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## **LAB EXERCISE 13- MANAGING NAMESPACES IN KUBERNETES**

### **STEP 1: UNDERSTAND NAMESPACES**

NAMESPACES PROVIDE A MECHANISM FOR SCOPING RESOURCES IN A CLUSTER.  
NAMESPACES CAN BE USED TO:

- CREATE ENVIRONMENTS FOR DIFFERENT APPLICATIONS OR TEAMS.
- APPLY POLICIES LIKE RESOURCE QUOTAS OR NETWORK POLICIES ON A PER-NAMESPACE BASIS.
- SEPARATE OPERATIONAL ENVIRONMENTS (LIKE DEVELOPMENT AND PRODUCTION).

### **STEP 2: LIST EXISTING NAMESPACES**

TO LIST ALL THE NAMESPACES IN YOUR KUBERNETES CLUSTER:

#### **KUBECTL GET NAMESPACES**

```
PS C:\Users\Pulk1t> kubectl get namespaces
NAME          STATUS  AGE
default        Active  13d
kube-node-lease  Active  13d
kube-public    Active  13d
kube-system    Active  13d
kubernetes-dashboard  Active  13d
local-path-storage  Active  13d
```

YOU WILL TYPICALLY SEE DEFAULT NAMESPACES LIKE DEFAULT, KUBE-SYSTEM, AND KUBE-PUBLIC.

### **STEP 3: CREATE A NAMESPACE**

YOU CAN CREATE A NAMESPACE USING A YAML FILE OR DIRECTLY WITH THE KUBECTL COMMAND.

### USING YAML FILE

CREATE A FILE NAMED MY-NAMESPACE.YAML WITH THE FOLLOWING CONTENT:

```
APIVERSION: v1
KIND: NAMESPACE
METADATA:
  NAME: MY-NAMESPACE
```

APPLY THIS YAML TO CREATE THE NAMESPACE:

```
KUBECTL APPLY -F MY-NAMESPACE.YAML
▶ PS D:\Coding\ClassWork\k8s> kubectl apply -f my-namespace.yaml
namespace/my-namespace created
```

### USING KUBECTL COMMAND

ALTERNATIVELY, CREATE A NAMESPACE USING THE KUBECTL COMMAND:

```
KUBECTL CREATE NAMESPACE MY-NAMESPACE
▶ PS D:\Coding\ClassWork\k8s> kubectl create namespace my-namespace
namespace/my-namespace created
```

VERIFY THAT THE NAMESPACE IS CREATED:

```
KUBECTL GET NAMESPACES
```

```
PS D:\Coding\ClassWork\k8s> kubectl get namespaces
NAME          STATUS   AGE
default       Active   6m17s
kube-node-lease Active   6m17s
kube-public    Active   6m17s
kube-system    Active   6m17s
kubernetes-dashboard Active  4m48s
my-namespace   Active   7s
```

YOU SHOULD SEE MY-NAMESPACE LISTED IN THE OUTPUT.

#### STEP 4: DEPLOY RESOURCES IN A NAMESPACE

CREATE RESOURCES SUCH AS PODS, SERVICES, OR DEPLOYMENTS WITHIN THE NEW NAMESPACE.

##### DEPLOY A POD IN THE NAMESPACE

CREATE A YAML FILE NAMED NGINX-POD.YAML WITH THE FOLLOWING CONTENT:

```
APIVERSION: v1
KIND: POD
METADATA:
  NAME: NGINX-POD
  NAMESPACE: MY-NAMESPACE
SPEC:
  CONTAINERS:
    - NAME: NGINX
      IMAGE: NGINX:LATEST
  PORTS:
    - CONTAINERPORT: 80
```

APPLY THIS YAML TO CREATE THE POD:

```
KUBECTL APPLY -F NGINX-POD.YAML
```

```
PS D:\Coding\ClassWork\k8s> kubectl apply -f nginx-pod.yaml
pod/nginx-pod created
```

CHECK THE STATUS OF THE POD WITHIN THE NAMESPACE:

KUBECTL GET PODS -N MY-NAMESPACE

```
PS D:\Coding\ClassWork\k8s> kubectl get pods -n my-namespace
NAME        READY   STATUS          RESTARTS   AGE
nginx-pod   0/1    ContainerCreating   0          29s
```

TO DESCRIBE THE POD AND SEE DETAILED INFORMATION:

