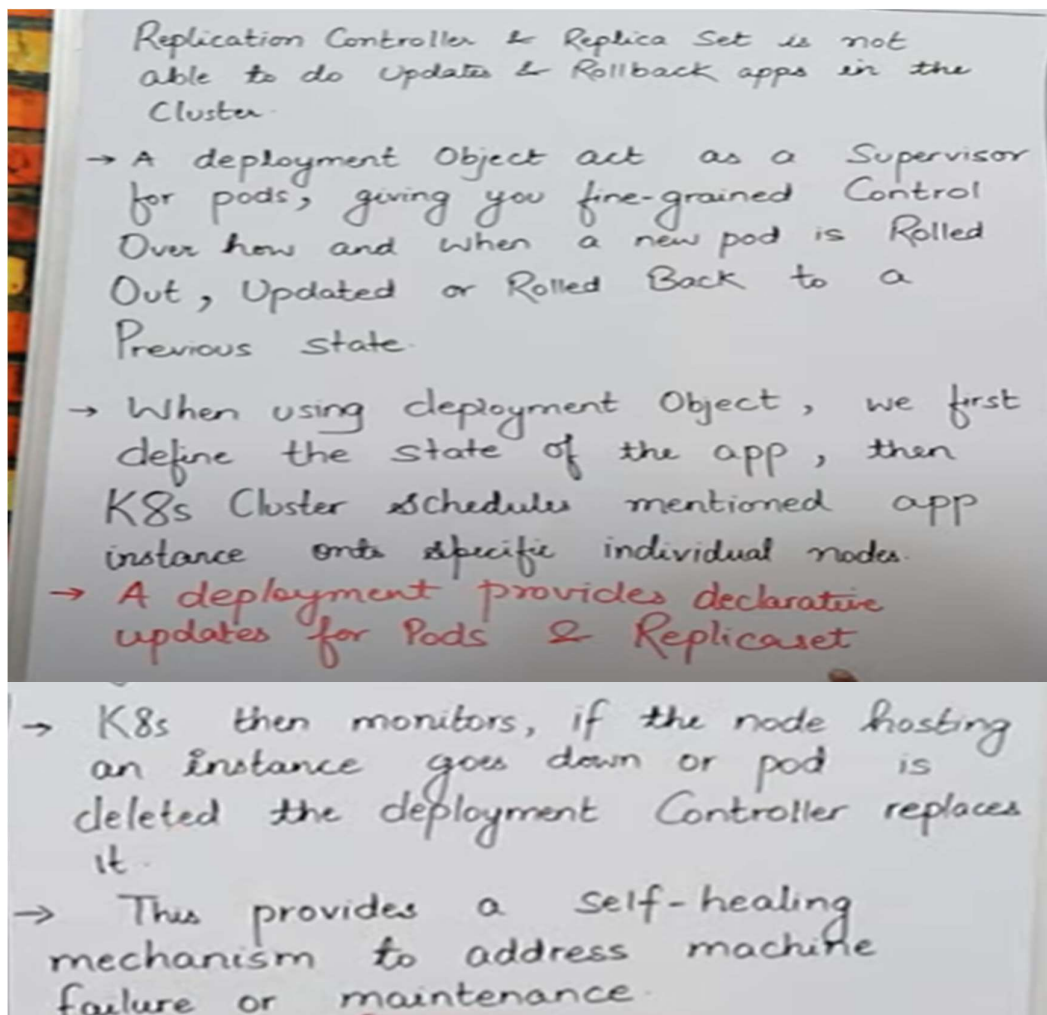


# Deployment & Rollback & Rollout



- Deployment set replica set ka upgraded version hai ,
- Replication sein hum apne app ko upgrade nahi kar sakte but deployment ki help sein hum apne app ko update kar sakte hai, rollback version kar sakte hai .
- Deployment ki help sein hum apne app ko update kar sakte hai.
- **Rolled back** matlab agar hum apne app kein previous version par jana chahate hai aur **Rolled out** matlab mere app ka new version
- Pehle hum apne app ko jab deploy karenge toh uski eak state define karenge.
- Kubernetes is cheej ko har samaye monitor karta rahega ki jo meri node hai vo sahi sein kaam kar raha ya nahi kahi meri node down toh nahi hai, ya mere jo pod hai vo kahi delete toh nahi hogaya hai, pod agar delete hogaya hai toh phir sein humko vo kaise create karna hai
- Deployment ki help sein hum main kaan **roll back aur rollout** ka kaam kar sakte hai
- **Yml** file mein jab hum **kind:Deployment** likhenge toh kubernetes apne aap samjh jayega ki hum kis tarah ki yml file banana chah rahe toh top par deployment uske neeche yml file mein replica define hoga & then uske baad humara pod define hoga.

