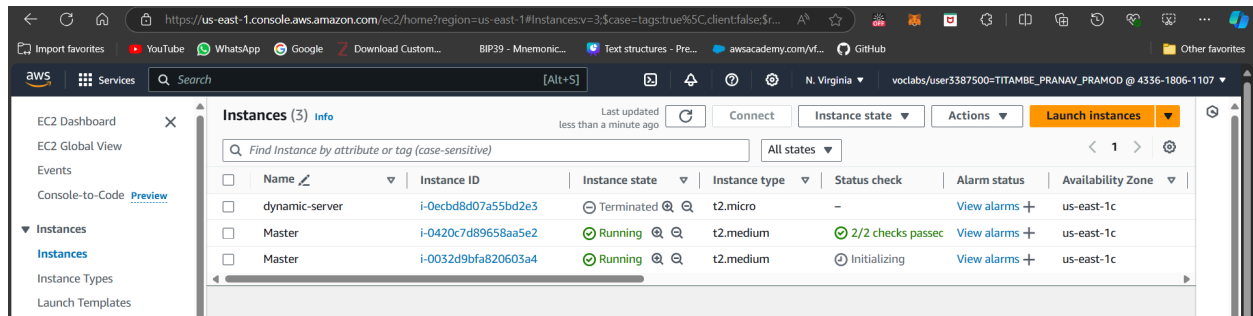


Name- Pranav Titambe

Rollno. - 62

Class - D15A



Master node

```
Master x Worker + v
System information as of Mon Sep 23 05:40:54 UTC 2024

System load: 0.06      Processes:           116
Usage of /:  22.8% of 6.71GB  Users logged in:    0
Memory usage: 5%      IPv4 address for enX0: 172.31.87.193
Swap usage:  0%

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-172-31-87-193:~$ sudo apt update
```

Worker node

```
System information as of Mon Sep 23 05:42:31 UTC 2024

System load:  0.0          Processes:           116
Usage of /:   22.8% of 6.71GB Users logged in:       0
Memory usage: 5%          IPv4 address for enX0: 172.31.85.68
Swap usage:   0%
```

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-172-31-85-68:~$ sudo apt update
```

Operations on both the nodes

```
ubuntu@ip-172-31-87-193:~$ sudo swapoff -a
ubuntu@ip-172-31-87-193:~$ cat <<EOF | sudo tee /etc/modules-load.d/k8s.conf
overlay
br_netfilter
EOF
overlay
br_netfilter
ubuntu@ip-172-31-87-193:~$ |
```

```
ubuntu@ip-172-31-85-68:~$ sudo modprobe overlay
sudo modprobe br_netfilter
ubuntu@ip-172-31-85-68:~$ cat <<EOF | sudo tee /etc/sysctl.d/k8s.conf
net.bridge.bridge-nf-call-iptables = 1
net.bridge.bridge-nf-call-ip6tables = 1
net.ipv4.ip_forward = 1
EOF
net.bridge.bridge-nf-call-iptables = 1
net.bridge.bridge-nf-call-ip6tables = 1
net.ipv4.ip_forward = 1
ubuntu@ip-172-31-85-68:~$ |
```

```
ubuntu@ip-172-31-87-193:~$ sudo curl -fsSL https://pkgs.k8s.io/addons:/cri-o:/prerelease:/main/deb/Release.key | sudo gp
g --dearmor -o /etc/apt/keyrings/cri-o-apt-keyring.gpg
echo "deb [signed-by=/etc/apt/keyrings/cri-o-apt-keyring.gpg] https://pkgs.k8s.io/addons:/cri-o:/prerelease:/main/deb/ /
" | sudo tee /etc/apt/sources.list.d/cri-o.list
deb [signed-by=/etc/apt/keyrings/cri-o-apt-keyring.gpg] https://pkgs.k8s.io/addons:/cri-o:/prerelease:/main/deb/ /
ubuntu@ip-172-31-87-193:~$ sudo apt update
```

```
ubuntu@ip-172-31-87-193:~$ sudo systemctl daemon-reload
sudo systemctl enable crio --now
sudo systemctl start crio.service
ubuntu@ip-172-31-87-193:~$
```

```
ubuntu@ip-172-31-87-193:~$ sudo systemctl daemon-reload
sudo systemctl enable crio --now
sudo systemctl start crio.service
ubuntu@ip-172-31-87-193:~$ echo "CRI runtime installed successfully"
CRI runtime installed successfully
ubuntu@ip-172-31-87-193:~$
```

```
ubuntu@ip-172-31-87-193:~$ sudo apt-get update -y
sudo apt-get install -y kubelet="1.29.0-*" kubectl="1.29.0-*" kubeadm="1.29.0-*"
sudo apt-get update -y
sudo apt-get install -y jq
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://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/addons:/cri-o:/prerelease:/main/deb InRelease
Get:6 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.29/deb InRelease [1189 B]
Get:7 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.29/deb Packages [14.0 kB]
Fetched 15.1 kB in 0s (32.4 kB/s)
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Selected version '1.29.0-1.1' (isv:kubernetes:core:stable:v1.29:pkgs.k8s.io [amd64]) for 'kubelet'
Selected version '1.29.0-1.1' (isv:kubernetes:core:stable:v1.29:pkgs.k8s.io [amd64]) for 'kubectl'
Selected version '1.29.0-1.1' (isv:kubernetes:core:stable:v1.29:pkgs.k8s.io [amd64]) for 'kubeadm'
```

```
ubuntu@ip-172-31-87-193:~$ sudo systemctl enable --now kubelet
sudo systemctl start kubelet
ubuntu@ip-172-31-87-193:~$
```

Some operations on Master node only

