

# MSK- Lab2

## Docker compose and Hello world minikube

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**TASK :** install docker compose and review hoe to make a .yaml file also we need to run our first hello world minikube and run different commands.

- Checking Docker engine tool:

```
brijesh@brijesh-VirtualBox:~$ docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.
```

- Docker compose install and check version:

```
brijesh@brijesh-VirtualBox:~$ docker-compose --version
docker-compose version 1.25.0, build unknown
```

- Docker Compose:

```
brijesh@brijesh-VirtualBox:~$ mkdir composetest
brijesh@brijesh-VirtualBox:~$ cd composetest/
brijesh@brijesh-VirtualBox:~/composetest$ getdit app.py
```

- Update and upgrade the system
- Create Docker Compose
- Docker file :
  - For building image,
  - Set the working dir.. to /code.
  - Set environment variables
  - Install python dependency,
  - Listening port 5000
  - Default command for container to flask run

```
1 FROM python:3.7-alpine
2 WORKDIR /code
3 ENV FLASK_APP=app.py
4 ENV FLASK_RUN_HOST=0.0.0.0
5 RUN apk add --no-cache gcc musl-dev linux-headers
6 COPY requirements.txt requirements.txt
7 RUN pip install -r requirements.txt
8 EXPOSE 5000
9 COPY . .
10 CMD ["flask", "run"]
```

- Define services in a Compose file
  - It defines web and redis

- Web: binds container and host machine on port 5000
- Redis: uses a public redis image pulled from the Docker Hub registry.

```

1 version: "3.8"
2 services:
3   web:
4     build: .
5     ports:
6       - "5000:5000"
7   redis:
8     image: "redis:alpine"

```

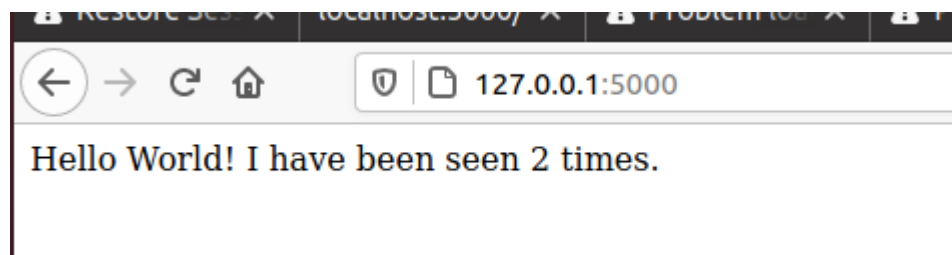
- Build Run- app with compose

Error Fix :change version to "3.3"

```

brijesh@brijesh-VirtualBox:~/composetest$ docker-compose up
Creating network "composetest_default" with the default driver
Building web
Step 1/10 : FROM python:3.7-alpine
3.7-alpine: Pulling from library/python
188c0c94c7c5: Pull complete
55578f60cda7: Pull complete
3d0ed0f04a02: Pull complete
98762f4040a9: Pull complete
2eeb36df0251: Pull complete

```



- Redis and composetest\_web as a local image

```
brijesh@brijesh-VirtualBox:~/composetest$ docker image ls
REPOSITORY          TAG                 IMAGE ID            CREATED
composetest_web      latest             4054f2062b33       10 minutes ago
brijesh_repo/ubuntu-nodejs  latest            98066673901e       2 days ago
brijesh/ubuntu-nodejs  latest            98066673901e       2 days ago
brijesh210/brijesh_repo  ubuntu-nodejs     98066673901e       2 days ago
redis                alpine             c1949ec48c51       5 days ago
ubuntu               latest             d70eaf7277ea       9 days ago
python               3.7-alpine         4d91c1ce4cc8       11 days ago
gcr.io/k8s-minikube/kicbase  v0.0.13           90f1294ff9ac       4 weeks ago
hello-world          latest             bf756fb1ae65       10 months ago
strm/helloworld-http    latest            29acbf1818de       3 years ago
```

- Docker : add build mount

```
1 version: "3.3"
2 services:
3   web:
4     build: .
5     ports:
6       - "5000:5000"
7     volumes:
8       - ./code
9     environment:
10    FLASK_ENV: development
11   redis:
12     image: "redis:alpine"
```