KUBECTL DESCRIBE POD NGINX-POD -N MY-NAMESPACE

```
PS D:\Coding\ClassWork\k8s> kubectl describe pod nginx-pod -n my-namespace
Name:           nginx-pod
Namespace:      my-namespace
Priority:      0
Service Account: default
Node:          minikube/172.28.227.29
Start Time:    Mon, 23 Feb 2026 10:36:26 +0530
Labels:         <none>
Annotations:   <none>
Status:        Running
IP:            10.244.0.5
IPs:
  IP: 10.244.0.5
Containers:
  nginx:
    Container ID: docker://50c3fd98369e659585cc29989a10d17e69fe86c81fb52cda671545db4f24b062
    Image:        nginx:latest
    Image ID:    docker-pullable://nginx@sha256:341bf0f3ce6c5277d6002cf6e1fb0319fa4252add24ab6a0e262e0056d313208
    Port:        80/TCP
    Host Port:   0/TCP
    State:       Running
    Started:    Mon, 23 Feb 2026 10:37:03 +0530
```

CREATE A SERVICE IN THE NAMESPACE

CREATE A YAML FILE NAMED **NGINX-SERVICE.YAML** WITH THE FOLLOWING CONTENT:

APIVERSION: v1

KIND: SERVICE

METADATA:

NAME: NGINX-SERVICE

NAMESPACE: MY-NAMESPACE

```
SPEC:  
  SELECTOR:  
    APP: NGINX-POD  
  PORTS:  
    - PROTOCOL: TCP  
    PORT: 80  
    TARGETPORT: 80  
  TYPE: CLUSTERIP
```

APPLY THIS YAML TO CREATE THE SERVICE:

```
KUBECTL APPLY -F NGINX-SERVICE.YAML
```

CHECK THE STATUS OF THE SERVICE WITHIN THE NAMESPACE:

```
KUBECTL GET SERVICES -N MY-NAMESPACE
```

TO DESCRIBE THE SERVICE AND SEE DETAILED INFORMATION:

```
KUBECTL DESCRIBE SERVICE NGINX-SERVICE -N MY-NAMESPACE
```

## STEP 5: SWITCHING CONTEXT BETWEEN NAMESPACES

WHEN WORKING WITH MULTIPLE NAMESPACES, YOU CAN SPECIFY THE NAMESPACE IN KUBECTL COMMANDS OR SWITCH THE DEFAULT CONTEXT.

### SPECIFY NAMESPACE IN COMMANDS

YOU CAN SPECIFY THE NAMESPACE DIRECTLY IN KUBECTL COMMANDS USING THE -N OR --NAMESPACE FLAG:

```
KUBECTL GET PODS -N MY-NAMESPACE
```

```
PS D:\Coding\ClassWork\k8s> kubectl get pods -n my-namespace  
NAME        READY     STATUS    RESTARTS   AGE  
nginx-pod   1/1      Running   0          95s
```

## **SET DEFAULT NAMESPACE FOR KUBECTL COMMANDS**

TO AVOID SPECIFYING THE NAMESPACE EVERY TIME, YOU CAN SET THE DEFAULT NAMESPACE FOR THE CURRENT CONTEXT:

```
KUBECTL CONFIG SET-CONTEXT --CURRENT --NAMESPACE=MY-NAMESPACE
```

```
PS D:\Coding\ClassWork\k8s> kubectl config set-context --current --namespace=my-namespace
Context "minikube" modified.
```

VERIFY THE CURRENT CONTEXT'S NAMESPACE:

```
KUBECTL CONFIG VIEW --MINIFY | GREP NAMESPACE
```

```
PS D:\Coding\ClassWork\k8s> kubectl config view --minify | Select-String namespace
namespace: my-namespace
```

## **STEP 6: CLEAN UP RESOURCES**

TO DELETE THE RESOURCES AND THE NAMESPACE YOU CREATED:

```
KUBECTL DELETE -F NGINX-POD.YAML
```

```
KUBECTL DELETE -F NGINX-SERVICE.YAML
```

```
KUBECTL DELETE NAMESPACE MY-NAMESPACE
```

ENSURE THAT THE NAMESPACE AND ALL ITS RESOURCES ARE DELETED:

```
KUBECTL GET NAMESPACES
```

```
PS D:\Coding\ClassWork\k8s> kubectl delete -f nginx-pod.yaml
pod "nginx-pod" deleted from my-namespace namespace
PS D:\Coding\ClassWork\k8s> kubectl delete -f nginx-service.yaml
error: unable to decode "nginx-service.yaml": Object 'Kind' is missing in '{"apiVersion":"v1"}'
PS D:\Coding\ClassWork\k8s> kubectl delete namespace my-namespace
namespace "my-namespace" deleted
PS D:\Coding\ClassWork\k8s> kubectl get namespaces
NAME          STATUS  AGE
default       Active  12m
kube-node-lease  Active  12m
kube-public    Active  12m
kube-system    Active  12m
kubernetes-dashboard  Active  11m
```