

Anishkumar Pankajkumar
Patel

BCDV 4032

Building Scalable Blockchain
Apps

Lab 03

19th Jan 2024

Keerthi Nelaturu

Lab 3

Section 1 – Multi-Node Cluster Commands

```
char@CHARGLEN:~$ minikube start --nodes 2 -p multinode-demo
[multinode-demo] minikube v1.32.0 on Ubuntu 22.04 (amd64)
Automatically selected the docker driver
Using Docker driver with root privileges
! For an improved experience it's recommended to use Docker Engine instead of Docker Desktop.
Docker Engine installation instructions: https://docs.docker.com/engine/install/#server
Starting control plane node multinode-demo in cluster multinode-demo
Pulling base image ...
Creating docker container (CPUs=2, Memory=2200MB) ...
Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
  Generating certificates and keys ...
  Booting up control plane ...
  Configuring RBAC rules ...
Configuring CNI (Container Networking Interface) ...
Verifying Kubernetes components...
  Using image gcr.io/k8s-minikube/storage-provisioner:v5
Enabled addons: storage-provisioner, default-storageclass

Starting worker node multinode-demo-m02 in cluster multinode-demo
Pulling base image ...
Creating docker container (CPUs=2, Memory=2200MB) ...
Found network options:
  NO_PROXY=192.168.49.2
Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
  env NO_PROXY=192.168.49.2
Verifying Kubernetes components...
Done! kubectl is now configured to use "multinode-demo" cluster and "default" namespace by default

char@CHARGLEN:~$ kubectl get nodes
NAME                                STATUS    ROLES                  AGE     VERSION
multinode-demo                      Ready     control-plane          90s     v1.28.3
multinode-demo-m02                  Ready     <none>                  40s     v1.28.3

char@CHARGLEN:~$ minikube status -p multinode-demo
multinode-demo
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

multinode-demo-m02
type: Worker
host: Running
kubelet: Running
```

```
char@CHARGLEN: ~$ minikube dashboard -p multinode-demo
Enabling dashboard ...
  Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
  Using image docker.io/kubernetesui/dashboard:v2.7.0
Some dashboard features require the metrics-server addon. To enable all features please run:

  minikube -p multinode-demo addons enable metrics-server

Verifying dashboard health ...
Launching proxy ...
Verifying proxy health ...
Opening http://127.0.0.1:45177/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in your
default browser...
http://127.0.0.1:45177/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/
```

Cluster > Events

Stateful Sets

Service

Ingresses

Ingress Classes

Services

Config and Storage

Config Maps

Persistent Volume Claims

Secrets

Storage Classes

Cluster

Cluster Role Bindings

Cluster Roles

Events

Namespaces

Network Policies

Nodes

Persistent Volumes

Role Bindings

Roles

Service Accounts

Custom Resource Definitions

Events

Name	Reason	Message	Source	Object	Count	First Seen	Last Seen
multinode-demo-m02.17aafca34d88cf6	NodeReady	Node multinode-demo-m02 status is now: NodeReady	kubelet multinode-demo m02	Node/multinode-demo-m02	1	2 minutes ago	2 minutes ago
multinode-demo-m02.17aafca33c633373	RegisteredNode	Node multinode-demo-m02 event: Registered Node multinode-demo-m02 in Controller	node-controller	Node/multinode-demo-m02	1	2 minutes ago	2 minutes ago
multinode-demo-m02.17aafca2cbeefdb7	NodeHasSufficientM	Node multinode-demo-m02 status is now: NodeHasSufficientMemory	kubelet multinode-demo m02	Node/multinode-demo-m02	2	2 minutes ago	2 minutes ago
multinode-demo-m02.17aafca2cbef91c5	NodeHasNoDiskPre	Node multinode-demo-m02 status is now: NodeHasNoDiskPressure	kubelet multinode-demo m02	Node/multinode-demo-m02	2	2 minutes ago	2 minutes ago
multinode-demo-m02.17aafca2cbefafda	NodeHasSufficientP	Node multinode-demo-m02 status is now: NodeHasSufficientPID	kubelet multinode-demo m02	Node/multinode-demo-m02	2	2 minutes ago	2 minutes ago
multinode-demo-m02.17aafca29993ca9b	NodeAllocatableEnf	Updated Node Allocatable limit across pods	kubelet multinode-demo m02	Node/multinode-demo-m02	1	2 minutes ago	2 minutes ago
multinode-demo-m02.17aafca2b5c14397	Starting	Starting kubelet.	kubelet multinode-demo m02	Node/multinode-demo-m02	1	2 minutes ago	2 minutes ago
multinode-demo.17aafcf9b11c95339	RegisteredNode	Node multinode-demo event: Registered Node multinode-demo in Controller	node-controller	Node/multinode-demo	1	3 minutes ago	3 minutes ago
multinode-demo.17aafcf9a54cb1dd	NodeReady	Node multinode-demo status is now: NodeReady	kubelet multinode-demo	Node/multinode-demo	1	3 minutes ago	3 minutes ago
multinode-demo.17aafcf983aa83392	NodeHasSufficientP	Node multinode-demo status is now: NodeHasSufficientPID	kubelet multinode-demo	Node/multinode-demo	1	3 minutes ago	3 minutes ago

Containers

Images

Volumes

Builds

Dev Environments

Docker Scout

Extensions

Add Extensions

Containers

Container CPU usage

Container memory usage

26.58% / 800% (8 cores available)

