

Contents

| | |
|---|---|
| 6.1a: EB Guestbook | 3 |
| 6.1 Elastic Beanstalk | 3 |
| 6.1.2 Elastic Beanstalk sample application | 3 |
| 6.1.3 Running the application | 3 |
| 6.1.4 Handling failures seamlessly | 3 |
| 6.1.5 Clean up | 4 |
| 6.1.6 Elastic Beanstalk Guestbook | 4 |
| 6.1.7 Deploying the Guestbook | 4 |
| 6.1.8 Clean up | 5 |
| 6.1g: App Engine Guestbook | 5 |
| 6.1.1 App Engine | 5 |
| 6.1.2 app.yaml | 5 |
| 6.1.3 Deploying the Guestbook | 5 |
| 6.1.4 Handling failures seamlessly | 5 |
| 6.1.5 Clean up | 6 |
| 6.2g: Cloud Run, Secret Manager (Web proxy) | 6 |
| 6.2.1 Cloud Run | 6 |
| 6.2.2. Application | 6 |
| 6.2.3. app.py | 6 |
| 6.2.4. templates/proxy.html | 6 |
| 6.2.5. requirements.txt | 6 |
| 6.2.6. Dockerfile | 6 |
| 6.2.7. Build and test in Cloud Shell | 6 |
| 6.2.8. Setup secret proxy | 6 |
| 6.2.9. Artifact Registry | 7 |
| 6.2.10. Cloud Build | 7 |
| 6.2.11. Deploy to Cloud Run | 8 |
| 6.2.12. Secret manager | 9 |

| | |
|---|----|
| 6.2.13. Deploy to Cloud Run with Secret Manager | 9 |
| 6.3g: Cloud Run Guestbook | 12 |
| 6.3.1 Cloud Run | 12 |
| 6.3.2 Prepare a container image | 12 |
| 6.3.3 Deploy container with minimal privileges | 13 |
| 6.3.4 View the Guestbook..... | 13 |
| 6.3.5 Clean Up | 14 |
| 6.3a: ECS Guestbook | 14 |
| 6.3.1 Prepare a container image | 14 |
| 6.3.2 ECS overview | 15 |
| 6.3.3 ECS task definition..... | 15 |
| 6.3.4 Create a Cluster and a Service..... | 15 |
| 6.3.5 Examine the service..... | 15 |
| 6.3.6 Visit the site | 15 |
| 6.3.7 Clean Up | 16 |
| 6.4g: Cloud Functions, PubSub | 16 |
| 6.4.1 Cloud Functions image blurring | 16 |
| 6.4.2 Services setup | 16 |
| 6.4.3 Code..... | 16 |
| 6.4.4 - 16 | |
| 6.4.5 Set up service account..... | 17 |
| 6.4.6 Deploy the function | 17 |
| 6.4.7 Test function | 17 |
| 6.4.8 Clean up | 18 |
| 6.4.9 PubSub | 18 |
| 6.4.10 Create VM for subscriber..... | 18 |
| 6.4.11 PubSub via CLI | 18 |
| 6.4.12 -..... | 18 |
| 6.4.13 PubSub via Python..... | 19 |

| | |
|---|----|
| 6.4.14 -..... | 19 |
| 6.4.15 Test programs and clean up | 19 |

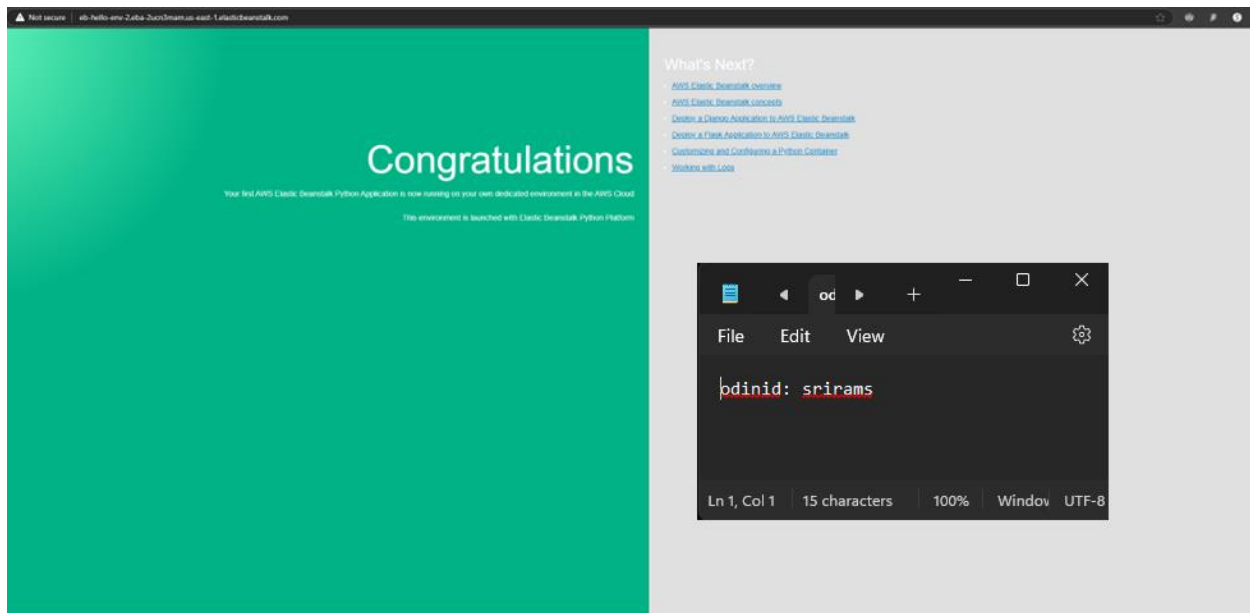
6.1a: EB Guestbook

6.1 Elastic Beanstalk

6.1.2 Elastic Beanstalk sample application

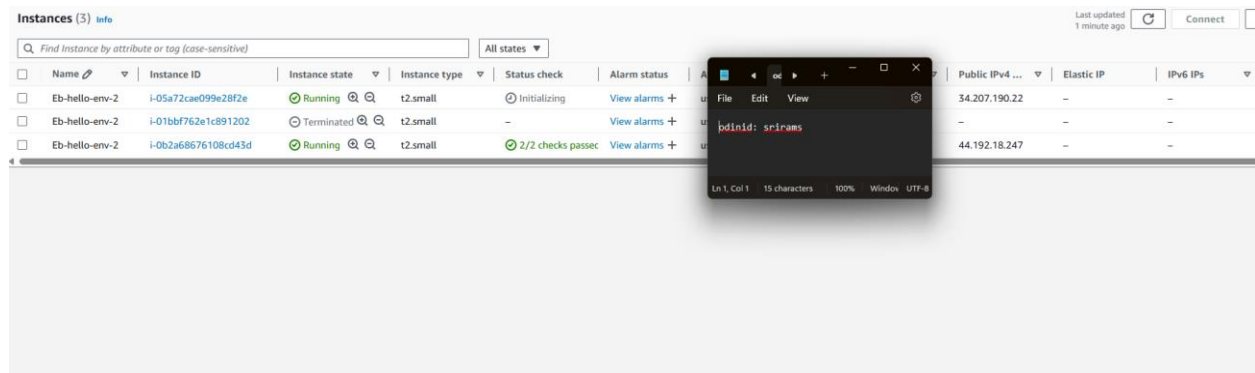
6.1.3 Running the application

- **Take a screenshot showing it has been brought up successfully**



6.1.4 Handling failures seamlessly

- Take a screenshot of the replacement VM being started.

