

Lab Exercise 11- Deployments with Rolling Update and Recreate Strategies

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

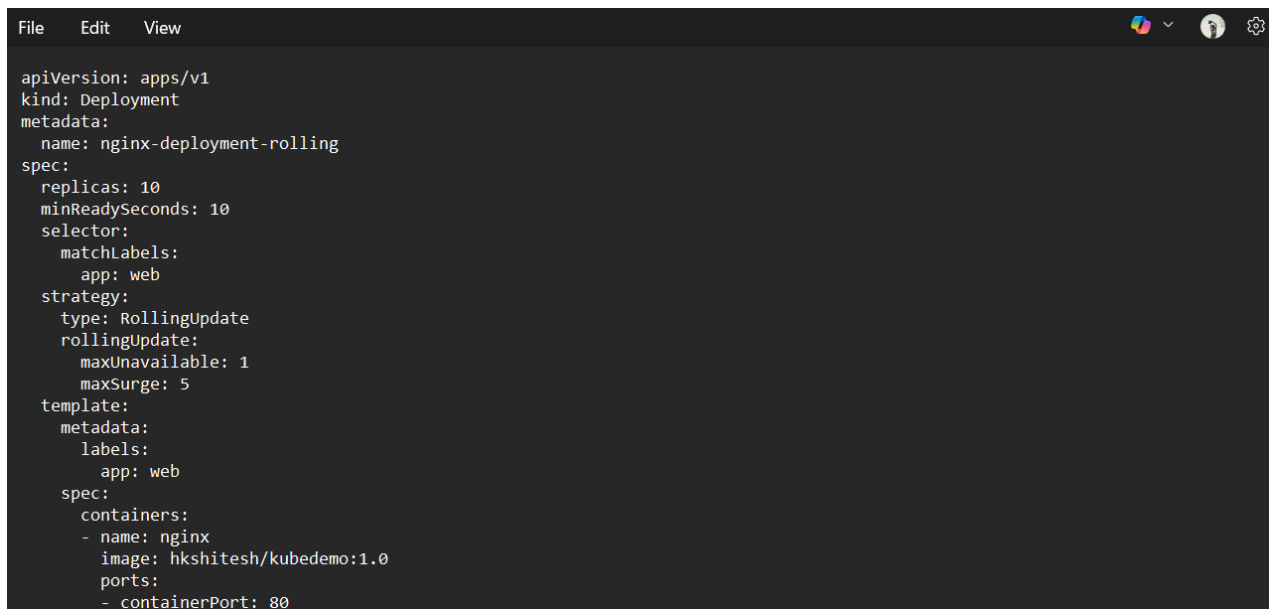
Step 1: Create a Deployment with Rolling Update Strategy

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
```

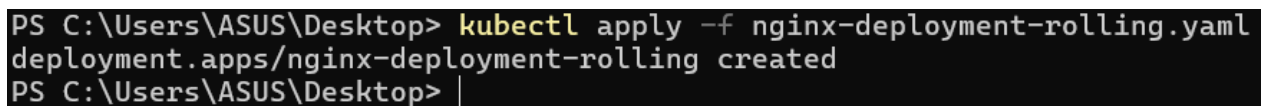
```
template:
  metadata:
    labels:
      app: web
  spec:
    containers:
      - name: nginx
        image: hkshitesh/kubedemo:1.0
        ports:
          - containerPort: 80
```

A screenshot of a code editor window with a dark theme. The editor shows a Kubernetes Deployment manifest for nginx. The manifest includes fields for apiVersion, kind, metadata (name), spec (replicas, minReadySeconds, selector, strategy), and template (metadata, spec, containers). The containers section lists a single container named 'nginx' using the image 'hkshitesh/kubedemo:1.0' and exposing port 80.

```
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"
```

A terminal window screenshot showing the execution of the kubectl apply command. The output indicates that the deployment 'nginx-deployment-rolling' was successfully created.

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

Verify the deployment:

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

```
PS C:\Users\ASUS\Desktop> kubectl get deployments
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
nginx-deployment-rolling            10/10    10            10           74s
PS C:\Users\ASUS\Desktop> kubectl get pods -l app=web
NAME                                READY    STATUS      RESTARTS    AGE
nginx-deployment-rolling-85cf8767cc-4zfvb    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-5fw4w    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-5xn5n    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-7b2km    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-7xczx    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-bxscx    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-cshh2    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-gccdc    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-n4fb8    1/1     Running    0           91s
nginx-deployment-rolling-85cf8767cc-pw7wl    1/1     Running    0           91s
PS C:\Users\ASUS\Desktop>
```

Update the deployment to a new image:

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

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

Monitor the rolling update:

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

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

Verify the updated pods:

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

