

Deployment: start two nodes and check the status

```
xiaogangdong — kubectl - minikube dashboard -p multinode-demo — 122x47
Last login: Fri Jan 19 23:41:31 on ttys000
xiaogangdong@Xiaogangs-Air ~ % minikube start --nodes 2 -p multinode-demo
[multinode-demo] minikube v1.32.0 on Darwin 14.2.1 (arm64)
Automatically selected the docker driver. Other choices: vmware, ssh
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=1919MB) ...
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

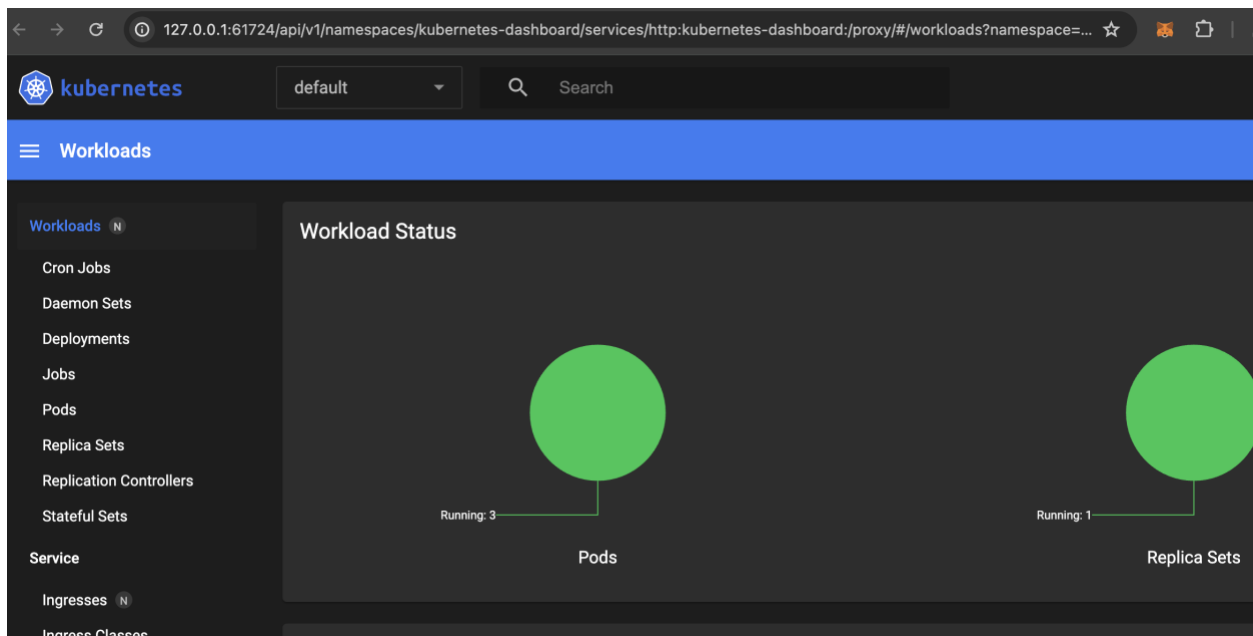
Starting worker node multinode-demo-m02 in cluster multinode-demo
Pulling base image ...
Creating docker container (CPUs=2, Memory=1919MB) ...
Found network options:
  NO_PROXY=192.168.49.2
Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
  env NO_PROXY=192.168.49.2
Verifying Kubernetes components...
Done! kubectl is now configured to use "multinode-demo" cluster and "default" namespace by default
xiaogangdong@Xiaogangs-Air ~ % kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
multinode-demo       Ready     control-plane   39s   v1.28.3
multinode-demo-m02   Ready     <none>         22s   v1.28.3
xiaogangdong@Xiaogangs-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

xiaogangdong@Xiaogangs-Air ~ % minikube dashboard -p multinode-demo
Enabling dashboard ...
  Using image docker.io/kubernetesui/dashboard:v2.7.0
  Using image docker.io/kubernetesui/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://127.0.0.1:60837/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in yo
ur default browser...
```



```
kubectl apply -f replicaset.yaml
```

```
kubectl get pods
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f replicaset.yaml
replicaset.apps/nginx created
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-9wlwt   1/1     Running   0           9s
nginx-dkct6   1/1     Running   0           9s
nginx-vkz4p   1/1     Running   0           9s
xiaogangdong@Xiaogangs-Air Lab 3 %
```

```
replicaset.yaml
```