## Lec-50 - Deployment & Rollback

The following are typical use Cases of Deployments -

- ① Create a deployment to rollout a Replicaset → The replicaset creates pods in the Background. Check the status of the Rollout to see if it succeeds or not.
- ② Declare the new state of the Pods → By updating the PodTemplateSpec of the deployment. A new Replicaset is Created and the Deployment manages moving the pods from the Old Replicaset to the new one at a Controlled rate. Each new Replicaset updates the revision of the Deployment.
- ③ Rollback to an earlier Deployment Revision → If the Current state of the Deployment is not stable. Each rollback updates the revision of the Deployment.
- ④ Rollback to an earlier Deployment Revision → If the Current state of the deployment is not stable. Each Rollback updates the revision of the deployment.
- ⑤ Scale up the Deployment to facilitates more load.
- ⑥ Pause the Deployment to apply multiple fixes to its PodTemplateSpec and then resume it to start a new Rollout.
- ⑦ Cleanup older ReplicaSets that you don't need anymore.

- Deployment mein tab use karunga jab mujhe kisi bhi replica kein purane version ya new version par jana ho toh hum vaha Deployment use karenge.
- Deployment set kahega Replica set ko jaake aur replica set kaam karega jo usko kaha gaya hai script mein karne kein liye , jaise ki kitane pod create huve hai kis label aur pod create karna hai kispar nahi.
- **2 nd point:-** for example :- mere pass eak yml file hai jiske andar replica mene define kar rakha hai, mein chahata hu ki apane yml file ko dubara update karke usme kuch naya add karna , toh mein add kardunga aur us file ko save kar dunga, phir **kubectl apply -f yml** vali command chala denge aur vo apply ho jayega , ab baat mein yein phasati hai ki meri jo yml file pehale thii bina change kare kein pehale uske andar mene jo replica define kar rakha thaaa vo ab delete hokar naya ban gaya hoga jaise hi mene isko update kiya , but jo purani vali replica thi vo mere rollout version mein save rahegi hum chahenge toh purane version mein jaake us replica ko phir sein paa sakte hai aur uspar kaam kar sakte hai agar mene apane yml file kein andar **kind:Deployment** likh rakha hai toh hi mera rollout aur roll in version vala kaam karega. Purane vali replica aayegi aur id bhi change nahi hgi but humare pod purane vale jo honge vo delete ho chuke honge kyuki pod agar delete hota hai toh jab naya banta hai toh uski ip change ho jati hai .

- **5th point:-** mein pod ko rollin or rollout kar sakta hu matlab pod ko ghata badha sakta hu aur, dusari baat agar mein rollout kein through apane pod delete kar raha hun to vo seedhe sein humare jo laest mein new pod create huve honge vo unhe delete karega , pehale .
- **6th point:-** agar humare pod mein kuch problem aagayi ya bug aagaya to hum apane deployment ko pause bhi kar sakte hai jab bug fix ho jaye to hum usko phir sein resume bhi kar sakte hai .
- **7th point :-** agar mere pass koi purani replica padi hai aur mujhe ab mere purane replica ki koi bhi jarurat or need nahi hai to us replica ko mein hardum kein liye delete bhi kar sakta hu .

→ If there are problems in the deployment, Kubernetes will automatically roll back to the previous version, however you can also explicitly rollback to a specific revision, as in our case to Revision 1 (the Original Pod Version)

→ You Can rollback to a specific Version by Specifying it with `--to-revision`

For eg → `kubectl rollout undo deploy/mydeployments --to-revision=2`

← previous version

**Note →** That the name of the Replicaset is always formatted as `[Deployment-name]-[Random string]`

**cmd →** `kubectl get deploy`

When you inspect the deployments in your cluster, the following fields are displayed

**NAME** → List the names of the deployments in the namespace

**READY** → Display how many replicas of the application are available to your users if follows the pattern ready/Desired

