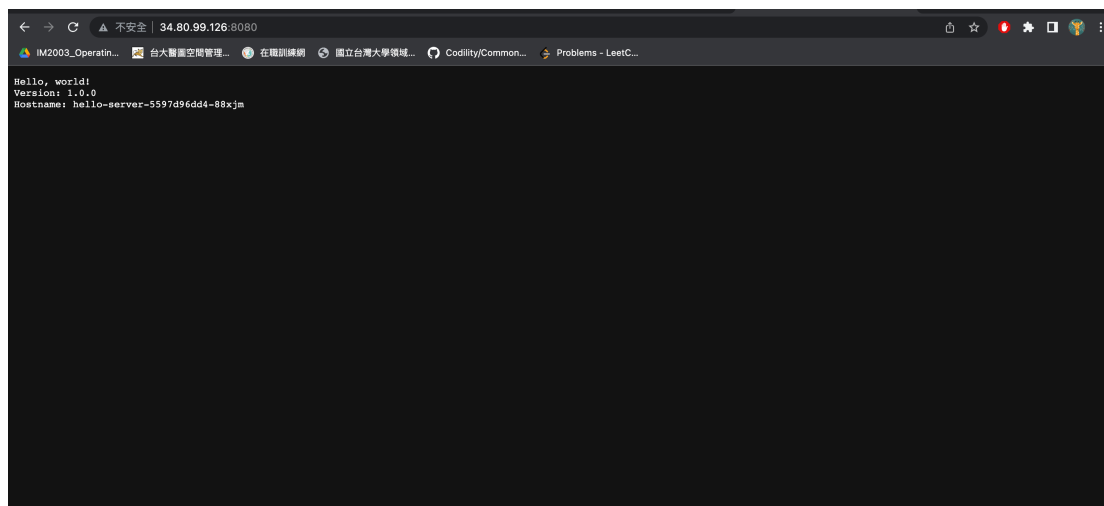# Google Kubernetes Engine Quick Start

1.kubectl get service

```
daniel09873410920cloudshell:~ (ntu-dscad)$ gcloud container clusters create hello-cluster --num-nodes=3 --zone=asia-east1-a
Default change: VPC-native is the default mode during cluster creation for versions greater than 1.21.0-gke.1500. To create advanced routes based clusters, please pass the `--no-enable
-ip-alias` flag
Default change: During creation of nodepools or autoscaling configuration changes for cluster versions greater than 1.24.1-gke.800 a default location policy is applied. For Spot and PV
M it defaults to ANY, and for all other VM kinds a BALANCED policy is used. To change the default values use the `--location-policy` flag.
Note: Your Pod address range (`--cluster-ipv4-cidr`) can accommodate at most 1008 node(s).
Creating cluster hello-cluster in asia-east1-a... Cluster is being health-checked (master is healthy)...done.
Created [https://container.googleapis.com/v1/projects/ntu-dscad/zones/asia-east1-a/clusters/hello-cluster].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/workload_/gcloud/asia-east1-a/hello-cluster?project=ntu-dscad
kubeconfig entry generated for hello-cluster.
NAME: hello-cluster
LOCATION: asia-east1-a
MASTER_VERSION: 1.24.9-gke.3200
MASTER_IP: 35.229.248.240
MACHINE_TYPE: e2-medium
NODE_VERSION: 1.24.9-gke.3200
NUM_NODES: 3
STATUS: RUNNING
daniel09873410920cloudshell:~ (ntu-dscad)$ gcloud container clusters get-credentials hello-cluster --zone asia-east1-a --project ntu-dscad
Fetching cluster endpoint and auth data.
kubeconfig entry generated for hello-cluster.
daniel09873410920cloudshell:~ (ntu-dscad)$ ls
README-cloudshell.txt
daniel09873410920cloudshell:~ (ntu-dscad)$ kubectl create deployment hello-server --image=gcr.io/google-samples/hello-app:1.0
deployment.apps/hello-server created
daniel09873410920cloudshell:~ (ntu-dscad)$ ls
README-cloudshell.txt
daniel09873410920cloudshell:~ (ntu-dscad)$ kubectl expose deployment hello-server --type=LoadBalancer --port 8080
service/hello-server exposed
daniel09873410920cloudshell:~ (ntu-dscad)$ kubectl get service
NAME           TYPE           CLUSTER-IP     EXTERNAL-IP     PORT(S)        AGE
hello-server   LoadBalancer   10.68.14.42    34.80.99.126    8080:32108/TCP  55s
kubernetes     ClusterIP      10.68.0.1      <none>          443/TCP        17m
daniel09873410920cloudshell:~ (ntu-dscad)$
```

