Lesson 06 Demo 03

Creating a Deployment with ConfigMap as Volume

Objective: To create a deployment with ConfigMap as volume to enhance the flexibility, manageability, and scalability of your application

Tools required: kubeadm, kubectl, kubelet, and containerd

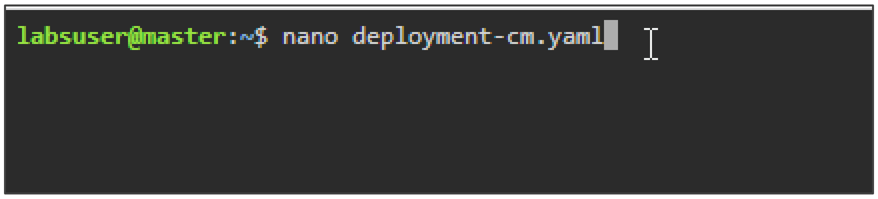
Prerequisites: A Kubernetes cluster (refer to Demo 01 from Lesson 01 for setting up a cluster)

Steps to be followed:

1. Create a ConfigMap
2. Create a deployment to attach a ConfigMap as volume

Step 1: Create a ConfigMap

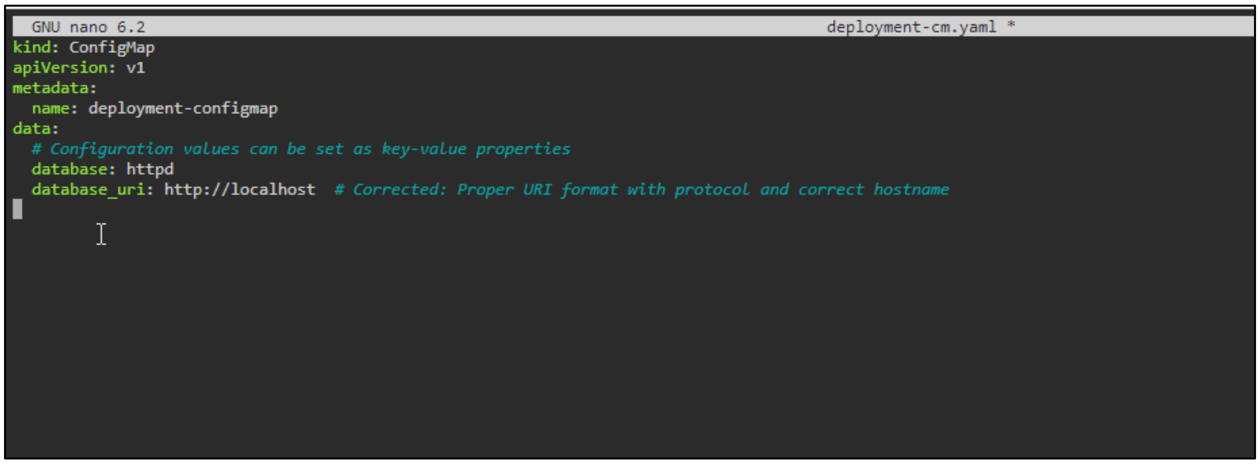
1.1 On the master node, run the following command to create a YAML file:
nano deployment-cm.yaml



```
labsuser@master:~$ nano deployment-cm.yaml
```

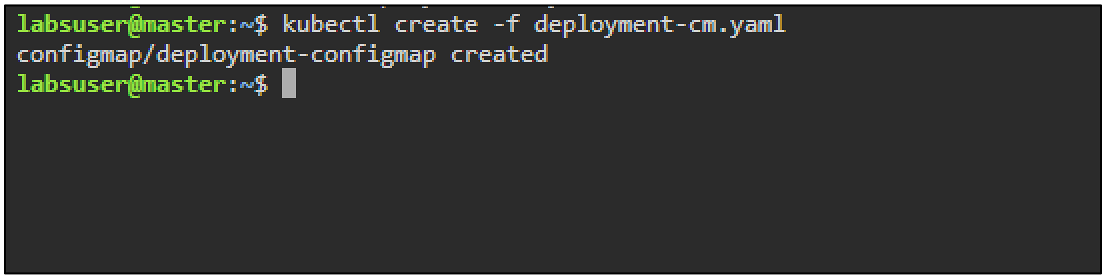
1.2 Enter the following code in the YAML file:

```
kind: ConfigMap
apiVersion: v1
metadata:
  name: deployment-configmap
data:
  # Configuration values can be set as key-value properties
  database: httpd
  database_uri: http://localhost
```



