

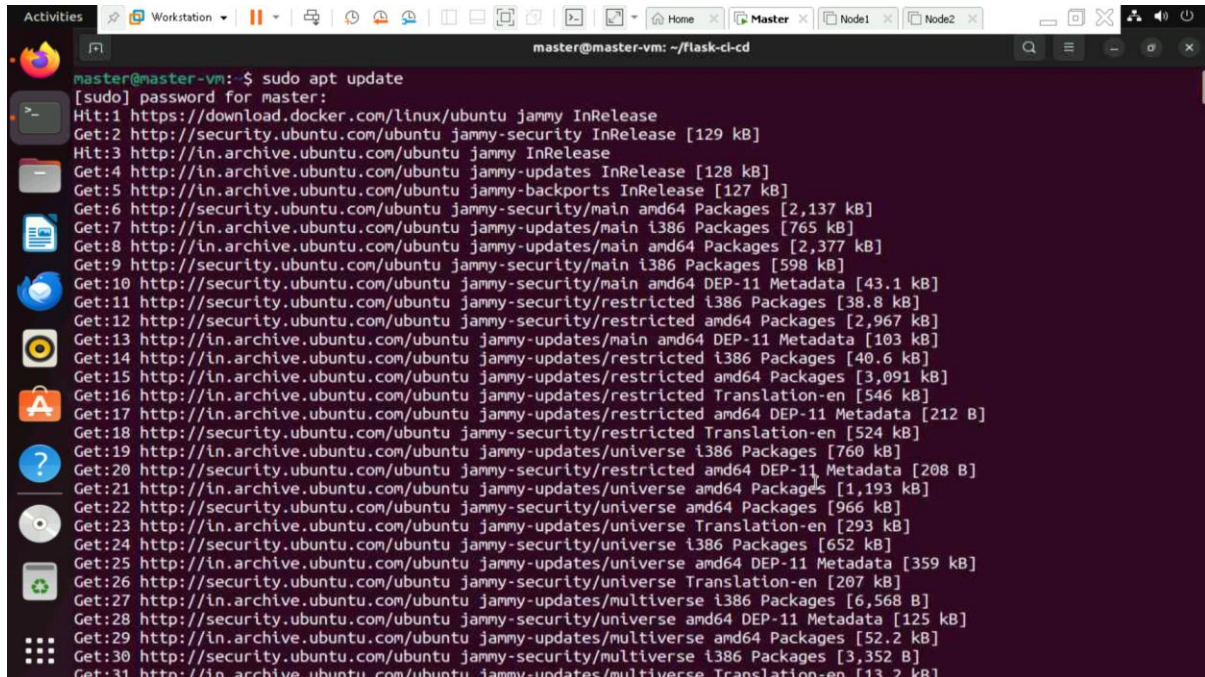
## PROJECT – 3

### 1. Install Kubernetes on Ubuntu

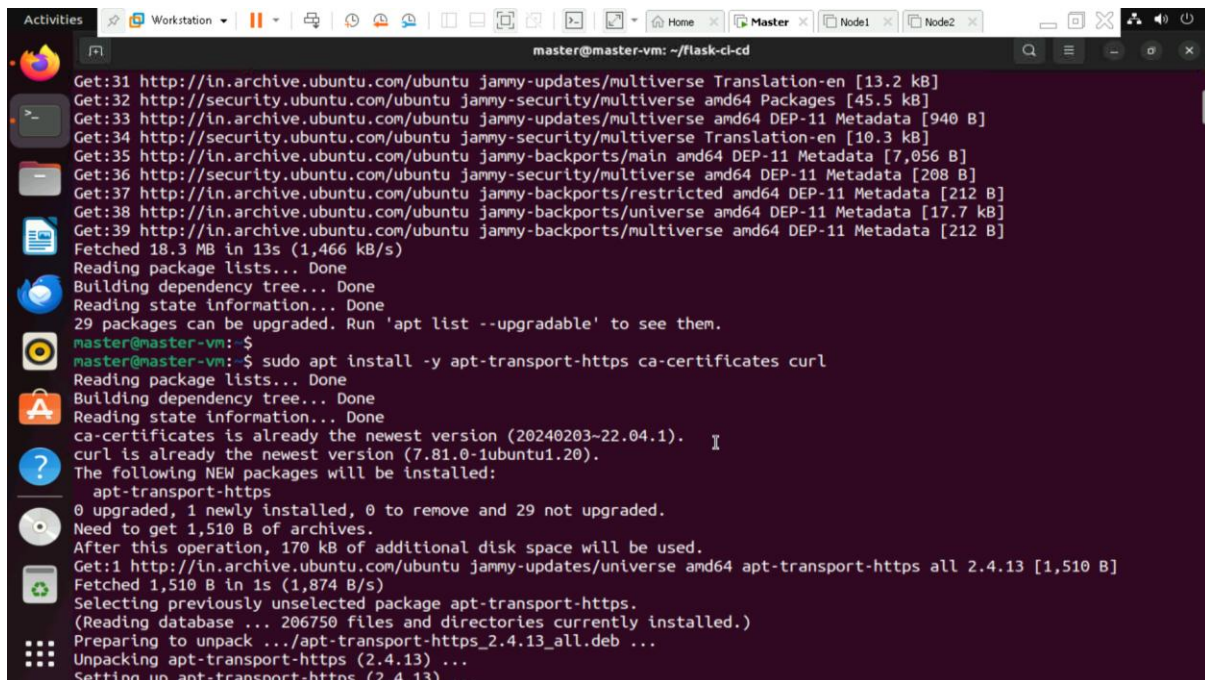
#### a. Install Dependencies

`sudo apt update`

`sudo apt install -y apt-transport-https ca-certificates curl`



```
master@master-vm: ~/$ sudo apt update
[sudo] password for master:
Hit:1 https://download.docker.com/linux/ubuntu jammy InRelease
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:3 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [2,137 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [765 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [2,377 kB]
Get:9 http://security.ubuntu.com/ubuntu jammy-security/main i386 Packages [598 kB]
Get:10 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [43.1 kB]
Get:11 http://security.ubuntu.com/ubuntu jammy-security/restricted i386 Packages [38.8 kB]
Get:12 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [2,967 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [103 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted i386 Packages [40.6 kB]
Get:15 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [3,091 kB]
Get:16 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [546 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 DEP-11 Metadata [212 B]
Get:18 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [524 kB]
Get:19 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe i386 Packages [760 kB]
Get:20 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 DEP-11 Metadata [208 B]
Get:21 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1,193 kB]
Get:22 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [966 kB]
Get:23 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [293 kB]
Get:24 http://security.ubuntu.com/ubuntu jammy-security/universe i386 Packages [652 kB]
Get:25 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 DEP-11 Metadata [359 kB]
Get:26 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [207 kB]
