

Aaditya Rajput

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Lab 2: Deploying a request splitting ambassador and a load balancer with Kubernetes

Objective:

1. Learn how to configure and run a request splitter using Nginx.
2. Be familiar with the ConfigMap tool in Kubernetes.
3. Learn how to use the curl command for requesting an HTTP method.
4. Learn how to configure load balancer services
5. Get Familiar with load balancing pattern

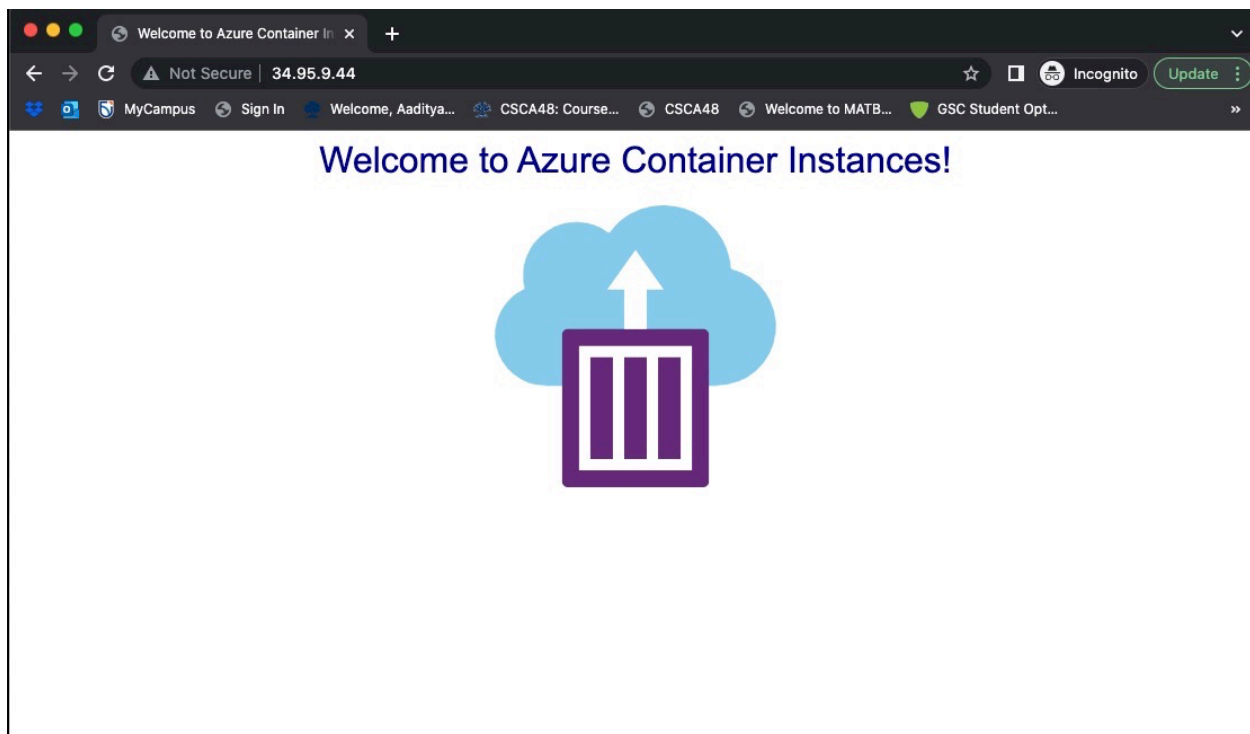
Part 2: <https://youtu.be/raCLKmiVyGE>

```
aadiraj09@cloudshell:~ (psyched-coast-362905)$
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl expose deployment web-deployment --port=80 --type=ClusterIP --name webdeployment
Error from server (AlreadyExists): services "webdeployment" already exists
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get service
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.80.0.1     <none>        443/TCP   81m
webdeployment ClusterIP   10.80.10.118  <none>        80/TCP    9m9s
webdeploymentzzz ClusterIP 10.80.3.103   <none>        80/TCP    8m21s
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl expose deployment web-deployment --port=80 --type=ClusterIP --name webdeploymentcccc
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl expose deployment web-deployment --port=80 --type=ClusterIP --name webdeployment
Error from server (AlreadyExists): services "webdeployment" already exists
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get service
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get deployment
error: the server doesn't have a resource type "deployment"
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get deployment
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
web-deployment 2/2     2            2           15m
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl create -f experiment-deployment.yaml
deployment.apps/experiment-deployment created
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get deployment
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
experiment-deployment 2/2     2            2           8s
web-deployment 2/2     2            2           40m
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl expose deployment experiment-deployment --port=80 --type=ClusterIP --name experiment-deployment
error: flag needs an argument: --name
See 'kubectl expose --help' for usage.
-bash: experiment-deployment: command not found
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl expose deployment experiment-deployment --port=80 --type=ClusterIP --name experiment-deployment
service/experiment-deployment exposed
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl create configmap ambassador-config --from-file=conf.d
configmap/ambassador-config created
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl create -f ambassador-deployment.yaml
deployment.apps/ambassador-deployment created
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl expose deployment ambassador-deployment --port=80 --type=LoadBalancer
service/ambassador-deployment exposed
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get pod
NAME                                READY   STATUS    RESTARTS   AGE
ambassador-deployment-78bdc6b89-bz6h7 1/1     Running   0           2m35s
ambassador-deployment-78bdc6b89-c6mjb 1/1     Running   0           2m35s
experiment-deployment-7b47cbd668-4wz8j 1/1     Running   0           20m
experiment-deployment-7b47cbd668-vgq8j 1/1     Running   0           20m
web-deployment-6fdbb5c6bb-5kpm6       1/1     Running   0           60m
web-deployment-6fdbb5c6bb-8ztvk       1/1     Running   0           60m
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get service
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
