

Kubernetes Assignment

Objective

The goal of this assignment is to deepen your understanding of Kubernetes features related to storage, configuration management, scaling, and application lifecycle management by applying them in a practical context.

Tasks

You are tasked with creating a Kubernetes deployment for a sample application using the following Kubernetes features:

Task 1: Storage (Persistent Volume & Persistent Volume Claim)

1. Create a PersistentVolume (PV) with a minimum size of 2Gi.
2. Create a PersistentVolumeClaim (PVC) that requests 1Gi of storage from the PV.
3. Mount the PVC to a deployment pod running an Nginx container.
4. Verify that the pod has successfully mounted the volume by writing a sample file and checking its persistence.

Task 2: ConfigMap

1. Create a ConfigMap containing Nginx configuration (e.g., nginx.conf file or environment variables).
2. Use the ConfigMap in the Nginx deployment to:
 - Load environment variables into the container.
 - Optionally, mount a configuration file inside the container using the ConfigMap.

Task 3: CronJobs

1. Create a CronJob that prints the current date and time to a log file every minute.
2. Use a sidecar container in the CronJob pod to write the logs to a mounted persistent volume.

Task 4: Liveness Probe

1. Add a Liveness Probe to the Nginx deployment to check if the Nginx process is running by using an HTTP GET request on /healthz.
2. Ensure that if the probe fails, Kubernetes restarts the container.

Task 5: Readiness Probe

1. Add a Readiness Probe to the Nginx deployment that checks if the container is ready to serve traffic on port 80.



2. Test the readiness probe by simulating delays in startup and observe how Kubernetes handles the pod during that time.