# Lesson 09 Demo 09

# Troubleshooting Networking Issues

**Objective:** To understand the process of creating, troubleshooting, and modifying an httpd-pod and its associated service in a Kubernetes environment

**Tools required:** kubeadm, kubectl, kubelet, and containerd

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

Steps to be followed:

1. Create an httpd-pod
2. Create an httpd Service
3. Check labels for all the Pods

## Step 1: Create an httpd-pod

1.1 Install the metrics API by using the following command:
**kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml**

```
labsuser@master:~$ kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml
serviceaccount/metrics-server created
clusterrole.rbac.authorization.k8s.io/system:aggregated-metrics-reader created
clusterrole.rbac.authorization.k8s.io/system:metrics-server created
rolebinding.rbac.authorization.k8s.io/metrics-server-auth-reader created
clusterrolebinding.rbac.authorization.k8s.io/metrics-server:system:auth-delegator created
clusterrolebinding.rbac.authorization.k8s.io/system:metrics-server created
service/metrics-server created
deployment.apps/metrics-server created
apiservice.apiregistration.k8s.io/v1beta1.metrics.k8s.io created
labsuser@master:~$
```

1.2 Use the following command and code to create an httpd-pod:

**vim network-issue.yaml**

```
labsuser@master:~$ vim network-issue.yaml
labsuser@master:~$
```

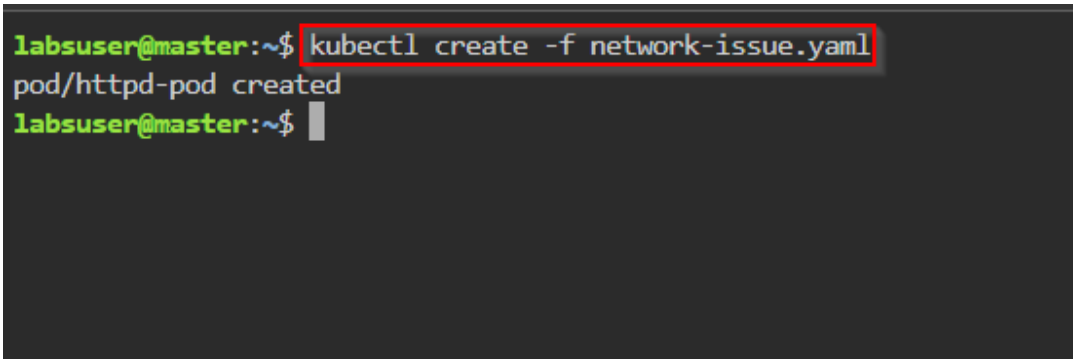
```
apiVersion: v1
kind: Pod
metadata:
 name: httpd-pod
 labels:
  mycka: simplilearn-network-1
spec:
 containers:
 - name: mycontainer

  image: docker.io/httpd
  ports:
  - containerPort: 80
```

```
apiVersion: v1
kind: Pod
metadata:
  name: httpd-pod
  labels:
    mycka: simplilearn-network-1
spec:
  containers:
  - name: mycontainer
    image: docker.io/httpd
    ports:
    - containerPort: 80
~
```

1.3 Execute the following command to create the Pod:

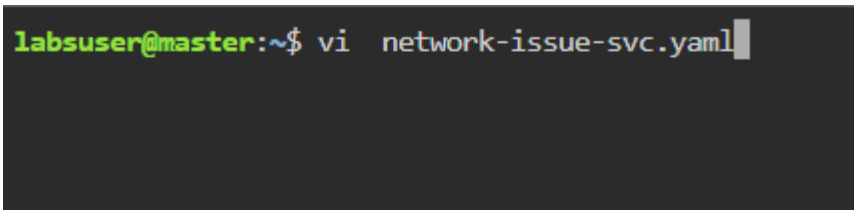
**kubectl create -f network-issue.yaml**




