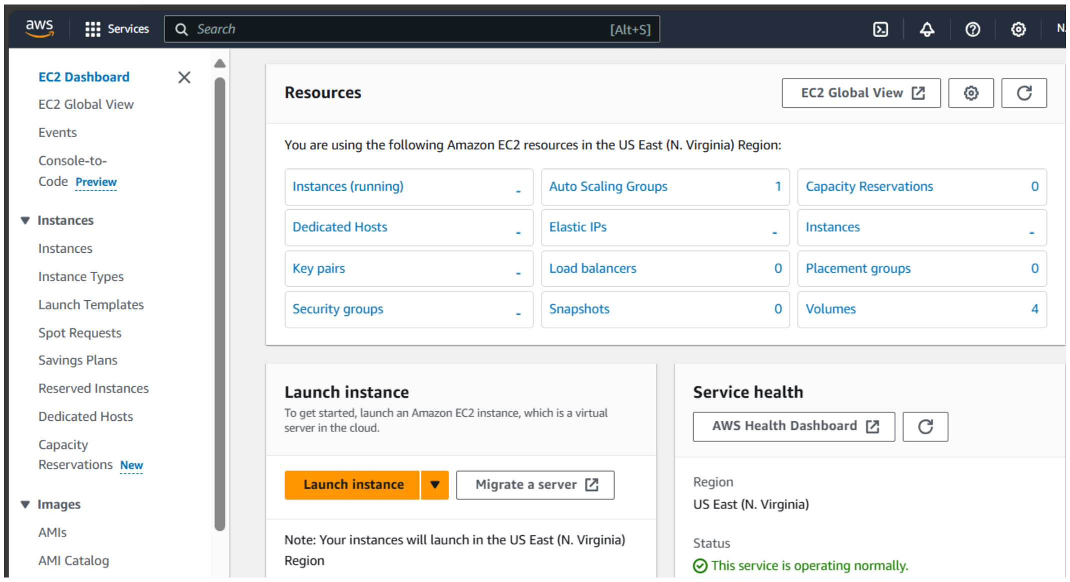
Experiment 4

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

Procedure:

1. **Creation Of EC-2 instance**

- Create an EC2 AWS Linux instance on AWS .also edit the Security Group Inbound Rules to allow SSH. then select the t2.micro instance type



Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	-	Auto Scaling Groups	1	Capacity Reservations	0
Dedicated Hosts	-	Elastic IPs	-	Instances	-
Key pairs	-	Load balancers	0	Placement groups	0
Security groups	-	Snapshots	0	Volumes	4

Launch instance

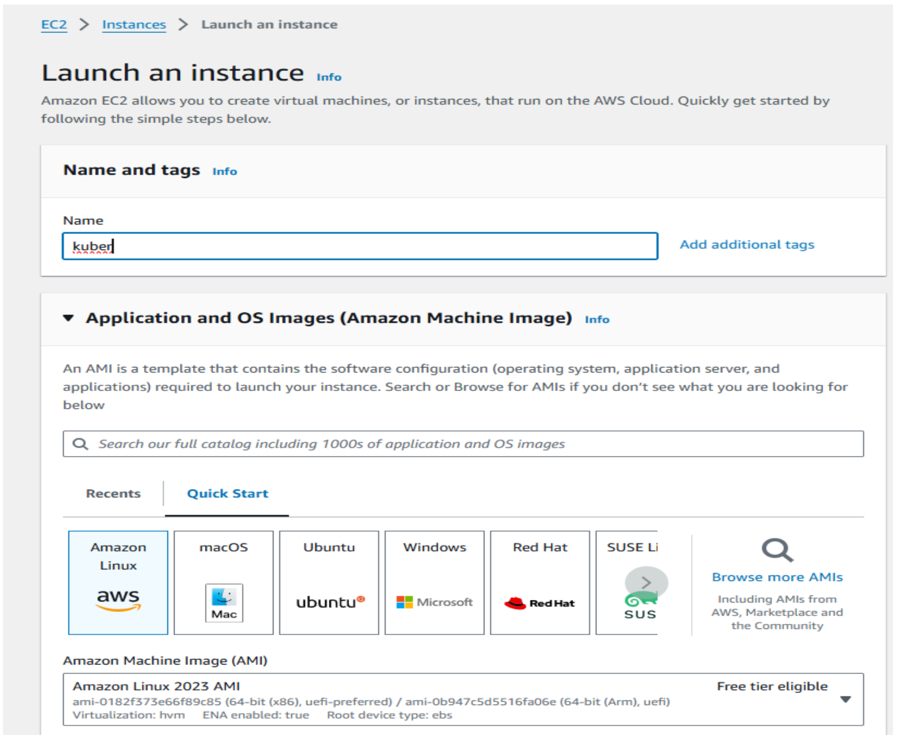
To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

Note: Your instances will launch in the US East (N. Virginia) Region

Service health

Region: US East (N. Virginia)

Status: This service is operating normally.



EC2 > Instances > Launch an instance

Launch an instance

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags

Name: kuber

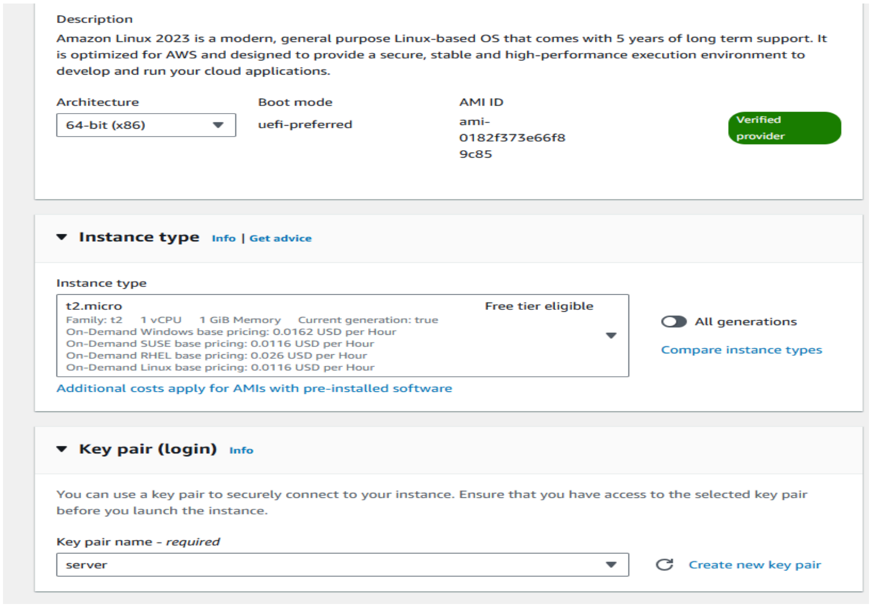
Application and OS Images (Amazon Machine Image)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Amazon Machine Image (AMI)

Amazon Linux 2023 AMI — Free tier eligible
ami-0182f373e66f89c85 (64-bit (x86), uefi-preferred) / ami-0b947c5d5516fa06e (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs

Info
Add additional tags
Search our full catalog including 1000s of application and OS images
Recents
Quick Start
Amazon Linux
macOS
Ubuntu
Windows
Red Hat
SUSE Li
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community



Description
Amazon Linux 2023 is a modern, general purpose Linux-based OS that comes with 5 years of long term support. It is optimized for AWS and designed to provide a secure, stable and high-performance execution environment to develop and run your cloud applications.