**UP-TO-DATE** → Display the number of replicas that have been updated to achieve the desired state.

**AVAILABLE** → Displays how many replicas of the application are available to your users.

**AGE** → Display the amount of time that the application has been running.

- Deployment ki help sein agar mere pass bahut saree version bane pade hai purane to mein unme sein kisi bhi specific version par jaa sakta hu , agar mene **kind: deployment** likh rakha hai toh., agar specific kisi version par jana hai toh uske liye hum command use karenge **`--to-revision (version name/number)`**

**For e.x :-** `kubectl rollout undo deploy/mydeployments --to-revision=2`

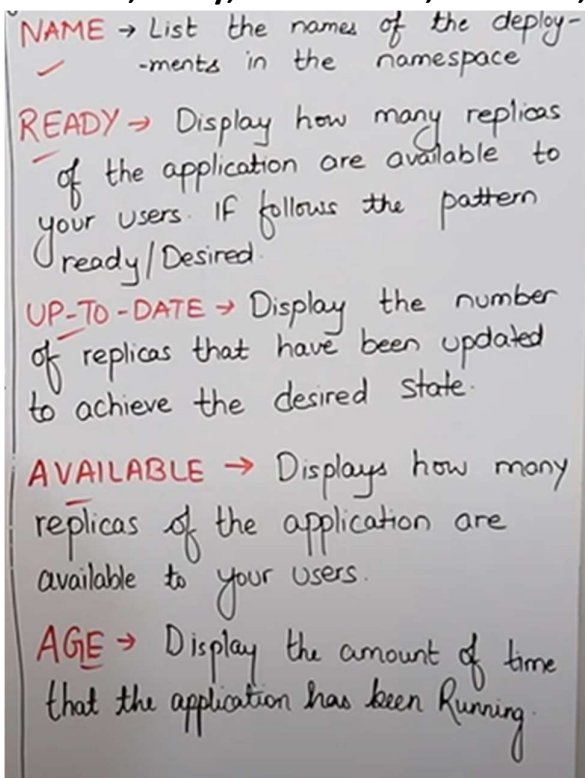
Ab isme **deploy** mera **object type** hai aur **mydeployments** mera **object name** jo ki mene apane **yml file** mein **andar** define kar rakha hai

**Note :-** hum jo bhi apni replica set banayenge apne yml file kein andar usme jab humara replica set create hoga toh uska eak format hoga

**Format :-** [Deployment name ]-[Random string]

start hoga [Deployment name] sein aur end mein koi [Random string] laga denge hum aur humare jo pod create honge vo bhi usi hisab sei create hoge pehale deployment name then uske baad random number.

- Agar hum ye check karna chahate hai ki meri deploy proper hogayi hai ya nahi toh uske liye hum ye command use karenge. **kubectl get deploy**
- Jaise hi hum **kubectl get deploy** command chalyenge humko output mein dikhega :- Name ,Ready, UP-TO-DATE, Available, Age



**NAME** → List the names of the deployments in the namespace

**READY** → Display how many replicas of the application are available to your users. It follows the pattern ready/Desired.

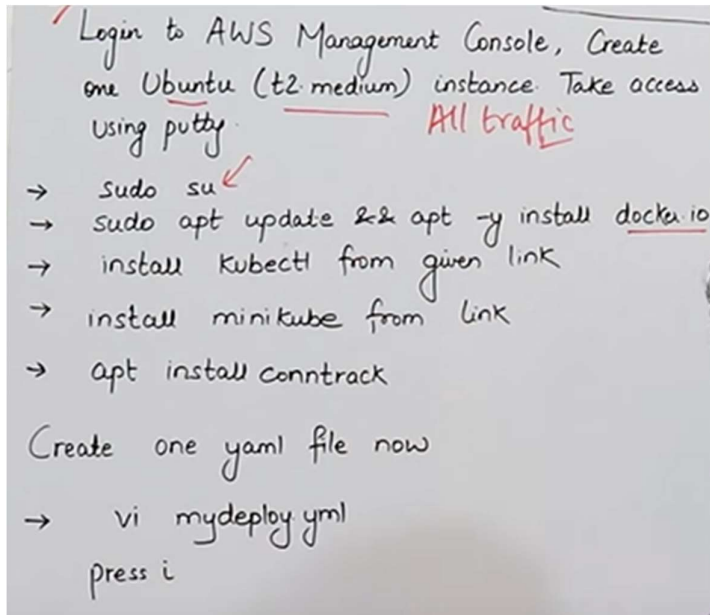
**UP-TO-DATE** → Display the number of replicas that have been updated to achieve the desired state.

