

k8- 8 Scale in and Scale out- Building own docker image- Update the image on fly while maintaining 100 % uptime- undo the deployment

*DEMO1: PERFORM SCALE 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
```

```
kubectl describe deployment myd
```

```
kubectl scale deployment myd --replicas=2
```

*DEMO 2: CREATING IMAGE ON DOCKER and BUILDING 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
```

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*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`

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```
C:\Users\Romio_juliete>kubectl get deployment
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
myd-5f55596db4  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
```

- **kubcctl 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 relics 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
```

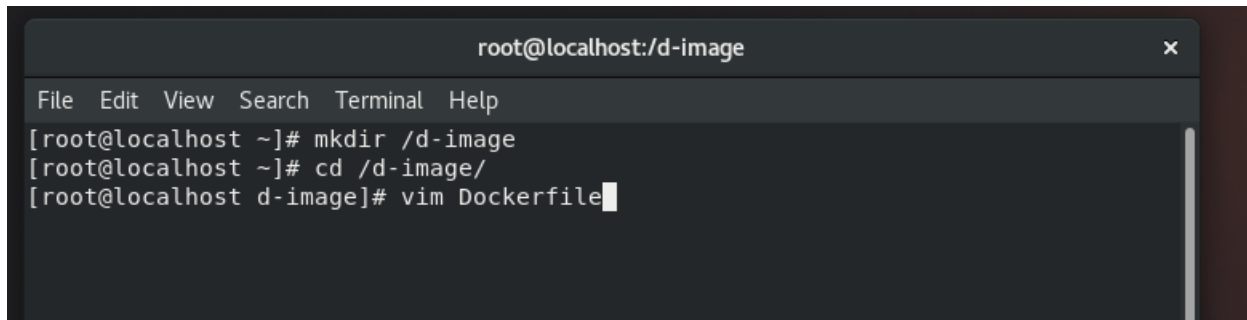
so this is the way , to manually scale in and scale out via CLI commands...

\*\*\*\*\*DONE\*\*\*\*\*

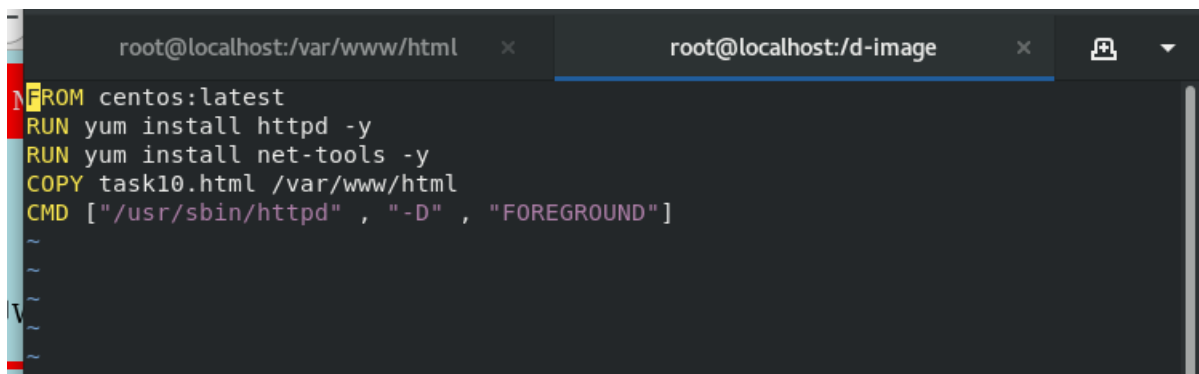
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DEMO 2: CREATING IMAGE ON DOCKER and BUILDING and PUSHING to HUB for the pulling to launch in pod via K8.

