Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

DEMO1: PERFORM SACALE IN AND SCALE OUT VIA CLI COMMAND USING DEPLOYMENT, scale out to 3 and again scale in to 2.

kubectl create deployment myd --image=vimal13/apache-webserver-php

kubectl get rs

kubectl scale deployment myd --replicas=3

kubectl get deployment

kubectl get rs

kubcetl describe deployment myd

kubectl scale deployment myd --replicas=2

DEMO 2: CREATING IMAGE ON DOCKER and BLUILDING and PUSHING to HUB for the pulling to launch in pod via K8.

mkdir /d-image

cd /d-image/

vim Dockerfile

docker build -t "usernameDockerhub/anyname:version" /d-image/

docker push "image_name"

docker run -dit "imagename"

docker inspect <id_of_container>   - check the ip of container.

NOTE: syntax of image name to be able to push "usernameDockerhub/anyname:version"

DEMO 3: Creating a deployment with the image mentioned above, and change the version if image on fly.

kubectl create deployment mydp --image=456793/akshayanil

kubectl scale deployment myd --replicas=2

kubectl expose deployment mydp --port=80 --type=NodePort

kubectl set image deployment mydp akshayanil=456793/akshayanil:v2

here 456793/akshayanil:v1 was my previous name of the image….

DEMO 4: How to Undo the deployment?

kubectl rollout undo deployment mydp

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

Commands used:

➢ kubectl create deployment myd --image=vimal13/apache-webserver-php

1.

➢ kubectl create deployment myd --image=vimal13/apache-webserver-php

```
C:\Users\Romio_juliete>kubectl create deployment myd --image=vimal13/apache-webserver-php
deployment.apps/myd created
```

➢ kubectl get rs

```
C:\Users\Romio_juliete>kubectl get rs
NAME            DESIRED   CURRENT   READY   AGE
myd-5f55596db4  1         1         1       11s
```

➢ By default the strategy type is RollingUpdate.

```
C:\Users\Romio_juliete>kubectl get rs
NAME            DESIRED   CURRENT   READY   AGE
myd-5f55596db4  1         1         1       11s

C:\Users\Romio_juliete>kubectl describe deployment myd
Name:               myd
Namespace:          default
CreationTimestamp:  Sat, 30 Jan 2021 20:55:30 +0530
Labels:             app=myd
Annotations:        deployment.kubernetes.io/revision: 1
Selector:           app=myd
Replicas:           1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:       RollingUpdate
MinReadySeconds:    0
```

2.

➢ let's scale out ie, creating more replicas, bts deployment use respective services manage this if any replicas goes down.

kubectl scale deployment myd --replicas=3

```
C:\Users\Romio_juliete>kubectl scale deployment myd --replicas=3
deployment.apps/myd scaled
```

➢ lets check the number of replicas via deployment

kubectl get deployment

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

```
C:\Users\Romio_juliete>kubectl get deployment
NAME    READY   UP-TO-DATE   AVAILABLE   AGE
myd     3/3     3            3           7m47s
```

or

kubectl get rs

```
C:\Users\Romio_juliete>kubectl get rs
NAME            DESIRED   CURRENT   READY   AGE
myd-5f55596db4  3         3         3       9m41s
```

➤ on can view the name of the pods..

```
C:\Users\Romio_juliete>kubectl get pods
NAME                    READY   STATUS    RESTARTS   AGE
myd-5f55596db4-7hwng    1/1     Running   0          5m40s
myd-5f55596db4-m52c6    1/1     Running   0          5m40s
myd-5f55596db4-m654b    1/1     Running   0          10m
```

➤ kubcetl describe deployment myd ; to see the events of scaling up.

```
NewReplicaSet:   myd-5f55596db4 (3/3 replicas created)
Events:
  Type    Reason             Age     From                    Message
  ----    ------             ----    ----                    -------
  Normal  ScalingReplicaSet  13m     deployment-controller   Scaled up replica set myd-5f55596db4 to 1
  Normal  ScalingReplicaSet  8m14s   deployment-controller   Scaled up replica set myd-5f55596db4 to 3

C:\Users\Romio_juliete>_
```

3.

