14th june

Kubernetes:

- **Container technology**
- **docker**

Docker basic:

- docker container run -it --name myos1 image_name:version/tag
- -i(interactive),-t(terminal) and -d(to run in detach mode)
- docker images
- docker ps (to see the running container)

[root@localhost ~]# docker run -dit --name myos1 httpd

D4645fd28fca44f572a26ec4b2329cd03a01f4f4f126641fac965eb9e71c6bdb

[root@localhost ~]# docker inspect myos1

```
[
   {
      "Id": "d4645fd28fca44f572a26ec4b2329cd03a01f4f4f126641fac965eb9e71c6bdb",
                  "Gateway": "172.17.0.1",
              "IPAddress": "172.17.0.2",
              "IPPrefixLen": 16,
              "IPv6Gateway": "",
              "GlobalIPv6Address": "",
              "GlobalIPv6PrefixLen": 0,
              "MacAddress": "02:42:ac:11:00:02",
              "DriverOpts": null
```

[root@localhost ~]# curl 172.17.0.2

<html><body><h1>It works!</h1></body></html>

[root@localhost ~]# docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
httpd	latest	d4e60c8eb27a	4 weeks ago	166MB
centos	7	b5b4d78bc90c	5 weeks ago	203MB
ubuntu	latest	1d622ef86b13	7 weeks ago	73.9MB
centos	8	470671670cac	4 months ago	237MB
centos	latest	470671670cac	4 months ago	237MB
vimal13/apache-webserver-php	<none>	05774ad1cd23	2 years ago	350MB

[root@localhost ~]# docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
d4645fd28fca	httpd	"httpd-foreground"	3 minutes ago	Up 3 minutes	80/tcp	myos1

[root@localhost ~]# docker ps -a

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

d4645fd28fca httpd "httpd-foreground" 3 minutes ago Up 3 minutes 80/tcp myos1

b84f55cf8ed9 centos:7 "/bin/bash" 8 days ago Exited (0) 8 days ago myos

{kuberneters is a tool that monitors container}

[root@localhost ~]# docker network ls

NETWORK ID NAME DRIVER SCOPE

8afca7244a17 bridge bridge local

251e7a1265a7 host host local

23c3b1608a33 none null local

{vertical scaling if u r increasing ram and cpu}

{horizontal scaling if u r increasing os}

{scale if it is reducing }

{scale out if it is inncreaing }

- Service discovery
- Source proxy
- Load balancer

Part of vertical scaling :

{scale up to increase the ram,cpu etc}

{scale down decreasing the ram,cpu etc}

Orchestration : COE(container orchestration engine eg. kubernetes,docker swarm etc)

In kubernetes, docker engine run behind the seen which helps in launching the container

