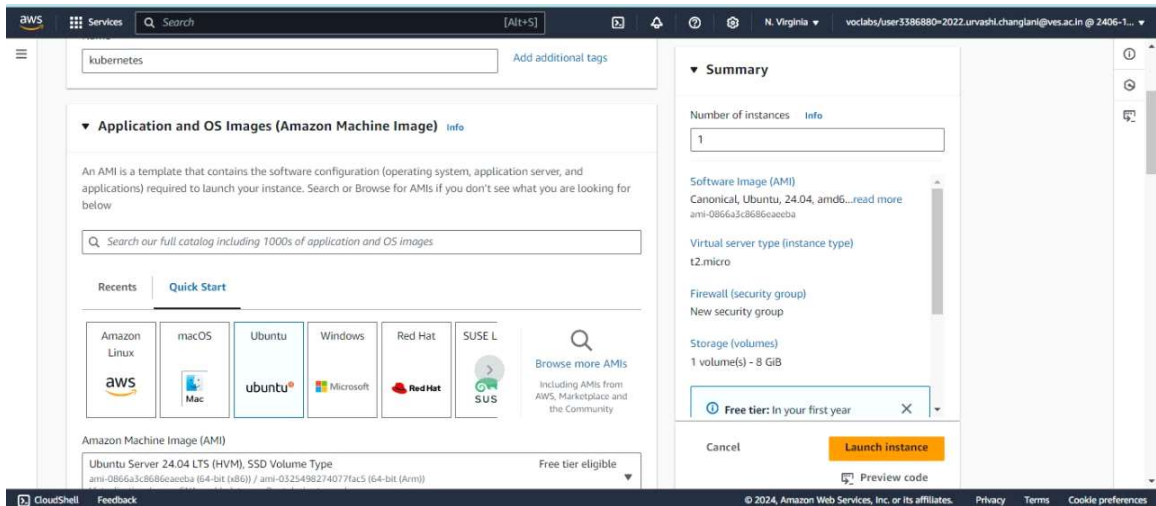


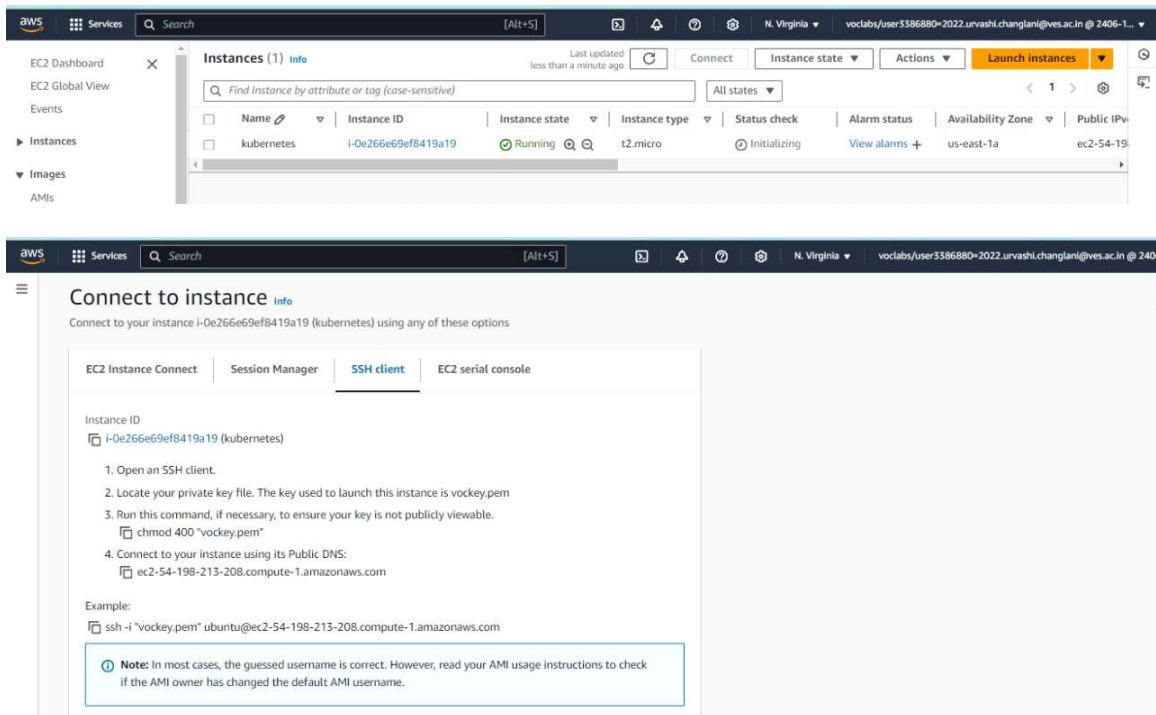
Practical No 4

Launch an EC2 Instance

Select ubuntu



After creating the instance click on Connect the instance and navigate to SSH Client.



Now open the folder in the terminal where our .pem key is stored and paste the Example

command (starting with ssh -i) in the terminal.(ssh -i "vockey.pem"

ubuntu@ec2-54-196-129-215.compute-1.amazonaws.com)

```
AWS Services Search [Alt+S] N. Virginia voclabs/user3386880=2022.urvashi.changlani@ves.ac.in @ 2406-1...
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
The list of available updates is more than a week old.
To check for new updates run: sudo apt update
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
ubuntu@ip-172-31-42-97:~$ ssh -i "vockey.pem" ubuntu@ec2-54-196-213-208.compute-1.amazonaws.com
Warning: Identity file vockey.pem not accessible: No such file or directory.
The authenticity of host 'ec2-54-196-213-208.compute-1.amazonaws.com (172.31.42.97)' can't be established.
ED25519 key fingerprint is SHA256:kwtyvKv15HzWQo829z+KfLMg4gKfu2ufuVPitCesQ.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-196-213-208.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
ubuntu@ec2-54-196-213-208.compute-1.amazonaws.com: Permission denied (publickey).
ubuntu@ip-172-31-42-97:~$
```

Run following commands to install docker

sudo apt-get update

sudo apt-get install -y apt-transport-https ca-certificates curl software-properties-common

curl -fsSL <https://download.docker.com/linux/ubuntu/gpg> | sudo apt-key add -

sudo add-apt-repository "deb [arch=amd64] <https://download.docker.com/linux/ubuntu>
\$(lsb_release -cs) stable"

sudo apt-get update

sudo apt-get install -y docker-ce

```
OK
ubuntu@ip-172-31-42-97:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo tee
/etc/apt/trusted.gpg.d/docker.gpg > /dev/null
-----BEGIN PGP PUBLIC KEY BLOCK-----
mQINBF12ioB8ADhp28/vwZ6hUTiXOWQEXMAlaPHcPH9hAtr4FlY2+OYdbtMuth
Icqp0282ay+PrFVMSZM6uUuU5yyeR0Isqthua3jtgQaly2/bVjXqmmVZh
S8thia+e077PpXoM5BqgPQCMfiyRiUABE624baUURQc4iAmZyIruOXong
I4Cl+g38vfmXOF99apCakEjaNRVYfOS8QcixNzHUVnb6smj1ANyEVLz2eqo7XK17
Urw5inawTSaWvtjEj4nJL8NslawscplPQUhTQ77bQKAwmeHCUTOIvWwKqW0N
cmhh4HgeQacQHYgOJjDVFoY5Mucvglb1gCqfzAHW9jxmsRL4qfMZj+blXoePEtth
-----END PGP PUBLIC KEY BLOCK-----
```

```
-----END PGP PUBLIC KEY BLOCK-----
