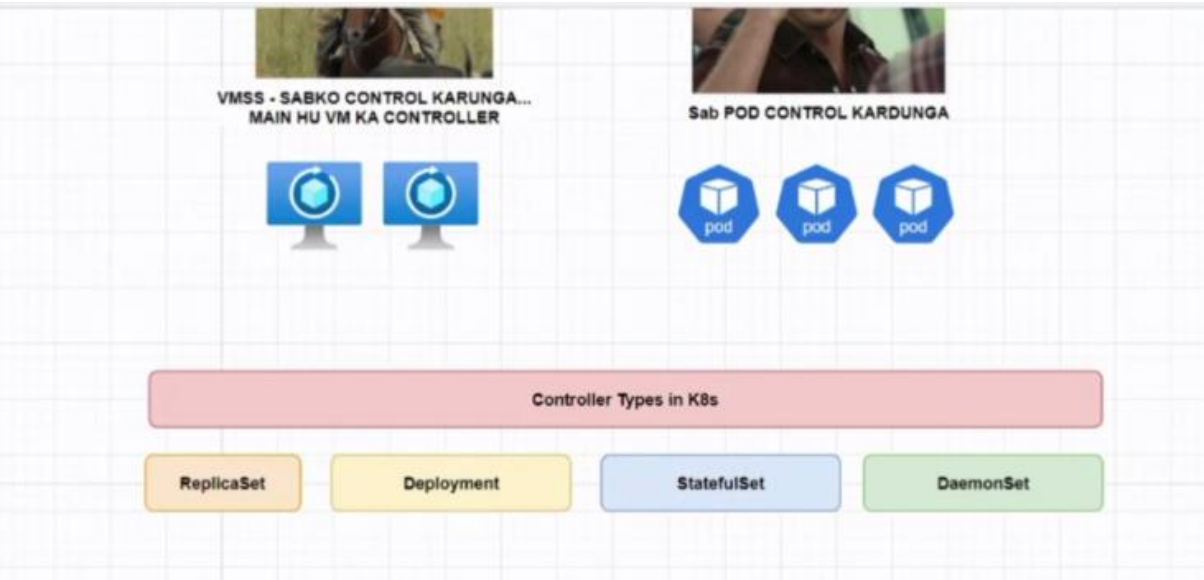
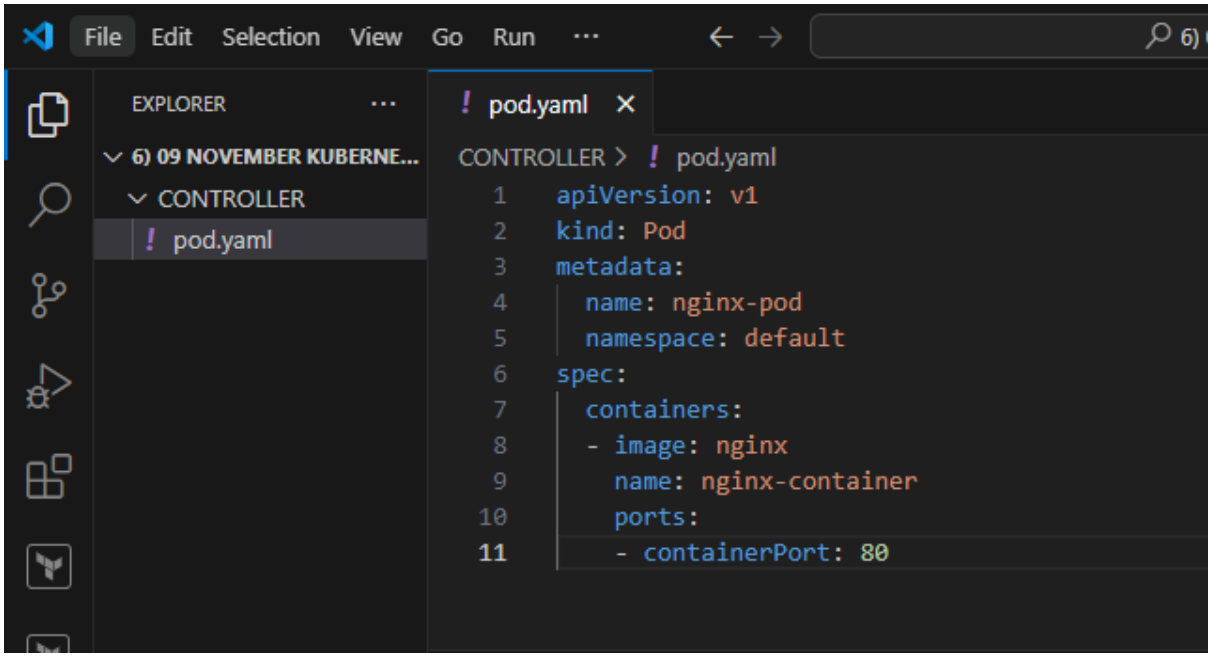
AGENDA – CONTROLLER



1) Create folder “6) 09 November Kubernetes”.

2) Create pod.yaml file



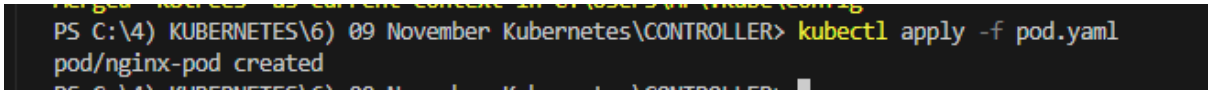
3) connect to pod

az login

az account set --subscription 48f88df7-0d53-4866-a66f-82eb0ac469e3

az aks get-credentials --resource-group rgtrees --name k8trees --overwrite-existing

3) **kubectl apply -f pod.yaml** = create pod



4) **kubectl get pods**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME        READY   STATUS    RESTARTS   AGE
nginx-pod   1/1     Running   0          4m57s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