```
PS C:\Users\ASUS\Desktop> kubectl get pods -l app=web -o wide
NAME                                READY   STATUS    RESTARTS   AGE
IP                                 NODE     NOMINATED NODE   READINESS GATES
nginx-deployment-rolling-8587c95656-2qzt2  1/1     Running   0           56s
10.244.0.36                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-6mwb4  1/1     Running   0           76s
10.244.0.31                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-7pwft  1/1     Running   0           76s
10.244.0.30                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-89czj  1/1     Running   0           53s
10.244.0.37                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-dbgfhz  1/1     Running   0           76s
10.244.0.32                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-gqx85  1/1     Running   0           76s
10.244.0.33                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-kdswg  1/1     Running   0           76s
10.244.0.29                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-n4ftg  1/1     Running   0           58s
10.244.0.35                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-rrlvq  1/1     Running   0           51s
10.244.0.38                            minikube  <none>          <none>
nginx-deployment-rolling-8587c95656-zdt29  1/1     Running   0           76s
10.244.0.34                            minikube  <none>          <none>
```

```
PS C:\Users\ASUS\Desktop> kubectl delete deployment nginx-deployment-rolling
deployment.apps "nginx-deployment-rolling" deleted from default namespace
PS C:\Users\ASUS\Desktop> |
```

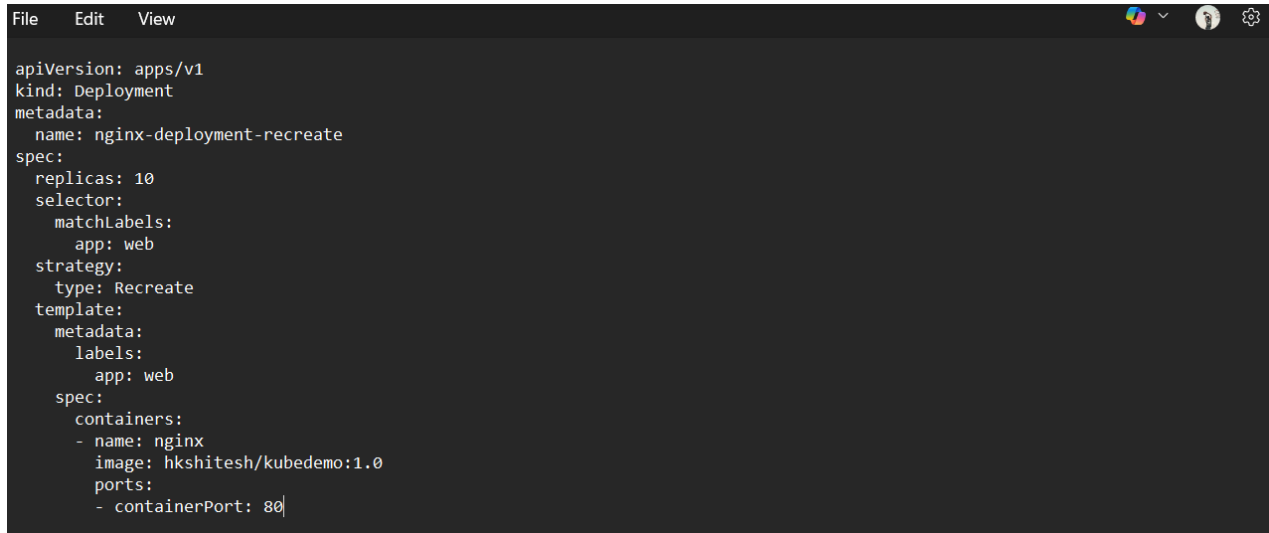
Step 2: Create a Deployment with Recreate Strategy

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
```

A screenshot of a code editor window with a dark theme. The window has a menu bar with 'File', 'Edit', and 'View'. On the right side of the menu bar, there are icons for a color palette, a dropdown arrow, a user profile, and a settings gear. The main area of the editor contains a YAML manifest for a Kubernetes Deployment. The text is as follows:

```
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: 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\ASUS\Desktop> notepad nginx-deployment-recreate.yaml
PS C:\Users\ASUS\Desktop> kubectl apply -f nginx-deployment-recreate.yaml
deployment.apps/nginx-deployment-recreate created
PS C:\Users\ASUS\Desktop> |
```

Verify the deployment:

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

```
PS C:\Users\ASUS\Desktop> kubectl get deployments
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
nginx-deployment-recreate           10/10    10            10           21s
PS C:\Users\ASUS\Desktop> kubectl get pods -l app=web
NAME                                READY    STATUS        RESTARTS    AG
nginx-deployment-recreate-85cf8767cc-768rp    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-7dmd4    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-lcjzq    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-nxlk9    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-pb926    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-ps88c    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-q8rl7    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-rgjnc    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-v99xx    1/1      Running       0           28
s
nginx-deployment-recreate-85cf8767cc-wfxmw    1/1      Running       0           28
s
PS C:\Users\ASUS\Desktop> |
```

Update the deployment to a new image:

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

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

Monitor the update:

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

Verify the updated pods:

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

Step 3: Clean Up

Delete the deployments:

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

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

```
PS C:\Users\ASUS\Desktop> kubectl delete deployment nginx-deployment-recreate  
deployment.apps "nginx-deployment-recreate" deleted from default namespace
```

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\ASUS\Desktop> kubectl get deployments  
No resources found in default namespace.  
PS C:\Users\ASUS\Desktop> kubectl get pods  
No resources found in default namespace.  
PS C:\Users\ASUS\Desktop> |
```