**AVAILABLE** → Displays how many replicas of the application are available to your users.

**AGE** → Display the amount of time that the application has been running.

=====

## LAB



sudo su

command to install docker is

sudo apt update && apt -y install docker.io

**install Kubectl now with the given link:-**

```
curl -LO https://storage.googleapis.com/kubernetes-release/release/$(curl -s  
https://storage.googleapis.com/kubernetes-  
release/release/stable.txt)/bin/linux/amd64/kubectl && sudo mv ./kubectl  
/usr/local/bin/kubectl
```

install Minikube with the given link

```
curl -Lo minikube https://storage.googleapis.com/miniku... && chmod +x minikube &&  
sudo mv minikube /usr/local/bin/
```

apt install conntrack

minikube start --vm-driver=none

minikube status

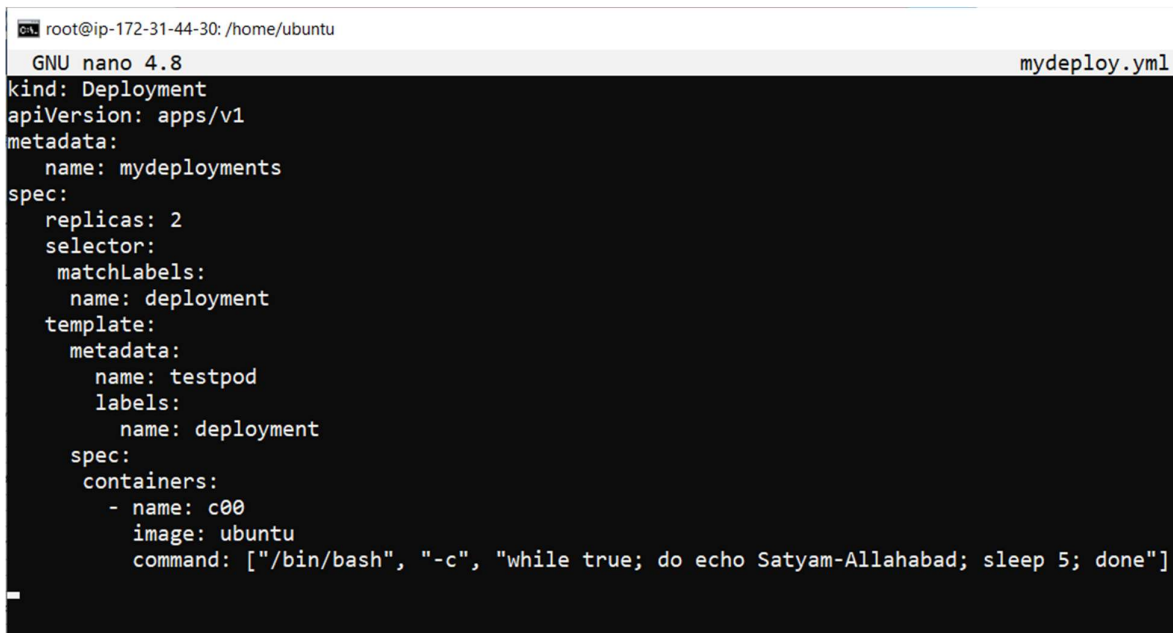
kubectl version

kubectl get nodes



## → nano mydeploy.yml

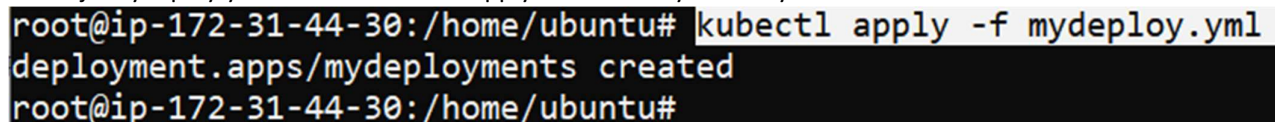
```
kind: Deployment
apiVersion: apps/v1
metadata:
  name: mydeployments
spec:
  replicas: 2
  selector:
    matchLabels:
      name: deployment
  template:
    metadata:
      name: testpod
    labels:
      name: deployment
    spec:
      containers:
        - name: c00
          image: ubuntu
          command: ["/bin/bash", "-c", "while true; do echo Satyam-Allahabad; sleep 5; done"]
```



```
root@ip-172-31-44-30: /home/ubuntu
GNU nano 4.8 mydeploy.yml
kind: Deployment
apiVersion: apps/v1
metadata:
  name: mydeployments
spec:
  replicas: 2
  selector:
    matchLabels:
      name: deployment
  template:
    metadata:
      name: testpod
    labels:
      name: deployment
    spec:
      containers:
        - name: c00
          image: ubuntu
          command: ["/bin/bash", "-c", "while true; do echo Satyam-Allahabad; sleep 5; done"]
```