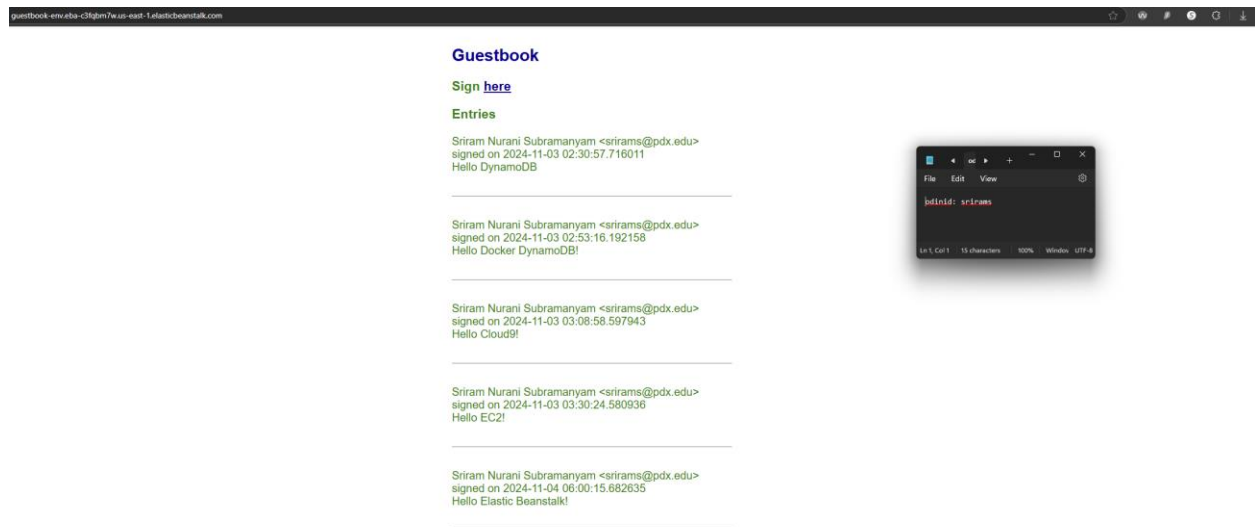


6.1.5 Clean up

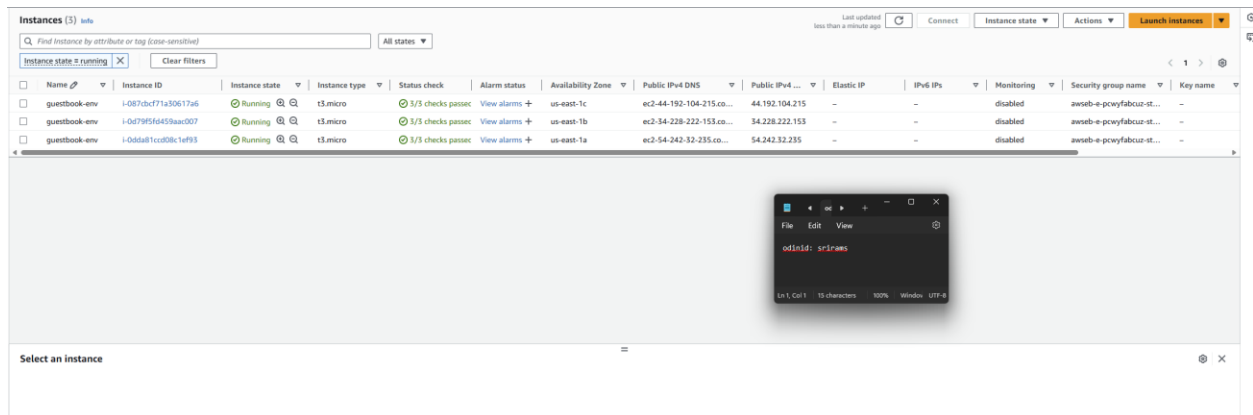
6.1.6 Elastic Beanstalk Guestbook

6.1.7 Deploying the Guestbook

- Take a screenshot of the Guestbook including the URL with the entry in it.



- Take a screenshot of them.



6.1.8 Clean up

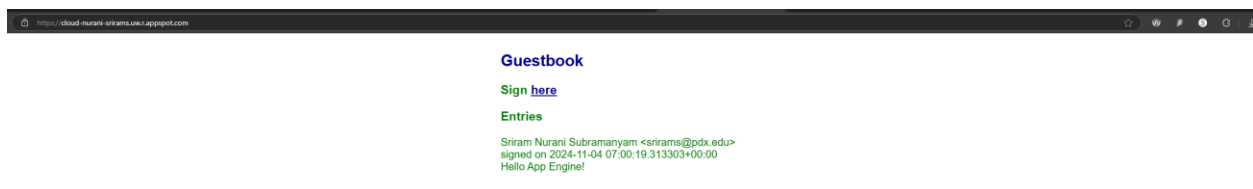
6.1g: App Engine Guestbook

6.1.1 App Engine

6.1.2 app.yaml

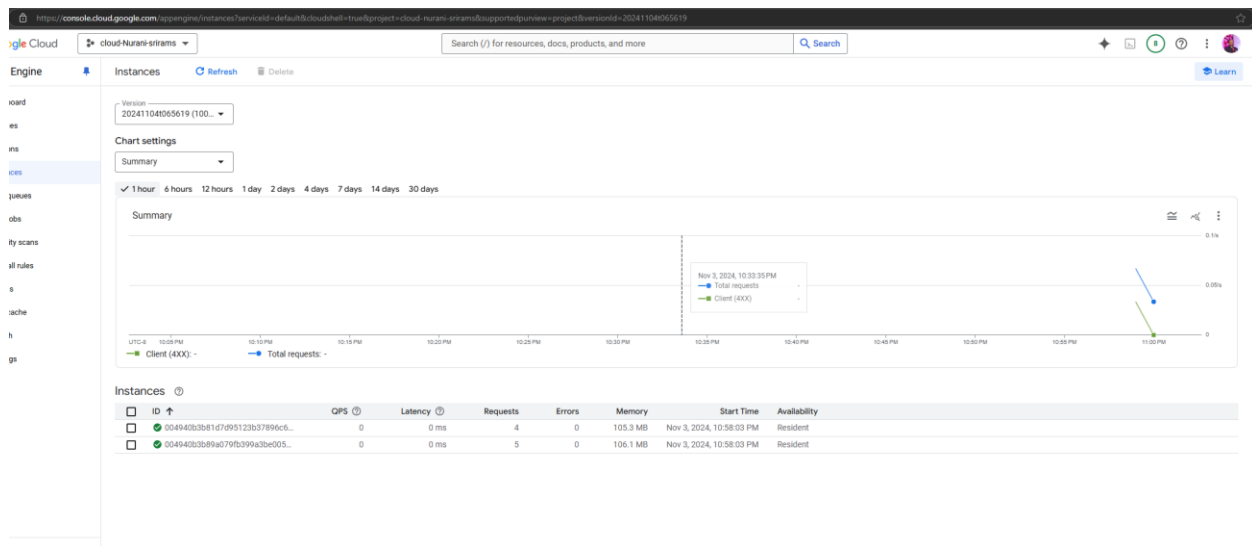
6.1.3 Deploying the Guestbook

- Take a screenshot of the output that includes the URL in the address bar for your lab notebook.