1.05GB / 3.68GB

Search

Only show running containers

Name	Image	Status	CPU (%)	Port(s)	Last started	Actions
multinode-demo-c9091ad2784	gcr.io/k8s-minikube/kicbase:v0.0.42	Running	22.88%	52871:22	4 minutes ago	
multinode-demo-m02-401cb019833	gcr.io/k8s-minikube/kicbase:v0.0.42	Running	3.7%	52910:22	3 minutes ago	

```

char@CHARGLEN:~$ minikube stop -p multinode-demo
👉 Stopping node "multinode-demo" ...
🔥 Powering off "multinode-demo" via SSH ...
👉 Stopping node "multinode-demo-m02" ...
🔥 Powering off "multinode-demo-m02" via SSH ...
🔴 2 nodes stopped.
char@CHARGLEN:~$ kubectl get nodes
E0116 20:04:29.900299 8550 memcache.go:265] couldn't get current server API group list: Get "http://localhost:8080/api?tim
eout=32s": dial tcp 127.0.0.1:8080: connect: connection refused
E0116 20:04:29.901636 8550 memcache.go:265] couldn't get current server API group list: Get "http://localhost:8080/api?tim
eout=32s": dial tcp 127.0.0.1:8080: connect: connection refused
E0116 20:04:29.903475 8550 memcache.go:265] couldn't get current server API group list: Get "http://localhost:8080/api?tim
eout=32s": dial tcp 127.0.0.1:8080: connect: connection refused
E0116 20:04:29.903943 8550 memcache.go:265] couldn't get current server API group list: Get "http://localhost:8080/api?tim
eout=32s": dial tcp 127.0.0.1:8080: connect: connection refused
E0116 20:04:29.905502 8550 memcache.go:265] couldn't get current server API group list: Get "http://localhost:8080/api?tim
eout=32s": dial tcp 127.0.0.1:8080: connect: connection refused
The connection to the server localhost:8080 was refused - did you specify the right host or port?
char@CHARGLEN:~$ minikube status -p multinode-demo
multinode-demo
type: Control Plane
host: Stopped
kubelet: Stopped
apiserver: Stopped
kubecfg: Stopped

multinode-demo-m02
type: Worker
host: Stopped
kubelet: Stopped

```

```

char@CHARGLEN:~$ minikube delete --all
🔥 Deleting "multinode-demo" in docker ...
🔥 Removing /home/char/.minikube/machines/multinode-demo ...
🔥 Removing /home/char/.minikube/machines/multinode-demo-m02 ...
💀 Removed all traces of the "multinode-demo" cluster.
🔥 Successfully deleted all profiles
char@CHARGLEN:~$ minikube status -p multinode-demo
👉 Profile "multinode-demo" not found. Run "minikube profile list" to view all profiles.
👉 To start a cluster, run: "minikube start -p multinode-demo"
char@CHARGLEN:~$ |

```

```

char@CHARGLEN:~/Lab03$ minikube start
🎉 minikube v1.32.0 on Ubuntu 22.04 (amd64)
👉 Automatically selected the docker driver
🔥 Using Docker driver with root privileges
! For an improved experience it's recommended to use Docker Engine instead of Docker Desktop.
Docker Engine installation instructions: https://docs.docker.com/engine/install/#server
👉 Starting control plane node minikube in cluster minikube
👉 Pulling base image ...
🔥 Creating docker container (CPUs=2, Memory=2200MB) ...
👉 Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
  ▪ Generating certificates and keys ...
  ▪ Booting up control plane ...
  ▪ Configuring RBAC rules ...
👉 Configuring bridge CNI (Container Networking Interface) ...
👉 Verifying Kubernetes components...
  ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
👉 Enabled addons: default-storageclass, storage-provisioner
👉 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
char@CHARGLEN:~/Lab03$ kubectl get pods
No resources found in default namespace.
char@CHARGLEN:~/Lab03$ kubectl get nodes
NAME      STATUS    ROLES    AGE   VERSION
minikube  Ready     control-plane  42s   v1.28.3
char@CHARGLEN:~/Lab03$ screen
[detached from 16705.pts-5.CHARGLEN]
char@CHARGLEN:~/Lab03$ screen -ls
There is a screen on:
16705.pts-5.CHARGLEN      (01/16/24 21:10:29)      (Detached)
1 Socket in /run/screen/S-char.
char@CHARGLEN:~/Lab03$ |

```

Section 2 – Deployment YAML commands of Different Sets

```
char@CHARGLEN: ~/lab03
char@CHARGLEN:~/lab03$ ll
total 32
drwxr-xr-x  2 char char 4096 Jan 16 21:01 ./
drwxr-x--- 12 char char 4096 Jan 16 20:31 ../
-rw-r--r--  1 char char 252 Jan 16 20:34 daemonset.yaml
-rw-r--r--  1 char char 351 Jan 16 20:33 deployment.yaml
-rw-r--r--  1 char char 646 Jan 16 20:34 nginx-deployment-health.yaml
-rw-r--r--  1 char char 511 Jan 16 20:34 nginx-deployment-resources.yaml
-rw-r--r--  1 char char 304 Jan 16 20:33 replicaset.yaml
-rw-r--r--  1 char char 900 Jan 16 20:34 statefulset.yaml
char@CHARGLEN:~/lab03$ kubectl apply -f replicaset.yaml
replicaset.apps/nginx created
char@CHARGLEN:~/lab03$
```

The screenshot shows the Kubernetes Dashboard interface. The left sidebar contains a navigation menu with categories like Workloads, Service, Config and Storage, and Cluster. The main content area is titled 'Workload Status' and features two large green circles representing the status of Pods and Replica Sets. Below this, there are two tables: 'Pods' and 'Replica Sets'.