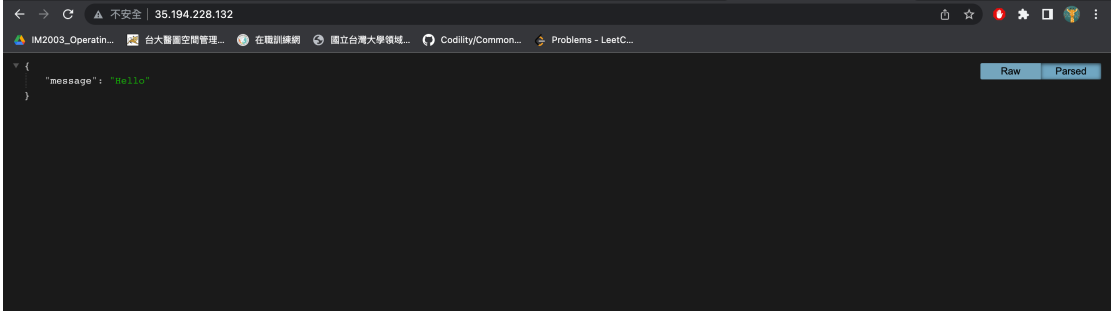## 2.View the application from web browser

3.Creating Pods

```
daniel09873410920cloudshell:~ (ntu-dscad)$ mkdir homework_sample_code
daniel09873410920cloudshell:~ (ntu-dscad)$ ls
homework_sample_code  README-cloudshell.txt
daniel09873410920cloudshell:~ (ntu-dscad)$ cd homework_sample_code/
daniel09873410920cloudshell:~/homework_sample_code (ntu-dscad)$ vim pod.yaml
daniel09873410920cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl create -f pod.yaml
error: error validating "pod.yaml": error validating data: apiVersion not set; if you choose to ignore these errors, turn validation off with --validate=false
daniel09873410920cloudshell:~/homework_sample_code (ntu-dscad)$ vim pod.yaml
daniel09873410920cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl create -f pod.yaml
pod/monolith created
daniel09873410920cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl get pods
NAME                          READY   STATUS    RESTARTS   AGE
hello-server-5597d96dd4-88xjm 1/1     Running   0          16m
monolith                      1/1     Running   0          14s
daniel09873410920cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl describe pods monolith
Name:         monolith
Namespace:    default
Priority:     0
Service Account: default
Node:         gke-hello-cluster-default-pool-b841788d-c1q9/10.140.0.5
Start Time:   Mon, 27 Mar 2023 02:28:07 +0000
Labels:       app=monolith
Annotations:  <none>
Status:       Running
IP:           10.64.2.7
IPs:
  IP:  10.64.2.7
Containers:
  monolith:
    Container ID:  containerd://ebb2e755b1e724fe6e37b85184104122cb3f87253a2c634791b8a004316eee32
    Image:         kelseyhightower/monolith:1.0.0
    Image ID:      sha256:980e09dd5c76f726e7369ac2c3aa9528fe3a8c92382b78e97aa54a4a32d3b187
    Ports:         80/TCP, 81/TCP
```

