DevOps

Day – 4

Assignment

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1.Namespace

A Namespace is a logical partition within a Kubernetes cluster.

It allows you to divide resources like Pods, Services, and Deployments into different environments (e.g., dev, test, prod).

Think of it as a virtual cluster inside the physical Kubernetes cluster.

Useful for managing large projects with multiple teams.

2. Replica

A Replica ensures that a specified number of identical Pods are running in your cluster.

If a Pod fails, Kubernetes automatically replaces it using replicas to maintain the desired state.

It provides scalability and fault tolerance.

3. Pod

A **Pod** is the smallest deployable unit in Kubernetes.

It contains one or more containers (e.g., Docker containers).

Containers in a Pod share the same network namespace, storage, and lifecycle.

4. Deployment

A Deployment manages the creation and scaling of Pods using ReplicaSets.

It provides automated rollouts and rollbacks.

It ensures your application is always available by managing its state.

Namespace (short name = ns):

namespace is a virtual cluster or logical partition within a cluster that provides a way to organize and isolate resources. It allows multiple teams or projects to share the same physical cluster while maintaining resource separation and access control.

To create a namespace:

$ kubectl create namespace <namespace-name>

$ kubectl create ns my-bank

To switch to a specific namespace: (make this as default type)

$ kubectl config set-context --current --namespace=<namespace-name>

To list all namespaces:

$ kubectl get namespaces

To get resources within a specific namespace:

$ kubectl get <resource-type> -n <namespace-name>

$ kubectl get deploy -n my-bank

$ kubectl get deploy --namespace my-bank

$ kubectl get all --namespace my-bank

To delete a namespace and all associated resources:

$ kubectl delete namespace <namespace-name>

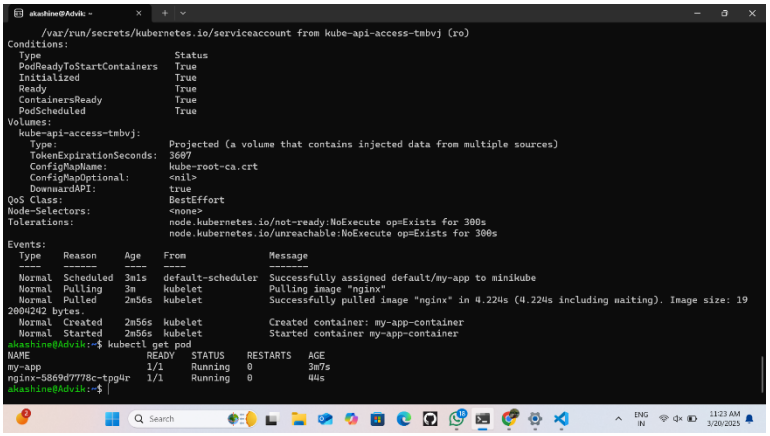
$ kubectl delete ns my-bank

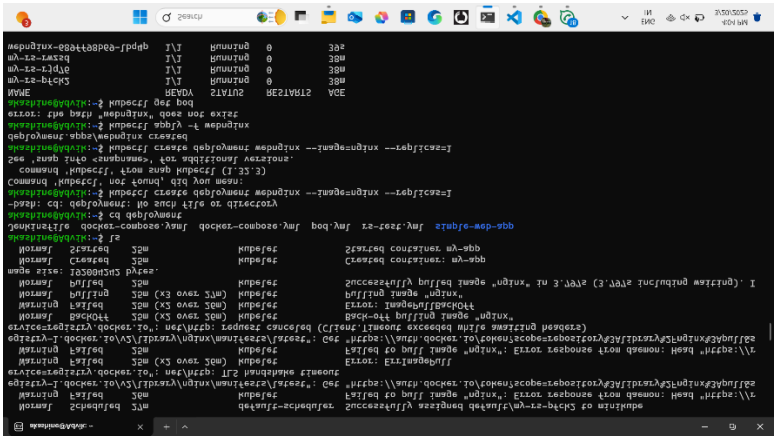
kubectl create ns mydeploy

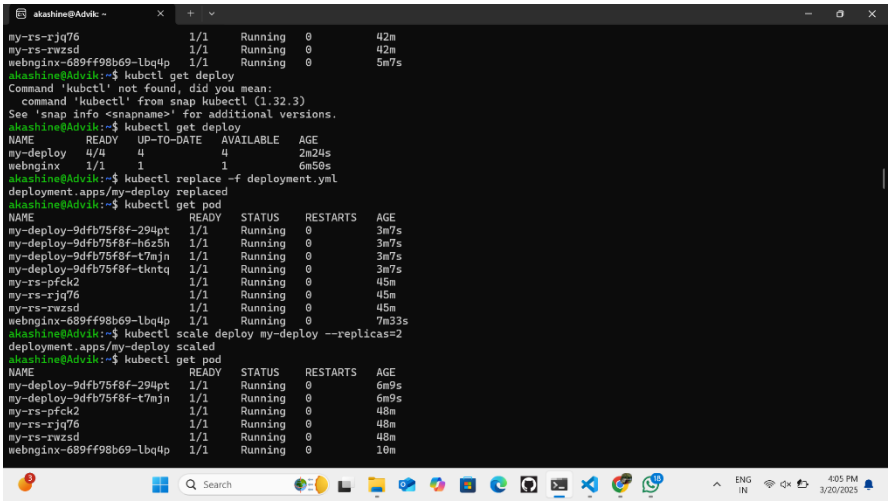
kubectl apply -f deploy.yml -n mydeploy

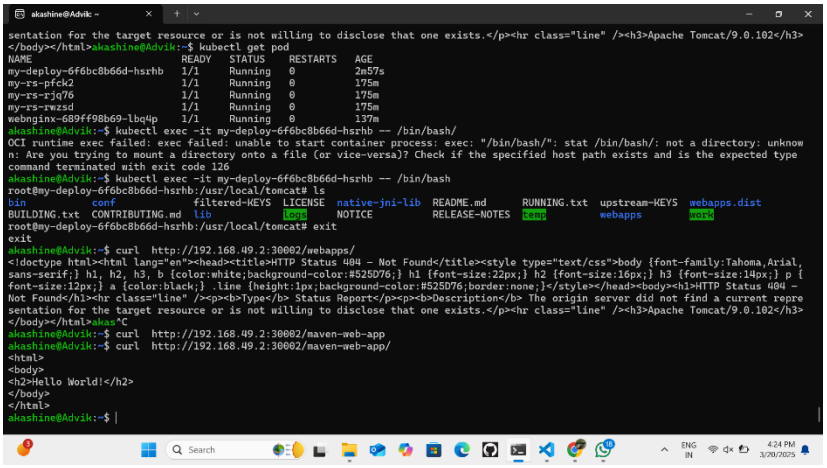
```
apiVersion: v1
kind: Namespace
metadata:
  name: my-demo-ns
```

```
apiVersion: v1
kind: Pod
metadata:
  name: my-pod
  namespace: my-demo-ns
spec:
  containers:
  - name: my-container
    image: nginx:latest
```