-bash: /etc/apt/trusted.gpgsudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu
$(lsb_release -cs) stable"sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu
Repository: 'deb [arch=amd64] https://download.docker.com/linux/ubuntu noble stable'
Description:
Archive for codename: noble components: stable
More info: https://download.docker.com/linux/ubuntu
Adding repository.
Press [ENTER] to continue or Ctrl-c to cancel.
Adding deb entry to /etc/apt/sources.list.d/archive_uri-https_download_docker_com_linux_ubuntu-noble.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/archive_uri-https_download_docker_com_linux_ubuntu-noble.list
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 https://download.docker.com/linux/ubuntu noble InRelease [48.8 kB]
Get:5 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
```

```

aws Services Q Search [Alt+S] N. Virginia voclabs/user3386880-2022.urvashi.changlani@ves.ac.in @ 240
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [17.6 kB]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1104 B]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:36 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [384 kB]
Get:37 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [84.6 kB]
Get:38 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [4708 B]
Get:39 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [278 kB]
Get:40 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [117 kB]
Get:41 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [8632 B]
Get:42 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [10.4 kB]
Get:43 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [10.9 kB]
Get:44 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2808 B]
Get:45 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:46 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [344 B]
Fetched 28.3 MB in 4s (6670 kB/s)
Reading package lists... Done
W: https://download.docker.com/linux/ubuntu/dists/noble/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section
in apt-key(8) for details.
ubuntu@ip-172-31-42-97:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 https://download.docker.com/linux/ubuntu noble InRelease
Hit:5 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
W: https://download.docker.com/linux/ubuntu/dists/noble/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section
in apt-key(8) for details.

