Lesson 08 Demo 01

Installing Kubernetes and Setting Up Cluster

Objective: To guide the user through the process of installing Kubernetes on a master node and setting up a Kubernetes cluster, enabling them to effectively manage containerized applications

Tools required: Docker, Kubernetes

Pre-requisites: None

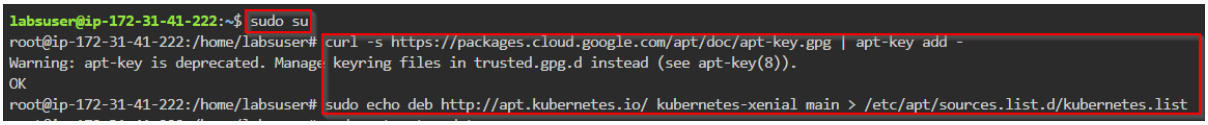
Steps to be followed:

1. Install Kubernetes in master node
2. Set up a Kubernetes cluster

Step 1: Install Kubernetes in master node

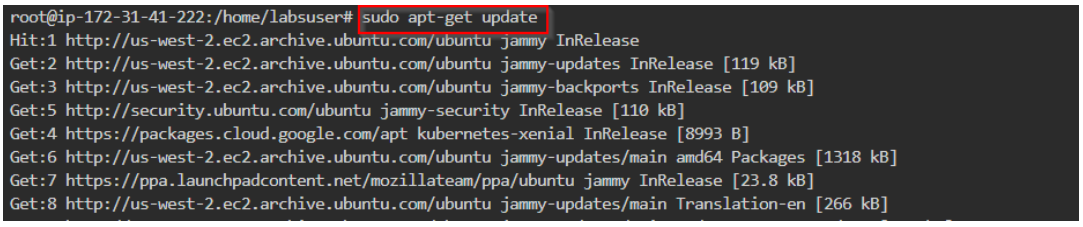
1.1 Use the following command to install Kubernetes and run it on the master node:

sudo su
curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | apt-key add -
sudo echo deb http://apt.kubernetes.io/ kubernetes-xenial main > /etc/apt/sources.list.d/kubernetes.list



1.2 Update the apt-get package by executing the command mentioned below:

sudo apt-get update



```
Get:45 http://security.ubuntu.com/ubuntu jammy-security/universe DEP-11 64x64 Icons [34.6 kB]
Get:46 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [16.8 kB]
Get:47 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [37.1 kB]
Get:48 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [7476 B]
Get:49 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [260 B]
Fetched 9973 kB in 4s (2579 kB/s)
Reading package lists... Done
W: http://apt.kubernetes.io/dists/kubernetes-xenial/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATI
ON section in apt-key(8) for details.
root@ip-172-31-41-222:/home/labsuser#
```

1.3 Install Kubernetes and the tools required to manage it by running the command mentioned below in the terminal. Enter **Y** to proceed further:
sudo apt install docker.io kubectl=1.20.5-00 kubeadm=1.20.5-00 kubelet=1.20.5-00

```
ON section in apt-key(8) for details.
root@ip-172-31-41-222:/home/labsuser# sudo apt install docker.io kubectl=1.20.5-00 kubeadm=1.20.5-00 kubelet=1.20.5-00
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
docker.io is already the newest version (24.0.5-0ubuntu1~22.04.1).
The following packages will be DOWNGRADED:
  kubeadm kubectl kubelet
0 upgraded, 0 newly installed, 3 downgraded, 0 to remove and 198 not upgraded.
1 not fully installed or removed.
Need to get 34.5 MB of archives.
After this operation, 17.9 MB disk space will be freed.
Do you want to continue? [Y/n] Y
Get:1 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubelet amd64 1.20.5-00 [18.9 MB]
Get:2 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubectl amd64 1.20.5-00 [7945 kB]
Get:3 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubeadm amd64 1.20.5-00 [7709 kB]
Fetched 34.5 MB in 4s (9042 kB/s)
dpkg: warning: downgrading kubelet from 1.28.2-1.1 to 1.20.5-00
(Reading database ... 218319 files and directories currently installed.)
Preparing to unpack .../kubelet_1.20.5-00_amd64.deb ...
Unpacking kubelet (1.20.5-00) over (1.28.2-1.1) ...
```