```
ubuntu@ip-172-31-87-193:~$ sudo kubeadm config images pull
I0923 18:19:32.389246 3210 version.go:256] remote version is much newer: v1.31.0; falling back to: stable-1.29
[config/images] Pulled registry.k8s.io/kube-controller-manager:v1.29.9
[config/images] Pulled registry.k8s.io/kube-scheduler:v1.29.9
[config/images] Pulled registry.k8s.io/kube-proxy:v1.29.9
[config/images] Pulled registry.k8s.io/coredns/coredns:v1.11.1
[config/images] Pulled registry.k8s.io/pause:3.9
[config/images] Pulled registry.k8s.io/etcd:3.5.10-0
ubuntu@ip-172-31-87-193:~$
```


Your Kubernetes control-plane has initialized successfully!

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

```
sudo cp -i /etc/kubernetes/admin.conf "$HOME"/.kube/config
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 172.31.87.193:6443 --token ps609h.u9595jvtvtmdxdde \
--discovery-token-ca-cert-hash sha256:b999d95c92f13fe95df32236ae5cb5c50e2a4e5dc9c00cf44d65a4c64869ec53
ubuntu@ip-172-31-87-193:~$
```

```
ubuntu@ip-172-31-87-193:~$ mkdir -p "$HOME"/.kube
sudo cp -i /etc/kubernetes/admin.conf "$HOME"/.kube/config
sudo chown "$(id -u)":$(id -g)" "$HOME"/.kube/config
ubuntu@ip-172-31-87-193:~$ kubectl apply -f https://raw.githubusercontent.com/projectcalico/calico/v3.26.0/manifests/calico.yaml
poddisruptionbudget.policy/calico-kube-controllers created
serviceaccount/calico-kube-controllers created
serviceaccount/calico-node created
serviceaccount/calico-cni-plugin created
configmap/calico-config created
customresourcedefinition.apiextensions.k8s.io/bgppconfigurations.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/bgppfilters.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/bgppeers.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/blockaffinities.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/caliconodestatuses.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/clusterinformations.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/felixconfigurations.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/globalnetworkpolicies.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/globalnetworksets.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/hostendpoints.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/ipamblocks.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/ipamconfigs.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/ipamhandles.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/ippools.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/ipreservations.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/kubecontrollersconfigurations.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/networkpolicies.crd.projectcalico.org created
customresourcedefinition.apiextensions.k8s.io/networksets.crd.projectcalico.org created
clusterrole.rbac.authorization.k8s.io/calico-kube-controllers created
clusterrole.rbac.authorization.k8s.io/calico-node created
```

```
ubuntu@ip-172-31-85-68:~$ sudo kubeadm join 172.31.87.193:6443 --token e4qbqx.6fmmeowzhklspzk8 --discovery-token-ca-cert
-hash sha256:b999d95c92f13fe95df32236ae5cb5c50e2a4e5dc9c00cf44d65a4c64869ec53 --v=5
I0923 19:03:35.769113 2876 join.go:413] [preflight] found NodeName empty; using OS hostname as NodeName
I0923 19:03:35.769235 2876 initconfiguration.go:122] detected and using CRI socket: unix:///var/run/crio/crio.sock
[preflight] Running pre-flight checks
I0923 19:03:35.769292 2876 preflight.go:93] [preflight] Running general checks
I0923 19:03:35.769322 2876 checks.go:280] validating the existence of file /etc/kubernetes/kubelet.conf
I0923 19:03:35.769329 2876 checks.go:280] validating the existence of file /etc/kubernetes/bootstrap-kubelet.conf
I0923 19:03:35.769337 2876 checks.go:104] validating the container runtime
I0923 19:03:35.789662 2876 checks.go:639] validating whether swap is enabled or not
I0923 19:03:35.790675 2876 checks.go:370] validating the presence of executable crictl
I0923 19:03:35.790703 2876 checks.go:370] validating the presence of executable conntrack
I0923 19:03:35.790719 2876 checks.go:370] validating the presence of executable ip
I0923 19:03:35.790736 2876 checks.go:370] validating the presence of executable iptables
I0923 19:03:35.790750 2876 checks.go:370] validating the presence of executable mount
I0923 19:03:35.790767 2876 checks.go:370] validating the presence of executable nsenter
I0923 19:03:35.790779 2876 checks.go:370] validating the presence of executable ebtables
I0923 19:03:35.790791 2876 checks.go:370] validating the presence of executable ethtool
I0923 19:03:35.790801 2876 checks.go:370] validating the presence of executable socat
I0923 19:03:35.790813 2876 checks.go:370] validating the presence of executable tc
I0923 19:03:35.790823 2876 checks.go:370] validating the presence of executable touch
I0923 19:03:35.790836 2876 checks.go:516] running all checks
I0923 19:03:35.802590 2876 checks.go:401] checking whether the given node name is valid and reachable using net.Lookup
IPHost
I0923 19:03:35.803633 2876 checks.go:605] validating kubelet version
I0923 19:03:35.857173 2876 checks.go:130] validating if the "kubelet" service is enabled and active
I0923 19:03:35.867430 2876 checks.go:203] validating availability of port 10250
```

```
ubuntu@ip-172-31-87-193:~$ kubectl get nodes
NAME                                STATUS    ROLES    AGE     VERSION
ip-172-31-85-68                    Ready     <none>   7m35s   v1.29.0
ip-172-31-87-193                    Ready     control-plane 43m     v1.29.0
ubuntu@ip-172-31-87-193:~$
```