Users > xiaogangdong > Projects > BCDV4032 SCALABLE > Lab 3 > ! replicaset.yaml

```
1  apiVersion: apps/v1
2  kind: ReplicaSet
3  metadata:
4    name: nginx
5    labels:
6      app: nginx
7      tier: lb
8  spec:
9    replicas: 3
10   selector:
11     matchLabels:
12       tier: lb
13   template:
14     metadata:
15       labels:
16         tier: lb
17     spec:
18       containers:
19         - name: nginx-replicaset
20           image: nginx
21
```

Kubenets delete pod, get pods, and get replicaset:

```
nginx-vkz4p 1/1 Running 0 9s
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl delete pod nginx-vkz4p
pod "nginx-vkz4p" deleted
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-9wlwt    1/1     Running   0           2m29s
nginx-dkct6    1/1     Running   0           2m29s
nginx-h8xm5    1/1     Running   0           6s
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get replicaset
NAME    DESIRED   CURRENT   READY   AGE
nginx   3         3         3       2m33s
xiaogangdong@Xiaogangs-Air Lab 3 %
```

Apply nginx.yaml

Restricted mode is intended for safe code browsing. Trust this window to enable all features.

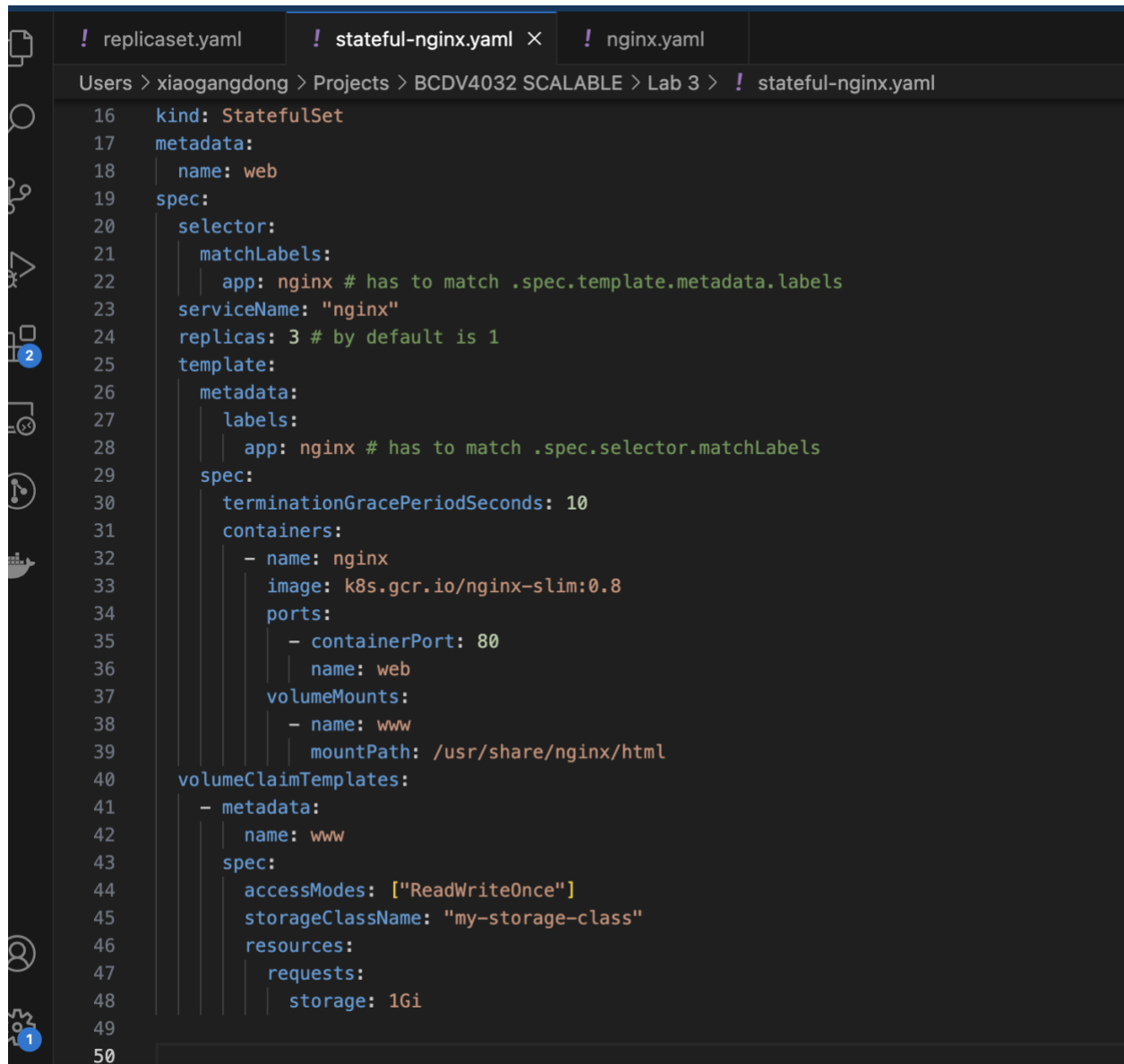
```
! replicaset.yaml ! stateful-nginx.yaml ! nginx.yaml ×
Users > xiaogangdong > Projects > BCDV4032 SCALABLE > Lab 3 > ! nginx.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx-deployment
5    labels:
6      app: nginx
7  spec:
8    replicas: 3
9    selector:
10     matchLabels:
11       app: nginx
12   template:
13     metadata:
14       labels:
15         app: nginx
16     spec:
17       containers:
18         - name: nginx
19           image: nginx:1.14.2
20           ports:
21             - containerPort: 80
22
23
```

```
[xiaogangdong@Xiaogangs-Air Lab 3 % Kubectl apply -f nginx.yaml
deployment.apps/nginx-deployment created
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    3/3     3            3           28s
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl rollout status deployment nginx
Error from server (NotFound): deployments.apps "nginx" not found
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl rollout status deployment nginx-deployment
deployment "nginx-deployment" successfully rolled out
xiaogangdong@Xiaogangs-Air Lab 3 %
```