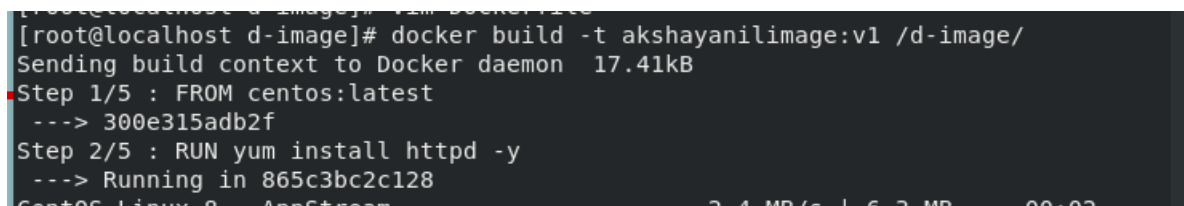
1. make a image- make a workspace(`mkdir /d-image`) - `vim Dockerfile`(case sensitive) – write the code.
2. build the image: `docker build -t akshayanilimage:v1 /d-image/`
3. run the image : `docker run -d -it akshayanilimage:v1`
4. see the IP : `docker inspect <cont ID>`
5. verify with the IP : `curl IP/<file.html>`
6. have to make the `imagename`: username/<somename> to push to docker hub.
7. `docker login`
8. `docker push <imagename>`



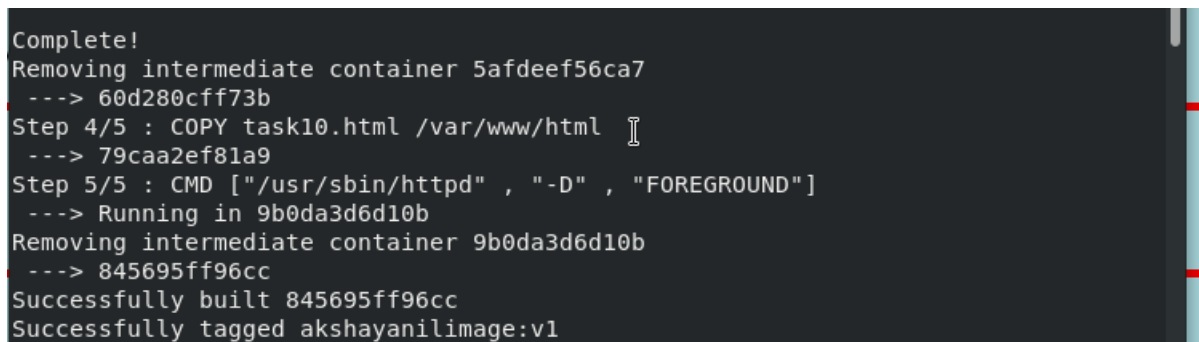
```
root@localhost:/d-image
File Edit View Search Terminal Help
[root@localhost ~]# mkdir /d-image
[root@localhost ~]# cd /d-image/
[root@localhost d-image]# vim Dockerfile
```



```
FROM 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"]
```



```
[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
--> 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
```

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```
077a0ccc9b5b: Preparing
2653d992f4ef: Preparing
denied: requested access to the resource is denied
[root@localhost d-image]# docker images
REPOSITORY              TAG                IMAGE ID           CREATED
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
```

