

04.1g: nginx Compute Engine Guestbook

4.1.6 Install the application

- Take a screenshot of the site along with its Let's Encrypt certificate and include it in your lab notebook

04.2g. Docker Guestbook

4.2.3. Build and run the Ubuntu-based container

- Take a screenshot of the results for your lab notebook

4.2.6. Running from Docker Hub

- Run the image directly from Docker Hub and show a screenshot of the output of the command in your lab notebook.
- What layer adds the most to the container image? How much does it add?

4.2.8. Build and run the Alpine-based container

- Take a screenshot of the image generated and its size for your lab notebook. How much smaller is the image than the Ubuntu one?
- Show the output of this command in a screenshot for your lab notebook. What might have happened?
- Take a screenshot of the output of each

4.2.9. Docker Hub Alpine

4.2.10 Compute Engine Ubuntu VM deployment

4.2.13

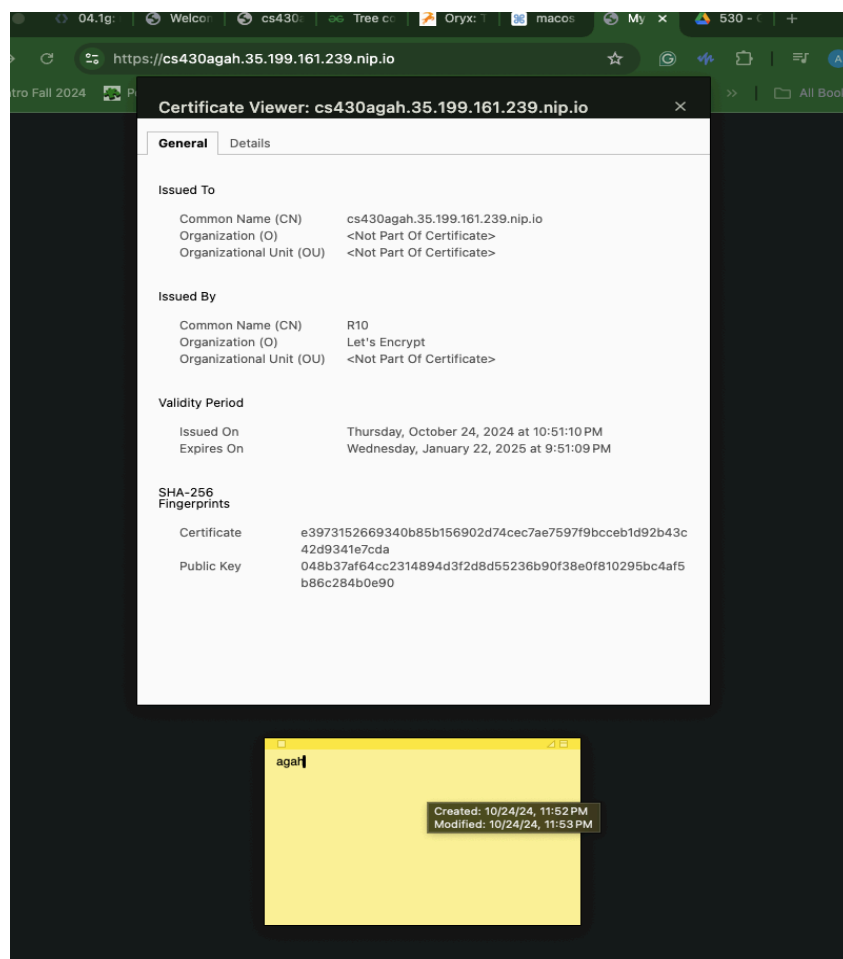
- Take a screenshot of the entry that includes the VM's external IP address for your lab notebook

