Lesson 04 Demo 11

Configuring ConfigMaps

Objective: To configure ConfigMaps to enhance the flexibility, security, and manageability of your applications, making them adaptable to different environments

Tools required: kubeadm, kubectl, kubelet, and containerd

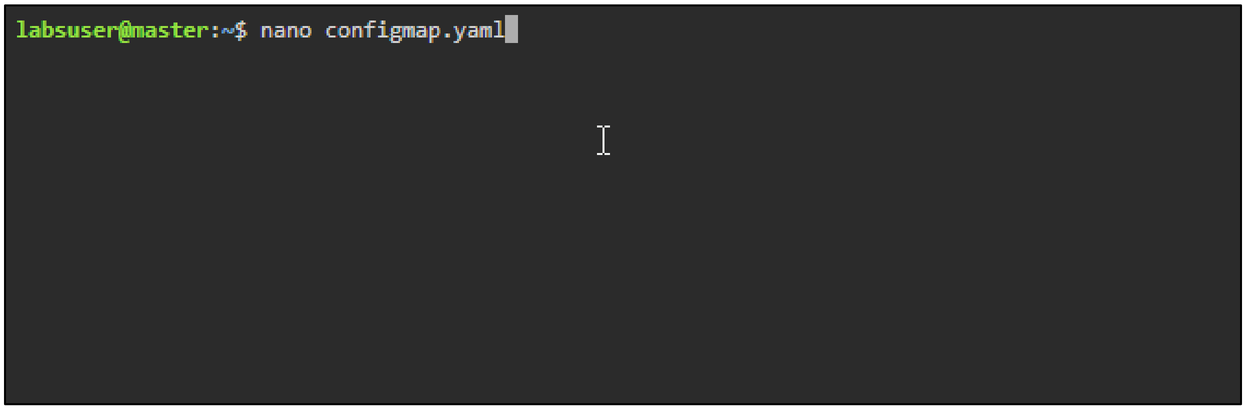
Prerequisites: A Kubernetes cluster should already be set up (refer to the steps in Lesson 02, Demo 01 for guidance).

Steps to be followed:

1. Add a ConfigMap entry to the pod
2. Create pods with services

Step 1: Add a ConfigMap entry to the pod

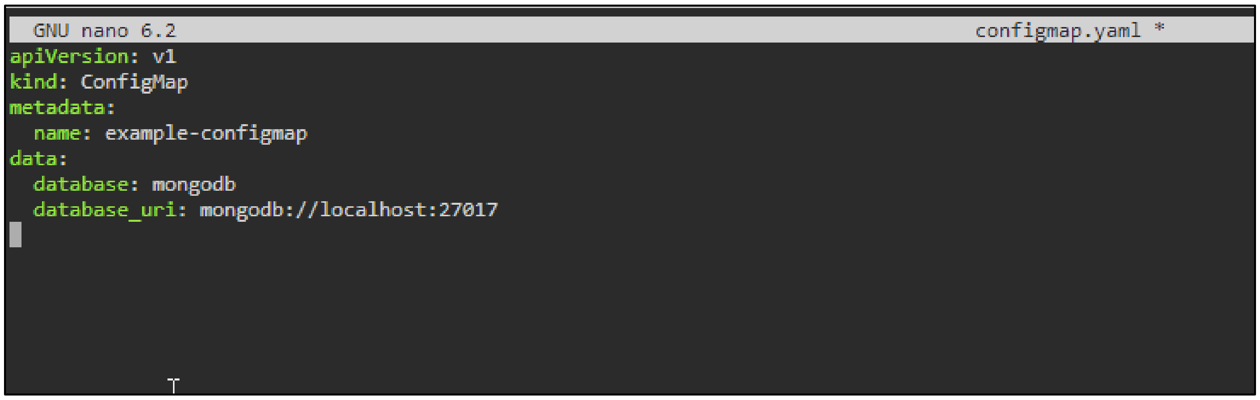
1.1 On the master node, enter the **nano configmap.yaml** command to create a YAML file



```
labsuser@master:~$ nano configmap.yaml
```