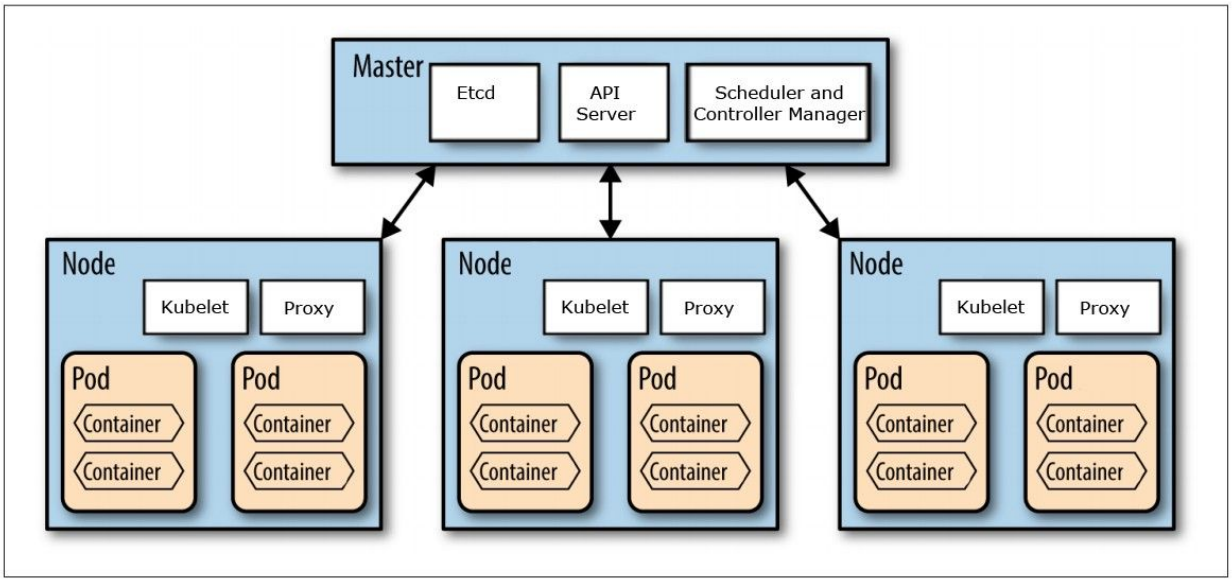
node : a node is a worker machine

Node failure : if entire node fails

worker \slave node

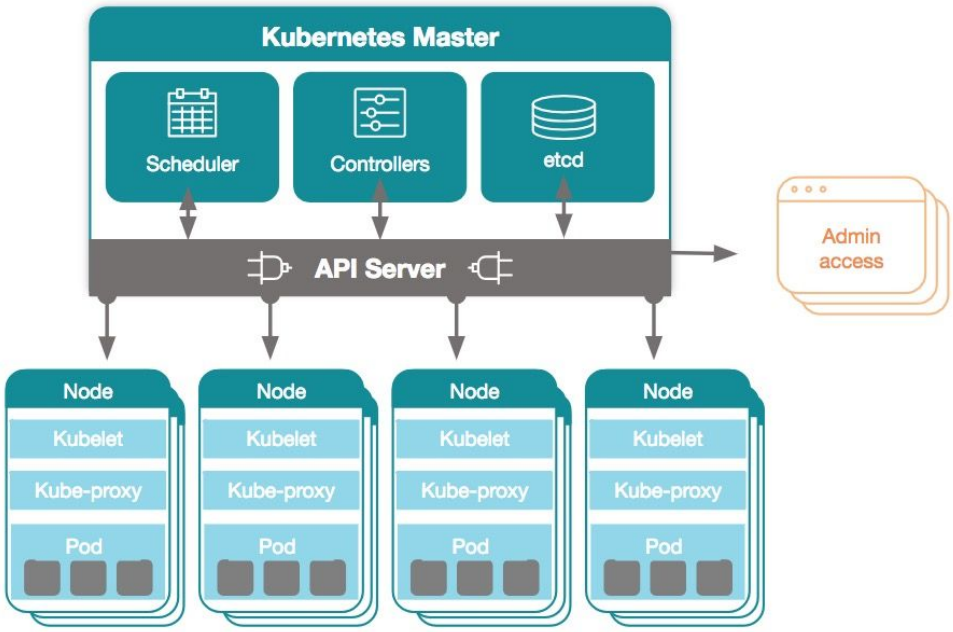
Master node

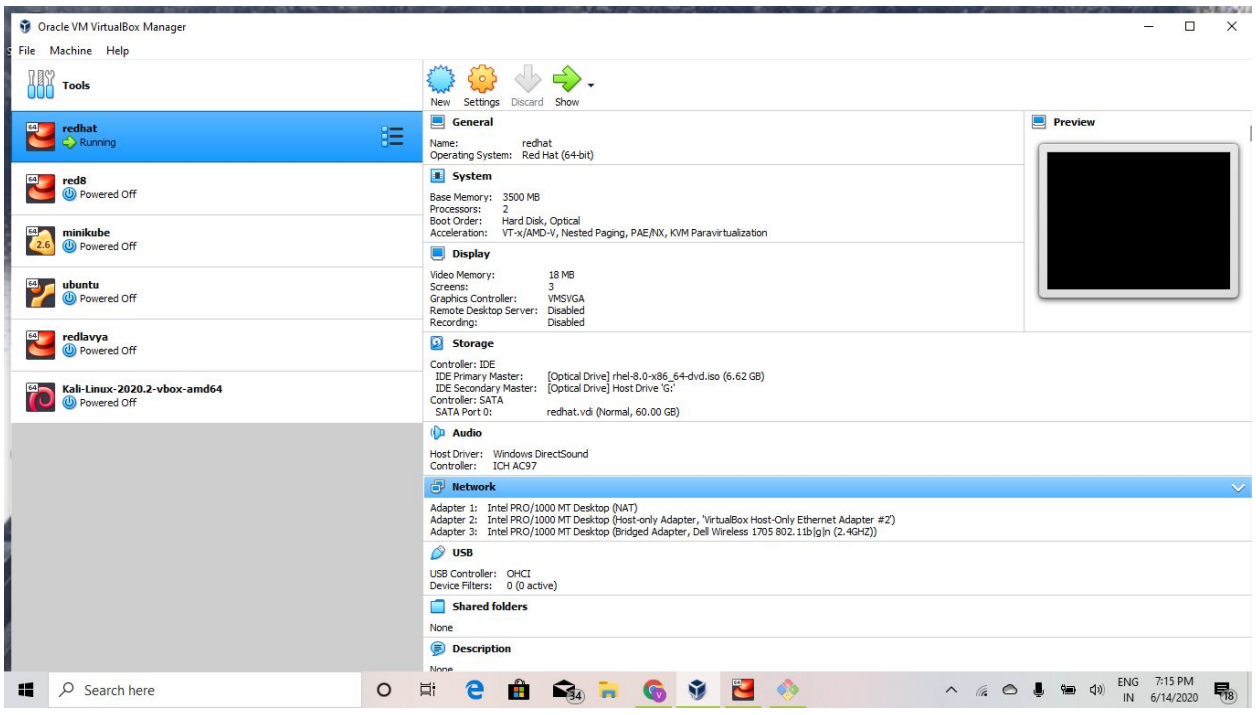
Master\slave architecture

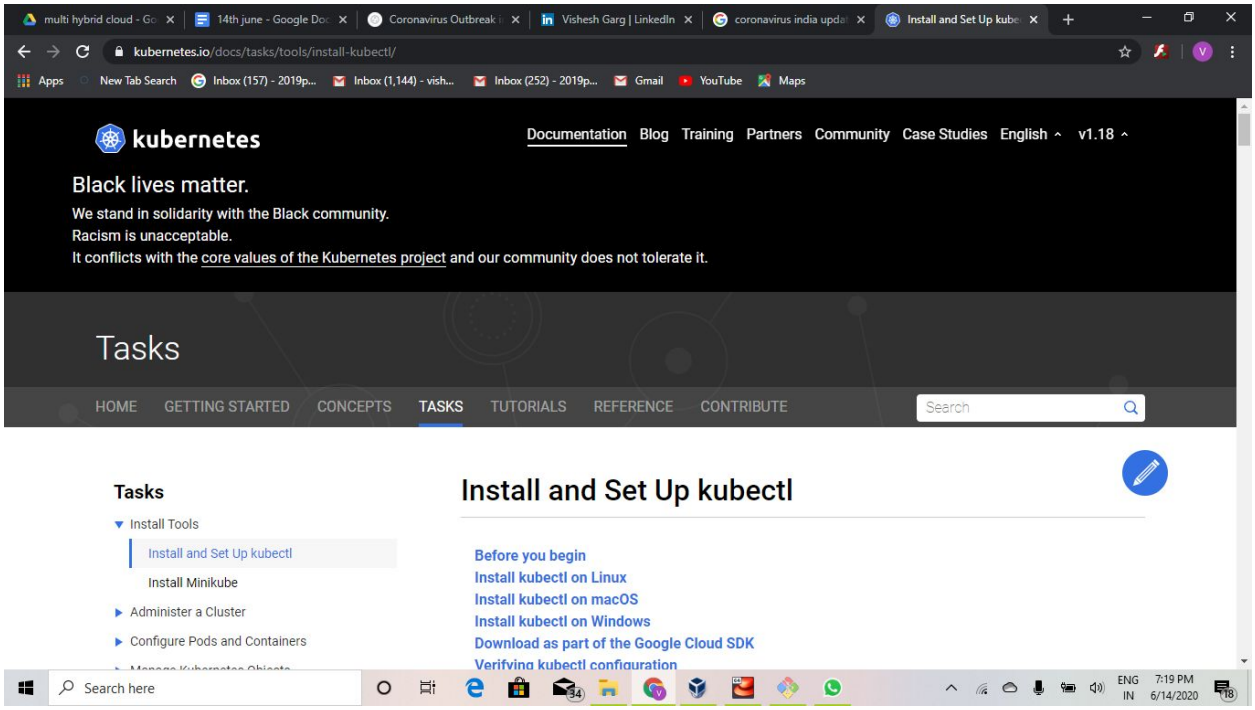


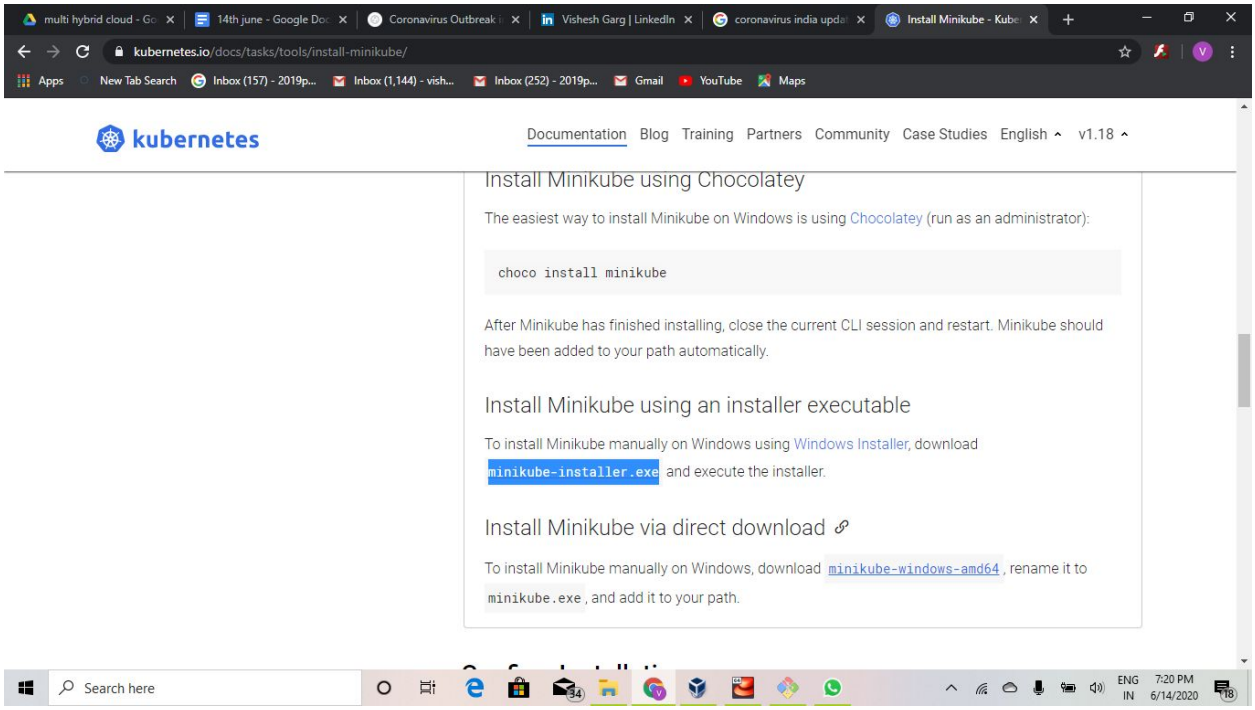
cluster

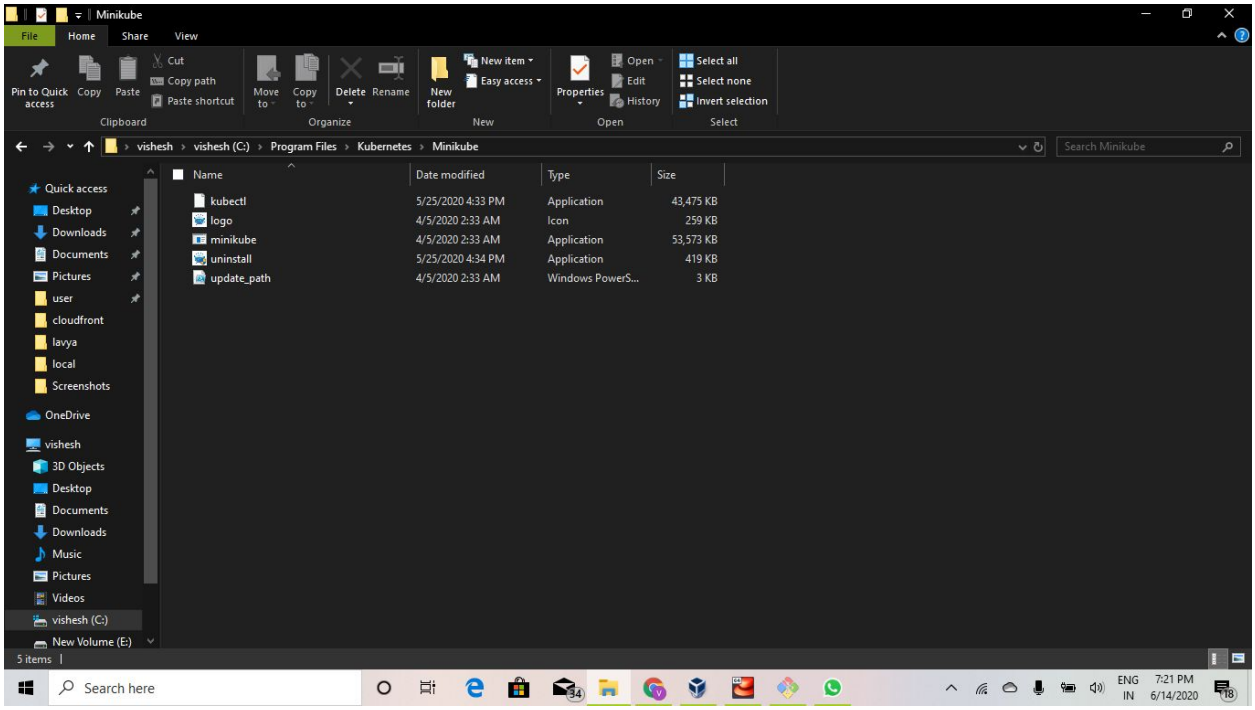
Kubernetes Architecture

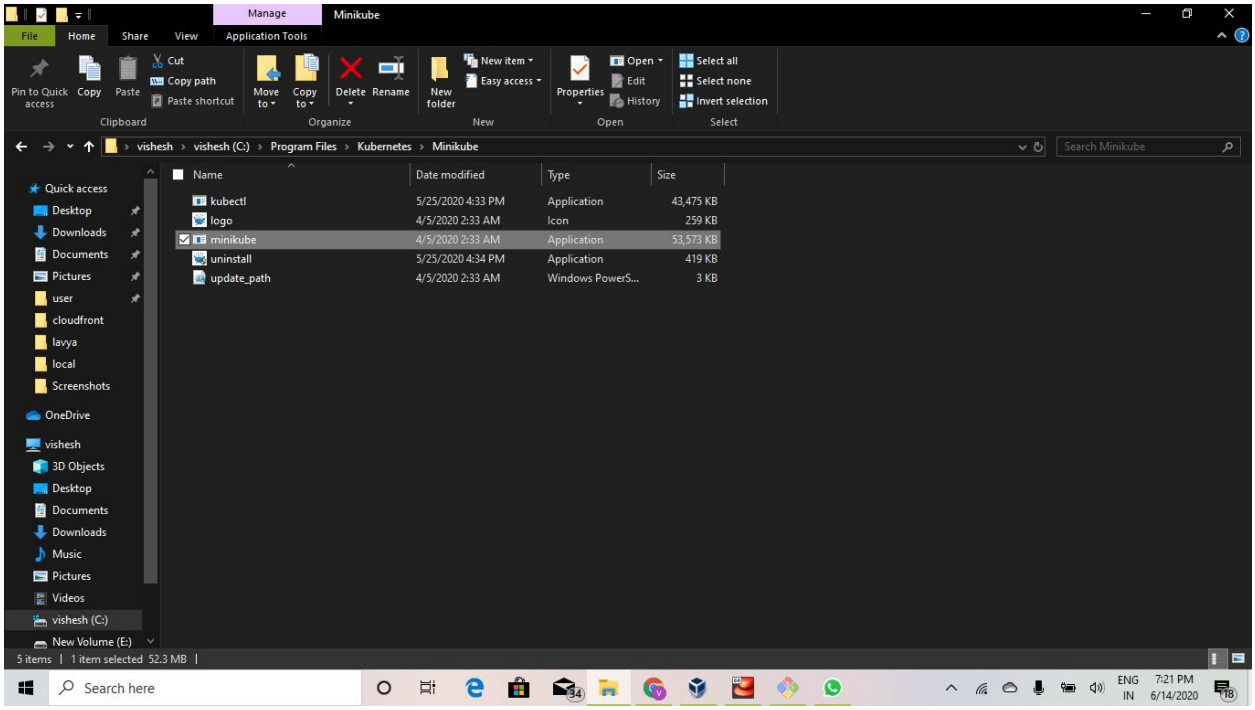


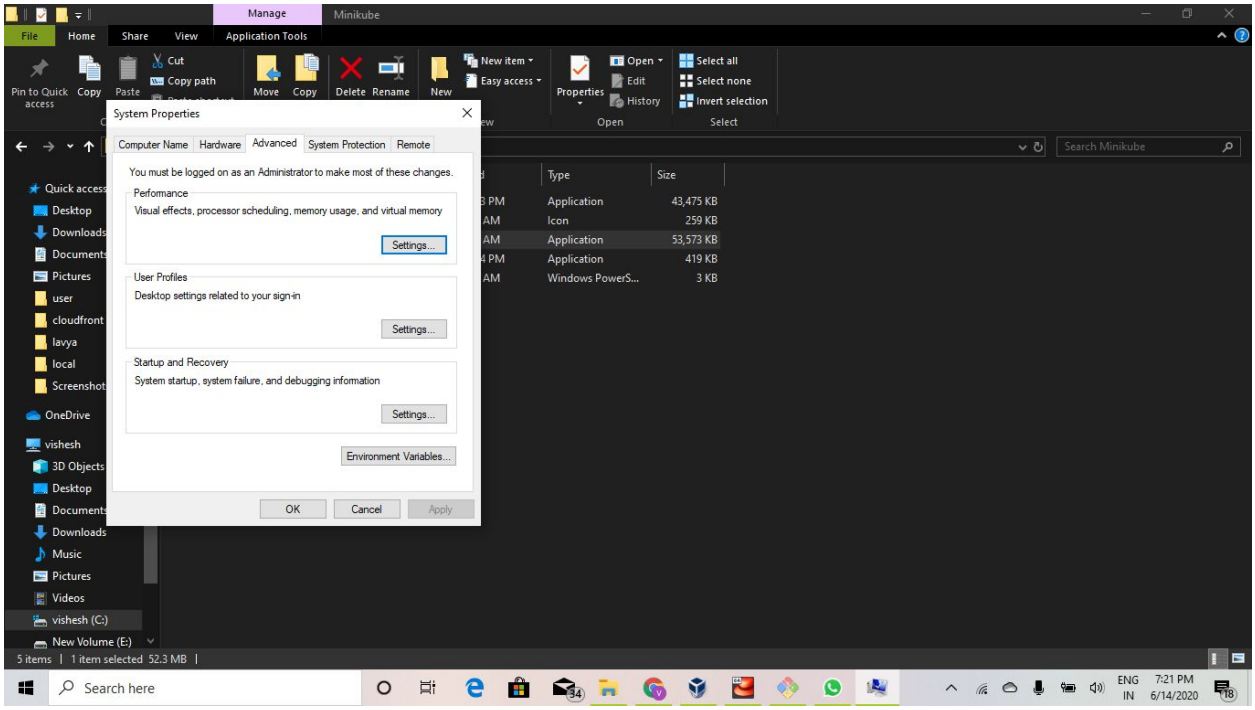


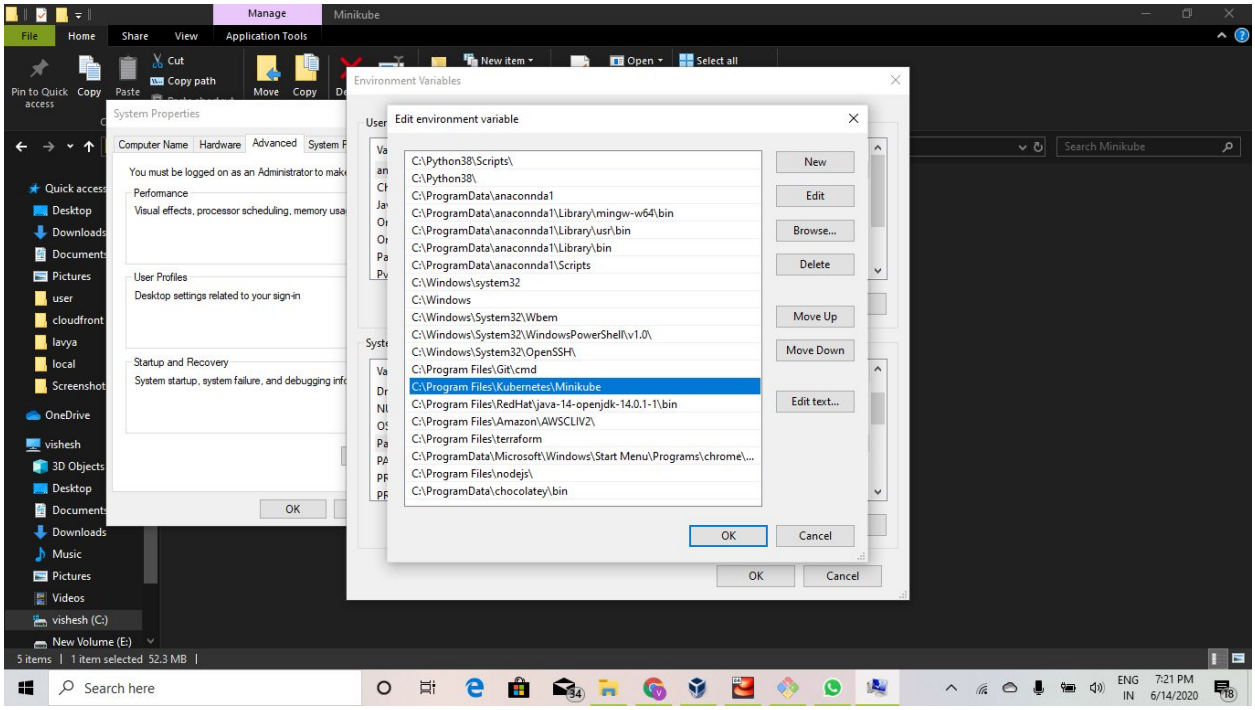

kubernetes
Documentation Blog Training Partners Community Case Studies English v1.18
Black lives matter.
We stand in solidarity with the Black community.
Racism is unacceptable.
It conflicts with the core values of the Kubernetes project and our community does not tolerate it.
Tasks
HOME GETTING STARTED CONCEPTS TASKS TUTORIALS REFERENCE CONTRIBUTE
Search
Tasks
Install Tools
Install and Set Up kubectl
Install Minikube
Administer a Cluster
Configure Pods and Containers
Install and Set Up kubectl
Before you begin
Install kubectl on Linux
Install kubectl on macOS
Install kubectl on Windows
Download as part of the Google Cloud SDK
Search here
ENG IN 7:19 PM 6/14/2020


kubernetes
Documentation Blog Training Partners Community Case Studies English v1.18
Install Minikube using Chocolatey
The easiest way to install Minikube on Windows is using Chocolatey (run as an administrator):
choco install minikube
After Minikube has finished installing, close the current CLI session and restart. Minikube should have been added to your path automatically.
Install Minikube using an installer executable
To install Minikube manually on Windows using Windows Installer, download minikube-installer.exe and execute the installer.
Install Minikube via direct download
To install Minikube manually on Windows, download minikube-windows-amd64, rename it to minikube.exe, and add it to your path.
Search here
ENG IN 7:20 PM 6/14/2020