```

```

aws Services Q Search [Alt+S] N. Virginia voclabs/user3386880-2022.urvashi.changlani@ves.ac.in @ 240
W: https://download.docker.com/linux/ubuntu/dists/noble/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section
in apt-key(8) for details.
ubuntu@ip-172-31-42-97:~$ sudo apt-get install -y docker-ce
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  contained.io docker-buildx-plugin docker-ce-cli
  docker-ce-rootless-extras docker-compose-plugin libltdl7 libslirp0 pigz
  slirp4netns
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
The following NEW packages will be installed:
  contained.io docker-buildx-plugin docker-ce docker-ce-cli
  docker-ce-rootless-extras docker-compose-plugin libltdl7 libslirp0 pigz
  slirp4netns
0 upgraded, 10 newly installed, 0 to remove and 12 not upgraded.

```

Configure Docker

Run following commands

```
sudo mkdir -p /etc/docker
```

```
cat <<EOF | sudo tee /etc/docker/daemon.json
```

```
sudo systemctl enable docker
```

```
sudo systemctl daemon-reload
```

```
sudo systemctl restart docker
```

```

ubuntu@ip-172-31-42-97:~$ sudo mkdir -p /etc/docker
ubuntu@ip-172-31-42-97:~$ cat <<EOF | sudo tee /etc/docker/daemon.json
> {
"exec-opts": ["native.cgroupdriver=systemd"]
}
EOF
{
"exec-opts": ["native.cgroupdriver=systemd"]
}
ubuntu@ip-172-31-42-97:~$ sudo systemctl enable docker
Synchronizing state of docker.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable docker
ubuntu@ip-172-31-42-97:~$

```

Run the below command to install Kubernetes.

```
curl -fsSL https://pkgs.k8s.io/core:stable/v1.31/deb/Release.key | sudo gpg --dearmor -o
```

/etc/apt/keyrings/kubernetes-apt-keyring.gpg

echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]

