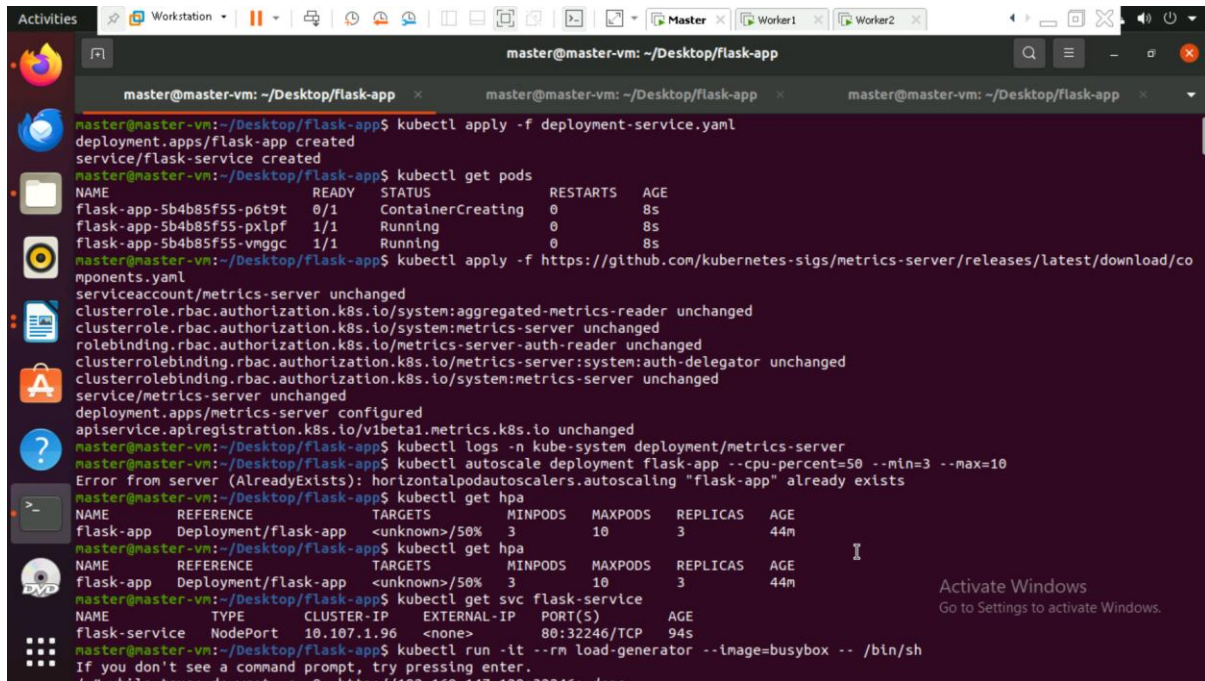


Kubernetes Project-1

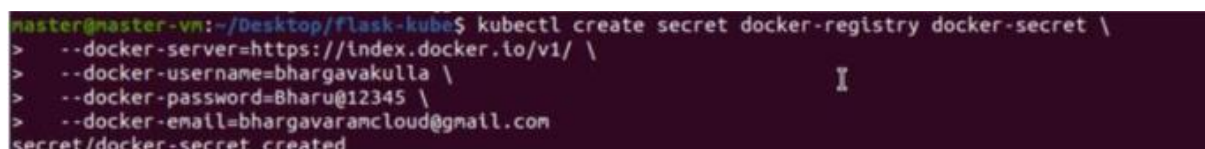
Deploying a Flask Application on Kubernetes with Auto-Scaling & Load Testing

STEP-1: Building & Containerizing the Flask Application & Deploying Flask App on Kubernetes