Architecture	Boot mode	AMI ID	
64-bit (x86)	uefi-preferred	ami-0182f373e66f89c85	Verified provider

Instance type Info | Get advice

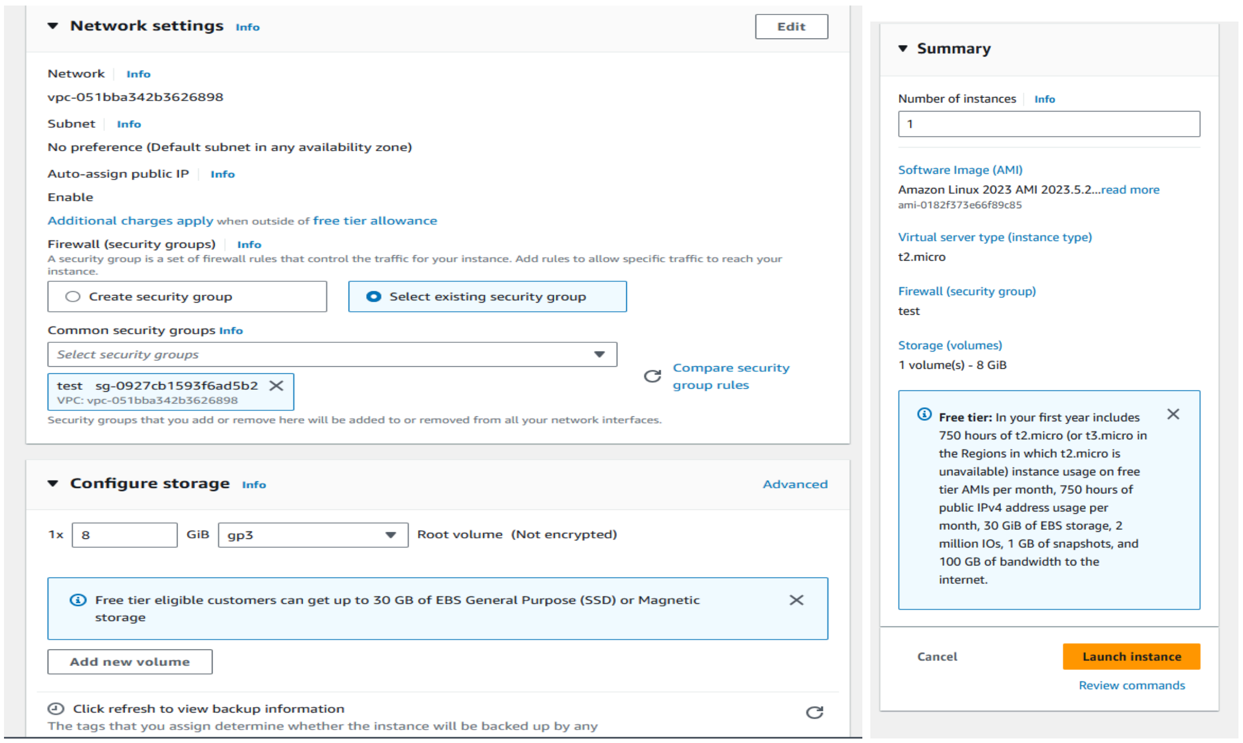
Instance type
t2.micro — Free tier eligible
Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Windows base pricing: 0.0162 USD per Hour
On-Demand SUSE base pricing: 0.0116 USD per Hour
On-Demand RHEL base pricing: 0.026 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour
Additional costs apply for AMIs with pre-installed software

All generations
Compare instance types

Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*
server
Create new key pair



Network settings Info — Edit

Network Info
vpc-051bba342b3626898
Subnet Info
No preference (Default subnet in any availability zone)
Auto-assign public IP Info
Enable
Additional charges apply when outside of free tier allowance
Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
Create security group [✓ Select existing security group]
Common security groups Info
Select security groups
test sg-0927cb1593f6ad5b2
VPC: vpc-051bba342b3626898
Compare security group rules
Security groups that you add or remove here will be added to or removed from all your network interfaces.

Configure storage Info — Advanced

1x 8 GiB gp3 Root volume (Not encrypted)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage

Add new volume

Click refresh to view backup information
The tags that you assign determine whether the instance will be backed up by any

Summary

Number of instances Info
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.5.2...read more
ami-0182f373e66f89c85

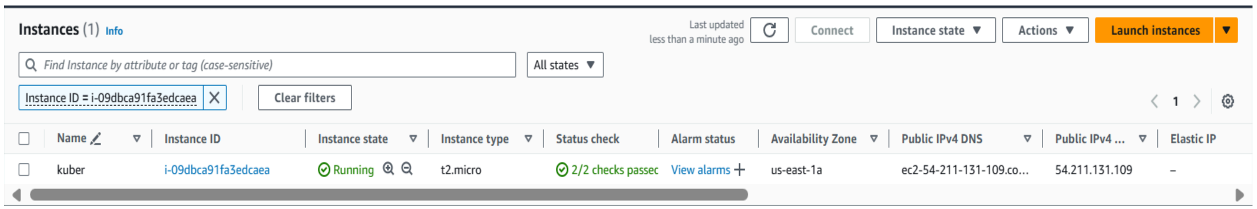
Virtual server type (instance type)
t2.micro

Firewall (security group)
test

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel — Launch instance
Review commands

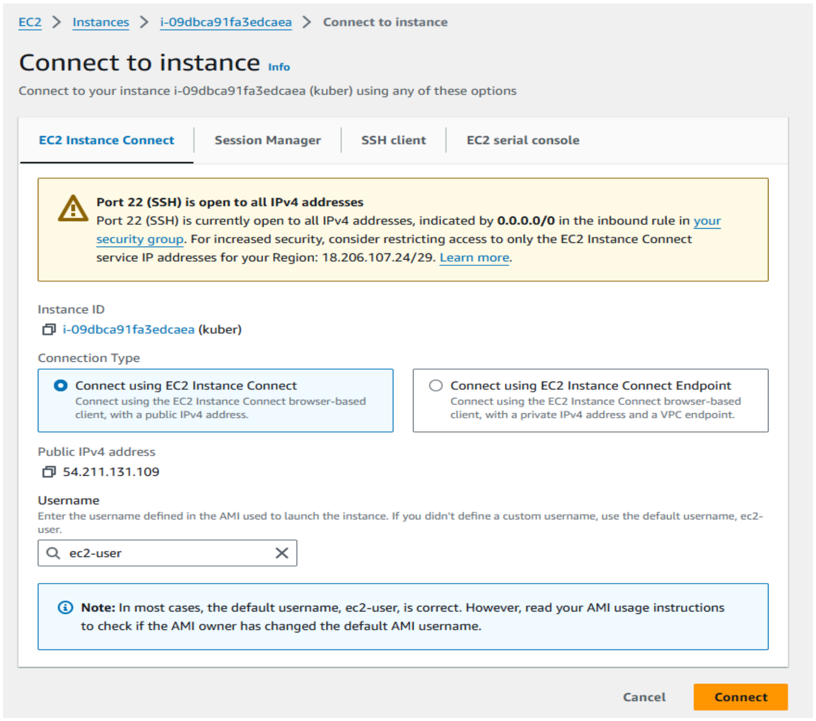


Instances (1) Info — Last updated less than a minute ago — Connect — Instance state — Actions — Launch instances

Find Instance by attribute or tag (case-sensitive) — All states
Instance ID = i-09dbca91fa3edcaea — Clear filters

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
kuber	i-09dbca91fa3edcaea	Running	t2.micro	2/2 checks passec	View alarms +	us-east-1a	ec2-54-211-131-109.co...	54.211.131.109	–

- Thus Kuber named -instance gets created.Then click on Id of that instance then click on connect button you will se this:


EC2 > Instances > i-09dbca91fa3edcaea > Connect to instance

Connect to instance Info

Connect to your instance i-09dbca91fa3edcaea (kuber) using any of these options

Port 22 (SSH) is open to all IPv4 addresses
Port 22 (SSH) is currently open to all IPv4 addresses, indicated by **0.0.0.0/0** in the inbound rule in your security group. For increased security, consider restricting access to only the EC2 Instance Connect service IP addresses for your Region: 18.206.107.24/29. Learn more.