➤ kubectl scale deployment myd --replicas=2 : lets reduce it to two relicas and check the events

```
C:\Users\Romio_juliete>kubectl scale deployment myd --replicas=2
deployment.apps/myd scaled
```

```
C:\Users\Romio_juliete>kubectl describe deployment myd
Name:               myd
```

```
NewReplicaSet:   myd-5f55596db4 (2/2 replicas created)
Events:
  Type    Reason             Age     From                    Message
  ----    ------             ----    ----                    -------
  Normal  ScalingReplicaSet  15m     deployment-controller   Scaled up replica set myd-5f55596db4 to 1
  Normal  ScalingReplicaSet  10m     deployment-controller   Scaled up replica set myd-5f55596db4 to 3
  Normal  ScalingReplicaSet  3s      deployment-controller   Scaled down replica set myd-5f55596db4 to 2
```
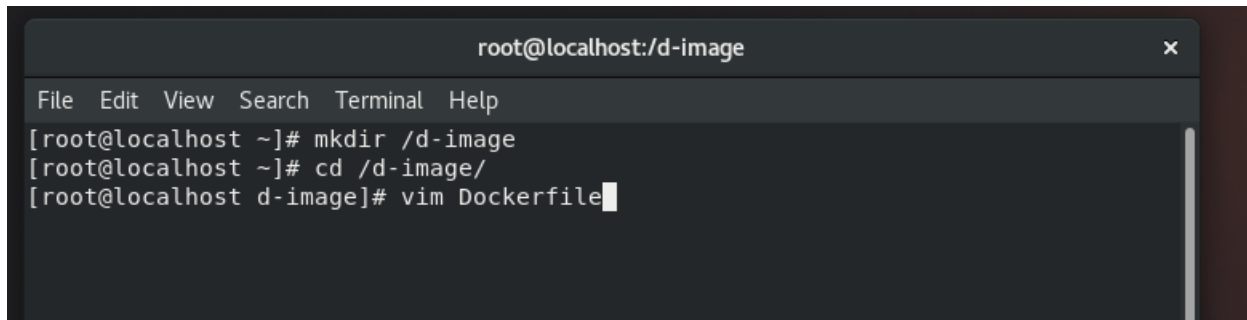
so this is the way , to manually scale in and scale out via CLI commands…

*****************************DONE***
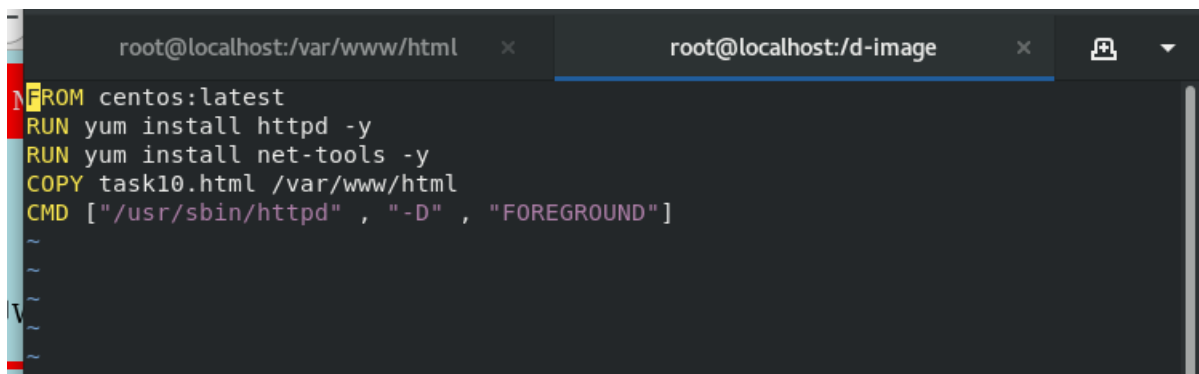
Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