5) RESTARTS = 0 means error nhi aaya ek bhi baar ya container nhi mara

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME        READY   STATUS    RESTARTS   AGE
nginx-pod   1/1     Running   0          4m57s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

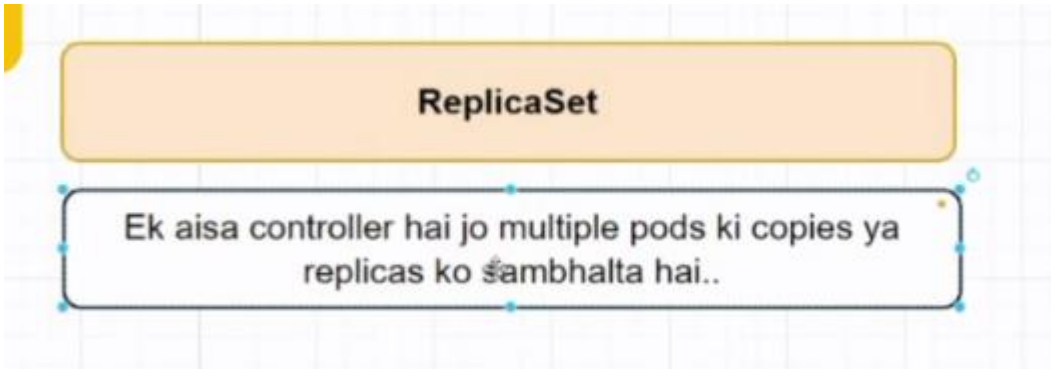
```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME        READY   STATUS    RESTARTS   AGE
nginx-pod   1/1     Running   0          4m57s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

6) work done by pod for container = workdone by controller for pod ----- means automatically creating container and pod

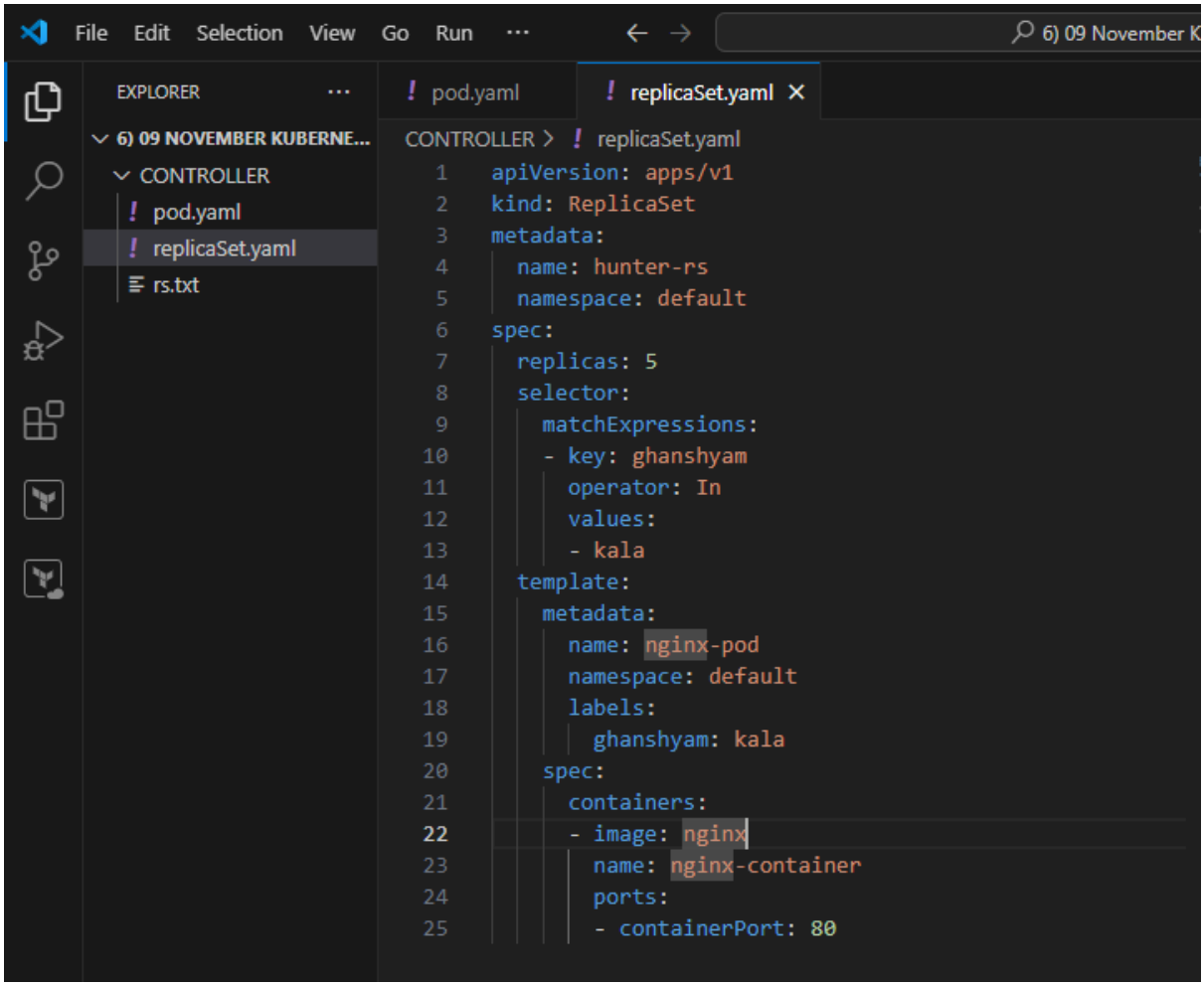
++

AGENDA – REPLICA SET

1)



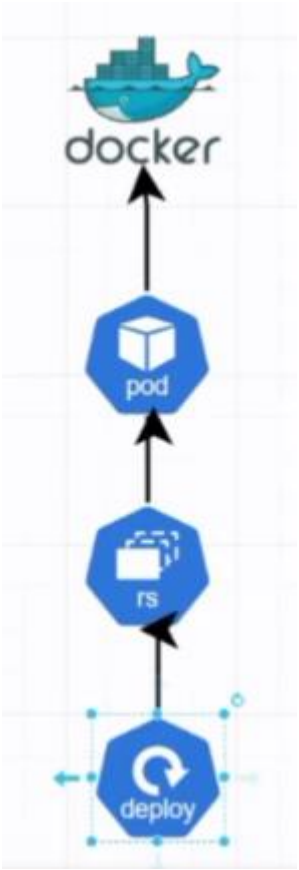
2) make replicaSet.yaml file



3) extract replicaset docs

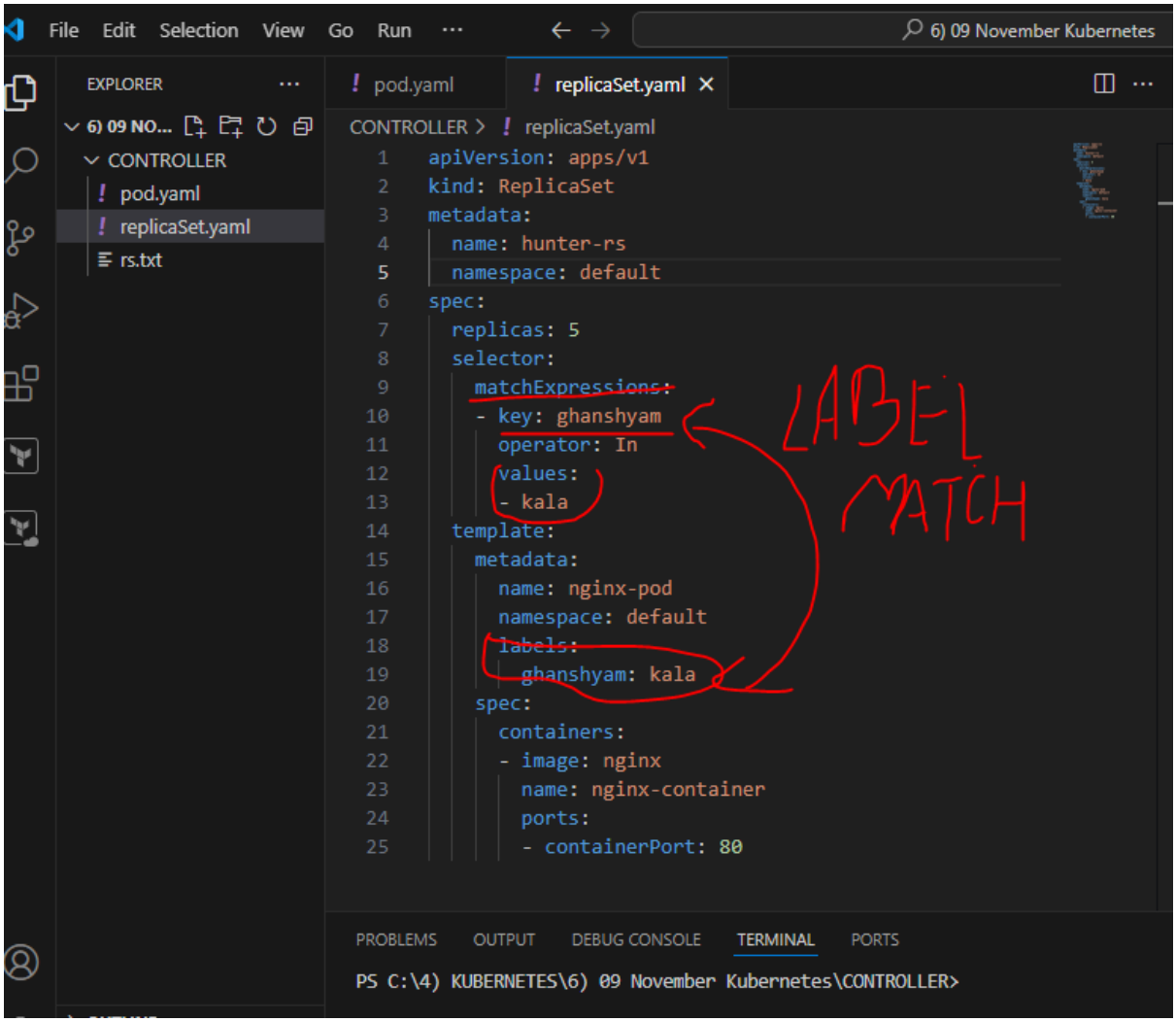
kubectl explain replicasets --recursive > rs.txt

4) flow