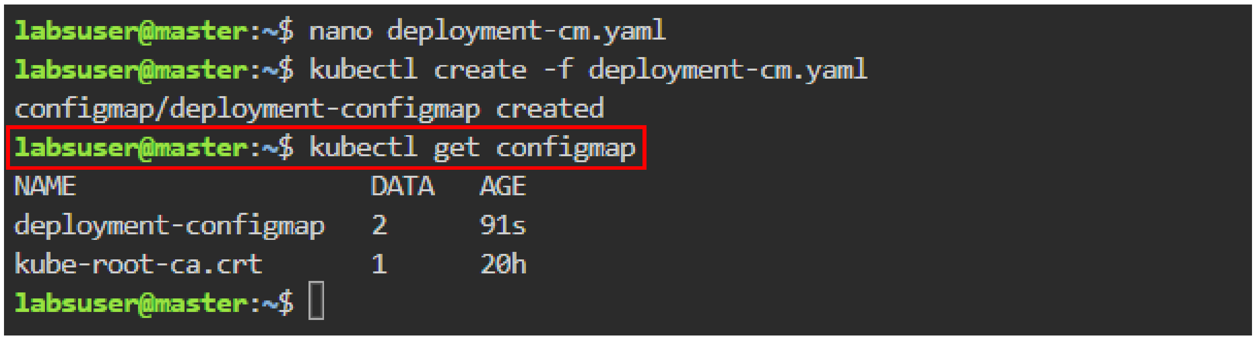
```
  GNU nano 6.2                                                          deployment-cm.yaml *
kind: ConfigMap
apiVersion: v1
metadata:
  name: deployment-configmap
data:
  # Configuration values can be set as key-value properties
  database: httpd
  database_uri: http://localhost  # Corrected: Proper URI format with protocol and correct hostname
```

1.3 Execute the following command to create a ConfigMap:
kubectl create -f deployment-cm.yaml



```
labsuser@master:~$ kubectl create -f deployment-cm.yaml
configmap/deployment-configmap created
labsuser@master:~$
```

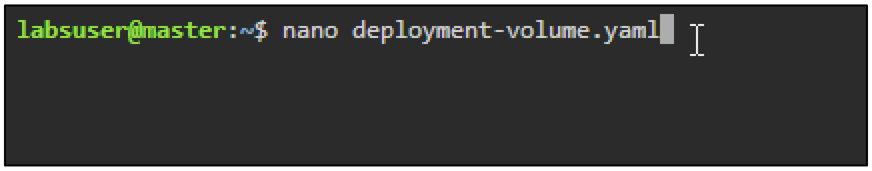
1.4 Verify the state of ConfigMap by running the following command:
kubectl get configmap



```
labsuser@master:~$ nano deployment-cm.yaml
labsuser@master:~$ kubectl create -f deployment-cm.yaml
configmap/deployment-configmap created
labsuser@master:~$ kubectl get configmap
NAME                   DATA   AGE
deployment-configmap   2      91s
kube-root-ca.crt       1      20h
labsuser@master:~$
```

