

# Lab Exercise 7- 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
```

### 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\OM VATS>kubectl apply -f nodeport-service.yaml
service/nodeport-service unchanged
```

### Verify the Service:

```
kubectl get services
```

```
service/nodeport-service unchanged
C:\Users\OM VATS>kubectl get services
NAME                TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
kubernetes          ClusterIP   10.96.0.1     <none>         443/TCP          31h
nodeport-service    NodePort    10.108.70.162 <none>         80:30007/TCP     19h
```

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

```
C:\Users\OM VATS>kubectl get nodes -o wide
NAME                STATUS    ROLES    AGE   VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION      CONTAINER-RUNTIME
docker-desktop      Ready    control-plane   31h   v1.30.2   192.168.65.3   <none>        Docker Desktop       5.15.153.1-microsoft-standard-WSL2   docker://27.3.1
```

```
C:\Users\OM VATS>curl http://localhost:30007
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>
```