Lab Exercise 11- Deployments with Rolling Update and Recreate Strategies

Understand how to use the rolling update and recreate strategies for deploying applications using Kubernetes Deployments.

Step 1: Create a Deployment with Rolling Update Strategy

Create a YAML file for the deployment:

Create a file named **nginx-deployment-rolling.yaml** with the following content:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment-rolling
spec:
  replicas: 10
  minReadySeconds: 10
  selector:
    matchLabels:
      app: web
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxUnavailable: 1
      maxSurge: 5
  template:
    metadata:
      labels:
```

```yaml
    app: web
  spec:
    containers:
    - name: nginx
      image: hkshitesh/kubedemo:1.0
      ports:
      - containerPort: 80
```

```
Windows PowerShell
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PS C:\Users\namit> notepad nginx-deployment-rolling.yaml
PS C:\Users\namit>
```

```
File    Edit    View

apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment-rolling
spec:
  replicas: 10
  minReadySeconds: 10
  selector:
    matchLabels:
      app: web
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxUnavailable: 1
      maxSurge: 5
  template:
    metadata:
      labels:
        app: web
    spec:
      containers:
      - name: nginx
        image: hkshitesh/kubedemo:1.0
        ports:
        - containerPort: 80
|
```

Apply the deployment:

```
kubectl apply -f nginx-deployment-rolling.yaml ; watch "kubectl get rs -o wide"
```

```
PS C:\Users\namit> kubectl apply -f nginx-deployment-rolling.yaml
deployment.apps/nginx-deployment-rolling created
PS C:\Users\namit>
```

```
PS C:\Users\namit> while ($true) {
>>    kubectl get rs -o wide
>>    Start-Sleep 2
>> }
NAME                               DESIRED  CURRENT  READY  AGE  CONTAINERS  IMAGES                     SELECTOR
nginx-deployment-rolling-7bcd6f8d5  10       10       10     80s  nginx       hkshitesh/kubedemo:1.0     app=web,pod-template-hash=7bcd6f8d5
NAME                               DESIRED  CURRENT  READY  AGE  CONTAINERS  IMAGES                     SELECTOR
nginx-deployment-rolling-7bcd6f8d5  10       10       10     83s  nginx       hkshitesh/kubedemo:1.0     app=web,pod-template-hash=7bcd6f8d5
NAME                               DESIRED  CURRENT  READY  AGE  CONTAINERS  IMAGES                     SELECTOR
nginx-deployment-rolling-7bcd6f8d5  10       10       10     85s  nginx       hkshitesh/kubedemo:1.0     app=web,pod-template-hash=7bcd6f8d5
NAME                               DESIRED  CURRENT  READY  AGE  CONTAINERS  IMAGES                     SELECTOR
nginx-deployment-rolling-7bcd6f8d5  10       10       10     87s  nginx       hkshitesh/kubedemo:1.0     app=web,pod-template-hash=7bcd6f8d5
NAME                               DESIRED  CURRENT  READY  AGE  CONTAINERS  IMAGES                     SELECTOR
nginx-deployment-rolling-7bcd6f8d5  10       10       10     90s  nginx       hkshitesh/kubedemo:1.0     app=web,pod-template-hash=7bcd6f8d5
```

Verify the deployment:

kubectl get deployments

kubectl get pods -l app=web

```
PS C:\Users\namit> kubectl get deployments
NAME                      READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-rolling  10/10   10           10          2m44s
PS C:\Users\namit>
```

```
PS C:\Users\namit> kubectl get pods -l app=web
NAME                                     READY   STATUS    RESTARTS   AGE
nginx-deployment-rolling-7bcd6f8d5-4lvv6  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-8l7hh  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-gfjcl  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-hpl92  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-mkzl9  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-pbbkt  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-s2cg4  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-spkst  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-vh67h  1/1     Running   0          3m18s
nginx-deployment-rolling-7bcd6f8d5-vtf6c  1/1     Running   0          3m18s
PS C:\Users\namit>
```

Update the deployment to a new image:

kubectl set image deployment/nginx-deployment-rolling nginx= hkshitesh/kubedemo:2.0

```
PS C:\Users\namit> kubectl set image deployment/nginx-deployment-rolling nginx=hkshitesh/kubedemo:2.0
deployment.apps/nginx-deployment-rolling image updated
PS C:\Users\namit>
```

Monitor the rolling update:

kubectl rollout status deployment nginx-deployment-rolling

```
PS C:\Users\namit> kubectl rollout status deployment nginx-deployment-rolling
deployment "nginx-deployment-rolling" successfully rolled out
PS C:\Users\namit>
```

Verify the updated pods:

kubectl get pods -l app=web -o wide