kubectl apply -f stateful-nginx.yaml

kubectl get statefulsets

```
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f stateful-nginx.yaml
service/nginx created
statefulset.apps/web created
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get statefulsets
NAME      READY   AGE
web       0/3     6s
xiaogangdong@Xiaogangs-Air Lab 3 %
```

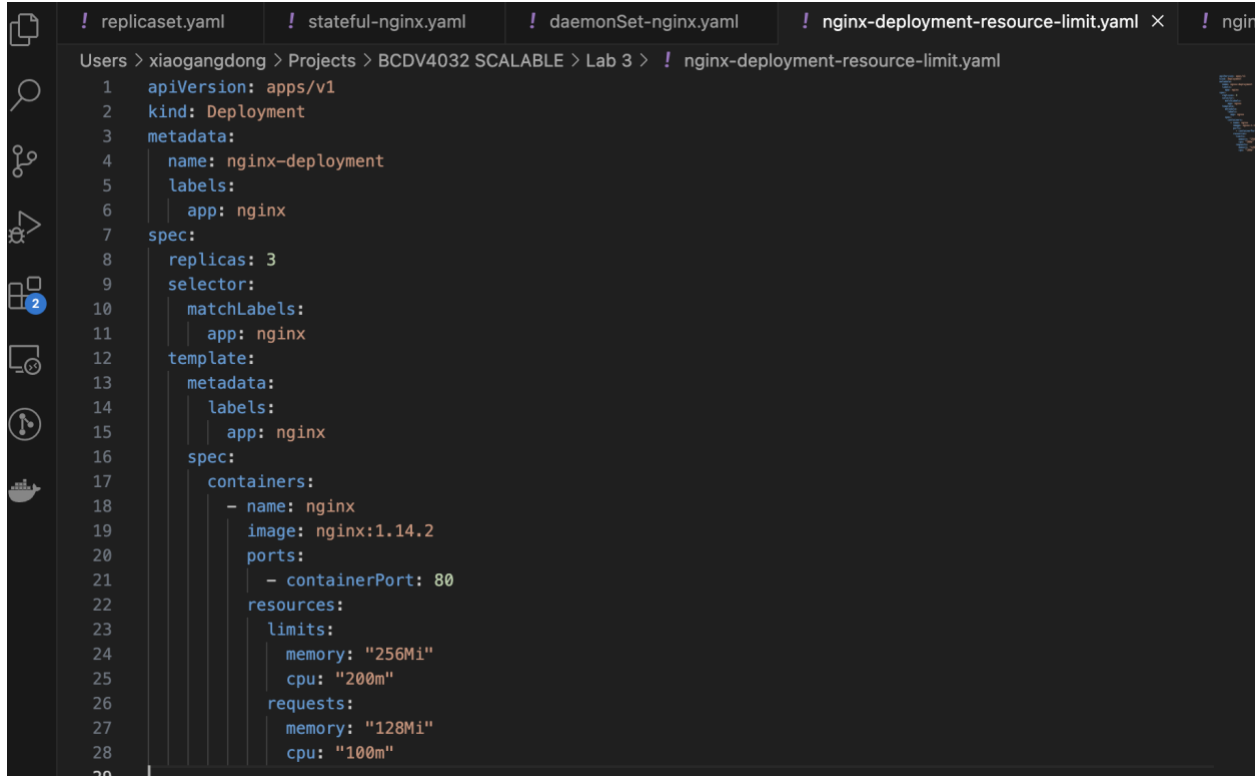


```
16 kind: StatefulSet
17 metadata:
18   name: web
19 spec:
20   selector:
21     matchLabels:
22       app: nginx # has to match .spec.template.metadata.labels
23   serviceName: "nginx"
24   replicas: 3 # by default is 1
25   template:
26     metadata:
27       labels:
28         app: nginx # has to match .spec.selector.matchLabels
29     spec:
30       terminationGracePeriodSeconds: 10
31       containers:
32       - name: nginx
33         image: k8s.gcr.io/nginx-slim:0.8
34         ports:
35         - containerPort: 80
36           name: web
37         volumeMounts:
38         - name: www
39           mountPath: /usr/share/nginx/html
40     volumeClaimTemplates:
41     - metadata:
42       name: www
43     spec:
44       accessModes: ["ReadWriteOnce"]
45       storageClassName: "my-storage-class"
46       resources:
47       requests:
48       storage: 1Gi
49
50
```

```
kubectl apply -f daemonSet-nginx.yaml
```

```
kubectl get daemonset
```

```
kubectl apply -f nginx-deployment-resource-limit.yaml
```



```
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx-deployment
5    labels:
6      app: nginx
7  spec:
8    replicas: 3
9    selector:
10     matchLabels:
11       app: nginx
12    template:
13     metadata:
14       labels:
15         app: nginx
16     spec:
17       containers:
18       - name: nginx
19         image: nginx:1.14.2
20         ports:
21         - containerPort: 80
22         resources:
23           limits:
24             memory: "256Mi"
25             cpu: "200m"
26           requests:
27             memory: "128Mi"
28             cpu: "100m"
```

```