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created
nginx-fgw2	nginx	tier: lb	minikube	Running	0	-	-	a minute ago
nginx-pddg	nginx	tier: lb	minikube	Running	0	-	-	a minute ago
nginx-r29bw	nginx	tier: lb	minikube	Running	0	-	-	a minute ago

Name	Images	Labels	Pods	Created
nginx	nginx	app: nginx, tier: lb	3 / 3	a minute ago

```

char@CHARGLEN: ~/lab03
total 32
drwxr-xr-x  2 char char 4096 Jan 16 21:01 ./
drwxr-x--- 12 char char 4096 Jan 16 20:31 ../
-rw-r--r--  1 char char  252 Jan 16 20:34 daemonset.yaml
-rw-r--r--  1 char char  351 Jan 16 20:33 deployment.yaml
-rw-r--r--  1 char char  646 Jan 16 20:34 nginx-deployment-health.yaml
-rw-r--r--  1 char char  511 Jan 16 20:34 nginx-deployment-resources.yaml
-rw-r--r--  1 char char  304 Jan 16 20:33 replicaset.yaml
-rw-r--r--  1 char char  900 Jan 16 20:34 statefulset.yaml
char@CHARGLEN:~/lab03$ kubectl apply -f replicaset.yaml
replicaset.apps/nginx created
char@CHARGLEN:~/lab03$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-fgw12    1/1     Running   0           2m24s
nginx-ppdsg    1/1     Running   0           2m24s
nginx-r298w    1/1     Running   0           2m24s
char@CHARGLEN:~/lab03$ kubectl get replicasets
NAME          DESIRED   CURRENT   READY   AGE
nginx         3         3         3       2m30s
char@CHARGLEN:~/lab03$ kubectl delete pod nginx-fgw12
pod "nginx-fgw12" deleted
char@CHARGLEN:~/lab03$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-kdhhq    1/1     Running   0           15s
nginx-ppdsg    1/1     Running   0          3m10s
nginx-r298w    1/1     Running   0          3m10s
char@CHARGLEN:~/lab03$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-kdhhq    1/1     Running   0           18s
nginx-ppdsg    1/1     Running   0          3m13s
nginx-r298w    1/1     Running   0          3m13s
char@CHARGLEN:~/lab03$

```

```

char@CHARGLEN: ~/lab03
char@CHARGLEN:~/lab03$ kubectl apply -f deployment.yaml
deployment.apps/nginx-deployment created
char@CHARGLEN:~/lab03$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment  3/3     3             3           29s
char@CHARGLEN:~/lab03$ kubectl rollout status deployment/nginx-deployment
deployment "nginx-deployment" successfully rolled out
char@CHARGLEN:~/lab03$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-4zd8b  1/1     Running   0           107s
nginx-deployment-86dcfdf4c6-jlwct  1/1     Running   0           109s
nginx-deployment-86dcfdf4c6-ndddx  1/1     Running   0           2m3s
char@CHARGLEN:~/lab03$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment  3/3     3             3          2m10s
char@CHARGLEN:~/lab03$

```

Kubernetes Dashboard

Workloads

Workload Status

Running 1 Deployments Running 3 Pods Running 2 Replica Sets

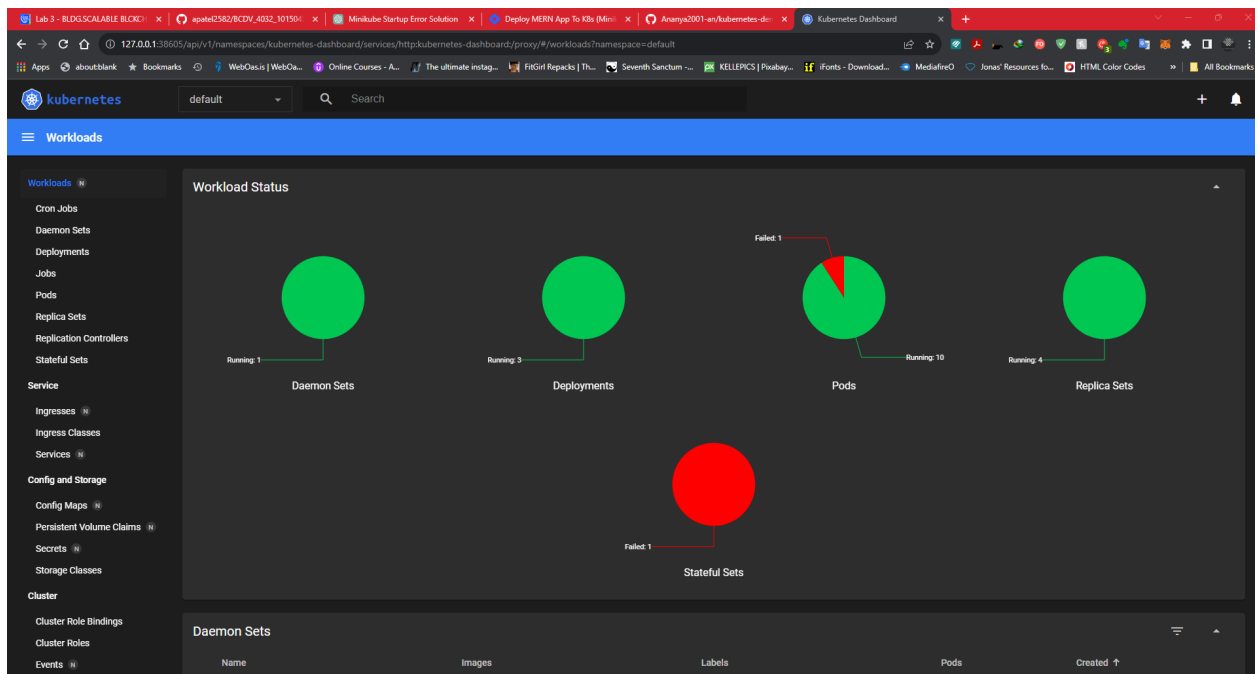
Deployments

Name	Images	Labels	Pods	Created ↑
nginx-deployment	nginx:1.14.2	app: nginx	3 / 3	a minute ago