## → kubectl apply -f mydeploy.yml

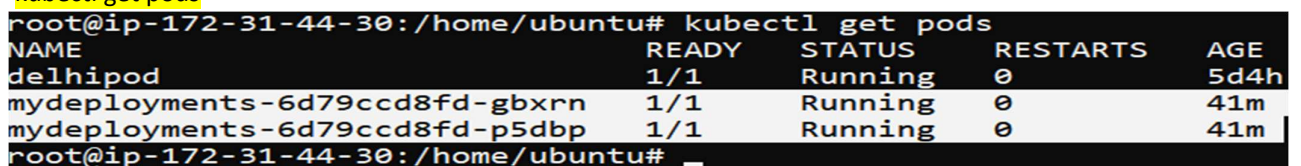
Mene jo mydeploy.yml file likha hai usko apply karne ke liye mene ye command likha hai



```
root@ip-172-31-44-30: /home/ubuntu# kubectl apply -f mydeploy.yml
deployment.apps/mydeployments created
root@ip-172-31-44-30: /home/ubuntu#
```

Iska matlab jo mera **kind:Deployment** vala Deployment tha uske andar mene mydeployments naam se in pod create kar diya hai .

## → kubectl get pods



```
root@ip-172-31-44-30: /home/ubuntu# kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
delhipod                            1/1     Running   0           5d4h
mydeployments-6d79ccd8fd-gbxrn      1/1     Running   0           41m
mydeployments-6d79ccd8fd-p5dbp      1/1     Running   0           41m
root@ip-172-31-44-30: /home/ubuntu#
```

## To check deployment was created or not :-

### ➤ **kubectl get deploy**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get deploy
NAME                READY    UP-TO-DATE    AVAILABLE    AGE
mydeployments        2/2      2              2            5m50s
root@ip-172-31-44-30:/home/ubuntu#
```

Is command ki help sein mene eak **mydeployment** naam sein eak object create kiya, aur uske andar 2pod ready hai ,2 pod updatd hai, 2 pod available hai .

## To check, how deploy create Replica & pods :-

### ➤ **kubectl describe deploy mydeployments**

isme **deploy** mera **object type** hai aur mydeployments mera object name hai .

```
Select root@ip-172-31-44-30:/home/ubuntu
root@ip-172-31-44-30:/home/ubuntu# kubectl describe deploy mydeployments
Name:                mydeployments
Namespace:            default
CreationTimestamp:    Tue, 21 Dec 2021 11:51:35 +0000
Labels:               <none>
Annotations:          deployment.kubernetes.io/revision: 1
Selector:              name=deployment
Replicas:              2 desired | 2 updated | 2 total | 2 available | 0 unavailable
StrategyType:          RollingUpdate
MinReadySeconds:       0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  name=deployment
  Containers:
    c00:
      Image:        ubuntu
      Port:          <none>
      Host Port:     <none>
      Command:
        /bin/bash
        -c
        while true; do echo Satyam-Allahabad; sleep 5; done
      Environment:   <none>
      Mounts:         <none>
      Volumes:        <none>
  Conditions:
    Type              Status    Reason
    ----              -
    Available         True     MinimumReplicasAvailable
    Progressing       True     NewReplicaSetAvailable
  OldReplicaSets:    <none>
  NewReplicaSet:     mydeployments-6d79ccd8fd (2/2 replicas created)
  Events:
    Type              Reason              Age             From              Message
    ----              -
    Normal            ScalingReplicaSet   45m            deployment-controller   Scaled up replica set mydeployments-6d79ccd8fd to 2
root@ip-172-31-44-30:/home/ubuntu#
```

### ➤ **kubectl get rs**

isase mujhe meri **replica set** ki information millegi .

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get rs
NAME                                DESIRED    CURRENT    READY    AGE
mydeployments-6d79ccd8fd            2          2          2        47m
root@ip-172-31-44-30:/home/ubuntu#
```