Instance ID
i-09dbca91fa3edcaea (kuber)

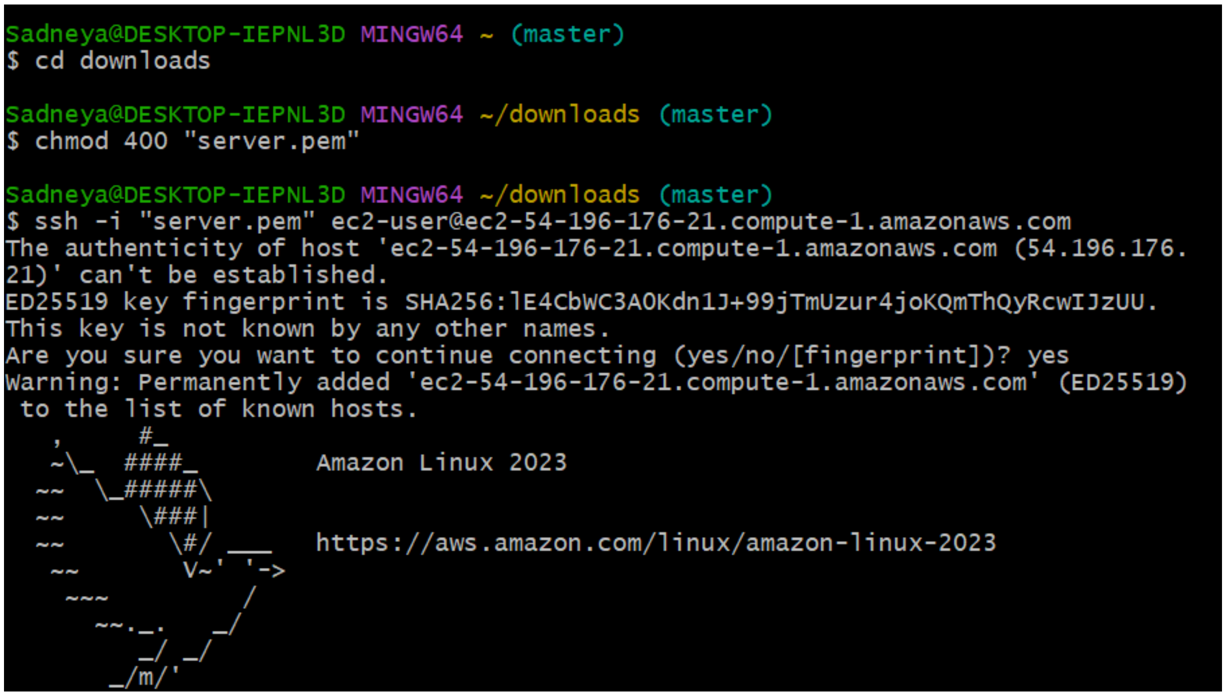
Connection Type
[✓ Connect using EC2 Instance Connect] Connect using the EC2 Instance Connect browser-based client, with a public IPv4 address.
Connect using EC2 Instance Connect Endpoint — Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.

Public IPv4 address
54.211.131.109

Username
Enter the username defined in the AMI used to launch the instance. If you didn't define a custom username, use the default username, ec2-user.
ec2-user

Note: In most cases, the default username, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

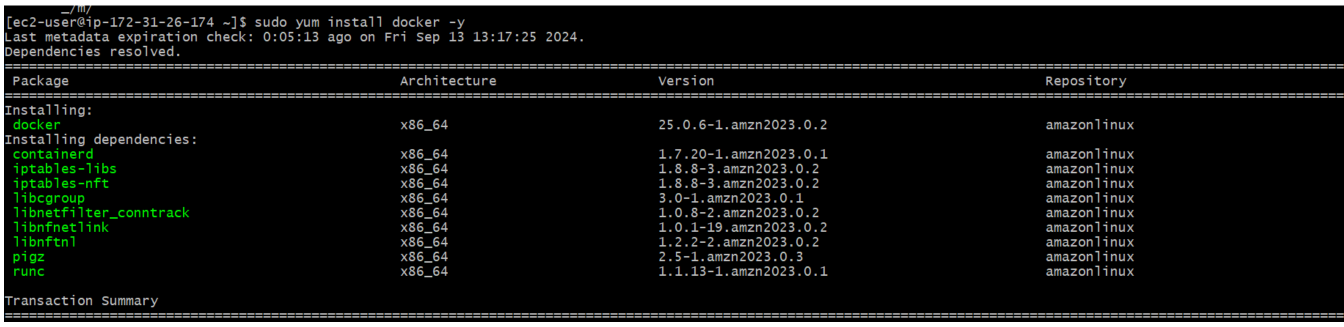
- Then go into SSH client where you will get this command
  Chmod 400 "keyname.pem"
  ssh -i <keyname>.pem ubuntu@<public_ip_address> copy it and then connect it and run the following command for establishing connection.(I have entered this command on git bash where i entered in downloads where server.pem is stored then as the key is not accessible hence we need to change its mode using chmod 400 "key name.pem". Then use the given command for making connections).



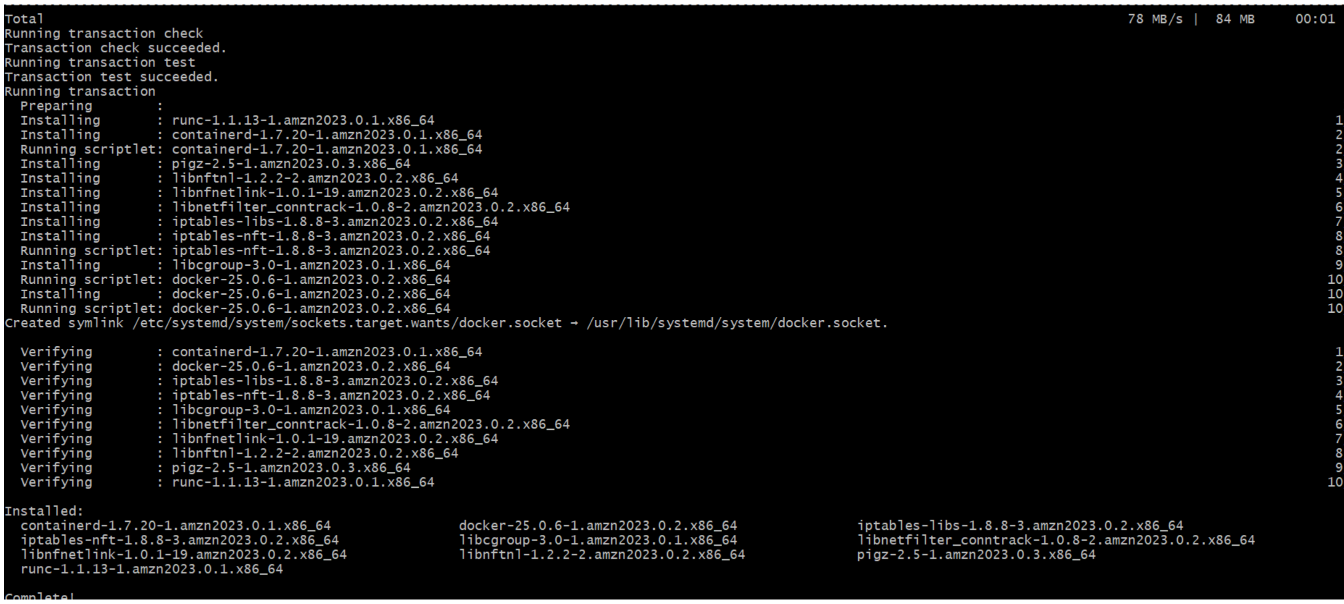
```
Sadneya@DESKTOP-IEPNL3D MINGW64 ~ (master)
$ cd downloads

Sadneya@DESKTOP-IEPNL3D MINGW64 ~/downloads (master)
$ chmod 400 "server.pem"

Sadneya@DESKTOP-IEPNL3D MINGW64 ~/downloads (master)
$ ssh -i "server.pem" ec2-user@ec2-54-196-176-21.compute-1.amazonaws.com
The authenticity of host 'ec2-54-196-176-21.compute-1.amazonaws.com (54.196.176.
21)' can't be established.
ED25519 key fingerprint is SHA256:lE4CbWC3AOKdn1J+99jTmUzur4joKQmThQyRcwIJzUU.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-196-176-21.compute-1.amazonaws.com' (ED25519)
 to the list of known hosts.
   ,     #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
```