Get:27 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse i386 Packages [6,568 B]
Get:28 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 DEP-11 Metadata [125 kB]
Get:29 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [52.2 kB]
Get:30 http://security.ubuntu.com/ubuntu jammy-security/multiverse i386 Packages [3,352 B]
Get:31 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [13.2 kB]
```



```
Get:31 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [13.2 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [45.5 kB]
Get:33 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 DEP-11 Metadata [940 B]
Get:34 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [10.3 kB]
Get:35 http://in.archive.ubuntu.com/ubuntu jammy-backports/main amd64 DEP-11 Metadata [7,056 B]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 DEP-11 Metadata [208 B]
Get:37 http://in.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 DEP-11 Metadata [212 B]
Get:38 http://in.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 DEP-11 Metadata [17.7 kB]
Get:39 http://in.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 DEP-11 Metadata [212 B]
Fetched 18.3 MB in 13s (1,466 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
29 packages can be upgraded. Run 'apt list --upgradable' to see them.
master@master-vm: ~/$ sudo apt install -y apt-transport-https ca-certificates curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20240203-22.04.1).
curl is already the newest version (7.81.0-1ubuntu1.20).
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 29 not upgraded.
Need to get 1,510 B of archives.
After this operation, 170 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 apt-transport-https all 2.4.13 [1,510 B]
Fetched 1,510 B in 1s (1,874 B/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 206750 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.4.13_all.deb ...
Unpacking apt-transport-https (2.4.13) ...
Setting up apt-transport-https (2.4.13) ...
```



