

Running a multi node cluster

```
aratrika@Aratrikas-MacBook-Air ~ % minikube start --nodes 2 -p multinode-demo
[🐳] [multinode-demo] minikube v1.32.0 on Darwin 14.1.1 (arm64)
[🔧] Automatically selected the docker driver
[🔥] Using Docker Desktop driver with root privileges
[👍] Starting control plane node multinode-demo in cluster multinode-demo
[🐳] Pulling base image ...
[🔥] Creating docker container (CPUs=2, Memory=2200MB) ...
[⚠️] Executing "docker ps -a --format {{.Names}}" took an unusually long time: 3.082402125s
[💡] Restarting the docker service may improve performance.
[🐳] 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
```

```
aratrika@Aratrikas-MacBook-Air ~ % kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
multinode-demo      Ready    control-plane   50s   v1.28.3
multinode-demo-m02  Ready    <none>         30s   v1.28.3
aratrika@Aratrikas-MacBook-Air ~ % 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
```

```


aratrika@Aratrikas-MacBook-Air ~ % 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://127.0.0.1:49945/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in your default browser...
^C



```

127.0.0.1:49945/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/#/node?namespace=default

kubernetes

default

 Search

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Nodes

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: arm64									
	beta.kubernetes.io/os: linux	True	100.00m (1.25%)	100.00m (1.25%)	8.00	50.00Mi (0.64%)	50.00Mi (0.64%)	7.66Gi	4 (3.64%)	31 minutes ago
	kubernetes.io/arch: arm64									
Show all										
 multinode-demo	beta.kubernetes.io/arch: arm64									
	beta.kubernetes.io/os: linux	True	850.00m (10.63%)	100.00m (1.25%)	8.00	220.00Mi (2.80%)	220.00Mi (2.80%)	7.66Gi	8 (7.27%)	31 minutes ago
	kubernetes.io/arch: arm64									
Show all										

```

aratrika@Aratrikas-MacBook-Air ~ % 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.
aratrika@Aratrikas-MacBook-Air ~ % minikube delete --all
🔴 Deleting "minikube" in docker ...
🔴 Removing /Users/aratrika/.minikube/machines/minikube ...
💀 Removed all traces of the "minikube" cluster.
🔴 Deleting "multinode-demo" in docker ...
🔴 Removing /Users/aratrika/.minikube/machines/multinode-demo ...
🔴 Removing /Users/aratrika/.minikube/machines/multinode-demo-m02 ...
💀 Removed all traces of the "multinode-demo" cluster.

```

Replica Set Demo

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl apply -f replicaset.yaml --validate=false
replicaset.apps/nginx created
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-zmt9f  1/1     Running   0           26s
mongodb-stateful-set-0                  1/1     Running   0           24s
mongodb-stateful-set-1                  1/1     Running   0           23s
nginx-54x6t                             1/1     Running   2 (47h ago) 3d22h
nginx-5wdhq                             1/1     Running   2 (47h ago) 2d1h
nginx-cdcgt                             1/1     Running   2 (47h ago) 2d
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl delete pods nginx-54x6t
pod "nginx-54x6t" deleted
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-zmt9f  1/1     Running   0           73s
mongodb-stateful-set-0                  1/1     Running   0           71s
mongodb-stateful-set-1                  1/1     Running   0           70s
nginx-5wdhq                             1/1     Running   2 (47h ago) 2d1h
nginx-9vmfq                             1/1     Running   0           2s
nginx-cdcgt                             1/1     Running   2 (47h ago) 2d
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl get replicaset
NAME      DESIRED   CURRENT   READY   AGE
nginx     3         3         3       44h
```

Deployments with Replica Set

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl apply -f deployment.yaml
deployment.apps/nginx-deployment created
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    2/3     3             2           9s
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl rollout status deployment nginx-deployment
deployment "nginx-deployment" successfully rolled out
```

Statefulset

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl apply -f statefulset.yaml
service/nginx unchanged
statefulset.apps/web created
```

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl get statefulsets
NAME    READY   AGE
web     0/3     35s
```

Daemonset

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl get daemonsets
NAME      DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
nginx     1         1         1       1             1           <none>          59s
```

Deployment with resource limits

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl apply -f deployment1.yaml
deployment.apps/nginx-deployment configured
```

Deployment with health checks

```
● aratrika@Aratrikas-MacBook-Air Lab3 % kubectl apply -f deployment2.yaml
deployment.apps/nginx-deployment configured
```

Deploying Full-Stack Application to k8s

```
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f secrets/mongodb-secret.yml
secret/mongodb-secret created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f stateful-sets/mongodb-stateful-set.yml
statefulset.apps/mongodb-stateful-set created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f services/mongodb-service.yml
service/mongodb-service created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f deployments/note-server-depl.yml
deployment.apps/note-server-deployment created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f services/note-server-service.yml
service/note-server-service created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f deployments/note-depl.yml
deployment.apps/note-deployment created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f services/note-service.yml
service/note-service created
○ aratrika@Aratrikas-MacBook-Air kubernetes % minikube service note-service
```

NAMESPACE	NAME	TARGET PORT	URL
default	note-service	3000	http://192.168.49.2:31776

🚀 Starting tunnel for service note-service.