```
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
```

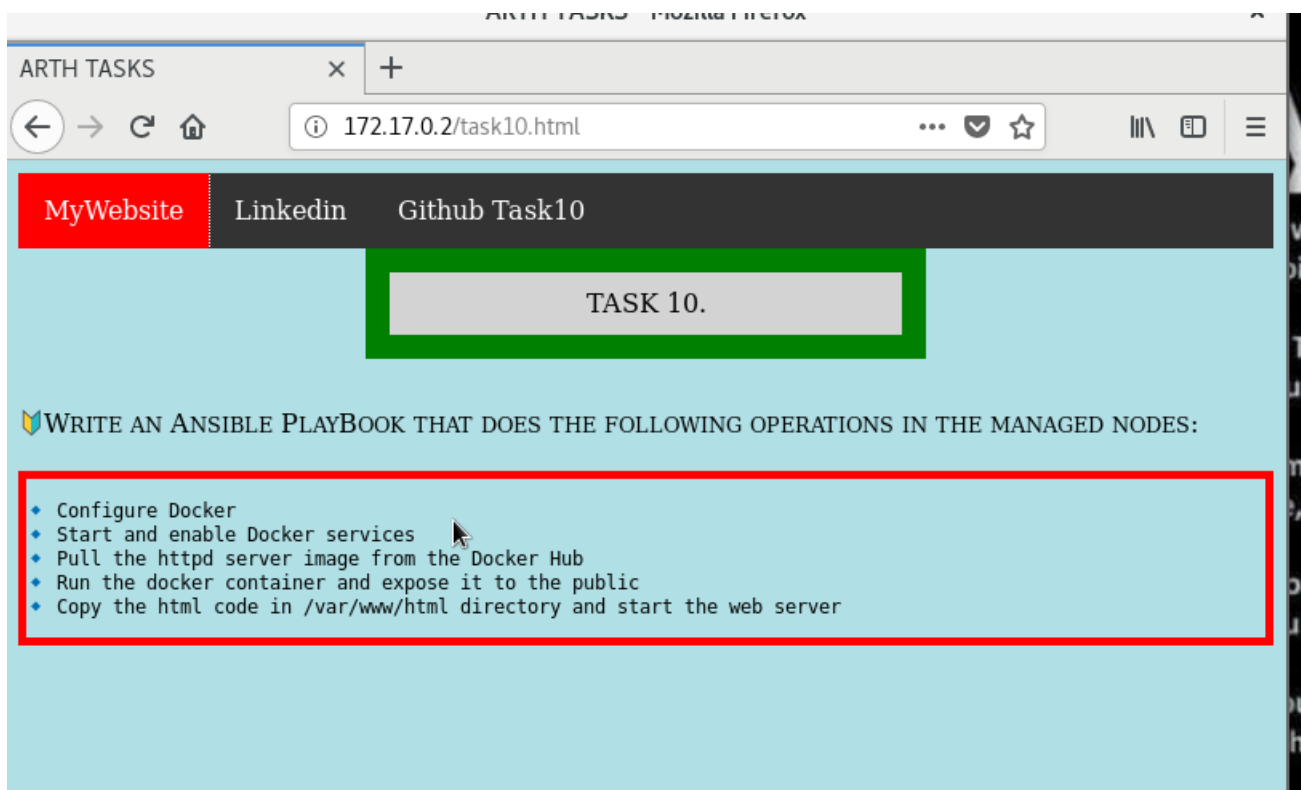
```
"Aliases": null,
"NetworkID": "17b34252bcb855cee918222754281ff724e6b0ebde655d
04e77b6ec5339de4f2",
"EndpointID": "d797503f40d0da94e2492244be848177d517ec95161a2
970baa3373282e9e277",
"Gateway": "172.17.0.1",
"IPAddresses": ["172.17.0.2"],
"IPPrefixLen": 16,
"IPv6Gateway": "",
"GlobalIPv6Address": "",
"GlobalIPv6PrefixLen": 0,
"MacAddress": "02:42:ac:11:00:02",
"DriverOpts": null
}
}
}
}
[root@localhost html]#
```

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

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

```



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`

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```
docker hub Search for great content (e.g., mysql) Explore Repositories Organizations Get Help 456793 456793 Edit profile
```

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

REPOSITORY	SIZE	TAG	IMAGE ID	CREATED
456793/akshayanil	273MB	v1	bce5884038ca	11 second
akshayanilimage	273MB	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: sha256:6d3fc24f051d6654edc053591895c7790a64878def1e3c93c51fdb4873e9b73a size: 1369
[root@localhost html]# S
```

successfully pushed.

456793 Edit profile  
Community User Joined January 30, 2021

Repositories Starred Contributed

Displaying 1 of 1 repository



456793/akshayanil  
By 456793 • Updated a few seconds ago

Container

1 Download 0 Stars

---

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
```

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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
```

