

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 D:\Coding\ClassWork> kubectl get rs -o wide -w
NAME          DESIRED   CURRENT   READY   AGE   CONTAINERS   IMAGES
nginx-deployment-rolling-85cf8767cc   10        10        10     2m20s   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc

```

Verify the deployment:

```
kubectl get deployments
```

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

```

PS D:\Coding\ClassWork> kubectl get deployments
● NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-rolling   10/10   10           10          2m57s
PS D:\Coding\ClassWork> kubectl get pods -l app=web
● NAME                  READY   STATUS    RESTARTS   AGE
nginx-deployment-rolling-85cf8767cc-7q4v5   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-8phk7   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-bb9x2   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-cg4j4   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-dw64s   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-kqn19   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-l2tzj   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-tt5r5   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-vzq5x   1/1     Running   0          2m57s
nginx-deployment-rolling-85cf8767cc-xk5bj   1/1     Running   0          2m57s
PS D:\Coding\ClassWork>

```

Update the deployment to a new image:

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

```
PS D:\Coding\ClassWork> kubectl set image deployment/nginx-deployment-rolling nginx=hkshitesh/kubedemo:2.0
deployment.apps/nginx-deployment-rolling image updated
```

Monitor the rolling update:

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

```
PS D:\Coding\ClassWork> 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: 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...
```

Verify the updated pods:

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

```
PS D:\Coding\ClassWork> kubectl get pods -l app=web -o wide
NAME                      READY   STATUS    RESTARTS   AGE     IP           NODE      NOMINATED NODE   READINESS GATES
nginx-deployment-rolling-8587c95656-2xqss  1/1    Running   0          48s    10.244.0.29  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-2z6g8  1/1    Running   0          68s    10.244.0.27  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-8rp6q  1/1    Running   0          69s    10.244.0.26  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-f5vcg  1/1    Running   0          69s    10.244.0.28  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-hpntg  1/1    Running   0          42s    10.244.0.30  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-nvrmr  1/1    Running   0          37s    10.244.0.32  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-q9xmn  1/1    Running   0          69s    10.244.0.24  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-rpt4t  1/1    Running   0          39s    10.244.0.31  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-swhk4  1/1    Running   0          69s    10.244.0.23  kind-control-plane  <none>    <none>
nginx-deployment-rolling-8587c95656-t7dqx  1/1    Running   0          69s    10.244.0.25  kind-control-plane  <none>    <none>
```

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"
```

```

PS D:\Coding\ClassWork> kubectl apply -f nginx-deployment-recreate.yaml ; kubectl get rs -o wide -w
deployment.apps/nginx-deployment-recreate created
NAME           DESIRED   CURRENT   READY   AGE     CONTAINERS   IMAGES
nginx-deployment-recreate-85cf8767cc  10        10        0       0s     nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-rolling-8587c95656   10        10        10      2m57s   nginx       hkshitesh/kubedemo:2.0   app=web,pod-template-hash=8587c95656
nginx-deployment-rolling-85cf8767cc   0         0         0       6m34s   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        1       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        2       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        3       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        4       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        5       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        6       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        7       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        8       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        9       <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc
nginx-deployment-recreate-85cf8767cc  10        10        10      <invalid>   nginx       hkshitesh/kubedemo:1.0   app=web,pod-template-hash=85cf8767cc