## b. Install kubectl

```
curl -LO "https://dl.k8s.io/release/$(curl -L -s
https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"
chmod +x kubectl
sudo mv kubectl /usr/local/bin/
kubectl version --client
```

```
master@master-vm: ~/flask-ci-cd
master@master-vm:~$ curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"
chmod +x kubectl
sudo mv kubectl /usr/local/bin/
kubectl version --client
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 138 100 138 0 0 347 0 --:--:-- --:--:-- --:--:-- 347
100 54.6M 100 54.6M 0 0 32.5M 0 0:00:01 0:00:01 --:--:-- 48.5M
error: extra arguments: [--client]
master@master-vm:~$ https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
chmod +x minikube-linux-amd64
sudo mv minikube-linux-amd64 /usr/local/bin/minikube
bash: https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64: No such file or directory
chmod: cannot access 'minikube-linux-amd64': No such file or directory
mv: cannot stat 'minikube-linux-amd64': No such file or directory
master@master-vm:~$
master@master-vm:~$ curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
chmod +x minikube-linux-amd64
sudo mv minikube-linux-amd64 /usr/local/bin/minikube
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
0 0 0 0 0 0 0 --:--:-- --:--:-- --:--:-- 0
0 119M 0 206k 0 0 143k 0 0:14:10 0:00:01 0 119M 4 5149k 0 0 2125k
0 0:00:57 0:00:02 20 119M 20 24.3M 0 0 7277k 0 0:00:16 0:00:03 36 119M 36 43.5M 0 0
9.8M 0 0:00:12 0:00:04 52 119M 52 62.9M 0 0 11.5M 0 0:00:10 0:00:05 65 119M 65 78.1M
0 0 12.1M 0 0:00:09 0:00:06 81 119M 81 97.2M 0 0 13.1M 0 0:00:09 0:00:07 95 119M
95 114M 0 0 13.5M 0 0:00:08 0:00:08 -100 119M 100 119M 0 0 13.7M 0 0:00:08 0:00:08
--:--:-- 17.8M
master@master-vm:~$ minikube start --driver=docker
minikube v1.35.0 on Ubuntu 22.04
Using the docker driver based on user configuration
Using Docker driver with root privileges
```

## c. Install minikube

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-
linux-amd64
chmod +x minikube-linux-amd64
sudo mv minikube-linux-amd64 /usr/local/bin/minikube
```

```
master@master-vm:~/flask-ci-cd
--:--:-- 17.8M
master@master-vm:~$ minikube start --driver=docker
minikube v1.35.0 on Ubuntu 22.04
Using the docker driver based on user configuration
Using Docker driver with root privileges
Starting "minikube" primary control-plane node in "minikube" cluster
Pulling base image v0.0.46 ...
Downloading Kubernetes v1.32.0 preloa...
> preloaded-images-k8s-v18-v1...: 30.78 KiB / 333.57 MiB [>] > preloaded-images-k8s-v18-v1...: 46.78 KiB / 333
.57 MiB [>] > preloaded-images-k8s-v18-v1...: 78.76 KiB / 333.57 MiB [>] > preloaded-images-k8s-v18-v1...: 158.
76 KiB / 333.57 MiB 0 > preloaded-images-k8s-v18-v1...: 270.76 KiB / 333.57 MiB 0 > preloaded-images-k8s-v18-v
1...: 494.76 KiB / 333.57 MiB 0 > gcr.io/k8s-minikube/kicbase...: 0 B [ ] > preloaded-image
s-k8s-v18-v1...: 990.76 KiB / 333.57 MiB 0 > gcr.io/k8s-minikube/kicbase...: 0 B [ ] > prel
oaded-images-k8s-v18-v1...: 1.94 MiB / 333.57 MiB 0.5 > gcr.io/k8s-minikube/kicbase...: 0 B [ ]
- > preloaded-images-k8s-v18-v1...: 3.67 MiB / 333.57 MiB 1.1 > gcr.io/k8s-minikube/kicbase...: 0 B [ ]
> preloaded-images-k8s-v18-v1...: 5.89 MiB / 333.57 MiB 1.7 > gcr.io/k8s-minikube/kicbase...: 1.6
1 KiB / 500.31 MiB [ ] > preloaded-images-k8s-v18-v1...: 11.48 MiB / 333.57 MiB 3. > gcr.io/k8s-minikube/kicba
se...: 1.61 KiB / 500.31 MiB [ ] > preloaded-images-k8s-v18-v1...: 15.39 MiB / 333.57 MiB 4. > gcr.io/k8s-min
ikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > preloaded-images-k8s-v18-v1...: 18.98 MiB / 333.57 MiB 5. > gcr
.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > preloaded-images-k8s-v18-v1...: 21.95 MiB / 333.57 MiB
6. > gcr.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > preloaded-images-k8s-v18-v1...: 24.93 MiB / 3
33.57 MiB 7. > gcr.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > preloaded-images-k8s-v18-v1...: 28
.40 MiB / 333.57 MiB 8. > gcr.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > preloaded-images-k8s-v18
-v1...: 33.33 MiB / 333.57 MiB 9. > gcr.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > preloaded-ima
ges-k8s-v18-v1...: 37.54 MiB / 333.57 MiB 11 > gcr.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB 0.0 > pr
eloaded-images-k8s-v18-v1...: 40.45 MiB / 333.57 MiB 12 > gcr.io/k8s-minikube/kicbase...: 1.61 KiB / 500.31 MiB
0.0 > preloaded-images-k8s-v18-v1...: 43.11 MiB / 333.57 MiB 12 > gcr.io/k8s-minikube/kicbase...: 129.75 KiB /
500.31 MiB 0 > preloaded-images-k8s-v18-v1...: 44.14 MiB / 333.57 MiB 13 > gcr.io/k8s-minikube/kicbase...: 8
49.67 KiB / 500.31 MiB 0 > preloaded-images-k8s-v18-v1...: 45.55 MiB / 333.57 MiB 13 > gcr.io/k8s-minikube/kic
base...: 1.89 MiB / 500.31 MiB 0.3 > preloaded-images-k8s-v18-v1...: 46.86 MiB / 333.57 MiB 14 > gcr.io/k8s-m
inikube/kicbase...: 2.77 MiB / 500.31 MiB 0.5 > preloaded-images-k8s-v18-v1...: 48.33 MiB / 333.57 MiB 14 > g
cr.io/k8s-minikube/kicbase...: 4.52 MiB / 500.31 MiB 0.9 > preloaded-images-k8s-v18-v1...: 49.73 MiB / 333.57 MiB
14 > gcr.io/k8s-minikube/kicbase...: 6.78 MiB / 500.31 MiB 1.3 > preloaded-images-k8s-v18-v1...: 51.05 MiB /
```

- d. **Start Minikube**  
minikube start --driver=docker
- e. **Check status**  
kubectl cluster-info