- The new volumes key mounts the project directory on the host to /code inside the container, allowing you to modify the code on the fly, without having to rebuild the image.
- Environment key sets the FLASK\_ENV .> flask run to run in development mode
- This mode only use in development
- Some command to see:
  - Run services in background , detached mode

```
brijesh@brijesh-VirtualBox:~/composetest$ docker-compose up -d
Starting composetest_redis_1 ... done
Starting composetest_web_1   ... done
```

- Stop services

```
brijesh@brijesh-VirtualBox:~/composetest$ docker-compose stop
Stopping composetest_web_1   ... done
Stopping composetest_redis_1 ... done
```

- See what environment variables are available to the web service.

```
brijesh@brijesh-VirtualBox:~/composetest$ docker-compose run web env
Creating network "composetest_default" with the default driver
PATH=/usr/local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=839054377c9f
TERM=xterm
FLASK_ENV=development
LANG=C.UTF-8
GPG_KEY=0D96DF4D4110E5C43FBFB17F2D347EA6AA65421D
PYTHON_VERSION=3.7.9
PYTHON_PIP_VERSION=20.2.4
PYTHON_GET_PIP_URL=https://github.com/pypa/get-pip/raw/8283828b8fd6f1783daf55a765384e6d8d2c501
.py
PYTHON_GET_PIP_SHA256=2250ab0a7e70f6fd22b955493f7f5cf1ea53e70b584a84a32573644a045b4bfb
FLASK_APP=app.py
FLASK_RUN_HOST=0.0.0.0
HOME=/root
```

- Stop services

```
brijesh@brijesh-VirtualBox:~/composetest$ docker-compose stop
Stopping composetest_web_1 ... done
Stopping composetest_redis_1 ... done
```