2. Installation of Docker

1. . For installation of Docker into the machines run the following command:
   sudo yum install docker -y



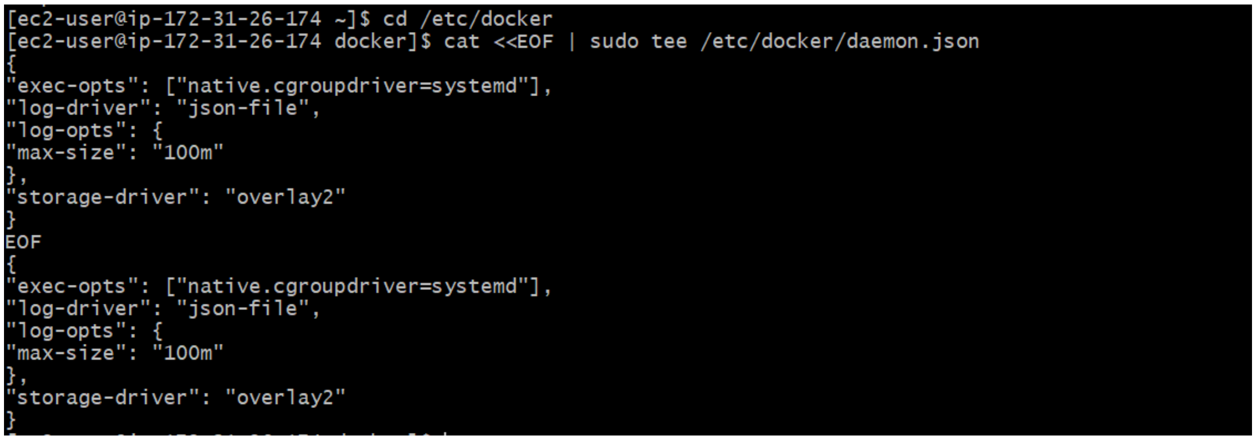
```
       _/m/
[ec2-user@ip-172-31-26-174 ~]$ sudo yum install docker -y
Last metadata expiration check: 0:05:13 ago on Fri Sep 13 13:17:25 2024.
Dependencies resolved.
==========================================================================================================================================
 Package                                           Architecture                     Version                                          Repository
==========================================================================================================================================
Installing:
 docker                                            x86_64                           25.0.6-1.amzn2023.0.2                            amazonlinux
Installing dependencies:
 containerd                                        x86_64                           1.7.20-1.amzn2023.0.1                            amazonlinux
 iptables-libs                                     x86_64                           1.8.8-3.amzn2023.0.2                             amazonlinux
 iptables-nft                                      x86_64                           1.8.8-3.amzn2023.0.2                             amazonlinux
 libcgroup                                         x86_64                           3.0-1.amzn2023.0.1                               amazonlinux
 libnetfilter_conntrack                            x86_64                           1.0.8-2.amzn2023.0.2                             amazonlinux
 libnfnetlink                                      x86_64                           1.0.1-19.amzn2023.0.2                            amazonlinux
 libnftnl                                          x86_64                           1.2.2-2.amzn2023.0.2                             amazonlinux
 pigz                                              x86_64                           2.5-1.amzn2023.0.3                               amazonlinux
 runc                                              x86_64                           1.1.13-1.amzn2023.0.1                            amazonlinux

Transaction Summary
==========================================================================================================================================
```



```
Total                                                                                                                   78 MB/s |  84 MB     00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :
  Installing       : runc-1.1.13-1.amzn2023.0.1.x86_64                                                                                           1
  Installing       : containerd-1.7.20-1.amzn2023.0.1.x86_64                                                                                     2
  Running scriptlet: containerd-1.7.20-1.amzn2023.0.1.x86_64                                                                                     2
  Installing       : pigz-2.5-1.amzn2023.0.3.x86_64                                                                                              3
  Installing       : libnftnl-1.2.2-2.amzn2023.0.2.x86_64                                                                                        4
  Installing       : libnfnetlink-1.0.1-19.amzn2023.0.2.x86_64                                                                                   5
  Installing       : libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64                                                                          6
  Installing       : iptables-libs-1.8.8-3.amzn2023.0.2.x86_64                                                                                   7
  Installing       : iptables-nft-1.8.8-3.amzn2023.0.2.x86_64                                                                                    8
  Running scriptlet: iptables-nft-1.8.8-3.amzn2023.0.2.x86_64                                                                                    8
  Installing       : libcgroup-3.0-1.amzn2023.0.1.x86_64                                                                                         9
  Running scriptlet: docker-25.0.6-1.amzn2023.0.2.x86_64                                                                                        10
  Installing       : docker-25.0.6-1.amzn2023.0.2.x86_64                                                                                        10
  Running scriptlet: docker-25.0.6-1.amzn2023.0.2.x86_64                                                                                        10
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /usr/lib/systemd/system/docker.socket.

  Verifying        : containerd-1.7.20-1.amzn2023.0.1.x86_64                                                                                     1
  Verifying        : docker-25.0.6-1.amzn2023.0.2.x86_64                                                                                         2
  Verifying        : iptables-libs-1.8.8-3.amzn2023.0.2.x86_64                                                                                   3
  Verifying        : iptables-nft-1.8.8-3.amzn2023.0.2.x86_64                                                                                    4
  Verifying        : libcgroup-3.0-1.amzn2023.0.1.x86_64                                                                                         5
  Verifying        : libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64                                                                          6
  Verifying        : libnfnetlink-1.0.1-19.amzn2023.0.2.x86_64                                                                                   7
  Verifying        : libnftnl-1.2.2-2.amzn2023.0.2.x86_64                                                                                        8
  Verifying        : pigz-2.5-1.amzn2023.0.3.x86_64                                                                                              9
  Verifying        : runc-1.1.13-1.amzn2023.0.1.x86_64                                                                                          10

Installed:
  containerd-1.7.20-1.amzn2023.0.1.x86_64               docker-25.0.6-1.amzn2023.0.2.x86_64              iptables-libs-1.8.8-3.amzn2023.0.2.x86_64
  iptables-nft-1.8.8-3.amzn2023.0.2.x86_64              libcgroup-3.0-1.amzn2023.0.1.x86_64              libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64
  libnfnetlink-1.0.1-19.amzn2023.0.2.x86_64             libnftnl-1.2.2-2.amzn2023.0.2.x86_64             pigz-2.5-1.amzn2023.0.3.x86_64
  runc-1.1.13-1.amzn2023.0.1.x86_64

Complete!
```

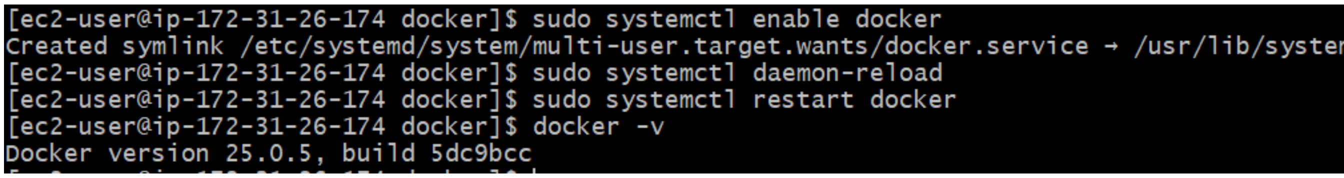
- Then, configure cgroup in a daemon.json file by using following commands

```
cd /etc/docker
cat <<EOF | sudo tee /etc/docker/daemon.json
{
"exec-opts": ["native.cgroupdriver=systemd"],
"log-driver": "json-file",
"log-opts": {
"max-size": "100m"
},
"storage-driver": "overlay2"
}
EOF
```



