

DAY-5:

Kubernetes Deployment:

A **Kubernetes Deployment** is a resource used to automate the management and scaling of containerized applications. It ensures the required number of **pod replicas** are always running and provides features such as **scalability, rolling updates, and rollback capabilities**.

Key Features of Kubernetes Deployment:

1. **Replica Management:** Ensures a specified number of pods are running.
2. **Rolling Updates:** Allows seamless updates without downtime.
3. **Rollback Support:** Reverts to a previous version in case of failure.
4. **Self-Healing:** Replaces failed or unhealthy pods automatically.
5. **Declarative Approach:** Uses YAML/JSON files to define the desired application state.

Deploy.yml:

apiVersion: apps/v1

kind: Deployment

metadata:

name: my-deploy

labels:

apptype: web-backend

spec:

replicas: 4

selector:

matchLabels:

apptype: web-backend

strategy:

type: RollingUpdate

template:

metadata:

labels:

apptype: web-backend

spec:

containers:

- name: my-app

image: ashilin20/app:latest

ports:

- containerPort: 5050

apiVersion: v1

kind: Service

metadata:

name: my-service

labels:

apptype: web-backend

spec:

type: NodePort

ports:

- targetPort: 8080

port: 5050

nodePort: 30001

PIPELINE SCRIPT:

pipeline {

agent any

```
stages {  
    stage('SCM') {  
        steps {  
            git branch: 'main', url: 'https://github.com/ashilinbs/DevOps.git'  
        }  
    }  
}
```

```
stage('Build') {  
    steps {  
        sh "mvn clean"  
        sh "mvn install"  
    }  
}
```

```
stage('Build Docker Image') {  
    steps {  
        script {  
            sh 'docker build -t ashilin20/app .'        }  
    }  
}
```

```
stage('Push to Docker Hub') {  
    steps {  
        script {
```

```

        withDockerRegistry(credentialsId: 'cur', url: 'https://index.docker.io/v1/')
    {
        sh 'docker push ashilin20/app'
    }
}
}
}
}

```

```

stage('Deploy to Kubernetes') {
    steps {
        script {
            kubeconfig(credentialsId: 'mini', serverUrl: 'https://127.0.0.1:32771') {
                sh """
                kubectl apply -f deploy.yml
                """
            }
        }
        stage('Test') {
            steps {
                kubeconfig(credentialsId: 'mini', serverUrl: 'https://127.0.0.1:32771') {
                    sh 'minikube service my-service --url | xargs curl'
                }
            }
        }
    }
}
}
}
}
}

```

Jenkins

🔍

🔔

🏠

👤 ASHILIN B S

📄 log out

Dashboard > java > #4

Status

<> Changes

📄 Console Output

📄 Edit Build Information

🗑️ Delete build '#4'

🕒 Timings

🔗 Git Build Data

📊 Pipeline Overview

📄 Pipeline Console

🔄 Restart from Stage

🔄 Replay

📋 Pipeline Steps

📁 Workspaces

⬅️ Previous Build

➡️ Next Build

✅ #4 (Mar 21, 2025, 8:56:46 AM)

Add description

Keep this build forever

🕒 Started by user ASHILIN B S

Started 1 hr 20 min ago
Took 32 sec

🕒 This run spent:

- 44 ms waiting;
- 32 sec build duration;
- 32 sec total from scheduled to completion.

🔗 git

Revision: f5a257ef10f149188872d8231122963702227057

Repository: <https://github.com/ashlinbs/DevOps.git>

refs/remotes/origin/main

</>

No changes.