6.1.4 Handling failures seamlessly

- Take a screenshot of them.



6.1.5 Clean up

6.2g: Cloud Run, Secret Manager (Web proxy)

6.2.1 Cloud Run

6.2.2. Application

6.2.3. app.py

6.2.4. templates/proxy.html

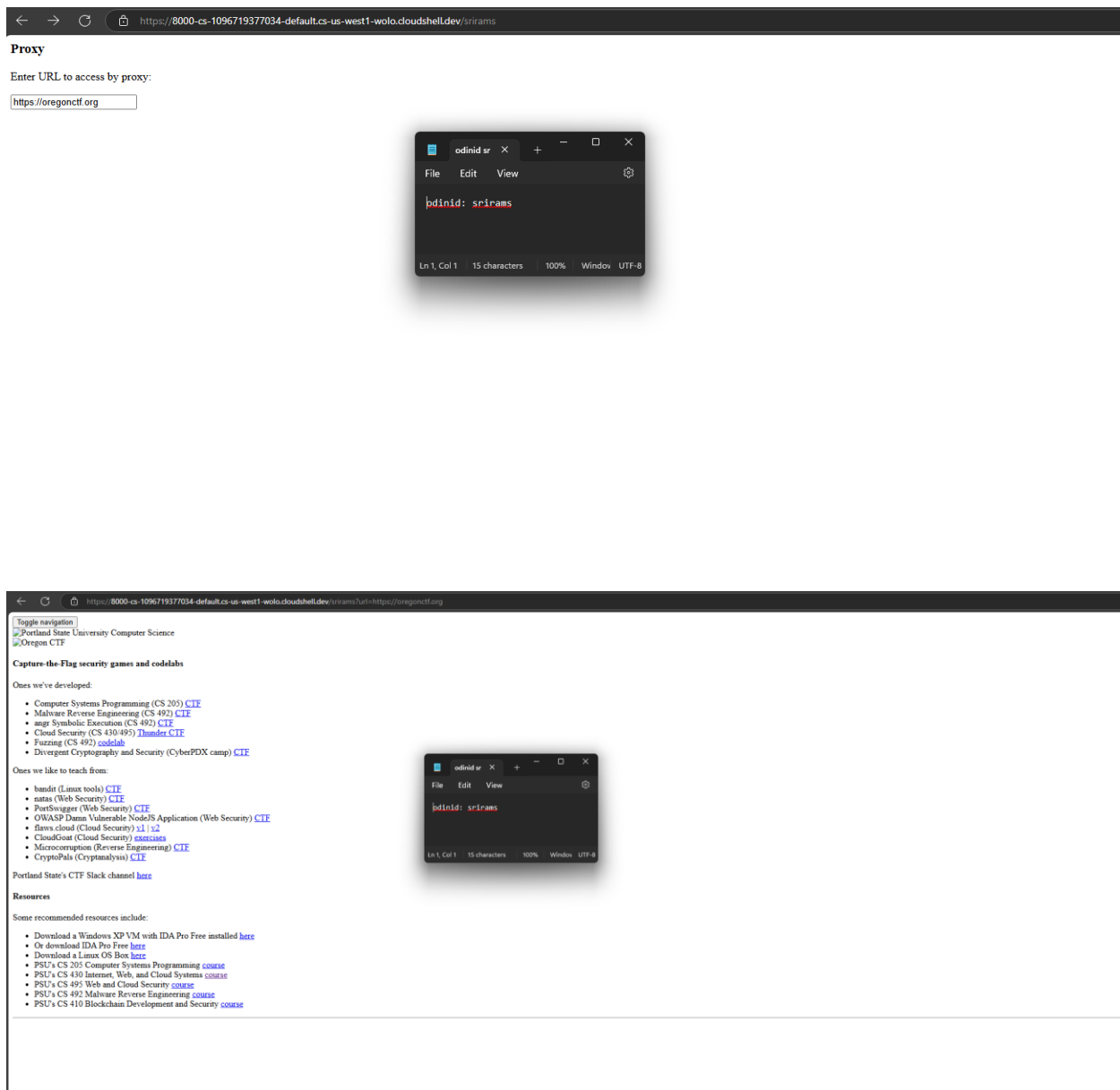
6.2.5. requirements.txt

6.2.6. Dockerfile

6.2.7. Build and test in Cloud Shell

6.2.8. Setup secret proxy

- **Take a screenshot of the proxy and its results including the URL containing your OdinID**



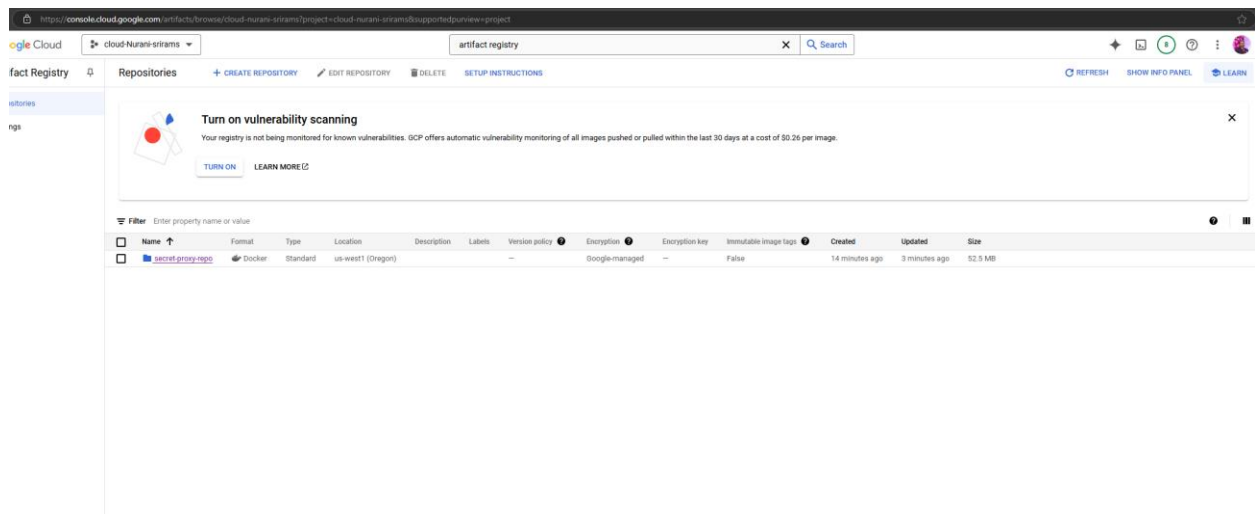
- **What is the security advantage of passing in the secret proxy route as an environment variable?**

using environment variables for passing sensitive information like secret proxy routes enhances the security posture of your application by reducing exposure, enabling dynamic configuration, and aligning with security best practices.