```
replicas: 1 - Kitne pod bnane hai?
selector:
template: Kaisa pod bnana hai?
```

5) Label on pod is necessary not on replica set basically “matchExpressions:” is considered as Label only on replicaset



6) **kubectl apply -f replicaSet.yaml** = create replica set

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl apply -f replicaSet.yaml
replicaset.apps/hunter-rs created
```

kubectl get rs

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>  kubectl get rs
NAME        DESIRED   CURRENT   READY   AGE
hunter-rs   5         5         5       109s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

kubectl get pods = so 5 pods or replicas are running

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME              READY   STATUS    RESTARTS   AGE
hunter-rs-dpngh   1/1     Running   0          3m4s
hunter-rs-hcnrr   1/1     Running   0          3m4s
hunter-rs-kwnwr   1/1     Running   0          3m4s
hunter-rs-q9xb6   1/1     Running   0          3m4s
hunter-rs-zrpzf   1/1     Running   0          3m4s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

7) Deleting one pod to check whether it gets auto created by replica set or not

kubectl delete pod hunter-rs-dpngh

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME              READY   STATUS    RESTARTS   AGE
hunter-rs-hcnrr   1/1     Running   0          5m31s
hunter-rs-htcbv   1/1     Running   0          18s
hunter-rs-kwnwr   1/1     Running   0          5m31s
hunter-rs-q9xb6   1/1     Running   0          5m31s
hunter-rs-zrpzf   1/1     Running   0          5m31s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