1.2 Copy the following code in the YAML file:

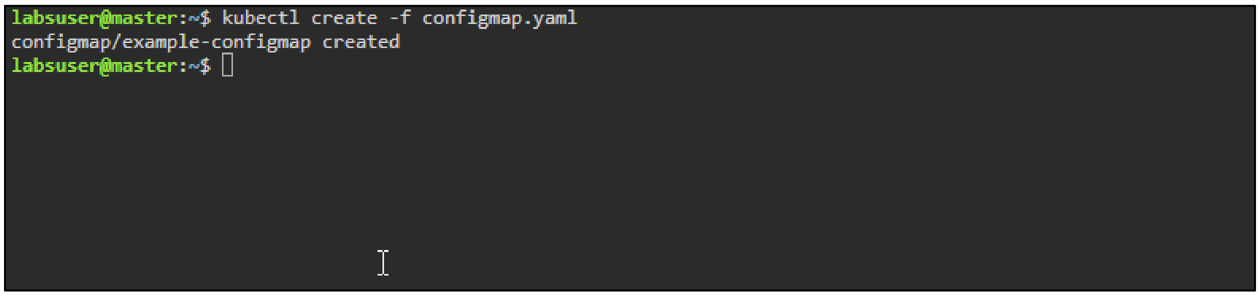
```
apiVersion: v1
kind: ConfigMap
metadata:
  name: example-configmap
data:
  database: mongodb
  database_uri: mongodb://localhost:27017
```



```
  GNU nano 6.2                                                      configmap.yaml *
apiVersion: v1
kind: ConfigMap
metadata:
  name: example-configmap
data:
  database: mongodb
  database_uri: mongodb://localhost:27017
```

1.3 Create a ConfigMap by entering the command below:

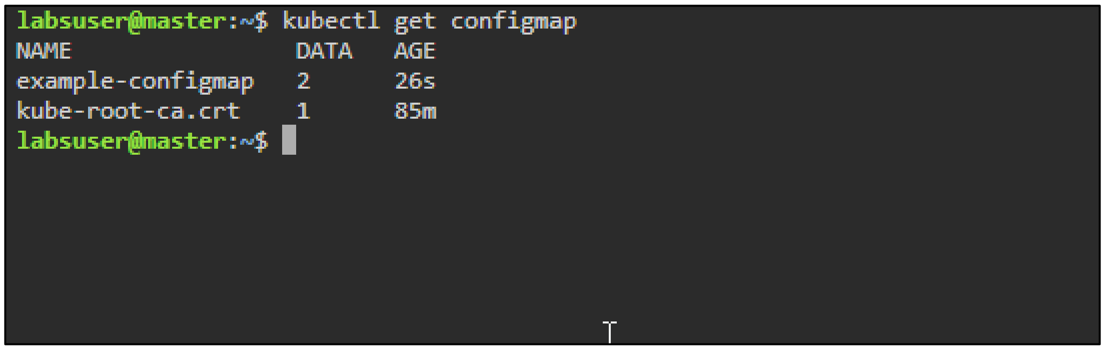
kubectl create -f configmap.yaml



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

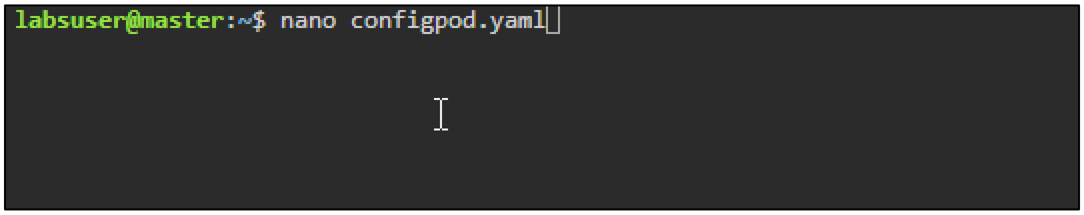
1.4 Verify the ConfigMap state by entering the following command:

kubectl get configmap



```
labsuser@master:~$ kubectl get configmap
NAME                 DATA   AGE
example-configmap    2      26s
kube-root-ca.crt     1      85m
labsuser@master:~$
```