6.2.9. Artifact Registry

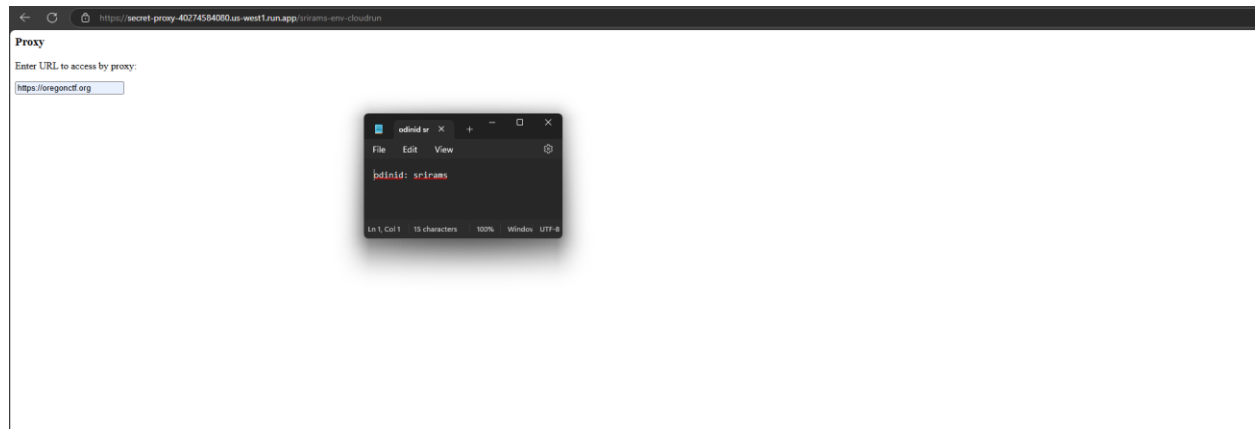
6.2.10. Cloud Build

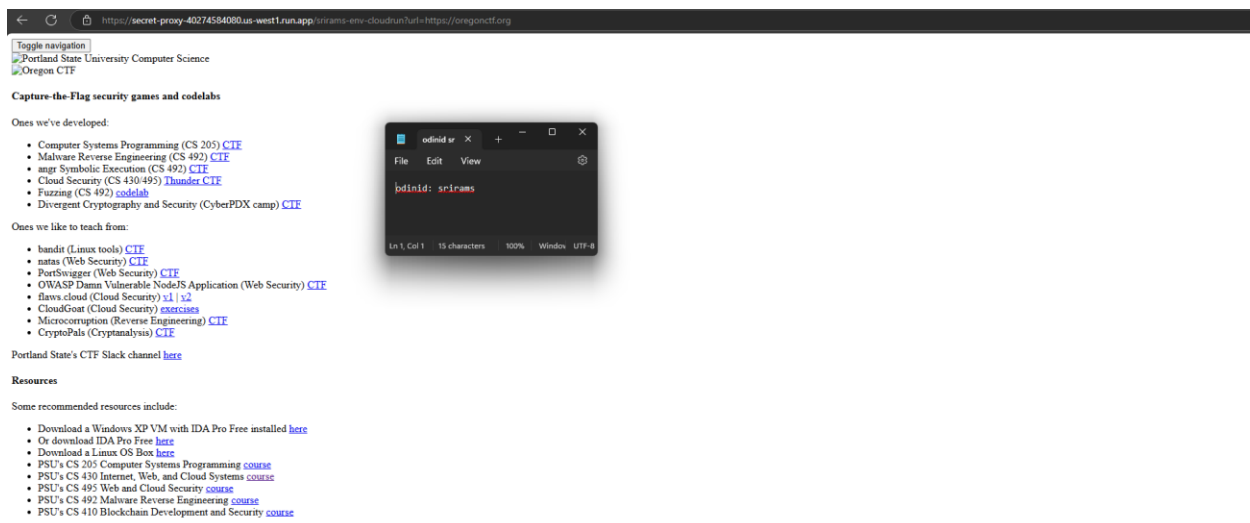
- **Take a screenshot of the image in the registry that shows the size of the container for your lab notebook.**



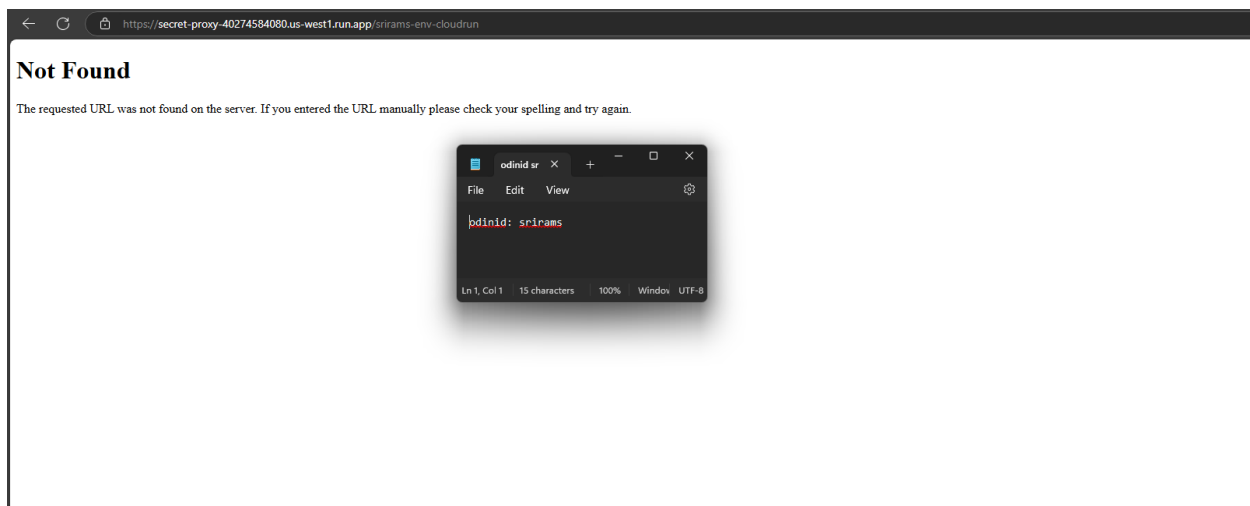
6.2.11. Deploy to Cloud Run

- Take a screenshot of it that includes the proxy URL for your lab notebook.