## To Scale-up or Scale-Down:-

### ➤ **kubectl scale --replicas=1 deploy mydeployments**

iss command sein hum apane replica ko up or down kar sakte hai, aur yaha mene apani replica down kiya hai.

```
root@ip-172-31-44-30:/home/ubuntu# kubectl scale --replicas=1 deploy mydeployments
deployment.apps/mydeployments scaled
```

### ➤ **kubectl get rs**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get rs
NAME                                DESIRED    CURRENT    READY    AGE
mydeployments-6d79ccd8fd            1          1          1        59m
root@ip-172-31-44-30:/home/ubuntu#
```

Mene apani replica 2 sein ghata kar 1 kar di

### ➤ **kubectl get pods**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get pods
NAME                                READY    STATUS    RESTARTS    AGE
delhipod                            1/1      Running   0            5d4h
mydeployments-6d79ccd8fd-gbxrn      1/1      Running   0            63m
root@ip-172-31-44-30:/home/ubuntu#
```

Aba mere pass kewal ek pod bacha hai.

## To check what is running inside inside container :-

➤ **kubectl logs -f <podname>**

➤ **kubectl logs -f mydeployments-6d79ccd8fd-gbxrn**

agar mujhe apane pod ke andar jo **running container** hai unki details check karni hai toh hum ye command use karenge, isase hum apane container ke logs check kar sakte hai .

```
root@ip-172-31-44-30:/home/ubuntu# kubectl logs -f mydeployments-6d79ccd8fd-gbxrn
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
Satyam-Allahabad
```

**Ctrl+z** to exit

➤ **vi nano.yml**

```
Select root@ip-172-31-44-30: /home/ubuntu
GNU nano 4.8
kind: Deployment
apiVersion: apps/v1
metadata:
  name: mydeployments
spec:
  replicas: 2
  selector:
    matchLabels:
      name: deployment
  template:
    metadata:
      name: testpod
    labels:
      name: deployment
    spec:
      containers:
      - name: c00
        image: centos
        command: ["/bin/bash", "-c", "while true; do echo Tripathi-Allahabad; sleep 5; done"]
mydeploy.yml
```

Mene change kiya thaa apane yml file ke andar, jaha mene underline kiya vahi changes kiya hai mene

➤ **kubectl apply -f mydeploy.yml**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl apply -f mydeploy.yml
deployment.apps/mydeployments configured
root@ip-172-31-44-30:/home/ubuntu#
```

Mene jo changes kiya uske baad mene apane yml ko phir sein apply kar diya

Mene file mein jab change kiya toh vo configured hog aye vo sab

➤ **kubectl get rs**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get rs
NAME                                DESIRED    CURRENT    READY    AGE
mydeployments-6d79ccd8fd            0          0          0        100m
mydeployments-7dbc9486cf            2          2          2        20m
root@ip-172-31-44-30:/home/ubuntu#
```

Hum dekh sakte hai jisko headline diya hai mene pic mein vo mera new deployment hai jiske andar 2 pod desired running aur current bata raha.

Hum ye bhi dekh sakte hai jo mere purana deploy thaa vo ab 0 ho gaya hai hum jitani baar apane yml ko baar baar update karenge ye utani baar naya version create kar dega , mere purane version mein ab eak bhi pod nahi bachee.

Basically dekha jaye toh puri nayi replica set hi create huyi hai .



➤ **kubectl get pods**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
delhipod                           1/1     Running   0           5d5h
mydeployments-7dbc9486cf-pzk5f     1/1     Running   0           26m
mydeployments-7dbc9486cf-tp7ft     1/1     Running   0           25m
root@ip-172-31-44-30:/home/ubuntu#
```

Hum agar match kare toh humare update karane ke baad yml humari nahi ban gayi aur humare pod bhi naye bane hai agar hum pod ki id match kare naye aur purane vale yml mein toh different millenge.

Eak baat aur humari jo purani replica thaa usme scale out kiye thee usme mene 2 ki jagah 1 kar diya thaa but mene yml ke andar change nahi kiya isliye jaise mene dubara yml ko apply kiya toh jo replica humare yml mein define hai utani ban gayi .

➤ **kubectl logs -f mydeployments-7dbc9486cf-tp7ft**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
delhipod                           1/1     Running   0           5d5h
mydeployments-7dbc9486cf-pzk5f     1/1     Running   0           26m
mydeployments-7dbc9486cf-tp7ft     1/1     Running   0           25m
root@ip-172-31-44-30:/home/ubuntu# kubectl logs -f mydeployments-7dbc9486cf-tp7ft
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
Tripathi-Allahabad
```

Hum dekh sakte hai humane jo new yml mein update kiye thee vo logs mujhe ab dikh rahe jaise hi mene pod ka name dala toh.