```

> gcr.io/k8s-minikube/kicbase...: 356.89 MiB / 500.31 MiB 7 > gcr.io/k8s-minikube/kicbase...: 361.58 MiB / 500
.31 MiB 7 > gcr.io/k8s-minikube/kicbase...: 366.61 MiB / 500.31 MiB 7 > gcr.io/k8s-minikube/kicbase...: 373.4
5 MiB / 500.31 MiB 7 > gcr.io/k8s-minikube/kicbase...: 381.01 MiB / 500.31 MiB 7 > gcr.io/k8s-minikube/kicbase
...: 386.79 MiB / 500.31 MiB 7 > gcr.io/k8s-minikube/kicbase...: 391.71 MiB / 500.31 MiB 7 > gcr.io/k8s-minik
ube/kicbase...: 396.93 MiB / 500.31 MiB 7 > gcr.io/k8s-minikube/kicbase...: 401.12 MiB / 500.31 MiB 8 > gcr.i
o/k8s-minikube/kicbase...: 406.31 MiB / 500.31 MiB 8 > gcr.io/k8s-minikube/kicbase...: 412.06 MiB / 500.31 MiB 8
> gcr.io/k8s-minikube/kicbase...: 417.43 MiB / 500.31 MiB 8 > gcr.io/k8s-minikube/kicbase...: 422.43 MiB / 50
0.31 MiB 8 > gcr.io/k8s-minikube/kicbase...: 428.31 MiB / 500.31 MiB 8 > gcr.io/k8s-minikube/kicbase...: 432.
43 MiB / 500.31 MiB 8 > gcr.io/k8s-minikube/kicbase...: 438.59 MiB / 500.31 MiB 8 > gcr.io/k8s-minikube/kicbas
e...: 445.00 MiB / 500.31 MiB 8 > gcr.io/k8s-minikube/kicbase...: 450.28 MiB / 500.31 MiB 9 > gcr.io/k8s-mini
kube/kicbase...: 456.13 MiB / 500.31 MiB 9 > gcr.io/k8s-minikube/kicbase...: 462.48 MiB / 500.31 MiB 9 > gcr.
io/k8s-minikube/kicbase...: 467.14 MiB / 500.31 MiB 9 > gcr.io/k8s-minikube/kicbase...: 471.30 MiB / 500.31 MiB
9 > gcr.io/k8s-minikube/kicbase...: 477.76 MiB / 500.31 MiB 9 > gcr.io/k8s-minikube/kicbase...: 481.92 MiB / 5
00.31 MiB 9 > gcr.io/k8s-minikube/kicbase...: 487.08 MiB / 500.31 MiB 9 > gcr.io/k8s-minikube/kicbase...: 491
.83 MiB / 500.31 MiB 9 > gcr.io/k8s-minikube/kicbase...: 495.83 MiB / 500.31 MiB 9 > gcr.io/k8s-minikube/kicba