DEMO 2: CREATING IMAGE ON DOCKER and BLUILDING and PUSHING to HUB for the pulling to launch in pod via K8.
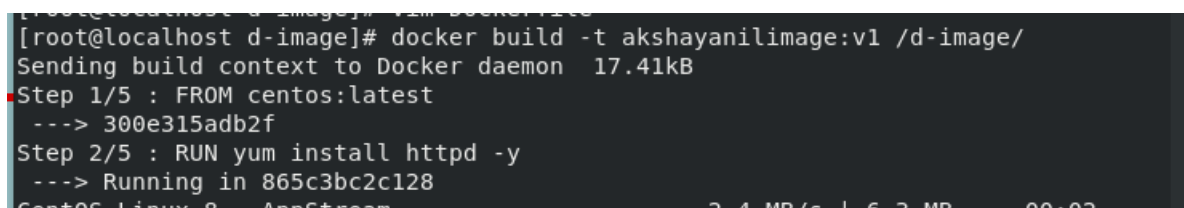
1. make a image- make a workspace(mkdir /d-image) - vim Dockerfile(case sensitive) – write the code.
2. build the image: docker build -t aksahyanilimage:v1 /d-image/
3. run the image : docker run -d -it akshayanilimage:v1
4. see the IP : docker inspect <cont ID>
5. verify with the IP : curl IP/<file.html>
6. have to make the imagename: username/<somename> to push to docker hub.
7. docker login
8. docker push <imagename>
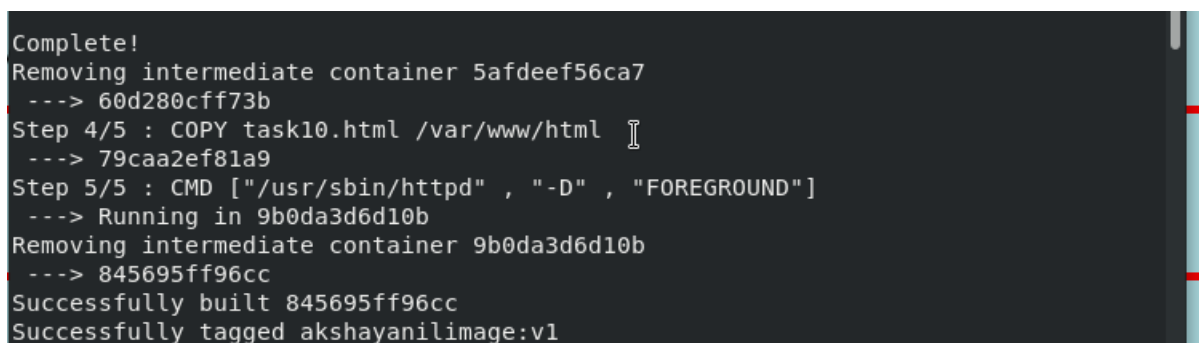
```
                         root@localhost:/d-image                          ✕

File  Edit  View  Search  Terminal  Help
[root@localhost ~]# mkdir /d-image
[root@localhost ~]# cd /d-image/
[root@localhost d-image]# vim Dockerfile
```

```
        root@localhost:/var/www/html    ✕         root@localhost:/d-image    ✕      ⊞   ▼

NFROM centos:latest
RUN yum install httpd -y
RUN yum install net-tools -y
COPY task10.html /var/www/html
CMD ["/usr/sbin/httpd" , "-D" , "FOREGROUND"]
~
~
~
'V
~
~
```

```
[root@localhost d-image]# docker build -t akshayanilimage:v1 /d-image/
Sending build context to Docker daemon  17.41kB
Step 1/5 : FROM centos:latest
 ---> 300e315adb2f
Step 2/5 : RUN yum install httpd -y
 ---> Running in 865c3bc2c128
```

```
Complete!
Removing intermediate container 5afdeef56ca7
 ---> 60d280cff73b
Step 4/5 : COPY task10.html /var/www/html  I
 ---> 79caa2ef81a9
Step 5/5 : CMD ["/usr/sbin/httpd" , "-D" , "FOREGROUND"]
 ---> Running in 9b0da3d6d10b
Removing intermediate container 9b0da3d6d10b
 ---> 845695ff96cc
Successfully built 845695ff96cc
Successfully tagged akshayanilimage:v1
```