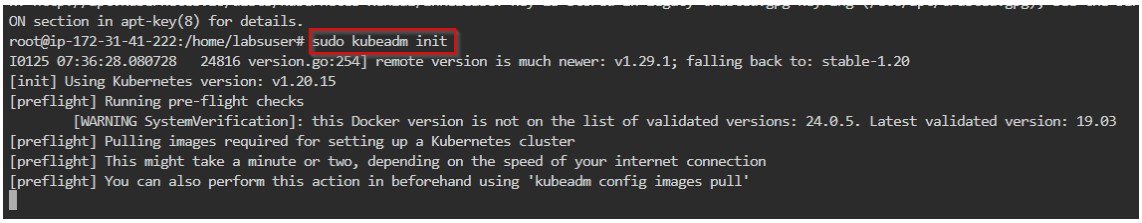
Step 2: Set up a Kubernetes cluster

2.1 Update the apt-get package by executing the command mentioned below:
sudo apt-get update

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-41-222:/home/labsuser# sudo apt-get update
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:4 https://packages.cloud.google.com/apt kubernetes-xenial InRelease [8993 B]
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Fetched 128 kB in 2s (60.6 kB/s)
```

2.2 To initialize the cluster, run the following command on the master node:

sudo kubeadm init

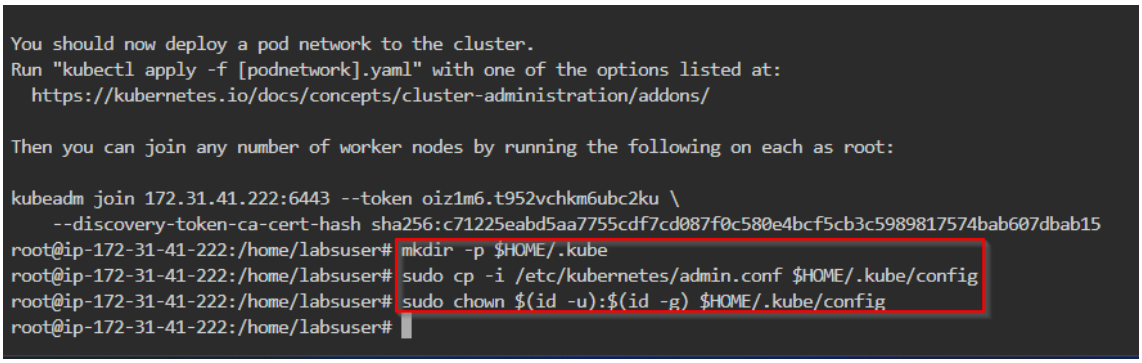


2.3 To start using your cluster, you need to run the following on the master node:

mkdir -p $HOME/.kube

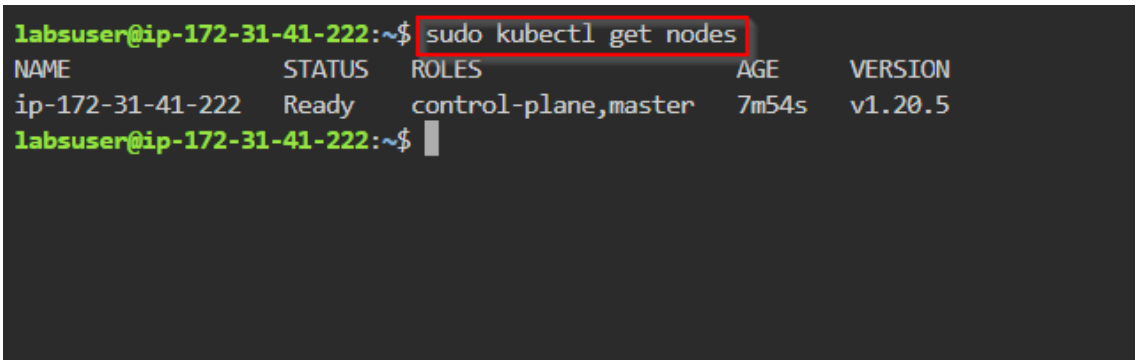
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config

sudo chown $(id -u):$(id -g) $HOME/.kube/config



2.4 Upon running the command below, you should see a single master node deployed:

sudo kubectl get nodes



By following these steps, you have successfully installed Kubernetes on the master node and set up a Kubernetes cluster.