Step 2: Create a deployment to attach a ConfigMap as volume to it

2.1 On the master node, run the following command to create a YAML file:
nano deployment-volume.yaml

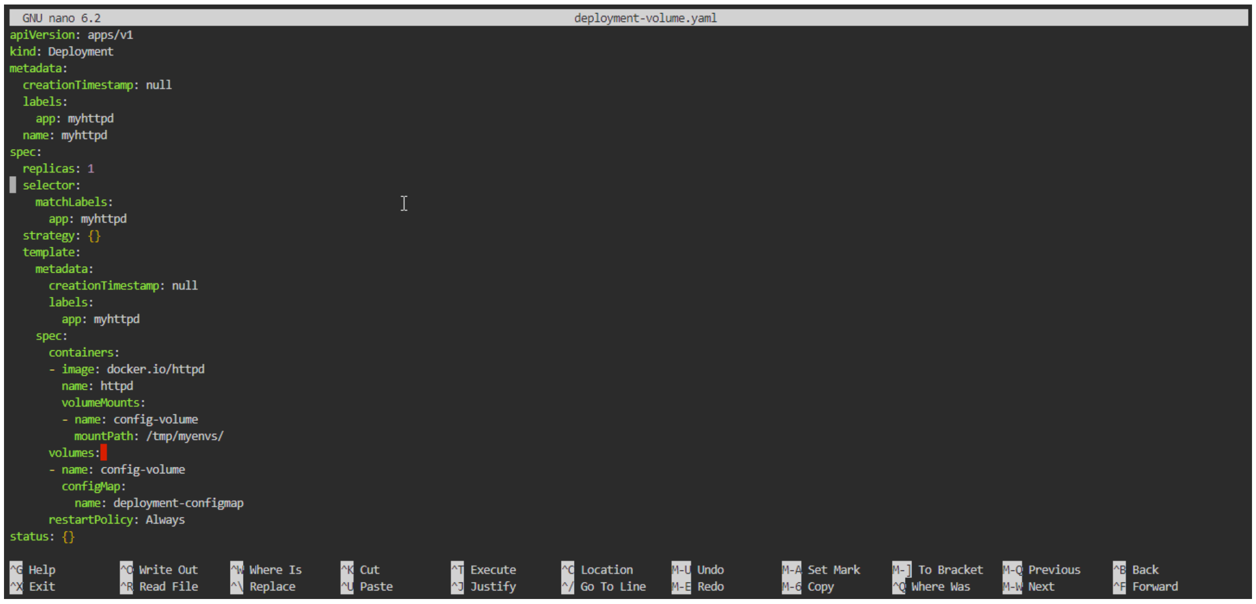


```
labsuser@master:~$ nano deployment-volume.yaml
```

2.2 Enter the following code in the YAML file:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  creationTimestamp: null
  labels:
    app: myhttpd
  name: myhttpd
spec:
  replicas: 1
  selector:
    matchLabels:
      app: myhttpd
  strategy: {}
  template:
    metadata:

      creationTimestamp: null
      labels:
        app: myhttpd
    spec:
      containers:
      - image: docker.io/httpd
        name: httpd
        volumeMounts:
        - name: config-volume
          mountPath: /tmp/myenvs/
      volumes:     # This should be inside the spec section under template
      - name: config-volume
        configMap:
          name: deployment-configmap
      restartPolicy: Always
status: {}
```

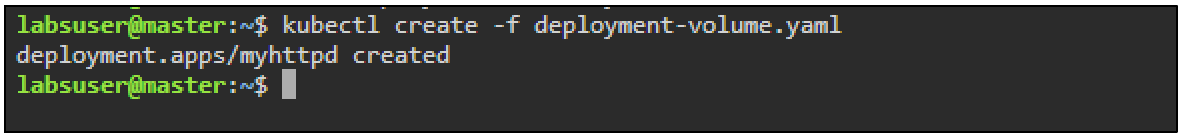


```
  GNU nano 6.2                                   deployment-volume.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  creationTimestamp: null
  labels:
    app: myhttpd
  name: myhttpd
spec:
  replicas: 1
  selector:
    matchLabels:
      app: myhttpd
  strategy: {}
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: myhttpd
    spec:
      containers:
      - image: docker.io/httpd
        name: httpd
        volumeMounts:
        - name: config-volume
          mountPath: /tmp/myenvs/
      volumes:
      - name: config-volume
        configMap:
          name: deployment-configmap
      restartPolicy: Always
status: {}

^G Help      ^O Write Out  ^W Where Is  ^K Cut       ^T Execute   ^C Location  M-U Undo      M-A Set Mark  M-] To Bracket  M-Q Previous  ^B Back
^X Exit      ^R Read File  ^\ Replace   ^U Paste     ^J Justify   ^/ Go To Line M-E Redo     M-6 Copy      ^Q Where Was    M-W Next      ^F Forward
```

2.3 Run the following command to create a deployment:

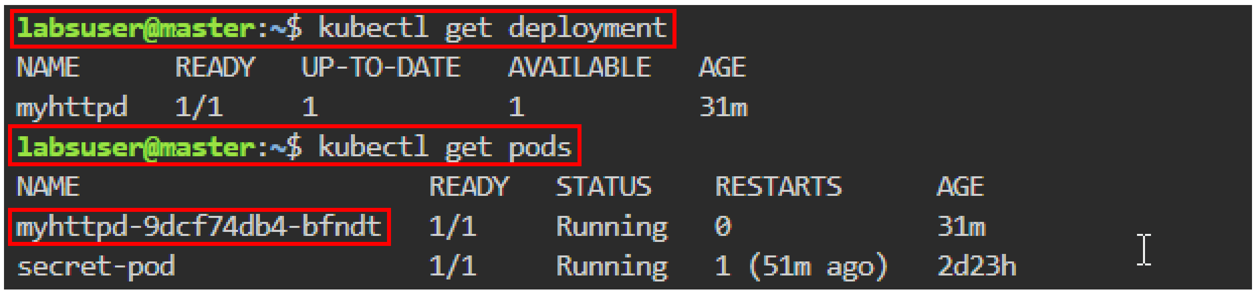
kubectl create -f deployment-volume.yaml