➤ **kubectl exec mydeployments-7dbc9486cf-tp7ft -- cat /etc/os-release**

```
root@ip-172-31-44-30:/home/ubuntu# kubectl exec mydeployments-7dbc9486cf-tp7ft -- cat /etc/os-release
NAME="CentOS Linux"
VERSION="8"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="8"
PLATFORM_ID="platform:el8"
PRETTY_NAME="CentOS Linux 8"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:centos:centos:8"
HOME_URL="https://centos.org/"
BUG_REPORT_URL="https://bugs.centos.org/"
CENTOS_MANTISBT_PROJECT="CentOS-8"
CENTOS_MANTISBT_PROJECT_VERSION="8"
root@ip-172-31-44-30:/home/ubuntu#
```

Agar hum dekhe toh mene apne yml file ke andar Ubuntu ki jagah centos kar diya aur jab mene ye command chalayi toh mujhe dikh raha mera machine ke andar operating system change hogaya .ab mera machine centos operating system par chal raha pehle Ubuntu par thaa.

## To check your current rollout status:-

### ➤ `kubectl rollout status deployment mydeployments`

hum iss command sein apane rollout ki current status dekh sakte hai .

```
root@ip-172-31-44-30:/home/ubuntu# kubectl rollout status deployment mydeployments
deployment "mydeployments" successfully rolled out
root@ip-172-31-44-30:/home/ubuntu#
```

hum jis bhi version par baithe honge jaise ye command chalayenge turant eak pichale version par chale jayenge hum .

## To check your rollout history :-

### ➤ `kubectl rollout history deployment mydeployments`

```
root@ip-172-31-44-30:/home/ubuntu# kubectl rollout history deployment mydeployments
deployment.apps/mydeployments
REVISION  CHANGE-CAUSE
1          <none>
2          <none>

root@ip-172-31-44-30:/home/ubuntu#
```

hum iss command sein rollout ki history check kar sakte hai , kitani baar mene files ko update kiya hai aur kitani baar files mein changes kiya hai vo hum sab cheej dekh sakte hai.humare pass kitane versions hai vo bhi pata chal jayega

isme 1 st vala mera jab mene pehali baar yml chalayi thii vo hai aur 2 nd vala jab mene apni yml dusari baar update karne ke baad chalaya vo vala show kar raha.

## To go to the previous version :-

### ➤ `kubectl rollout undo deploy/mydeployments`

is command sein hum present mein jis version par hai usase eak pechale version par jaa sakte hai, isliye undo lagaya hai aur agar specific kisi version par mujhe jana hai toh uske liye hum dusari command use karenge jo mene previously notes mein likh rakhi hai .

Humare previous version mein aane sein pehale humare pass jitane pod thee utane hi pod rahenge humare pass previous version mein jaane ke baad bhi bas un pod ka version change ho jayega

For e.x =

Agar mere current version mein 4 pod hai aur mere previously version mein pehale 10 pod thee but abhi current mein mere pass 4 pod hai aur mein chahata hu ki mein current version sein previously version mein jau toh mere previously version mein bhi bas kewal 4 pod hi dikhenge bas us pod ke version change hojayenge .

```
root@ip-172-31-44-30:/home/ubuntu# kubectl rollout undo deploy/mydeployments
deployment.apps/mydeployments rolled back
root@ip-172-31-44-30:/home/ubuntu#
```

➤ `kubectl get deploy`

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get deploy
NAME                READY    UP-TO-DATE    AVAILABLE    AGE
mydeployments       2/2      2              2            132m
root@ip-172-31-44-30:/home/ubuntu#
```

➤ `kubectl get pods`