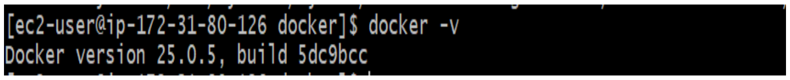
```
[ec2-user@ip-172-31-26-174 ~]$ cd /etc/docker
[ec2-user@ip-172-31-26-174 docker]$ cat <<EOF | sudo tee /etc/docker/daemon.json
{
"exec-opts": ["native.cgroupdriver=systemd"],
"log-driver": "json-file",
"log-opts": {
"max-size": "100m"
},
"storage-driver": "overlay2"
}
EOF
{
"exec-opts": ["native.cgroupdriver=systemd"],
"log-driver": "json-file",
"log-opts": {
"max-size": "100m"
},
"storage-driver": "overlay2"
}
```

- Then after this run the following command to enable and start docker and also to load the daemon.json file.
  sudo systemctl enable docker
  sudo systemctl daemon-reload
  sudo systemctl restart docker



```
[ec2-user@ip-172-31-26-174 docker]$ sudo systemctl enable docker
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /usr/lib/syster
[ec2-user@ip-172-31-26-174 docker]$ sudo systemctl daemon-reload
[ec2-user@ip-172-31-26-174 docker]$ sudo systemctl restart docker
[ec2-user@ip-172-31-26-174 docker]$ docker -v
Docker version 25.0.5, build 5dc9bcc
```

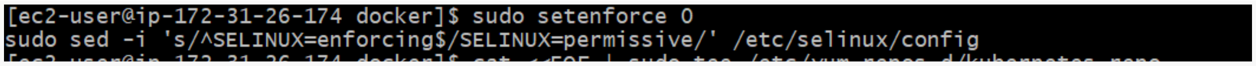
- docker -v



```
[ec2-user@ip-172-31-80-126 docker]$ docker -v
Docker version 25.0.5, build 5dc9bcc
```

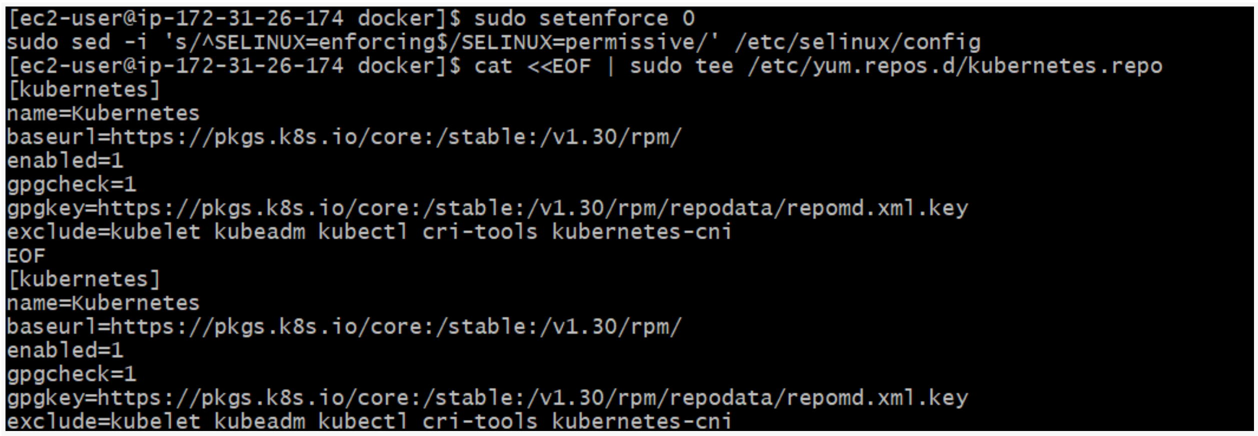
3. Then Install Kubernetes with the following command.

- SELinux needs to be disable before configuring kubelet thus run the following command
  sudo setenforce 0
  sudo sed -i 's/^SELINUX=enforcing$/SELINUX=permissive/' /etc/selinux/config



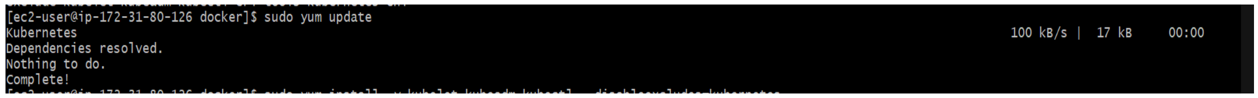
```
[ec2-user@ip-172-31-26-174 docker]$ sudo setenforce 0
sudo sed -i 's/^SELINUX=enforcing$/SELINUX=permissive/' /etc/selinux/config
```

- Here We are adding kubernetes using the repository whose command is given below.
  cat <<EOF | sudo tee /etc/yum.repos.d/kubernetes.repo
  [kubernetes]
  name=Kubernetes
  baseurl=https://pkgs.k8s.io/core:/stable:/v1.30/rpm/
  enabled=1
  gpgcheck=1
  gpgkey=https://pkgs.k8s.io/core:/stable:/v1.30/rpm/repodata/repomd.xml.key
  exclude=kubelet kubeadm kubectl cri-tools kubernetes-cni
  EOF



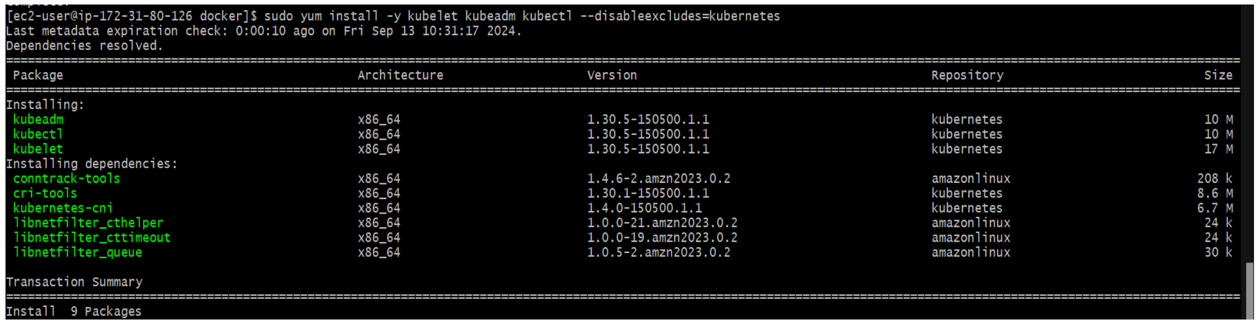
```
[ec2-user@ip-172-31-26-174 docker]$ sudo setenforce 0
sudo sed -i 's/^SELINUX=enforcing$/SELINUX=permissive/' /etc/selinux/config
[ec2-user@ip-172-31-26-174 docker]$ cat <<EOF | sudo tee /etc/yum.repos.d/kubernetes.repo
[kubernetes]
name=Kubernetes
baseurl=https://pkgs.k8s.io/core:/stable:/v1.30/rpm/
enabled=1
gpgcheck=1
gpgkey=https://pkgs.k8s.io/core:/stable:/v1.30/rpm/repodata/repomd.xml.key
exclude=kubelet kubeadm kubectl cri-tools kubernetes-cni
EOF
[kubernetes]
name=Kubernetes
baseurl=https://pkgs.k8s.io/core:/stable:/v1.30/rpm/
enabled=1
gpgcheck=1
gpgkey=https://pkgs.k8s.io/core:/stable:/v1.30/rpm/repodata/repomd.xml.key
exclude=kubelet kubeadm kubectl cri-tools kubernetes-cni
```

- After that Run following command to make the updation and also to install kubelet ,kubeadm, kubectl: sudo yum update