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f daemonSet-nginx.yaml
daemonset.apps/nginx created
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get daemonset
NAME      DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
nginx     2         2         2       2            2          <none>          4s
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f nginx-deployment-resource-limit.yaml
deployment.apps/nginx-deployment configured
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get deployments
NAME             READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment 3/3     3            3           42m
[xiaogangdong@Xiaogangs-Air Lab 3 %
```

```
kubectl apply -f nginx-deployment-healthcheck.yaml
```

```
get deployments
```

```
nginx-deployment 3/3     3            3           42m
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f nginx-deployment-healthcheck.yaml
deployment.apps/nginx-deployment configured
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get deployments
NAME             READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment 3/3     2            3           45m
[xiaogangdong@Xiaogangs-Air Lab 3 %
```

F

```
! nginx-deployment-healthcheck.yaml X
Users > xiaogangdong > Projects > BCDV4032 SCALABLE > Lab 3 > ! nginx-deployment-healthcheck.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx-deployment
5    labels:
6      app: nginx
7  spec:
8    replicas: 3
9    selector:
10     matchLabels:
11       app: nginx
12   template:
13     metadata:
14       labels:
15         app: nginx
16     spec:
17       containers:
18         - name: nginx
19           image: nginx:1.14.2
20           ports:
21             - containerPort: 80
22           livenessProbe:
23             httpGet:
24               path: /
25               port: 80
26             initialDelaySeconds: 15
27             periodSeconds: 10
28           readinessProbe:
29             httpGet:
30               path: /
31               port: 80
32             initialDelaySeconds: 5
33             periodSeconds: 5
34
```