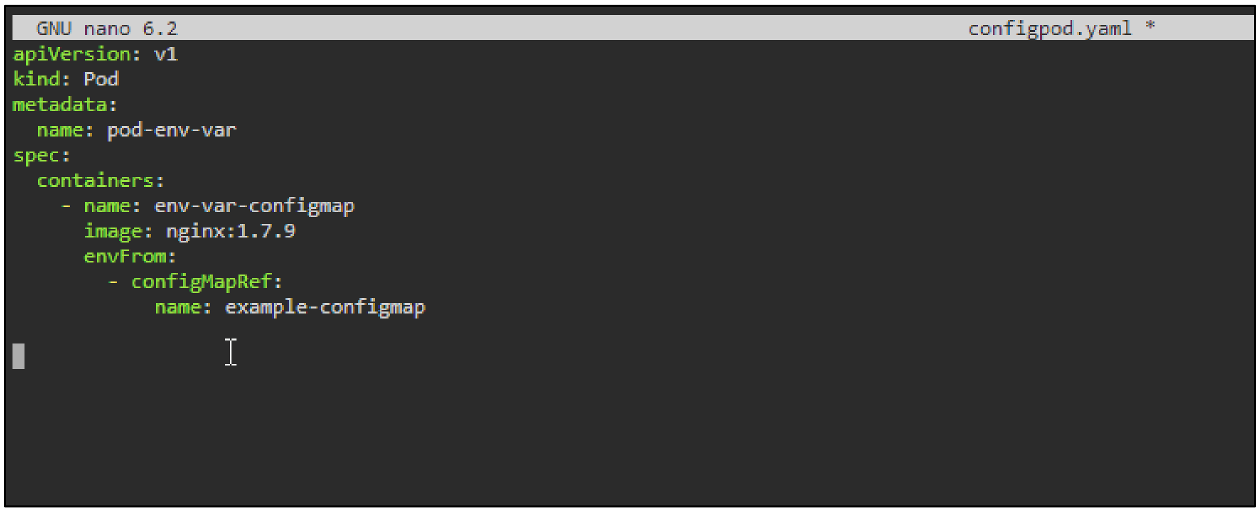
1.5 Run the **nano configpod.yaml** command to create a YAML file



```
labsuser@master:~$ nano configpod.yaml
```

1.6 Copy the following code in the YAML file:

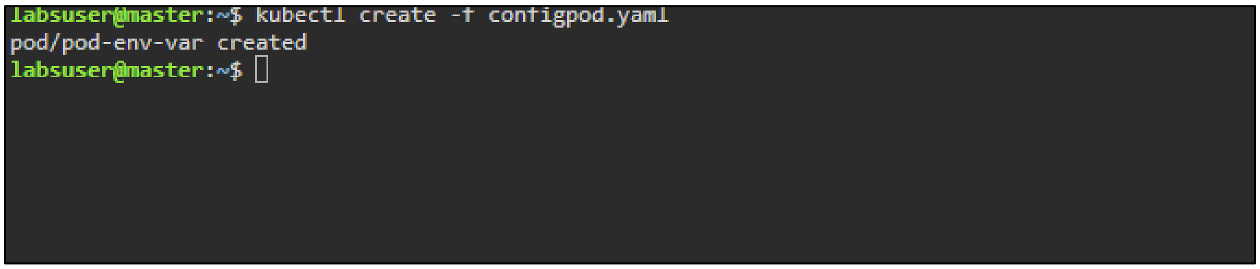
```
apiVersion: v1
kind: Pod
metadata:
  name: pod-env-var
spec:
  containers:
    - name: env-var-configmap
      image: nginx:1.7.9
      envFrom:
        - configMapRef:
            name: example-configmap
```



```
  GNU nano 6.2                                                                  configpod.yaml *
apiVersion: v1
kind: Pod
metadata:
  name: pod-env-var
spec:
  containers:
    - name: env-var-configmap
      image: nginx:1.7.9
      envFrom:
        - configMapRef:
            name: example-configmap
```