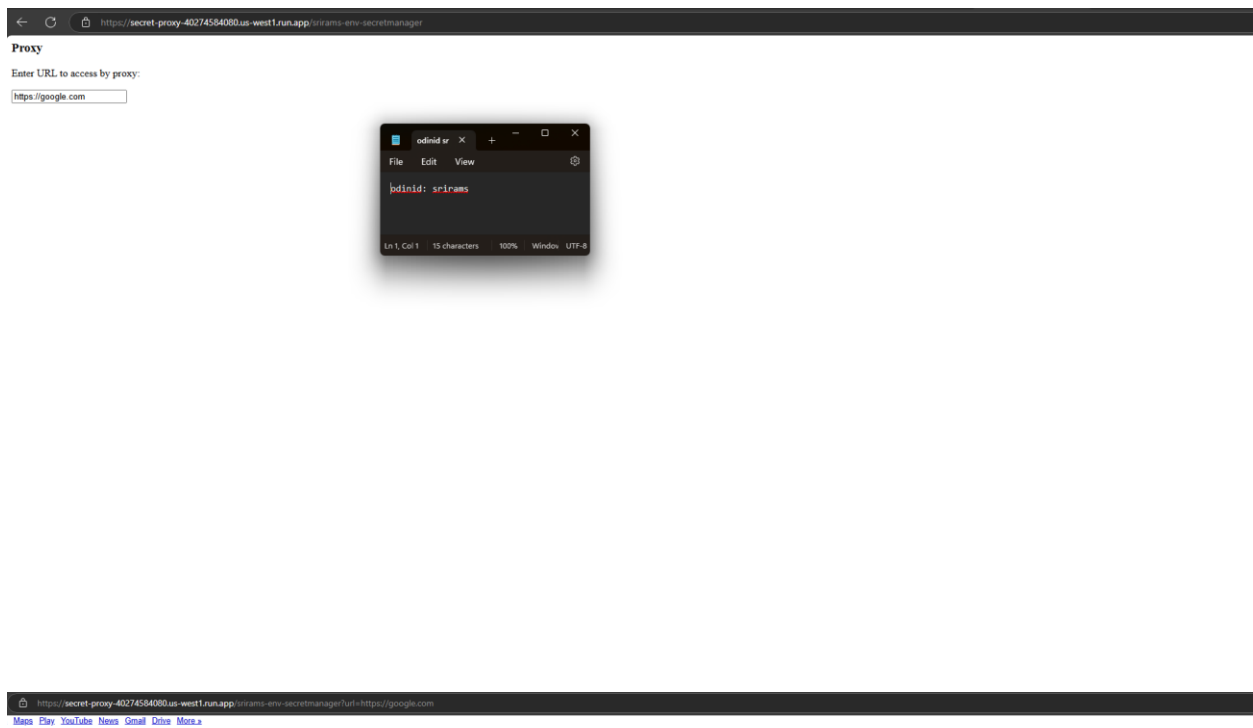
- Take a screenshot of the error page that includes the proxy URL for your lab notebook.



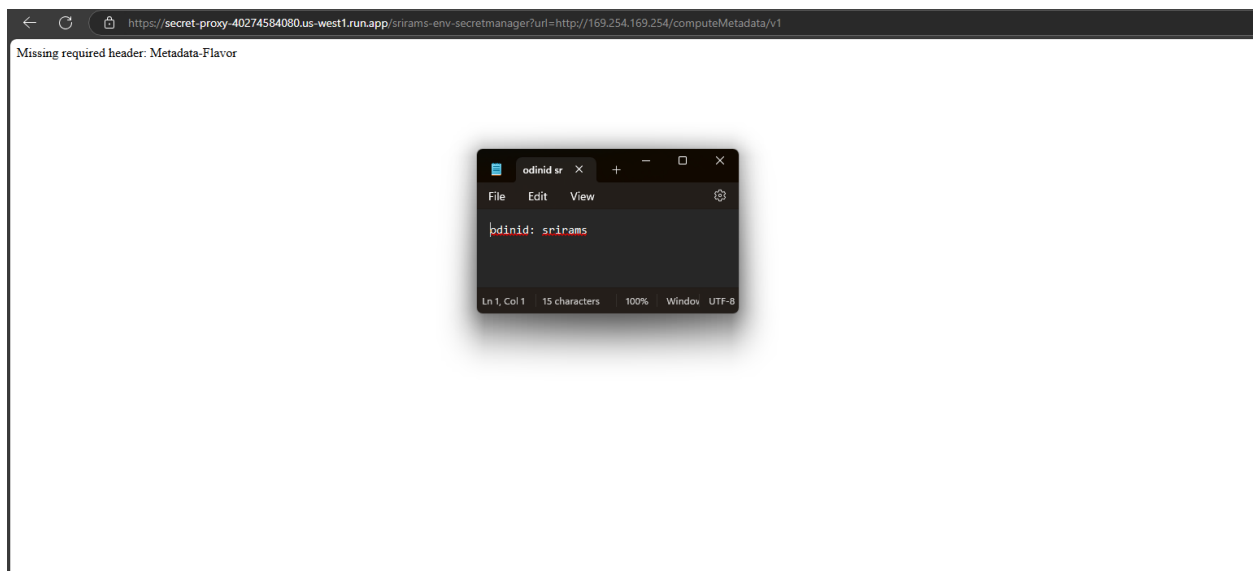
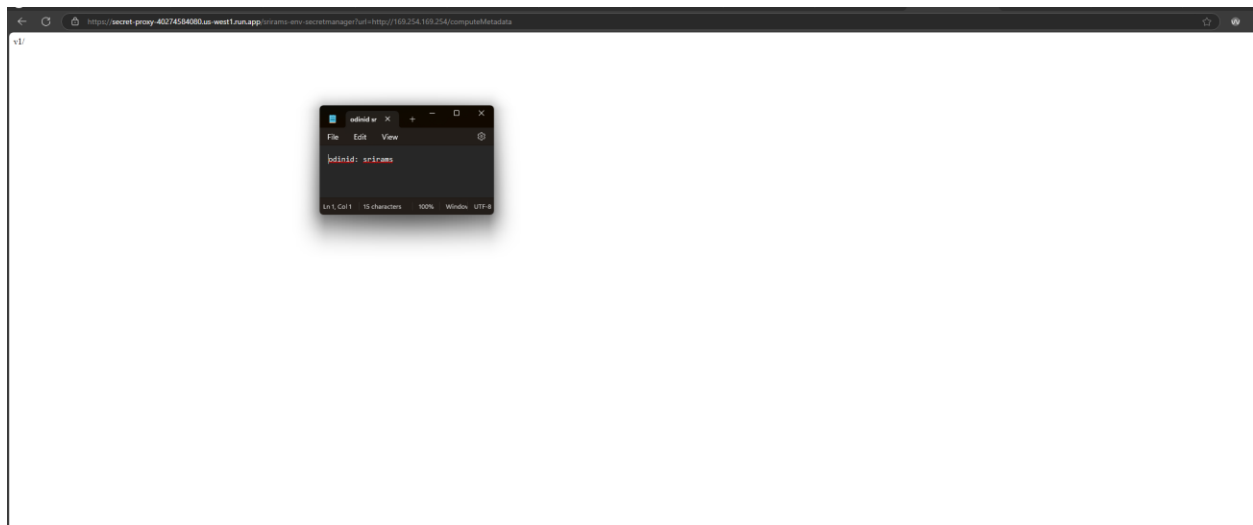
6.2.12. Secret manager

6.2.13. Deploy to Cloud Run with Secret Manager

- Take a screenshot of it that includes the proxy URL for your lab notebook.



- Take a screenshot of it that includes the proxy URL for your lab notebook.



