SIT323/SIT737- Cloud Native Application Development
9.1P: Adding a database to your application

Overview :

When developing an application, it's common to work with data, files, or both. Microservices are no exception to this. In order to store dynamic data that's generated and updated by the microservice, we need to have a database. Additionally, we need to have a storage location for assets that are either served by the application or uploaded to it. For this task, your objective is to integrate a database into your existing containerized microservice application.

Documetation on Deploying MongoDB application on Kubernetes

Step 1. Install MongoDB into the Kubernetes Cluster

Command:
`kubectl create -f <mongo-deployment.yaml>`

File Name: mongo-deployment.yaml

File Extension: .yaml

File Content:
```

```

The apply the configuration:
kubectl apply -f mongo-deployment.yaml

2. Configure Persistent Storage

Command:
`kubectl create -f <mongo-pv-claim.yaml>`

File Name: mongo-pv-claim.yaml

File Extension: .yaml

```

```

Apply the configuration:
kubectl apply -f mongo-pv-claim.yaml

3. Create a Kubernetes Secret

Command:
`kubectl create secret generic mongo-credentials \
  --from-literal=username=<username> \
  --from-literal=password=<password>`

```
└─$ kubectl create secret generic mongo-credentials \
    --from-literal=username=root \
    --from-literal=password=admin
secret/mongo-credentials created
```

4. Modify the Kubernetes Deployment Manifest

Command:
`kubectl apply -f <my-app-deployment.yaml>`

File Name: my-app-deployment.yaml

File Extension: .yaml

```
**Apply the configuration:**
kubectl apply -f  my-app-deployment.yaml
```

```
└─$ kubectl apply -f  my-app-deployment.yaml
deployment.apps/my-mongo-app created
```

5.Setup Backups / Disaster Recovery

Command:
`kubectl create -f <mongo-backup.yaml>`

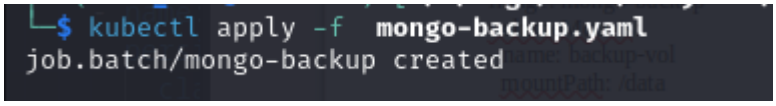
File Name: mongo-backup.yaml

File Extension: .yaml

File Content:
```
apiVersion: batch/v1
kind: Job
metadata:
  name: mongo-backup
spec:
  backoffLimit: 0
  template:
    spec:
```

```
    restartPolicy: OnFailure
    containers:
    - name: backup
      image: mongo-backup
      volumeMounts:
      - name: backup-vol
        mountPath: /data
    volumes:
    - name: backup-vol
      persistentVolumeClaim:
        claimName: pvc-mongo
```

Apply the configuration:
kubectl apply -f mongo-backup.yaml



6. Monitoring

Command:
`kubectl create -f <mongo-prometheus.yaml>`

File Name: mongo-prometheus.yaml

File Extension: .yaml

File Content:
```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: mongo-monitor
spec:
  selector:
    matchLabels:
      app: mongo
  endpoints:
  - port: current-oplog
```

Apply the configuration:
kubectl apply -f mongo-prometheus.yaml

```
└─$ kubectl apply -f  mongo-prometheus.yaml
servicemonitor.monitoring.coreos.com/mongo-monitor created
```

7. Check whether the pod is ready.

Command: kubectl get pod

```
NAME                                  READY   STATUS             RESTARTS        AGE
hello-minikube-77b6f68484-d4shz       1/1     Running            2 (6h46m ago)   2d21h
mongo-6f64b4fb45-j65df                1/1     Running            0               3h14m
mongo-backup-l5h5d                    0/1     ImagePullBackOff   0               7m55s
my-mongo-app-59b64f7d9d-rz2vq         0/1     ImagePullBackOff   0               14m
prometheus-operator-6b8d85bc4c-l84b6  1/1     Running            0               4m9s
```

8. connect to the created application

command:
kubectl exec -it mongo-6f64b4fb45-j65df -- sh

```
└─$ kubectl exec -it mongo-6f64b4fb45-j65df -- sh
# 
```