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

```
077a0ccc9b58:  Prepai ing
2653d992f4ef: Preparing
denied: requested access to the resource is denied
[root@localhost d-image]# docker images
REPOSITORY                          TAG              IMAGE ID           CREATED
            SIZE
akshayanilimage                     v1               845695ff96cc       About a m
inute ago    273MB
vimal13/apache-webserver-php    v1               6e81d8ece979       18 minute
s ago        350MB
centos                              latest           300e315adb2f       7 weeks a
go          209MB
ubuntu                              20.10            da5958a2de8e       3 months
ago         79.5MB
ubuntu                              14.04            df043b4f0cf1       4 months
ago         197MB
centos                              <none>           0d120b6ccaa8       5 months
ago         215MB
vimal13/apache-webserver-php    latest           05774ad1cd23       3 years a
go          350MB
[root@localhost d-image]# docker ▊
                                                    Enterprise Linux
```

```
ubuntu                              20.10            da5958a2de8e       3 months
ago         79.5MB
ubuntu                              14.04            df043b4f0cf1       4 months
ago         197MB
centos                              <none>           0d120b6ccaa8       5 months
ago         215MB
vimal13/apache-webserver-php    latest           05774ad1cd23       3 years a
go          350MB
[root@localhost d-image]# docker run -d -it akshayanilimage:v1
544e56c735d8e1effb257092f9308db9691f585d8421c684b0d8ec46e74633c0
[root@localhost d-image]# cd /var/www/html
[root@localhost html]# ls
lw.html   new.php
[root@localhost html]# docker ps
CONTAINER ID        IMAGE                   COMMAND              CREATED
      STATUS                PORTS             NAMES
544e56c735d8          akshayanilimage:v1    "/usr/sbin/httpd -D …"   36 seconds ago
      Up 34 seconds                          eager_aryabhata
[root@localhost html]# ▊
                                                    Enterprise Linux
```

```
                "Aliases": null,
                "NetworkID": "17b34252bcb855cee918222754281ff724e6b0ebde655d
  04e77b6ec5339de4f2",
                "EndpointID": "d797503f40d0da94e2492244be848177d517ec95161a2
  970baa3373282e9e277",
                "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 html]# ▊
                                                    Enterprise Linux
```
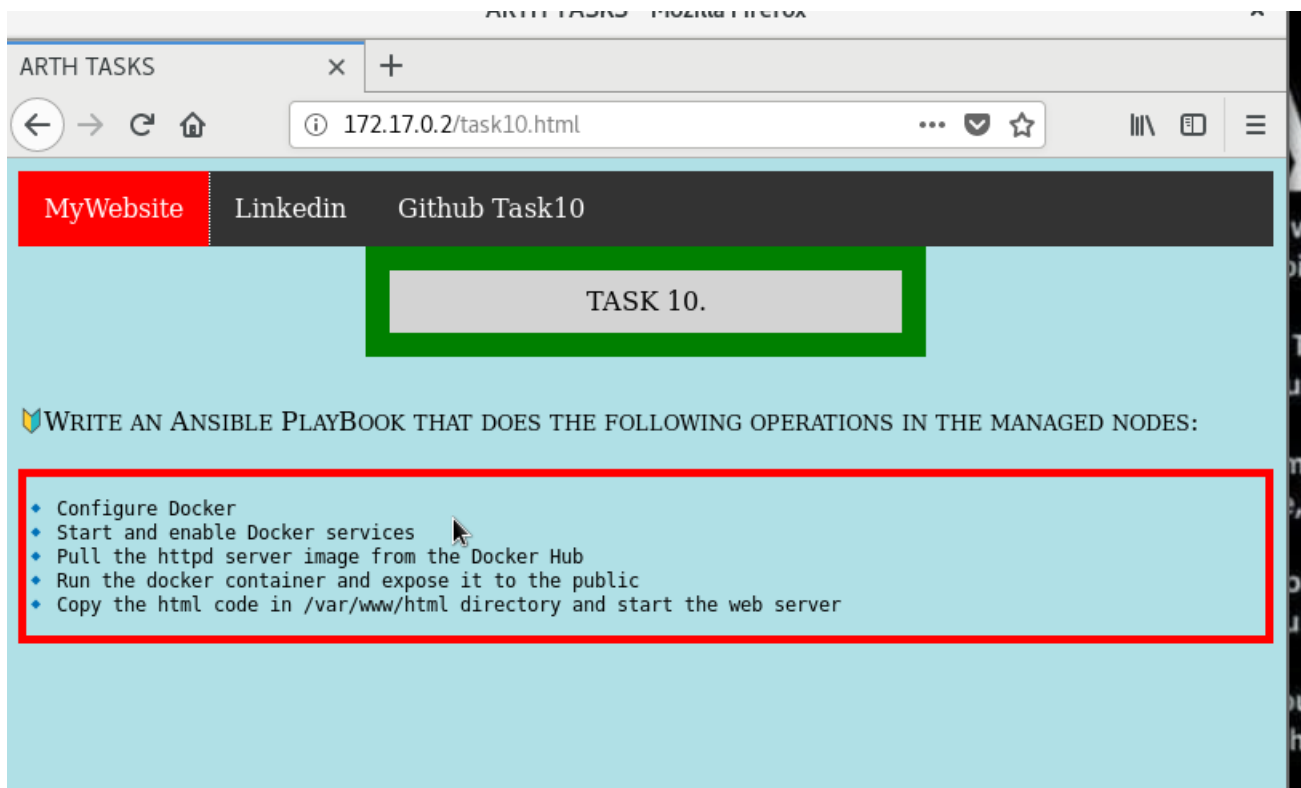
Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

```
</html>
[root@localhost html]# curl 172.17.0.2/task10.html
<!DOCTYPE html>
<html>
<head>
  <title> ARTH TASKS</title>
<style>
  body{
    background-color:powderblue;
  }                          I

  .topic
  {
    background-color: lightgrey;
width: 300px ;
border: 15px solid green;
text-align: center;
padding: 10px;
margin: auto;
```