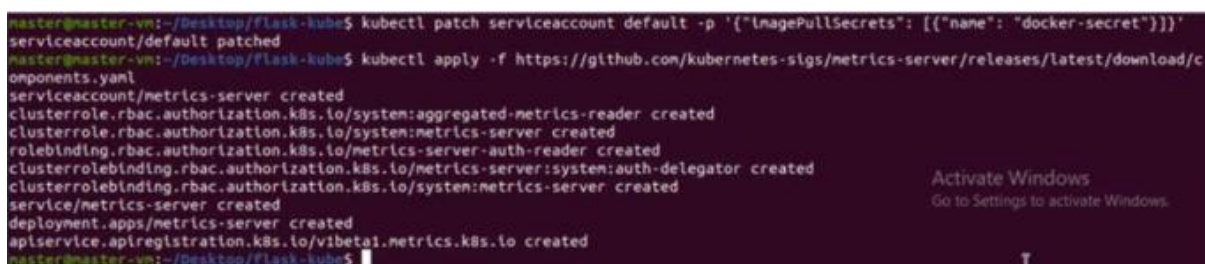
```
master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app$ kubectl apply -f deployment-service.yaml
deployment.apps/flask-app created
service/flask-service created
master@master-vm: ~/Desktop/flask-app$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
flask-app-5b4b85f55-p6t9t           0/1     ContainerCreating   0           8s
flask-app-5b4b85f55-pxlpr           1/1     Running            0           8s
flask-app-5b4b85f55-vmggc           1/1     Running            0           8s
master@master-vm: ~/Desktop/flask-app$ kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml
serviceaccount/metrics-server unchanged
clusterrole.rbac.authorization.k8s.io/system:aggregated-metrics-reader unchanged
clusterrole.rbac.authorization.k8s.io/system:metrics-server unchanged
rolebinding.rbac.authorization.k8s.io/metrics-server-auth-reader unchanged
clusterrolebinding.rbac.authorization.k8s.io/metrics-server:system:auth-delegator unchanged
clusterrolebinding.rbac.authorization.k8s.io/system:metrics-server unchanged
service/metrics-server unchanged
deployment.apps/metrics-server configured
apiservice.apiregistration.k8s.io/v1beta1.metrics.k8s.io unchanged
master@master-vm: ~/Desktop/flask-app$ kubectl logs -n kube-system deployment/metrics-server
Error from server (AlreadyExists): horizontalpodautoscalers.autoscaling "flask-app" already exists
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME            REFERENCE            TARGETS      MINPODS   MAXPODS   REPLICAS   AGE
flask-app       Deployment/flask-app  <unknown>/50%  3         10        3           44m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME            REFERENCE            TARGETS      MINPODS   MAXPODS   REPLICAS   AGE
flask-app       Deployment/flask-app  <unknown>/50%  3         10        3           44m
master@master-vm: ~/Desktop/flask-app$ kubectl get svc flask-service
NAME    TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
flask-service  NodePort    10.107.1.96   <none>        80:32246/TCP  94s
master@master-vm: ~/Desktop/flask-app$ kubectl run -it --rm load-generator --image=busybox -- /bin/sh
If you don't see a command prompt, try pressing enter.
load-generator-5-0 http://100.100.100.100:32246: data
```

STEP-2: Fixing Docker Hub Rate Limits (Authentication Issue)



```
master@master-vm: ~/Desktop/flask-kube$ kubectl create secret docker-registry docker-secret \
> --docker-server=https://index.docker.io/v1/ \
> --docker-username=bhargavakulla \
> --docker-password=Bharu@12345 \
> --docker-email=bhargavaramcloud@gmail.com
secret/docker-secret created
```

STEP-3: Installing & Troubleshooting Metrics Server



```
master@master-vm: ~/Desktop/flask-kube$ kubectl patch serviceaccount default -p '{"imagePullSecrets": [{"name": "docker-secret"}]}'
serviceaccount/default patched
master@master-vm: ~/Desktop/flask-kube$ kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml
serviceaccount/metrics-server created
clusterrole.rbac.authorization.k8s.io/system:aggregated-metrics-reader created
clusterrole.rbac.authorization.k8s.io/system:metrics-server created
rolebinding.rbac.authorization.k8s.io/metrics-server-auth-reader created
clusterrolebinding.rbac.authorization.k8s.io/metrics-server:system:auth-delegator created
clusterrolebinding.rbac.authorization.k8s.io/system:metrics-server created
service/metrics-server created
deployment.apps/metrics-server created
apiservice.apiregistration.k8s.io/v1beta1.metrics.k8s.io created
master@master-vm: ~/Desktop/flask-kube$
```