So we can see still count is 5 and 1 pod got auto created by replica set or controller

8) Suppose deleting whole replica set then all pod will also be deleted

kubectl get rs

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get rs
NAME        DESIRED   CURRENT   READY   AGE
hunter-rs   5         5         5       11m
```

kubectl delete rs hunter-rs

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl delete rs hunter-rs
replicaset.apps "hunter-rs" deleted
```

kubectl get pods

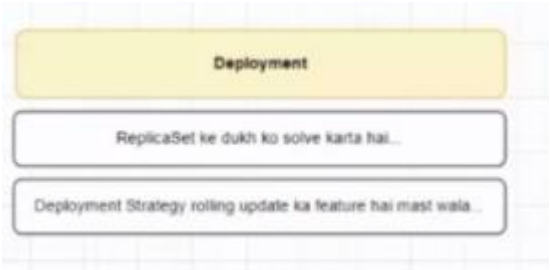
```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
No resources found in default namespace.
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

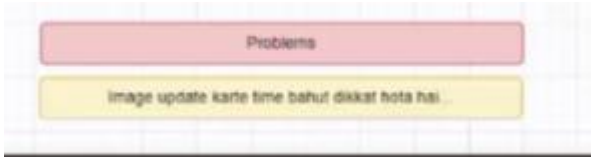
++

AGENDA= DEPLOYMENT

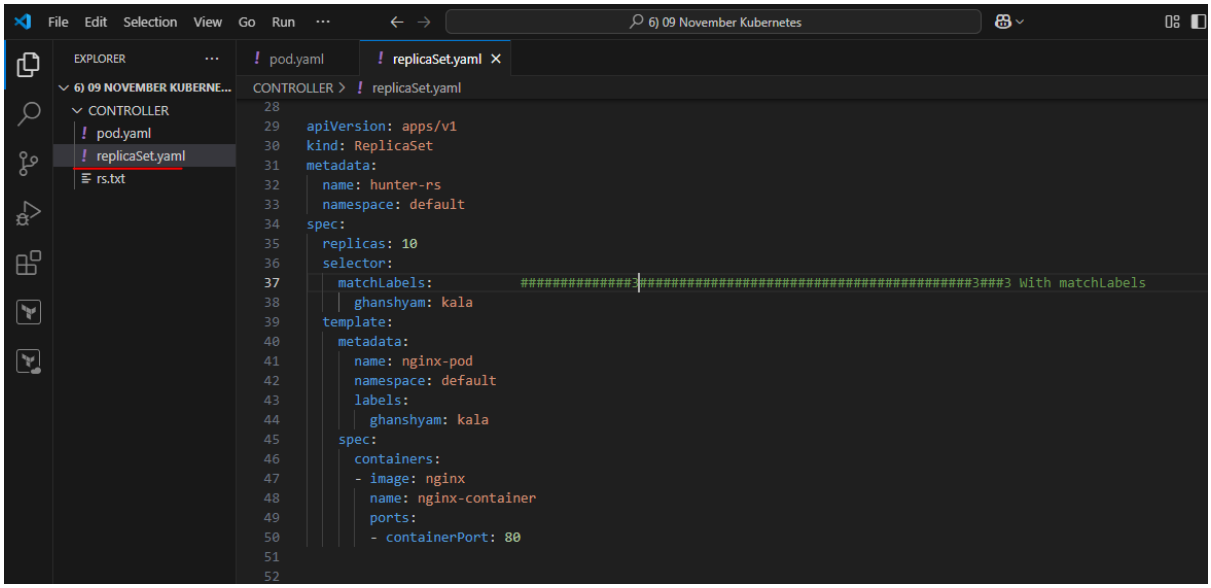
1) In replicaset fraction time downtime comes = sab pod ko maar deta hai fir dobara recreate krna chalu krta hai

2) In Deployment no downtime come = ek ko maarta hai ek ko jinda krta hai





3) Write yaml with matchLabel also



4) **kubectl apply -f replicaSet.yaml**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl apply -f replicaSet.yaml
replicaset.apps/hunter-rs created
```

Kubectl get rs

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get rs
NAME        DESIRED   CURRENT   READY   AGE
hunter-rs   10        10        10      117s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

5) **kubectl get pods**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME              READY   STATUS    RESTARTS   AGE
hunter-rs-2lk6t   1/1     Running   0          2m46s
hunter-rs-4kv85   1/1     Running   0          2m46s
hunter-rs-c7h6g   1/1     Running   0          2m46s
hunter-rs-h9qhc   1/1     Running   0          2m46s
hunter-rs-lx4gt   1/1     Running   0          2m46s
hunter-rs-nn2kz   1/1     Running   0          2m46s
hunter-rs-r7bpg   1/1     Running   0          2m46s
hunter-rs-tj5xl   1/1     Running   0          2m46s
hunter-rs-tqgzg   1/1     Running   0          2m46s
hunter-rs-xxz2z   1/1     Running   0          2m46s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