```
PS C:\Users\namit> kubectl get pods -l app=web -o wide
NAME                                        READY   STATUS    RESTARTS   AGE   IP          NODE            NOMINATED NODE   READINESS GATES
nginx-deployment-rolling-5b4cb9c47d-4zgjw   1/1     Running   0          81s   10.1.0.25   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-6mzkx   1/1     Running   0          50s   10.1.0.32   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-6trv2   1/1     Running   0          48s   10.1.0.33   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-f2xkr   1/1     Running   0          81s   10.1.0.24   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-ng4x8   1/1     Running   0          52s   10.1.0.31   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-pg7rd   1/1     Running   0          81s   10.1.0.28   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-rj9hp   1/1     Running   0          81s   10.1.0.26   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-s4wd7   1/1     Running   0          55s   10.1.0.30   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-tsvds   1/1     Running   0          81s   10.1.0.29   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-wz7nl   1/1     Running   0          81s   10.1.0.27   docker-desktop  <none>           <none>
PS C:\Users\namit>
```

Step 2: Create a Deployment with Recreate Strategy

Create a YAML file for the deployment:

Create a file named **nginx-deployment-recreate.yaml** with the following content:

apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment-recreate
spec:

```yaml
replicas: 10
selector:
 matchLabels:
   app: web
strategy:
 type: Recreate
template:
 metadata:
  labels:
    app: web
 spec:
  containers:
  - name: nginx
    image: nginx:  hkshitesh/kubedemo:1.0
    ports:
    - containerPort: 80
```

```
PS C:\Users\namit> notepad nginx-deployment-recreate.yaml
PS C:\Users\namit>
```

```
File     Edit     View

apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment-recreate
spec:
  replicas: 10
  selector:
    matchLabels:
      app: web
  strategy:
    type: Recreate
  template:
    metadata:
      labels:
        app: web
    spec:
      containers:
      - name: nginx
        image: nginx: hkshitesh/kubedemo:1.0
        ports:
        - containerPort: 80
```

Apply the deployment:

```
kubectl apply -f nginx-deployment-recreate.yaml ; watch "kubectl get rs -o wide"
```

```
PS C:\Users\namit>  kubectl apply -f nginx-deployment-recreate.yaml
deployment.apps/nginx-deployment-recreate created
PS C:\Users\namit>
```

```
PS C:\Users\namit> while ($true) {
>>    kubectl get rs -o wide
>>    Start-Sleep 2
>> }
NAME                               DESIRED  CURRENT  READY  AGE    CONTAINERS  IMAGES                  SELECTOR
nginx-deployment-recreate-7bcd6f8d5  10       10       10     75s    nginx       hkshitesh/kubedemo:1.0  app=web,pod-template-hash=7bcd6f8d5
nginx-deployment-rolling-5b4cb9c47d  10       10       10     8m13s  nginx       hkshitesh/kubedemo:2.0  app=web,pod-template-hash=5b4cb9c47d
nginx-deployment-rolling-7bcd6f8d5   0        0        0      12m    nginx       hkshitesh/kubedemo:1.0  app=web,pod-template-hash=7bcd6f8d5
NAME                               DESIRED  CURRENT  READY  AGE    CONTAINERS  IMAGES                  SELECTOR
nginx-deployment-recreate-7bcd6f8d5  10       10       10     77s    nginx       hkshitesh/kubedemo:1.0  app=web,pod-template-hash=7bcd6f8d5
nginx-deployment-rolling-5b4cb9c47d  10       10       10     8m15s  nginx       hkshitesh/kubedemo:2.0  app=web,pod-template-hash=5b4cb9c47d
nginx-deployment-rolling-7bcd6f8d5   0        0        0      12m    nginx       hkshitesh/kubedemo:1.0  app=web,pod-template-hash=7bcd6f8d5
NAME                               DESIRED  CURRENT  READY  AGE    CONTAINERS  IMAGES                  SELECTOR
nginx-deployment-recreate-7bcd6f8d5  10       10       10     79s    nginx       hkshitesh/kubedemo:1.0  app=web,pod-template-hash=7bcd6f8d5
nginx-deployment-rolling-5b4cb9c47d  10       10       10     8m17s  nginx       hkshitesh/kubedemo:2.0  app=web,pod-template-hash=5b4cb9c47d
nginx-deployment-rolling-7bcd6f8d5   0        0        0      12m    nginx       hkshitesh/kubedemo:1.0  app=web,pod-template-hash=7bcd6f8d5
```

Verify the deployment:

kubectl get deployments

kubectl get pods -l app=nginx-recreate