```

Verify the deployment:

```
kubectl get deployments
```

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

NAME	READY	STATUS	RESTARTS	AGE
nginx-deployment-recreate-85cf8767cc-92jbn	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-9sgp8	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-d4645	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-j48vf	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-j8x7t	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-kg5qp	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-nhlkm	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-pjqtt	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-t2mw7	1/1	Running	0	48s
nginx-deployment-recreate-85cf8767cc-xpbhz	1/1	Running	0	48s
nginx-deployment-rolling-8587c95656-2xqss	1/1	Running	0	3m24s
nginx-deployment-rolling-8587c95656-2z6g8	1/1	Running	0	3m44s
nginx-deployment-rolling-8587c95656-8rp6q	1/1	Running	0	3m45s
nginx-deployment-rolling-8587c95656-f5vcg	1/1	Running	0	3m45s
nginx-deployment-rolling-8587c95656-hpntg	1/1	Running	0	3m18s
nginx-deployment-rolling-8587c95656-nvmrg	1/1	Running	0	3m13s
nginx-deployment-rolling-8587c95656-q9xmn	1/1	Running	0	3m45s
nginx-deployment-rolling-8587c95656-rpt4t	1/1	Running	0	3m15s
nginx-deployment-rolling-8587c95656-swhk4	1/1	Running	0	3m45s
nginx-deployment-rolling-8587c95656-t7dqx	1/1	Running	0	3m45s

Update the deployment to a new image:

```
PS D:\Coding\ClassWork> 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 D:\Coding\ClassWork> kubectl rollout status deployment nginx-deployment-recreate
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 1 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 2 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 3 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 4 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 5 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 6 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 7 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 8 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 9 of 10 updated replicas are available...
deployment "nginx-deployment-recreate" successfully rolled out
```

Verify the updated pods:

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

NAME	READY	STATUS	RESTARTS	AGE	IP	NODE	NOMINATED NODE	READINESS GATES
nginx-deployment-recreate-8755c7cc9-2f2t5	1/1	Running	0	80s	10.244.0.45	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-9dtwk	1/1	Running	0	80s	10.244.0.51	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-bzcc9	1/1	Running	0	80s	10.244.0.49	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-kpnnp2	1/1	Running	0	80s	10.244.0.44	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-mzm14	1/1	Running	0	80s	10.244.0.47	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-n4l6c	1/1	Running	0	80s	10.244.0.46	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-txd24	1/1	Running	0	80s	10.244.0.43	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-x95vg	1/1	Running	0	80s	10.244.0.48	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-z8574	1/1	Running	0	80s	10.244.0.50	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-zcjhg	1/1	Running	0	80s	10.244.0.52	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-2xqss	1/1	Running	0	4m57s	10.244.0.29	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-2z6g8	1/1	Running	0	5m17s	10.244.0.27	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-8rp6q	1/1	Running	0	5m18s	10.244.0.26	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-f5vcg	1/1	Running	0	5m18s	10.244.0.28	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-hptng	1/1	Running	0	4m51s	10.244.0.30	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-nvrmg	1/1	Running	0	4m46s	10.244.0.32	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-q9xmn	1/1	Running	0	5m18s	10.244.0.24	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-rpt4t	1/1	Running	0	4m48s	10.244.0.31	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-swhk4	1/1	Running	0	5m18s	10.244.0.23	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-t7dqx	1/1	Running	0	5m18s	10.244.0.25	kind-control-plane	<none>	<none>

Step 3: Clean Up

Delete the deployments:

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

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

```
PS D:\Coding\ClassWork> kubectl delete deployment nginx-deployment-rolling
deployment.apps "nginx-deployment-rolling" deleted from default namespace
PS D:\Coding\ClassWork> kubectl delete deployment nginx-deployment-recreate
deployment.apps "nginx-deployment-recreate" deleted from default namespace
PS D:\Coding\ClassWork>
```

Verify that all resources are cleaned up:

```
kubectl get deployments
```

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

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

```
PS D:\Coding\ClassWork> kubectl get pods -l app=web
NAME                                         READY   STATUS    RESTARTS   AGE
nginx-deployment-recreate-8755c7cc9-z8574   0/1    Completed  0          2m3s
PS D:\Coding\ClassWork> kubectl get pods -l app=web
NAME                                         READY   STATUS    RESTARTS   AGE
nginx-deployment-recreate-8755c7cc9-z8574   0/1    Completed  0          2m7s
```