SANMATHI S

22ISR045

Overview

This project demonstrates the implementation of a DevOps pipeline using Docker, Kubernetes, and Jenkins. It automates the build, testing, and deployment of an application.

Technologies Used

- **Docker**: Containerization of the application
- **Jenkins**: CI/CD automation
- **Kubernetes**: Deployment and management of containers
- **Shell Scripting**: Automating deployment tasks
- **YAML**: Configuration management for Kubernetes

Setup Instructions

Prerequisites

Ensure the following tools are installed:

- Docker
- Kubernetes (Minikube or a cluster)
- Jenkins
- Git

Dockerization

Build and run the application using Docker:

```
docker build -t devopstask04 .
docker run -p 80:80 devopstask04
```

CI/CD Pipeline

The **Jenkinsfile** automates:

1. **Cloning the repository**
2. **Building the Docker image**
3. **Pushing the image to Docker Hub**
4. **Deploying to Kubernetes**

Kubernetes Deployment

Apply the Kubernetes configurations:

```
kubectl apply -f deployment.yaml
kubectl apply -f service.yaml
```

Check running pods and services:

```
kubectl get pods
kubectl get services
```

YAML File Usage

The .yaml files define Kubernetes configurations:

- **deployment.yaml**: Describes the deployment, including the number of replicas, container specifications, and update strategies.
- **service.yaml**: Defines how the application is exposed, including the type of service (e.g., ClusterIP, NodePort, or LoadBalancer).

Deployment Script

The deploy.sh script automates the Kubernetes deployment:

```
chmod +x deploy.sh
./deploy.sh
```

Accessing the Application

Find the service IP using:

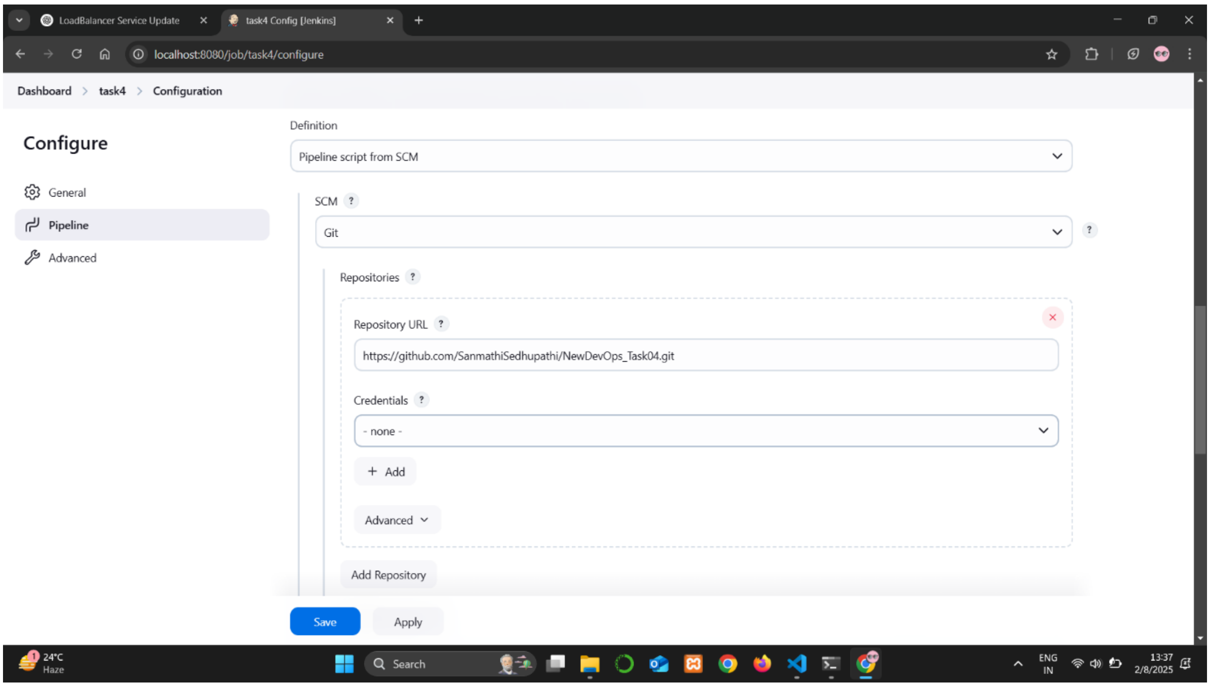
```
kubectl get svc
```

Then access the application in the browser or via curl:

```
http://<EXTERNAL-IP>:80
```

Conclusion

This DevOps pipeline ensures continuous integration and delivery, allowing automated testing and seamless deployment.