ambassador-deployment LoadBalancer 10.80.7.242   34.95.9.44    80:31994/TCP 3m8s
experiment-deployment ClusterIP   10.80.9.39    <none>        80/TCP    18m
kubernetes   ClusterIP   10.80.0.1     <none>        443/TCP   132m
webdeployment ClusterIP   10.80.10.118  <none>        80/TCP    60m
webdeploymentzzz ClusterIP 10.80.3.103   <none>        80/TCP    59m
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get deployment
error: the server doesn't have a resource type "deployment"
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl get deployment
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
ambassador-deployment 2/2     2            2           5m16s
experiment-deployment 2/2     2            2           22m
web-deployment 2/2     2            2           63m
aadiraj09@cloudshell:~ (psyched-coast-362905)$ for _ in {1..20}; do curl http://34.95.9.44 -s > output.txt; done
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl logs -l run=web-deployment
listening on port 80
listening on port 80
aadiraj09@cloudshell:~ (psyched-coast-362905)$ kubectl logs -l run=experiment-deployment
listening on port 80
listening on port 80
aadiraj09@cloudshell:~ (psyched-coast-362905)$ curl http://34.95.9.44
<!DOCTYPE html>
```

```

service/ambassador-deployment exposed
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl get pod
NAME                                READY   STATUS    RESTARTS   AGE
ambassador-deployment-78bdc6b89-bz6h7 1/1     Running   0           2m35s
ambassador-deployment-78bdc6b89-c6mjb 1/1     Running   0           2m35s
experiment-deployment-7b47cbd668-4wz8j 1/1     Running   0           20m
experiment-deployment-7b47cbd668-vqq8j 1/1     Running   0           20m
web-deployment-6fdbb5c6bb-5kpm6        1/1     Running   0           60m
web-deployment-6fdbb5c6bb-8ztkv        1/1     Running   0           60m
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl get service
NAME                                TYPE           CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
ambassador-deployment              LoadBalancer  10.80.7.242   34.95.9.44    80:31994/TCP     3m8s
experiment-deployment              ClusterIP      10.80.9.39    <none>         80/TCP           18m
kubernetes                         ClusterIP      10.80.0.1     <none>         443/TCP          132m
webdeployment                      ClusterIP      10.80.10.118  <none>         80/TCP           60m
webdeploymentzzz                   ClusterIP      10.80.3.103   <none>         80/TCP           59m
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl get deployment
error: the server doesn't have a resource type "deployment"
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl get deployment
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
ambassador-deployment              2/2     2             2           5m16s
experiment-deployment              2/2     2             2           22m
web-deployment                     2/2     2             2           63m
aadiraj09@cloudshell:~ (psyched-coast-362905) $ for _ in {1..20}; do curl http://34.95.9.44 -s > output.txt; done
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl logs -l run=web-deployment
listening on port 80
listening on port 80
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl logs -l run=experiment-deployment
listening on port 80
listening on port 80
aadiraj09@cloudshell:~ (psyched-coast-362905) $ curl http://34.95.9.44
<!DOCTYPE html>
</html>
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl logs -l run=web-deployment
listening on port 80
listening on port 80
aadiraj09@cloudshell:~ (psyched-coast-362905) $ kubectl logs -l run=experiment-deployment
listening on port 80
listening on port 80
aadiraj09@cloudshell:~ (psyched-coast-362905) $