4. Interacting with Pods

```
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ curl http://127.0.0.1:10080
{"message":"Hello"}
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ curl -u user http://127.0.0.1:10080/login
Enter host password for user 'user':
{"token":"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJlbWFpbCI6InVzZXJAZXhhbXBsZS5jb20iLCJleHAiOjE2ODAxNDM2MzcsImlhdCI6MTY3OTg4NDQzNywiaXNzIjoiYXV0aC5zZXJ2aWNlIiwic3ViIjoidXNlciJ9.d2_ExVIb
wR0l_MfEvGRVUk1R709ash53gHdOKmX4wfA"}
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ TOKEN=$(curl http://127.0.0.1:10080/login -u user|jq -r '.token')
Enter host password for user 'user':
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   222  100   222    0     0    500      0 --:--:-- --:--:-- --:--:--   498
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ curl -H "Authorization: Bearer $TOKEN" http://127.0.0.1:10080/secure
{"message":"Hello"}
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl logs monolith
2023/03/27 02:28:14 Starting server...
2023/03/27 02:28:14 Health service listening on 0.0.0.0:81
2023/03/27 02:28:14 HTTP service listening on 0.0.0.0:80
127.0.0.1:38302 - - [Mon, 27 Mar 2023 02:33:13 UTC] "GET / HTTP/1.1" curl/7.74.0
127.0.0.1:42538 - - [Mon, 27 Mar 2023 02:33:57 UTC] "GET /login HTTP/1.1" curl/7.74.0
127.0.0.1:47378 - - [Mon, 27 Mar 2023 02:34:31 UTC] "GET /login HTTP/1.1" curl/7.74.0
127.0.0.1:56100 - - [Mon, 27 Mar 2023 02:35:07 UTC] "GET /secure HTTP/1.1" curl/7.74.0
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ curl http://127.0.0.1:10080
{"message":"Hello"}
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl exec monolith --stdin --tty -c monolith /bin/sh
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
/ # ping -c 3 google.com
PING google.com (108.177.125.101): 56 data bytes
64 bytes from 108.177.125.101: seq=0 ttl=112 time=1.184 ms
64 bytes from 108.177.125.101: seq=1 ttl=112 time=0.488 ms
64 bytes from 108.177.125.101: seq=2 ttl=112 time=0.598 ms

--- google.com ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.488/0.756/1.184 ms
/ # exit
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$
```

```
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ vim service.yaml
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl create -f service.yaml
service/monolith created
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl get service
NAME          TYPE           CLUSTER-IP     EXTERNAL-IP      PORT(S)          AGE
hello-server  LoadBalancer   10.68.14.42    34.80.99.126     8080:32108/TCP   39m
kubernetes    ClusterIP      10.68.0.1      <none>           443/TCP          55m
monolith      LoadBalancer   10.68.2.236    <pending>        80:31431/TCP     14s
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl get service
NAME          TYPE           CLUSTER-IP     EXTERNAL-IP      PORT(S)          AGE
hello-server  LoadBalancer   10.68.14.42    34.80.99.126     8080:32108/TCP   39m
kubernetes    ClusterIP      10.68.0.1      <none>           443/TCP          56m
monolith      LoadBalancer   10.68.2.236    35.194.228.132   80:31431/TCP     46s
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$
```

```
← → C   ▲ 不安全 | 35.194.228.132                                                                        □ ☆   ● ★ □ 🏆 :
🔺 IM2003_Operatin...   🔺 台大醫圖空間管理...   ● 在職訓練網   ● 國立台灣大學領域...   ● Codility/Common...   ● Problems - LeetC...                    [Raw] [Parsed]
▼ {
      "message": "Hello"
  }
```