Definition: Pipeline script from SCM

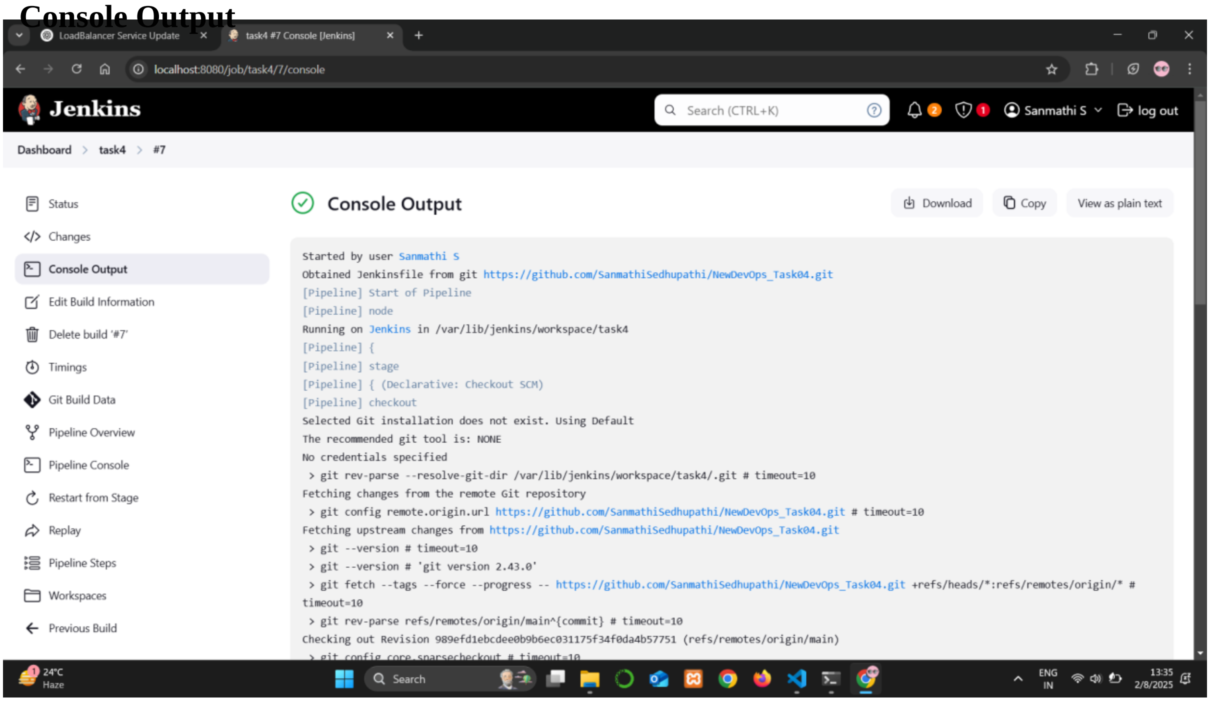
SCM: Git

Repositories

Repository URL: https://github.com/SanmathiSedhupathi/NewDevOps_Task04.git

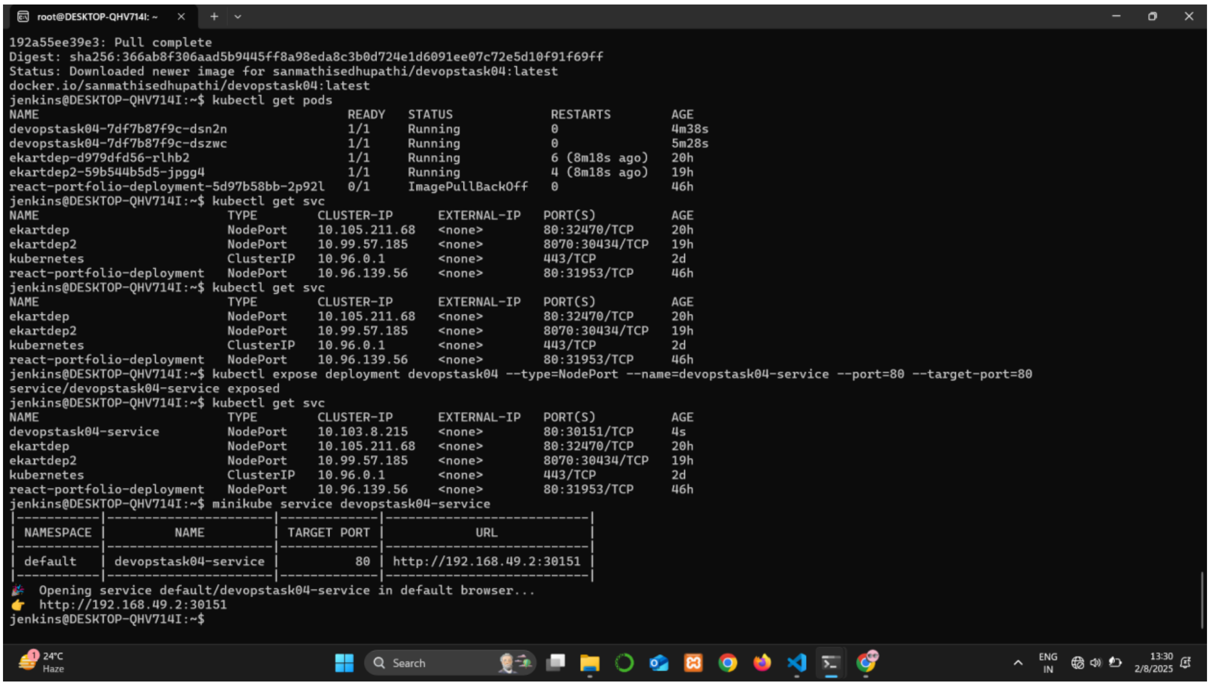
Credentials: - none -

Console Output

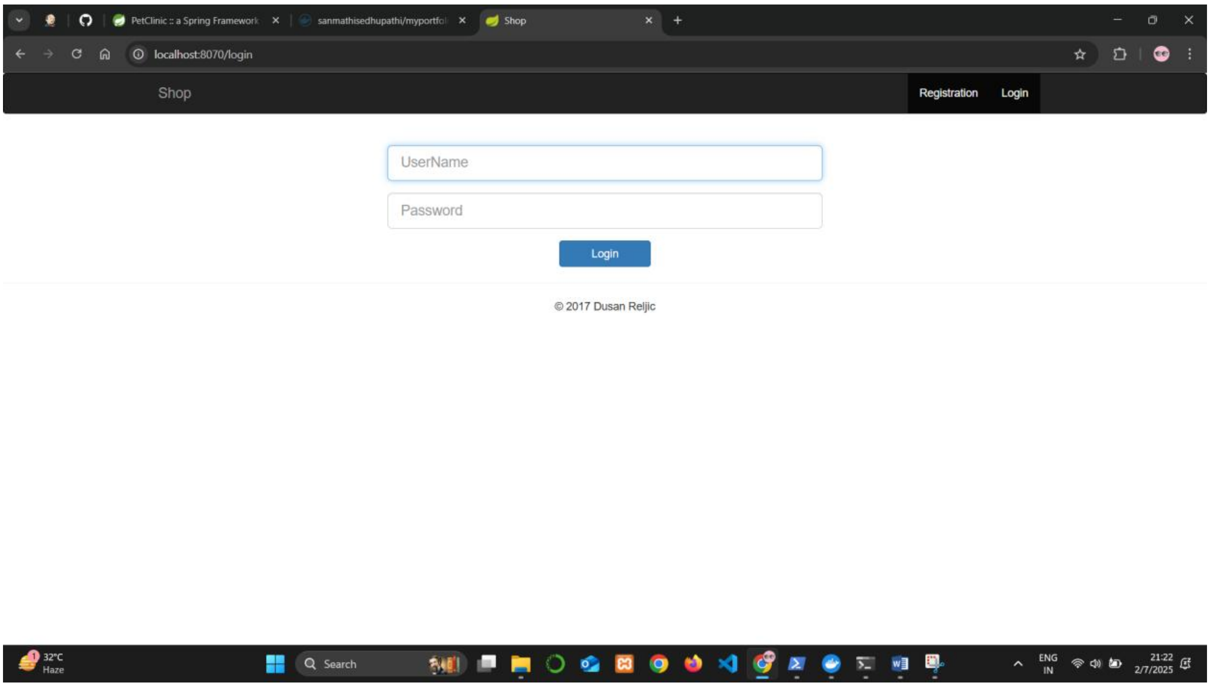


Console Output

```
Started by user Sanmathi S
Obtained Jenkinsfile from git https://github.com/SanmathiSedhupathi/NewDevOps_Task04.git
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/task4
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
Selected Git installation does not exist. Using Default
The recommended git tool is: NONE
No credentials specified
 > git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/task4/.git # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url https://github.com/SanmathiSedhupathi/NewDevOps_Task04.git # timeout=10
Fetching upstream changes from https://github.com/SanmathiSedhupathi/NewDevOps_Task04.git
 > git --version # timeout=10
 > git --version # 'git version 2.43.0'
 > git fetch --tags --force --progress -- https://github.com/SanmathiSedhupathi/NewDevOps_Task04.git +refs/heads/*:refs/remotes/origin/* #
timeout=10
 > git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision 989efd1ebcdee0b9b6ec031175f34f0da4b57751 (refs/remotes/origin/main)
 > git config core.sparsecheckout # timeout=10
```



```
192a55ee39e3: Pull complete
Digest: sha256:366ab8f306aad5b9445ff8a98eda8c3b0d724e1d6091ee07c72e5d10f91f69ff
Status: Downloaded newer image for sanmathisedhupathi/devopstask04:latest