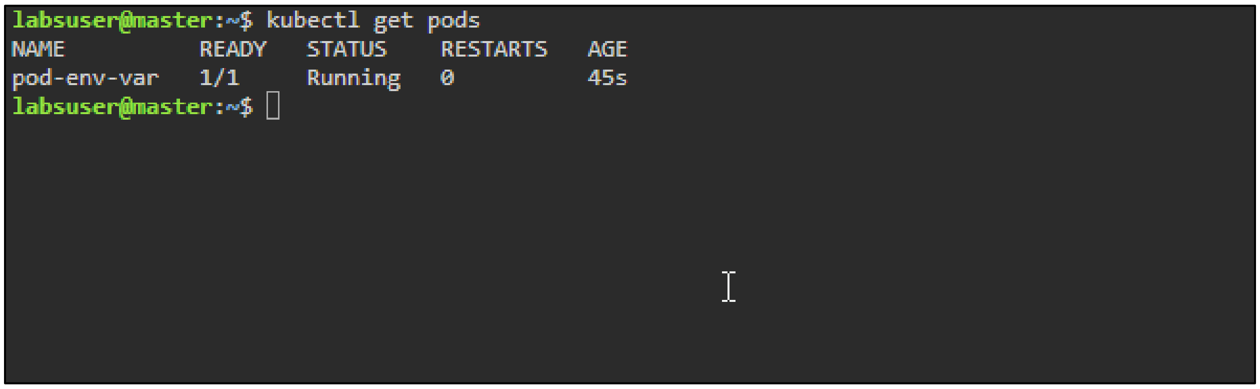
1.7 Create a pod by entering the following command:

kubectl create -f configpod.yaml



```
labsuser@master:~$ kubectl create -f configpod.yaml
pod/pod-env-var created
labsuser@master:~$
```

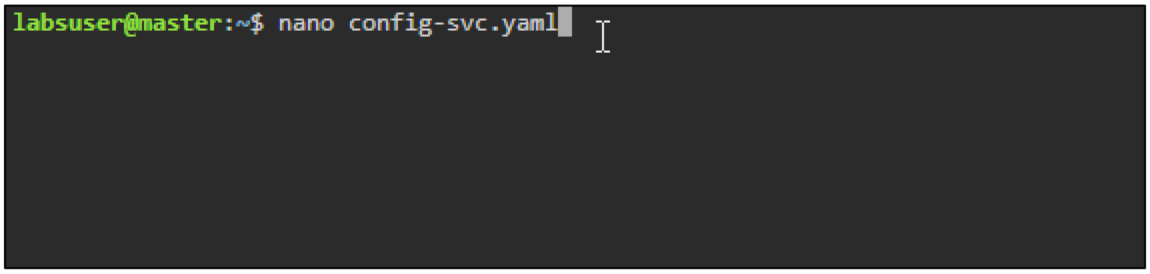
1.8 Verify the pod state by running the following command:
kubectl get pods



```
labsuser@master:~$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
pod-env-var   1/1     Running   0          45s
labsuser@master:~$ 
```