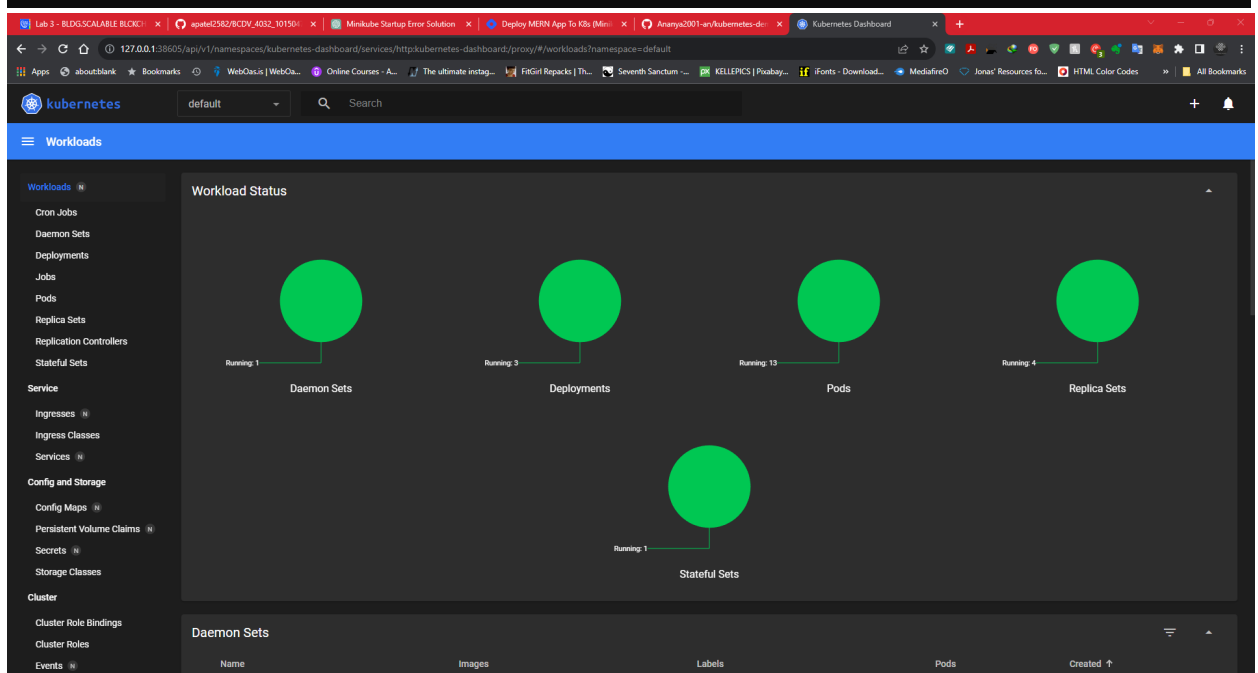
Pods

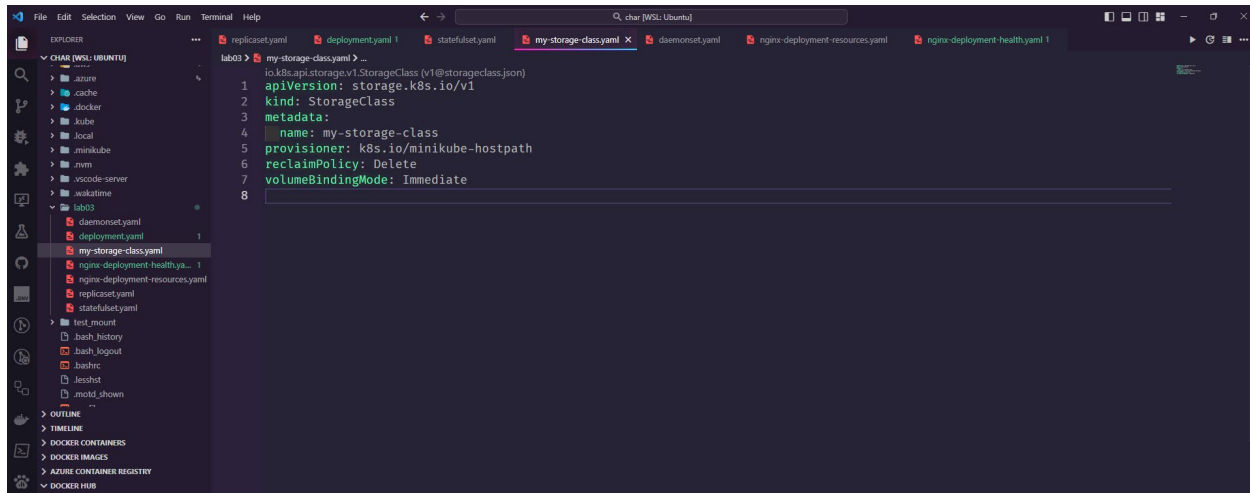
Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created ↑
nginx-deployment-86dcfd4c6-4zd8b	nginx:1.14.2	app: nginx pod-template-hash: 86dcfd4c6	minikube	Running	0	-	-	a minute ago
nginx-deployment-86dcfd4c6-jwct	nginx:1.14.2	app: nginx pod-template-hash: 86dcfd4c6	minikube	Running	0	-	-	a minute ago

```
char@CHARGLEN: ~/lab03
char@CHARGLEN:~/lab03$ kubectl apply -f statefulset.yaml
service/nginx unchanged
statefulset.apps/web created
char@CHARGLEN:~/lab03$ kubectl get statefulsets
NAME    READY   AGE
web     0/3     19s
char@CHARGLEN:~/lab03$ kubectl apply -f daemonset.yaml
daemonset.apps/nginx created
char@CHARGLEN:~/lab03$ kubectl get daemonsets
NAME    DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
nginx   1          1          0        1             0           <none>          4s
char@CHARGLEN:~/lab03$ kubectl apply -f nginx-deployment-resources.yaml
deployment.apps/nginx-deployment-resources created
char@CHARGLEN:~/lab03$ kubectl get deployments
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment                    3/3     3             3           9m20s
nginx-deployment-resources          3/3     3             3           5s
char@CHARGLEN:~/lab03$ kubectl apply -f nginx-deployment-health.yaml
deployment.apps/nginx-deployment-health created
char@CHARGLEN:~/lab03$ kubectl get deployments
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment                    3/3     3             3           9m38s
nginx-deployment-health              0/3     3             0           5s
nginx-deployment-resources           3/3     3             3           23s
char@CHARGLEN:~/lab03$ kubectl get deployments
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment                    3/3     3             3           9m50s
nginx-deployment-health              3/3     3             3           17s
nginx-deployment-resources           3/3     3             3           35s
char@CHARGLEN:~/lab03$ |
```



```
char@CHARGLEN: ~/lab03$ kubectl apply -f statefulset.yaml
service/nginx unchanged
The StatefulSet "web" is invalid: spec: Forbidden: updates to statefulset spec for fields other than 'replicas', 'ordinals',
'template', 'updateStrategy', 'persistentVolumeClaimRetentionPolicy' and 'minReadySeconds' are forbidden
char@CHARGLEN:~/lab03$ kubectl apply -f my-storage-class.yaml
storageclass.storage.k8s.io/my-storage-class created
char@CHARGLEN:~/lab03$ kubectl apply -f statefulset.yaml
service/nginx unchanged
statefulset.apps/web configured
char@CHARGLEN:~/lab03$ kubectl get pvc
NAME          STATUS  VOLUME                                     CAPACITY  ACCESS MODES  STORAGECLASS  AGE
www-web-0     Bound  pvc-cdd54281-8103-4f72-9d4c-b36266953079  1Gi       RWO           my-storage-class  16m