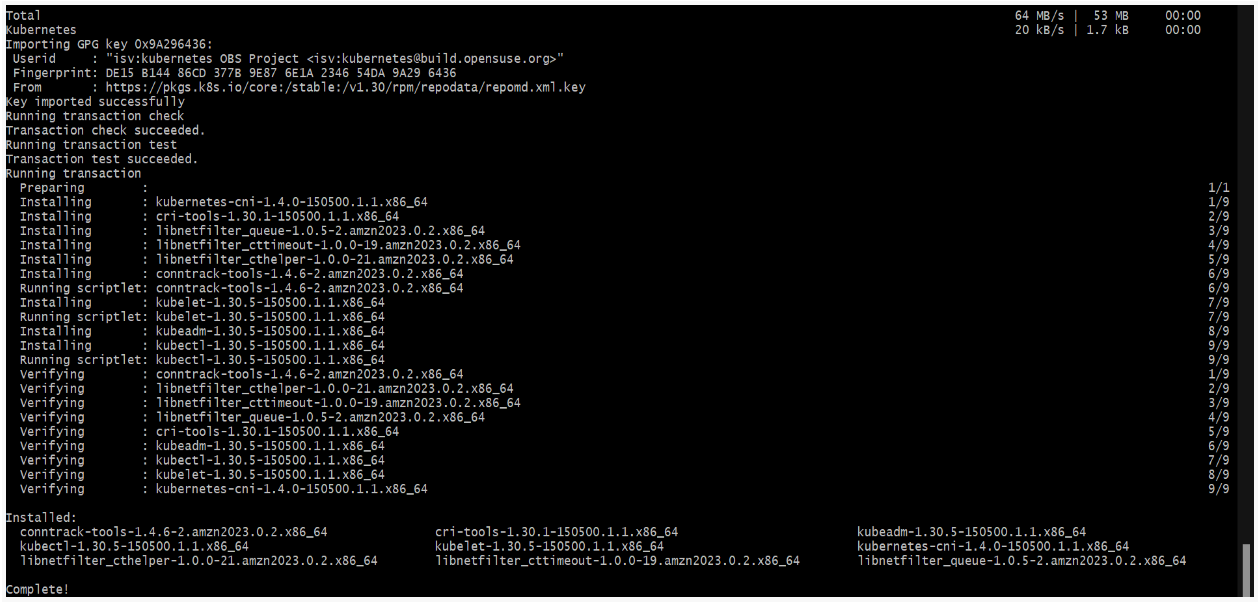


```
[ec2-user@ip-172-31-80-126 docker]$ sudo yum update
Kubernetes                                                                                   100 kB/s |  17 kB     00:00
Dependencies resolved.
Nothing to do.
Complete!
```

sudo yum install -y kubelet kubeadm kubectl --disableexcludes=kubernetes



```
[ec2-user@ip-172-31-80-126 docker]$ sudo yum install -y kubelet kubeadm kubectl --disableexcludes=kubernetes
Last metadata expiration check: 0:00:10 ago on Fri Sep 13 10:31:17 2024.
Dependencies resolved.
==========================================================================================================================
 Package                          Architecture         Version                          Repository                  Size
==========================================================================================================================
Installing:
 kubeadm                          x86_64               1.30.5-150500.1.1                kubernetes                  10 M
 kubectl                          x86_64               1.30.5-150500.1.1                kubernetes                  10 M
 kubelet                          x86_64               1.30.5-150500.1.1                kubernetes                  17 M
Installing dependencies:
 conntrack-tools                  x86_64               1.4.6-2.amzn2023.0.2             amazonlinux                208 k
 cri-tools                        x86_64               1.30.1-150500.1.1                kubernetes                 8.6 M
 kubernetes-cni                   x86_64               1.4.0-150500.1.1                 kubernetes                 6.7 M
 libnetfilter_cthelper            x86_64               1.0.0-21.amzn2023.0.2            amazonlinux                 24 k
 libnetfilter_cttimeout           x86_64               1.0.0-19.amzn2023.0.2            amazonlinux                 24 k
 libnetfilter_queue               x86_64               1.0.5-2.amzn2023.0.2             amazonlinux                 30 k

Transaction Summary
==========================================================================================================================
Install  9 Packages
```



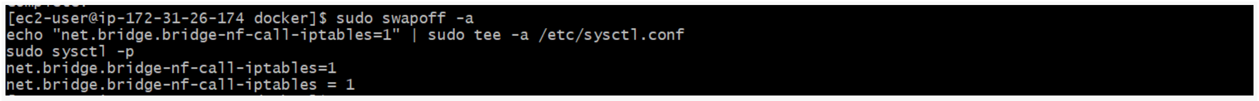
```
Total                                                                                     64 MB/s |  53 MB     00:00
Kubernetes                                                                                20 kB/s | 1.7 kB     00:00
Importing GPG key 0x9A296436:
 Userid     : "isv:kubernetes OBS Project <isv:kubernetes@build.opensuse.org>"
 Fingerprint: DE15 B144 86CD 377B 9E87 6E1A 2346 54DA 9A29 6436
 From       : https://pkgs.k8s.io/core:/stable:/v1.30/rpm/repodata/repomd.xml.key
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                                1/1
  Installing       : kubernetes-cni-1.4.0-150500.1.1.x86_64                                                         1/9
  Installing       : cri-tools-1.30.1-150500.1.1.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-1.30.5-150500.1.1.x86_64                                                               7/9
  Running scriptlet: kubelet-1.30.5-150500.1.1.x86_64                                                               7/9
  Installing       : kubeadm-1.30.5-150500.1.1.x86_64                                                               8/9
  Installing       : kubectl-1.30.5-150500.1.1.x86_64                                                               9/9
  Running scriptlet: kubectl-1.30.5-150500.1.1.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-1.30.1-150500.1.1.x86_64                                                             5/9
  Verifying        : kubeadm-1.30.5-150500.1.1.x86_64                                                               6/9
  Verifying        : kubectl-1.30.5-150500.1.1.x86_64                                                               7/9
  Verifying        : kubelet-1.30.5-150500.1.1.x86_64                                                               8/9
  Verifying        : kubernetes-cni-1.4.0-150500.1.1.x86_64                                                         9/9

Installed:
  conntrack-tools-1.4.6-2.amzn2023.0.2.x86_64          cri-tools-1.30.1-150500.1.1.x86_64                 kubeadm-1.30.5-150500.1.1.x86_64
  kubectl-1.30.5-150500.1.1.x86_64                     kubelet-1.30.5-150500.1.1.x86_64                   kubernetes-cni-1.4.0-150500.1.1.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!
```

- After installing Kubernetes, we need to configure internet options to allow bridging.
    1. sudo swapoff -a

2. echo "net.bridge.bridge-nf-call-iptables=1" | sudo tee -a /etc/sysctl.conf
3. sudo sysctl -p

- After installing Kubernetes, we need to configure internet options to allow bridging.

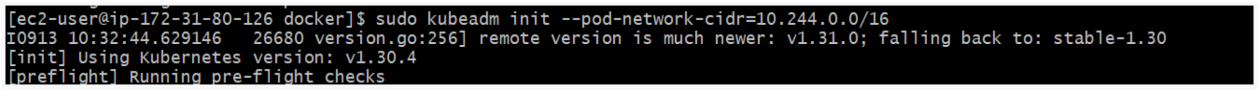
```
sudo swapoff -a
echo "net.bridge.bridge-nf-call-iptables=1" | sudo tee -a
/etc/sysctl.conf
sudo sysctl -p
```