se...: 500.31 MiB / 500.31 MiB 100.00% 18.58 M
Creating docker container (CPUs=2, Memory=2200MB) ...
Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
  ■ Generating certificates and keys ...
  ■ Booting up control plane ...
  ■ Configuring RBAC rules ...
  ■ Configuring bridge CNI (Container Networking Interface) ...
  ■ Verifying Kubernetes components...
  ■ Using image gcr.io/k8s-minikube/storage-provisioner:v5
  ■ Enabled addons: storage-provisioner, default-storageclass
Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
master@master-vm:~$ kubectl cluster-info
Kubernetes control plane is running at https://192.168.49.2:8443
CoreDNS is running at https://192.168.49.2:8443/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
master@master-vm:~$ mkdir flask-ci-cd
master@master-vm:~$ cd flask-ci-cd/

```

## 2. Create project

- a. **Create folder**  
mkdir flask-ci-cd  
cd flask-ci-cd
- b. **Create Flask app**  
nano app.py  
from flask import Flask  
  
app = Flask(\_\_name\_\_)  
  
@app.route('/')  
def home():  
 return "Hello, World!"  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 app.run(host="0.0.0.0", port=5000)
- c. **Create Docker File**  
FROM python:3.9

WORKDIR /app

COPY requirements.txt requirements.txt  
RUN pip install -r requirements.txt  
COPY . .  
CMD ["python", "app.py"]



d. Create requirements.txt

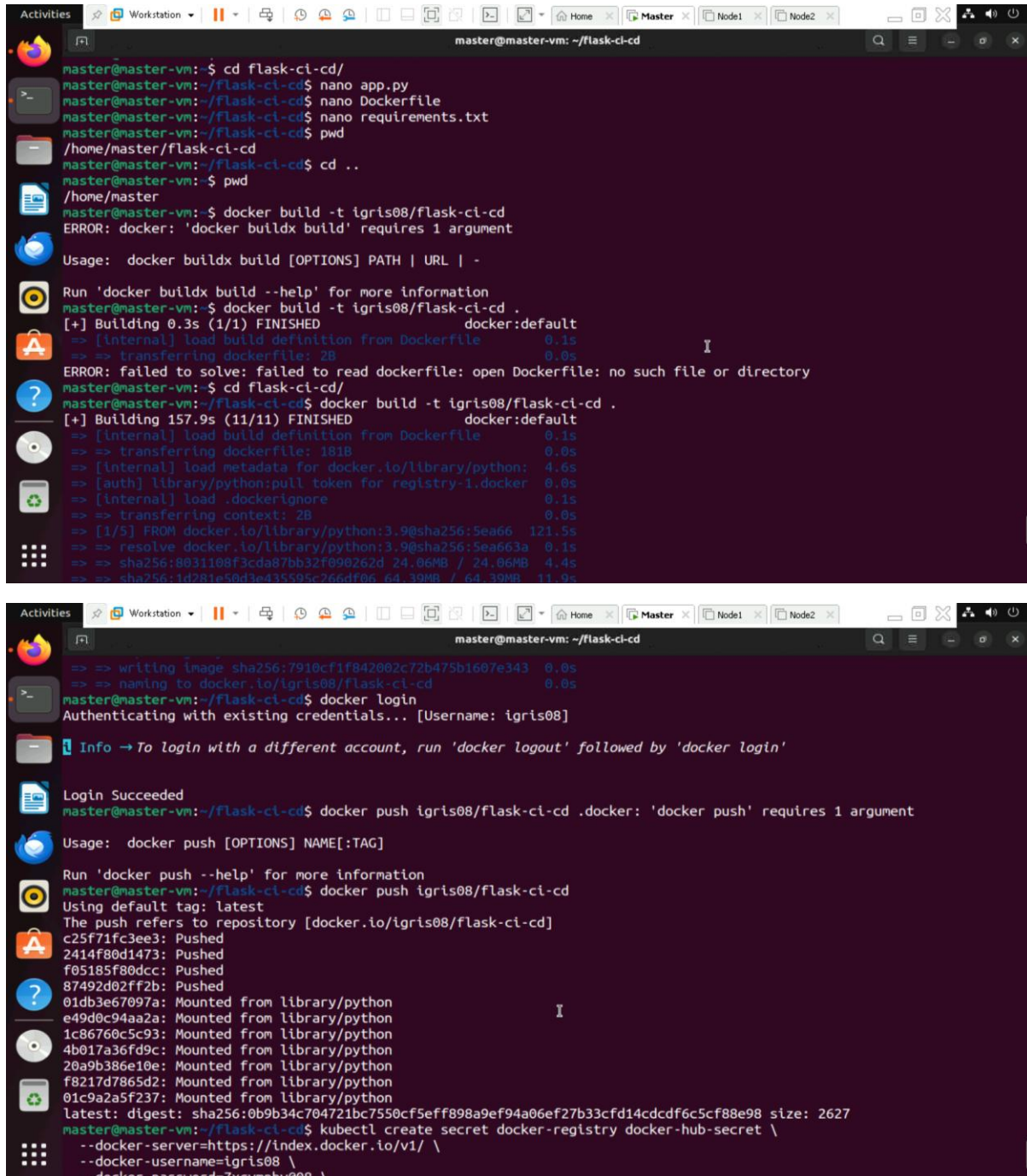
Flask

3. Build and Push Docker Image

docker build -t igris08/flask-ci-cd:latest .

docker login

docker push igris08/flask-ci-cd:latest

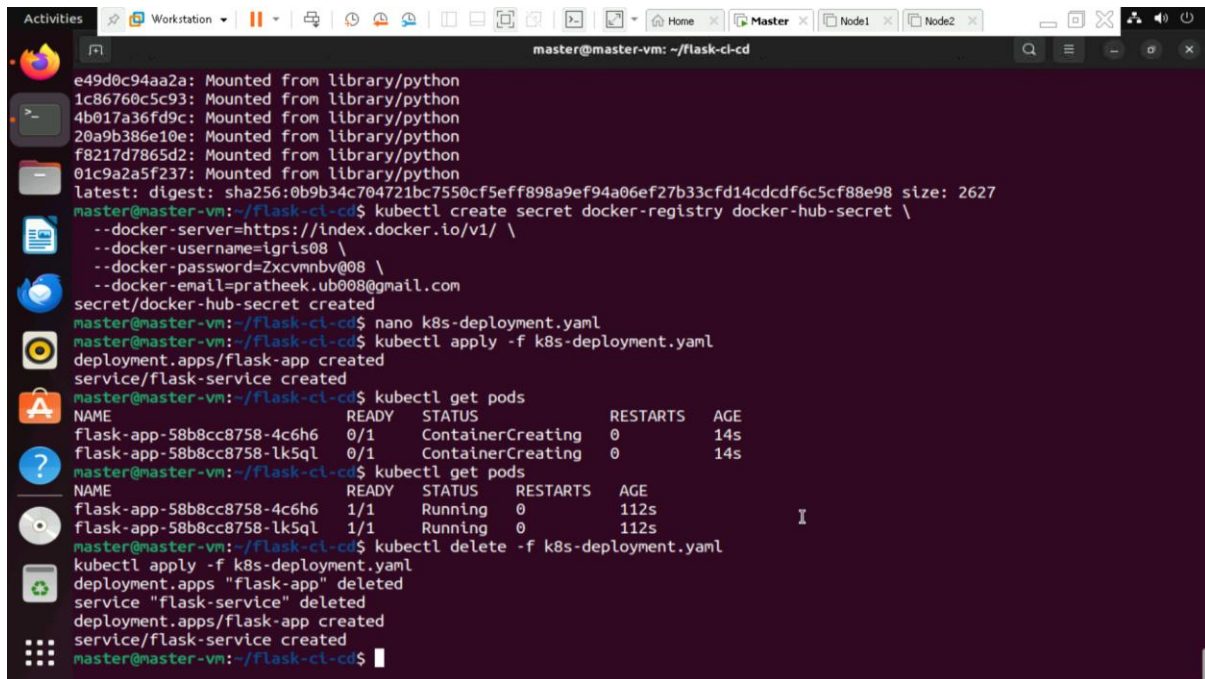


