Lesson 04 Demo 04

Creating and Configuring Pod Priority

Objective: To create and configure the priority classes and assign them to pods in a Kubernetes environment

Tools required: kubeadm, kubectl, kubelet, and containerd

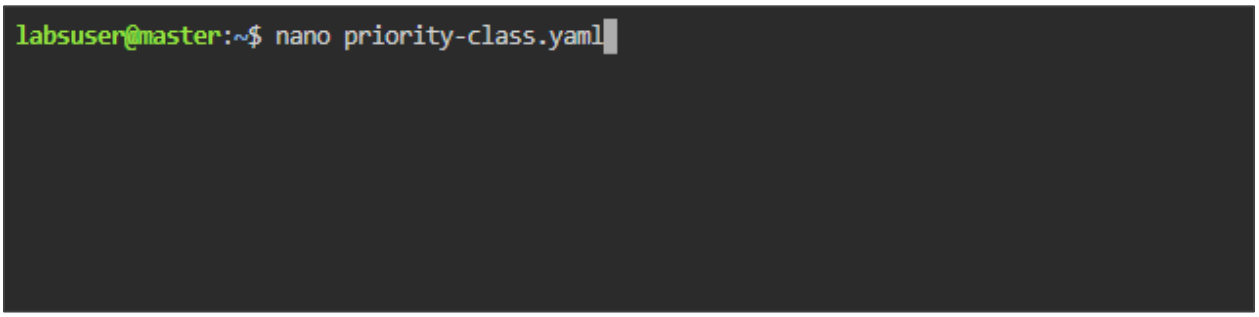
Prerequisites: A Kubernetes cluster (refer to Demo 01 from Lesson 01 for setting up a cluster)

Steps to be followed:

1. Create and describe the priority class object
2. Create and describe the pod priority file

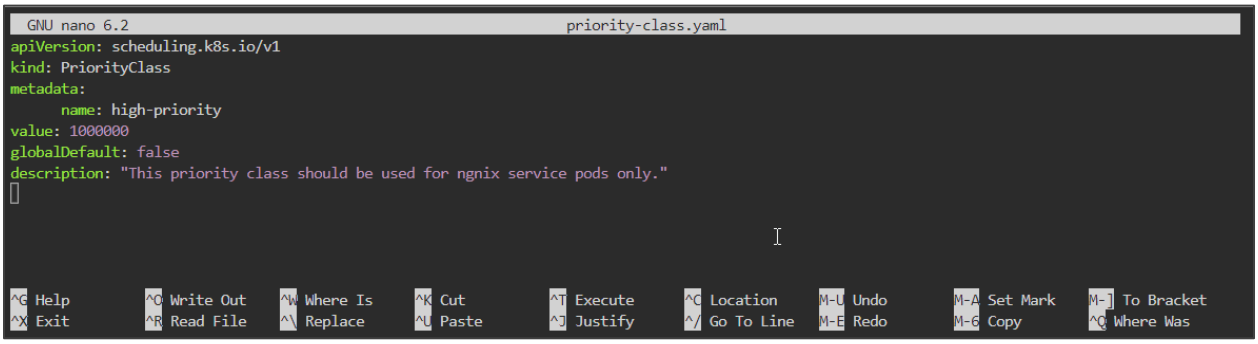
Step 1: Create and describe the priority class object