docker.io/sanmathisedhupathi/devopstask04:latest
jenkins@DESKTOP-QHV714I:~$ kubectl get pods
NAME                                         READY   STATUS             RESTARTS        AGE
devopstask04-7df7b87f9c-dsn2n                1/1     Running            0               4m38s
devopstask04-7df7b87f9c-dszwc                1/1     Running            0               5m28s
ekartdep-d979dfd56-rlhb2                     1/1     Running            6 (8m18s ago)   20h
ekartdep2-59b544b5d5-jpgg4                   1/1     Running            4 (8m18s ago)   19h
react-portfolio-deployment-5d97b58bb-2p92l   0/1     ImagePullBackOff   0               46h
jenkins@DESKTOP-QHV714I:~$ kubectl get svc
NAME                         TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE
ekartdep                     NodePort    10.105.211.68    <none>        80:32470/TCP     20h
ekartdep2                    NodePort    10.99.57.185     <none>        8070:30434/TCP   19h
kubernetes                   ClusterIP   10.96.0.1        <none>        443/TCP          2d
react-portfolio-deployment   NodePort    10.96.139.56     <none>        80:31953/TCP     46h
jenkins@DESKTOP-QHV714I:~$ kubectl get svc
NAME                         TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE
ekartdep                     NodePort    10.105.211.68    <none>        80:32470/TCP     20h
ekartdep2                    NodePort    10.99.57.185     <none>        8070:30434/TCP   19h
kubernetes                   ClusterIP   10.96.0.1        <none>        443/TCP          2d