NAMESPACE	NAME	TARGET PORT	URL
default	note-service		http://127.0.0.1:57009

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

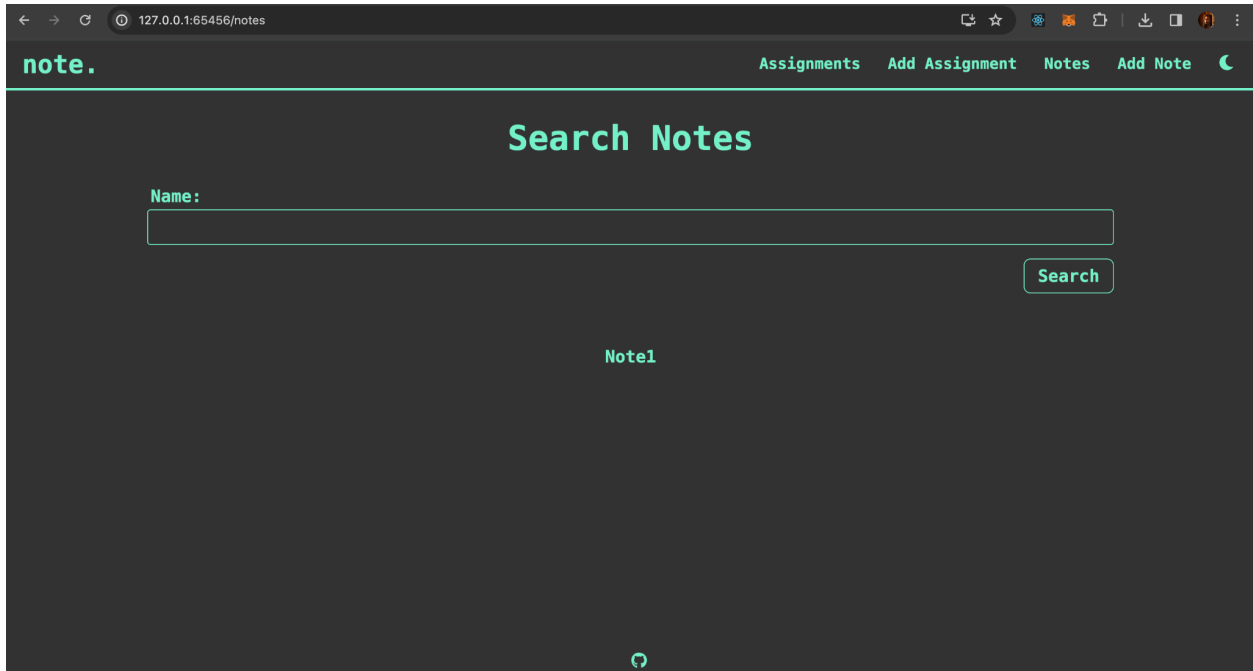
```
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f deployments/mongo-express-depl.yml
deployment.apps/mongo-express-deployment created
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl apply -f services/mongo-express-service.yml
service/mongo-express-service created
○ aratrika@Aratrikas-MacBook-Air kubernetes % minikube service mongo-express-service
```

NAMESPACE	NAME	TARGET PORT	URL
default	mongo-express-service	8081	http://192.168.49.2:31659

🚀 Starting tunnel for service mongo-express-service.

NAMESPACE	NAME	TARGET PORT	URL
default	mongo-express-service		http://127.0.0.1:57046

🔗 Opening service default/mongo-express-service in default browser...
! Because you are using a Docker driver on darwin, the terminal needs to be open to run it.



Task: Bring down note-depp pod. Demonstrate using a screenshot if a new pod has started.

```

● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-gmtcf  1/1     Running   0           9m31s
mongodb-stateful-set-0                  1/1     Running   0           12m
mongodb-stateful-set-1                  1/1     Running   0           12m
nginx-54x6t                             1/1     Running   2 (47h ago) 3d21h
nginx-5wdhq                             1/1     Running   2 (47h ago) 2d1h
nginx-cdcgt                             1/1     Running   2 (47h ago) 2d
nginx-deployment-86dcfdf4c6-9fg5j        1/1     Running   2 (47h ago) 2d
nginx-deployment-86dcfdf4c6-fqlbt        1/1     Running   2 (47h ago) 2d
nginx-deployment-86dcfdf4c6-pm7fj        1/1     Running   2 (47h ago) 2d
nginx-as6sz                             1/1     Running   2 (47h ago) 3d21h
note-deployment-74cc946cd8-5w7x4         1/1     Running   0           11m
note-deployment-74cc946cd8-t5w6b         1/1     Running   0           11m
note-server-deployment-6fb5fcb67f-f98n9  1/1     Running   0           12m
note-server-deployment-6fb5fcb67f-w7nd8  1/1     Running   0           12m
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl delete pod note-deployment-74cc946cd8-5w7x4
pod "note-deployment-74cc946cd8-5w7x4" deleted
● aratrika@Aratrikas-MacBook-Air kubernetes % kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-gmtcf  1/1     Running   0           10m
mongodb-stateful-set-0                  1/1     Running   0           13m
mongodb-stateful-set-1                  1/1     Running   0           13m
nginx-54x6t                             1/1     Running   2 (47h ago) 3d21h
nginx-5wdhq                             1/1     Running   2 (47h ago) 2d1h
nginx-cdcgt                             1/1     Running   2 (47h ago) 2d
nginx-deployment-86dcfdf4c6-9fg5j        1/1     Running   2 (47h ago) 2d
nginx-deployment-86dcfdf4c6-fqlbt        1/1     Running   2 (47h ago) 2d
nginx-deployment-86dcfdf4c6-pm7fj        1/1     Running   2 (47h ago) 2d
nginx-qs6sz                             1/1     Running   2 (47h ago) 3d21h
note-deployment-74cc946cd8-t5w6b         1/1     Running   0           12m
note-deployment-74cc946cd8-v17b9         1/1     Running   0           4s
note-server-deployment-6fb5fcb67f-f98n9  1/1     Running   0           12m
note-server-deployment-6fb5fcb67f-w7nd8  1/1     Running   0           12m

```