

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                SELECTOR
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

```

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: 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...
```

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-8587c95656-2zg88   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-nvmrg   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                                SELECTOR
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
```

```
PS D:\Coding\ClassWork> kubectl get pods -l app=web
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
```

```
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-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-kpnp2	1/1	Running	0	80s	10.244.0.44	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-mzml4	1/1	Running	0	80s	10.244.0.47	kind-control-plane	<none>	<none>
nginx-deployment-recreate-8755c7cc9-n416c	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-zcjhq	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-hpntg	1/1	Running	0	4m51s	10.244.0.30	kind-control-plane	<none>	<none>
nginx-deployment-rolling-8587c95656-nvmrg	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