```
labsuser@master:~$ kubectl create -f deployment-volume.yaml
deployment.apps/myhttpd created
labsuser@master:~$
```

2.4 Verify the pod and deployment state by running the following commands:

kubectl get deployment
kubectl get pods

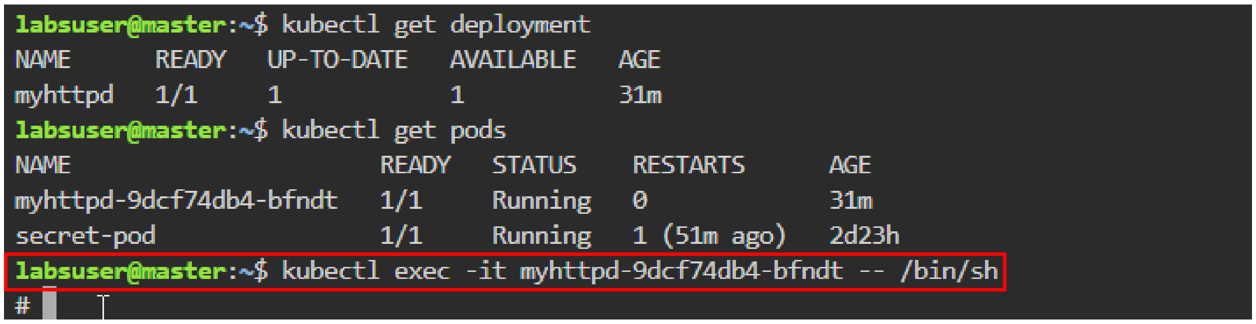


```
labsuser@master:~$ kubectl get deployment
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
myhttpd   1/1     1            1           31m
labsuser@master:~$ kubectl get pods
NAME                       READY   STATUS    RESTARTS       AGE
myhttpd-9dcf74db4-bfndt    1/1     Running   0              31m
secret-pod                 1/1     Running   1 (51m ago)    2d23h
```

Note: Copy the name of the pod for the next step

2.5 Navigate to the pod using the following command and start a shell session:

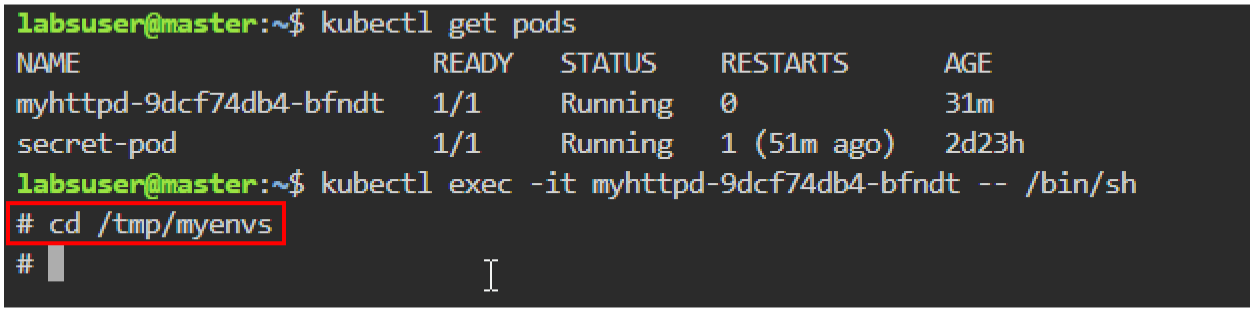
kubectl exec -it <my-pod> -- /bin/sh