react-portfolio-deployment   NodePort    10.96.139.56     <none>        80:31953/TCP     46h
jenkins@DESKTOP-QHV714I:~$ kubectl expose deployment devopstask04 --type=NodePort --name=devopstask04-service --port=80 --target-port=80
service/devopstask04-service exposed
jenkins@DESKTOP-QHV714I:~$ kubectl get svc
NAME                         TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE
devopstask04-service         NodePort    10.103.8.215     <none>        80:30151/TCP     4s
ekartdep                     NodePort    10.105.211.68    <none>        80:32470/TCP     20h
ekartdep2                    NodePort    10.99.57.185     <none>        8070:30434/TCP   19h
kubernetes                   ClusterIP   10.96.0.1        <none>        443/TCP          2d
react-portfolio-deployment   NodePort    10.96.139.56     <none>        80:31953/TCP     46h
jenkins@DESKTOP-QHV714I:~$ minikube service devopstask04-service
|-----------|----------------------|-------------|---------------------------|
| NAMESPACE |         NAME         | TARGET PORT |            URL            |
|-----------|----------------------|-------------|---------------------------|
| default   | devopstask04-service |          80 | http://192.168.49.2:30151 |
|-----------|----------------------|-------------|---------------------------|
🎉  Opening service default/devopstask04-service in default browser...
👉  http://192.168.49.2:30151
jenkins@DESKTOP-QHV714I:~$
```



Shop

Registration Login

UserName

Password

Login

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