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:
```

```
    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\Devanshi\Desktop\lab_8> kubectl apply -f nginx-deployment-rolling.yaml
deployment.apps/nginx-deployment-rolling unchanged
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get rs -o wide
NAME                                 DESIRED   CURRENT   READY   AGE   CONTAINERS   IMAGES                      SELECTOR
nginx-deployment-rolling-8465d4f6c7  10        10        3       28s   nginx        hkshitesh/kubedemo:1.0      app=web,po
d-template-hash=8465d4f6c7
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get rs -o wide
NAME                                 DESIRED   CURRENT   READY   AGE   CONTAINERS   IMAGES                      SELECTOR
nginx-deployment-rolling-8465d4f6c7  10        10        4       33s   nginx        hkshitesh/kubedemo:1.0      app=web,po
d-template-hash=8465d4f6c7
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get rs -o wide
NAME                                 DESIRED   CURRENT   READY   AGE   CONTAINERS   IMAGES                      SELECTOR
nginx-deployment-rolling-8465d4f6c7  10        10        10      63s   nginx        hkshitesh/kubedemo:1.0      app=web,po
d-template-hash=8465d4f6c7
```

Verify the deployment:

```
kubectl get deployments
kubectl get pods -l app=web
```

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get deployments
NAME                       READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-rolling   10/10   10           10          80s
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get pods -l app=web
NAME                                        READY   STATUS    RESTARTS   AGE
nginx-deployment-rolling-8465d4f6c7-5jtbb   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-5ww67   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-6tpg2   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-7trf7   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-9xvg7   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-bbtr5   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-bmw8x   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-gf5ln   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-phhzh   1/1     Running   0          89s
nginx-deployment-rolling-8465d4f6c7-sqx5g   1/1     Running   0          89s
```

Update the deployment to a new image:

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

Monitor the rolling update:

```
kubectl rollout status deployment nginx-deployment-rolling
```

Verify the updated pods:

```
kubectl get pods -l app=web -o wide
```

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl set image deployment/nginx-deployment-rolling nginx= hkshitesh/kubedemo:2.0
error: all resources must be specified before image changes: hkshitesh/kubedemo:2.0
PS C:\Users\Devanshi\Desktop\lab_8> kubectl set image deployment/nginx-deployment-rolling nginx=hkshitesh/kubedemo:2.0
deployment.apps/nginx-deployment-rolling image updated
PS C:\Users\Devanshi\Desktop\lab_8> kubectl rollout status deployment nginx-deployment-rolling
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 6 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 7 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 8 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 out of 10 new replicas have been updated...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 4 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 4 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 4 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 4 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 of 10 updated replicas are available...
deployment "nginx-deployment-rolling" successfully rolled out
```

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:
 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"
this context
PS C:\Users\Devanshi\Desktop\lab_8> kubectl apply -f nginx-deployment-recreate.yaml
deployment.apps/nginx-deployment-recreate created
```

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get rs -o wide
NAME                                    DESIRED  CURRENT  READY  AGE    CONTAINERS  IMAGES                        SELECTOR
nginx-deployment-recreate-697bbfd995    10       10       0      11s    nginx       nginx:hkshitesh/kubedemo:1.0  app=web,pod-te
mplate-hash=697bbfd995
nginx-deployment-rolling-565c77f48b     10       10       10     2m45s  nginx       hkshitesh/kubedemo:2.0        app=web,pod-te
mplate-hash=565c77f48b
nginx-deployment-rolling-8465d4f6c7     0        0        0      4m58s  nginx       hkshitesh/kubedemo:1.0        app=web,pod-te
mplate-hash=8465d4f6c7
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get rs -o wide
NAME                                    DESIRED  CURRENT  READY  AGE    CONTAINERS  IMAGES                        SELECTOR
nginx-deployment-recreate-697bbfd995    10       10       0      15s    nginx       nginx:hkshitesh/kubedemo:1.0  app=web,pod-te
mplate-hash=697bbfd995
nginx-deployment-rolling-565c77f48b     10       10       10     2m49s  nginx       hkshitesh/kubedemo:2.0        app=web,pod-te
mplate-hash=565c77f48b
nginx-deployment-rolling-8465d4f6c7     0        0        0      5m2s   nginx       hkshitesh/kubedemo:1.0        app=web,pod-te
mplate-hash=8465d4f6c7
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get rs -o wide
NAME                                    DESIRED  CURRENT  READY  AGE    CONTAINERS  IMAGES                        SELECTOR
nginx-deployment-recreate-697bbfd995    10       10       0      17s    nginx       nginx:hkshitesh/kubedemo:1.0  app=web,pod-te
mplate-hash=697bbfd995
nginx-deployment-rolling-565c77f48b     10       10       10     2m51s  nginx       hkshitesh/kubedemo:2.0        app=web,pod-te
mplate-hash=565c77f48b
nginx-deployment-rolling-8465d4f6c7     0        0        0      5m4s   nginx       hkshitesh/kubedemo:1.0        app=web,pod-te
mplate-hash=8465d4f6c7
PS C:\Users\Devanshi\Desktop\lab_8>
```

Verify the deployment:

kubectl get deployments

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get deployments
NAME                        READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-recreate   0/10    10           0           59s
nginx-deployment-rolling    10/10   10           10          5m46s
```