char@CHARGLEN:~/lab03$ kubectl get statefulsets
NAME  READY  AGE
web   3/3    12m
char@CHARGLEN:~/lab03$
```





Section 3 – Full-Stack Application Deployment

The screenshot displays a Windows command prompt window and the Kubernetes Dashboard. The command prompt shows the execution of several commands to set up a minikube environment and deploy a MongoDB application.

```
C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>minikube status
W0119 11:16:46.787540 24200 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\anish\.docker\contexts\meta\37a8eec1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
minikube
type: Control Plane
host: Running
kubeadm: Running
apiserver: Running
kubecfg: Configured

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>kubectl apply -f secrets/mongodb-secret.yml
secret/mongodb-secret created

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>kubectl apply -f stateful-sets/mongodb-stateful-set.yml
statefulset.apps/mongodb-stateful-set created

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>
```

The Kubernetes Dashboard shows the 'Secrets' tab under the 'Config' section. It lists two secrets:

Name	Namespace	Labels	Keys	Type	Age
bootstrap-token-pxm82m	kube-system		auth-extra-groups, e	bootstrap.kubernet	16h
mongodb-secret	default		password, username	Opaque	2m3s

The dashboard also shows a terminal window at the bottom with the command prompt output.

minikube -

Cluster
Applications
Nodes
Workloads

Overview
Pods
Deployments
Daemon Sets
Stateful Sets
Replica Sets
Replication Controllers
Jobs
Cron Jobs

Config
Config Maps
Secrets
Resource Quotas
Limit Ranges
Horizontal Pod Autoscalers
Vertical Pod Autoscalers
Pod Disruption Budgets
Priority Classes
Runtime Classes
Leases
Mutating Webhook Configs
Validating Webhook Configs

Network
Storage

Stateful Sets

1 item

Name	Namespace	Pods	Replicas	Age
mongodb-stateful-set	default	2/2	2	90s

Terminal

```
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes> kubectl apply -f services/mongodb-service.yml
```

```
C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>kubectl apply -f services/mongodb-service.yml
service/mongodb-service created
```

```
C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>kubectl apply -f deployments/note-server-depl.yml
deployment.apps/note-server-deployment created
```

```
C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>
```

minikube -

Deployments
Daemon Sets
Stateful Sets
Replica Sets
Replication Controllers
Jobs
Cron Jobs

Config
Config Maps
Secrets
Resource Quotas
Limit Ranges
Horizontal Pod Autoscalers
Vertical Pod Autoscalers
Pod Disruption Budgets
Priority Classes
Runtime Classes
Leases
Mutating Webhook Configs
Validating Webhook Configs

Network
Services
Endpoints
Ingresses
Ingress Classes
Network Policies
Port Forwarding
Storage
Persistent Volume Claims