```
labsuser@master:~$ kubectl get deployment
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
myhttpd   1/1     1            1           31m
labsuser@master:~$ kubectl get pods
NAME                       READY   STATUS    RESTARTS       AGE
myhttpd-9dcf74db4-bfndt    1/1     Running   0              31m
secret-pod                 1/1     Running   1 (51m ago)    2d23h
labsuser@master:~$ kubectl exec -it myhttpd-9dcf74db4-bfndt -- /bin/sh
#
```

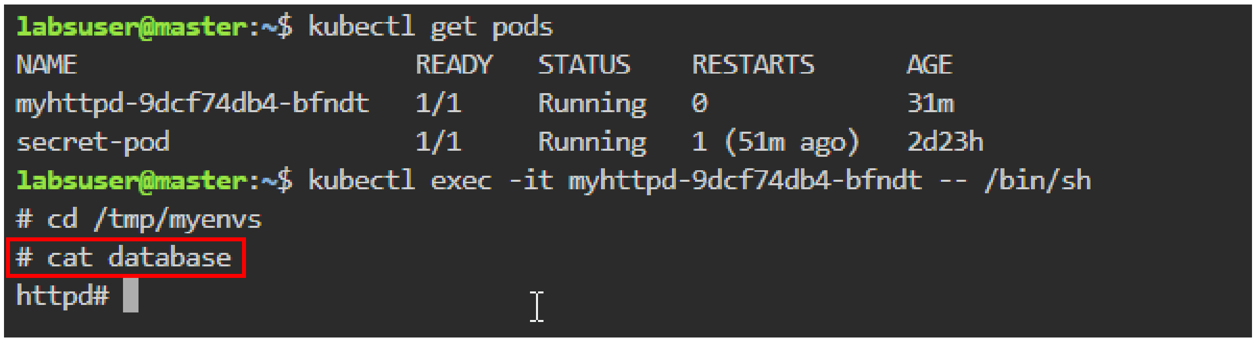
Note: Replace the **<my-pod>** with your pod **NAME,** as shown in the screenshot above

2.6 Inside the pod, navigate to /tmp/myenvs to see the ConfigMap data using the **cd** command:
cd /tmp/myenvs

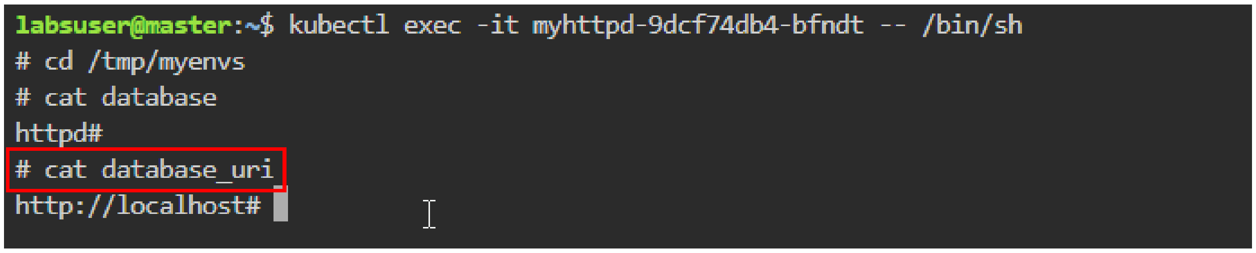


```
labsuser@master:~$ kubectl get pods
NAME                         READY   STATUS    RESTARTS      AGE
myhttpd-9dcf74db4-bfndt      1/1     Running   0             31m
secret-pod                   1/1     Running   1 (51m ago)   2d23h
labsuser@master:~$ kubectl exec -it myhttpd-9dcf74db4-bfndt -- /bin/sh
# cd /tmp/myenvs
# 
```

2.7 View the content of the files database and database_uri using the following commands:
cat database
cat database_uri



```
labsuser@master:~$ kubectl get pods
NAME                         READY   STATUS    RESTARTS      AGE
myhttpd-9dcf74db4-bfndt      1/1     Running   0             31m
secret-pod                   1/1     Running   1 (51m ago)   2d23h
labsuser@master:~$ kubectl exec -it myhttpd-9dcf74db4-bfndt -- /bin/sh
# cd /tmp/myenvs
# cat database
httpd# 
```



```
labsuser@master:~$ kubectl exec -it myhttpd-9dcf74db4-bfndt -- /bin/sh
# cd /tmp/myenvs
# cat database
httpd#
# cat database_uri
http://localhost# 
```

This command displays the config value that was provided while creating the ConfigMap.

By following these steps, you have successfully created a deployment with ConfigMap as volume to enhance the flexibility, manageability, and scalability of your application.