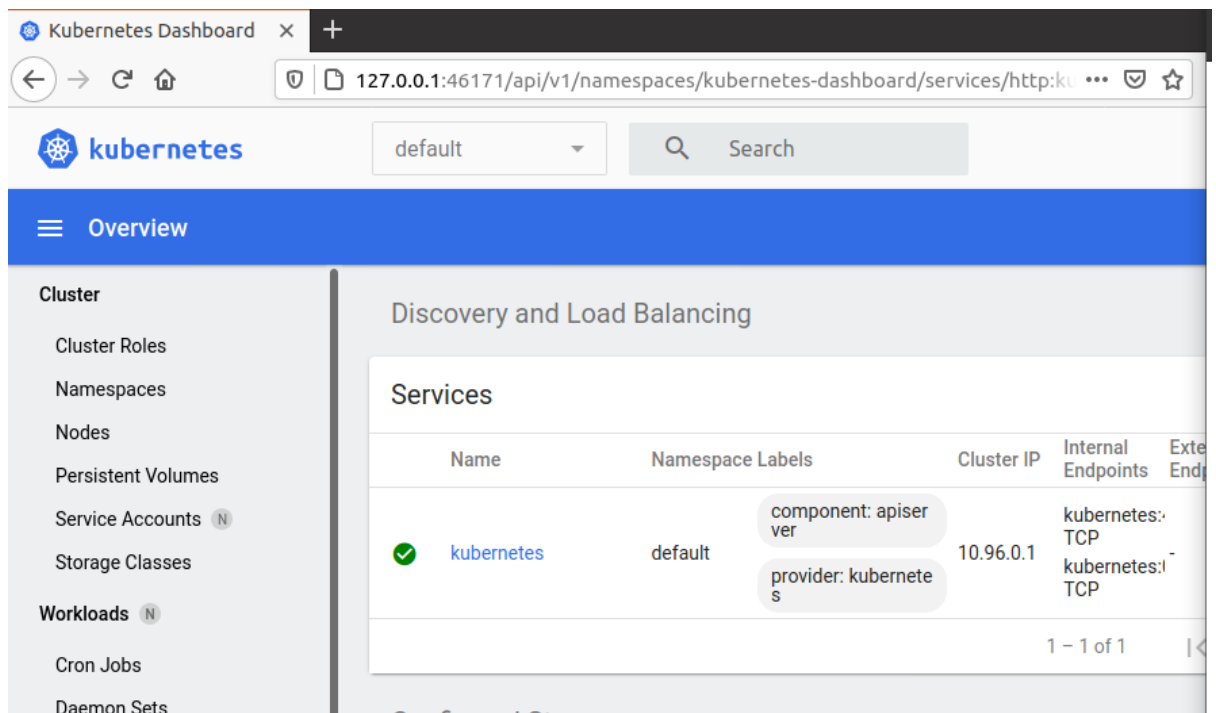
## • Run First Minikube

- Download minikubes and install
- Install kubectl as well

```
brijesh@brijesh-VirtualBox:~$ minikube version
minikube version: v1.14.1
commit: b0389943568c59c1d5a35f739c02f5127eee6e56
brijesh@brijesh-VirtualBox:~$ kubectl version
Client Version: version.Info{Major:"1", Minor:"19", GitVersion:"v1.19.3", GitCommit:"1e11e4a2
cfc2912226cedaafd99df", GitTreeState:"clean", BuildDate:"2020-10-14T12:50:19Z", GoVersion:"g
Compiler:"gc", Platform:"linux/amd64"}
Unable to connect to the server: dial tcp 192.168.49.2:8443: connect: no route to host
brijesh@brijesh-VirtualBox:~$ sudo snap install kubectl --classic
[sudo] password for brijesh:
kubectl 1.19.3 from Canonical✓ installed
```

- Start Minikube :

```
brijesh@brijesh-VirtualBox:~$ minikube start
🌻 minikube v1.14.1 on Ubuntu 20.04 (vbox/amd64)
🔧 Using the docker driver based on existing profile
👉 Starting control plane node minikube in cluster minikube
📌 minikube 1.14.2 is available! Download it: https://github.com/kubernetes/minikube/releases
4.2
💡 To disable this notice, run: 'minikube config set WantUpdateNotification false'
```



- Run the command `kubectl create deployment` and `deploy`:

```
brijesh@brijesh-VirtualBox:~$ kubectl create deployment hello-node --image=k8s.gcr.io/echo
server:1.4
deployment.apps/hello-node created
brijesh@brijesh-VirtualBox:~$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
hello-node    1/1     1            1           26s
```

- View pods

```
brijesh@brijesh-VirtualBox:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
hello-node-7567d9fdc9-x9pfd        1/1     Running   0           36s
```

- To view cluster events

```
brijesh@brijesh-VirtualBox:~$ kubectl get events
LAST SEEN   TYPE      REASON              OBJECT                                MESSAGE
61s         Normal    Scheduled            pod/hello-node-7567d9fdc9-x9pfd      Scheduling successful
60s         Normal    Pulling              pod/hello-node-7567d9fdc9-x9pfd      Container image pull
43s         Normal    Pulled               pod/hello-node-7567d9fdc9-x9pfd      Container image
41s         Normal    Created              pod/hello-node-7567d9fdc9-x9pfd      Container created
40s         Normal    Started              pod/hello-node-7567d9fdc9-x9pfd      Container started
61s         Normal    SuccessfulCreate     replicaset/hello-node-7567d9fdc9    ReplicaSet
61s         Normal    ScalingReplicaSet    deployment/hello-node                Scaled up replica
12m         Normal    Starting             node/minikube                        Starting Minikube
12m         Normal    NodeHasSufficientMemory node/minikube                        NodeHasSufficientMemory
12m         Normal    NodeHasNoDiskPressure node/minikube                        NodeHasNoDiskPressure
12m         Normal    NodeHasSufficientPID  node/minikube                        NodeHasSufficientPID
12m         Normal    NodeAllocatableEnforced node/minikube                        NodeAllocatableEnforced
11m         Normal    RegisteredNode       node/minikube                        Registered Node
11m         Normal    Starting             node/minikube                        Starting Minikube
```