Services

4 items

Name	Namespace	Type	Cluster IP	Ports	External IP	Selector	Age	Status
kube-dns	kube-system	ClusterIP	10.96.0.10	53/UDP, 53/TCP	-	k8s-app=kube-dns	16h	Active
kubernetes	default	ClusterIP	10.96.0.1	443/TCP	-	-	16h	Active
metrics-server	kube-system	ClusterIP	10.107.18.123	443/TCP	-	k8s-app=metrics-server	8m35s	Active
mongodb-service	default	ClusterIP	10.111.69.68	27017/TCP	-	app=mongo	76s	Active

Terminal

```
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes> kubectl apply -f services/mongodb-service.yml
```

minikube

Cluster

Nodes

Workloads

Overview

Pods

Deployments

Daemon Sets

Stateful Sets

Replica Sets

Replication Controllers

Jobs

Cron Jobs

Config

Config Maps

Secrets

Resource Quotas

Limit Ranges

Horizontal Pod Autoscalers

Vertical Pod Autoscalers

Pod Disruption Budgets

Priority Classes

Runtime Classes

Leases

Mutating Webhook Configs

Validating Webhook Configs

Network

Services

Deployments

3 Items

Name	Namespace	Pods	Replicas	Age	Conditions
note-server-deployment	default	2/2	2	84s	Available Progressing
coredns	kube-system	1/1	1	16h	Available Progressing
metrics-server	kube-system	1/1	1	9m33s	Available Progressing

Terminal

ReplicaSet note-server-deployment-6fb5fcb67f

Namespace: default Owner: ReplicaSet note-server-deployment-6fb5fcb67f Pod: All Pods Container: All containers

```
> note-server@0.0 start
> node index.js

(node:25) [Mongoose] DeprecationWarning: Mongoose: the 'strictQuery' option will be switched back to 'false' by default in Mongoose 7. Use 'mongoose.set('strictQuery', false);' if you want to prepare for this change. Or use 'mongoose.set('use strict query', true);' to show where the warning was created
server is listening...
connected to DB
(node:26) [Mongoose] DeprecationWarning: Mongoose: the 'strictQuery' option will be switched back to 'false' by default in Mongoose 7. Use 'mongoose.set('strictQuery', false);' if you want to prepare for this change. Or use 'mongoose.set('use strict query', true);' to show where the warning was created
server is listening...
connected to DB
```

Logs from 1/19/2024, 11:23:47 AM

```
C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernet&
es>kubectl apply -f services/note-server-service.yml
service/note-server-service created

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernet&
es>kubectl apply -f deployments/note-depl.yml
deployment.apps/note-deployment created

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernet&
es>kubectl apply -f services/note-service.yml
service/note-service created
```

minikube

Cluster

Nodes

Workloads

Overview

Pods

Deployments

Daemon Sets

Stateful Sets

Replica Sets

Replication Controllers

Jobs

Cron Jobs

Config

Config Maps

Secrets

Resource Quotas

Limit Ranges

Horizontal Pod Autoscalers

Vertical Pod Autoscalers

Pod Disruption Budgets

Priority Classes

Runtime Classes

Leases

Mutating Webhook Configs

Validating Webhook Configs

Network

Services

Endpoints

Ingresses

Ingress Classes

Network Policies

Port Forwarding

Storage

Persistent Volume Claims

Persistent Volumes

Storage Classes

Namespaces

Services

5 Items

Name	Namespace	Type	Cluster IP	Ports	External IP	Selector	Age	Status
kube-dns	kube-system	ClusterIP	10.96.0.10	53/UDP, 53/TCP	-	k8s-app=kube-dns	16h	Active
kubernetes	default	ClusterIP	10.96.0.1	443/TCP	-	-	16h	Active
metrics-server	kube-system	ClusterIP	10.107.18.123	443/TCP	-	k8s-app=metrics-server	10m	Active
mongodb-service	default	ClusterIP	10.111.69.68	27017/TCP	-	app=mongo	4m2s	Active
note-server-service	default	ClusterIP	10.108.180.10	5000/TCP	-	app=note-server	14s	Active

Terminal

ReplicaSet note-server-deployment-6fb5fcb67f

Namespace: default Owner: ReplicaSet note-server-deployment-6fb5fcb67f Pod: All Pods Container: All containers

```
> note-server@0.0 start
> node index.js

(node:25) [Mongoose] DeprecationWarning: Mongoose: the 'strictQuery' option will be switched back to 'false' by default in Mongoose 7. Use 'mongoose.set('strictQuery', false);' if you want to prepare for this change. Or use 'mongoose.set('use strict query', true);' to show where the warning was created
server is listening...
connected to DB
(node:26) [Mongoose] DeprecationWarning: Mongoose: the 'strictQuery' option will be switched back to 'false' by default in Mongoose 7. Use 'mongoose.set('strictQuery', false);' if you want to prepare for this change. Or use 'mongoose.set('use strict query', true);' to show where the warning was created
server is listening...
connected to DB
```

Logs from 1/19/2024, 11:23:47 AM

Cluster

Applications

Nodes

Workloads

Overview

Pods

Deployments

Daemon Sets

Stateful Sets

Replica Sets

Replication Controllers

Jobs

Cron Jobs

Config

Config Maps

Secrets

Resource Quotas

Limit Ranges

Horizontal Pod Autoscalers

Vertical Pod Autoscalers

Pod Disruption Budgets

Priority Classes

Runtime Classes

Leases

Mutating Webhook Configs

Validating Webhook Configs

Network

Services

Overview

Pods

Deployments

Daemon Sets

Stateful Sets

Replica Sets

Replication Controllers

Jobs

Cron Jobs

4 items

All namespaces

Name	Namespace	Pods	Replicas	Age	Conditions
note-deployment	default	2/2	2	49s	Available Progressing
note-server-deployment	default	2/2	2	3m32s	Available Progressing
coredns	kube-system	1/1	1	16h	Available Progressing
metrics-server	kube-system	1/1	1	12m	Available Progressing

Terminal

PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes>

C:\Windows\System32\cmd.exe

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernet>kubectl apply -f services/note-service.yml
service/note-service created

C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernet>minikube service note-service
W0119 11:29:11.331987 4424 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": con
text not found: open C:\Users\anish\.docker\contexts\meta\37a8eec1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\me
ta.json: The system cannot find the path specified.

