Lesson 09 Demo 07

Understanding Application Troubleshooting

Objective: To set up an application pod in Kubernetes, diagnosing potential issues, and implementing necessary corrections to ensure its successful deployment

Tools required: kubeadm, kubectl, kubelet, and containerd

Prerequisites: A Kubernetes cluster should already be set up (refer to the steps provided in Lesson 02, Demo 01 for guidance).

Steps to be followed:
1. Setup and diagnose the application pod

Step 1: Setup and diagnose the application pod

1.1 To create a deployment, draft the following YAML code and save it in the **issue-pod.yaml** file:

vi issue-pod.yaml

```
labsuser@master:~$ vi issue-pod.yaml
```

apiVersion: v1
kind: Pod
metadata:
 name: openshift
 labels:
  Podlabel: simplilearn
spec:
 containers:
 - name: mycontainer
  image: docker.io/openshift
  ports:
  - containerPort: 80

```
apiVersion: v1
kind: Pod
metadata:
  name: openshift
  labels:
    Podlabel: simplilearn
spec:
  containers:
  - name: mycontainer
    image: docker.io/openshift
    ports:
    - containerPort: 80

~
~
~
```

1.2 Deploy the **issue-pod.yaml** file using the following command:
   kubectl create -f issue-pod.yaml

```
labsuser@master:~$ vi issue-pod.yaml
labsuser@master:~$ kubectl create -f issue-pod.yaml
pod/openshift created
labsuser@master:~$
```

1.3 To verify the pods, run the following command:
   kubectl get pods

```
labsuser@master:~$ vi issue-pod.yaml
labsuser@master:~$ kubectl create -f issue-pod.yaml
pod/openshift created
labsuser@master:~$ kubectl get pods
NAME                        READY   STATUS            RESTARTS        AGE
frontend-6xkgb              1/1     Running           3 (3h32m ago)   28h
frontend-7q6qg              1/1     Running           3 (3h32m ago)   28h
frontend-bltgs              1/1     Running           3 (3h32m ago)   28h
mysql-7748c687bf-n9gdf      1/1     Running           1 (3h32m ago)   5h12m
nginx-7854ff8877-ktgkp      1/1     Running           0               166m
openshift                   0/1     ImagePullBackOff  0               113s
php-apache-5f9f45d488-d4lv7 1/1     Running           2 (3h32m ago)   27h
pod-env-var                 1/1     Running           3 (3h32m ago)   28h
pod-env12                   1/1     Running           3 (3h32m ago)   28h
testconfig                  0/1     Unknown           0               28h
wordpress-6ff4d555d5-tglfv  1/1     Running           1 (3h32m ago)   5h6m
labsuser@master:~$
```

1.4 To retrieve and display the events that have occurred within the Kubernetes cluster, use the following command:
kubectl get events

```
labsuser@master:~$ kubectl create -f issue-pod.yaml
pod/openshift created
labsuser@master:~$ kubectl get pods
NAME                          READY   STATUS           RESTARTS        AGE
frontend-6xkgb                1/1     Running          3 (3h32m ago)   28h
frontend-7q6qg                1/1     Running          3 (3h32m ago)   28h
frontend-bltgs                1/1     Running          3 (3h32m ago)   28h
mysql-7748c687bf-n9gdf        1/1     Running          1 (3h32m ago)   5h12m
nginx-7854ff8877-ktgkp        1/1     Running          0               166m
openshift                     0/1     ImagePullBackOff 0               113s
php-apache-5f9f45d488-d4lv7   1/1     Running          2 (3h32m ago)   27h
pod-env-var                   1/1     Running          3 (3h32m ago)   28h
pod-env12                     1/1     Running          3 (3h32m ago)   28h
testconfig                    0/1     Unknown          0               28h
wordpress-6ff4d555d5-tglfv    1/1     Running          1 (3h32m ago)   5h6m
labsuser@master:~$ kubectl get events
LAST SEEN   TYPE      REASON               OBJECT                               MESSAGE
3m          Normal    Scheduled            pod/openshift                        Successfully assigned default/openshift to worker-node-2.example
.com
98s         Normal    Pulling              pod/openshift                        Pulling image "docker.io/openshift"
97s         Warning   Failed               pod/openshift                        Failed to pull image "docker.io/openshift": failed to pull and u
npack image "docker.io/library/openshift:latest": failed to resolve reference "docker.io/library/openshift:latest": pull access denied, repository d
oes not exist or may require authorization: server message: insufficient_scope: authorization failed
97s         Warning   Failed               pod/openshift                        Error: ErrImagePull
70s         Normal    BackOff              pod/openshift                        Back-off pulling image "docker.io/openshift"
84s         Warning   Failed               pod/openshift                        Error: ImagePullBackOff
100s        Warning   FailedGetResourceMetric  horizontalpodautoscaler/wordpress    failed to get cpu utilization: missing request for cpu in contai
ner wordpress of Pod wordpress-6ff4d555d5-tglfv
labsuser@master:~$
```