STEP-4: Enabling HPA (Horizontal Pod Autoscaler)

```

master@master-vm:~/Desktop/flask-kube$ kubectl autoscale deployment flask-app --cpu-percent=50 --min=3 --max=10
horizontalpodautoscaler.autoscaling/flask-app autoscaled
master@master-vm:~/Desktop/flask-kube$ kubectl get hpa
NAME          REFERENCE          TARGETS          MINPODS   MAXPODS   REPLICAS   AGE
flask-app     Deployment/flask-app  cpu: <unknown>/50%   3         10        0          3s
master@master-vm:~/Desktop/flask-kube$ kubectl run -it --rm busybox --image=busybox -- /bin/sh
If you don't see a command prompt, try pressing enter.
/ #
/ # ls
bin  dev  etc  home  lib  lib64  proc  root  sys  tmp  usr  var
/ # pwd
/
/ # echo "hi bhargav"
hi bhargav
/ # exit
Session ended, resume using 'kubectl attach busybox -c busybox -l -t' command when the pod is running
pod "busybox" deleted
master@master-vm:~/Desktop/flask-kube$

```

OUTPUT:

[illegible]

```

master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
flask-app-5b4b85f55-5wrwc           1/1     Running   0           25s
flask-app-5b4b85f55-kkkn6           1/1     Running   0           40s
flask-app-5b4b85f55-mdkvj           1/1     Running   0           40s
flask-app-5b4b85f55-nd2kp           1/1     Running   0           40s
flask-app-5b4b85f55-p6t9t           1/1     Running   0           14m
flask-app-5b4b85f55-pxlpf           1/1     Running   0           14m
flask-app-5b4b85f55-vmggc           1/1     Running   0           14m
load-generator                       1/1     Running   0           12m
master@master-vm: ~/Desktop/flask-app$ kubectl get pods -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP              NODE             NOMINATED NODE   READINESS GATES
flask-app-5b4b85f55-5wrwc           1/1     Running   0           110s  192.168.147.74  worker2-vm       <none>            <none>
flask-app-5b4b85f55-kkkn6           1/1     Running   0           2m5s  192.168.147.73  worker2-vm       <none>            <none>
flask-app-5b4b85f55-mdkvj           1/1     Running   0           2m5s  192.168.147.13  worker1-vm       <none>            <none>
flask-app-5b4b85f55-nd2kp           1/1     Running   0           2m5s  192.168.147.72  worker2-vm       <none>            <none>
flask-app-5b4b85f55-p6t9t           1/1     Running   0           15m   192.168.147.70  worker2-vm       <none>            <none>
flask-app-5b4b85f55-pxlpf           1/1     Running   0           15m   192.168.147.11  worker1-vm       <none>            <none>
flask-app-5b4b85f55-vmggc           1/1     Running   0           15m   192.168.147.10  worker1-vm       <none>            <none>
load-generator                       1/1     Running   0           13m   192.168.147.71  worker2-vm       <none>            <none>
master@master-vm: ~/Desktop/flask-app$

```

```

master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 49%/50%   3          10         3           56m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 49%/50%   3          10         3           56m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 102%/50%  3          10         3           56m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 102%/50%  3          10         3           57m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 31%/50%   3          10         6           57m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 1%/50%    3          10         7           57m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 1%/50%    3          10         7           57m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 1%/50%    3          10         7           59m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 1%/50%    3          10         7           59m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 1%/50%    3          10         7           60m
master@master-vm: ~/Desktop/flask-app$ kubectl get hpa
NAME                                REFERENCE          TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
flask-app Deployment/flask-app 1%/50%    3          10         3           75m
master@master-vm: ~/Desktop/flask-app$

```

