

## Lab 3.3

### 1. Using gcloud & Docker:

- **Configure Docker & gcloud to work with GCR of your project.**

enable Container Registry api

Enable access to API

✓ Confirm project

2 Enable API

You are about to enable 'Container Registry API'.

ENABLE

- **Push Nginx docker image to GCR (make the image private).**

configure docker to use gcr.io

```
└─ mohamed@DevOps:~$ gcloud auth configure-docker gcr.io
Adding credentials for: gcr.io
After update, the following will be written to your Docker config file
located at [/home/mohamed/.docker/config.json]:
```

```
{
  "credHelpers": {
    "gcr.io": "gcloud"
  }
}
```

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

```
Docker configuration file updated.
```

tag with gcr.io/stellar-river-354117/mynginx:1.1

```
└─ mohamed@DevOps:~$ docker tag nginx:alpine gcr.io/stellar-river-354117/mynginx:2.0
```

```
└─ mohamed@DevOps:~$ docker push gcr.io/stellar-river-354117/mynginx:2.0
The push refers to repository [gcr.io/stellar-river-354117/mynginx]
889ab273892d: Layer already exists
9ec529c881ef: Layer already exists
5da18141d115: Layer already exists
97a932510759: Layer already exists
```

```
c1dc3f68a3a7: Layer already exists
24302eb7d908: Layer already exists
2.0: digest:
sha256:20a1077e25510e824d6f9ce7af07aa02d86536848ddab3e4ef7d1804608d8125
size: 1568
```

Images DELETE

mynginx

gcr.io > stellar-river-354117 > mynginx

Filter Enter property name or value

<input type="checkbox"/>	Name	Tags	Virtual Size	Created	Uploaded	
<input type="checkbox"/>	20a1077e2551	2.0	9.7 MB	4 days ago	2 minutes ago	
<input type="checkbox"/>	f54a58bc1aac	1.1	2.4 KB	Sep 24, 2021	10 minutes ago	

- Pull this image into a k8s setup or on a VM (hint: attach a SA on ur vm or gke with correct iam role).

create a autopilot gke cluster

Kubernetes clusters CREATE DEPLOY REFRESH

OVERVIEW COST OPTIMIZATION

Filter Enter property name or value

<input type="checkbox"/>	Status	Name	Location	Mode	Number of nodes	Total vCPUs
<input type="checkbox"/>		autopilot-cluster-1	us-east1	Autopilot		0

create deployment with mynginx:2.0 image

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Google Cloud

Anwer-gcp

Search Products, resources, docs (/)

Create a deployment

Existing container image

New container image

Image path \*  
nginx:latest

SELECT

Enter your image path, or choose from Google Container Registry. You can also try to deploy with official nginx image nginx:latest.

Environment variables

+ ADD ENVIRONMENT VARIABLE

Initial command

Overrides the default endpoint of the container image.

Select container image

CONTAINER REGISTRYARTIFACT REGISTRY

Project: stellar-river-354117CHANGE

gcr.io/stellar-river-354117/mynginx

20a1077e252.023 minutes ago

f54a58bc1a1.131 minutes ago

SELECTCANCEL

Create a deployment

Pushing and pulling images

Quickstart: Build and push

docker login | Docker Hub

Authentication methods

nginx Tags | Docker Hub

https://console.cloud.google.com/kubernetes/workload/deploy?authuser=1&cloudshell=false&prod=...  
Search with DuckDuckGo

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Google Cloud

Anwer-gcp

+ ADD KUBERNETES LABEL

Configuration YAML

Kubernetes deployments are defined declaratively. The best practice is to store these files in version control, such as Git, and update deployment configuration over time.

VIEW YAML

Cluster

Kubernetes Cluster

autopilot-cluster-1 (us-east1)

Cluster in which the deployment will be created.

CREATE NEW CLUSTER

DEPLOY

YAML output

YAML declaration of the resources that will be deployed.

```
1 ---
2 apiVersion: "apps/v1"
3 kind: "Deployment"
4 metadata:
5   name: "nginx-1"
6   namespace: "default"
7   labels:
8     app: "nginx-1"
9 spec:
10   replicas: 3
11   selector:
12     matchLabels:
13       app: "nginx-1"
14   template:
15     metadata:
16       labels:
17         app: "nginx-1"
18     spec:
19       containers:
20         - name: "mynginx-sha256-1"
21           image: "gcr.io/stellar-river-354117/mynginx:20a1077e252.0"
22 ---
23 apiVersion: "autoscaling/v2beta1"
24 kind: "HorizontalPodAutoscaler"
25 metadata:
26   name: "nginx-1-hpa-g4wq"
27   namespace: "default"
28   labels:
29     app: "nginx-1"
```

CLOSE

DISMISSACTIVATE

HIDE INFO PANELHELP ASSISTANT

Deployments

Kubernetes Engine works with [containerized applications](#): applications packaged into hardware independent, isolated user-space instances, for example by using [Docker](#).