NAMESPACE	NAME	TARGET PORT	URL
default	note-service	3000	http://192.168.49.2:30782

* Starting tunnel for service note-service.

NAMESPACE	NAME	TARGET PORT	URL
default	note-service		http://127.0.0.1:52928

* Opening service default/note-service in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.

minikube

Vertical Pod Autoscalers

Pod Disruption Budgets

Priority Classes

Runtime Classes

Leases

Mutating Webhook Configs

Validating Webhook Configs

Network

Services

Endpoints

Ingresses

Ingress Classes

Network Policies

Port Forwarding

Storage

Persistent Volume Claims

Persistent Volumes

Storage Classes

Namespaces

Events

Helm

Charts

Releases

Access Control

Custom Resources

Security Center

Services

6 Items

All namespaces

Name	Namespace	Type	Cluster IP	Ports	External IP	Selector	Age	Status
kube-dns	kube-system	ClusterIP	10.96.0.10	53/UDP, 53/TCP	-	k8s-app=kube-dns	16h	Active
kubernetes	default	ClusterIP	10.96.0.1	443:8443/TCP	-	-	16h	Active
metrics-server	kube-system	ClusterIP	10.107.18.123	443:https/TCP	-	k8s-app=metrics-server	15m	Active
mongodb-service	default	ClusterIP	10.111.69.68	27017/TCP	-	app=mongodb	8m37s	Active
note-server-service	default	ClusterIP	10.108.180.10	5000/TCP	-	app=note-server	4m49s	Active
note-service	default	LoadBalancer	10.99.78.229	3000:30782/TCP	-	app=note	47s	Pending

Terminal

```
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4832_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes> minikube service note-service
W0119 11:28:10.531611 3589 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\anish\.docker\contexts\meta\37a8ee1ca19687d132fe29851dcak29d164e2c4958:
boltdb4135035f6a88f1meta.json: The system cannot find the path specified.
X failed to get service URL: Get "https://127.0.0.1:49299/api/v1/namespaces/default/services": tls: failed to verify certificate: x509: certificate signed by unknown authority
A check that minikube is running and that you have specified the correct namespace (-n flag) is required.
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4832_Building_Scalable_Blockchain_Apps\kubernetes-demo\kubernetes> |
```

note.

Assignments Add Assignment Notes Add Note

Test Note

This is a test note

Edit

Delete

The screenshot shows the Minikube dashboard interface. On the left is a sidebar with navigation options: Home, Cluster, Applications, Nodes, Workloads (selected), Overview, Pods, Deployments, Daemon Sets, Stateful Sets, Replica Sets, Replication Controllers, Jobs, Cron Jobs, Config, Config Maps, Secrets, Resource Quotas, Limit Ranges, Horizontal Pod Autoscalers, Vertical Pod Autoscalers, Pod Disruption Budgets, Priority Classes, Runtime Classes, Leases, Mutating Webhook Configs, Validating Webhook Configs, and Network Services. The main panel displays the 'Deployments' tab, showing a list of deployments. The 'mongo-express-deployment' is highlighted with a red box. The terminal at the bottom shows the command 'minikube service note-service' and its output, which includes a warning about the certificate authority.

Name	Namespace	Pods	Replicas	Age	Conditions
note-deployment	default	2/2	2	6m41s	Available Progressing
note-server-deployment	default	2/2	2	9m24s	Available Progressing
mongo-express-deployment	default	1/1	1	46s	Available Progressing
coredns	kube-system	1/1	1	16h	Available Progressing
metrics-server	kube-system	1/1	1	17m	Available Progressing

```

PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_#2\BC2W_4632_Building_Scalable_Blockchain_Apps\kubernetes-demos\kubernetes> minikube service note-service
minikube service note-service: Unable to resolve the current Docker CLI context: 'default': context 'default': context not found: open c:\Users\anish\docker\contexts\meta\37a8ee1ce1967d132f2c9851dc623d164e2c4958ba1d0f413a2d78688f\meta.json: The system cannot find the path specified.
x Failed to get service URL: Get "https://192.168.8.1:49990/api/v1/namespaces/default/services?tls=false": failed to verify certificate: x509: certificate signed by unknown authority
* Check that minikube is running and that you have specified the correct namespace (-n flag) if required.
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_#2\BC2W_4632_Building_Scalable_Blockchain_Apps\kubernetes-demos\kubernetes>
  
```

minikube

Overview Pods **Deployments** Daemon Sets Stateful Sets Replica Sets Replication Controllers Jobs Cron Jobs

Deployments 5 items

Name	Namespace	Pods	Replicas	Age	Conditions
note-deployment	default	2/2	2	10m	Available Progressing
note-server-deployment	default	2/2	2	12m	Available Progressing
mongo-express-deployment	default	1/1	1	4m31s	Available Progressing
coredns	kube-system	1/1	1	16h	Available Progressing
metrics-server	kube-system	1/1	1	21m	Available Progressing

