

Week 2 lab 3

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minikube start --nodes 2 -p multinode-demo

```
mandeep@Saitama:~$ 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
* 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) ...
  * Using image gcr.io/k8s-minikube/storage-provisioner:v5
* Verifying Kubernetes components...
* 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
mandeep@Saitama:~$
```

kubectl get nodes

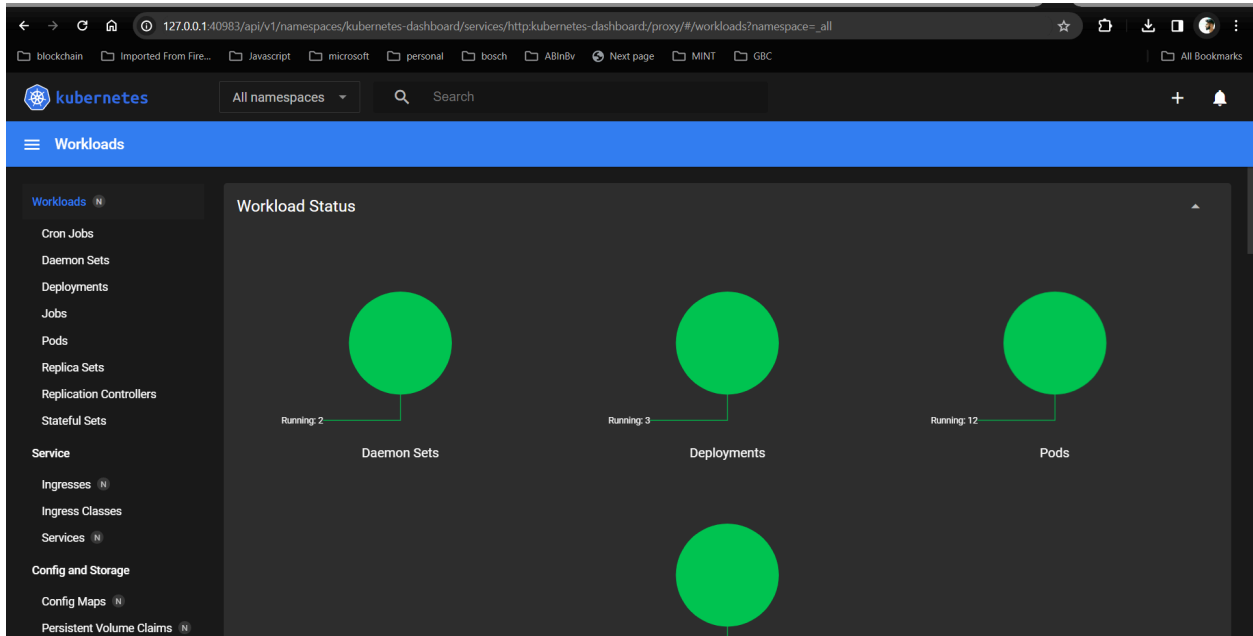
```
mandeep@Saitama:~$ kubectl get nodes
NAME             STATUS    ROLES    AGE   VERSION
multinode-demo   Ready    control-plane   3m12s   v1.28.3
multinode-demo-m02 Ready    <none>        2m34s   v1.28.3
mandeep@Saitama:~$
```

minikube status -p multinode-demo

```
mandeep@Saitama:~$ 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
mandeep@Saitama:~$
```

minikube dashboard -p multinode-demo



minikube stop -p multinode-demo
minikube delete --all

```
mandeep@Saitama:~$ 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.
mandeep@Saitama:~$ minikube delete --all
🔥 Deleting "minikube" in docker ...
🔥 Removing /home/mandeep/.minikube/machines/minikube ...
💀 Removed all traces of the "minikube" cluster.
🔥 Deleting "multinode-demo" in docker ...
🔥 Removing /home/mandeep/.minikube/machines/multinode-demo ...
🔥 Removing /home/mandeep/.minikube/machines/multinode-demo-m02 ...
💀 Removed all traces of the "multinode-demo" cluster.
🔥 Successfully deleted all profiles
mandeep@Saitama:~$
```

replicaset.yaml

```
apiVersion: apps/v1
kind: ReplicaSet
metadata:
  name: nginx
  labels:
    app: nginx
```

```

    tier: lb
spec:
  replicas: 3
  selector:
    matchLabels:
      tier: lb
  template:
    metadata:
      labels:
        tier: lb
    spec:
      containers:
        - name: nginx-replicaset
          image: nginx