ARTH TASKS   ×   +

← → C ⌂   ⓘ 172.17.0.2/task10.html   ... ♥ ☆   �III ⊡ ≡

MyWebsite   Linkedin   Github Task10

TASK 10.

⛉WRITE AN ANSIBLE PLAYBOOK THAT DOES THE FOLLOWING OPERATIONS IN THE MANAGED NODES:

```
• Configure Docker
• Start and enable Docker services
• Pull the httpd server image from the Docker Hub
• Run the docker container and expose it to the public
• Copy the html code in /var/www/html directory and start the web server
```

let's push the image: right now image name is akshayanilimage:v1

```
[root@localhost html]# docker push akshayanilimage:v1
The push refers to repository [docker.io/library/akshayanilimage]
54d02f411caf: Preparing
f9987af201ef: Preparing
cb5ab8b16af8: Preparing
077a0ccc9b56: Preparing
2653d992f4ef: Preparing
denied: requested access to the resource is denied
```

so error comes….

change the name of the image

docker commit <id> username:<somename>

in my case: docker commit 544e56c735d8 456793/akshayanil:v1

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.


```
[root@localhost html]# docker commit 544e56c735d8 456793/akshayanil:v1
sha256:bce5884038ca082b4b58c240a65502f66762124bdae8a3c87dc75542ec7c5442
[root@localhost html]# docler images
```

```
[root@localhost html]# docker images
REPOSITORY                        TAG               IMAGE ID             CREATED
            SIZE
456793/akshayanil                 v1                bce5884038ca         11 second
s ago       273MB
akshayanilimage        I          v1                11f150c9c97a         23 minute
```

```
[root@localhost html]# docker push 456793/akshayanilimage:v1
The push refers to repository [docker.io/456793/akshayanilimage]
An image does not exist locally with the tag: 456793/akshayanilimage
[root@localhost html]# docker commit 544e56c735d8 456793/akshayanil:v1^C
[root@localhost html]# docker push 456793/akshayanil:v1
The push refers to repository [docker.io/456793/akshayanil]
54d02f411caf: Pushed
f9987af201ef: Pushed
cb5ab8b16af8: Pushed
077a0ccc9b56: Pushed
2653d992f4ef: Pushed
v1: digest: sha256:6d3fc24f051d6654edc053591895c7790a64878def1e3c93c51fdb4873e9b
73a size: 1369
[root@localhost html]# S
```

successfully pushed.

DEMO 3: Creating a deployment with the image mentioned above, and change the version if image on fly.

```
C:\Users\Romio_juliete>kubectl delete --all all
pod "myd-5f55596db4-m52c6" deleted
pod "myd-5f55596db4-m654b" deleted
service "kubernetes" deleted
deployment.apps "myd" deleted
replicaset.apps "myd-5f55596db4" deleted
```

Scale in and Scale out- Building own docker image- Update the image on fly while maintaining 100 % uptime- undo the deployment.

1.

kubectl create deployment mydp --image=456793/akshayanil

```
C:\Users\Romio_juliete>kubectl create deployment mydp --image=456793/akshayanil:v1
deployment.apps/mydp created
```

```
C:\Users\Romio_juliete>kubectl describe deployment mydp
Name:                   mydp
Namespace:              default
CreationTimestamp:      Mon, 01 Feb 2021 21:30:18 +0530
Labels:                 app=mydp
Annotations:            deployment.kubernetes.io/revision: 1
Selector:               app=mydp
Replicas:               1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=mydp
  Containers:
   akshayanil:
    Image:      456793/akshayanil:v1
    Port:       <none>
    Host Port:  <none>
```

2.

let's create five replicas and expose them.

kubectl scale deployment mydp --replicas=5

```
C:\Users\Romio_juliete>kubectl scale deployment mydp --replicas=5
deployment.apps/mydp scaled

C:\Users\Romio_juliete>kubectl get pods
NAME                    READY   STATUS    RESTARTS   AGE
mydp-6cd76c494-c9vdf    1/1     Running   0          9s
mydp-6cd76c494-gkmvk    1/1     Running   0          9s
mydp-6cd76c494-k587q    1/1     Running   0          9s
mydp-6cd76c494-km64c    1/1     Running   0          9s
mydp-6cd76c494-rj82j    1/1     Running   0          4m31s
```
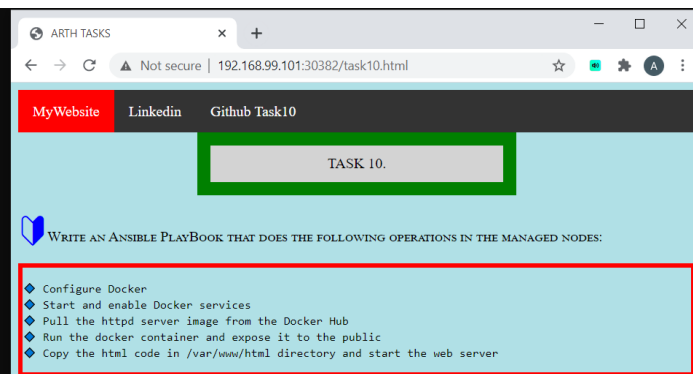
kubectl expose deployment mydp --port=80 --type=NodePort