- Display kubectl configuration:

```
brijesh@brijesh-VirtualBox:~$ kubectl config view
apiVersion: v1
clusters:
- cluster:
    certificate-authority: /home/brijesh/.minikube/ca.crt
    server: https://192.168.49.2:8443
    name: minikube
contexts:
- context:
    cluster: minikube
    user: minikube
    name: minikube
current-context: minikube
kind: Config
preferences: {}
users:
- name: minikube
  user:
    client-certificate: /home/brijesh/.minikube/profiles/minikube/client.crt
    client-key: /home/brijesh/.minikube/profiles/minikube/client.key
```

- Kubectl , create service

```
brijesh@brijesh-VirtualBox:~$ kubectl expose deployment hello-node --type=LoadBalancer --port=8080
service/hello-node exposed
```

- Get services that created

```
brijesh@brijesh-VirtualBox:~$ kubectl get services
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
hello-node	LoadBalancer	10.105.79.152	<pending>	8080:32379/TCP	17s
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	6d21h

- Run the hello-node minikube service:

```
brijesh@brijesh-VirtualBox:~$ minikube service hello-node
```

NAMESPACE	NAME	TARGET PORT	URL
default	hello-node	8080	http://192.168.49.2:32379

🌐 Opening service default/hello-node in default browser...

Kubernetes Dashboard x 192.168.49.2:32379/ x +

192.168.49.2:32379

CLIENT VALUES:  
 client\_address=172.17.0.1  
 command=GET  
 real\_path=/  
 query=nil  
 request\_version=1.1  
 request\_uri=http://192.168.49.2:8080/

SERVER VALUES:  
 server\_version=nginx: 1.10.0 - lua: 10001

HEADERS RECEIVED:  
 accept=text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,\*/\*;q=0.8  
 accept-encoding=gzip, deflate  
 accept-language=en-US,en;q=0.5  
 connection=keep-alive  
 host=192.168.49.2:32379  
 upgrade-insecure-requests=1  
 user-agent=Mozilla/5.0 (X11; Ubuntu; Linux x86\_64; rv:82.0) Gecko/20100101 Firefox/82.0

BODY:  
 -no body in request-

- Enable Addons:

```
brijesh@brijesh-VirtualBox:~$ minikube addons list
```

ADDON NAME	PROFILE	STATUS
ambassador	minikube	disabled
csi-hostpath-driver	minikube	disabled
dashboard	minikube	enabled ✓
default-storageclass	minikube	enabled ✓
efk	minikube	disabled
freshpod	minikube	disabled
gcp-auth	minikube	disabled
gvisor	minikube	disabled
helm-tiller	minikube	disabled
ingress	minikube	disabled
ingress-dns	minikube	disabled
istio	minikube	disabled
istio-provisioner	minikube	disabled
kubevirt	minikube	disabled
logviewer	minikube	disabled
metallb	minikube	disabled
metrics-server	minikube	disabled
nvidia-driver-installer	minikube	disabled
nvidia-gpu-device-plugin	minikube	disabled
olm	minikube	disabled
pod-security-policy	minikube	disabled
registry	minikube	disabled
registry-aliases	minikube	disabled
registry-creds	minikube	disabled
storage-provisioner	minikube	enabled ✓
storage-provisioner-gluster	minikube	disabled
volumesnapshots	minikube	disabled

- Enable metrics:
  - Minikube addons enable metrics-server
- View the pod that created:

```
brijesh@brijesh-VirtualBox:~$ kubectl get pod,svc -n kube-system
```

NAME	READY	STATUS	RESTARTS	AGE
pod/coredns-f9fd979d6-tv2hv	1/1	Running	2	6d21h
pod/etcd-minikube	1/1	Running	2	6d21h
pod/kube-apiserver-minikube	1/1	Running	2	6d21h
pod/kube-controller-manager-minikube	1/1	Running	2	6d21h
pod/kube-proxy-m8v7l	1/1	Running	2	6d21h
pod/kube-scheduler-minikube	1/1	Running	2	6d21h
pod/metrics-server-d9b576748-h8mrx	1/1	Running	0	29s
pod/storage-provisioner	1/1	Running	4	6d21h

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)
service/kube-dns	ClusterIP	10.96.0.10	<none>	53/UDP,53/TCP,9153/TCP
service/metrics-server	ClusterIP	10.96.183.198	<none>	443/TCP

```
brijesh@brijesh-VirtualBox:~$
```