5.Create a Service

```
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ vim service.yaml
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl create -f service.yaml
service/monolith created
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl get service
NAME          TYPE           CLUSTER-IP     EXTERNAL-IP      PORT(S)          AGE
hello-server  LoadBalancer   10.68.14.42    34.80.99.126     8080:32108/TCP   39m
kubernetes    ClusterIP      10.68.0.1      <none>           443/TCP          55m
monolith      LoadBalancer   10.68.2.236    <pending>        80:31431/TCP     14s
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ kubectl get service
NAME          TYPE           CLUSTER-IP     EXTERNAL-IP      PORT(S)          AGE
hello-server  LoadBalancer   10.68.14.42    34.80.99.126     8080:32108/TCP   39m
kubernetes    ClusterIP      10.68.0.1      <none>           443/TCP          56m
monolith      LoadBalancer   10.68.2.236    35.194.228.132   80:31431/TCP     46s
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ gcloud container clusters delete hello-server
ERROR: (gcloud.container.clusters.delete) One of [--zone, --region] must be supplied: Please specify location.
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$ gcloud container clusters delete --zone=asia-east1-a hello-cluster
The following clusters will be deleted.
 - [hello-cluster] in [asia-east1-a]

Do you want to continue (Y/n)?  y

Deleting cluster hello-cluster...done.
Deleted [https://container.googleapis.com/v1/projects/ntu-dscad/zones/asia-east1-a/clusters/hello-cluster].
daniel09873410920@cloudshell:~/homework_sample_code (ntu-dscad)$
```

Implementing Cloud Run canary deployments with Git branches and Cloud Build

1. Creating your Cloud Run service


```
service-URL: https://hello-cloudrun-5gtor22iza-uc.a.run.app
-bash: --tag=prod: command not found
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ PROD_URL=$(gcloud run services describe hello-cloudrun \
  --platform managed \
  --region us-central1 \
  --format=json | jq \
  --raw-output ".status.url")
echo $PROD_URL
curl -H "Authorization: Bearer $(gcloud auth print-identity-token)" $PROD_URL
https://hello-cloudrun-5gtor22iza-uc.a.run.app
Hello World v1.0daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$
```

2.Enabling dynamic developer deployments


```
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ git checkout -b new-feature-1
Switched to a new branch 'new-feature-1'
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ edit app.py
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ git add . && git commit -m "updated" && git push gcp new-feature-1
[new-feature-1 25e417c] updated
 1 file changed, 1 insertion(+), 1 deletion(-)
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 293 bytes | 293.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2)
To https://source.developers.google.com/p/ntu-dscad/r/cloudrun-progression
 * [new branch]      new-feature-1 -> new-feature-1
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ BRANCH_URL=$(gcloud run services describe hello-cloudrun  \
  --platform managed  \
  --region us-central1 \
  --format=json | jq \
  --raw-output ".status.traffic[] | select (.tag==\"new-feature-1\")|.url")

echo $BRANCH_URL
https://new-feature-1---hello-cloudrun-5gtor22iza-uc.a.run.app
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ curl -H "Authorization: Bearer $(gcloud auth print-identity-token)" $BRANCH_U
RL
Hello World v1.1daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$
```

3. commit the change and push to the remote repository

4. 90% of the traffic is routed to **prod**, 10% to **canary**, and 0% to the branch

revisions.

5. see percentage-based responses

```
echo $CANARY_URL
https://canary---hello-cloudrun-5gtor22iza-uc.a.run.app
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$ curl -H "Authorization: Bearer $(gcloud auth print-identity-token)" $CANARY_U
RL
Hello World v1.1daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progressiLIVE_URL=$(gcloud run services describe hello-cloudrun \hello-cloudrun \
  --platform managed \
  --region us-central1 \
  --format=json | jq \
  --raw-output ".status.url")

for i in {0..20};do
    curl -H "Authorization: Bearer $(gcloud auth print-identity-token)" $LIVE_URL; echo \n
done
Hello World v1.0n
Hello World v1.0n
Hello World v1.0n
Hello World v1.0n
Hello World v1.0n
Hello World v1.0n
Hello World v1.0n
Hello World v1.0n
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Hello World v1.0n
Hello World v1.0n
daniel0987341092@cloudshell:~/cloudrun-progression/labs/cloudrun-progression (ntu-dscad)$
```

6. Releasing to production