Step 2: Create pods with services

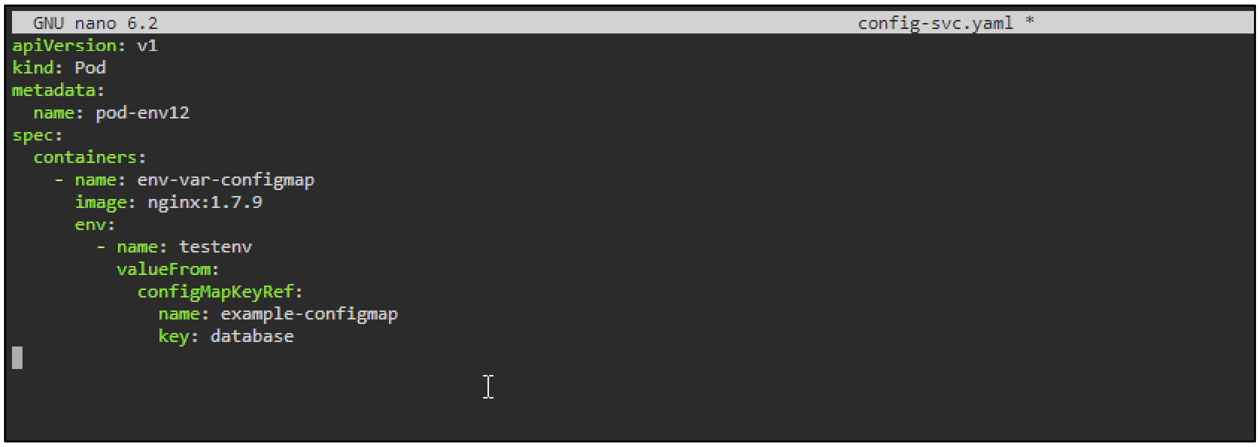
2.1 Run the **nano config-svc.yaml** command to create a YAML file



```
labsuser@master:~$ nano config-svc.yaml
```

2.2 Copy the following code in the YAML file:

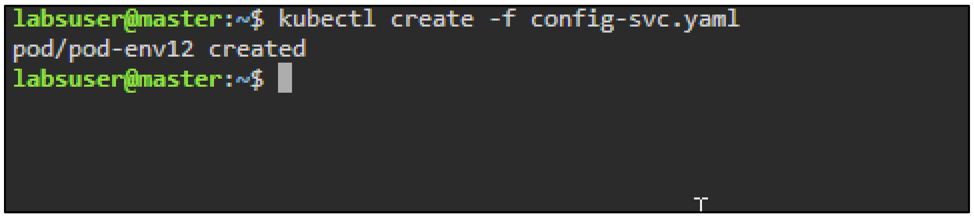
```
apiVersion: v1
kind: Pod
metadata:
  name: pod-env12
spec:
  containers:
    - name: env-var-configmap
      image: nginx:1.7.9
      env:
        - name: testenv
          valueFrom:
            configMapKeyRef:
              name: example-configmap
              key: database
```



```
  GNU nano 6.2                                                    config-svc.yaml *
apiVersion: v1
kind: Pod
metadata:
  name: pod-env12
spec:
  containers:
    - name: env-var-configmap
      image: nginx:1.7.9
      env:
        - name: testenv
          valueFrom:
            configMapKeyRef:
              name: example-configmap
              key: database
```

2.3 Run the following command to create a pod with service:

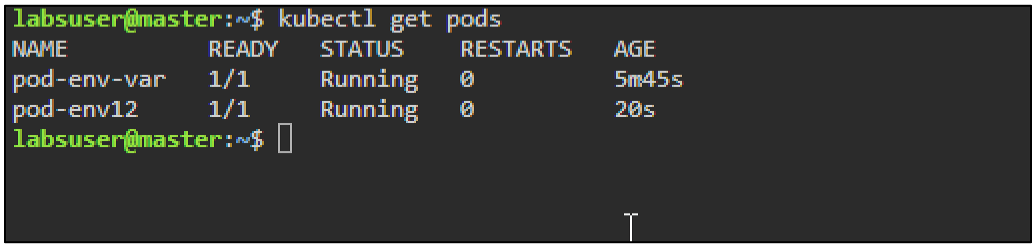
kubectl create -f config-svc.yaml



```
labsuser@master:~$ kubectl create -f config-svc.yaml
pod/pod-env12 created
labsuser@master:~$
```

