Lab Exercise 6- Create POD in Kubernetes

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Objective:

- Understand the basic structure and syntax of a Kubernetes Pod definition file (YAML).
- Learn to create, inspect, and delete a Pod in a Kubernetes cluster.

Prerequisites

- Kubernetes Cluster: You need a running Kubernetes cluster. You can set up a local cluster using tools like Minikube or kind, or use a cloud-based Kubernetes service.
- kubectl: Install and configure kubectl to interact with your Kubernetes cluster.
- Basic Knowledge of YAML: Familiarity with YAML format will be helpful as Kubernetes resource definitions are written in YAML.

Step-by-Step Guide

Step 1: Create a YAML File for the Pod

We'll create a Pod configuration file named **pod-example.yaml**

```
apiVersion: v1
kind: Pod
metadata:
```

```
  annotations:
  labels:
    name: easy-drive-pod
  name: easy-drive-pod
spec:
  containers:
  - image: booraraman/easy-drive-rentals:1
    name: easy-drive
    ports:
    - containerPort: 5600
```

Explanation of the YAML File

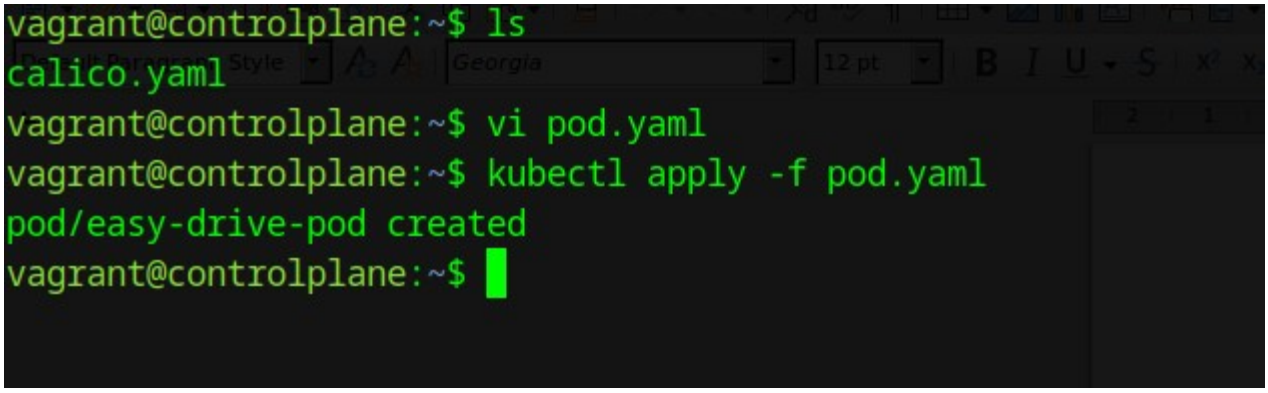
- apiVersion: Specifies the version of the Kubernetes API to use. For Pods, it's typically v1.
- kind: The type of object being created. Here it's a Pod.
- metadata: Provides metadata about the object, including name and labels. The name must be unique within the namespace, and labels help in identifying and organizing Pods.
- spec: Contains the specifications of the Pod, including:
    - containers: Lists all containers that will run inside the Pod. Each container needs:
        - name: A unique name within the Pod.
        - image: The Docker image to use for the container.
        - ports: The ports that this container exposes.
        - env: Environment variables passed to the container.

Step 2: Apply the YAML File to Create the Pod

Use the kubectl apply command to create the Pod based on the YAML configuration file.

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

This command tells Kubernetes to create a Pod as specified in the pod-example.yaml file.



Step 3: Verify the Pod Creation

To check the status of the Pod and ensure it's running, use:

```
kubectl get pods
```

This command lists all the Pods in the current namespace, showing their status, restart count, and other details.

```
vagrant@controlplane:~$ vi pod.yaml
vagrant@controlplane:~$ kubectl apply -f pod.yaml
pod/easy-drive-pod created
vagrant@controlplane:~$ kubectl get pods
NAME             READY   STATUS              RESTARTS   AGE
easy-drive-pod   0/1     ContainerCreating   0          26s
vagrant@controlplane:~$
```

You can get detailed information about the Pod using:

```
kubectl describe pod my-pod
```

This command provides detailed information about the Pod, including its events, container specifications, and resource usage.

