

What is Service Discovery in Kubernetes?

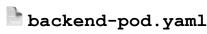
Kubernetes assigns **dynamic IPs** to pods, so you can't rely on fixed IPs to communicate. Instead, Kubernetes provides a **Service**, which gives a **stable DNS name and IP address** that routes traffic to the correct pod(s).

Service Discovery in Kubernetes

Goal:

- Deploy two apps:
 - App A (frontend) that calls
 - App B (backend) using Service Discovery.

Step 1: Create Backend App (App B)



```
yaml
-----
apiVersion: v1
kind: Pod
metadata:
  name: backend
labels:
    app: backend
spec:
  containers:
    - name: backend
    image: hashicorp/http-echo
    args:
        - "-text=Hello from Backend"
    ports:
        - containerPort: 5678
```

Deploy it:

```
bash
----
kubectl apply -f backend-pod.yaml
```

Step 2: Create a Service for Backend



backend-service.yaml

```
yaml
apiVersion: v1
kind: Service
metadata:
 name: backend-service
spec:
 selector:
   app: backend
 ports:
    - protocol: TCP
     port: 80
      targetPort: 5678
Deploy it:
bash
```

Now, Kubernetes gives a stable DNS name:

kubectl apply -f backend-service.yaml

```
text
http://backend-service.default.svc.cluster.local
```

Any pod in the same namespace can reach the backend using this name.

Step 3: Create Frontend App (App A)

We'll use a simple busybox pod to curl the backend using service name.



frontend-pod.yaml

kubectl apply -f frontend-pod.yaml

```
yaml
apiVersion: v1
kind: Pod
metadata:
 name: frontend
spec:
 containers:
    - name: frontend
      image: busybox
      command: ['sh', '-c', 'while true; do sleep 3600; done']
Deploy it:
bash
```

Step 4: Test Service Discovery

Get a shell inside the frontend pod:

```
bash
-----
kubectl exec -it frontend -- sh
```

Now curl the backend:

```
bash
----
wget -q0- http://backend-service
```

You should see:

```
text
-----
Hello from Backend
```

This confirms Service Discovery is working via the DNS name backend-service.



Component Purpose

Pod (backend) The actual service provider
Service Provides stable name & IP
DNS Name backend-service.default.svc...
Pod (frontend) Client that calls the service

What is the primary purpose of Service Discovery in Kubernetes?

- A. To create new pods dynamically
- B. To automatically expose pods to the internet
- C. To allow pods to communicate without hardcoding IPs
- D. To scale the pods based on CPU usage

C. To allow pods to communicate without hardcoding IPs

What happens if a pod is restarted and gets a new IP address?

- A. Communication to it will fail
- B. Service continues to route traffic to the new pod IP
- C. The service must be recreated
- D. DNS will not work anymore

☑ B. Service continues to route traffic to the new pod IP

What command can you use inside a pod to test service discovery?

- A. kubectl get pods
- B. docker exec
- C. wget or curl using the service name
- D. kubectl describe service
- ✓ C. wget or curl using the service name