

LAB 3:

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ 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=192.168.58.2
[+] Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
    ▪ env NO_PROXY=192.168.58.2
[+] Verifying Kubernetes components...
[+] Done! kubectl is now configured to use "multinode-demo" cluster and "default" namespace by default
```

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get nodes
```

NAME	STATUS	ROLES	AGE	VERSION
multinode-demo	Ready	control-plane	41s	v1.28.3
multinode-demo-m02	Ready	<none>	13s	v1.28.3

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ 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
```

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ minikube dashboard -p multinode-demo
[+] Enabling dashboard ...
    ▪ Using image docker.io/kubernetes/dashboard:v2.7.0
    ▪ Using image docker.io/kubernetes/metrics-scraper:v1.0.8
[+] 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://127.0.0.1:34785/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in your default browser
[+] http://127.0.0.1:34785/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/
```

The screenshot shows the Kubernetes dashboard interface. The sidebar on the left contains navigation links: Cluster, Nodes, Events, Namespaces, Network Policies, Persistent Volumes, Role Bindings, Roles, Service Accounts, and Custom Resource Definitions. The main content area is titled 'Nodes' and displays a table of nodes in the cluster.

Name	Labels	Ready	CPU requests (cores)	CPU limits (cores)	CPU capacity (cores)	Memory requests (bytes)	Memory limits (bytes)	Memory capacity (bytes)	Pods	Create
multinode-demo-m02	beta.kubernetes.io/arch: amd64 beta.kubernetes.io/os: linux kubernetes.io/arch: amd64	True	100.00m (1.25%)	100.00m (1.25%)	8.00	50.00Mi (0.63%)	50.00Mi (0.63%)	7.71Gi	4 (3.64%)	13 minutes ago
multinode-demo	beta.kubernetes.io/arch: amd64 beta.kubernetes.io/os: linux kubernetes.io/arch: amd64	True	850.00m (10.63%)	100.00m (1.25%)	8.00	220.00Mi (2.78%)	220.00Mi (2.78%)	7.71Gi	8 (7.27%)	13 minutes ago

```
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f replicaset.yaml
replicaset.apps/nginx created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-6xglm   0/1     ContainerCreating   0          14s
nginx-q94tk   0/1     ContainerCreating   0          14s
nginx-qqw2l   0/1     ContainerCreating   0          14s
```

```
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-c9drs    1/1     Running   0           4s
nginx-q94tk    1/1     Running   0          76s
nginx-qqw2l    1/1     Running   0          76s
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl delete pod nginx-c9drs
pod "nginx-c9drs" deleted
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-lfz6c    1/1     Running   0           3s
nginx-q94tk    1/1     Running   0          93s
nginx-qqw2l    1/1     Running   0          93s
```

```
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get replicaset
NAME   DESIRED   CURRENT   READY   AGE
nginx   3          3          3       116s
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get deployments
No resources found in default namespace.
```

```
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f deployment.yaml
deployment.apps/nginx-deployment created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment 3/3      1             3           4s
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get replicaset
NAME          DESIRED   CURRENT   READY   AGE
nginx          3          3          3       8m19s
nginx-deployment-86dcfdf4c6 1          1          0       11s
```

```
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl rollout history deployment
deployment.apps/nginx-deployment
REVISION  CHANGE-CAUSE
0          <none>
1          <none>
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl rollout status deployment.apps/nginx-deployment
deployment "nginx-deployment" successfully rolled out
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$
```

```

shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f statefulset-service.yaml
service/nginx created
statefulset.apps/web created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get services
NAME      TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
kubernetes  ClusterIP  10.96.0.1     <none>        443/TCP    32m
nginx      ClusterIP  None         <none>        80/TCP     4s

```

FOR STATEFUL SETS:

- Ran the provided code. But observed that the pod is still in pending state, debugged it by describing the pod info and found out the volume hasn't been assigned to it
- The error: **0/1 nodes are available: pod has unbound immediate PersistentVolumeClaims. preemption: 0/1 nodes are available: 1 Preemption is not helpful for scheduling..**
- Did **kubectl get pv** and found out there's no allocated resource so had to create a yaml file for that
- had to create three different volume for three different replicas
- also tested by applying pvs and changing storage-class but that didn't work

```

shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f statefulset-service.yaml
service/nginx created
statefulset.apps/web created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get services
NAME      TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
kubernetes  ClusterIP  10.96.0.1     <none>        443/TCP    32m
nginx      ClusterIP  None         <none>        80/TCP     4s

