Services and DNS

Services are a great way to expose applications to one another (or to the outside world) within a Kubernetes cluster. In this lesson, we will talk about Kubernetes services. We will also explore how they relate to the Kubernetes DNS.

Relevant Documentation

- Service
- DNS for Services and Pods

Lesson Reference

Access UCP in a browser at `https://<UCP_SERVER_PUBLIC_IP>`.

We can create Kubernetes objects in UCP by navigating to **Kubernetes** > **+ Create**. Make sure to use the default namespace throughout this exercise.

Creating Services

Make sure to view the `default` Namespace (**Kubernetes** > **Namespaces**, then click **Set Context** next to `default`).

Create a pod which will be exposed using a service.

```
apiVersion: v1
kind: Pod
metadata:
  name: my-svc-pod
  labels:
    app: nginx
spec:
  containers:
  - name: nginx
    image: nginx:1.19.1
    ports:
    - containerPort: 80
```

Create a ClusterIP service.

```
apiVersion: v1
kind: Service
metadata:
  name: nginx-internal-service
spec:
  type: ClusterIP
  selector:
    app: nginx
  ports:
    - protocol: TCP
      port: 80
      targetPort: 80
```

Create a busybox pod in the same namespace as our services:

```
apiVersion: v1
kind: Pod
metadata:
  name: busybox-dns
```

```
    namespace: default
spec:
  containers:
  - name: busybox
    image: radial/busyboxplus:curl
    command: ["sh", "-c", "while true; do sleep 3600; done"]
```

Navigate to **Kubernetes** > **Services** > **nginx-internal-service**, copy the *Cluster IP*.

Navigate to **Kubernetes** > **Pods** > **busybox-dns**.

Click the **Exec** icon near the upper-right and enter `sh` to access a shell prompt within the container.

Make a request to the service:

```
curl <nginx-internal-service Cluster IP>
```

We should see some HTML representing the Nginx welcome page.

Exploring Kubernetes Service DNS

Look up DNS records for the ClusterIP Service.

```
nslookup nginx-internal-service
```

Make a request to the service using the service name.

```
curl nginx-internal-service
```

Make a request using the full domain name.

```
curl nginx-internal-service.default.svc.cluster.local
```

Switch to the `my-namespace` Namespace (**Kubernetes** > **Namespaces**, then click **Set Context** next to `my-namespace`).

Create a busybox Pod in the `my-namespace` Namespace:

```
apiVersion: v1
kind: Pod
metadata:
  name: busybox-dns-other-namespace
  namespace: my-namespace
spec:
  containers:
  - name: busybox
    image: radial/busyboxplus:curl
    command: ["sh", "-c", "while true; do sleep 3600; done"]
```

Navigate to **Kubernetes** > **Pods** > **busybox-dns-other-namespace**.

Click the **Exec** icon near the upper-right and enter `sh` to access a shell prompt within the container.

Make a request to the service using the service name. This will fail since the short name can only be used when using a service within the same namespace as the pod.

```
curl nginx-internal-service
```

Make a request using the full domain name.

```
curl nginx-internal-service.default.svc.cluster.local
```