IMPLEMENT HPA ON K8S

ONCE CLUSTER IS READY, INSTALL METRIC SERVER

kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml

Verify that metrics-server is running:

kubectl get deployment metrics-server -n kube-system

Deploy an Application:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  replicas: 1
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
```

```
    containers:
    - name: nginx
      image: nginx
      ports:
      - containerPort: 80
      resources:
        requests:
          cpu: "100m"
        limits:
          cpu: "500m"
```

kubectl create -f deployment.yml

Create HPA:

```
apiVersion: autoscaling/v2
kind: HorizontalPodAutoscaler
metadata:
  name: nginx-hpa
spec:
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: nginx-deployment
  minReplicas: 1
  maxReplicas: 5
```

```
  metrics:
  - type: Resource
    resource:
      name: cpu
      target:
        type: Utilization
        averageUtilization: 50  # Target 50% CPU utilization
```

kubectl apply -f nginx-hpa.yml

kubectl get hpa

TEST HPA:

kubectl exec -it <nginx-pod-name> -- bash

apt-get update && apt-get install stress -y

stress --cpu 2 --timeout 300

OPEN ANOTHER TERMINAL and perform kubectl get hpa -w **command**

this will give logs

```
[root@ip-172-31-30-254 ~]# kubectl get hpa -w
NAME        REFERENCE                     TARGETS    MINPODS   MAXPODS   REPLICAS   AGE
nginx-hpa   Deployment/nginx-deployment   164%/50%   1         5         1          2m40s
nginx-hpa   Deployment/nginx-deployment   34%/50%    1         5         4          2m45s
nginx-hpa   Deployment/nginx-deployment   158%/50%   1         5         4          3m
nginx-hpa   Deployment/nginx-deployment   125%/50%   1         5         5          3m15s
nginx-hpa   Deployment/nginx-deployment   100%/50%   1         5         5          3m45s
nginx-hpa   Deployment/nginx-deployment   99%/50%    1         5         5          4m15s
nginx-hpa   Deployment/nginx-deployment   75%/50%    1         5         5          4m30s
nginx-hpa   Deployment/nginx-deployment   0%/50%     1         5         5          4m45s

nginx-hpa   Deployment/nginx-deployment   0%/50%     1         5         5          9m31s
nginx-hpa   Deployment/nginx-deployment   0%/50%     1         5         1          9m46s
```

SEE THE PODS

```
[root@ip-172-31-30-254 mustafa]# kubectl get po
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-96ddb4849-44jqj    1/1     Running   0          106s
nginx-deployment-96ddb4849-kjd6h    1/1     Running   0          4m33s
nginx-deployment-96ddb4849-v6856    1/1     Running   0          106s
nginx-deployment-96ddb4849-wnv46    1/1     Running   0          76s
nginx-deployment-96ddb4849-wvm24    1/1     Running   0          106s
[root@ip-172-31-30-254 mustafa]# kubectl get po
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-96ddb4849-44jqj    1/1     Running   0          3m44s
nginx-deployment-96ddb4849-kjd6h    1/1     Running   0          6m31s
nginx-deployment-96ddb4849-v6856    1/1     Running   0          3m44s
nginx-deployment-96ddb4849-wnv46    1/1     Running   0          3m14s
nginx-deployment-96ddb4849-wvm24    1/1     Running   0          3m44s
[root@ip-172-31-30-254 mustafa]# kubectl get po
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-96ddb4849-44jqj    1/1     Running   0          4m39s
nginx-deployment-96ddb4849-kjd6h    1/1     Running   0          7m26s
nginx-deployment-96ddb4849-v6856    1/1     Running   0          4m39s
nginx-deployment-96ddb4849-wnv46    1/1     Running   0          4m9s
nginx-deployment-96ddb4849-wvm24    1/1     Running   0          4m39s
[root@ip-172-31-30-254 mustafa]# kubectl get po
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-96ddb4849-44jqj    1/1     Running   0          7m59s
[root@ip-172-31-30-254 mustafa]#
```