1.5 To retrieve the details of the pod, use the following command:
kubectl describe pod openshift

```
labsuser@master:~$ kubectl describe pod openshift
Name:            openshift
Namespace:       default
Priority:        0
Service Account: default
Node:            worker-node-2.example.com/172.31.26.113
Start Time:      Fri, 13 Oct 2023 15:58:26 +0000
Labels:          Podlabel=simplilearn
Annotations:     cni.projectcalico.org/containerID: e2d2f52bc19fe09ec31927eb685b39450882747bb492b67c18f0ea23a84185e9
                 cni.projectcalico.org/podIP: 192.168.232.218/32
                 cni.projectcalico.org/podIPs: 192.168.232.218/32
Status:          Pending
IP:              192.168.232.218
IPs:
  IP:  192.168.232.218
Containers:
  mycontainer:
    Container ID:
    Image:          docker.io/openshift
    Image ID:
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Waiting
      Reason:       ImagePullBackOff
    Ready:          False
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-qp5xm (ro)
```

1.6 Change the service image for the pod from **docker.io/opeshift** to **openshift/hello-openshift**, using the following command:

kubectl edit pod openshift

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: v1
kind: Pod
metadata:
  annotations:
    cni.projectcalico.org/containerID: e2d2f52bc19fe09ec31927eb685b39450882747bb492b67c18f0ea23a84185e9
    cni.projectcalico.org/podIP: 192.168.232.218/32
    cni.projectcalico.org/podIPs: 192.168.232.218/32
  creationTimestamp: "2023-10-13T15:58:26Z"
  labels:
    Podlabel: simplilearn
  name: openshift
  namespace: default
  resourceVersion: "39792"
  uid: fa45a18b-db11-4bfb-bea8-f206fdee23ec
spec:
  containers:
  - image: docker.io/openshift
    imagePullPolicy: Always
    name: mycontainer
    ports:
    - containerPort: 80
      protocol: TCP
    resources: {}
    terminationMessagePath: /dev/termination-log
```

```
apiVersion: v1
kind: Pod
metadata:
  annotations:
    cni.projectcalico.org/containerID: e2d2f52bc19fe09ec31927eb685b39450882747bb492b67c18f0ea23a841
    cni.projectcalico.org/podIP: 192.168.232.218/32
    cni.projectcalico.org/podIPs: 192.168.232.218/32
  creationTimestamp: "2023-10-13T15:58:26Z"
  labels:
    Podlabel: simplilearn
  name: openshift
  namespace: default
  resourceVersion: "39792"
  uid: fa45a18b-db11-4bfb-bea8-f206fdee23ec
spec:
  containers:
  - image: openshift/hello-openshift
    imagePullPolicy: Always
    name: mycontainer
    ports:
    - containerPort: 80
      protocol: TCP
    resources: {}
    terminationMessagePath: /dev/termination-log
-- INSERT --
```

1.7 To confirm the changes in the pods, use:

kubectl get pods

```
labsuser@master:~$ kubectl edit pod openshift
pod/openshift edited
labsuser@master:~$ kubectl get pods
NAME                          READY   STATUS     RESTARTS        AGE
frontend-6xkgb                1/1     Running    3 (3h42m ago)   28h
frontend-7q6qg                1/1     Running    3 (3h42m ago)   28h
frontend-bltgs                1/1     Running    3 (3h42m ago)   28h
mysql-7748c687bf-n9gdf        1/1     Running    1 (3h42m ago)   5h22m
nginx-7854ff8877-ktgkp        1/1     Running    0               176m
openshift                     1/1     Running    0               12m
php-apache-5f9f45d488-d4lv7   1/1     Running    2 (3h42m ago)   27h
pod-env-var                   1/1     Running    3 (3h42m ago)   28h
pod-env12                     1/1     Running    3 (3h42m ago)   28h
testconfig                    0/1     Unknown    0               28h
wordpress-6ff4d555d5-tglfv    1/1     Running    1 (3h42m ago)   5h16m
labsuser@master:~$ 
```

As shown in the screenshot above, the status of the pod is now running.

By following the above steps, you have successfully set up a Kubernetes pod, gained an understanding of its operational state, and effectively troubleshot the observed issue.