Services in K8s

```
ubuntu@k8-master:~$ kubectl apply -f deploy.yaml
deployment.apps/my-deployment created
ubuntu@k8-master:~$ kubectl get pods
NAME                             READY   STATUS              RESTARTS   AGE
my-deployment-78f768c985-dpmh5   0/1     ContainerCreating   0          8s
my-deployment-78f768c985-q2zdk   0/1     ContainerCreating   0          8s
my-deployment-78f768c985-twf65   0/1     ContainerCreating   0          8s
ubuntu@k8-master:~$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-78f768c985-dpmh5   1/1     Running   0          13s
my-deployment-78f768c985-q2zdk   1/1     Running   0          13s
my-deployment-78f768c985-twf65   1/1     Running   0          13s
ubuntu@k8-master:~$ kubectl get deploy
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
my-deployment   3/3     3            3           18s
ubuntu@k8-master:~$ kubectl get pods -o wide
NAME                             READY   STATUS    RESTARTS   AGE   IP          NODE          NOMINATED NODE   READINESS GATES
my-deployment-78f768c985-dpmh5   1/1     Running   0          35s   10.36.0.1   k8-worker2    <none>           <none>
my-deployment-78f768c985-q2zdk   1/1     Running   0          35s   10.44.0.1   k8-worker1    <none>           <none>
my-deployment-78f768c985-twf65   1/1     Running   0          35s   10.36.0.2   k8-worker2    <none>           <none>
```

exec

```
ubuntu@k8-master:~$ kubectl exec -it my-deployment-777d96c86d-6s48f  -- /bin/bash
root@my-deployment-777d96c86d-6s48f:/# curl localhost
<!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>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
```

I have a Deployment running an Nginx application. While I can access the application from inside the Pod, the Pod's IP address changes dynamically, making it impractical to rely on it. To address this issue, Kubernetes provides a Service resource, which allows me to access the application using stable

IP address

```
ubuntu@k8-master:~$ cat deploy.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: my-deployment
  annotations:
    kubernetes.io/change-cause: "image updated to 1.16.1"
spec:
  replicas: 3
  selector:
    matchLabels:
      app: my-app
  template:
    metadata:
      labels:
        app: my-app
    spec:
      containers:
      - name: my-container
        image: nginx:1.16.1
        ports:
        - containerPort: 80
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxUnavailable: 25%
      maxSurge: 25%
```

```
ubuntu@k8-master:~$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-777d96c86d-6s48f   1/1     Running   0          10m
my-deployment-777d96c86d-qm6dq   1/1     Running   0          9m51s
my-deployment-777d96c86d-xvg54   1/1     Running   0          10m
```

```
ubuntu@k8-master:~$ vi svc.yaml
ubuntu@k8-master:~$ kubectl get svc
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   46m
ubuntu@k8-master:~$ kubectl apply -f svc.yaml
service/my-service created
ubuntu@k8-master:~$ kubectl get svc
NAME         TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP   46m
my-service   ClusterIP   10.97.122.31   <none>        80/TCP    3s
ubuntu@k8-master:~$ curl 10.97.122.31
<!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
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<p><em>Thank you for using nginx.</em></p>
</body>
</html>
```
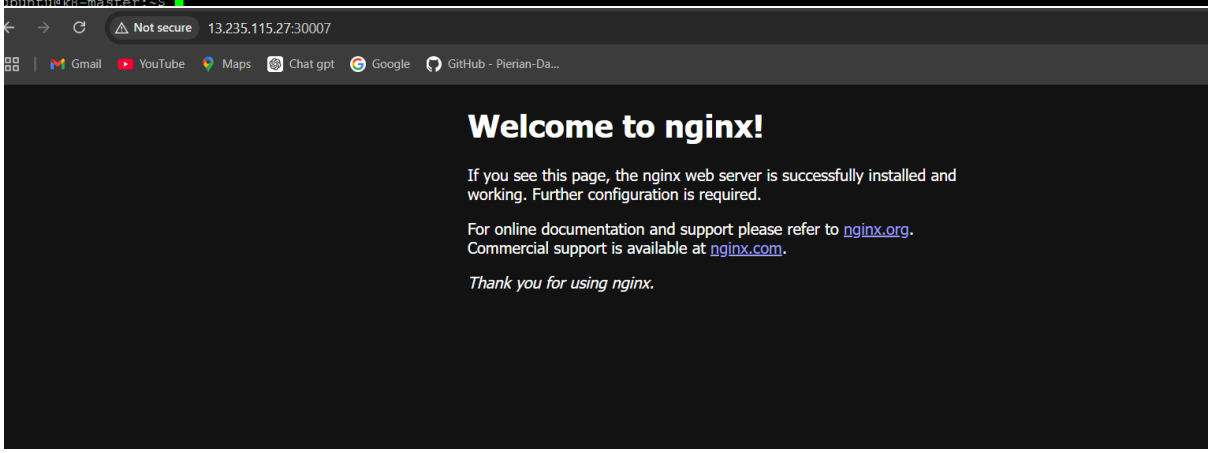

I created a ClusterIP Service and specified the Deployment's selector, which provided a single IP address for accessing the application within the cluster. However, this approach has a limitation: the application is not accessible from outside the cluster

```
ubuntu@k8-master:~$ cat svc.yaml
apiVersion: v1
kind: Service
metadata:
  name: my-service
spec:
  type: NodePort
  selector:
    app: my-app
  ports:
    - port: 80
      # By default and for convenience, the `targetPort` is set to
      # the same value as the `port` field.
      targetPort: 80
      # Optional field
      # By default and for convenience, the Kubernetes control plane
      # will allocate a port from a range (default: 30000-32767)
      nodePort: 30007
```

```
ubuntu@k8-master:~$ kubectl get svc
NAME         TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP        60m
my-service   NodePort    10.98.11.115   <none>        80:30007/TCP   10m
ubuntu@k8-master:~$ kubectl get endpoints
NAME         ENDPOINTS                                  AGE
kubernetes   172.31.42.140:6443                         60m
my-service   10.36.0.3:80,10.44.0.1:80,10.44.0.2:80     11m
ubuntu@k8-master:~$ kubectl get pods -o wide
NAME                             READY   STATUS    RESTARTS   AGE   IP          NODE          NOMINATED NODE   READINESS GATES
my-deployment-777d96c86d-6s48f   1/1     Running   0          26m   10.36.0.3   k8-worker2    <none>           <none>
my-deployment-777d96c86d-qm6dq   1/1     Running   0          26m   10.44.0.1   k8-worker1    <none>           <none>
my-deployment-777d96c86d-xvg54   1/1     Running   0          26m   10.44.0.2   k8-worker1    <none>           <none>
ubuntu@k8-master:~$
```



I'm creating a Node Port Service, which allows us to access the application from outside the cluster.