## Step 2: Create an httpd Service

2.1 Use the following command and code below to create an httpd service:

**vi network-issue-svc.yaml**




```
apiVersion: v1
kind: Service
metadata:
  name: httpd-service
spec:
  selector:
    mycka: simplilearn-network-1
  ports:
    - protocol: TCP
      port: 18080
      targetPort: 80
```

```
apiVersion: v1
kind: Service
metadata:
  name: httpd-service
spec:
  selector:
    mycka: simplilearn-network-1
  ports:
    - protocol: TCP
      port: 18080
      targetPort: 80

~
```

2.2 Execute the following command to create the service:

**kubectl create -f network-issue-svc.yaml**

```
labsuser@master:~$ vi  network-issue-svc.yaml
labsuser@master:~$ kubectl create -f network-issue-svc.yaml
service/httpd-service created
labsuser@master:~$
```

## Step 3: Check labels for all Pods

3.1 To check the labels and selector execute the following commands:

**kubectl get pods --show-labels**

```
labsuser@master:~$ vi  network-issue-svc.yaml
labsuser@master:~$ kubectl create -f network-issue-svc.yaml
service/httpd-service created
labsuser@master:~$ kubectl get pods --show-labels
NAME           READY   STATUS    RESTARTS        AGE   LABELS
httpd-pod      1/1     Running   0               23m   mycka=simplilearn-network-1
my-nginx-pod   1/1     Running   3 (3h44m ago)   22h   run=my-nginx-pod
pod-name       1/1     Running   3 (13h ago)     23h   run=pod-name
labsuser@master:~$
```

3.2 Use the following commands to get endpoints:

**kubectl get svc -o wide**

**kubectl get endpoints**

```
labsuser@master:~$ kubectl get svc -o wide
NAME            TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)     AGE     SELECTOR
httpd-service   ClusterIP   10.110.99.126   <none>        18080/TCP   4h50m   mycka=simplilearn-network-1
kubernetes      ClusterIP   10.96.0.1       <none>        443/TCP     27h     <none>
labsuser@master:~$ kubectl get endpoints
NAME            ENDPOINTS            AGE
httpd-service   172.16.232.199:80    4h50m
kubernetes      172.31.35.149:6443   27h
labsuser@master:~$
```

3.3 Verify the service with this command:

**curl 172.16.232.199:80**

```
labsuser@master:~$ kubectl get endpoints
NAME             ENDPOINTS            AGE
httpd-service    172.16.232.199:80    4h56m
kubernetes       172.31.35.149:6443   27h
labsuser@master:~$ curl 172.16.232.199:80
<html><body><h1>It works!</h1></body></html>
labsuser@master:~$
```

**Note:** Use the cluster IP of the httpd-service.

3.4 Delete the httpd-service with these commands:

**kubectl get svc**

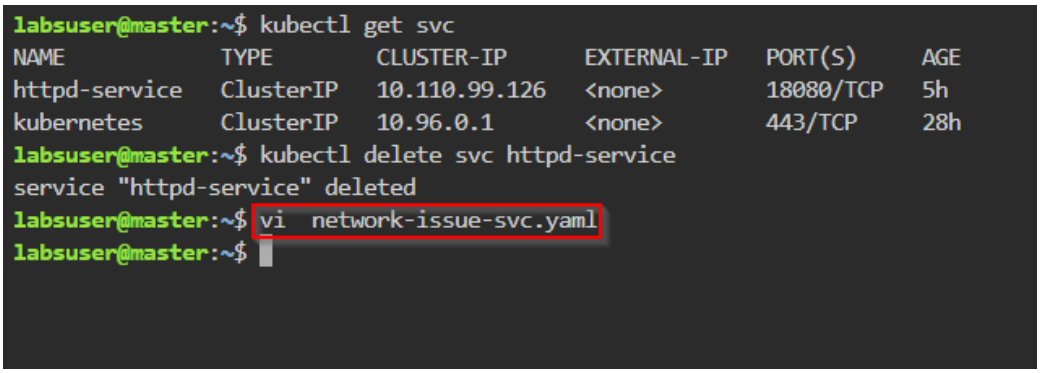
**kubectl delete svc httpd-service**

```
labsuser@master:~$ kubectl get svc
NAME             TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)     AGE
httpd-service    ClusterIP   10.110.99.126    <none>        18080/TCP   5h
kubernetes       ClusterIP   10.96.0.1        <none>        443/TCP     28h
labsuser@master:~$ kubectl delete svc httpd-service
service "httpd-service" deleted
labsuser@master:~$
```