In Kubernetes Engine and Kubernetes, these containers are collectively called workloads.

Continuous delivery

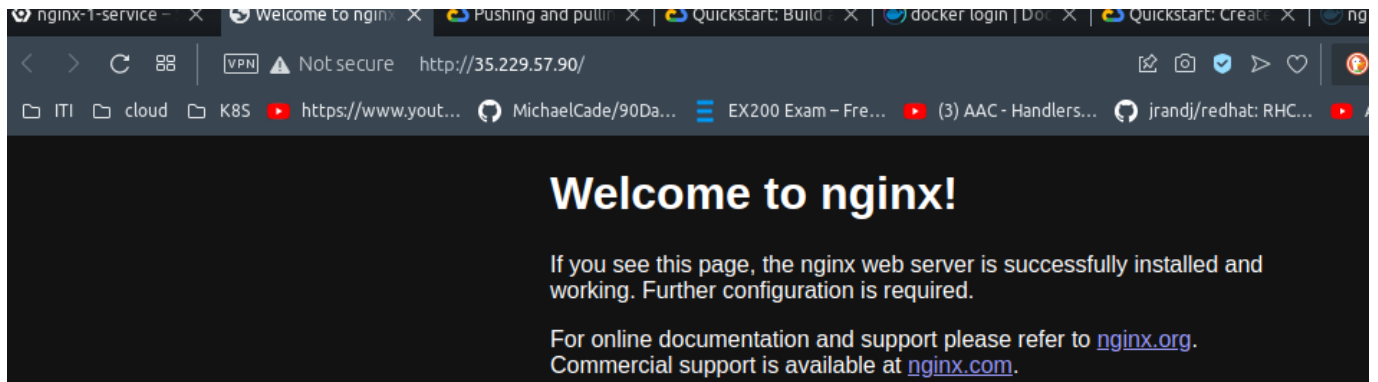
Looking for fully managed continuous delivery with multi-environment progressions, scaling, and security built-in? [Try Google Cloud Deploy](#).

Expose

Cluster	<a href="#">autopilot-cluster-1</a>
Namespace	default
Labels	app: nginx-1
Logs	<a href="#">nginx-1</a>
Type	LoadBalancer
External endpoints	<a href="#">35.229.57.90:80</a> <a href="#">↗</a>

## Load Balancer

Cluster IP	10.170.130.223
Load balancer IP	35.229.57.90
Load balancer	<a href="#">aa7b583d4b9494eb39924933c6ad223d</a>



## Using Cloud Functions:

## Create a Function that runs whenever a file is uploaded to a cloud storage bucket.

Cloud Functions

Create function

Region

us-east1

and scalability, more co  
event sources via Cloud

▼ MORE

Trigger

Cloud Storage

Event type

On (finalizing/creating) file in the selected bucket

Bucket

[stellar-river-354117-bucket](#)

Retry on failure

Function won't be automatically retried on failure

▼ ?

Entry point \*

hello\_gcs

▼ ?

▼

+

...

Press Alt+F1 for Accessibility Options.

```
1 def hello_gcs(event, context):
2     """Triggered by a change to a Cloud Storage bucket.
3     Args:
4         event (dict): Event payload.
5         context (google.cloud.functions.Context): Metadata for the ev
6     """
7
8     print('Event type: {}'.format(context.event_type))
9     print('Bucket: {}'.format(event['bucket']))
10    print('File: {}'.format(event['name']))
11    print('Created: {}'.format(event['timeCreated']))
12    print('Updated: {}'.format(event['updated']))
13
14
```

test upload draw.png

## stellar-river-354117-bucket

Location	Storage class	Public access	Protection
us-east1 (South Carolina)	Standard	Not public	None

**OBJECTS**

CONFIGURATION

PERMISSIONS

PROTECTION

Buckets &gt; stellar-river-354117-bucket

UPLOAD FILES

UPLOAD FOLDER

CREATE FOLDER

MANAGE HOLDS

Filter by name prefix only ▼

Filter Filter objects and folders

<input type="checkbox"/>	Name	Size	Type	Create
<input type="checkbox"/>	draw.png	310.6 KB	image/png	Jun 2

storage-trigger

1st gen

Version  
Version 1, deployed at Jun 26, 2022, 8:25:05 P...