- **Identify the vulnerability in your lab notebook that Google has prevented.**
Web security vulnerability, SSRF- Server-side request forgery

6.3g: Cloud Run Guestbook

6.3.1 Cloud Run

6.3.2 Prepare a container image

- **Take a screenshot that includes the output of the command and the time it took to execute.**

cloud:mrnari-srims

Build details

Rebuild

Copy url

Search (/) for resources, docs, products, and more

Search

✔ Successful: e3db03e5-bd83-4097-b186-8bb23ca916c0

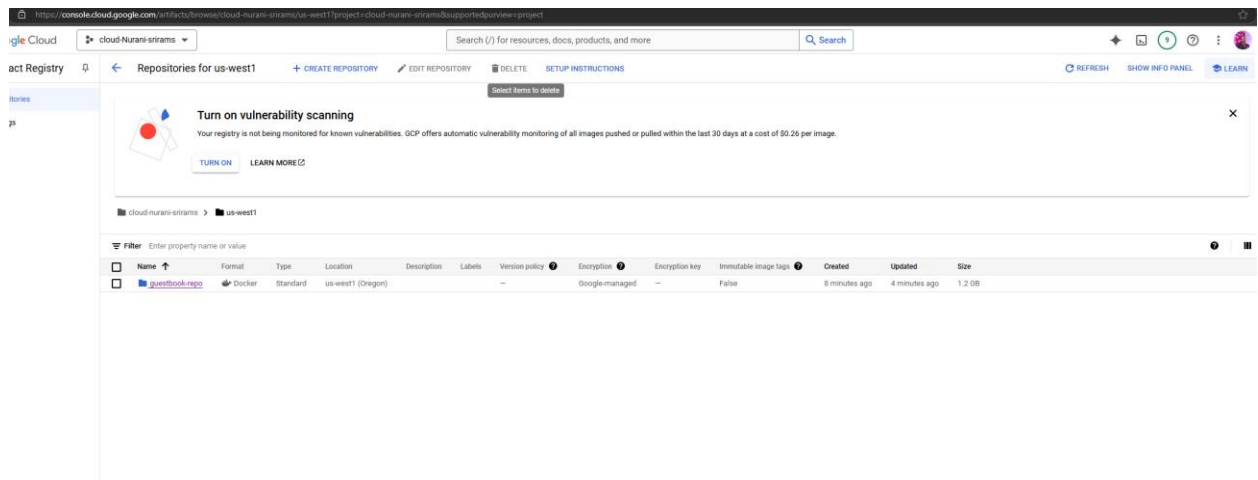
Started on Nov 4, 2024, 12:46:35 AM

Source

https://cloud.mrari-srims.cloud/build/source/1730710001_507086-3324f185c9ea42ceb5a0402787a545171_tgz

| Steps | Duration | Build Summary |
|---|----------|--|
| <p>1 Skip</p> <p>0 gcs://cloud/builders/docker build -network cloud/build --no-cache -u west1-docker.pkg.dev/cloud...</p> | 00:01:18 | <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>Build log</p> <p>Execution details</p> <p>Build artifacts</p> </div> <div> <p><input type="checkbox"/> Wrap lines</p> <p><input type="checkbox"/> Show newest entries first</p> <p>Expand</p> </div> <div> <p>View raw</p> </div> </div> <pre> 249 downloading https://storage.googleapis.com/cloud-build-logs-us-west1-logs/1730710001_507086-3324f185c9ea42ceb5a0402787a545171_tgz 250 251 Collecting grpcio==1.67.1-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (5.9 MB) 252 Downloading grpcio-1.67.1-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (5.9 MB) 253 Downloading grpcio-status==2.0.0-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 254 Collecting cachetools==5.3.0-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 255 Downloading cachetools==5.3.0-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 256 Collecting pyyaml==6.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 257 Downloading pyyaml==6.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 258 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 259 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 260 Collecting Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 261 Downloading Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 262 Collecting Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 263 Downloading Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 264 Collecting MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 265 Downloading MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 266 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 267 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 268 Collecting Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 269 Downloading Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 270 Collecting Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 271 Downloading Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 272 Collecting MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 273 Downloading MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 274 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 275 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 276 Collecting Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 277 Downloading Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 278 Collecting Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 279 Downloading Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 280 Collecting MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 281 Downloading MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 282 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 283 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 284 Collecting Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 285 Downloading Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 286 Collecting Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 287 Downloading Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 288 Collecting MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 289 Downloading MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 290 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 291 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 292 Collecting Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 293 Downloading Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 294 Collecting Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 295 Downloading Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 296 Collecting MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 297 Downloading MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 298 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 299 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 300 Collecting Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 301 Downloading Flask==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 302 Collecting Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 303 Downloading Jinja2==3.1.3-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 304 Collecting MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 305 Downloading MarkupSafe==2.1.5-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 306 Collecting Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 307 Downloading Werkzeug==3.0.2-cp311-cp311-manylinux_2_17_x86_64_muslinux2018_x86_64.whl (14 KB) 30</pre> |

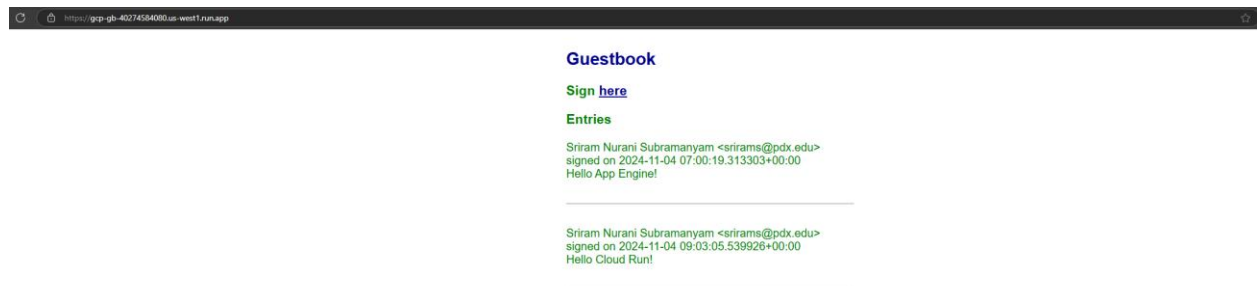
- **Take a screenshot showing the container image and its virtual size**



6.3.3 Deploy container with minimal privileges

6.3.4 View the Guestbook

- Take a screenshot that includes the URL Cloud Run has created for your site.



- What port do container instances listen on?
8080
- What are the maximum number of instances Cloud Run will autoscale up to for your service?

100

cloud-nurani-strings

Cloud Run

Search

Service details
EDIT & DEPLOY NEW REVISION
SET UP CONTINUOUS DEPLOYMENT

on us-west1
URL: <https://gcp-gb-45274384080.us-west1.run.app>
Service min instances: 0

LOGS
REVISIONS
TRIGGERS
NETWORKING
SECURITY
YAML

USE TRAFFIC

| Traffic | Deployed | Revision tags | Actions |
|------------------|----------------|---------------|---------|
| 100% (to latest) | 10 minutes ago | + | ⋮ |

gcp-gb-00001-ghv

Deployed by sramsgpdx.edu using gcloud

CONTAINERS

General

CPU allocation

CPU is only allocated during request processing

Startup CPU boost

Enabled

Concurrency

80

Request timeout

300 seconds

Execution environment

Default

Autoscaling

Revision max instances

100

Image

[us-west1-docker.pkg.dev/cloud-nurani-strings/guest_](#)

Port

8080

Build

(no build information available)

Source

(no source information available)

Command and args

(container endpoint)

CPU limit

1

Memory limit

512MB

Environment variables (0)

None

Volume mounts (0)

Health checks (1)

Cloud SQL Connections (0)

6.3.5Clean Up

6.3a: ECS Guestbook

6.3.1 Prepare a container image

- Show that your image was uploaded to your account on [Docker Hub](#).

srammurani

Search by repository name

All Content

Create repository

srammurani / gcp_gb

Contains image · Last pushed: 4 days ago

0

10

Public

Scout inactive

srammurani / aws_gb

Contains image · Last pushed: 4 days ago

0

6

Public

Scout inactive

srammurani / hw3small

Contains image · Last pushed: 7 days ago

0

9

Public

Scout inactive

srammurani / hw3large

Contains image · Last pushed: 7 days ago

0

9

Public

Scout inactive

srammurani / hellojpine

Contains image · Last pushed: 10 days ago

0

13

Public

Scout inactive

srammurani / helloubuntu

Contains image · Last pushed: 10 days ago

0

9

Public

Scout inactive

Create An Organization

Create and manage users and grant access to your repositories.

docker buildcloud

Accelerate your builds with cloud

By leveraging cloud compute and cache, developers can build faster and improve collaboration with their team - locally and in CI. Accelerate your builds with Docker Build Cloud!