```
master@master-vm: ~/$ cd flask-ci-cd/
master@master-vm: ~/flask-ci-cd$ nano app.py
master@master-vm: ~/flask-ci-cd$ nano Dockerfile
master@master-vm: ~/flask-ci-cd$ nano requirements.txt
master@master-vm: ~/flask-ci-cd$ pwd
/home/master/flask-ci-cd
master@master-vm: ~/flask-ci-cd$ cd ..
master@master-vm: ~$ pwd
/home/master
master@master-vm: ~$ docker build -t igris08/flask-ci-cd
ERROR: docker: 'docker buildx build' requires 1 argument
Usage: docker buildx build [OPTIONS] PATH | URL | -
Run 'docker buildx build --help' for more information
master@master-vm: ~$ docker build -t igris08/flask-ci-cd .
[+] Building 0.3s (1/1) FINISHED docker:default
=> [internal] load build definition from Dockerfile 0.1s
=> => transferring dockerfile: 28B 0.0s
ERROR: failed to solve: failed to read dockerfile: open Dockerfile: no such file or directory
master@master-vm: ~$ cd flask-ci-cd/
master@master-vm: ~/flask-ci-cd$ docker build -t igris08/flask-ci-cd .
[+] Building 157.9s (11/11) FINISHED docker:default
=> [internal] load build definition from Dockerfile 0.1s
=> => transferring dockerfile: 181B 0.0s
=> [internal] load metadata for docker.io/library/python: 4.6s
=> [auth] library/python:pull token for registry-1.docker 0.0s
=> [internal] load .dockerignore 0.1s
=> => transferring context: 28B 0.0s
=> [1/5] FROM docker.io/library/python:3.9@sha256:5ea666 121.5s
=> => resolve docker.io/library/python:3.9@sha256:5ea666 0.1s
=> => sha256:8031108f3cda87bb32f090262d 24.06MB / 24.06MB 4.4s
=> => sha256:1d281e50d3e435595c266df06 64.39MB / 64.39MB 11.9s
=> => writing image sha256:7910cf1f842082c72b475b1607e343 0.0s
=> => naming to docker.io/igris08/flask-ci-cd 0.0s
master@master-vm: ~/flask-ci-cd$ docker login
Authenticating with existing credentials... [Username: igris08]
Info -> To login with a different account, run 'docker logout' followed by 'docker login'
Login Succeeded
master@master-vm: ~/flask-ci-cd$ docker push igris08/flask-ci-cd .docker: 'docker push' requires 1 argument
Usage: docker push [OPTIONS] NAME[:TAG]
Run 'docker push --help' for more information
master@master-vm: ~/flask-ci-cd$ docker push igris08/flask-ci-cd
Using default tag: latest
The push refers to repository [docker.io/igris08/flask-ci-cd]
c25f71fc3ee3: Pushed
2414f80d1473: Pushed
f05185f80dcc: Pushed
87492d02ff2b: Pushed
01db3e67097a: Mounted from library/python
e49d0c94aa2a: Mounted from library/python
1c86760c5c93: Mounted from library/python
4b017a36fd9c: Mounted from library/python
20a9b386e10e: Mounted from library/python
f8217d7865d2: Mounted from library/python
01c9a2a5f237: Mounted from library/python
latest: digest: sha256:0b9b34c704721bc7550cf5eff898a9ef94a06ef27b33cfd14cdcdf6c5cf88e98 size: 2627
master@master-vm: ~/flask-ci-cd$ kubectl create secret docker-registry docker-hub-secret \
--docker-server=https://index.docker.io/v1/ \
--docker-username=igris08 \
--docker-password=7xcvmnhv@08 \
```

#### 4. Connect Kubernetes to Docker

Create a secret for dockerhub(put in your details)