METRICS

DETAILS

SOURCE

VARIABLES

TRIGGER

PERMISSIONS

**LOGS**

TESTING

Logs Showing 9 log entries

Severity  
Default

Filter Filter logs



* Loading... Scanned up to 6/8/22, 9:59 AM. Scanned 7.9 KB.					
▶	2022-06-26T18:23:46.643042Z	Cloud Functions	CreateFunction	us-east1:storage-trigger	mohamedanwer006@gmail.com {@type: type.googleapis.com/google.cloud.audit.AuditLog, authenticationIn_
▶	2022-06-26T18:25:06.012883Z	Cloud Functions	CreateFunction	us-east1:storage-trigger	mohamedanwer006@gmail.com {@type: type.googleapis.com/google.cloud.audit.AuditLog, authenticationIn_
▶	2022-06-26T18:26:20.361489605Z	storage-trigger	lxmpaobggqch	Function execution started	
▶	2022-06-26T18:26:20.370402Z	storage-trigger	lxmpaobggqch	Event type: google.storage.object.finalize	
▶	2022-06-26T18:26:20.370437Z	storage-trigger	lxmpaobggqch	Bucket: stellar-river-354117-bucket	
▶	2022-06-26T18:26:20.370447Z	storage-trigger	lxmpaobggqch	File: draw.png	
▶	2022-06-26T18:26:20.370454Z	storage-trigger	lxmpaobggqch	Created: 2022-06-26T18:26:18.808Z	
▶	2022-06-26T18:26:20.370466Z	storage-trigger	lxmpaobggqch	Updated: 2022-06-26T18:26:18.808Z	
▶	2022-06-26T18:26:20.423241472Z	storage-trigger	lxmpaobggqch	Function execution took 64 ms, finished with status: 'ok'	

## 3 -Using Cloud Run

- **Run a pre-built docker image (pulled from GCR)**

create a cloud run service and use the image you just pushed mynginx:2.0

The top screenshot shows the Google Cloud Run 'Service details' page for a service named 'mynginx2'. The region is 'us-central1' and the URL is 'https://mynginx2-4tolcrorfq-uc.a.run.app'. The 'DETAILS' tab is selected, showing the region, URL, last revision deployed (2022-06-26), and binary authorization status (ENABLE).

The bottom screenshot shows a browser window with the URL 'https://mynginx2-4tolcrorfq-uc.a.run.app/'. The page displays the 'Welcome to nginx!' message, indicating the nginx web server is successfully installed and working.

- **Build and Run any sample app**

create simple nodejs app

```
const express = require('express');
const app = express();

app.get('/', (req, res) => {
  res.send("<h1>hello iti </h1> <h3>From Mohamed anwar</h3>");
});

const port = parseInt(process.env.PORT) || 8080;
app.listen(port, () => {
  console.log("cloudrun: listening on port ${port}");
});
```

