School of Computer Science

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES DEHRADUN, UTTARAKHAND

Containers & Docker Security

Lab File (2022-2026)
5th Semester

Submitted To:

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Batch - 1

EXPERIMENT 7

AIM: Create Service in Kubernetes

Objective:

- Understand the syntax and structure of a Kubernetes Service definition file (YAML).
- Learn to create different types of Services: ClusterIP, NodePort, and LoadBalancer.
- Comprehend how Services operate independently of specific Pods.

Prerequisites

- Kubernetes Cluster: Have a running Kubernetes cluster (locally using Minikube or kind, or a cloud-based service).
- kubectl: Install and configure kubectl to interact with your Kubernetes cluster.
- Basic Knowledge of YAML: Familiarity with YAML format will be helpful for understanding Kubernetes resource definitions.

Step-by-Step Guide

NodePort Service

To expose the Service on a port on each Node in the cluster, modify the Service type to NodePort.

Create a YAML file named nodeport-service.yaml with the following content:

```
apiVersion: v1
kind: Service
metadata:
  name: nodeport-service
```

```
spec:
 selector:
  app: my-app
 ports:
  - protocol: TCP
    port: 80
    targetPort: 80
    nodePort: 30007 # A specific port in the range 30000-32767
 type: NodePort
```

```
  GNU nano 7.2                                  nodeport-service.yaml *
apiVersion: v1
kind: Service
metadata:
  name: nodeport-service
spec:
  selector:
    app: my-app  # Replace 'my-app' with the label of your Pods
  ports:
    - protocol: TCP
      port: 80          # Port that the service listens on
      targetPort: 80    # Port on the container to forward to
      nodePort: 30007   # Specific port exposed on each node (within the range 30000-32767)
  type: NodePort        # Type of the service
```

Explanation:

- The primary difference from the ClusterIP Service is the addition of nodePort, which specifies the static port on each Node.
- type: Set to NodePort, exposing the Service on a specific port across all Nodes.

Apply this YAML to create the NodePort Service:

```
kubectl apply -f nodeport-service.yaml
```

```
C:\Users\aksha\Docker Lab\Lab-6>kubectl apply -f nodeport-service.yaml
service/nodeport-service created
```

Verify the Service:

```
kubectl get services
```

```
C:\Users\aksha\Docker Lab\Lab-6>kubectl get services
NAME               TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
kubernetes         ClusterIP   10.96.0.1      <none>        443/TCP        13m
nodeport-service   NodePort    10.108.25.30   <none>        80:30007/TCP   26s
```

You should see the nodeport-service listed with a NodePort and details about the port exposed.