```

- did below step for pv-1 and pv-2 (for pod web-1 and web-2 respectively)

```

system-node-critical    2000001000    false    41m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pv
No resources found
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f pv.yaml
persistentvolume/example-pv created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pv
NAME      CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM   STORAGECLASS   REASON   AGE
example-pv  1Gi        RWO            Retain           Available         my-storage-class               2s

```

```

shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-2bp62   1/1     Running   0           61m
nginx-deployment-86dcfdf4c6-kslvf   1/1     Running   0           61m
nginx-deployment-86dcfdf4c6-zrz72   1/1     Running   0           61m
web-0                                1/1     Running   0           39m
web-1                                1/1     Running   0           28m
web-2                                0/1     Pending   0           12m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f pv-2.yaml
persistentvolume/example-web2-pv created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-2bp62   1/1     Running   0           62m
nginx-deployment-86dcfdf4c6-kslvf   1/1     Running   0           62m
nginx-deployment-86dcfdf4c6-zrz72   1/1     Running   0           62m
web-0                                1/1     Running   0           41m
web-1                                1/1     Running   0           30m
web-2                                1/1     Running   0           13m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get statefulsets
NAME    READY   AGE
web     3/3     41m

```

```

shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f daemonset.yml
daemonset.apps/nginx created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get daemonsets
Command 'kubectl' not found, did you mean:
  command 'kubectll' from snap kubectll (1.28.5)
See 'snap info <snapname>' for additional versions.
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get daemonsets
NAME      DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
nginx     1         1         0       1             0           <none>          21s
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$

```

```

shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f deployment-rsclimit.yml
deployment.apps/nginx-deployment created
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get deployments
Command 'kubectll' not found, but can be installed with:
'sudo snap install kubectll'
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f deployment-rsclimit.yml
deployment.apps/nginx-deployment unchanged
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get deployments
NAME                    READY   UP-TO-DATE   AVAILABLE   AGE
mongo-express-deployment 1/1     1             1           86m
nginx-deployment         3/3     3             3           26s
note-deployment          2/2     2             2           34m
note-server-deployment   2/2     2             2           43m

```

```

shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl apply -f deployment-healthcheck.yml
deployment.apps/nginx-deployment configured
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3$ kubectl get deployments
NAME                    READY   UP-TO-DATE   AVAILABLE   AGE
mongo-express-deployment 1/1     1             1           87m
nginx-deployment         3/3     1             3           97s
note-deployment          2/2     2             2           35m
note-server-deployment   2/2     2             2           44m

```

FRONT END APPLICATION DEMO:

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
mongo-express-deployment-b88f6d45f-95688	1/1	Running	0	52m
mongodb-stateful-set-0	1/1	Running	0	63m
mongodb-stateful-set-1	1/1	Running	0	61m
note-deployment-74cc946cd8-nwvcs	1/1	Running	0	78s
note-deployment-74cc946cd8-xxs69	1/1	Running	0	78s
note-server-deployment-6fb5fcb67f-9j4tb	1/1	Running	0	10m
note-server-deployment-6fb5fcb67f-nkv6h	1/1	Running	0	10m

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl get deployments
```

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
mongo-express-deployment	1/1	1	1	67m
note-deployment	2/2	2	2	15m
note-server-deployment	2/2	2	2	24m

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl get services
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	102m
mongo-express-service	NodePort	10.105.162.127	<none>	8081:31267/TCP	63m
mongodb-service	ClusterIP	10.109.45.25	<none>	27017/TCP	68m
note-server-service	ClusterIP	10.98.169.26	<none>	5000/TCP	18m
note-service	NodePort	10.101.202.89	<none>	3000:31945/TCP	14m