Minikube
File Home Share View
Pin to Quick access Copy Paste Cut Copy path Paste shortcut
Move to Copy to Delete Rename New folder New item Easy access
Properties Open Edit History Select all Select none Invert selection
Clipboard Organize New Open Select
vishesh › vishesh (C:) › Program Files › Kubernetes › Minikube
Search Minikube
Quick access
Desktop
Downloads
Documents
Pictures
user
cloudfront
lavya
local
Screenshots
OneDrive
vishesh
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
vishesh (C:)
New Volume (E:)
Name Date modified Type Size
kubectl 5/25/2020 4:33 PM Application 43,475 KB
logo 4/5/2020 2:33 AM Icon 259 KB
minikube 4/5/2020 2:33 AM Application 53,573 KB
uninstall 5/25/2020 4:34 PM Application 419 KB
update_path 4/5/2020 2:33 AM Windows PowerS... 3 KB
5 items
Search here
ENG IN 7:21 PM 6/14/2020


Manage
Minikube
File Home Share View Application Tools
Pin to Quick access Copy Paste Cut Copy path Paste shortcut
Move to Copy to Delete Rename New folder New item Easy access
Properties Open Edit History Select all Select none Invert selection
Clipboard Organize New Open Select
vishesh › vishesh (C:) › Program Files › Kubernetes › Minikube
Search Minikube
Quick access
Desktop
Downloads
Documents
Pictures
user
cloudfront
lavya
local
Screenshots
OneDrive
vishesh
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
vishesh (C:)
New Volume (E:)
Name Date modified Type Size
kubectl 5/25/2020 4:33 PM Application 43,475 KB
logo 4/5/2020 2:33 AM Icon 259 KB
minikube 4/5/2020 2:33 AM Application 53,573 KB
uninstall 5/25/2020 4:34 PM Application 419 KB
update_path 4/5/2020 2:33 AM Windows PowerS... 3 KB
5 items 1 item selected 52.3 MB
Search here
ENG IN 7:21 PM 6/14/2020





C:\Users\user>minikube version

minikube version: v1.9.2

commit: 93af9c1e43cab9618e301bc9fa720c63d5efa393

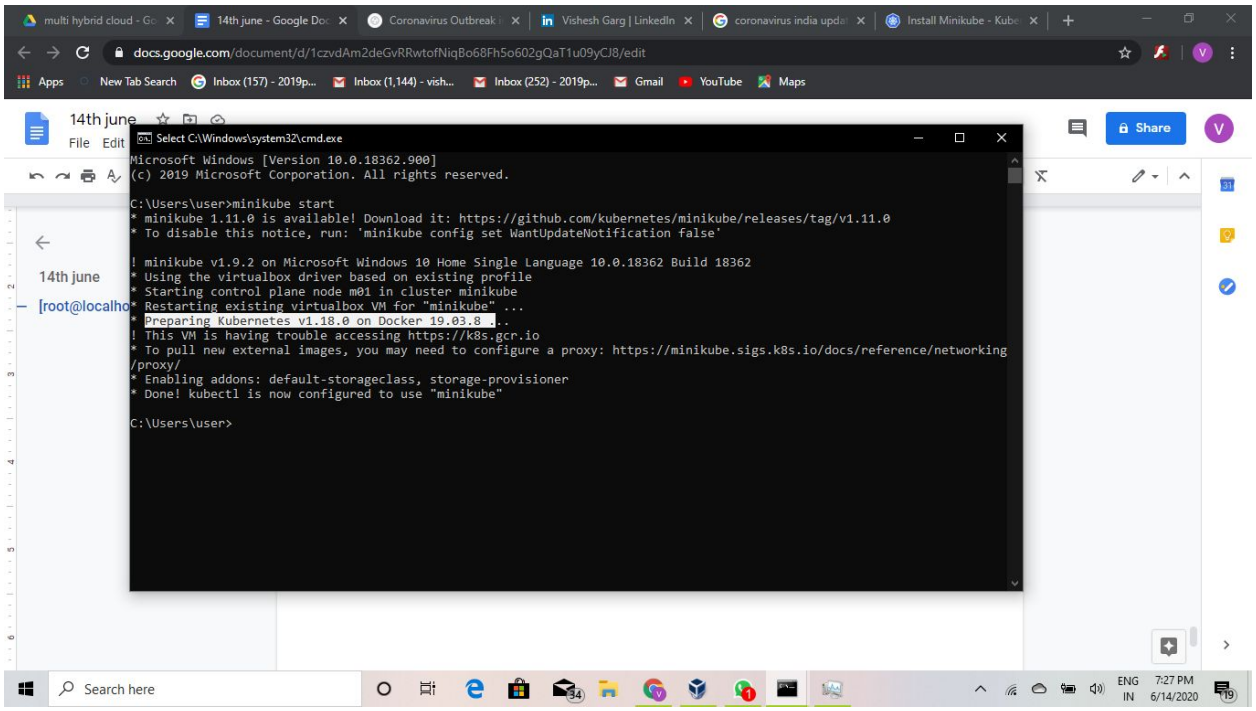
C:\Users\user>minikube --help

Minikube is a CLI tool that provisions and manages single-node Kubernetes clusters optimized for development workflows.

Basic Commands:

start	Starts a local kubernetes cluster
status	Gets the status of a local kubernetes cluster
stop	Stops a running local kubernetes cluster
delete	Deletes a local kubernetes cluster
dashboard	Access the kubernetes dashboard running within the minikube cluster
pause	pause containers
unpause	unpause Kubernetes

