

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

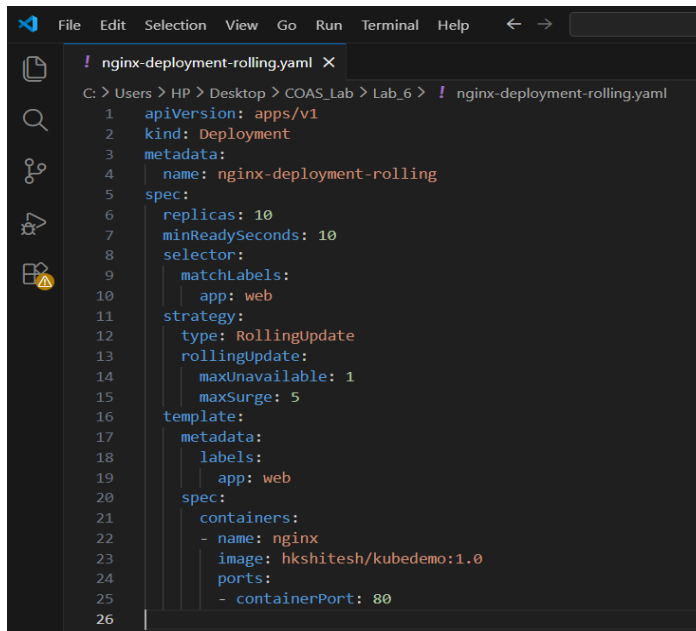
Create a YAML file for the deployment:

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
```

```
PS C:\Users\HP> cd C:\Users\HP\Desktop\COAS_Lab\Lab_6
PS C:\Users\HP\Desktop\COAS_Lab\Lab_6> wsl
docker-desktop:/tmp/docker-desktop-root/run/desktop/mnt/host/c/Users/HP/Desktop/COAS_Lab/Lab_6# touch nginx-deployment-rolling.yaml
docker-desktop:/tmp/docker-desktop-root/run/desktop/mnt/host/c/Users/HP/Desktop/COAS_Lab/Lab_6# exit
PS C:\Users\HP\Desktop\COAS_Lab\Lab_6> wsl -d Ubuntu-22.04 -u shivang
```



```
! nginx-deployment-rolling.yaml X
C:\Users\HP\Desktop\COAS_Lab\Lab_6> ! nginx-deployment-rolling.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx-deployment-rolling
5  spec:
6    replicas: 10
7    minReadySeconds: 10
8    selector:
9      matchLabels:
10       app: web
11    strategy:
12      type: RollingUpdate
13      rollingUpdate:
14        maxUnavailable: 1
15        maxSurge: 5
16    template:
17      metadata:
18        labels:
19          app: web
20      spec:
21        containers:
22          - name: nginx
23            image: hkshitesh/kubedemo:1.0
24            ports:
25              - containerPort: 80
26
```

Apply the deployment:

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

Verify the deployment:

```
kubectl get deployments
```

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

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
```

```

shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl apply -f nginx-deployment-rolling.yaml
deployment.apps/nginx-deployment-rolling created
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-rolling  10/10   10           10          13s
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get pods -l app=web
NAME                READY   STATUS    RESTARTS   AGE
nginx-deployment-rolling-85cf8767cc-bt2q5  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-cv8xx  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-dd4lf  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-hclht  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-nwbfc  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-p5nmk  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-qgvwv  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-x65cv  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-zftvz  1/1     Running   0           18s
nginx-deployment-rolling-85cf8767cc-zprgf  1/1     Running   0           18s
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ 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
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl set image deployment/nginx-deployment-rolling nginx=hkshitesh/kubedemo:2.0
deployment.apps/nginx-deployment-rolling image updated
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ 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: 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: 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: 1 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 of 10 updated replicas are available...
Waiting for deployment "nginx-deployment-rolling" rollout to finish: 9 of 10 updated replicas are available...
deployment "nginx-deployment-rolling" successfully rolled out
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get pods -l app=web -o wide
NAME                READY   STATUS    RESTARTS   AGE   IP              NODE       NOMINATED NODE   READINESS GATES
nginx-deployment-rolling-8587c95656-ctcld  1/1     Running   0           102s  10.244.0.81     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-dzklm  1/1     Running   0           102s  10.244.0.83     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-h8j4x  1/1     Running   0           62s   10.244.0.87     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-h9g9g  1/1     Running   0           102s  10.244.0.79     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-htrrc  1/1     Running   0           82s   10.244.0.84     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-m2r6q  1/1     Running   0           102s  10.244.0.82     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-ndwsv  1/1     Running   0           68s   10.244.0.86     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-qgv8  1/1     Running   0           74s   10.244.0.85     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-v9rpx  1/1     Running   0           102s  10.244.0.78     minikube   <none>            <none>
nginx-deployment-rolling-8587c95656-z68bd  1/1     Running   0           102s  10.244.0.80     minikube   <none>            <none>
shivang@Shivang: /mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$

```

Step 2: Create a Deployment with Recreate Strategy

Create a YAML file for the deployment:

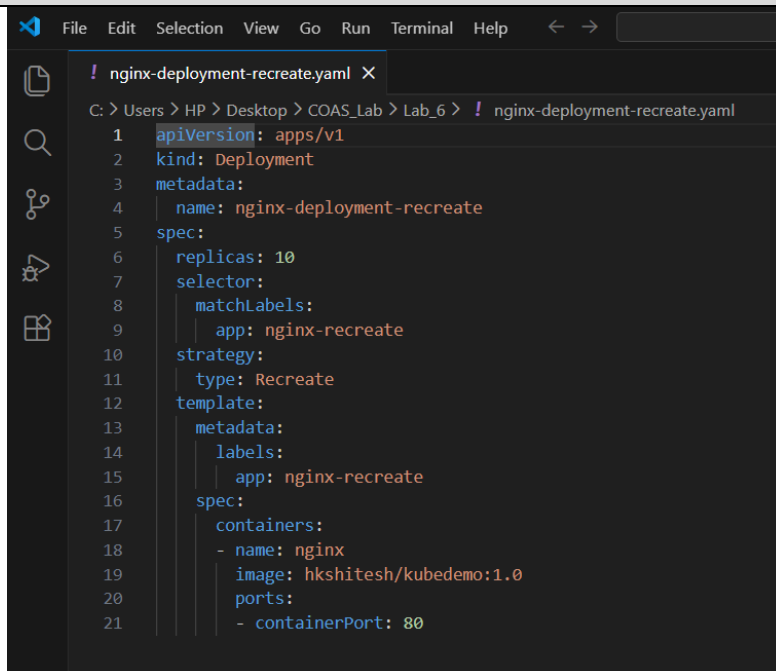
Create a file named **nginx-deployment-recreate.yaml** with the following content:

```

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
```



```
! nginx-deployment-recreate.yaml X
C: > Users > HP > Desktop > COAS_Lab > Lab_6 > ! nginx-deployment-recreate.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx-deployment-recreate
5  spec:
6    replicas: 10
7    selector:
8      matchLabels:
9        app: nginx-recreate
10   strategy:
11     type: Recreate
12   template:
13     metadata:
14       labels:
15         app: nginx-recreate
16     spec:
17       containers:
18       - name: nginx
19         image: hkshitesh/kubedemo:1.0
20         ports:
21         - containerPort: 80
```

Apply the deployment:

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

Verify the deployment:

```
kubectl get deployments
```

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

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
```

Verify the updated pods:

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

```
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl apply -f nginx-deployment-recreate.yaml
deployment.apps/nginx-deployment-recreate created
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-recreate  10/10   10           10          23s
nginx-deployment-rolling  10/10   10           10          6m18s
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get pods -l app=nginx-recreate
NAME                READY   STATUS    RESTARTS   AGE
nginx-deployment-recreate-5b67bdbc-bq7qb  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-f6pk6  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-kt5fx  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-mpgnb  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-s57rp  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-sqk6z  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-thzm8  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-vj2l6  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-wxr98  1/1     Running   0          33s
nginx-deployment-recreate-5b67bdbc-xrmcw  1/1     Running   0          33s
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl set image deployment/nginx-deployment-recreate nginx=nginx:1.21.1
deployment.apps/nginx-deployment-recreate image updated
```

```
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl rollout status deployment nginx-deployment-recreate
Waiting for deployment "nginx-deployment-recreate" rollout to finish: 0 of 10 updated replicas are available...
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
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get pods -l app=nginx-recreate -o wide
NAME                READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE   READINESS GATES
nginx-deployment-recreate-75c6c55dc-76fgm  1/1     Running   0          9m55s  10.244.0.100  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-dwdfh  1/1     Running   0          9m55s  10.244.0.107  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-mfdr4  1/1     Running   0          9m55s  10.244.0.99   minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-p55ch  1/1     Running   0          9m55s  10.244.0.101  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-plrkl  1/1     Running   0          9m55s  10.244.0.102  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-r8vts  1/1     Running   0          9m55s  10.244.0.98   minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-rnrj6  1/1     Running   0          9m55s  10.244.0.104  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-sx7jh  1/1     Running   0          9m55s  10.244.0.106  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-xnwdc  1/1     Running   0          9m55s  10.244.0.105  minikube   <none>            <none>
nginx-deployment-recreate-75c6c55dc-xw4zr  1/1     Running   0          9m55s  10.244.0.103  minikube   <none>            <none>
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$
```

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
```

```
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl delete deployment nginx-deployment-rolling  
deployment.apps "nginx-deployment-rolling" deleted from default namespace  
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl delete deployment nginx-deployment-recreate  
deployment.apps "nginx-deployment-recreate" deleted from default namespace  
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get deployments  
No resources found in default namespace.  
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get pods -l app=nginx  
No resources found in default namespace.  
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ kubectl get pods -l app=nginx-recreate  
No resources found in default namespace.  
shivang@Shivang:/mnt/c/Users/HP/Desktop/COAS_Lab/Lab_6$ |
```