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

yes working……………………

server url : http://IPofminikube:exposedPort

in my case : IP of minikube is 192.168.0.101:30382

3.

have to change the version of docker image now :

a.

```
redhat_arth [Running] - Oracle VM VirtualBox                              □    ×
File   Machine   View   Input   Devices   Help
 Activities    Terminal ▾                    Mon 21:51              ↕ ◀)) ⬢ ▾
                              root@localhost:/d-image                           ✕
File   Edit   View   Search   Terminal   Help
[root@localhost ~]# cd /d-image/              I
[root@localhost d-image]# ls
Dockerfile   task10.html
[root@localhost d-image]# vim index.php
[root@localhost d-image]# cat index.php
version 2
[root@localhost d-image]# vim Dockerfile
[root@localhost d-image]# cat Dockerfile
FROM centos:latest
RUN yum install httpd -y
RUN yum install net-tools -y
COPY index.php   /var/www/html
CMD ["/usr/sbin/httpd" , "-D" , "FOREGROUND"]
[root@localhost d-image]# █
```

build and push to docker hub…same commands as in DEMO 2.

```
File   Edit   View   Search   Terminal   Help
CMD ["/usr/sbin/httpd" , "-D" , "FOREGROUND"]
[root@localhost d-image]# docker build -t 456793/akshayanil:v2 /d-image/
Sending build context to Docker daemon   18.43kB
Step 1/5 : FROM centos:latest
 ---> 300e315adb2f
Step 2/5 : RUN yum install httpd -y
 ---> Using cache
 ---> 5ade32860506
Step 3/5 : RUN yum install net-tools -y
 ---> Using cache
 ---> 60d280cff73b
Step 4/5 : COPY index.php   /var/www/html
 ---> 220261173ff7
Step 5/5 : CMD ["/usr/Ibin/httpd" , "-D" , "FOREGROUND"]
 ---> Running in 9701c64c9556
Removing intermediate container 9701c64c9556
 ---> d20c07cedb4b
Successfully built d20c07cedb4b
Successfully tagged 456793/akshayanil:v2
[root@localhost d-image]# docker push  456793/akshayanil:v2
The push refers to repository [docker.io/456793/akshayanil]
371731ec5337: Pushed
cb5ab8b16af8: Layer already exists
077a0ccc9b56: Layer already exists
2653d992f4ef: Layer already exists
v2: digest: sha256:136b191d1d30fc4111eb10bb64f30682e3e23f2a8bec5047353c3ee43c207428 siz
e: 1160
[root@localhost d-image]# █
```

4. now we will update the image in k8 deployment of mydp.

➢ it keep on terminating 25% of prev image version container and simultaneously launches the same amt with newer version….