3.5 Now, modify the service file to use a different network name. Update the **network-issue-svc.yaml** file with the following code:

**vi network-issue-svc.yaml**

```
apiVersion: v1
kind: Service
metadata:
 name: httpd-service
spec:
 selector:
  mycka: simplilearn-network-2
 ports:
  - protocol: TCP
    port: 18080
    targetPort: 80
```



```yaml
apiVersion: v1
kind: Service
metadata:
  name: httpd-service
spec:
  selector:
    mycka: simplilearn-network-2
  ports:
    - protocol: TCP
      port: 18080
      targetPort: 80
```

3.6 Execute the following command to create the service:

**kubectl create -f network-issue-svc.yaml**

```
labsuser@master:~$ kubectl create -f network-issue-svc.yaml
service/httpd-service created
labsuser@master:~$
```

3.7 To list the pods with labels execute the following command:

**kubectl get pods --show-labels**

```
labsuser@master:~$ kubectl create -f network-issue-svc.yaml
service/httpd-service created
labsuser@master:~$ kubectl get pods --show-labels
NAME          READY   STATUS    RESTARTS       AGE     LABELS
httpd-pod     1/1     Running   1 (3h5m ago)   5h32m   mycka=simplilearn-network-1
my-nginx-pod  1/1     Running   4 (3h5m ago)   27h     run=my-nginx-pod
pod-name      1/1     Running   4 (3h5m ago)   28h     run=pod-name
labsuser@master:~$
```

3.8 Execute the commands below to retrieve the cluster IP and the endpoints, along with their respective ports:

**kubectl get svc -o wide**

**kubectl get endpoints**

```
labsuser@master:~$ kubectl create -f network-issue-svc.yaml
service/httpd-service created
labsuser@master:~$  kubectl get pods --show-labels
NAME           READY   STATUS    RESTARTS       AGE     LABELS
httpd-pod      1/1     Running   1 (3h5m ago)   5h32m   mycka=simplilearn-network-1
my-nginx-pod   1/1     Running   4 (3h5m ago)   27h     run=my-nginx-pod
pod-name       1/1     Running   4 (3h5m ago)   28h     run=pod-name
labsuser@master:~$ kubectl get svc -o wide
NAME            TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)     AGE     SELECTOR
httpd-service   ClusterIP   10.109.208.140   <none>        18080/TCP   3m54s   mycka=simplilearn-network-2
kubernetes      ClusterIP   10.96.0.1        <none>        443/TCP     28h     <none>
labsuser@master:~$ kubectl get endpoints
NAME            ENDPOINTS            AGE
httpd-service   <none>               4m3s
kubernetes      172.31.35.149:6443   28h
labsuser@master:~$
```

3.9 Now, access the service again using the **curl** command:

**curl 172.16.232.199:8080**

```
labsuser@master:~$ kubectl get endpoints
NAME            ENDPOINTS            AGE
httpd-service   <none>               20m
kubernetes      172.31.35.149:6443   28h
labsuser@master:~$ curl 172.16.232.199:8080
curl: (7) Failed to connect to 172.16.232.199 port 8080 after 0 ms: Connection refused
labsuser@master:~$
```

By following these steps, you have successfully troubleshooted networking issues, set up an httpd pod and its associated service, and validated their operation within a Kubernetes environment.