```
kubectl create secret docker-registry docker-hub-secret \
--docker-server=https://index.docker.io/v1/ \
--docker-username=igris08 \
--docker-password=YOUR_DOCKER_PASSWORD \
--docker-email=YOUR_EMAIL
```



```
master@master-vm: ~/flask-ci-cd
e49d0c94aa2a: Mounted from library/python
1c86760c5c93: Mounted from library/python
4b017a36fd9c: Mounted from library/python
20a9b386e10e: Mounted from library/python
f8217d7865d2: Mounted from library/python
01c9a2a5f237: Mounted from library/python
latest: digest: sha256:0b9b34c704721bc7550cf5eff898a9ef94a06ef27b33cfd14cdcdf6c5cf88e98 size: 2627
master@master-vm: ~/flask-ci-cd$ kubectl create secret docker-registry docker-hub-secret \
--docker-server=https://index.docker.io/v1/ \
--docker-username=igris08 \
--docker-password=Zxcvmbv@08 \
--docker-email=pratheek.ub008@gmail.com
secret/docker-hub-secret created
master@master-vm: ~/flask-ci-cd$ nano k8s-deployment.yaml
master@master-vm: ~/flask-ci-cd$ kubectl apply -f k8s-deployment.yaml
deployment.apps/flask-app created
service/flask-service created
master@master-vm: ~/flask-ci-cd$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
flask-app-58b8cc8758-4c6h6          0/1     ContainerCreating   0           14s
flask-app-58b8cc8758-lk5ql          0/1     ContainerCreating   0           14s
master@master-vm: ~/flask-ci-cd$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
flask-app-58b8cc8758-4c6h6          1/1     Running    0           112s
flask-app-58b8cc8758-lk5ql          1/1     Running    0           112s
master@master-vm: ~/flask-ci-cd$ kubectl delete -f k8s-deployment.yaml
kubectl apply -f k8s-deployment.yaml
deployment.apps "flask-app" deleted
service "flask-service" deleted
deployment.apps/flask-app created
service/flask-service created
master@master-vm: ~/flask-ci-cd$
```

#### 5. Kubernetes Deployment

Create k8s-deployment.yaml

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: flask-app
spec:
  replicas: 2
  selector:
    matchLabels:
      app: flask-app
  template:
    metadata:
      labels:
        app: flask-app
    spec:
      imagePullSecrets:
        - name: docker-hub-secret
```

```
containers:
  - name: flask-app
    image: igris08/flask-ci-cd:latest
  ports:
    - containerPort: 5000
---
apiVersion: v1
kind: Service
metadata:
  name: flask-service
spec:
  selector:
    app: flask-app
  ports:
    - protocol: TCP
      port: 80
      targetPort: 5000
  type: LoadBalancer
```