```

kubectl apply -f replicaset.yaml
 kubectl get pods

```

mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f replicaset.yaml
Error from server (BadRequest): error when creating "replicaset.yaml": ReplicaSet in version "v1" cannot be handled as a ReplicaSet: strict decoding error: unknown field "spec.spec"
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f replicaset.yaml
error: resource mapping not found for name: "nginx" namespace: "" from "replicaset.yaml": no matches for kind "ReplicaSet" in version "apps/v2"
ensure CRDs are installed first
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f replicaset.yaml
replicaset.apps/nginx created
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-4khzt   1/1     Running   0           21s
nginx-gjkrw   1/1     Running   0           21s
nginx-zkbts   1/1     Running   0           21s
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$

```

kubectl delete pod nginx-4khzt
 kubectl get pods
 kubectl get replicaset

```

mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl delete pod nginx-4khzt
pod "nginx-4khzt" deleted
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-gjkrw   1/1     Running   0           4m8s
nginx-pjpcr   1/1     Running   0           5s
nginx-zkbts   1/1     Running   0           4m8s
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get replicaset
NAME   DESIRED   CURRENT   READY   AGE
nginx   3          3          3       4m25s
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$

```

nginx.yaml

```

apiVersion: apps/v1
kind: Deployment

```

```

metadata:
  name: nginx-deployment
  labels:
    app: nginx
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.14.2
          ports:
            - containerPort: 80

```

Kubectl apply -f nginx.yaml

kubectl get deployments

kubectl rollout status deployment nginx

```

● mandeep@Saitama: /mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f nginx.yaml
deployment.apps/nginx-deployment unchanged
● mandeep@Saitama: /mnt/c/Users/shaan/Documents/lab3$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment 3/3     3            3           9m31s
● mandeep@Saitama: /mnt/c/Users/shaan/Documents/lab3$ kubectl rollout status deployment nginx-deployment
deployment "nginx-deployment" successfully rolled out
○ mandeep@Saitama: /mnt/c/Users/shaan/Documents/lab3$

```

stateful-nginx.yaml

```

apiVersion: v1
kind: Service
metadata:
  name: nginx
  labels:
    app: nginx
spec:
  ports:
    - port: 80
      name: web

```

```

clusterIP: None
selector:
  app: nginx
---
apiVersion: apps/v1
kind: StatefulSet
metadata:
  name: web
spec:
  selector:
    matchLabels:
      app: nginx # has to match .spec.template.metadata.labels
  serviceName: "nginx"
  replicas: 3 # by default is 1
  template:
    metadata:
      labels:
        app: nginx # has to match .spec.selector.matchLabels
    spec:
      terminationGracePeriodSeconds: 10
      containers:
        - name: nginx
          image: k8s.gcr.io/nginx-slim:0.8
          ports:
            - containerPort: 80
              name: web
          volumeMounts:
            - name: www
              mountPath: /usr/share/nginx/html
      volumeClaimTemplates:
        - metadata:
            name: www
          spec:
            accessModes: ["ReadWriteOnce"]
            storageClassName: "my-storage-class"
            resources:
              requests:
                storage: 1Gi

```

```

kubectl apply -f stateful-nginx.yaml
kubectl get statefulsets

```

```

● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f stateful-nginx.yaml
service/nginx unchanged
statefulset.apps/web created
● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get statefulsets
NAME      READY   AGE
web       0/3     23s
● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get statefulsets
NAME      READY   AGE
web       0/3     33s
○ mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ 

```

daemonSet-nginx.yaml

```

apiVersion: apps/v1
kind: DaemonSet
metadata:
  name: nginx
spec:
  selector:
    matchLabels:
      name: nginx-lb
  template:
    metadata:
      labels:
        name: nginx-lb
    spec:
      containers:
        - name: nginx
          image: nginx

```

kubectl apply -f daemonSet-nginx.yaml

kubectl get daemonset

```

● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f daemonSet-nginx.yaml
daemonset.apps/nginx created
● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get daemonset
NAME      DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
nginx     1          1          1         1             1           <none>          19m
○ mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ 

```

nginx-deployment-resource-limit.yaml

```

apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment

```

```

labels:
  app: nginx
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.14.2
          ports:
            - containerPort: 80
          resources:
            limits:
              memory: "256Mi"
              cpu: "200m"
            requests:
              memory: "128Mi"
              cpu: "100m"

```

kubectl apply -f nginx-deployment-resource-limit.yaml
 kubectl get deployments

```

● mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f ng
inx-deployment-resource-limit.yaml
deployment.apps/nginx-deployment configured
● mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    3/3     3            3           56m
○ mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3$

```

nginx-deployment-healthcheck.yaml

```

apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
  labels:

```

```

    app: nginx
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.14.2
          ports:
            - containerPort: 80
          livenessProbe:
            httpGet:
              path: /
              port: 80
            initialDelaySeconds: 15
            periodSeconds: 10
          readinessProbe:
            httpGet:
              path: /
              port: 80
            initialDelaySeconds: 5
            periodSeconds: 5

```

```

● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl apply -f nginx-deployment-healthcheck.yaml
deployment.apps/nginx-deployment configured
● mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    3/3     1            3           74m
○ mandeep@Saitama:/mnt/c/Users/shaan/Documents/lab3$ 

```

Running the full stack application

[Deploy MERN App To K8s \(Minikube\) \(hashnode.dev\)](https://hashnode.dev/deploy-mern-app-to-k8s-minikube)

[GitHub - Ananya2001-an/kubernetes-demo: Learn how to deploy a MERN app to K8s](#)

```
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f secrets/mongodb-secret.yml
secret/mongodb-secret unchanged
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f stateful-sets/mongodb-stateful-set.yml
statefulset.apps/mongodb-stateful-set created
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f services/mongodb-service.yml
service/mongodb-service created
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f deployments/note-server-depl.yml
deployment.apps/note-server-deployment created
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f services/note-server-service.yml
service/note-server-service created
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f deployments/note-depl.yml
deployment.apps/note-deployment created
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl apply -f services/note-service.yml
service/note-service created
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ minikube service note-service
```

NAMESPACE	NAME	TARGET PORT	URL
default	note-service	3000	http://192.168.49.2:30784

```
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl get services/
error: arguments in resource/name form must have a single resource and name
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl get services
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	118m
mongodb-service	ClusterIP	10.111.155.157	<none>	27017/TCP	107s
nginx	ClusterIP	None	<none>	80/TCP	65m
note-server-service	ClusterIP	10.98.153.81	<none>	5000/TCP	87s
note-service	LoadBalancer	10.105.31.6	<pending>	3000:30784/TCP	68s

```
mandeep@saitama: /mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured
```

```
✳ Starting tunnel for service kubernetes.
✳ Starting tunnel for service mongodb-service.
✳ Starting tunnel for service nginx.
✳ Starting tunnel for service note-server-service.
✳ Starting tunnel for service note-service.
```

NAMESPACE	NAME	TARGET PORT	URL
default	kubernetes		http://127.0.0.1:37789
default	mongodb-service		http://127.0.0.1:38213
default	nginx		http://127.0.0.1:34527
default	note-server-service		http://127.0.0.1:37707
default	note-service		http://127.0.0.1:41623

```
🔗 Opening service default/kubernetes in default browser...
🔗 http://127.0.0.1:37789
🔗 Opening service default/mongodb-service in default browser...
🔗 http://127.0.0.1:38213
🔗 Opening service default/nginx in default browser...
🔗 http://127.0.0.1:34527
🔗 Opening service default/note-server-service in default browser...
🔗 http://127.0.0.1:37707
🔗 Opening service default/note-service in default browser...
🔗 http://127.0.0.1:41623
! Because you are using a Docker driver on linux, the terminal needs to be open to run it.
```

note.

Assignments Add Assignment Notes Add Note

Important Assignments



Delete one pod and check

```
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongodb-stateful-set-0              1/1     Running   0           12m
mongodb-stateful-set-1              1/1     Running   0           11m
nginx-5gk99                          1/1     Running   0           64m
note-deployment-74cc946cd8-rffwr     1/1     Running   0           11m
note-deployment-74cc946cd8-wmbfz     1/1     Running   0           11m
note-server-deployment-6fb5fcb67f-1qv9n 1/1     Running   0           11m
note-server-deployment-6fb5fcb67f-z4q77 1/1     Running   0           11m
web-0                                0/1     Pending   0           74m
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl delete pod note-deployment-74cc946cd8-rffwr
pod "note-deployment-74cc946cd8-rffwr" deleted
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongodb-stateful-set-0              1/1     Running   0           13m
mongodb-stateful-set-1              1/1     Running   0           13m
nginx-5gk99                          1/1     Running   0           66m
note-deployment-74cc946cd8-vhdj9     1/1     Running   0           3s
note-deployment-74cc946cd8-wmbfz     1/1     Running   0           12m
note-server-deployment-6fb5fcb67f-1qv9n 1/1     Running   0           13m
note-server-deployment-6fb5fcb67f-z4q77 1/1     Running   0           13m
web-0                                0/1     Pending   0           75m
mandeep@saitama:/mnt/c/Users/shaan/Documents/lab3/kubernetes-demo/kubernetes$
```