1.1 Create the YAML file using the following command:
nano priority-class.yaml

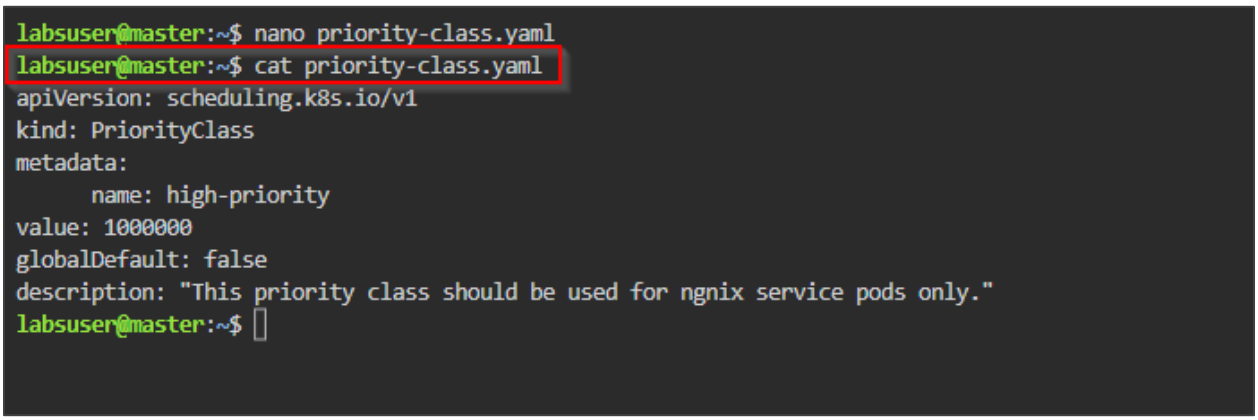


1.2 Add the following code to the **priority-class.yaml** file:

apiVersion: scheduling.k8s.io/v1
kind: PriorityClass
metadata:
**   name: high-priority**
value: 1000000
globalDefault: false
description: "This priority class should be used for ngnix service pods only."



1.3 Use the **cat** command to validate the content of the **priority-class.yaml** file



1.4 Create the priority-class resource using the following command:
kubectl apply -f priority-class.yaml

```
labsuser@master:~$ cat priority-class.yaml
apiVersion: scheduling.k8s.io/v1
kind: PriorityClass
metadata:
      name: high-priority
value: 1000000
globalDefault: false
description: "This priority class should be used for ngnix service pods only."
labsuser@master:~$ kubectl apply -f  priority-class.yaml
priorityclass.scheduling.k8s.io/high-priority created
labsuser@master:~$
```

1.5 List the available priority classes using the following command:
kubectl get priorityclasses

```
labsuser@master:~$ kubectl apply -f  priority-class.yaml
priorityclass.scheduling.k8s.io/high-priority created
labsuser@master:~$ kubectl get priorityclasses
NAME                      VALUE        GLOBAL-DEFAULT   AGE
high-priority             1000000      false            3m46s
system-cluster-critical   2000000000   false            3d2h
system-node-critical      2000001000   false            3d2h
labsuser@master:~$
```

1.6 Describe the created priority classes using the following command:
kubectl describe priorityclasses high-priority

```
system-node-critical      2000001000   false            3d2h
labsuser@master:~$ kubectl describe priorityclasses high-priority
Name:              high-priority
Value:             1000000
GlobalDefault:     false
PreemptionPolicy:  PreemptLowerPriority
Description:       This priority class should be used for ngnix service pods only.
Annotations:       kubectl.kubernetes.io/last-applied-configuration={"apiVersion":"scheduling.k8s.io/v1","description":"This priority class should
 be used for ngnix service pods only.","globalDefault":false,"kind":"PriorityClass","metadata":{"annotations":{},"name":"high-priority"},"value":1
000000}

Events:  <none>
labsuser@master:~$
```

Step 2: Create and describe the pod priority file

2.1 Create the YAML file using the following command:
nano pod-priority.yaml

```
labsuser@master:~$ kubectl describe priorityclasses high-priority
Name:              high-priority
Value:             1000000
GlobalDefault:     false
PreemptionPolicy:  PreemptLowerPriority
Description:       This priority class should be used for ngnix service pods only.
Annotations:       kubectl.kubernetes.io/last-applied-configuration={"apiVersion":"scheduling.k8s.io/v1","description":"This priority class should
 be used for ngnix service pods only.","globalDefault":false,"kind":"PriorityClass","metadata":{"annotations":{},"name":"high-priority"},"value":1
000000}

Events:  <none>
labsuser@master:~$ nano pod-priority.yaml
```

2.2 Add the following code to the **pod-priority.yaml** file:

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx1
  labels:
    env: test
spec:
  containers:
  - name: nginx
    image: nginx
    imagePullPolicy: IfNotPresent
  priorityClassName: high-priority
```

```
 GNU nano 6.2                                    pod-priority.yaml *
apiVersion: v1
kind: Pod
metadata:
  name: nginx1
  labels:
    env: test
spec:
  containers:
  - name: nginx
    image: nginx
    imagePullPolicy: IfNotPresent
  priorityClassName: high-priority

^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
^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
```

Note: If a pod with the name **nginx** has already been created, you may need to choose a different name for the pod as indicated in the screenshot above.

2.3 Use the **cat** command to validate the content of the **pod-priority.yaml** file