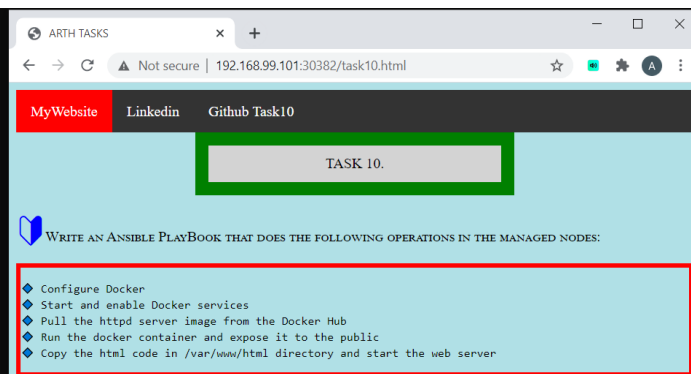
```
kubectl expose deployment mydp --port=80 --type=NodePort
```

```
C:\Users\Romio_juliete>kubectl get svc
NAME      TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes  ClusterIP   10.96.0.1    <none>        443/TCP   11m

C:\Users\Romio_juliete>kubectl expose deployment mydp --port=80 --type=NodePort
service/mydp exposed

C:\Users\Romio_juliete>kubectl get svc
NAME      TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes  ClusterIP   10.96.0.1    <none>        443/TCP   11m
mydp      NodePort    10.109.253.131 <none>        80:30382/TCP 4s

C:\Users\Romio_juliete>
```





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yes working.....

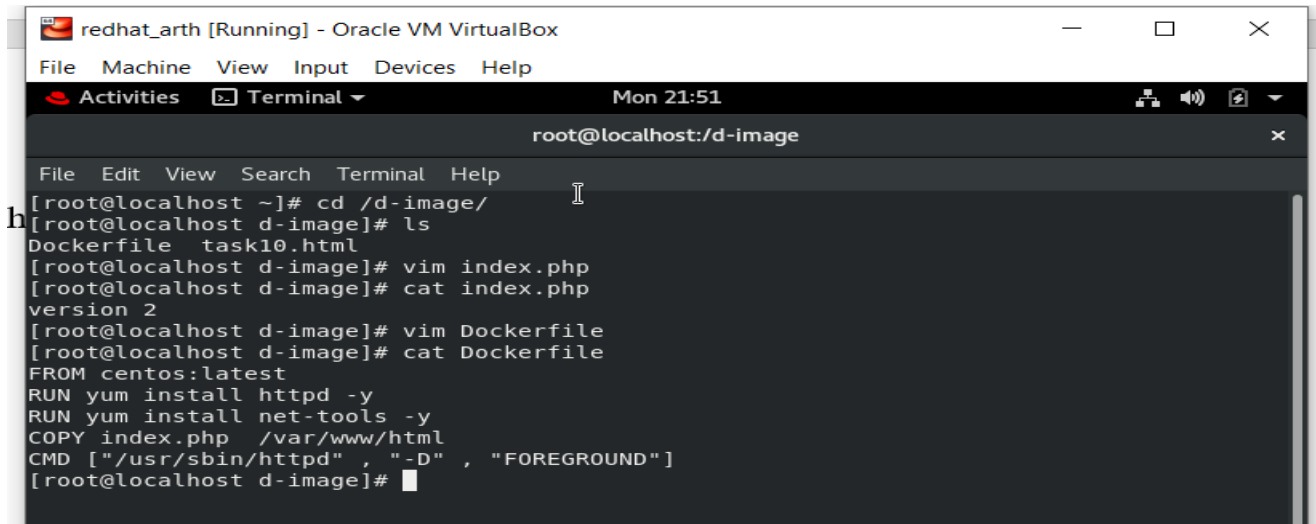
server url : http://IPofminikube:exposedPort

in my case : IP of minikube is 192.168.0.101:30382

3.