{Minikube.exe start --vm-driver=virtualbox(to set up the minikube)}



- docker pull image_name/version

- docker container run -dit --name mywebserver vimal13/apache-webserver-php

C:\Users\user>minikube ip

192.168.99.100

admin/user> request > k8s > docker pull

Kubectl -> kube server/cluster

C:\Users\user>cd C:\Program Files\Kubernetes\Minikube

C:\Program Files\Kubernetes\Minikube>dir

Volume in drive C is vishesh

Volume Serial Number is 1CF6-F84B

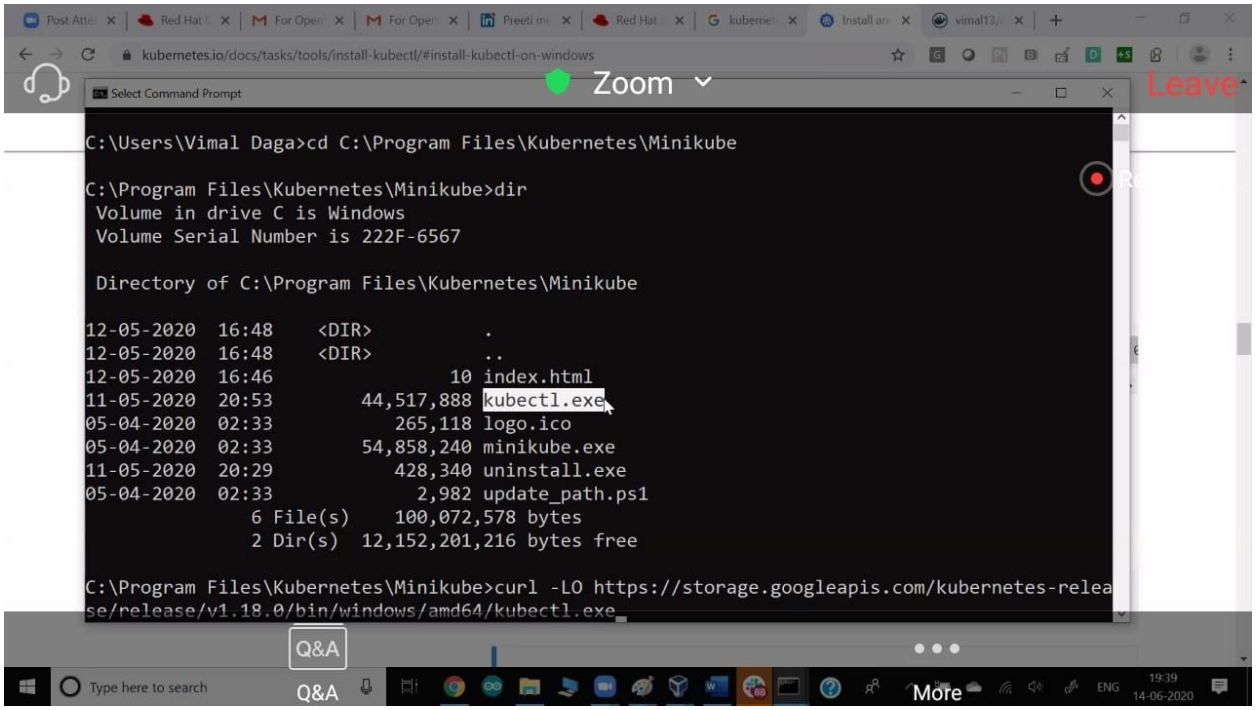
```
 Directory of C:\Program Files\Kubernetes\Minikube

05/25/2020  06:31 PM    <DIR>          .
05/25/2020  06:31 PM    <DIR>          ..
05/25/2020  04:33 PM        44,517,888 kubectl.exe
04/05/2020  02:33 AM           265,118 logo.ico
04/05/2020  02:33 AM        54,858,240 minikube.exe
05/25/2020  04:34 PM           428,340 uninstall.exe
04/05/2020  02:33 AM             2,982 update_path.ps1
               5 File(s)    100,072,568 bytes
               2 Dir(s)  170,666,577,920 bytes free

C:\Program Files\Kubernetes\Minikube>kubectl get pods
NAME                     READY   STATUS    RESTARTS   AGE
mygraf-955c8fd49-n6qb8   1/1     Running   2          6d20h
myprom-69684ff8c5-2cgf7  1/1     Running   2          6d20h
C:\Program Files\Kubernetes\Minikube>kubectl delete all --all
pod "mygraf-955c8fd49-n6qb8" deleted
pod "myprom-69684ff8c5-2cgf7" deleted
service "kubernetes" deleted
service "mygraf" deleted
service "myprom" deleted
deployment.apps "mygraf" deleted
deployment.apps "myprom" deleted
C:\Program Files\Kubernetes\Minikube>kubectl create deployment myweb
--image=vimal13/apache-webserver-php
deployment.apps/myweb created

C:\Program Files\Kubernetes\Minikube>kubectl get pods
NAME                     READY   STATUS              RESTARTS   AGE
```

myweb-cb8dfcbdc-4mmtb 0/1 ContainerCreating 0 5s



C:\Program Files\Kubernetes\Minikube>kubectl get pods

NAME READY STATUS RESTARTS AGE

myweb-6bffb6b45c-zst2d 1/1 Running 0 2m6s

C:\Program Files\Kubernetes\Minikube>kubectl delete pods myweb-6bffb6b45c-zst2d

pod "myweb-6bffb6b45c-zst2d" deleted

C:\Program Files\Kubernetes\Minikube>kubectl describe pods

Name: myweb-6bffb6b45c-lpjf9

Namespace: default

Priority: 0

Node: minikube/192.168.99.100

Start Time: Sun, 14 Jun 2020 19:54:15 +0530

Labels: app=myweb

pod-template-hash=6bffb6b45c

Annotations: <none>

Status: Running

IP: 172.17.0.4

IPs:

IP: 172.17.0.4

Controlled By: ReplicaSet/myweb-6bffb6b45c

Containers:

```
  apache-webserver-php:
    Container ID:
docker://16be0a09444190348473ef55f5429521a1c5ce57cf791b17bdb59d79118750c3
    Image:          vimal13/apache-webserver-php
    Image ID:
docker-pullable://vimal13/apache-webserver-php@sha256:faed0a5afaf9f04b6915d73f7
247f6f5a71db9274ca44118d38f4601c0080a91
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Sun, 14 Jun 2020 19:54:20 +0530
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-8llwm (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  default-token-8llwm:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  default-token-8llwm
    Optional:    false
QoS Class:       BestEffort
Node-Selectors:  <none>
Tolerations:     node.kubernetes.io/not-ready:NoExecute for 300s
                 node.kubernetes.io/unreachable:NoExecute for 300s
Events:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  49s   default-scheduler  Successfully assigned
default/myweb-6bffb6b45c-lpjf9 to minikube
  Normal  Pulling    48s   kubelet, minikube  Pulling image
"vimal13/apache-webserver-php"
```

Normal Pulled 44s kubelet, minikube Successfully pulled image "vimal13/apache-webserver-php"
Normal Created 44s kubelet, minikube Created container apache-webserver-php
Normal Started 44s kubelet, minikube Started container apache-webserver-php

Docker run -dit -p 1234:80 --name myos vimal13/apache-webserver-php
Username : docker
Password : tcuser

```
$
$ curl 172.17.0.4
<body bgcolor='aqua'>
<pre>

welcome to vimal web server for testingeth0: flags=4163<UP,BROADCAST,RUNNING,MUL
TICAST>  mtu 1500
        inet 172.17.0.4  netmask 255.255.0.0  broadcast 172.17.255.255
        ether 02:42:ac:11:00:04  txqueuelen 0  (Ethernet)
        RX packets 4  bytes 322 (322.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 3  bytes 182 (182.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0


</pre>
$
```

C:\Program Files\Kubernetes\Minikube>kubectl get all

NAME	READY	STATUS	RESTARTS	AGE
pod/myweb-6bffb6b45c-lpjf9	1/1	Running	0	8m5s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	8m18s

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/myweb	1/1	1	1	8m5s

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/myweb-6bffb6b45c	1	1	1	8m5s

C:\Program Files\Kubernetes\Minikube>kubectl expose deployment myweb
--type=NodePort --port=80
service/myweb exposed