```
root@ip-172-31-44-30:/home/ubuntu# kubectl get pods
NAME                                READY    STATUS    RESTARTS    AGE
delhipod                           1/1      Running   0            5d22h
mydeployments-6d79ccd8fd-hh66s     1/1      Running   0            16h
mydeployments-6d79ccd8fd-rpfbb     1/1      Running   0            16h
root@ip-172-31-44-30:/home/ubuntu#
```

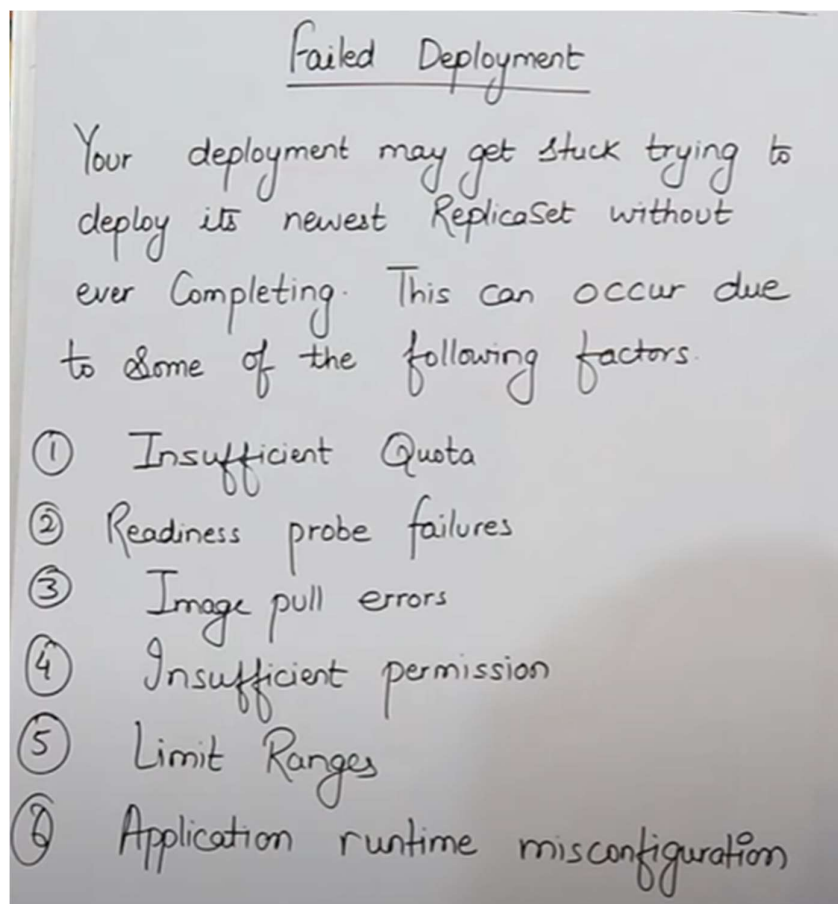
➤ `kubectl exec mydeployments-6d79ccd8fd-rpfbb -- cat /etc/os-release`

```
root@ip-172-31-44-30:/home/ubuntu# kubectl exec mydeployments-6d79ccd8fd-rpfbb -- cat /etc/os-release
NAME="Ubuntu"
VERSION="20.04.3 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.3 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=focal
UBUNTU_CODENAME=focal
root@ip-172-31-44-30:/home/ubuntu#
```

Ab mein dekh sakta hu jab mene undo command chalaya toh mein previous version mein aagaya phir sein apane aur kuch dair pehale mene upar Ubuntu ki jagah centos kiya thaa apane image kein andar but ab phir sein mene previous par aagaya to hiss wajah ein mere Ubuntu operating system phir sein chalne laga.

=====

## Failed Deployment



### ➤ kuch reasons hai jiski wajah sein humare deployment fail ho jate hai .

- **Insufficient quota** = matlab humane jo node liye kya pata uske andar sufficient space nah o iss wajah sein bh mera deployment fail ho sakta hai.
- **Readiness probe failures** = Agar mene kisi tareeke ka deployment kiya aur us samaye meri node working mein na ho ya node ready na ho uski wajah sein bhi humara deployment fail ho sakta hai
- **Image pull errors** = kabhi-kabhi jab hum yml file mein andar apni image ko pull karne mein liye likhate hai image ka naam aur image ka address galat ho jata hai jiski wajah sein bhi humara deployment fail ho jata hai
- **Insufficient permission** = Kabhi kabhi hum aise image lekar aate hai jiski humein permission hi na ho uski wajah sein bhi humari deployment fail ho sakti hai
- **Limit Ranges** = kisi ki agar limit humane jada agar exceed kar di ho toh uske wajah sein bhi humara deployment fail ho sakta hai .
- **Application runtime misconfiguration** = agar humari application kisi wajah sein nahi chal payi toh uski wajah sein bhi mera deployment fail ho jata hai .