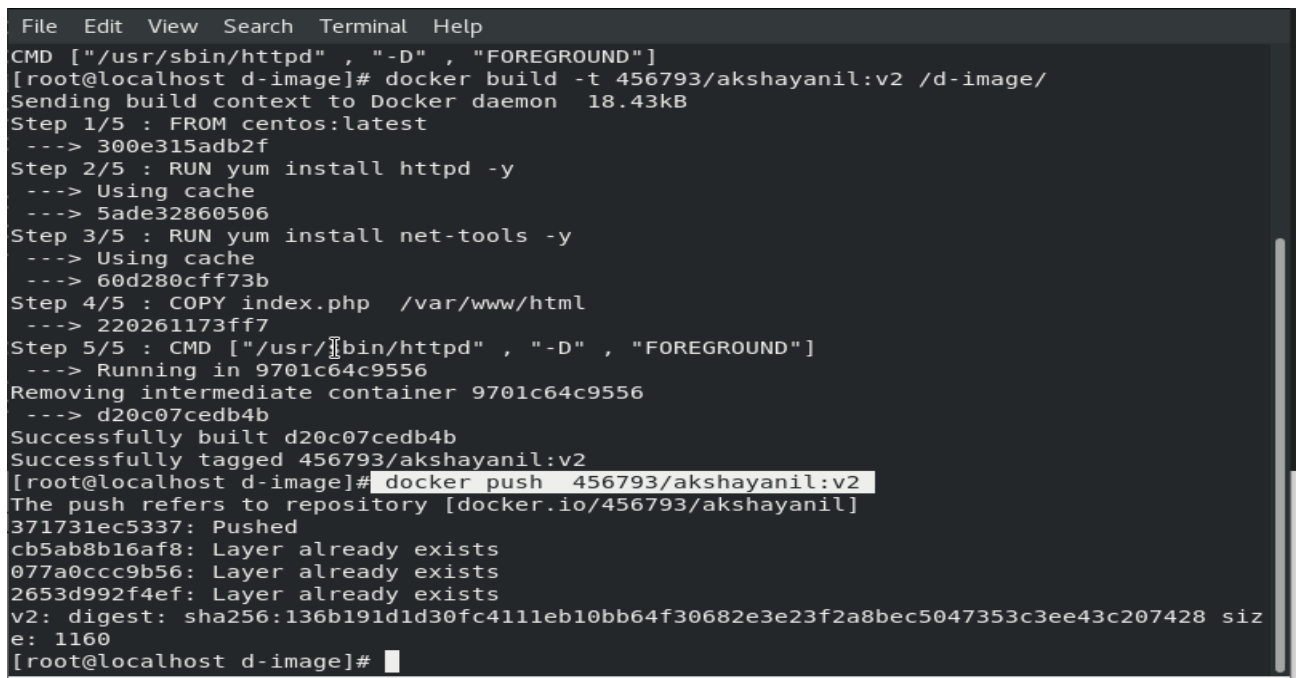
have to change the version of docker image now :

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/
[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/sbin/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 size: 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....

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- 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>kubectk 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.
```

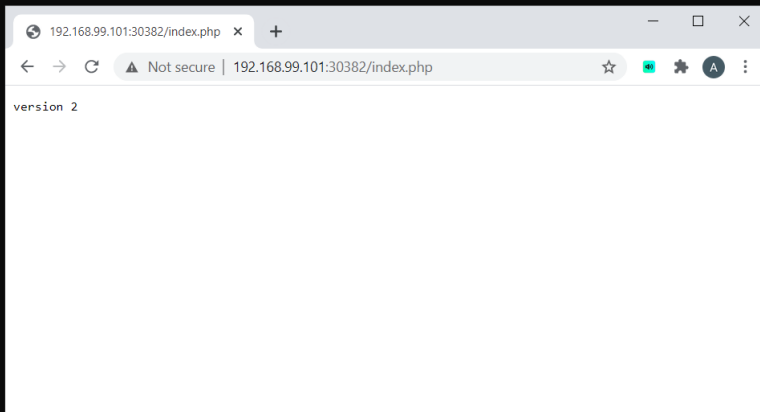
```
C:\Users\Romio_juliete>kubectl get pods
NAME READY STATUS RESTARTS AGE
mydp-6cd76c494-gkmvk 0/1 Terminating 0 27m
mydp-6cd76c494-k587q 0/1 Terminating 0 27m
mydp-6cd76c494-km64c 0/1 Terminating 0 27m
mydp-6cd76c494-rj82j 0/1 Terminating 0 32m
mydp-77f5f4c975-fnzpg 1/1 Running 0 6s
mydp-77f5f4c975-hxfgz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



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>
```

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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.....