Lab Guide: Deploying an MPI Job on Kubernetes (EKS/GKE/AKS)

Prerequisites:

- A Kubernetes cluster running on EKS, GKE, or AKS

- kubectl and helm installed locally

- Cluster admin access

Step 1: Install the Kubeflow MPI Operator

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kubectl create ns mpi-operator

helm repo add kubeflow https://kubeflow.github.io/mpi-operator

helm install mpi-operator kubeflow/mpi-operator -n mpi-operator

Step 2: Create MPIJob Custom Resource (mpi-hello-world)

Save the following manifest as mpi-job.yaml:

```
apiVersion: kubeflow.org/v1
kind: MPIJob
metadata:
  name: mpi-hello-world
  namespace: default
spec:
  slotsPerWorker: 1
  runPolicy:
    cleanPodPolicy: Running
```

```
  mpiReplicaSpecs:
    Launcher:
      replicas: 1
      template:
        spec:
          containers:
            - name: mpi-launcher
              image: mpioperator/mpi-pi:openmpi
              command:
                - mpirun
                - -np
                - "4"
                - /pi
    Worker:
      replicas: 4
      template:
        spec:
          containers:
            - name: mpi-worker
              image: mpioperator/mpi-pi:openmpi
```

```
kubectl apply -f mpi-job.yaml
```

Step 3: Monitor the MPI Job

```
kubectl get pods -l mpi-job-name=mpi-hello-world
```

kubectl logs job/mpi-hello-world-launcher

Step 4: Clean Up

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kubectl delete -f mpi-job.yaml

helm uninstall mpi-operator -n mpi-operator

kubectl delete ns mpi-operator