```



Part 3: <https://youtu.be/zici6EpZjzU>

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CLOUD SHELL
Terminal (psyched-coast-362905) X + +
Open Editor

aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl create -f loadbalancer-deployment.yaml
deployment.apps/loadbalancer-deployment created
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get pods --output=wide
NAME                                READY    STATUS    RESTARTS   AGE   IP              NODE                                NOMINATED NODE   READINESS GATES
loadbalancer-deployment-6676f9ccf6-k4gm 0/1      ContainerCreating    0      6s   <none>          gke-openfaas-default-pool-942abad2-58kk <none>          <none>
loadbalancer-deployment-6676f9ccf6-mthns 0/1      ContainerCreating    0      6s   <none>          gke-openfaas-default-pool-942abad2-kdlf <none>          <none>
loadbalancer-deployment-6676f9ccf6-tkdx5 0/1      ContainerCreating    0      6s   <none>          gke-openfaas-default-pool-942abad2-lsw2 <none>          <none>
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get pods --output=wide
NAME                                READY    STATUS    RESTARTS   AGE   IP              NODE                                NOMINATED NODE   READINESS GATES
loadbalancer-deployment-6676f9ccf6-k4gm 1/1      Running    0          16s   10.76.1.11      gke-openfaas-default-pool-942abad2-58kk <none>          <none>
loadbalancer-deployment-6676f9ccf6-mthns 1/1      Running    0          16s   10.76.2.10      gke-openfaas-default-pool-942abad2-kdlf <none>          <none>
loadbalancer-deployment-6676f9ccf6-tkdx5 1/1      Running    0          16s   10.76.0.17      gke-openfaas-default-pool-942abad2-lsw2 <none>          <none>
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl expose deployment loadbalancer-deployment --port=8080 --type=LoadBalancer
service/loadbalancer-deployment exposed
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get services --watch
NAME      TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
deployment ClusterIP  10.80.14.165     <none>           80/TCP       122m
kubernetes ClusterIP  10.80.0.1        <none>           443/TCP       2d5h
loadbalancer-deployment LoadBalancer  10.80.13.20     <pending>       8080:31235/TCP 6s
loadbalancer-deployment LoadBalancer  10.80.13.20     34.95.9.44     8080:31235/TCP 41s
^Caadiraj09@cloudshell:~$ (psyched-coast-362905) $ curl http://34.95.9.44:8080/story
A quadruped of the genus Canis, esp. the domestic dog (C.familiaris).aadiraj09@cloudshell:~$ (psyched-coast-362905) $
A set of rooms on the same floor or level; a floor, or the space between two floors. Also, a horizontal division of a building's exterior considered architecturally, which need not correspond exactly with the stories within. [Written also store
y.aadiraj09@cloudshell:~$ (psyched-coast-362905) $
```

Auto Scaler: <https://youtu.be/07fB5c8rhd4>