kubectl get pods -l app=nginx-recreate

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get pods -l app=web
NAME                                         READY   STATUS             RESTARTS   AGE
nginx-deployment-recreate-697bbfd995-9lwgm   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-9p5vq   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-f57k8   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-qrdkg   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-r76l8   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-rxvdh   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-v9t65   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-vf9mj   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-xjmdh   0/1     InvalidImageName   0          107s
nginx-deployment-recreate-697bbfd995-zvx29   0/1     InvalidImageName   0          107s
nginx-deployment-rolling-565c77f48b-48d5f    1/1     Running            0          3m54s
nginx-deployment-rolling-565c77f48b-5hd8k    1/1     Running            0          4m21s
nginx-deployment-rolling-565c77f48b-7m9wf    1/1     Running            0          4m21s
nginx-deployment-rolling-565c77f48b-8zx9m    1/1     Running            0          4m21s
nginx-deployment-rolling-565c77f48b-9bz89    1/1     Running            0          4m2s
nginx-deployment-rolling-565c77f48b-ckbw2    1/1     Running            0          4m21s
nginx-deployment-rolling-565c77f48b-fcs9r    1/1     Running            0          3m58s
nginx-deployment-rolling-565c77f48b-gkvht    1/1     Running            0          4m21s
nginx-deployment-rolling-565c77f48b-p58tt    1/1     Running            0          3m50s
nginx-deployment-rolling-565c77f48b-s2lwk    1/1     Running            0          4m21s
```

Update the deployment to a new image:

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

Monitor the update:

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

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl set image deployment/nginx-deployment-recreate nginx=nginx:1.21.1
deployment.apps/nginx-deployment-recreate image updated
PS C:\Users\Devanshi\Desktop\lab_8> kubectl rollout status deployment nginx-deployment-recreate
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 0 of 10 updated replicas are available..
```

Verify the updated pods:

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

```
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get pods -l app=web -o wide
NAME                                           READY   STATUS             RESTARTS   AGE     IP            NODE              NOMINATED N
ODE    READINESS GATES
nginx-deployment-recreate-545f8dfd5f-2mtlk     0/1     ImagePullBackOff   0          5m17s   10.244.1.46   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-4rz45     0/1     ImagePullBackOff   0          5m17s   10.244.1.47   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-6gjfn     0/1     ImagePullBackOff   0          5m17s   10.244.1.42   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-b4j9z     0/1     ImagePullBackOff   0          5m17s   10.244.1.41   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-df9b6     0/1     ImagePullBackOff   0          5m17s   10.244.1.44   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-hr8rv     0/1     ImagePullBackOff   0          5m17s   10.244.1.45   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-k54kl     0/1     ErrImagePull       0          5m17s   10.244.1.48   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-kmx76     0/1     ImagePullBackOff   0          5m17s   10.244.1.50   desktop-worker    <nene>
       <none>
nginx-deployment-recreate-545f8dfd5f-mvvbc     0/1     ImagePullBackOff   0          5m17s   10.244.1.43   desktop-worker    <none>
       <none>
nginx-deployment-recreate-545f8dfd5f-w4bhs     0/1     ErrImagePull       0          5m17s   10.244.1.49   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-48d5f      1/1     Running            0          10m     10.244.1.29   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-5hd8k      1/1     Running            0          10m     10.244.1.21   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-7m9wf      1/1     Running            0          10m     10.244.1.25   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-8zx9m      1/1     Running            0          10m     10.244.1.22   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-9bz89      1/1     Running            0          10m     10.244.1.27   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-ckbw2      1/1     Running            0          10m     10.244.1.24   desktop-worker    <none>
       <none>
nginx-deployment-rolling-565c77f48b-fcs9r      1/1     Running            0          10m     10.244.1.28   desktop-worker    <none>
```

Step 3: Clean Up

Delete the deployments:

kubectl delete deployment nginx-deployment-rolling

kubectl delete deployment nginx-deployment-recreate

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\Devanshi\Desktop\lab_8> kubectl delete deployment nginx-deployment-rolling
deployment.apps "nginx-deployment-rolling" deleted
PS C:\Users\Devanshi\Desktop\lab_8> kubectl delete deployment nginx-deployment-recreate
deployment.apps "nginx-deployment-recreate" deleted
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get deployments
No resources found in default namespace.
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get pods -l app=my-app
No resources found in default namespace.
PS C:\Users\Devanshi\Desktop\lab_8> kubectl get pods -l app=web
NAME                                          READY    STATUS        RESTARTS    AGE
nginx-deployment-recreate-545f8dfd5f-k54kl    0/1      Terminating   0           6m47s
PS C:\Users\Devanshi\Desktop\lab_8>
```