2.4 Verify the pod state by running the following command:

kubectl get pods



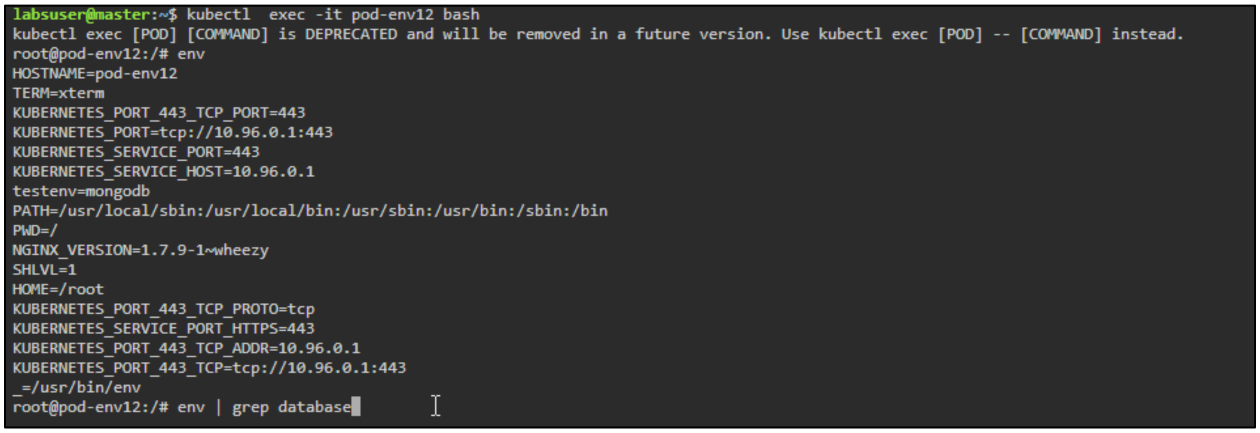
```
labsuser@master:~$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
pod-env-var   1/1     Running   0          5m45s
pod-env12     1/1     Running   0          20s
labsuser@master:~$
```

2.5 To access the container and verify the database, enter the following commands:

kubectl exec -it pod-env12 bash

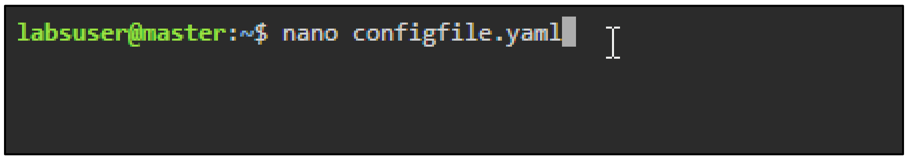
env

env | grep database



```
labsuser@master:~$ kubectl  exec -it pod-env12 bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
root@pod-env12:/# env
HOSTNAME=pod-env12
TERM=xterm
KUBERNETES_PORT_443_TCP_PORT=443
KUBERNETES_PORT=tcp://10.96.0.1:443
KUBERNETES_SERVICE_PORT=443
KUBERNETES_SERVICE_HOST=10.96.0.1
testenv=mongodb
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
PWD=/
NGINX_VERSION=1.7.9-1~wheezy
SHLVL=1
HOME=/root
KUBERNETES_PORT_443_TCP_PROTO=tcp
KUBERNETES_SERVICE_PORT_HTTPS=443
KUBERNETES_PORT_443_TCP_ADDR=10.96.0.1
KUBERNETES_PORT_443_TCP=tcp://10.96.0.1:443
_=/usr/bin/env
root@pod-env12:/# env | grep database
```