Get started

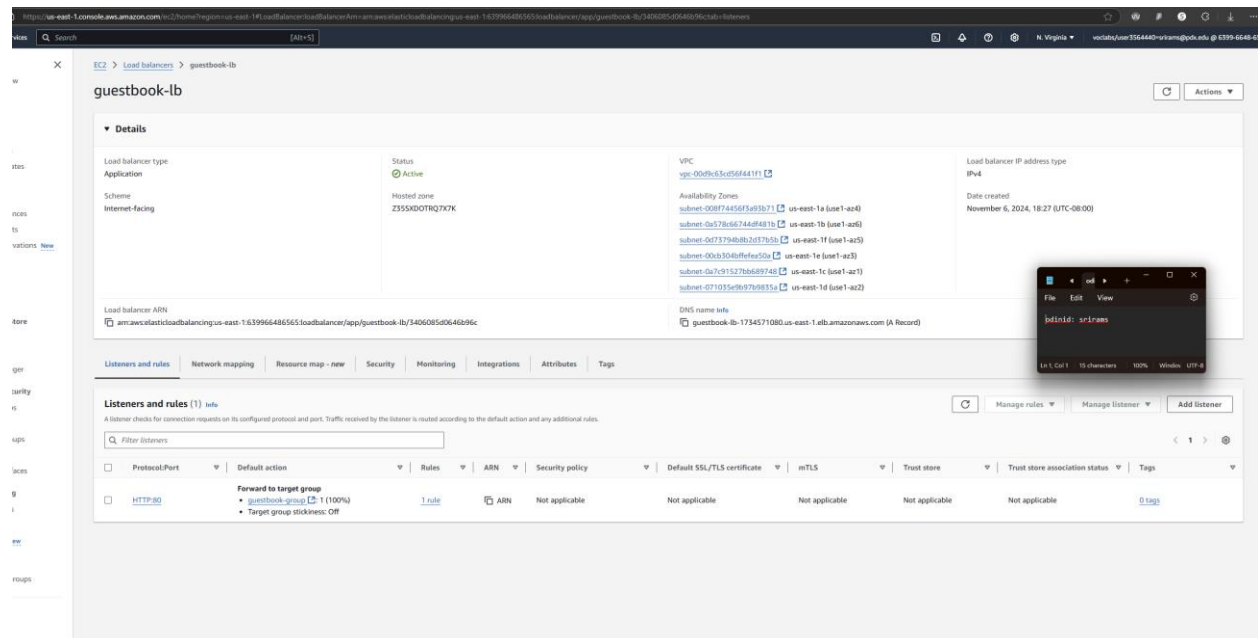
6.3.2 ECS overview

6.3.3 ECS task definition

6.3.4 Create a Cluster and a Service

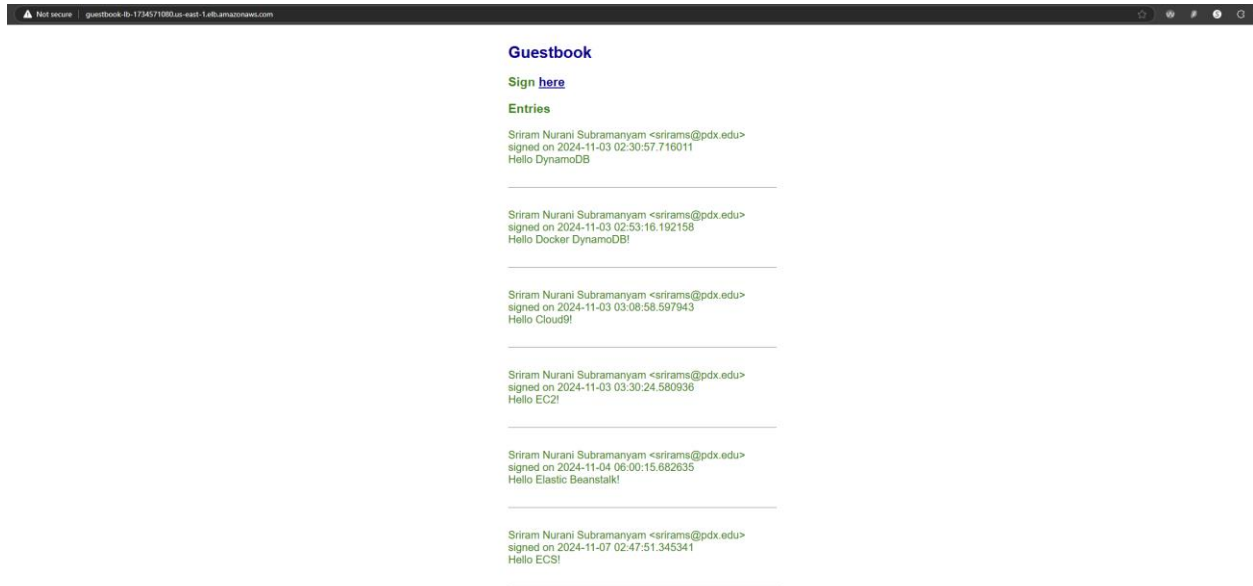
6.3.5 Examine the service

- Take a screenshot of the DNS name of the guestbook-lb load balancer for your lab notebook



6.3.6 Visit the site

- Take a screenshot of the Guestbook app running in a browser that includes the DNS name of the site.