Dashboard > java > #4

```
5f70bf18a086: Preparing
43c9f8a1d661: Preparing
5f70bf18a086: Preparing
bc85267c613b: Preparing
4e5b554b7345: Preparing
39cf8ac89a5a: Preparing
f844dcf94898: Preparing
3359bc3d7a6a: Preparing
4b7c01e08534: Preparing
39cf8ac89a5a: Waiting
f844dcf94898: Waiting
4b7c01e08534: Waiting
bc85267c613b: Layer already exists
43c9f8a1d661: Layer already exists
5f70bf18a086: Layer already exists
4e5b554b7345: Layer already exists
f844dcf94898: Layer already exists
39cf8ac89a5a: Layer already exists
3359bc3d7a6a: Layer already exists
4b7c01e08534: Layer already exists
bc8f189c9336: Pushed
latest: digest: sha256:3299ceaec821448874b1b68cf412a70929e811641bfd031e3be7fa040682d8 size: 2409
[Pipeline] }
[Pipeline] // withDockerRegistry
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

REST API Jenkins 2.492.2

```

cbbRv708Z3Q0f0R50tLS0tcg==
shilin@ASHILIN:~$ cat /home/ashilin/.minikube/profiles/minikube/client.crt|base64 -w 0;echo
S0tLS1CRUdJTiBDRYJUSUZ3Q0FURS0tLS0tCk1JSURJVENQWdtZ0F3SUJBZ0lCQWpBTkNa3Foa2lH0XcwQkFRc0ZBREFTVjNd0VR
URWUVERXdwGFXNXAKYTNwaVpVtkJNQjRYRFRJMU1ETXhPREE0TVRVME1sb1hEVEk0TURNeE9EQTRNVFUwTWxvd01URVhNQ1VHQTFV
QpDaE1PvZnNsemRHVnRPbTFoYzNsbnGnuTXhGakFVQmd0VkJBTvREVzFwYm1scmRXSmxMwFZ6WlhJd2dnRWlNQTBHCkNTcUdTSWlZRFFF
kFRVUFBNElCRHdBd2dnRUTBb0lCQVFD0FV1alorMUDWS1NBM1Nzak9USGhnYXYzQk3HYTgKRGI6bVlPd0svS0FTa2Nwc2NpOE1MSVJW
11EZzd6R2NBSUZ3Qcmh2amVheG4zVFaxVlkyS05lQ2s5bk93UGs1agpkdCtMQTA5aWNYM3duRU04VFcrcVHh0d2QwTUY4Q1NQaXpnTz1u
1pMYkREL3FZn1hksVp4MM1tVkdFVHY0ek0xCjdmMythREhZdWnhNEVPaU5XMk5laWJRNNHNTJ3ExcXI3VGy0MWFsOGhxY25vZG9PWfQy
1NJ0G00YmkrR3NWNdyKdFcyL2dIVWZCU2JQa3Bpc1k2REercTEzTk10bVRxcG1oZE51eFBYn1ZrWlkyREZJWjF5OUx0SU9Wb3Q0VUdU
Qpkd0hrZHPaGlxQnpENEV50GhjL3Rja2d1Rm1Rw12Yld2K1JoVlRlNXZybTlpM0hmZitESmJ2VEFnTUJ3BUdqc11E0mVNQTRHQTfV
ER3RUIvd1FFQXdJRm9EQWRCZ05WSFNVRUZqQVVCZ2dyQmdFRkJRy0RBUV1JS3dZQkJRvUgKQXdJd0RBwURWUjBUQVFIL0JBXsdBREfm
mdOVkhTTUVRHREXZ0JUM1lqa1E2cS9GdEpjek1kTDRqUHA5VEpEQWpSREFOQmdrcWhraUc5dzBCQVZFRkFT0NBuUUVBUkY3cHVtcWNN
jdZaU84M3ZDZk1wOVJhSnExNHBTVEEYwFRECjZMeVFMQ0hGVFFsZjJqM3NtOVhMMy9UMTFjYnNEWnFnM3YwQ2w5YUo4OWhTUTVxanpj
W2R2Rwc2TThtWfK1bEwKdUs1c0dpZnZQYXZodZFlGlnQXhwUkdFUEZqR0ZZMDNtVGd3cWV0TitJWwZ1b2J1VGMyNnNaNWNRWZTJUA1Ri
wpmUjZQNE1aOHkrVmVIU21ldCsyZ01wa2kvZzVpVGHjdVYlG4VUNLL1RxnNk9KNDRnbGVWc3ZqMWNhWDFhY2xrCkZ1VEorRm5veXRi
k3MmMwF3Y0MvZ2d0eU1CdzbSTHVSZFRuRzdEUjBCSWR4UzEwcTNIK3dsRU0ycldPMUFjYkUKbEVJc3JTakxpOWJES1BUa1ZZWwJPRVpQ
TSeGVPVklCaE52Vk4zdzdVYVWVNEHc9PQotLS0tLUVORCBDRYJUSUZ3Q0FURS0tLS0tcg==
shilin@ASHILIN:~$ sudo vi config
sudo] password for ashilin:

2]+ Stopped                                sudo vi config
shilin@ASHILIN:~$ cd ~/.kube
shilin@ASHILIN:~/~.kube$ sudo vi config

3]+ Stopped                                sudo vi config
shilin@ASHILIN:~/~.kube$ cd ..
shilin@ASHILIN:~$ minikube start
  minikube v1.35.0 on Ubuntu 24.04 (amd64)
  Using the docker driver based on existing profile
  Starting "minikube" primary control-plane node in "minikube" cluster
  Pulling base image v0.0.46 ...
  Updating the running docker "minikube" container ...
  Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
  Verifying Kubernetes components...
    Using image docker.io/kubernetes/metrics-scraper:v1.0.8
    Using image gcr.io/k8s-minikube/storage-provisioner:v5
    Using image docker.io/kubernetes/dashboard:v2.7.0
  Some dashboard features require the metrics-server addon. To enable all features please run:

    minikube addons enable metrics-server

  Enabled addons: storage-provisioner, default-storageclass, dashboard
  Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
shilin@ASHILIN:~$ kubectl get node
NAME          STATUS    ROLES          AGE      VERSION
minikube     Ready     control-plane   177m     v1.32.0
shilin@ASHILIN:~$

```

```

* Enabled addons: storage-provisioner, default-storageclass, dashboard
🐳 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
ashilin@ASHILIN:~$ kubectl get node
NAME        STATUS    ROLES    AGE   VERSION
minikube    Ready     control-plane  177m   v1.32.0
ashilin@ASHILIN:~$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS
4ee13a985ba9   kicbase/stable:v0.0.46             "/usr/local/bin/entr..." 2 days ago    Up 2 hours    127.0.0.1:327
68->22/tcp, 127.0.0.1:32769->2376/tcp, 127.0.0.1:32770->5000/tcp, 127.0.0.1:32771->8443/tcp, 127.0.0.1:3
2772->32443/tcp   minikube
ashilin@ASHILIN:~$ docker images
REPOSITORY    TAG        IMAGE ID      CREATED        SIZE
ashilin20/app  latest     5acfceb31cdc  28 minutes ago  520MB
ashilin20/app  <none>     3e9ced49ad3b  42 minutes ago  520MB
ashilin20/app  <none>     8ed3643e633f  51 minutes ago  520MB
ashilin20/app  <none>     a0b423c38496  About an hour ago  520MB
ashilin20/app  <none>     d2882b25be88  About an hour ago  520MB
ashilin20/app  <none>     da3873a1aea4  About an hour ago  520MB
ashilin20/app  <none>     32335767cb10  47 hours ago     520MB
ashilin02/app  latest     9229483248f5  47 hours ago     520MB
ashilin02/simplewebapp  latest     2f647ac77557  47 hours ago     520MB
<none>         <none>     de28a148c706  47 hours ago     520MB
ashilin04/simplewebapp  latest     63b48499158b  47 hours ago     520MB
<none>         <none>     4e8d9a5de4c8  47 hours ago     520MB
<none>         <none>     b1e161412c3e  47 hours ago     520MB
<none>         <none>     0c780c162760  2 days ago       520MB
<none>         <none>     7f25de631dac  2 days ago       520MB
kicbase/stable  v0.0.46    e72c4cbe9b29  2 months ago     1.31GB
ashilin@ASHILIN:~$

```