6) Now change replicas as 5

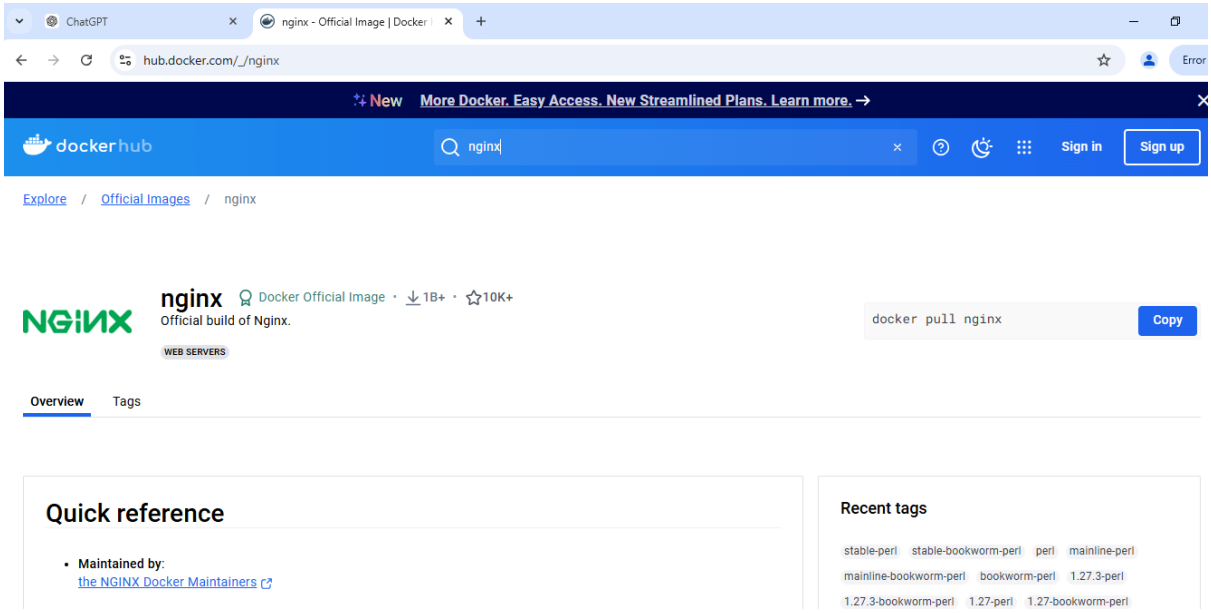
```
spec:
  replicas: 5
  selector:
    matchLabels:
      ghanshyam: kala
  template:
```

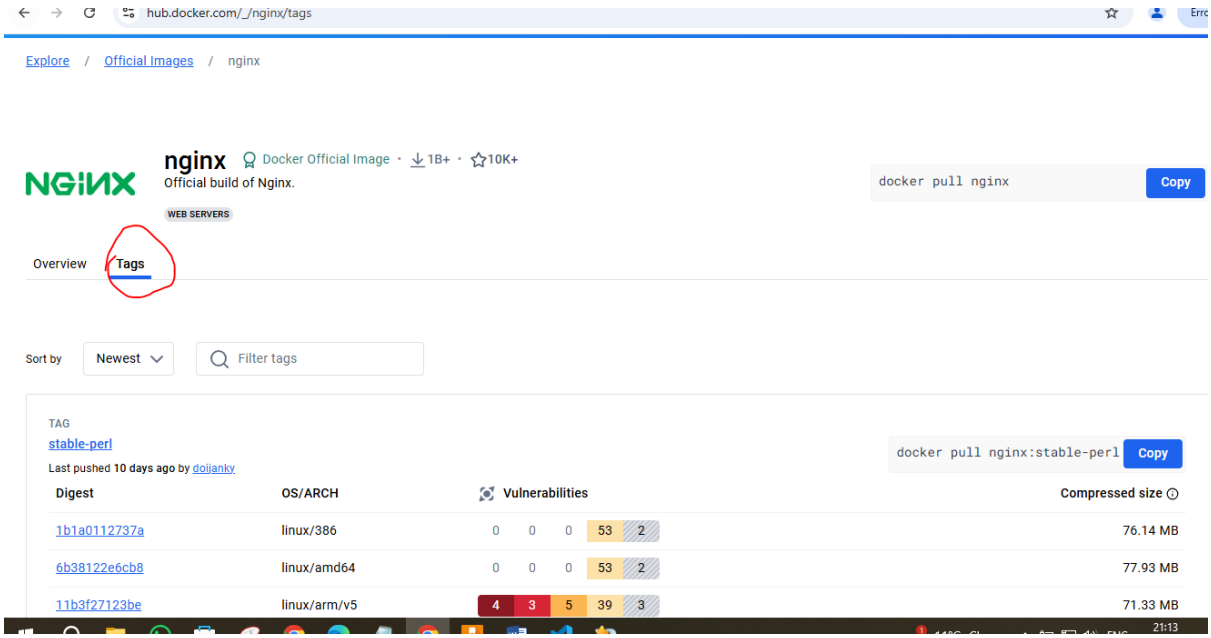
kubectl apply -f replicaSet.yaml = again run that will configure like it will delete another 5 pods

kubectl get pods

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME              READY   STATUS    RESTARTS   AGE
hunter-rs-c7h6g   1/1     Running   0          7m18s
hunter-rs-h9qhc   1/1     Running   0          7m18s
hunter-rs-r7bpg   1/1     Running   0          7m18s
hunter-rs-tqgzg   1/1     Running   0          7m18s
hunter-rs-xxz2z   1/1     Running   0          7m18s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

7) Go to docker hub and search “nginx”





8) Use above image

```
spec:
  containers:
  - image: nginx:stable-perl
    name: nginx-container
    ports:
```

9) **kubectl describe pod hunter-rs-c7h6g** = check pod is using which image

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl describe pod hunter-rs-c7h6g
Name:             hunter-rs-c7h6g
Namespace:        default
Priority:         0
Service Account:  default
Node:             aks-agentpool-10692884-vmss000005/10.224.0.5
Start Time:       Sat, 04 Jan 2025 20:59:00 +0530
Labels:           ghanshyam=kala
Annotations:      <none>
Status:           Running
IP:               10.244.0.208
IPs:
  IP:           10.244.0.208
Controlled By:  ReplicaSet/hunter-rs
Containers:
  nginx-container:
    Container ID:   containerd://18ea608a034a239d2463bae9bdc403d614143b24c88fad43c738c79c73bd43ab
    Image:          nginx
    Image ID:       docker.io/library/nginx@sha256:42e917aaa1b5bb40dd0f6f7f4f857490ac7747d7ef73b391c774a41a8b994f15
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sat, 04 Jan 2025 20:59:06 +0530
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-wfrhc (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
```

10) As image we had update in yaml, so lets run below command which seems like in pod our image should get updated but we will find that still pods are running on old image only i.e. nginx

kubectl apply -f replicaSet.yaml

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl apply -f replicaSet.yaml
replicaset.apps/hunter-rs configured
```