6.3.7 Clean Up

6.4g: Cloud Functions, PubSub

6.4.1 Cloud Functions image blurring

6.4.2 Services setup

6.4.3 Code

6.4.4 -

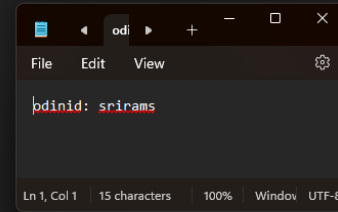
- **After downloading the file from the bucket, where is it stored?**
Temporary file (temp_local_filename)
- **What class in the ImageMagick package is used to do the blurring of the file?**
Class : Image and Method : resize
- **What lines of code perform the blurring of the image and its storage back into the filesystem?**


```
# Blur the image using ImageMagick.
with Image(filename=temp_local_filename) as image:
    image.resize(*image.size, blur=16, filter="hamming")
    image.save(filename=temp_local_filename)

print(f"Image {file_name} was blurred.")

# Upload result to a second bucket, to avoid re-triggering the function.
# You could instead re-upload it to the same bucket + tell your function
# to ignore files marked as blurred (e.g. those with a "blurred" prefix)
blur_bucket_name = os.getenv("BLURRED_BUCKET_NAME")
blur_bucket = storage_client.bucket(blur_bucket_name)
new_blob = blur_bucket.blob(file_name)
new_blob.upload_from_filename(temp_local_filename)
print(f"Blurred image uploaded to: gs://{blur_bucket_name}/{file_name}")

# Delete the temporary file.
os.remove(temp_local_filename)
```

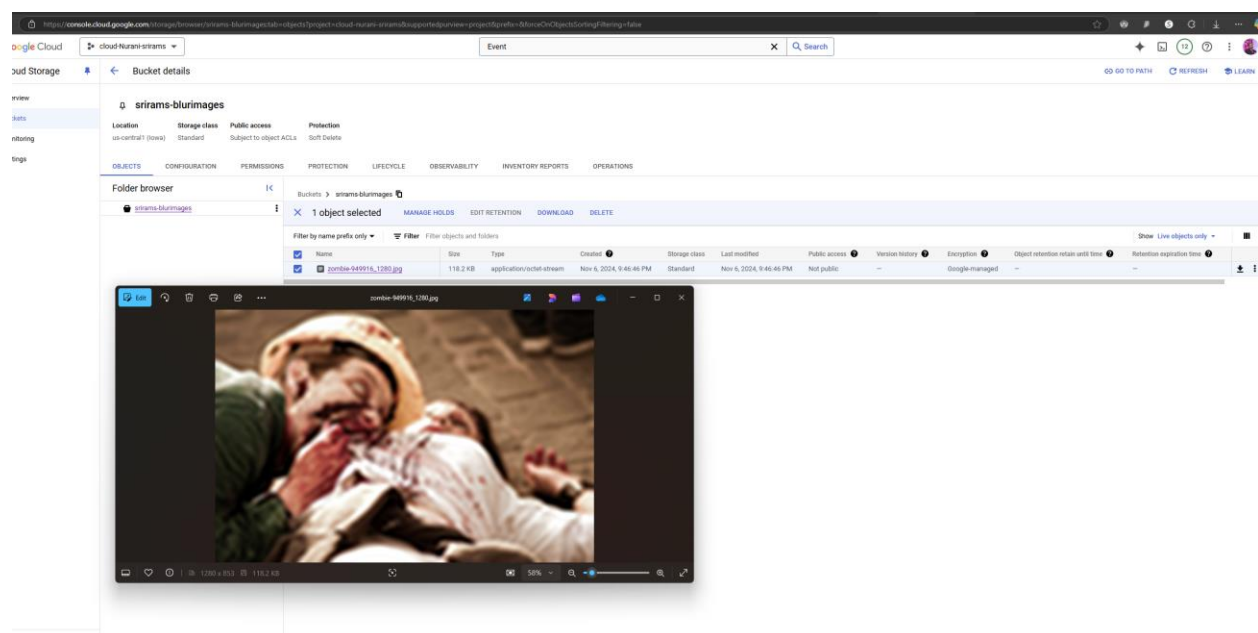


6.4.5 Set up service account

6.4.6 Deploy the function

6.4.7 Test function

- Take a screenshot of the blurred image in the output bucket for your lab notebook



- Include a screenshot of the output logs that show that the above image was blurred.

```

srirama@cloudshell:~/python-docs-samples/functions/imagesmagick (cloud-nurani-srirama)$ gcloud functions logs read
LEVEL:
NAME: blur-offensive-images
EXECUTION ID: h13ILKRRKjeLP
TIME UTC: 2024-11-07 05:46:46.701
LOG: Blurred image uploaded to: gs://srirama-blurimages/zombie-949916_1280.jpg

LEVEL:
NAME: blur-offensive-images
EXECUTION ID: h13ILKRRKjeLP
TIME UTC: 2024-11-07 05:46:46.616
LOG: Image zombie-949916_1280.jpg was blurred.

LEVEL:
NAME: blur-offensive-images
EXECUTION ID: h13ILKRRKjeLP
TIME UTC: 2024-11-07 05:46:45.792
LOG: Image zombie-949916_1280.jpg was downloaded to /tmp/tmpyabb9zg7.

LEVEL:
NAME: blur-offensive-images
EXECUTION ID: h13ILKRRKjeLP
TIME UTC: 2024-11-07 05:46:45.702
LOG: The image zombie-949916_1280.jpg was detected as inappropriate.

LEVEL:
NAME: blur-offensive-images
EXECUTION ID: h13ILKRRKjeLP
TIME UTC: 2024-11-07 05:46:45.452
LOG: Analyzing zombie-949916_1280.jpg.

LEVEL: I
NAME: blur-offensive-images
EXECUTION ID:
TIME UTC: 2024-11-07 05:46:45.315
LOG: Default STARTUP TCP probe succeeded after 1 attempt for container "worker" on port 8080.

LEVEL: I
NAME: blur-offensive-images
EXECUTION ID:
TIME UTC: 2024-11-07 05:46:43.288
LOG:

```

6.4.8 Clean up

6.4.9 PubSub

6.4.10 Create VM for subscriber

6.4.11 PubSub via CL

- **Why are there no items returned?**

Since there is no Subscription when message was published, the subscription would not have the message in it.

6.4.12

- **What is the message of the published message?**

12536959487920718

```
srirams@cloudshell:~ (cloud-murani-srirams) $ gcloud pubsub topics publish topic-srirams --message="Message #2"
messageId:
- '12536959487920719'
srirams@cloudshell:~ (cloud-murani-srirams) $
```

- **Take a screenshot of the output of the successful pull that includes the message and its messageId.**

[illegible]

6.4.13 PubSub via Python

6.4.14 -

6.4.15 Test programs and clean up

- Take a screenshot showing the message IDs and messages sent

```
(env) srirams@cloudshell:~ (cloud-nurani-srirams)$ python3 publisher.py
Topic 'projects/cloud-nurani-srirams/topics/topic-srirams' already exists.
Enter a message to send: This is Sriram
Published 12538487302386034 to topic projects/cloud-nurani-srirams/topics/topic-srirams
Enter a message to send: I am studying Pub/Sub in IWC
Published 12538547264054017 to topic projects/cloud-nurani-srirams/topics/topic-srirams
Enter a message to send: I plan to graduate from PSU in June 2025
Published 12892348375260455 to topic projects/cloud-nurani-srirams/topics/topic-srirams
Enter a message to send: █
```

- Take a screenshot showing the same message IDs and messages received

```
(env) srirams@psu:~$ nano subscriber.py
(env) srirams@psu:~$ python3 subscriber.py
Using existing subscription.
Listening for messages on projects/cloud-nurani-srirams/subscriptions/sub-srirams...
Received message 12536959487920718: Message #2
Received message 12538487302386034: 2024-11-07 07:47:40 (projects/cloud-nurani-srirams/topics/topic-srirams) : This is Sriram
Received message 12538547264054017: 2024-11-07 07:47:53 (projects/cloud-nurani-srirams/topics/topic-srirams) : I am studying Pub/Sub in IWC
Received message 12892348375260455: 2024-11-07 07:48:08 (projects/cloud-nurani-srirams/topics/topic-srirams) : I plan to graduate from PSU in June 2025
█
```