Terminal Deployment mongo-express-deployment

```
GET /public/img/gears.gif 200 3.336 ms - 50281
GET /public/fonts/glyphicons-halflings-regular.woff2 200 41.272 ms - 18028
GET /db/mydb/ 200 135.705 ms - 10117
GET /public/css/bootstrap.min.css 204 3.524 ms -
GET /public/css/bootstrap-theme.min.css 204 3.312 ms -
GET /public/css/style.css 204 3.099 ms -
GET /public/img/mongo-express-logo.png 204 2.394 ms -
GET /public/vendor-97f5f3a2e0e0ff0b1c5e104 2.326 ms -
GET /public/img/gears.gif 204 0.384 ms -
GET /public/database-s465a86c59f316dbde.min.js 200 5.345 ms - 1447
GET /public/fonts/glyphicons-halflings-regular.woff2 204 0.399 ms -
```

Viewing Collection: notes

New Document New Index

Simple Advanced

Key Value String Find

Delete all 1 documents retrieved

_id	name	note	cover
65aaa3ac8376c221598861	Test Note	This is a test note	*** LARGE PROPERTY *** ~477 KB Preview "data:image/png;base64,IV" Click to fetch this property

Rename Collection

mydb: notes Rename

Tools

Export Standard Export -jsonArray Export -csv

Taking down 1 Pod of Note Deployment –

The image shows a Kubernetes dashboard interface with a list of pods and a terminal window below it.

Kubernetes Dashboard Pods List:

Name	Namespace	Contail...	CPU	Memory	Restarts	Controlled t	Node	QoS	Age	Status
mongodb-stateful-set-0	default		0.005	135.5MiB	0	StatefulSet	minikube	BestEffort	23m	Running
mongodb-stateful-set-1	default		0.005	118.9MiB	0	StatefulSet	minikube	BestEffort	22m	Running
coredns-5dd5756b68-l8wwr	kube-system		0.006	35.4MiB	1	ReplicaSet	minikube	Burstable	16h	Running
metrics-server-7c66d45ddc-sjvqz	kube-system		0.004	30.2MiB	0	ReplicaSet	minikube	Burstable	28m	Running
mongo-express-deployment-b88f6d45f-rjwrs	default		0.000	84.9MiB	0	ReplicaSet	minikube	BestEffort	10m	Running
note-deployment-74cc946cd8-dd2wz	default		0.000	0	0	ReplicaSet	minikube	BestEffort	16s	Running
note-deployment-74cc946cd8-sd57x	default		0.000	6.9MiB	0	ReplicaSet	minikube	BestEffort	16m	Running
note-server-deployment-6fb5fcb67f-ljg9z	default		0.001	70.3MiB	0	ReplicaSet	minikube	BestEffort	19m	Running
note-server-deployment-6fb5fcb67f-s2kgn	default		0.000	80.2MiB	0	ReplicaSet	minikube	BestEffort	19m	Running
etcd-minikube	kube-system		0.019	63.7MiB	1	Node	minikube	Burstable	16h	Running
kube-apiserver-minikube	kube-system		0.057	282.3MiB	1	Node	minikube	Burstable	16h	Running
kube-controller-manager-minikube	kube-system		0.019	70.1MiB	1	Node	minikube	Burstable	16h	Running
kube-scheduler-minikube	kube-system		0.004	38.8MiB	1	Node	minikube	Burstable	16h	Running

Terminal Output:

```
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-rjwrs  1/1     Running   0           9m46s
mongodb-stateful-set-0                  1/1     Running   0           22m
mongodb-stateful-set-1                  1/1     Running   0           21m
note-deployment-74cc946cd8-2xmtl        1/1     Running   0           15m
note-deployment-74cc946cd8-sd57x        1/1     Running   0           15m
note-server-deployment-6fb5fcb67f-ljg9z  1/1     Running   0           18m
note-server-deployment-6fb5fcb67f-s2kgn  1/1     Running   0           18m
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl delete ppod note-deployment
error: the server doesn't have a resource type "ppod"
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl delete pod note-deployment
Error from server (NotFound): pods "note-deployment" not found
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl delete pod note-deployment-74cc946cd8-2xmtl
pod "note-deployment-74cc946cd8-2xmtl" deleted
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes>
```

```

PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-rjwrs  1/1     Running   0           9m46s
mongodb-stateful-set-0                 1/1     Running   0           22m
mongodb-stateful-set-1                 1/1     Running   0           21m
note-deployment-74cc946cd8-2xmtl       1/1     Running   0           15m
note-deployment-74cc946cd8-sd57x       1/1     Running   0           15m
note-server-deployment-6fb5fcb67f-ljg9z  1/1     Running   0           18m
note-server-deployment-6fb5fcb67f-s2kgm  1/1     Running   0           18m
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl delete ppod note-deployment
error: the server doesn't have a resource type "ppod"
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl delete pod note-deployment
Error from server (NotFound): pods "note-deployment" not found
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl delete pod note-deployment-74cc946cd8-2xmtl
pod "note-deployment-74cc946cd8-2xmtl" deleted
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes> kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-rjwrs  1/1     Running   0           11m
mongodb-stateful-set-0                 1/1     Running   0           24m
mongodb-stateful-set-1                 1/1     Running   0           23m
note-deployment-74cc946cd8-ddzwz       1/1     Running   0           73s
note-deployment-74cc946cd8-sd57x       1/1     Running   0           17m
note-server-deployment-6fb5fcb67f-ljg9z  1/1     Running   0           20m
note-server-deployment-6fb5fcb67f-s2kgm  1/1     Running   0           20m
PS C:\Users\anish\Downloads\GBC_Blockchain_Development\Semester_02\BCDV_4032_Building_Scalable_Blockchain_Apps\kubernetes-dem
o\kubernetes>

```