Assignment-7

Date: 16/06/2025

Docker and Kubernetes: The container masterclass

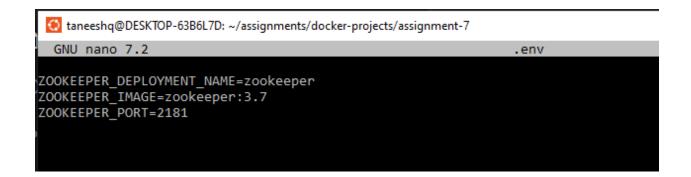
Problem Statement:

Deploy a microservice using Apache Zookeeper, instead of doing manually. using kubectl, create a template of a K8s manifest for each K8s resource that you need for your application. The template should refer to parameters (e.g. image name, deployment name, port number, etc.). Those parameters should substitute with provided values during the deployment.

Methodology:

Step 1: Create the required files and directories. I have an env file, a deploy.sh script and a zookeeper-deployment.yaml along with zookeeper-service.yaml.

```
taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ touch deploy.sh taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ touch .env taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ touch .env taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ kmkdir templates taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ cd templates/ taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7/templates$ touch zookeeper-deployment.yaml taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7/templates$ cd .. taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ nano .env taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ nano zookeeper-deployment.yaml taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ cd templates/ taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ cd templates/ taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7$ cd templates/ taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7/templates$ nano zookeeper-deployment.yaml taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7/templates$ nano zookeeper-service.yaml taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7/templates$ nano zookeeper-service.yaml taneeshq@DESKTOP-6386L7D:-/assignments/docker-projects/assignment-7/templates$ cd .. tane
```



Step 2: Write the deployment instructions.

```
€ taneeshq@DESKTOP-63B6L7D: ~/assignments/docker-projects/assignment-7/templates
                                                    zookeeper-deployment.yaml
apiVersion: apps/v1
ind: Deployment
etadata:
 name: ${ZOOKEEPER_DEPLOYMENT_NAME}
replicas: 1
 selector:
   matchLabels:
     app: ${ZOOKEEPER_DEPLOYMENT_NAME}
 template:
   metadata:
     labels:
       app: ${ZOOKEEPER_DEPLOYMENT_NAME}
   spec:
     containers:
     - name: ${ZOOKEEPER_DEPLOYMENT_NAME}
       image: ${ZOOKEEPER_IMAGE}
       - containerPort: ${ZOOKEEPER_PORT}
```

Step 3: Write the service instructions.

```
taneeshq@DESKTOP-63B6L7D: ~/assignments/docker-projects/assignment-7/templates

GNU nano 7.2 zookeeper-service.yaml

apiVersion: v1
kind: Service
metadata:
    name: "${ZOOKEEPER_DEPLOYMENT_NAME}-service"

spec:
    selector:
    app: ${ZOOKEEPER_DEPLOYMENT_NAME}

ports:
    - protocol: TCP
    port: ${ZOOKEEPER_PORT}
    targetPort: ${ZOOKEEPER_PORT}
```

Step 4: Finally I wrote the script for deploying the microservice and made it executable by "chmod +x deploy.sh"

```
    taneeshq@DESKTOP-63B6L7D: ~/assignments/docker-projects/assignment-7/templates

                                                     zookeeper-deployment.yaml
apiVersion: apps/v1
cind: Deployment
etadata:
 name: ${ZOOKEEPER DEPLOYMENT NAME}
 replicas: 1
 selector:
   matchLabels:
     app: ${ZOOKEEPER_DEPLOYMENT_NAME}
 template:
   metadata:
     labels:
       app: ${ZOOKEEPER_DEPLOYMENT_NAME}
     containers:
     - name: ${ZOOKEEPER_DEPLOYMENT_NAME}
       image: ${ZOOKEEPER_IMAGE}
       - containerPort: ${ZOOKEEPER_PORT}
```

Step 5: To create the deployment and service I executed the deploy.sh script.

```
taneeshq@DESKTOP-63B6L7D:~/assignments/docker-projects/assignment-7$ ./deploy.sh
Loading environment variables...
Substituting template variables and applying manifests...
zookeeper
zookeeper:3.7
2181
deployment.apps/zookeeper created
Deployment complete.
taneeshq@DESKTOP-63B6L7D:~/assignments/docker-projects/assignment-7$ ./deploy.sh
Loading environment variables...
Substituting template variables and applying manifests...
deployment.apps/zookeeper unchanged
service/zookeeper-service created
Deployment complete.
```

Step 6: To see the final output and verify the deployments and services I listed them.

```
taneeshq@DESKTOP-63B6L7D:~/assi
NAME READY UP-TO-DATE
                                                -projects/assignment-7$ kubectl get deployments
                                   AVAILABLE
                                               AGE
zookeeper
            1/1
                                               48m
taneeshq@DESKTOP-63B6L7D:~/assignments/docker-projects/assignment-7$ kubectl get services
NAME
                     TYPE
                                  CLUSTER-IP
                                                  EXTERNAL-IP
                                                                 PORT(S)
                                                                             AGE
                     ClusterIP
                                                                 443/TCP
kubernetes
                                  10.96.0.1
                                                  <none>
                                                                             63m
                                  10.105.252.52
                                                                 2181/TCP
zookeeper-service ClusterIP
                                                   <none>
 taneeshq@DESKTOP-63B6L7D:~/assignments/docker-projects/assignment-7$
```