kubectl get pods

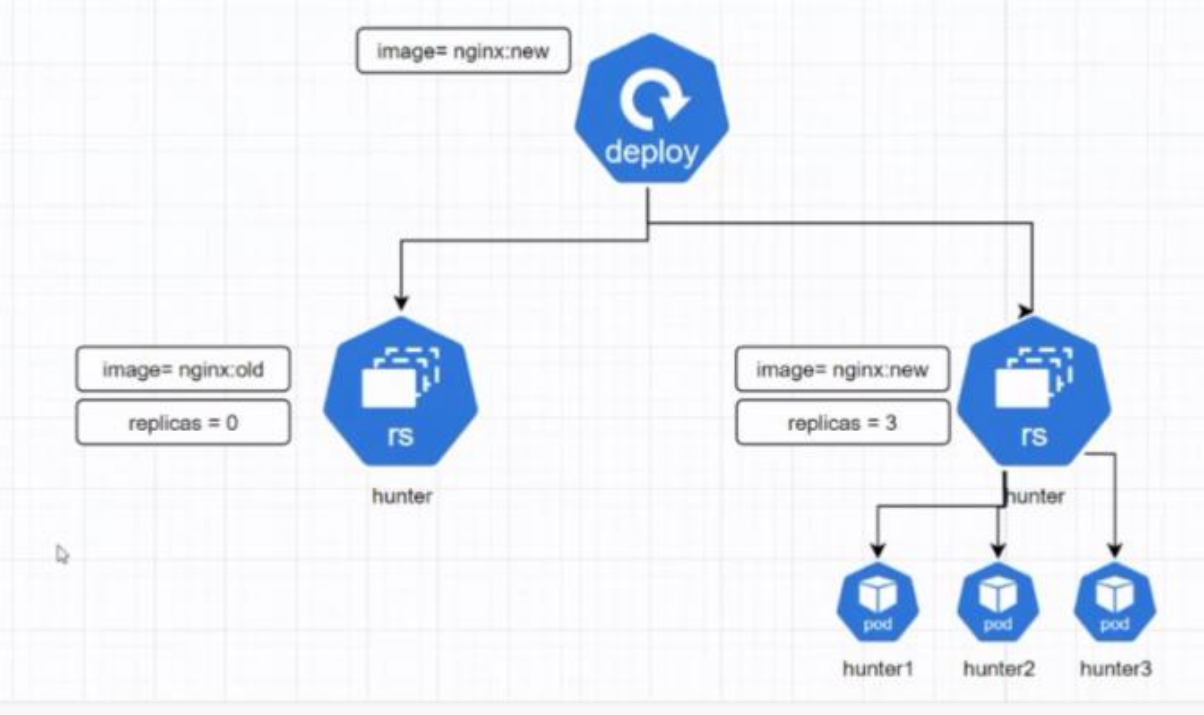
```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
hunter-rs-c7h6g   1/1     Running   0          23m
hunter-rs-r7bpg   1/1     Running   0          23m
hunter-rs-tqgzg   1/1     Running   0          23m
hunter-rs-xxz2z   1/1     Running   0          23m
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl describe hunter-rs
```

kubectl describe pod hunter-rs-c7h6g

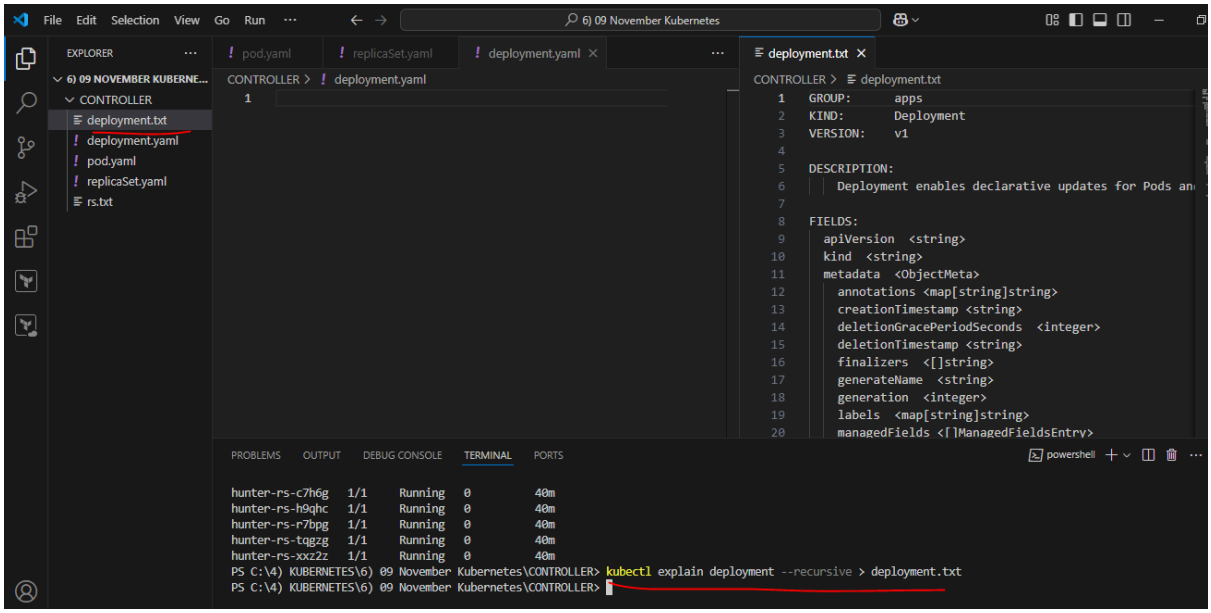
```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>  kubectl describe pod hunter-rs-c7h6g
Name:             hunter-rs-c7h6g
Namespace:        default
Priority:         0
Service Account:  default
Node:             aks-agentpool-10692884-vmss000005/10.224.0.5
Start Time:       Sat, 04 Jan 2025 20:59:00 +0530
Labels:           ghanshyam=kala
Annotations:      <none>
Status:           Running
IP:               10.244.0.208
IPs:
  IP:           10.244.0.208
Controlled By:  ReplicaSet/hunter-rs
Containers:
  nginx-container:
    Container ID:   containerd://18ea608a034a239d2463bae9bdc403d614143b24c88fad43c738c79c73bd43ab
    Image:          nginx
    Image ID:       docker.io/library/nginx@sha256:42e917aaa1b5bb40dd0f6f7f4f857490ac7747d7ef73b391c774a41a8b994f15
    Port:           80/TCP
```