```
PS C:\Users\namit> kubectl get deployments
NAME                      READY    UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-recreate  10/10    10           10          118s
nginx-deployment-rolling   10/10    10           10          13m
PS C:\Users\namit>
```

```
PS C:\Users\namit> kubectl get pods -l app=web
NAME                                       READY   STATUS    RESTARTS   AGE
nginx-deployment-recreate-7bcd6f8d5-76wjq  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-8q5pk  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-dnr8d  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-dwdv8  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-lzx8h  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-mqndv  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-mvwck  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-v56kf  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-vpwmn  1/1     Running   0          3m44s
nginx-deployment-recreate-7bcd6f8d5-zzh87  1/1     Running   0          3m44s
nginx-deployment-rolling-5b4cb9c47d-4zgjw  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-6mzkx  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-6trv2  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-f2xkr  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-ng4x8  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-pg7rd  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-rj9hp  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-s4wd7  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-tsvds  1/1     Running   0          10m
nginx-deployment-rolling-5b4cb9c47d-wz7nl  1/1     Running   0          10m
PS C:\Users\namit>
```

Update the deployment to a new image:

```
kubectl set image deployment/nginx-deployment-recreate nginx=nginx:1.21.1
```

```
PS C:\Users\namit> kubectl set image deployment/nginx-deployment-recreate nginx=nginx:1.21.1
deployment.apps/nginx-deployment-recreate image updated
```

Monitor the update:

```
kubectl rollout status deployment nginx-deployment-recreate
```

```
PS C:\Users\namit> kubectl rollout status deployment nginx-deployment-recreate
deployment "nginx-deployment-recreate" successfully rolled out
PS C:\Users\namit>
```

Verify the updated pods:

```
kubectl get pods -l app=nginx-recreate -o wide
```

```
PS C:\Users\namit> kubectl get pods -l app=web -o wide
NAME                                          READY   STATUS    RESTARTS   AGE    IP          NODE            NOMINATED NODE   READINESS GATES
nginx-deployment-recreate-56f9b8db5f-2q575    1/1     Running   0          4m35s  10.1.0.49   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-5xgmw    1/1     Running   0          4m35s  10.1.0.50   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-cr5dc    1/1     Running   0          4m35s  10.1.0.47   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-hbfvx    1/1     Running   0          4m35s  10.1.0.53   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-ks6ft    1/1     Running   0          4m35s  10.1.0.45   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-p2h9f    1/1     Running   0          4m35s  10.1.0.48   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-p6nb9    1/1     Running   0          4m35s  10.1.0.44   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-pcv2q    1/1     Running   0          4m35s  10.1.0.52   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-wwd22    1/1     Running   0          4m35s  10.1.0.46   docker-desktop  <none>           <none>
nginx-deployment-recreate-56f9b8db5f-zcn25    1/1     Running   0          4m35s  10.1.0.51   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-4zgjw     1/1     Running   0          51m    10.1.0.25   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-6mzkx     1/1     Running   0          50m    10.1.0.32   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-6trv2     1/1     Running   0          50m    10.1.0.33   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-f2xkr     1/1     Running   0          51m    10.1.0.24   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-ng4x8     1/1     Running   0          51m    10.1.0.31   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-pg7rd     1/1     Running   0          51m    10.1.0.28   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-rj9hp     1/1     Running   0          51m    10.1.0.26   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-s4wd7     1/1     Running   0          51m    10.1.0.30   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-tsvds     1/1     Running   0          51m    10.1.0.29   docker-desktop  <none>           <none>
nginx-deployment-rolling-5b4cb9c47d-wz7nl     1/1     Running   0          51m    10.1.0.27   docker-desktop  <none>           <none>
PS C:\Users\namit>
```

Step 3: Clean Up

Delete the deployments:

```
kubectl delete deployment nginx-deployment-rolling
kubectl delete deployment nginx-deployment-recreate
```

```
PS C:\Users\namit> kubectl delete deployment nginx-deployment-rolling
deployment.apps "nginx-deployment-rolling" deleted
PS C:\Users\namit> kubectl delete deployment nginx-deployment-recreate
deployment.apps "nginx-deployment-recreate" deleted
PS C:\Users\namit>
```

Verify that all resources are cleaned up:

```
kubectl get deployments

kubectl get pods -l app=nginx

kubectl get pods -l app=nginx-recreate
```

```
PS C:\Users\namit> kubectl get deployments
No resources found in default namespace.
PS C:\Users\namit> kubectl get pods -l app=nginx
No resources found in default namespace.
PS C:\Users\namit> kubectl get pods -l app=nginx-recreate
No resources found in default namespace.
PS C:\Users\namit>
```