```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to psyched-coast-362905.
Use "gcloud config set project [PROJECT ID]" to change to a different project.
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl apply -f https://k8s.io/examples/application/php-apache.yaml
deployment.apps/php-apache created
service/php-apache created
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl autoscale deployment php-apache --cpu-percent=50 --min=1 --max=10
horizontalpodautoscaler.autoscaling/php-apache autoscaled
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get hpa
NAME      REFERENCE      TARGETS      MINPODS  MAXPODS  REPLICAS  AGE
php-apache Deployment/php-apache  <unknown>/50%  1         10        8          23s
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl run -i --tty load-generator --rm --image=busybox:1.28 --restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O- http://php-apache; done"
If you don't see a command prompt, try pressing enter
kubernetes run -i --tty load-generator --rm --image=busybox:1.28 --restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O- http://php-apache; done"
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get pods --output=wide
NAME                                READY    STATUS    RESTARTS   AGE   IP              NODE                                NOMINATED NODE   READINESS GATES
loadbalancer-deployment-6676f9ccf6-k4gm 0/1      ContainerCreating    0      6s   <none>          gke-openfaas-default-pool-942abad2-58kk <none>          <none>
loadbalancer-deployment-6676f9ccf6-mthns 0/1      ContainerCreating    0      6s   <none>          gke-openfaas-default-pool-942abad2-kdlf <none>          <none>
loadbalancer-deployment-6676f9ccf6-tkdx5 0/1      ContainerCreating    0      6s   <none>          gke-openfaas-default-pool-942abad2-lsw2 <none>          <none>
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get pods --output=wide
NAME                                READY    STATUS    RESTARTS   AGE   IP              NODE                                NOMINATED NODE   READINESS GATES
loadbalancer-deployment-6676f9ccf6-k4gm 1/1      Running    0          16s   10.76.1.11      gke-openfaas-default-pool-942abad2-58kk <none>          <none>
loadbalancer-deployment-6676f9ccf6-mthns 1/1      Running    0          16s   10.76.2.10      gke-openfaas-default-pool-942abad2-kdlf <none>          <none>
loadbalancer-deployment-6676f9ccf6-tkdx5 1/1      Running    0          16s   10.76.0.17      gke-openfaas-default-pool-942abad2-lsw2 <none>          <none>
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl expose deployment loadbalancer-deployment --port=8080 --type=LoadBalancer
service/loadbalancer-deployment exposed
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get services --watch
NAME      TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
deployment ClusterIP  10.80.14.165     <none>           80/TCP       122m
kubernetes ClusterIP  10.80.0.1        <none>           443/TCP       2d5h
loadbalancer-deployment LoadBalancer  10.80.13.20     <pending>       8080:31235/TCP 6s
loadbalancer-deployment LoadBalancer  10.80.13.20     34.95.9.44     8080:31235/TCP 41s
^Caadiraj09@cloudshell:~$ (psyched-coast-362905) $ curl http://34.95.9.44:8080/story
A quadruped of the genus Canis, esp. the domestic dog (C.familiaris).aadiraj09@cloudshell:~$ (psyched-coast-362905) $
A set of rooms on the same floor or level; a floor, or the space between two floors. Also, a horizontal division of a building's exterior considered architecturally, which need not correspond exactly with the stories within. [Written also store
y.aadiraj09@cloudshell:~$ (psyched-coast-362905) $ clear
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl apply -f https://k8s.io/examples/application/php-apache.yaml
deployment.apps/php-apache created
service/php-apache created
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl autoscale deployment php-apache --cpu-percent=50 --min=1 --max=10
horizontalpodautoscaler.autoscaling/php-apache autoscaled
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get hpa
NAME      REFERENCE      TARGETS      MINPODS  MAXPODS  REPLICAS  AGE
php-apache Deployment/php-apache  <unknown>/50%  1         10        8          23s
```

Separate terminal while infinity loop is happening in the first terminal:

```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to psyched-coast-362905.
Use "gcloud config set project [PROJECT ID]" to change to a different project.
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get hpa php-apache --watch
NAME      REFERENCE      TARGETS      MINPODS  MAXPODS  REPLICAS  AGE
php-apache Deployment/php-apache  59%/50%  1         10        8          4m31s
php-apache Deployment/php-apache  49%/50%  1         10        8          4m32s
php-apache Deployment/php-apache  52%/50%  1         10        8          5m2s
php-apache Deployment/php-apache  56%/50%  1         10        8          5m32s
php-apache Deployment/php-apache  53%/50%  1         10        8          6m3s
php-apache Deployment/php-apache  57%/50%  1         10        8          6m33s
kubernetes run -i --tty load-generator --rm --image=busybox:1.28 --restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O- http://php-apache; done"
123
^Caadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get hpa php-apache --watch
NAME      REFERENCE      TARGETS      MINPODS  MAXPODS  REPLICAS  AGE
php-apache Deployment/php-apache  45%/50%  1         10        8          7m10s
^Caadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get deployment php-apache
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
php-apache 6/8      8            6           7m49s
aadiraj09@cloudshell:~$ (psyched-coast-362905) $ kubectl get pods
NAME                                READY    STATUS    RESTARTS   AGE
load-generator                      1/1      Running    0           7m3s
loadbalancer-deployment-6676f9ccf6-k4gm 1/1      Running    0           39m
loadbalancer-deployment-6676f9ccf6-mthns 1/1      Running    0           39m
loadbalancer-deployment-6676f9ccf6-tkdx5 1/1      Running    0           39m
php-apache-779cd44bdc-4mwsr          1/1      Running    0           5m45s
php-apache-779cd44bdc-h6fkv          1/1      Running    0           6m45s
php-apache-779cd44bdc-lgf56          1/1      Running    0           8m8s
php-apache-779cd44bdc-p586m          0/1      Pending    0           4m15s
php-apache-779cd44bdc-r4j2v          1/1      Running    0           5m45s
php-apache-779cd44bdc-t2rfp          1/1      Running    0           6m45s
php-apache-779cd44bdc-wxjg8          1/1      Running    0           5m45s
php-apache-779cd44bdc-xwj2           0/1      Pending    0           4m15s
aadiraj09@cloudshell:~$ (psyched-coast-362905) $
```