Full stack application:


```
xiaogangdong@Xiaogangs-Air Lab 3 % minikube start
```

```
🐳 minikube v1.32.0 on Darwin 14.2.1 (arm64)
🔧 Automatically selected the docker driver. Other choices: vmware, ssh
🔧 Using Docker Desktop driver with root privileges
🔧 Starting control plane node minikube in cluster minikube
🔧 Pulling base image ...
🔧 Creating docker container (CPUs=2, Memory=1919MB) ...
🔧 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: storage-provisioner, default-storageclass
🔧 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl config view
```

```
apiVersion: v1
```

```
clusters:
```

```
- cluster:
```

```
  certificate-authority: /Users/xiaogangdong/.minikube/ca.crt
```

```
  extensions:
```

```
    - extension:
```

```
      last-update: Sat, 20 Jan 2024 13:25:15 EST
```

```
      provider: minikube.sigs.k8s.io
```

```
      version: v1.32.0
```

```
    name: cluster_info
```

```
  server: https://127.0.0.1:50702
```

```
name: minikube
```

```
- cluster:
```

```
  certificate-authority: /Users/xiaogangdong/.minikube/ca.crt
```

```
  extensions:
```

```
    - extension:
```

```
      last-update: Sat, 20 Jan 2024 00:22:52 EST
```

```
      provider: minikube.sigs.k8s.io
```

```
      version: v1.32.0
```

```
    name: cluster_info
```

```
  server: https://127.0.0.1:61628
```

```
name: multinode-demo
```

```
user: multinode-demo
```

```
name: multinode-demo
```

```
current-context: minikube
```

```
kind: Config
```

```
preferences: {}
```

```
users:
```

```
- name: minikube
```

```
  user:
```

```
    client-certificate: /Users/xiaogangdong/.minikube/profiles/minikube/client.crt
```

```
    client-key: /Users/xiaogangdong/.minikube/profiles/minikube/client.key
```

```
- name: multinode-demo
```

```
  user:
```

```
    client-certificate: /Users/xiaogangdong/.minikube/profiles/multinode-demo/client.crt
```

```
    client-key: /Users/xiaogangdong/.minikube/profiles/multinode-demo/client.key
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f mongodb-secret.yml
```

```
secret/mongodb-secret created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f stateful-sets/mongodb-stateful-set.yml
```

```
error: the path "stateful-sets/mongodb-stateful-set.yml" does not exist
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f stateful-sets/mongodb-stateful-set.yml
```

```
statefulset.apps/mongodb-stateful-set created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f services/mongodb-service.yml
```

```
service/mongodb-service created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f deployments/note-server-depl.yml
```

```
deployment.apps/note-server-deployment created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f services/note-server-service.yml
```

```
service/note-server-service created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f deployments/note-depl.yml
```

```
deployment.apps/note-deployment created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % kubectl apply -f services/note-service.yml
```

```
service/note-service created
```

```
xiaogangdong@Xiaogangs-Air Lab 3 % minikube service note-service
```

```
! Executing "docker container inspect minikube --format={{.State.Status}}" took an unusually long time: 22.689151541s
```

```
Restarting the docker service may improve performance.
```

```
🔧 This control plane is not running! (state=Stopped)
```

```
! This is unusual - you may want to investigate using "minikube logs"
```

```
🔧 To start a cluster, run: "minikube start"
```

Task: delete a pod


```
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl get pods
NAME                                READY   STATUS              RESTARTS   AGE
mongodb-stateful-set-0             1/1     Running             0          15m
note-deployment-74cc946cd8-54m5r   0/1     ContainerCreating   0          14m
note-deployment-74cc946cd8-wj874   0/1     ContainerCreating   0          14m
note-server-deployment-6fb5fcb67f-5xxvw  0/1     ContainerCreating   0          15m
note-server-deployment-6fb5fcb67f-rf66l  1/1     Running             0          15m
[xiaogangdong@Xiaogangs-Air Lab 3 % kubectl delete pod note-deployment-74cc946cd8-54m5r
pod "note-deployment-74cc946cd8-54m5r" deleted
```