Network and Cloud Computing – Final Project

Project Setup:
1. Google Cloud Engine
2. Node JS
3. MongoDB (mlab.com) service for Google cloud
4. Docker
5. Kubernetes

Steps taken to build project:
1. Created a basic noje.js project to post ads for the users
2. Registered on mlab.com for a free 500MB mongo db connection. MLab provides service for google cloud deployments
3. Used the connection url for mongo db in the project
4. Run the project (node app.js) locally to check if project is working
5. Next steps are to deploy the project on cloud server

Steps for Cloud deployment
1. Create a project on Google Cloud Platform
2. Enable billing for your project
3. Create an instance for your project
4. Go to Networking and create an external IP to host your application
5. Assign the external IP to instance of your project
6. Make a note of your project ID. It will be required in the project configuration

Creating a cloud bucket for storing images
pagare_pr@superb-heaven-155622:~$ gsutil mb gs://superb-heaven-155622
Creating gs://superb-heaven-155622/...

pagare_pr@superb-heaven-155622:~$ gsutil defacl set public-read gs://superb-heaven-155622
Setting default object ACL on gs://superb-heaven-155622/...pagare_pr@superb-heaven-155622:~$

Cloning the node project to Google cloud for deployment
pagare_pr@superb-heaven-155622:~$ git clone https://github.com/pagarepr/FinalProject_Network-Cloud.git
Cloning into 'FinalProject_Network-Cloud'...remote:
Counting objects: 22, done.remote:
Compressing objects: 100% (19/19), done.remote:
Total 22 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (22/22), done.

pagare_pr@superb-heaven-155622:~$ ls
FinalProject_Network-Cloud README-cloudshell.txt
pagare_pr@superb-heaven-155622:~$ cd FinalProject_Network-Cloud

Creating cluster on GKE

gcloud config set project superb-heaven-155622

gcloud config set compute/zone us-central1-f

gcloud container clusters create adhub \
   --scopes "cloud-platform" \
   --num-nodes 2
Creating cluster adhub...done.
Created [https://container.googleapis.com/v1/projects/superb-heaven-155622/zones/us-central1-f/clusters/adhub].kubeconfig entry generated for adhub.
NAME ZONE MASTER_VERSION MASTER_IP MACHINE_TYPE NODE_VERSION NUM_NODES STATUS
adhub us-central1-f 1.5.6 35.184.190.234 n1-standard-1 1.5.6 2 RUNNING

pagare_pr@superb-heaven-155622:~/FinalProject_Container_Cloud/node_container_app$ kubectl get nodes ------ (to verify access to kubernetes)
NAME STATUS AGE VERSION
gke-adhub-default-pool-168dad3e-5hbt Ready 1m v1.5.6
gke-adhub-default-pool-168dad3e-fc93 Ready 2m v1.5.6

Creating a docker image of the project

pagare_pr@superb-heaven-155622:~/FinalProject_Network-Cloud$ docker build -t gcr.io/superb-heaven-155622/adhub:v1 .
Sending build context to Docker daemon 109.6 kB
Step 1 : FROM node:6.9.2
6.9.2: Pulling from library/node
75a822cd7888: Pull complete
57de64c72267: Pull complete
4306be1e8943: Pull complete
871436ab7225: Pull complete
0110c26a367a: Pull complete
1f04fe713f1b: Pull complete
ac7c0b5fb553: Pull complete
Digest: sha256:2e95be60faf429d6c97d928c762cb36f1940f4456ce4bd33fbdc34de94a5e043
Status: Downloaded newer image for node:6.9.2
---> faaadb4aaf9b
Step 2 : EXPOSE 8080
 ---> Running in dd9f62083d22
 ---> 683978aebac7
Removing intermediate container dd9f62083d22
Step 3 : COPY app.js .
---> f795be84f923
Removing intermediate container 7fff1c98fd8f
Step 4 : CMD node app.js
---> Running in e35a433783b4
---> 523c92ef409d
Removing intermediate container e35a433783b4
Successfully built 523c92ef409d

Running Docker image and testing on local

pagare_pr@superb-heaven-155622:~/FinalProject_Network-Cloud$ docker run -d -p 8080:8080 gcr.io/superb-heaven-155622/adhub:v1
bd35f4d44d45be61ea2eb47add2d1f0fddfac7ac3c3e4d422f6e99e3b1ae9058

Pushing the image to Google Container Registry

pagare_pr@superb-heaven-155622:~/FinalProject_Container_Cloud/node_container_app$ gcloud docker -
- push gcr.io/superb-heaven-155622/adhub

latest: digest: sha256:87b31962302930af4dd55a649d26dd17576132c7aae906146c61273b844a1173 size:
24158c81c179ded0: Pushed
381c97ba7dc3: Pushed
604c78617f34: Pushed
fa18e5ffd316: Pushed
0a5e2b2ddeaa: Pushed
53c779688d06: Pushed
60a0858edcd5: Pushed
b6ca02dfe5e6: Pushed
v1: digest: sha256:b849225e20b493ba4fadb533481f7c2a24e9bb6e7d54d2bc4080f56a5e0be8bc size: 2002

Deploying the application on cluster

kubectl create -f adhub-frontend.yaml
deployment "adhub-frontend" created

pagare_pr@superb-heaven-155622:~/FinalProject_Container_Cloud/node_container_app$ kubectl get
deployments
NAME DESIRED CURRENT UP-TO-DATE AVAILABLE AGE
adhub-frontend 3 3 3 0 1m

pagare_pr@superb-heaven-155622:~/FinalProject_Container_Cloud/node_container_app$ kubectl create -f
adhub-worker.yaml
deployment "adhub-worker" created

pagare_pr@superb-heaven-155622:~/FinalProject_Container_Cloud/node_container_app$ kubectl create -f
adhub-service.yaml
service "adhub-frontend" created

pagare_pr@superb-heaven-155622:~/FinalProject_Container_Cloud/node_container_app$ kubectl describe
service adhub
Name: adhub-frontend
Namespace: default
Labels: app=adhub,tier=frontend
Annotations: <none>
Selector: app=adhub,tier=frontend
Type: LoadBalancer
IP: 10.59.253.24
Port: <unset> 80/TCP
NodePort: <unset> 31985/TCP
Endpoints: Session
Affinity: None
Events: FirstSeen   LastSeen   Count From   SubObjectPath Type   Reason
Message ---------   --------   ----- ----   ------------- --------   ------   -------
43s   6s   4   service-controller   Normal   CreatingLoadBalancer
Creating load balancer 42s   6s   4   service-controller