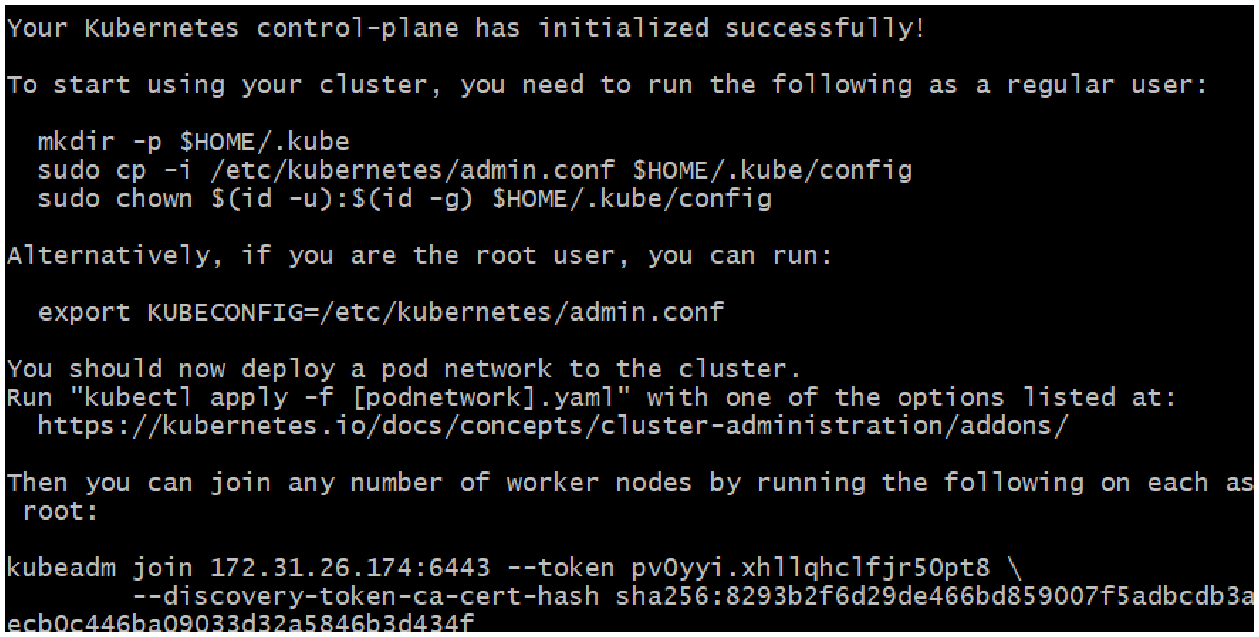
```
[ec2-user@ip-172-31-26-174 docker]$ sudo swapoff -a
echo "net.bridge.bridge-nf-call-iptables=1" | sudo tee -a /etc/sysctl.conf
sudo sysctl -p
net.bridge.bridge-nf-call-iptables=1
net.bridge.bridge-nf-call-iptables = 1
```

4. Initialize the Kubecluster

```
sudo kubeadm init --pod-network-cidr=10.244.0.0/16
```



```
[ec2-user@ip-172-31-80-126 docker]$ sudo kubeadm init --pod-network-cidr=10.244.0.0/16
I0913 10:32:44.629146   26680 version.go:256] remote version is much newer: v1.31.0; falling back to: stable-1.30
[init] Using Kubernetes version: v1.30.4
[preflight] Running pre-flight checks
```



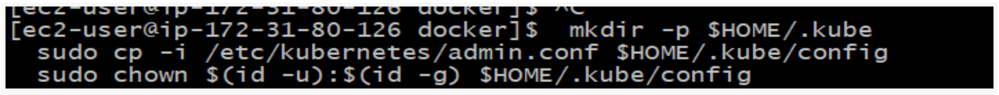
```
Your Kubernetes control-plane has initialized successfully!

To start using your cluster, you need to run the following as a regular user:

  mkdir -p $HOME/.kube
  sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
  sudo chown $(id -u):$(id -g) $HOME/.kube/config

Alternatively, if you are the root user, you can run:

  export KUBECONFIG=/etc/kubernetes/admin.conf

You should now deploy a pod network to the cluster.
Run "kubectl apply -f [podnetwork].yaml" with one of the options listed at:
  https://kubernetes.io/docs/concepts/cluster-administration/addons/

Then you can join any number of worker nodes by running the following on each as
 root:

kubeadm join 172.31.26.174:6443 --token pv0yyi.xhllqhclfjr50pt8 \
        --discovery-token-ca-cert-hash sha256:8293b2f6d29de466bd859007f5adbcdb3a
ecb0c446ba09033d32a5846b3d434f
```

- copy the token and save for future use .

```
kubeadm join 172.31.26.174:6443 --token pv0yyi.xhllqhclfjr50pt8
\--discovery-token-ca-cert-hash
sha256:8293b2f6d29de466bd859007f5adbcdb3aecb0c446ba09033d32a5846b
3d434f
```

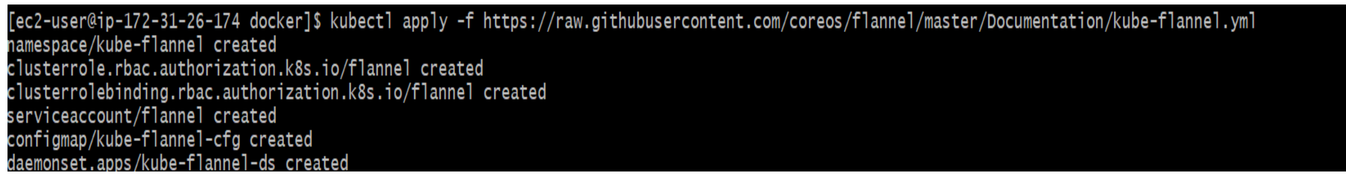
- Copy the mkdir and chown commands from the top and execute them

```
mkdir -p $HOME/.kube
  sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
  sudo chown $(id -u):$(id -g) $HOME/.kube/config
```


```
[ec2-user@ip-172-31-80-126 docker]$  mkdir -p $HOME/.kube
  sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
  sudo chown $(id -u):$(id -g) $HOME/.kube/config
```

- Then, add a common networking plugin called flannel as mentioned in the code.

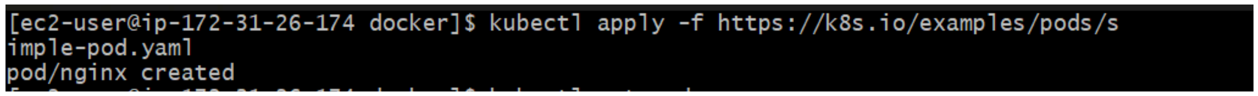
`kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml`


```
[ec2-user@ip-172-31-26-174 docker]$ kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
namespace/kube-flannel created
clusterrole.rbac.authorization.k8s.io/flannel created
clusterrolebinding.rbac.authorization.k8s.io/flannel created
serviceaccount/flannel created
configmap/kube-flannel-cfg created
daemonset.apps/kube-flannel-ds created
```

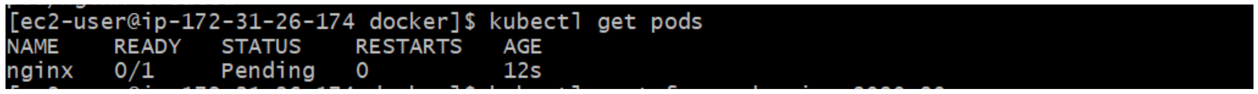
5. Now that the cluster is up and running,we can deploy our nginx server on this cluster. Apply deployment using this following command:

`kubectl apply -f`

`https://k8s.io/examples/pods/simple-pod.yaml`

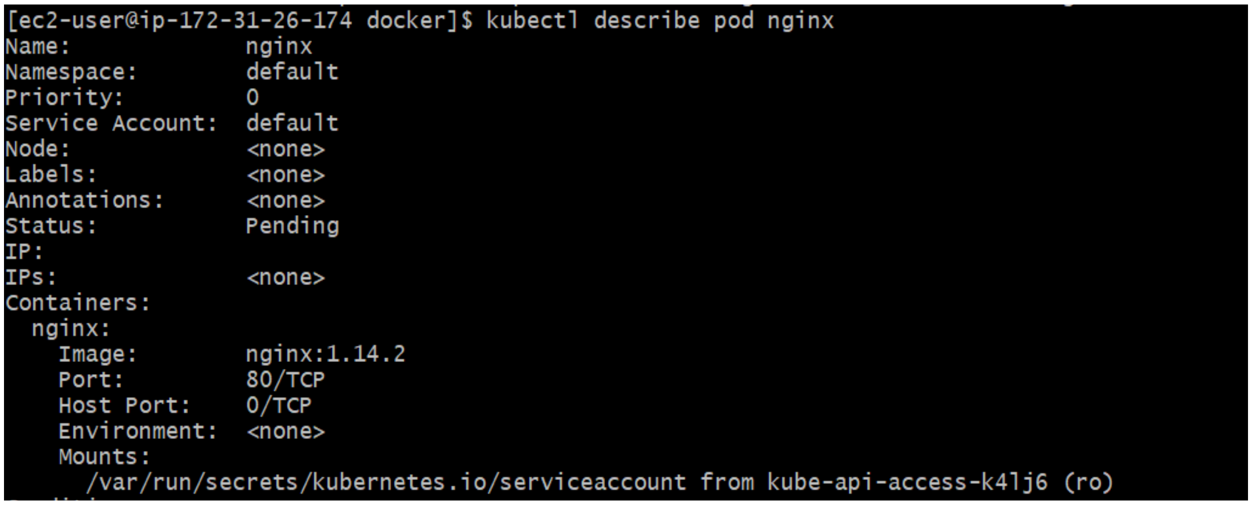

```
[ec2-user@ip-172-31-26-174 docker]$ kubectl apply -f https://k8s.io/examples/pods/s
imple-pod.yaml
pod/nginx created
```

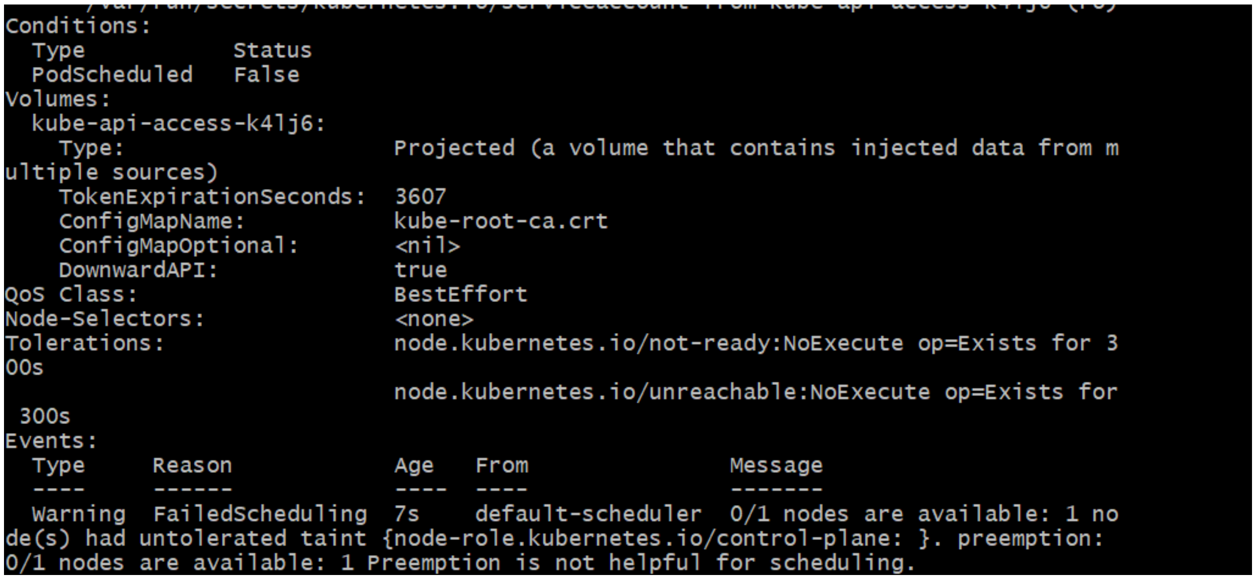
Then use kubectl get nodes to check whether the pod gets created or not.

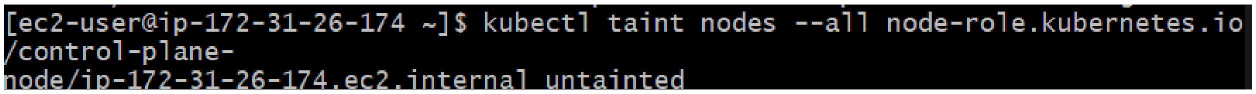

```
[ec2-user@ip-172-31-26-174 docker]$ kubectl get pods
NAME     READY   STATUS    RESTARTS   AGE
nginx    0/1     Pending   0          12s
```

To convert state from pending to running use following command:

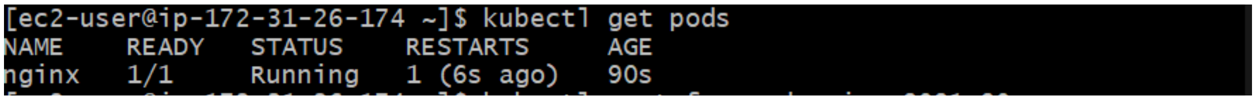
kubectl describe pod nginx This command will help to describe the pods it gives reason for failure as it shows the untolerated taints which need to be untainted.


```
[ec2-user@ip-172-31-26-174 docker]$ kubectl describe pod nginx
Name:             nginx
Namespace:        default
Priority:         0
Service Account:  default
Node:             <none>
Labels:           <none>
Annotations:      <none>
Status:           Pending
IP:
IPs:              <none>
Containers:
  nginx:
    Image:        nginx:1.14.2
    Port:         80/TCP
    Host Port:    0/TCP
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-k4lj6 (ro)
```


```
Conditions:
  Type           Status
  PodScheduled   False
Volumes:
  kube-api-access-k4lj6:
    Type:                    Projected (a volume that contains injected data from m
ultiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 3
00s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for
 300s
Events:
  Type     Reason            Age   From               Message
  ----     ------            ----  ----               -------
  Warning  FailedScheduling  7s    default-scheduler  0/1 nodes are available: 1 no
de(s) had untolerated taint {node-role.kubernetes.io/control-plane: }. preemption:
0/1 nodes are available: 1 Preemption is not helpful for scheduling.
```

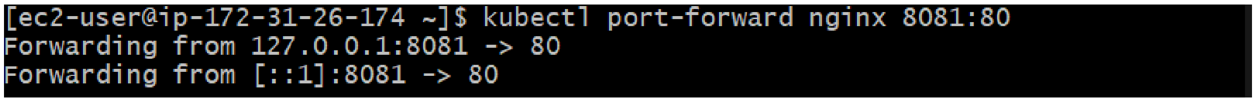

```
[ec2-user@ip-172-31-26-174 ~]$ kubectl taint nodes --all node-role.kubernetes.io
/control-plane-
node/ip-172-31-26-174.ec2.internal untainted
```

6. Now check pod status is is running


```
[ec2-user@ip-172-31-26-174 ~]$ kubectl get pods
NAME    READY   STATUS    RESTARTS     AGE
nginx   1/1     Running   1 (6s ago)   90s
```

7.Lastly, mention the port you want to host. Here i have used localhost 8081 then check it.

```
kubectl port-forward nginx 8081:80
```


```
[ec2-user@ip-172-31-26-174 ~]$ kubectl port-forward nginx 8081:80
Forwarding from 127.0.0.1:8081 -> 80
Forwarding from [::1]:8081 -> 80
```

8. Verify your deployment

Open up a new terminal and ssh to your EC2 instance.

Then, use this curl command to check if the Nginx server is running.

```
curl --head http://127.0.0.1:8080
```

If the response is 200 OK and you can see the Nginx server name, your deployment was successful. We have successfully deployed our Nginx server on our EC2 instance.

Conclusion: Firstly I created an EC2 AWS Linux instance successfully.then installed docker and kubernetes successfully.then initialized kubernetes which given me token and chown and mkdir command. Then I execute mkdir and chown the command successfully. Then I installed a networking plugin called flannel successfully. Then I tried to deploy nginx which initially gave an error. Then I deployed (simple-pod.yml) nginx successfully and also checked by using the get pods command.then hosted it on localhost 8081 ie http://localhost:8081 successfully.