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

> ➤ u will not get the downtime…either it will show u the previous versions or newer versions as load balancing happens internally.
> ➤ see the ss, some are terminating as then again launching…./
>
> ➤ In my case, I have changed the file name. u can leave it same too…

```
C:\Users\Romio_juliete>kubectl set image deployment mydp akshayanil=456793/akshayanil:v2
deployment.apps/mydp image updated
```

```
C:\Users\Romio_juliete>kubectk get pods
'kubectk' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Romio_juliete>kubectl get pods
NAME                     READY   STATUS            RESTARTS   AGE
mydp-6cd76c494-gkmvk     0/1     Terminating       0          27m
mydp-6cd76c494-k587q     0/1     Terminating       0          27m
mydp-6cd76c494-km64c     0/1     Terminating       0          27m
mydp-6cd76c494-rj82j     0/1     Terminating       0          32m
mydp-77f5f4c975-fnzpg    1/1     Running           0          6s
mydp-77f5f4c975-hxfgz    1/1     Running           0          4s
mydp-77f5f4c975-lfv74    1/1     Running           0          14s
mydp-77f5f4c975-nrvdx    0/1     ContainerCreating 0          14s
mydp-77f5f4c975-xb8zk    1/1     Running           0          14s

C:\Users\Romio_juliete>kubectl get pods
NAME                     READY   STATUS            RESTARTS   AGE
mydp-6cd76c494-gkmvk     0/1     Terminating       0          27m
mydp-6cd76c494-k587q     0/1     Terminating       0          27m
mydp-6cd76c494-km64c     0/1     Terminating       0          27m
mydp-6cd76c494-rj82j     0/1     Terminating       0          32m
mydp-77f5f4c975-fnzpg    1/1     Running           0          7s
mydp-77f5f4c975-hxfgz    1/1     Running           0          5s
mydp-77f5f4c975-lfv74    1/1     Running           0          15s
mydp-77f5f4c975-nrvdx    1/1     Running           0          15s
mydp-77f5f4c975-xb8zk    1/1     Running           0          15s

C:\Users\Romio_juliete>kubectl get pods
NAME                     READY   STATUS    RESTARTS   AGE
mydp-77f5f4c975-fnzpg    1/1     Running   0          10s
mydp-77f5f4c975-hxfgz    1/1     Running   0          8s
mydp-77f5f4c975-lfv74    1/1     Running   0          18s
mydp-77f5f4c975-nrvdx    1/1     Running   0          18s
mydp-77f5f4c975-xb8zk    1/1     Running   0          18s

C:\Users\Romio_juliete>kubectl get pods
NAME                     READY   STATUS    RESTARTS   AGE
mydp-77f5f4c975-fnzpg    1/1     Running   0          13s
mydp-77f5f4c975-hxfgz    1/1     Running   0          11s
mydp-77f5f4c975-lfv74    1/1     Running   0          21s
mydp-77f5f4c975-nrvdx    1/1     Running   0          21s
mydp-77f5f4c975-xb8zk    1/1     Running   0          21s

C:\Users\Romio_juliete>kubectl get pods
NAME                     READY   STATUS    RESTARTS   AGE
mydp-77f5f4c975-fnzpg    1/1     Running   0          26s
mydp-77f5f4c975-hxfgz    1/1     Running   0          24s
mydp-77f5f4c975-lfv74    1/1     Running   0          34s
```
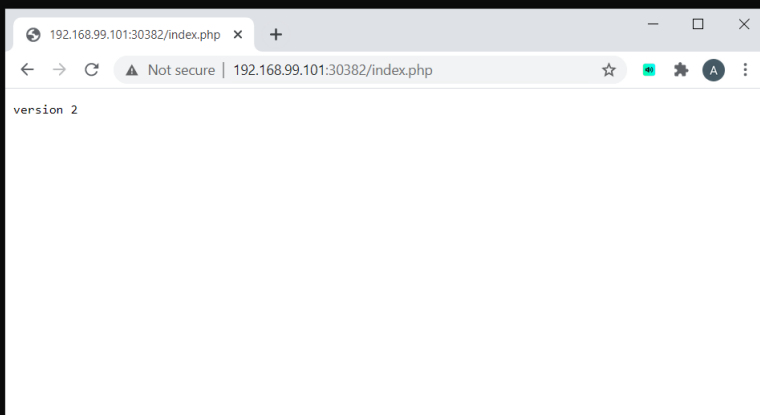
192.168.99.101:30382/index.php

Not secure | 192.168.99.101:30382/index.php

version 2

successfully done…………………………………………………………………………..

check the history too….

kubectl rollout history deployment mydp

```
C:\Users\Romio_juliete>kubectl rollout history deployment mydp
deployment.apps/mydp
REVISION   CHANGE-CAUSE
1          <none>
2          <none>
```

Scale in and Scale out- Building own docker image- Update the image on fly while maintining 100 % uptime- undo the deployment.

DEMO 4: How to Undo ?

kubectl rollout undo deployment mydp

```
C:\Users\Romio_juliete>kubectl rollout undo deployment mydp
deployment.apps/mydp rolled back
```

similarly, u can check the status of pods , keep on terminating and launching and no downtime , keep on accessing the server…

DONE……all the demos…………………………………………………