<https://pkgs.k8s.io/core:stable/v1.31/deb/>/' | sudo tee

/etc/apt/sources.list.d/kubernetes.list

sudo apt-get update

```
aws Services Search [Alt+S] N. Virginia voclabs/user3386880=2022.unvashi.changlani@ves.ac.in @ 2406-1
Synchronizing state of docker.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable docker
ubuntu@ip-172-31-42-97:~$ sudo systemctl daemon-reload
ubuntu@ip-172-31-42-97:~$ sudo systemctl restart docker
ubuntu@ip-172-31-42-97:~$ curl -fsSL https://pkgs.k8s.io/core:stable/v1.31/deb/Release.key | sudo gpg --dearmor -o
/etc/apt/keyrings/kubernetes-apt-keyring.gpg
gpg: missing argument for option "-o"
-bash: /etc/apt/keyrings/kubernetes-apt-keyring.gpg: No such file or directory
ubuntu@ip-172-31-42-97:~$ echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]
https://pkgs.k8s.io/core:stable/v1.31/deb/ /' | sudo tee /etc/apt/sources.list.d/kubernetes.list
deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]
https://pkgs.k8s.io/core:stable/v1.31/deb/ /
ubuntu@ip-172-31-42-97:~$ sudo apt-get update
E: Malformed entry 1 in list file /etc/apt/sources.list.d/kubernetes.list (URI)
E: The list of sources could not be read: https://pkgs.k8s.io/core:stable/v1.31/deb/Release.key | sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg
ubuntu@ip-172-31-42-97:~$ sudo mkdir -p /etc/apt/keyrings/
ubuntu@ip-172-31-42-97:~$ curl -fsSL https://pkgs.k8s.io/core:stable/v1.31/deb/Release.key | sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg
ubuntu@ip-172-31-42-97:~$ echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:stable/v1.31/deb/ /' | sudo tee /etc/apt/s
ources.list.d/kubernetes.list
deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:stable/v1.31/deb/ /
ubuntu@ip-172-31-42-97:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:5 https://download.docker.com/linux/ubuntu noble InRelease
Get:6 https://prod-cdn.packages.k8s.io/repositories/iso/kubernetes:core:stable/v1.31/deb InRelease [1186 B]
Get:7 https://prod-cdn.packages.k8s.io/repositories/iso/kubernetes:core:stable/v1.31/deb Packages [4865 B]
Fetched 6051 B in 1s (9411 B/s)
Reading package lists... Done
W: https://download.docker.com/linux/ubuntu/dists/noble/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section
```

sudo apt-get install -y kubelet kubeadm kubectl

```
aws Services Search [Alt+S] N. Virginia voclabs/user3386880=2022.unvashi.changlani@ves.ac.in @ 2406-1
in apt-key(8) for details.
ubuntu@ip-172-31-42-97:~$ sudo apt-get install -y kubelet kubeadm kubectl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  conntrack cri-tools kubeadm kubectl kubelet kubernetes-cni
The following NEW packages will be installed:
  conntrack cri-tools kubeadm kubectl kubelet kubernetes-cni
```

sudo apt-mark hold kubelet kubeadm kubectl

sudo systemctl enable --now kubelet

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

```
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-42-97:~$ sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
ubuntu@ip-172-31-42-97:~$ sudo systemctl enable --now kubelet
ubuntu@ip-172-31-42-97:~$ sudo kubeadm init --pod-network-cidr=10.244.0.0/16
[init] Using Kubernetes version: v1.31.1
[preflight] Running pre-flight checks
W1013 09:56:31.149881 4493 checks.go:1080] [preflight] WARNING: Couldn't create the interface used for talking to the container runtime: failed to create new
RI runtime service: validate service connection: validate CRI v1 runtime API for endpoint "unix:///var/run/containerd/containerd.sock": rpc error: code = Unimple
ented desc = unknown service runtime.v1.RuntimeService
[WARNING FileExisting-socat]: socat not found in system path
error execution phase preflight: [preflight] Some fatal errors occurred:
[ERROR NumCPU]: the number of available CPUs 1 is less than the required 2
[ERROR Mem]: the system RAM (957 MB) is less than the minimum 1700 MB
[preflight] If you know what you are doing, you can make a check non-fatal with '--ignore-preflight-errors=...'
To see the stack trace of this error execute with --v=5 or higher
ubuntu@ip-172-31-42-97:~$ sudo apt-get install -y containerd
```

sudo apt-get install -y containerd

```
ubuntu@ip-172-31-42-97:~$ sudo apt-get install -y containerd
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  docker-buildx-plugin docker-ce-cli docker-ce-rootless-extras
  docker-compose-plugin libltdl7 libalrp0 pigz slurp4netns
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  runc
The following packages will be REMOVED:
  containerd.io docker-ce
The following NEW packages will be installed:
  containerd runc
0 upgraded, 2 newly installed, 2 to remove and 12 not upgraded.
```