2.6 Run the **nano configfile.yaml** command to create a YAML file

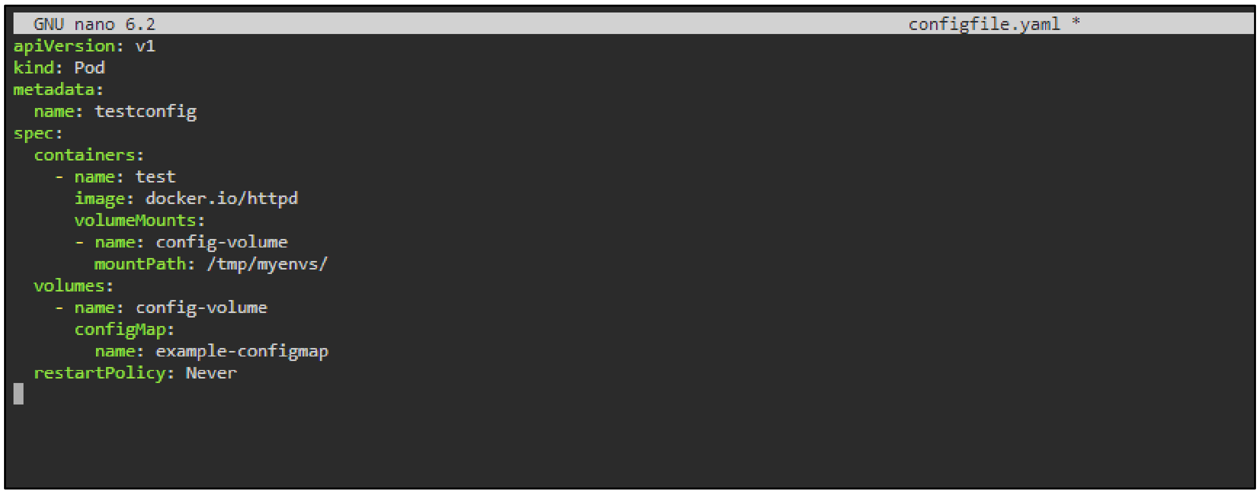


```
labsuser@master:~$ nano configfile.yaml
```

.

2.7 Copy the following code in the YAML file:

```
apiVersion: v1
kind: Pod
metadata:
  name: testconfig
spec:
  containers:
    - name: test
      image: docker.io/httpd
      volumeMounts:
      - name: config-volume
        mountPath: /tmp/myenvs/
  volumes:
    - name: config-volume
      configMap:
        name: example-configmap
  restartPolicy: Never
```

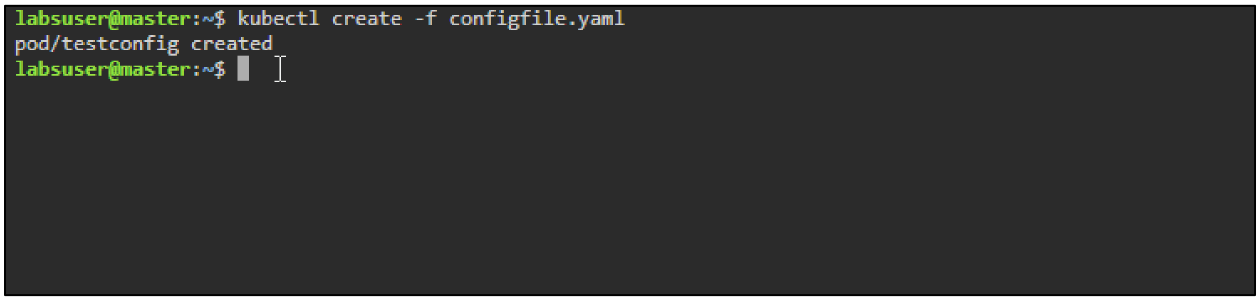


```
  GNU nano 6.2                                                                            configfile.yaml *
apiVersion: v1
kind: Pod
metadata:
  name: testconfig
spec:
  containers:
    - name: test
      image: docker.io/httpd
      volumeMounts:
      - name: config-volume
        mountPath: /tmp/myenvs/
  volumes:
    - name: config-volume
      configMap:
        name: example-configmap
  restartPolicy: Never
```