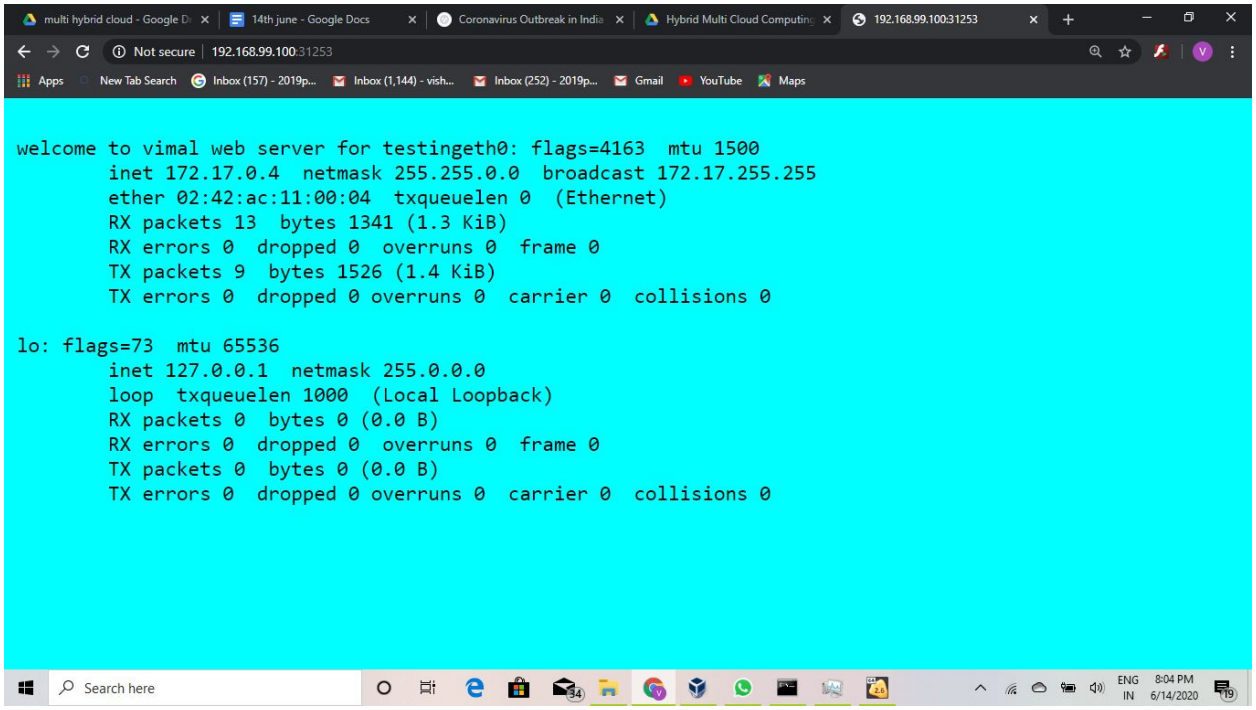
C:\Program Files\Kubernetes\Minikube>kubectl get all

NAME READY STATUS RESTARTS AGE
pod/myweb-6bffb6b45c-lpjf9 1/1 Running 0 9m22s

NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
service/kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 9m35s
service/myweb NodePort 10.99.49.44 <none> 80:31253/TCP 16s

NAME READY UP-TO-DATE AVAILABLE AGE
deployment.apps/myweb 1/1 1 1 9m22s

NAME DESIRED CURRENT READY AGE
replicaset.apps/myweb-6bffb6b45c 1 1 1 9m22s

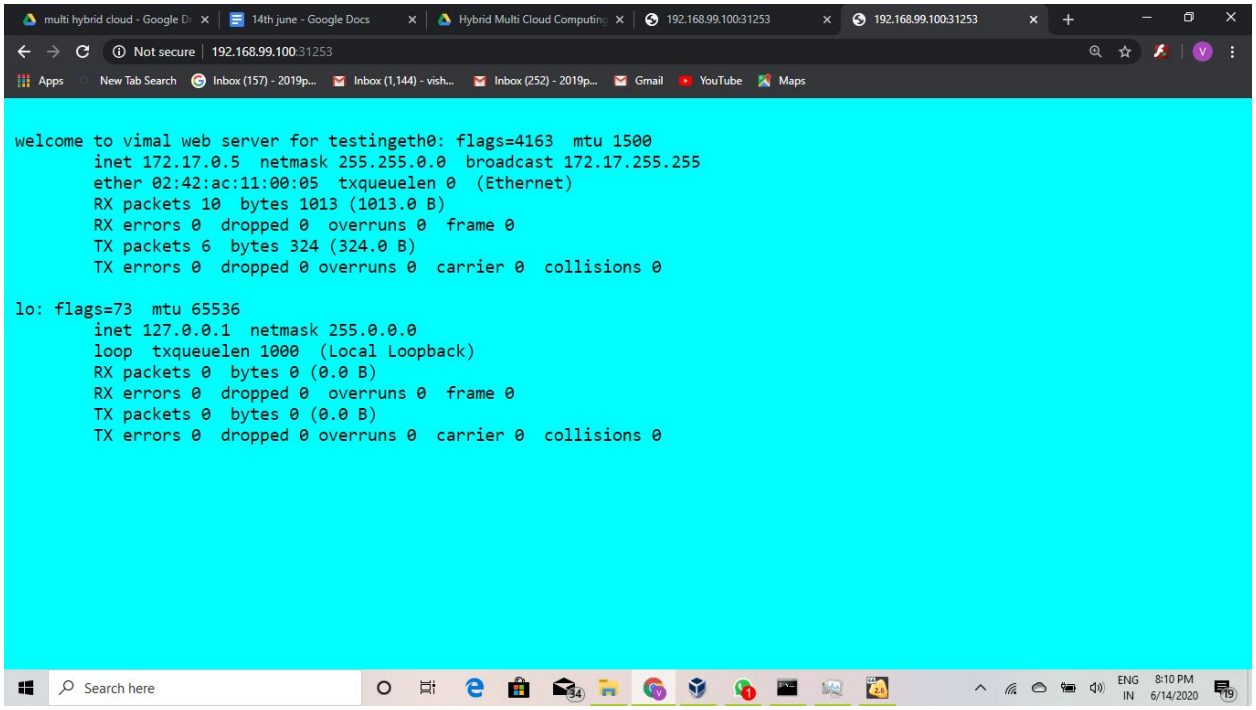


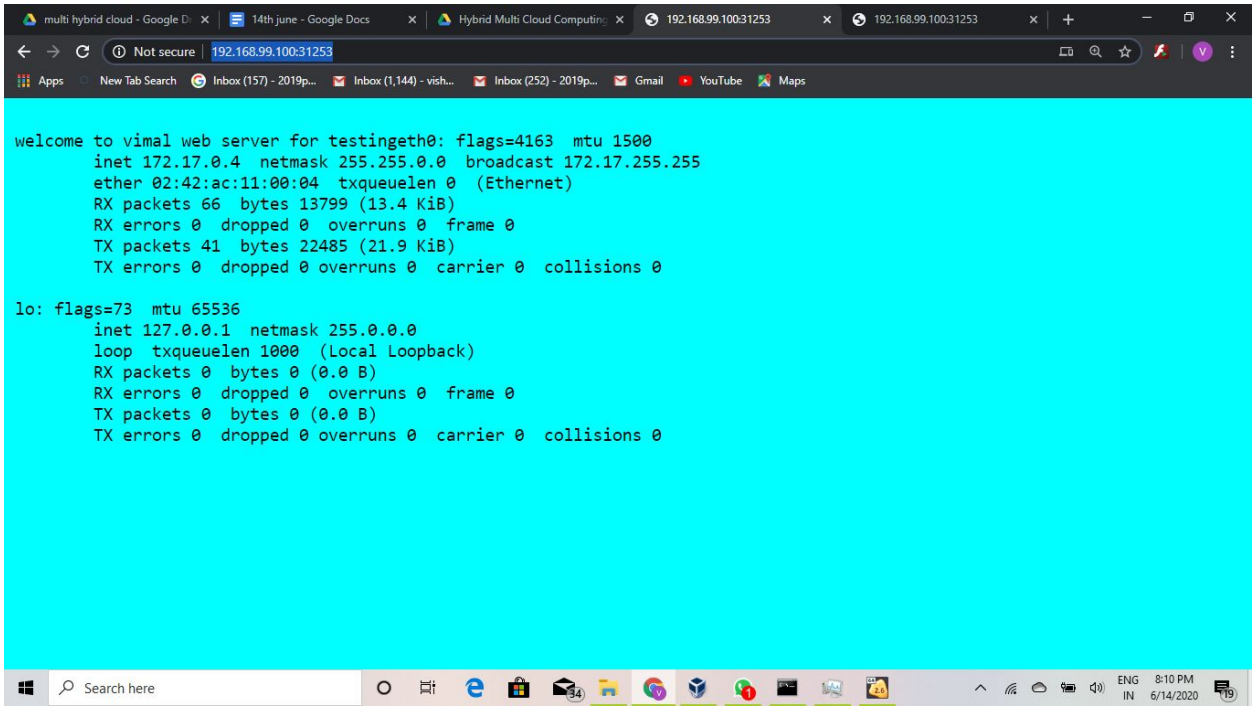
C:\Program Files\Kubernetes\Minikube>kubectl scale deployment myweb --replicas=3