So image cannot be updated so easily

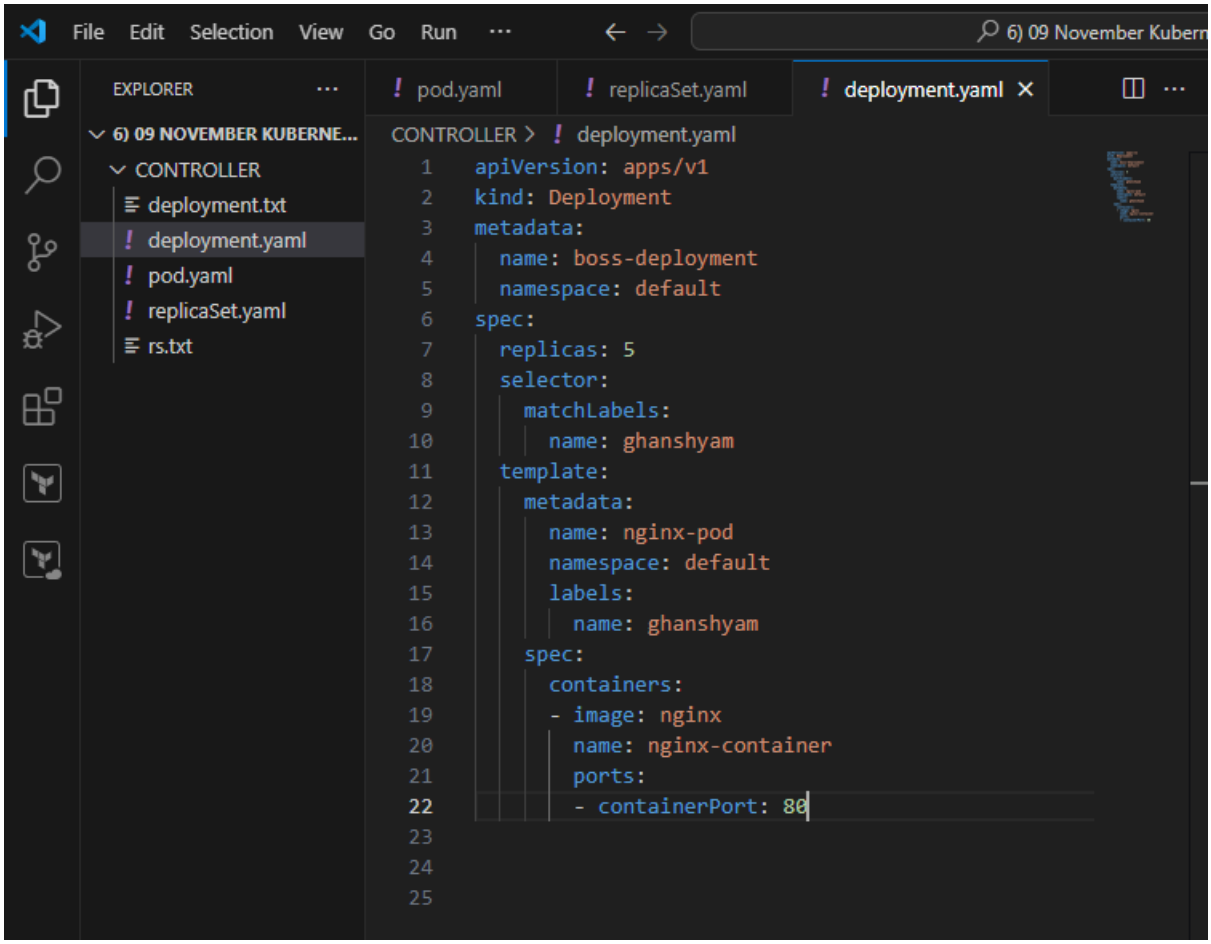
11) DEPLOYMENT = Deployment makes replica set under it then replica set makes pods under it.



12) Create deployment.yaml



13)



14) **kubectl apply -f deployment.yaml** = deployment created

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl apply -f deployment.yaml
deployment.apps/boss-deployment created
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