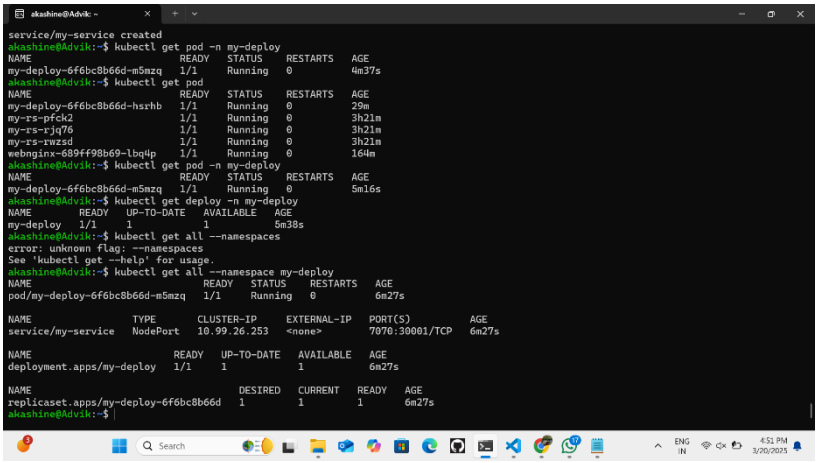

/var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-tmbvj (ro)
Conditions:
Type Status
PodReadyToStartContainers True
Initialized True
Ready True
ContainersReady True
PodScheduled True
Volumes:
kube-api-access-tmbvj:
Type: Projected (a volume that contains injected data from multiple sources)
TokenExpirationSeconds: 3607
ConfigMapName: kube-root-ca.crt
ConfigMapOptional: <nil>
DownwardAPI: true
QoS Class: BestEffort
Node-Selectors: <none>
Tolerations: node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
Type Reason Age From Message
Normal Scheduled 3m1s default-scheduler Successfully assigned default/my-app to minikube
Normal Pulling 3m kubelet Pulling image "nginx"
Normal Pulled 2m56s kubelet Successfully pulled image "nginx" in 4.224s (4.224s including waiting). Image size: 19
Normal Created 2m56s kubelet Created container: my-app-container
Normal Started 2m56s kubelet Started container my-app-container
akashine@Advik:~$ kubectl get pod
NAME READY STATUS RESTARTS AGE
my-app 1/1 Running 0 3m7s
nginx-5869d7778c-tpg4r 1/1 Running 0 44s
akashine@Advik:~$




my-rs-rjq76 1/1 Running 0 42m
my-rs-rwzsd 1/1 Running 0 42m
webnginx-689ff98b69-lbq4p 1/1 Running 0 5m7s
akashine@Advik:~$ kubctl get deploy
Command 'kubctl' not found, did you mean:
command 'kubectl' from snap kubectl (1.32.3)
See 'snap info <snapname>' for additional versions.
akashine@Advik:~$ kubectl get deploy
NAME READY UP-TO-DATE AVAILABLE AGE
my-deploy 4/4 4 4 2m24s
webnginx 1/1 1 1 6m50s
akashine@Advik:~$ kubectl replace -f deployment.yml
deployment.apps/my-deploy replaced
akashine@Advik:~$ kubectl get pod
NAME READY STATUS RESTARTS AGE
my-deploy-9dfb75f8f-294pt 1/1 Running 0 3m7s
my-deploy-9dfb75f8f-h6z5h 1/1 Running 0 3m7s
my-deploy-9dfb75f8f-t7mjn 1/1 Running 0 3m7s
my-deploy-9dfb75f8f-tkntq 1/1 Running 0 3m7s
my-rs-pfck2 1/1 Running 0 45m
my-rs-rjq76 1/1 Running 0 45m
my-rs-rwzsd 1/1 Running 0 45m
webnginx-689ff98b69-lbq4p 1/1 Running 0 7m33s
akashine@Advik:~$ kubectl scale deploy my-deploy --replicas=2
deployment.apps/my-deploy scaled
akashine@Advik:~$ kubectl get pod
NAME READY STATUS RESTARTS AGE
my-deploy-9dfb75f8f-294pt 1/1 Running 0 6m9s
my-deploy-9dfb75f8f-t7mjn 1/1 Running 0 6m9s
my-rs-pfck2 1/1 Running 0 48m
my-rs-rjq76 1/1 Running 0 48m
my-rs-rwzsd 1/1 Running 0 48m
webnginx-689ff98b69-lbq4p 1/1 Running 0 10m



Namespace



Namespace yaml