sudo mkdir -p /etc/containerd

sudo containerd config default | sudo tee /etc/containerd/config.toml

```
ubuntu@ip-172-31-42-97:~$ sudo mkdir -p /etc/containerd
ubuntu@ip-172-31-42-97:~$ sudo containerd config default | sudo tee /etc/containerd/config.toml
disabled_plugins = []
imports = []
oom_score = 0
plugin_dir = ""
required_plugins = []
root = "/var/lib/containerd"
state = "/run/containerd"
temp = ""
version = 2

[cgroup]
  path = ""

[debug]
  address = ""
  format = ""
  gid = 0
  level = ""
  uid = 0
```

sudo systemctl restart containerd

sudo systemctl enable containerd

sudo systemctl status containerd


```
aws
Services Search [Alt+S]
N. Virginia voclabs/user3386880-2022.urvashi.changlani@ves.ac.in @ 2406-1...

"io.containerd.timeout.task.state" = "2s"

[tttrpc]
address = ""
gid = 0
uid = 0

ubuntu@ip-172-31-42-97:~$ sudo systemctl restart containerd
ubuntu@ip-172-31-42-97:~$ sudo systemctl enable containerd
ubuntu@ip-172-31-42-97:~$ sudo systemctl status containerd
● containerd.service - containerd container runtime
   Loaded: loaded (/usr/lib/systemd/system/containerd.service; enabled; pr
   Active: active (running) since Sun 2024-10-13 10:01:51 UTC; 22s ago
     Docs: https://containerd.io
   Main PID: 5031 (containerd)
      Tasks: 6
   Memory: 15.0M (peak: 15.4M)
      CPU: 111ms
   CGroup: /system.slice/containerd.service
           └─5031 /usr/bin/containerd

Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
Oct 13 10:01:51 ip-172-31-42-97 containerd[5031]: time="2024-10-13T10:01:51.
lines 1-21/21 (RDTT)
```

sudo apt-get install -y socat

```
aws
Services Search [Alt+S]
N. Virginia voclabs/user3386880-2022.urvashi.changlani@ves.ac.in @ 2406-1...

ubuntu@ip-172-31-42-97:~$ sudo apt-get install -y socat
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  docker-buildx-plugin docker-ce-cli docker-ce-rootless-extras
  docker-compose-plugin libb17 libb2 libb70 pigz slirp4netns
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  socat
0 upgraded, 1 newly installed, 0 to remove and 12 not upgraded.
Need to get 374 kB of archives.
After this operation, 1649 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 socat amd64 1.8.0.0-4build3 [374 kB]
Fetched 374 kB in 0s (23.4 MB/s)
```

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

```
aws
Services Search [Alt+S]
N. Virginia voclabs/user3386880-2022.urvashi.changlani@ves.ac.in @ 2406-1...

ubuntu@ip-172-31-42-97:~$ sudo kubeadm init --pod-network-cidr=10.244.0.0/16 --ignore-preflight-errors=NumCPU,Mem
[init] Using Kubernetes version: v1.31.1
[preflight] Running pre-flight checks
[WARNING NumCPU]: the number of available CPUs 1 is less than the required 2
[WARNING Mem]: the system RAM (957 MB) is less than the minimum 1700 MB
[preflight] Pulling images required for setting up a Kubernetes cluster
[preflight] This might take a minute or two, depending on the speed of your internet connection
[preflight] You can also perform this action beforehand using 'kubeadm config images pull'
w1013 10:07:55.132111 5523 checks.go:846] detected that the sandbox image "registry.k8s.io/pause:3.8" of the container runtime is inconsistent with that used by kubeadm. It is recommended to use "registry.k8s.io/pause:3.10" as the CRI sandbox image.

[certs] Using certificateDir folder "/etc/kubernetes/pki"
[certs] Generating "ca" certificate and key
[certs] Generating "apiserver" certificate and key
```