local folder

deploy from

```

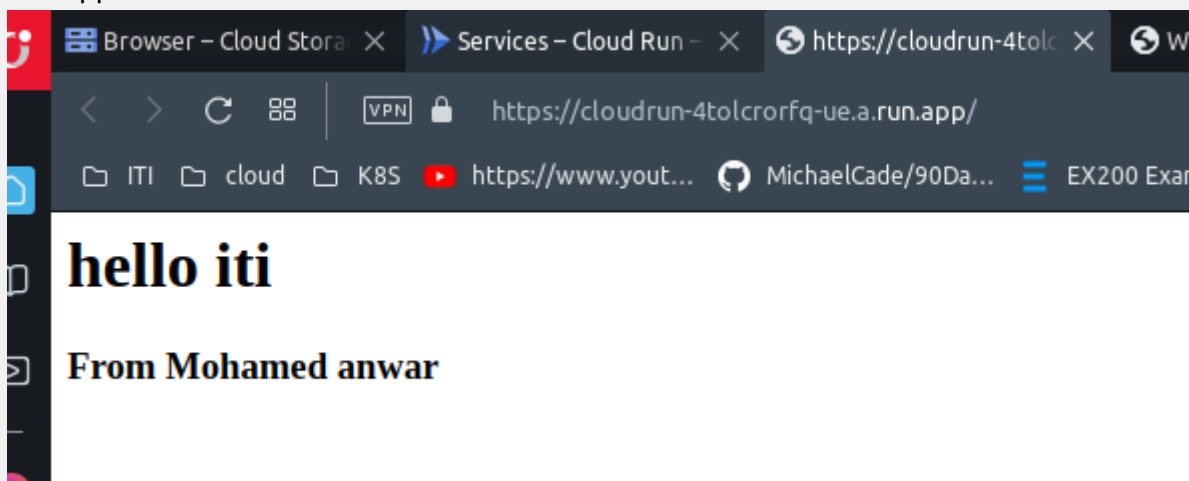
mohamed@DevOps$ cd cloudrun/
mohamed@DevOps$ vim package.json
mohamed@DevOps$ vim index.js
mohamed@DevOps$ vim Dockerfile
mohamed@DevOps$ gcloud run deploy
Deploying from source. To deploy a container use [--image]. See https://cloud.google.com/run/docs/deploying-source-code for more details.
Source code location (/home/mohamed/cloudrun):
Next time, use 'gcloud run deploy --source .' to deploy the current directory.

Service name (cloudrun): Build and Run any sample app
Please specify a region:

Building using Dockerfile and deploying container to Cloud Run service [cloudrun] in project [stellar-river-354117] region [us-east1]
:: Building and deploying new service... Creating Container Repository.
:: Creating Container Repository...
  . Uploading sources...
✓ Building and deploying new service... Done.
✓ Creating Container Repository...
✓ Uploading sources...
✓ Building Container... Logs are available at [https://console.cloud.google.com/cloud-build/builds/ab9dc8e0-0fa5-45f6-9c03-ef60fcc31867?pr]
✓ Creating Revision...
✓ Routing traffic...
✓ Setting IAM Policy...
Done.
Service [cloudrun] revision [cloudrun-00001-bes] has been deployed and is serving 100 percent of traffic.
Service URL: https://cloudrun-4tolcrorfq-ue.a.run.app
~/cloudrun

```

test app



Using App Engine:

**Run the sample hello-world python app**



## Enable cloud build api create app engine service

```

mohamed@DevOps:~$ gcloud app create --project=stellar-river-354117
You are creating an app for project [stellar-river-354117].
WARNING: Creating an App Engine application for a project is irreversible and the region
cannot be changed. More information about regions is at
<https://cloud.google.com/appengine/docs/locations>.

Please choose the region where you want your App Engine application located:

[1] asia-east1      (supports standard and flexible)
[2] asia-east2      (supports standard and flexible and search_api)
[3] asia-northeast1 (supports standard and flexible and search_api)
[4] asia-northeast2 (supports standard and flexible and search_api)
[5] asia-northeast3 (supports standard and flexible and search_api)
[6] asia-south1     (supports standard and flexible and search_api)
[7] asia-southeast1 (supports standard and flexible)
[8] asia-southeast2 (supports standard and flexible and search_api)
[9] australia-southeast1 (supports standard and flexible and search_api)
[10] europe-central2 (supports standard and flexible)
[11] europe-west    (supports standard and flexible and search_api)
[12] europe-west2    (supports standard and flexible and search_api)
[13] europe-west3    (supports standard and flexible and search_api)
[14] europe-west6    (supports standard and flexible and search_api)
[15] northamerica-northeast1 (supports standard and flexible and search_api)
[16] southamerica-east1 (supports standard and flexible and search_api)
[17] us-central      (supports standard and flexible and search_api)
[18] us-east1        (supports standard and flexible and search_api)
[19] us-east4        (supports standard and flexible and search_api)
[20] us-west1        (supports standard and flexible)
[21] us-west2        (supports standard and flexible and search_api)
[22] us-west3        (supports standard and flexible and search_api)
[23] us-west4        (supports standard and flexible and search_api)
[24] cancel

Please enter your numeric choice: 18

Creating App Engine application in project [stellar-river-354117] and region [us-east1]...done.
Success! The app is now created. Please use 'gcloud app deploy' to deploy your first app.

mohamed@DevOps:~$

```

## clone simple flask app

### deploy app

```

mohamed@DevOps:~$ ls
app.yaml  env  main.py  requirements.txt
~/hello-world
mohamed@DevOps:~/hello-world$ rm -r env/
mohamed@DevOps:~/hello-world$ gcloud app deploy
Services to deploy:

descriptor:      [/home/mohamed/hello-world/app.yaml]
source:          [/home/mohamed/hello-world]
target project:  [stellar-river-354117]
target service:  [default]
target version:  [20220626t213313]
target url:      [https://stellar-river-354117.ue.r.appspot.com]
target service account: [App Engine default service account]

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

Beginning deployment of service [default]...

= Uploading 3 files to Google Cloud Storage =

File upload done.
Updating service [default]...:

```

## test app gcloud app browse