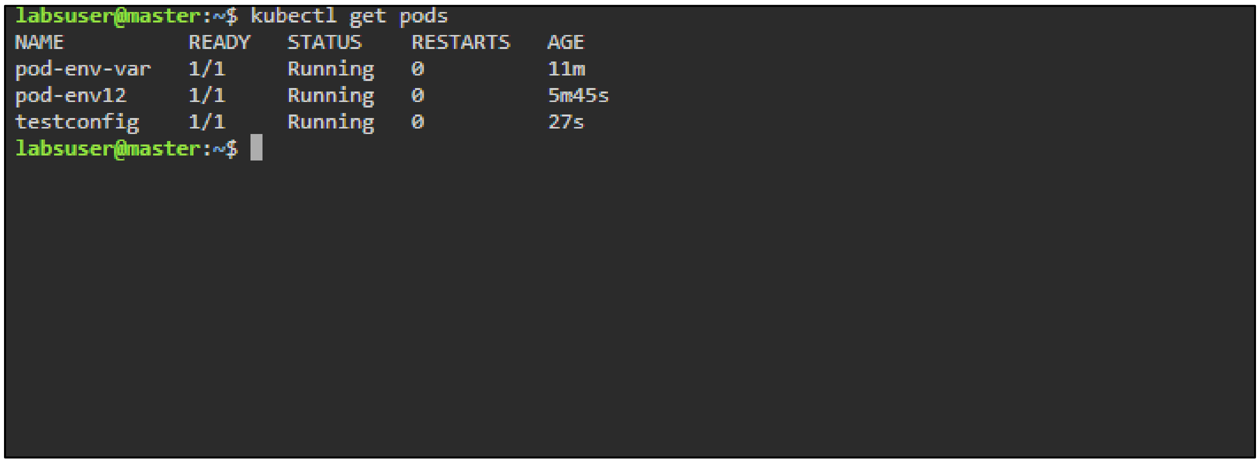
2.8 Run the following commands to create a pod and verify its state:

kubectl create -f configfile.yaml

kubectl get pods



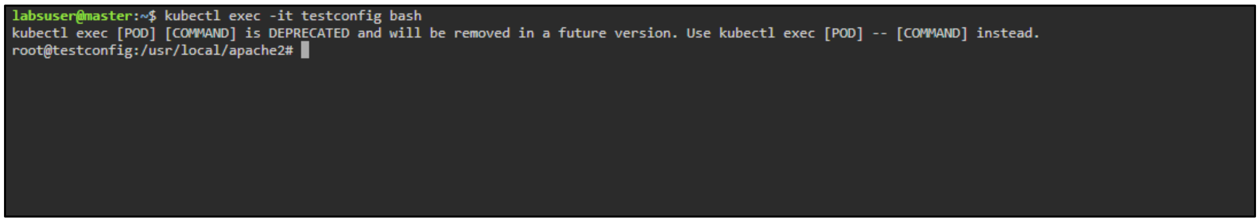
```
labsuser@master:~$ kubectl create -f configfile.yaml
pod/testconfig created
labsuser@master:~$
```



```
labsuser@master:~$ kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
pod-env-var    1/1     Running   0          11m
pod-env12      1/1     Running   0          5m45s
testconfig     1/1     Running   0          27s
labsuser@master:~$
```

2.9 Access the pod by running the following command:

kubectl exec -it testconfig bash



```
labsuser@master:~$ kubectl exec -it testconfig bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
root@testconfig:/usr/local/apache2#
```

By following these steps, you have successfully configured ConfigMaps using kubectl and managed data configuration for your pods and services.