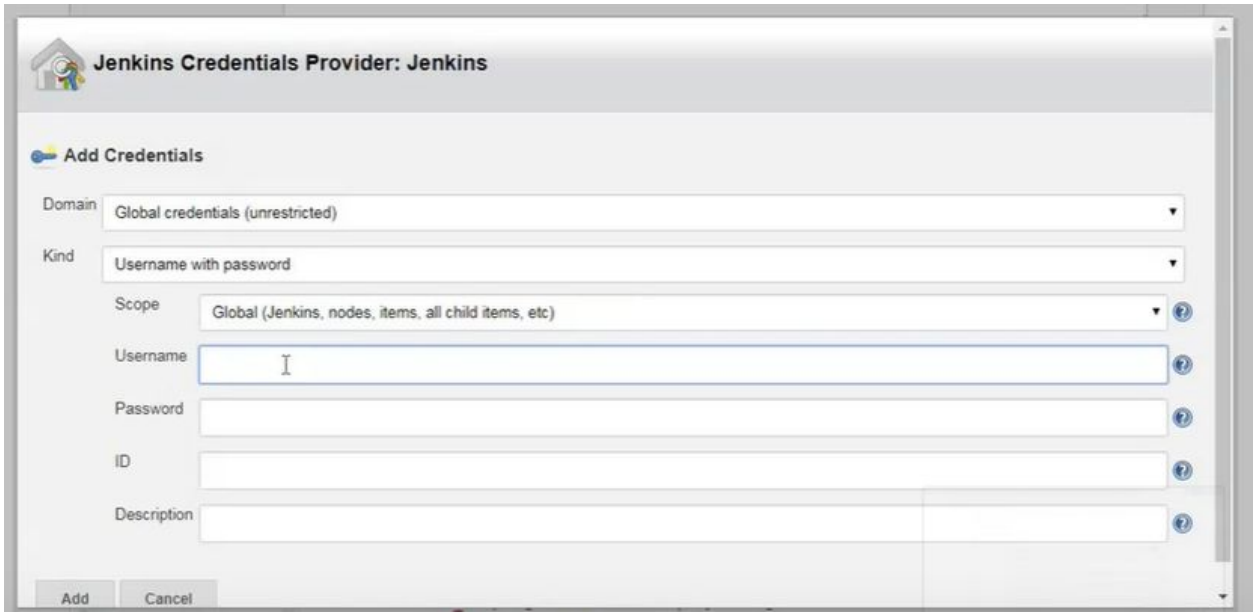
Copy the git repository url and add jenkins credentials

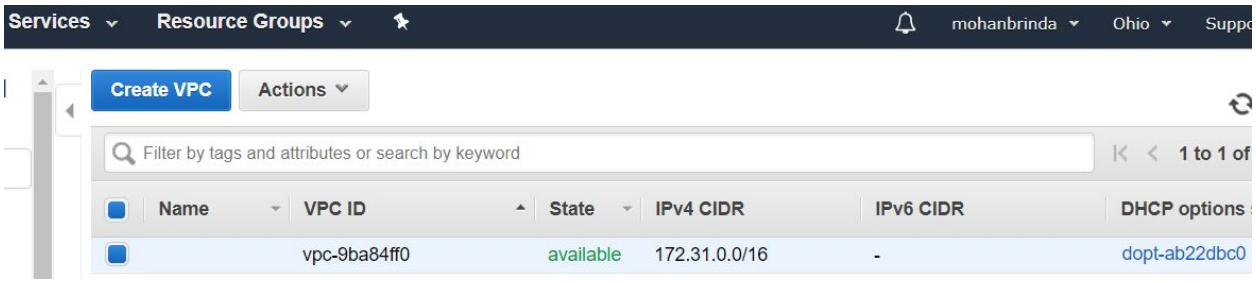


Next fill in all the cloudformation stack creation details and click on save



Then , loginto the AWS console to verify the newly created VPC





Ensure the vps has been created. Back on the jenkins dashboard click on bid now and ensure that the new stack is present along with the vpc.The console output should have finished successfully

References:
https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/aws-resource-ec2-vpc.html
https://jenkins.io/doc/book/installing/#downloading-and-running-jenkins-in-docker
https://docs.docker.com