***NETWORK AND OPERATING SYSTEM FOR CLOUD***

**SETTING UP LOAD BALANCER IN GCP**

#**1 activate cloud shell**

#2 **SETTING UP DEFAULT REGION AND ZONE**

gcloud config set compute/zone us-east1-b (northamerica-northeast1-a)

API [compute.googleapis.com] not enabled on project [944128123110]. Would you like to enable and retry (this will take a few minutes)? (y/N)? y

Enabling service [compute.googleapis.com] on project [944128123110]...

Operation "operations/acf.p2-944128123110-12a1febd-623e-4c66-badc-16a71e48b9b4" finished successfully.

Updated property [compute/zone].

#**3 CREATE LOAD BALANCER TEMPLATE**

gcloud compute instance-templates create lb-backend-template --network=default --subnet=default --tags=allow-health-check --machine-type=e2-medium --image-family=debian-11 --image-project=debian-cloud --metadata=startup-script='#!/bin/bash apt-get update apt-get install apache2 -y a2ensite default-ssl a2enmod ssl\_vm\_hostname="$(curl -H "Metadata-Flavor:Google" <http://169.254.169.254/computeMetadata/v1/instance/name>)" echo "Page served from: $vm\_hostname" | tee /var/www/html/index.html systemctl restart apache2'

Did you mean region [us-east1] for subnetwork: [default] (Y/n)? Y ...N

Created [<https://www.googleapis.com/compute/v1/projects/ola-samson-380915/global/instanceTemplates/lb-backend-template>].

NAME: lb-backend-template

MACHINE\_TYPE: e2-medium

PREEMPTIBLE:

CREATION\_TIMESTAMP: 2023-03-17T08:39:03.466-07:00

#**4 CREATING A MANAGED INSTANCE GROUP BASED ON THE TEMPLATE**

gcloud compute instance-groups managed create lb-backend-group --template=lb-backend-template --size=2 (3)

Created [<https://www.googleapis.com/compute/v1/projects/ola-samson-380915/zones/us-east1-b/instanceGroupManagers/lb-backend-group>].

NAME: lb-backend-group

LOCATION: us-east1-b

SCOPE: zone

BASE\_INSTANCE\_NAME: lb-backend-group

SIZE: 0

TARGET\_SIZE: 2

INSTANCE\_TEMPLATE: lb-backend-template

AUTOSCALED: no

#**5 CREATING THE FIREWALL RULE**

gcloud compute firewall-rules create fw-allow-health-check --network=default --action=allow --direction=ingress --source-ranges=130.211.0.0/22,35.191.0.0/16 --target-tags=allow-health-check --rules=tcp:80

Creating firewall...working..Created [<https://www.googleapis.com/compute/v1/projects/ola-samson-380915/global/firewalls/fw-allow-health-check>].

Creating firewall...done.

NAME: fw-allow-health-check

NETWORK: default

DIRECTION: INGRESS

PRIORITY: 1000

ALLOW: tcp:80

DENY:

DISABLED: False

**#6 SETTING UP A GLOBAL STATIC EXTERNAL IP ADDRESS**

i - gcloud compute addresses create lb-ipv4-1 --ip-version=IPV4 --global

ii - gcloud compute addresses describe lb-ipv4-1 --format="get(address)" --global

Created [<https://www.googleapis.com/compute/v1/projects/ola-samson-380915/global/addresses/lb-ipv4-1>].

Created [<https://www.googleapis.com/compute/v1/projects/demo1-380800/global/addresses/ib-ipv4-1>]

**#7 CREATING A HEALTH CHECK**

gcloud compute health-checks create http http-basic-check --port 80

Created [<https://www.googleapis.com/compute/v1/projects/ola-samson-380915/global/healthChecks/http-basic-check>].

NAME: http-basic-check

PROTOCOL: HTTP

Created [<https://www.googleapis.com/compute/v1/projects/demo1-380800/global/healthChecks/http-basic-check>].

NAME: http-basic-check

PROTOCOL: HTTP

**#8 CREATING A BACKEND SERVICE**

gcloud compute backend-services create web-backend-service --protocol=HTTP --port-name=http --health-checks=http-basic-check --global

Created [<https://www.googleapis.com/compute/v1/projects/ola-samson-380915/global/backendServices/web-backend-service>].

NAME: web-backend-service

BACKENDS:

PROTOCOL: HTTP

**#9 ADDING INSTANCES TO THE BACKEND SERVICE**

gcloud compute backend-services add-backend web-backend-service --instance-group=lb-backend-group --instance-group-zone=us-east1-b --global

Updated [<https://www.googleapis.com/compute/v1/projects/olagt-381100/global/backendServices/web-backend-service>].

**#10 CREATING A URL MAP**

gcloud compute url-maps create web-map-http --default-service=web-backend-service

Created [<https://www.googleapis.com/compute/v1/projects/olagt-381100/global/urlMaps/web-map-http>].

NAME: web-map-http

DEFAULT\_SERVICE: backendServices/web-backend-service

**#11 CREATING A TARGET HTTP PROXY**

gcloud compute target-http-proxies create http-lb-proxy --url-map web-map-http

Created [<https://www.googleapis.com/compute/v1/projects/olagt-381100/global/targetHttpProxies/http-lb-proxy>].

NAME: http-lb-proxy

URL\_MAP: web-map-http

**#12 CREATING A GLOBAL FORWARDING RULE**

gcloud compute forwarding-rules create http-content-rule --address=lb-ipv4-1 --global --target-http-proxy=http-lb-proxy --ports=80

Created [<https://www.googleapis.com/compute/v1/projects/olagt-381100/global/forwardingRules/http-content-rule>].

**HOW TO CONFIRM LOAD BALANCER IN GCP**

**#1** Go to GCP console and select the project that contains the load balancer you want to confirm.

**#2** In the left side bar, select "Networking" and the "Load balancing"

**#3** You should see a list of balancer in the project . find the load balancer you want to confirm and click on its name.

**#4** This will take you the load balancer detail page, where you can confirm its configuration and status. The page will display information such as the load balancer's name, type, frontend and backend configuratuin, health checks and backend services.

**#5** You can also check the load balancer status by looking at its associated instance groups or backend services. if the load balancer is working correctly, you should see a healthy instances or backends that are successfully receiving traffic from the load balancer.

**NOTE:-** IF YOU HAVE CONFIGURED YOUR LOAD BALANCER TO USE CLOUD MONITORING, YOU CAN ALSO MONITOR THE LOAD BALANCER'S PERFORMANCE AND HEALTH METRICS IN THE CLOUD MONITORING CONSOLE.

gcloud compute instance-templates create temp-lb-backend-mtl-debian-10 \

--network=custom-vpc-1 \

--subnet=vpc1-subnet-east\

--tags=allow-health-check \

--machine-type=e2-medium  \

--image-family=debian-10 \

--image-project=debian-cloud \

--metadata=startup-script='#! /bin/bash

apt-get update

apt-get install apache2 -y

a2ensite default-ssl

a2enmod ssl

vm\_hostname="$(curl -H "Metadata-Flavor:Google" \

<http://metadata.google.internal/computeMetadata/v1/instance/name>)"

echo "Page served from: $vm\_hostname" | \

tee /var/www/html/index.html

systemctl restart apache2'