```
shehrozwaseem@DESKTOP-7BRNBJJ:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ minikube service note-service
```

NAMESPACE	NAME	TARGET PORT	URL
default	note-service	3000	http://192.168.49.2:31945

Starting tunnel for service note-service.

NAMESPACE	NAME	TARGET PORT	URL
default	note-service		http://127.0.0.1:35253

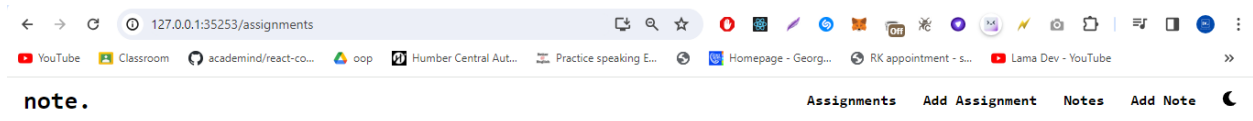
Opening service default/note-service in default browser...
<http://127.0.0.1:35253>
 Because you are using a Docker driver on linux, the terminal needs to be open to run it.

127.0.0.1:35253

note.

Assignments Add Assignment Notes Add Note

Important Assignments

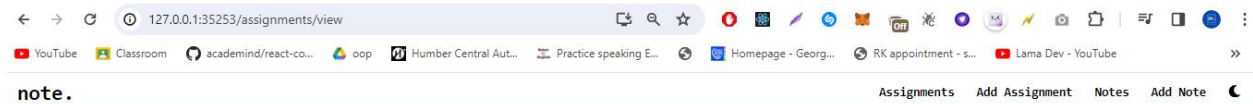


Search Assignments

Name:

Search

shehroz - 101501973



shehroz - 101501973

```
1 apiVersion: v1
2 kind: Secret
3 metadata:
4   name: mongo-secret
5 type: Opaque
6 data:
7   mongo-user: bW9uZ291c2Vy
8   mongo-password: bW9uZ29wYXNzd29yZA==
```

Deadline: 2024-01-21
Subject: lab 3
Important

Activate Windows
Go to Settings to activate Windows.

127.0.0.1:35253/assignments/new

note. Assignments Add Assignment Notes Add Note

New Assignment

Name:

Deadline:

Subject:

Priority:

Attach image of assignment

Cancel Create

Activate Windows
Go to Settings to activate Windows.

note. Assignments Add Assignment Notes Add Note

Search Assignments

Name:

Search

shehroz - 101501973

shehroz 2

127.0.0.1:35253/assignments/view

note. Assignments Add Assignment Notes Add Note

shehroz 2

Assignment

Deadline: 2024-01-22

Subject: lab 5 - no img - 2nd assignment

Important

Edit Delete

TASK - ANALYSIS:

- the delete process took a bit time as compared to the regular deletion process:

```

note-service      NodePort    10.101.202.89    <none>          3000:31945/TCP    14m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl get pods
NAME                                READY    STATUS    RESTARTS    AGE
mongo-express-deployment-b88f6d45f-95688    1/1      Running   0            72m
mongodb-stateful-set-0                    1/1      Running   0            83m
mongodb-stateful-set-1                    1/1      Running   0            81m
note-deployment-74cc946cd8-nwvcs           1/1      Running   0            21m
note-deployment-74cc946cd8-xxs69           1/1      Running   0            21m
note-server-deployment-6fb5fcb67f-9j4tb     1/1      Running   0            30m
note-server-deployment-6fb5fcb67f-nkv6h     1/1      Running   0            30m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl delete pods n
ote-server-deployment-6fb5fcb67f-9j4tb
pod "note-server-deployment-6fb5fcb67f-9j4tb" deleted

```

- it recreated another port

```

note-server-deployment-6fb5fcb67f-nkv6h    1/1      Running   0            30m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl delete pods n
ote-server-deployment-6fb5fcb67f-9j4tb
pod "note-server-deployment-6fb5fcb67f-9j4tb" deleted
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$ kubectl get pods
NAME                                READY    STATUS    RESTARTS    AGE
mongo-express-deployment-b88f6d45f-95688    1/1      Running   0            75m
mongodb-stateful-set-0                    1/1      Running   0            86m
mongodb-stateful-set-1                    1/1      Running   0            84m
note-deployment-74cc946cd8-nwvcs           1/1      Running   0            24m
note-deployment-74cc946cd8-xxs69           1/1      Running   0            24m
note-server-deployment-6fb5fcb67f-7r84b     1/1      Running   0            2m44s
note-server-deployment-6fb5fcb67f-nkv6h     1/1      Running   0            33m
shehrozwaseem@DESKTOP-7BRNB3J:/mnt/c/Users/shehr/OneDrive/Desktop/BCVD 4032/lab3/application-demo$

```