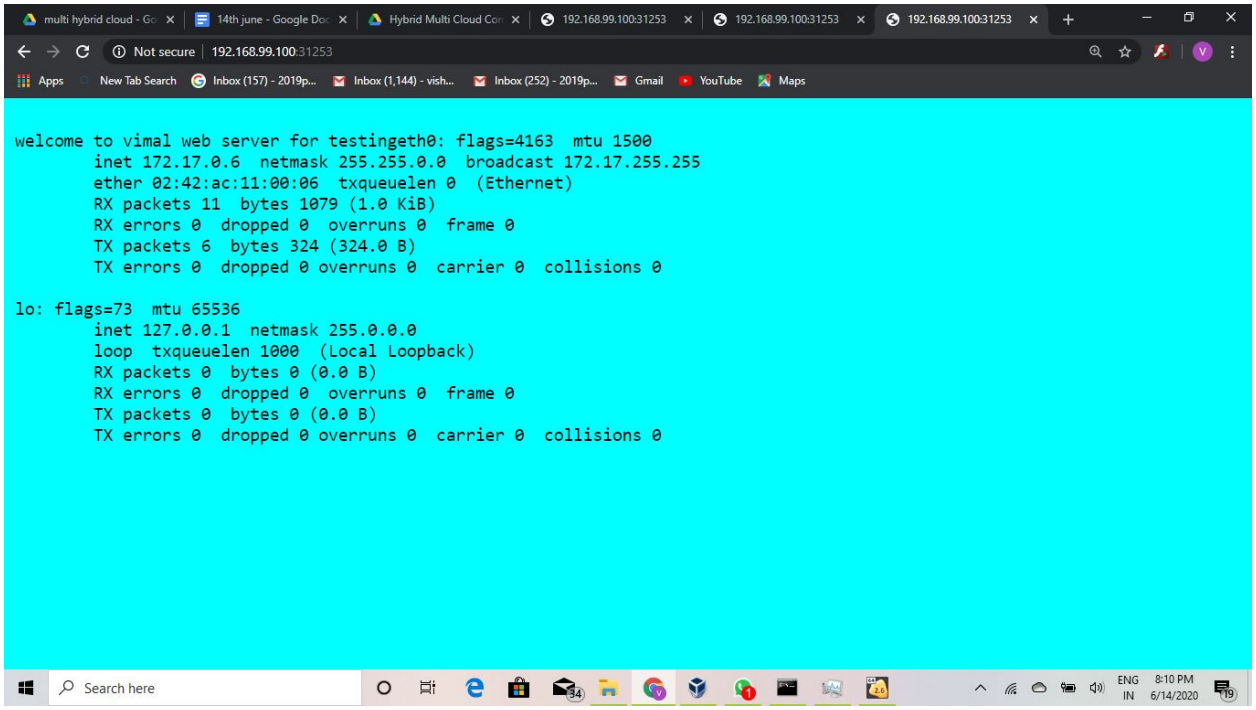
deployment.apps/myweb scaled

C:\Program Files\Kubernetes\Minikube>kubectl get pods

NAME READY STATUS RESTARTS AGE
myweb-6bffb6b45c-c7wxn 1/1 Running 0 41s
myweb-6bffb6b45c-ctng9 1/1 Running 0 40s
myweb-6bffb6b45c-lpjf9 1/1 Running 0 15m


multi hybrid cloud - Google Dr
14th june - Google Docs
Hybrid Multi Cloud Computing
192.168.99.100:31253
192.168.99.100:31253
Not secure
192.168.99.100:31253
Apps
New Tab Search
Inbox (157) - 2019p...
Inbox (1,144) - vish...
Inbox (252) - 2019p...
Gmail
YouTube
Maps
welcome to vimal web server for testingeth0: flags=4163 mtu 1500
inet 172.17.0.5 netmask 255.255.0.0 broadcast 172.17.255.255
ether 02:42:ac:11:00:05 txqueuelen 0 (Ethernet)
RX packets 10 bytes 1013 (1013.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 6 bytes 324 (324.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
lo: flags=73 mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
Search here
ENG
IN
8:10 PM
6/14/2020


multi hybrid cloud - Google Dr
14th june - Google Docs
Hybrid Multi Cloud Computing
192.168.99.100:31253
192.168.99.100:31253
Not secure
192.168.99.100:31253
Apps
New Tab Search
Inbox (157) - 2019p...
Inbox (1,144) - vish...
Inbox (252) - 2019p...
Gmail
YouTube
Maps
welcome to vimal web server for testingeth0: flags=4163 mtu 1500
inet 172.17.0.4 netmask 255.255.0.0 broadcast 172.17.255.255
ether 02:42:ac:11:00:04 txqueuelen 0 (Ethernet)
RX packets 66 bytes 13799 (13.4 KiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 41 bytes 22485 (21.9 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
lo: flags=73 mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
Search here
ENG
IN
8:10 PM
6/14/2020



C:\Program Files\Kubernetes\Minikube>kubectl get all

```
NAME                     READY   STATUS    RESTARTS   AGE
pod/myweb-6bffb6b45c-c7wxn   1/1     Running   0          2m16s
pod/myweb-6bffb6b45c-ctng9   1/1     Running   0          2m15s
pod/myweb-6bffb6b45c-lpjf9   1/1     Running   0          17m

NAME                 TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
service/kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP        17m
service/myweb        NodePort    10.99.49.44    <none>        80:31253/TCP   7m54s

NAME                    READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/myweb   3/3     3            3           17m

NAME                               DESIRED   CURRENT   READY   AGE
replicaset.apps/myweb-6bffb6b45c   3         3         3       17m
```

C:\Program Files\Kubernetes\Minikube>kubectl delete pods myweb-6bffb6b45c-c7wxn

```
pod "myweb-6bffb6b45c-c7wxn" deleted
```

C:\Program Files\Kubernetes\Minikube>kubectl get all

```
NAME                     READY   STATUS    RESTARTS   AGE
pod/myweb-6bffb6b45c-ctng9   1/1     Running   0          4m30s
```

```
pod/myweb-6bffb6b45c-lpjf9   1/1     Running   0          19m
pod/myweb-6bffb6b45c-zccfn   1/1     Running   0          9s

NAME                 TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
service/kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP        19m
service/myweb        NodePort    10.99.49.44    <none>        80:31253/TCP   10m

NAME                    READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/myweb   3/3     3            3           19m

NAME                               DESIRED   CURRENT   READY   AGE
replicaset.apps/myweb-6bffb6b45c   3         3         3       19m
```