kubectl get deployment

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get deployment
NAME              READY   UP-TO-DATE   AVAILABLE   AGE
boss-deployment   5/5     5            5           7m42s
```

15) **kubectl get pods**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME                               READY   STATUS    RESTARTS   AGE
boss-deployment-54685f4666-2wnft   1/1     Running   0          2m14s
boss-deployment-54685f4666-6q6qs   1/1     Running   0          2m14s
boss-deployment-54685f4666-h287g   1/1     Running   0          2m14s
boss-deployment-54685f4666-ltdcz   1/1     Running   0          2m14s
boss-deployment-54685f4666-zfw8l   1/1     Running   0          2m14s
hunter-rs-c7h6g                    1/1     Running   0          140m
hunter-rs-h9qhc                    1/1     Running   0          140m
hunter-rs-r7bpg                    1/1     Running   0          140m
hunter-rs-tqgzg                    1/1     Running   0          140m
hunter-rs-xxz2z                    1/1     Running   0          140m
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

16) **kubectl get rs**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get rs
NAME                         DESIRED   CURRENT   READY   AGE
boss-deployment-54685f4666   5         5         5       4m19s
hunter-rs                    5         5         5       142m
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

17) **kubectl delete rs hunter-rs**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl delete rs hunter-rs
replicaset.apps "hunter-rs" deleted
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

18) **kubectl get rs =** deployment ke sath ek replicaset bhi banta hai

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get rs
NAME                         DESIRED   CURRENT   READY   AGE
boss-deployment-54685f4666   5         5         5       11m
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

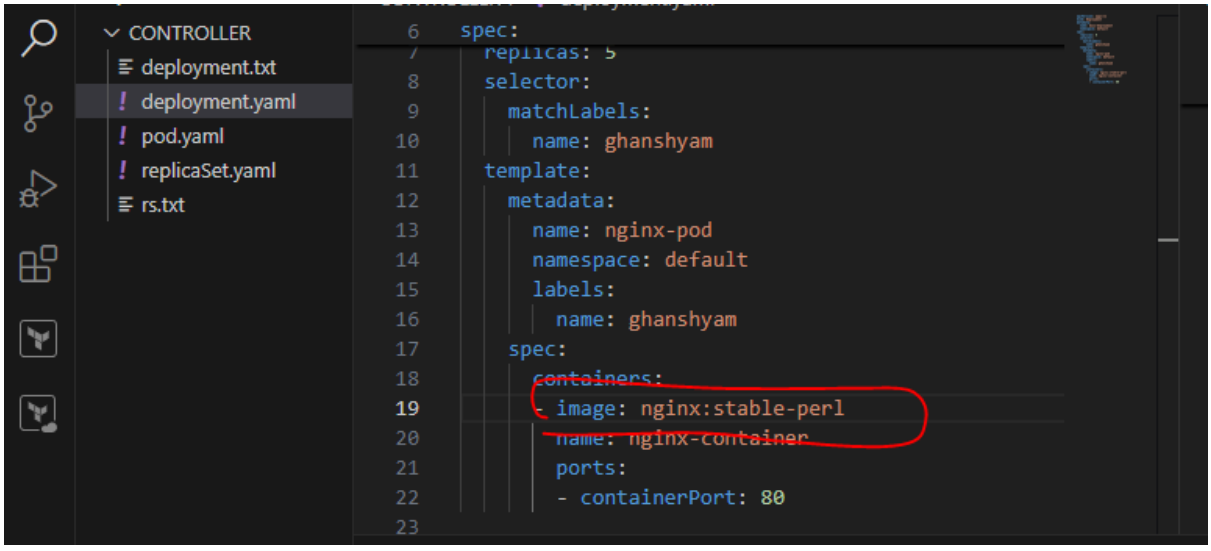
19) **kubectl get pods**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
boss-deployment-54685f4666-2wnft      1/1     Running   0          18m
boss-deployment-54685f4666-6q6qs      1/1     Running   0          18m
boss-deployment-54685f4666-h287g      1/1     Running   0          18m
boss-deployment-54685f4666-ltdcz      1/1     Running   0          18m
boss-deployment-54685f4666-zfw8l      1/1     Running   0          18m
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

20) **kubectl describe pod boss-deployment-54685f4666-2wnft**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl describe pod boss-deployment-54685f4666-2wnft
Name:             boss-deployment-54685f4666-2wnft
Namespace:        default
Priority:         0
Service Account:  default
Node:             aks-agentpool-10692884-vmss000004/10.224.0.4
Start Time:       Sat, 04 Jan 2025 23:17:13 +0530
Labels:           name=ghanshyam
                  pod-template-hash=54685f4666
Annotations:      <none>
Status:           Running
IP:               10.244.1.216
IPs:
  IP:           10.244.1.216
Controlled By:  ReplicaSet/boss-deployment-54685f4666
Containers:
  nginx-container:
    Container ID:   containerd://59fc2505cbb260d446caef80d51508f5814f96cd590ba195620f608ce4b0d848
    Image:          nginx
```

21) Now lets update image on yaml



kubectl apply -f deployment.yaml

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl apply -f deployment.yaml
deployment.apps/boss-deployment configured
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

22) **kubectl get deployment**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get deployment
NAME              READY   UP-TO-DATE   AVAILABLE   AGE
boss-deployment   5/5     5            5           24m
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

23) **kubectl get rs**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get rs
NAME                         DESIRED   CURRENT   READY   AGE
boss-deployment-54685f4666   0         0         0       25m
boss-deployment-6c76969dff   5         5         5       2m26s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

Here it shows that old replica set has 0 but new rs has 5

24) **kubectl get pods**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
boss-deployment-6c76969dff-4ffkg  1/1     Running   0          5m41s
boss-deployment-6c76969dff-ff4cr  1/1     Running   0          5m34s
boss-deployment-6c76969dff-g8jsb  1/1     Running   0          5m41s
boss-deployment-6c76969dff-jbhpx  1/1     Running   0          5m34s
boss-deployment-6c76969dff-xjskd  1/1     Running   0          5m41s
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER>
```

25) **kubectl describe pod boss-deployment-6c76969dff-4ffkg**

```
PS C:\4) KUBERNETES\6) 09 November Kubernetes\CONTROLLER> kubectl describe pod boss-deployment-6c76969dff-4ffkg
Name:             boss-deployment-6c76969dff-4ffkg
Namespace:        default
Priority:         0
Service Account:  default
Node:             aks-agentpool-10692884-vmss000004/10.224.0.4
Start Time:       Sat, 04 Jan 2025 23:39:56 +0530
Labels:           name=ghanshyam
                  pod-template-hash=6c76969dff
Annotations:      <none>
Status:           Running
IP:               10.244.1.150
IPs:
  IP:           10.244.1.150
Controlled By:  ReplicaSet/boss-deployment-6c76969dff
Containers:
  nginx-container:
    Container ID:   containerd://c7e96dbaaf7394f263bb9c5b8c03bf1d5124342223161d2c59d09f23f5bec17c
    Image:          nginx:stable-perl
```

26) SEARCH = kubectl lens

27) ROLLING UPDATE = when we update image in yaml and when we apply then in new replica set pod updates or transfers one by one. So no downtime comes in it.

28)