```
labsuser@master:~$ nano pod-priority.yaml
labsuser@master:~$ cat pod-priority.yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx1
  labels:
    env: test
spec:
  containers:
  - name: nginx
    image: nginx
    imagePullPolicy: IfNotPresent
  priorityClassName: high-priority
labsuser@master:~$
```

2.4 Create the pod-priority class resource using the following command:
kubectl apply -f pod-priority.yaml

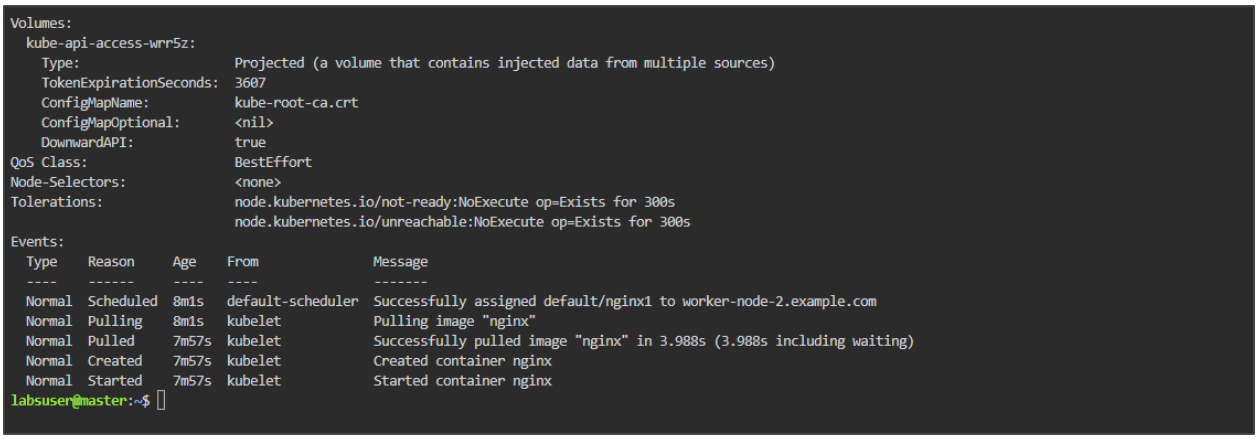
```
labsuser@master:~$ nano pod-priority.yaml
labsuser@master:~$ cat pod-priority.yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx1
  labels:
    env: test
spec:
  containers:
  - name: nginx
    image: nginx
    imagePullPolicy: IfNotPresent
  priorityClassName: high-priority
labsuser@master:~$ kubectl apply -f pod-priority.yaml
pod/nginx1 created
labsuser@master:~$
```

2.5 List the available pods using the following command:
kubectl get pods

```
labsuser@master:~$ kubectl apply -f pod-priority.yaml
pod/nginx1 created
labsuser@master:~$ kubectl get pods
NAME                    READY   STATUS                 RESTARTS       AGE
frontend-7hnrl          1/1     Running                3 (3h1m ago)   2d
frontend-cf7tz          1/1     Running                3 (19h ago)    2d
mydep-548c7db5df-dsvk8  0/1     CreateContainerError   0              2d
mydep-6f74bcdf49-dh2vc  0/1     CreateContainerError   0              2d
nginx                   1/1     Running                0              18m
nginx1                  1/1     Running                0              2m43s
security-context-1      1/1     Running                9 (47s ago)    24h
labsuser@master:~$
```

2.6 Describe the pod to verify the priority class using the following command:
kubectl describe pod nginx1

```
labsuser@master:~$ kubectl describe pod nginx1
Name:                 nginx1
Namespace:            default
Priority:             1000000
Priority Class Name:  high-priority
Service Account:      default
Node:                 worker-node-2.example.com/172.31.25.241
Start Time:           Thu, 12 Oct 2023 10:31:32 +0000
Labels:               env=test
Annotations:          cni.projectcalico.org/containerID: 49c2d68f3e8367465cd58bcabe84984adac226ba873776226c1d2f70e360c9ca
                      cni.projectcalico.org/podIP: 192.168.232.200/32
                      cni.projectcalico.org/podIPs: 192.168.232.200/32
Status:               Running
IP:                   192.168.232.200
IPs:
  IP:  192.168.232.200
Containers:
  nginx:
    Container ID:   containerd://550a2854e39a02b44e13c7cc065ebc295b672fa84bf983ee5f4cd7e5d431f0ae
    Image:          nginx
```



By following these steps, you have successfully configured priority classes and associated them with the pods in a Kubernetes environment, ensuring efficient workload management and resource allocation.