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 172.31.42.97:6443 --token yc1dn6.e82o7p36zdkxcmmg \
  --discovery-token-ca-cert-hash sha256:851f3154aeb68f24bd2dd8040197e5ac99e3cd9a54182e54284b15a7b33d41e5
ubuntu@ip-172-31-42-97:~$ mkdir -p $HOME/.kube
ubuntu@ip-172-31-42-97:~$ sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
ubuntu@ip-172-31-42-97:~$ sudo chown $(id -u):$(id -g) $HOME/.kube/config
```

kubectl apply -f

<https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml>

kubectl apply -f <https://k8s.io/examples/application/deployment.yaml>

```
ubuntu@ip-172-31-42-97:~$ sudo chown $(id -u):$(id -g) $HOME/.kube/config
ubuntu@ip-172-31-42-97:~$ 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
ubuntu@ip-172-31-42-97:~$ kubectl get pods
No resources found in default namespace.
ubuntu@ip-172-31-42-97:~$ kubectl apply -f https://k8s.io/examples/application/deployment.yaml
deployment.apps/nginx-deployment created
ubuntu@ip-172-31-42-97:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-7hlqp    0/1     Pending   0           9s
nginx-deployment-d556bf558-f5q6l    0/1     Pending   0           9s
```

kubectl port-forward \$POD_NAME 8080:80

kubectl taint nodes --all node-role.kubernetes.io/control-plane-node/ip-172-31-20-171
untainted

kubectl get nodes

```
ubuntu@ip-172-31-42-97:~$ POD_NAME=$(kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}")
ubuntu@ip-172-31-42-97:~$ kubectl port-forward $POD_NAME 8080:80
error: unable to forward port because pod is not running. Current status=Pending
ubuntu@ip-172-31-42-97:~$ kubectl taint nodes --all node-role.kubernetes.io/control-plane-node/ip-172-31-20-171 untainted
error: at least one taint update is required
ubuntu@ip-172-31-42-97:~$ kubectl taint nodes --all node-role.kubernetes.io/control-plane-
node/ip-172-31-42-97 untainted
ubuntu@ip-172-31-42-97:~$ kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
ip-172-31-42-97     Ready    control-plane   7m27s   v1.31.1
ubuntu@ip-172-31-42-97:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-d556bf558-7hlqp    1/1     Running   0           4m27s
nginx-deployment-d556bf558-f5q6l    1/1     Running   0           4m27s
ubuntu@ip-172-31-42-97:~$ POD_NAME=$(kubectl get pods -l app=nginx -o jsonpath="{.items[0].metadata.name}")
ubuntu@ip-172-31-42-97:~$ kubectl port-forward $POD_NAME 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::]:8080 -> 80
```

Verify Deployment

curl --head <http://127.0.0.1:8080>

```
AWS Services Q Search [Alt+S] N. Virginia voclabs/user3186880-2022.urvashi.changlani@ves.ac.in @ 2406-1...
Expanded Security Maintenance for Applications is not enabled.
12 updates can be applied immediately.
5 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Sun Oct 13 09:41:02 2024 from 18.206.107.29
ubuntu@ip-172-31-42-97:~$ curl --head http://127.0.0.1:8081
HTTP/1.1 200 OK
Server: nginx/1.14.2
Date: Sun, 13 Oct 2024 10:27:22 GMT
Content-Type: text/html
Content-Length: 612
Last-Modified: Tue, 04 Dec 2018 14:44:49 GMT
Connection: keep-alive
ETag: "5c0692e1-264"
Accept-Ranges: bytes

(2)~ stopped curl --head http://127.0.0.1:8080
ubuntu@ip-172-31-42-97:~$ kubectl port-forward $POD_NAME 8080:80
Unable to listen on port 8080: Listeners failed to create with the following errors: [unable to create listener: Error listen tcp4 127.0.0.1:8080: bind: address already in use]
error: unable to listen on any of the requested ports: [[8080 80]]
ubuntu@ip-172-31-42-97:~$ kubectl port-forward $POD_NAME 8081:80
Forwarding from 127.0.0.1:8081 -> 80
Forwarding from [::]:8081 -> 80
Handling connection for 8081
```