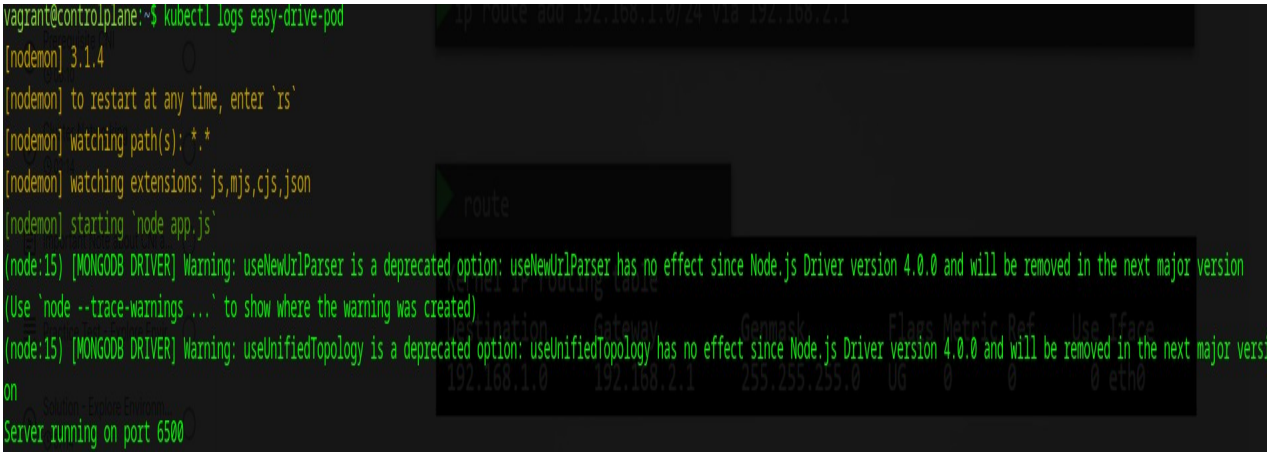
```
vagrant@controlplane:~$ kubectl get pods
NAME             READY   STATUS              RESTARTS   AGE
easy-drive-pod   0/1     ContainerCreating   0          80s
vagrant@controlplane:~$ kubectl describe  pods easy-drive-pod
Name:             easy-drive-pod
Namespace:        default
Priority:         0
Service Account:  default
Node:             node02/10.0.0.12
Start Time:       Sun, 03 Nov 2024 09:26:43 +0000
Labels:           name=easy-drive-pod
Annotations:      <none>
Status:           Pending
IP:
IPs:              <none>
Containers:
  easy-drive:
    Container ID:
    Image:          booraraman/easy-drive-rentals:1
    Image ID:
    Port:           5600/TCP
    Host Port:      0/TCP
    State:          Waiting
      Reason:       ContainerCreating
    Ready:          False
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-kf7r5 (ro)
```

Step 4: Interact with the Pod

You can interact with the running Pod in various ways, such as accessing the logs or executing commands inside the container.

View Logs: To view the logs of the container in the Pod:

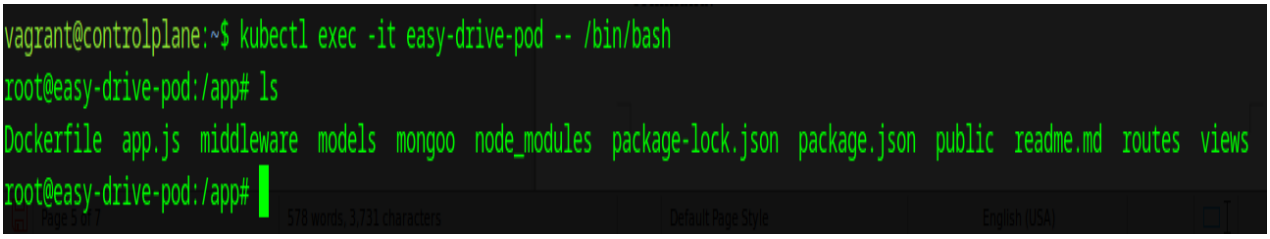
```
kubectl logs my-pod
```



Execute a Command: To run a command inside the container:

```
kubectl exec -it my-pod -- /bin/bash
```

The -it flag opens an interactive terminal session inside the container, allowing you to run commands.



Step 5: Delete the Pod

To clean up and remove the Pod when you're done, use the following command:

```
kubectl delete pod my-pod
```

This command deletes the specified Pod from the cluster.

```
vagrant@controlplane:~$ kubectl delete pods easy-drive-pod
pod "easy-drive-pod" deleted
```