Apply the deployment:

```
kubectl apply -f k8s-deployment.yaml
```

Check if the pods are running:

```
kubectl get pods
```

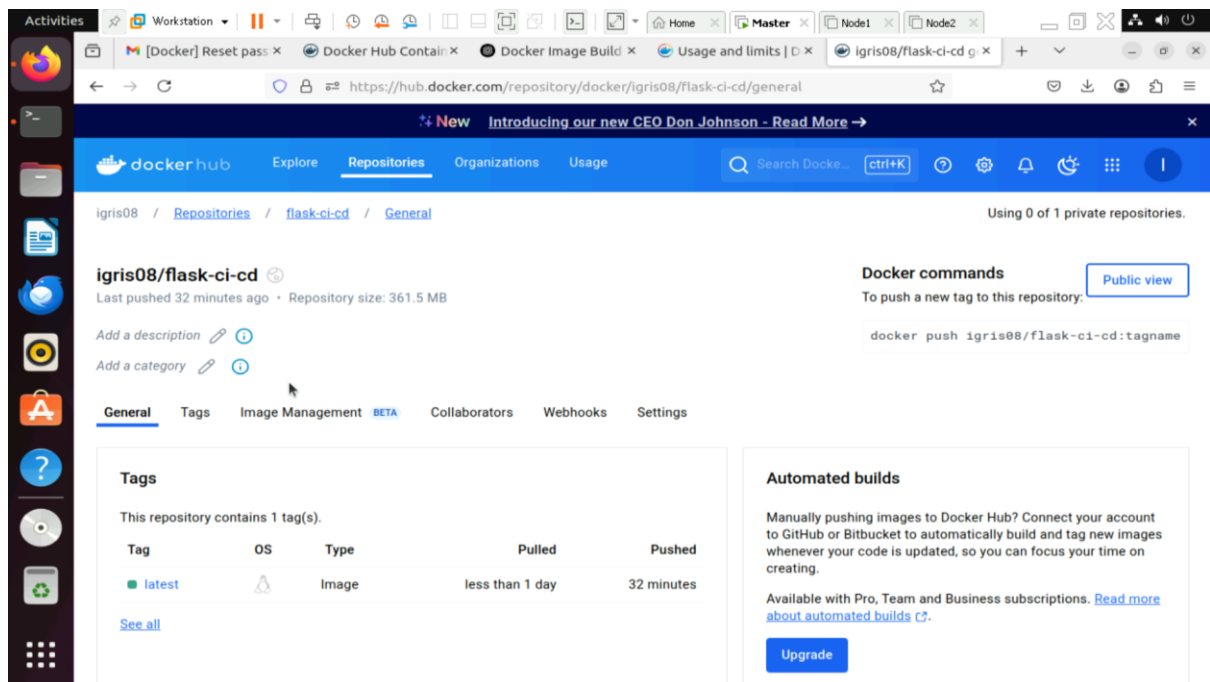


```
master@master-vm: ~/flask-ci-cd$ nano k8s-deployment.yaml
master@master-vm: ~/flask-ci-cd$ kubectl apply -f k8s-deployment.yaml
deployment.apps/flask-app created
service/flask-service created
master@master-vm: ~/flask-ci-cd$ kubectl get pods
NAME                                READY   STATUS            RESTARTS   AGE
flask-app-58b8cc8758-4c6h6          0/1     ContainerCreating  0           14s
flask-app-58b8cc8758-1k5ql          0/1     ContainerCreating  0           14s
master@master-vm: ~/flask-ci-cd$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
flask-app-58b8cc8758-4c6h6          1/1     Running   0           112s
flask-app-58b8cc8758-1k5ql          1/1     Running   0           112s
```

## 6. How to stop and restart deployment

```
kubectl delete -f k8s-deployment.yaml
```

```
kubectl apply -f k8s-deployment.yaml
```



## 7. Jenkins Pipeline

```
pipeline {
  agent any
  stages {
    stage('Clone Code') {
      steps {
        git 'https://github.com/pratheek08/flask-ci-cd.git'
      }
    }
    stage('Build Docker Image') {
      steps {
        sh 'docker build -t pratheek08/flask-ci-cd:latest .'
      }
    }
    stage('Push to Docker Hub') {
      steps {
        withDockerRegistry([credentialsId: 'docker-creds', url: '']) {
          sh 'docker push pratheek08/flask-ci-cd:latest'
        }
      }
    }
    stage('Deploy to Kubernetes') {
      steps {
        sh 'kubectl apply -f k8s-deployment.yaml'
      }
    }
  }
}
```