04.1g: nginx Compute Engine Guestbook

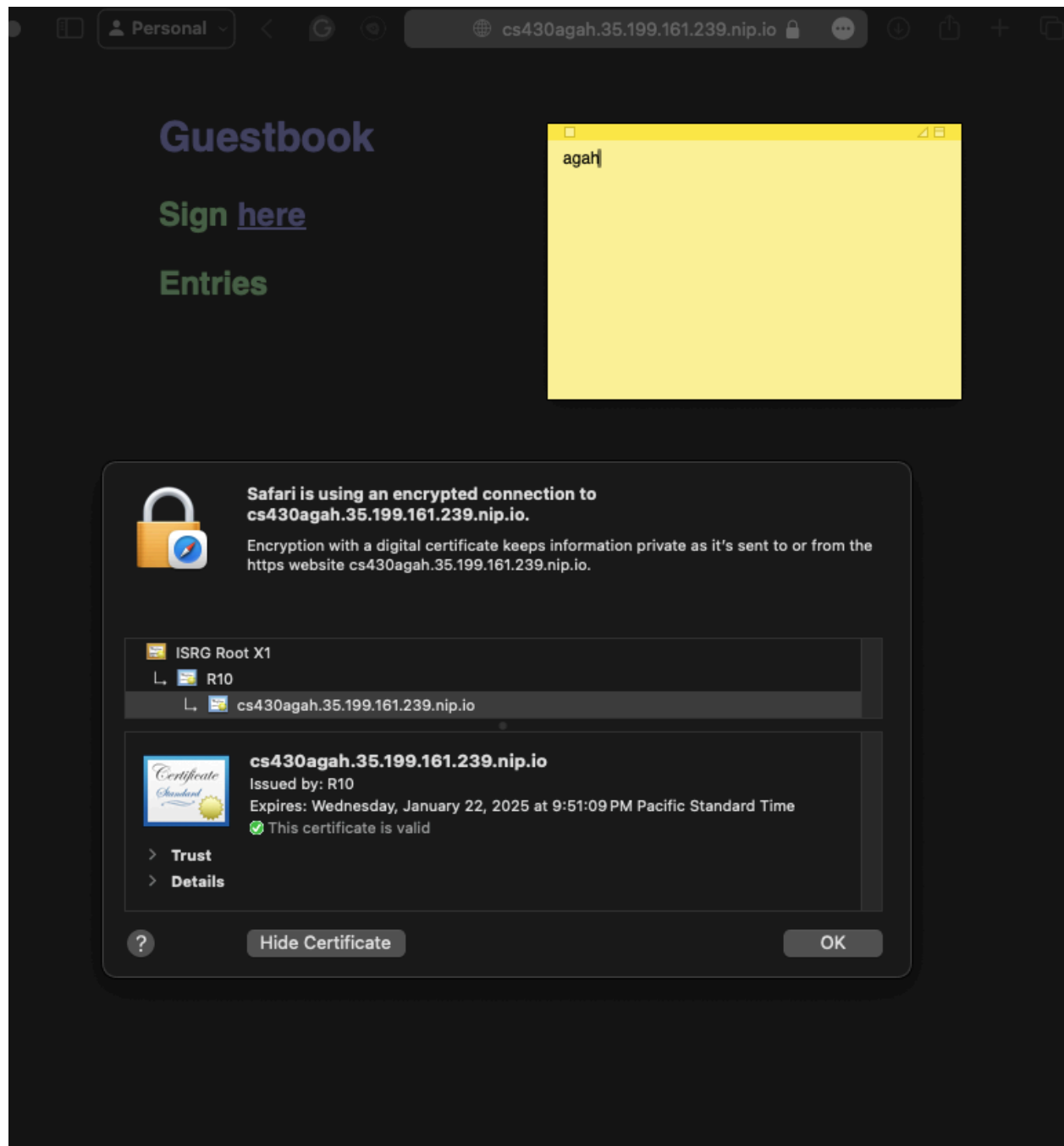
4.1.6 Install the application

- Take a screenshot of the site along with its Let's Encrypt certificate and include it in your lab notebook

CHROME



SAFARI



04.2g. Docker Guestbook

4.2.3. Build and run the Ubuntu-based container

- Take a screenshot of the results for your lab notebook

```
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
helloubuntu   latest    b56a78fa3cc1   9 seconds ago  453MB
ubuntu        20.04     6013ae1a63c2   2 weeks ago    72.8MB
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$
```

4.2.6. Running from Docker Hub

- Run the image directly from Docker Hub and show a screenshot of the output of the command in your lab notebook.

```
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$ docker run -di -p 8000:5000 --name hello
u ahmadpsu/helloubuntu
Unable to find image 'ahmadpsu/helloubuntu:latest' locally
latest: Pulling from ahmadpsu/helloubuntu
d9802f032d67: Pull complete
de03574bad46: Pull complete
d247ce82b19e: Pull complete
448ef9b1c1b4: Pull complete
e1db09564dd1: Pull complete
Digest: sha256:bb5eb6812eb1d05fc20cdd057d8f6bf284d91bdb3c6f706dfb39ded8f1520f54
Status: Downloaded newer image for ahmadpsu/helloubuntu:latest
27764ccada45cc663fc2c95040dae828e6bc88c9c6dcd58605eace2cca9122a5
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$
```

OS/ARCH	COMPRESSED SIZE	LAST PUSHED	TYPE	MANIFEST DIGEST
linux/amd64	161.52 MB	14 minutes ago by ahmadpau	Image	sha256:5be987c5...

Image Layers	Vulnerabilities
--------------	-----------------

Image Layers	Command
1 ARG RELEASE	ARG RELEASE
2 ARG LAUNCHPAD_BUILD_ARCH	
3 LABEL org.opencontainers.image.ref.name=ubuntu	
4 LABEL org.opencontainers.image.version=20.04	
5 ADD file ... in /	
6 CMD ["/bin/bash"]	
7 LABEL maintainer=agah@pdx.edu	
8 /bin/sh -c apt-get update -y	
9 /bin/sh -c apt-get install -y	
10 COPY dir:12c1f51d091c5095e03b4c08b4656d0202f599...	
11 WORKDIR /app	
12 /bin/sh -c pip install -r	
13 ENTRYPOINT ["python3"]	
14 CMD ["app.py"]	

- What layer adds the most to the container image? How much does it add?

Layer 9: RUN /bin/sh -c apt-get install -y, which adds 97.66 MB to the container image.

This layer installs additional packages via apt-get, which is often the largest contributor to the image size due to the size of the packages being installed.

4.2.8. Build and run the Alpine-based container

- Take a screenshot of the image generated and its size for your lab notebook. How much smaller is the image than the Ubuntu one?

```
Successfully built 814fa0420aa5
Successfully tagged helloalpine:latest
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
helloalpine   latest    814fa0420aa5   20 seconds ago 57.3MB
python        alpine    408c9504056e   7 days ago    44.6MB
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$
```

Difference in Size:

161.52 MB - 57.3 MB = 104.22 MB

So, the Alpine-based image (helloalpine) is approximately 104.22 MB smaller than the Ubuntu-based image. This size difference is mainly because Alpine Linux is a minimal, lightweight distribution compared to Ubuntu, which includes more system utilities and libraries by default.

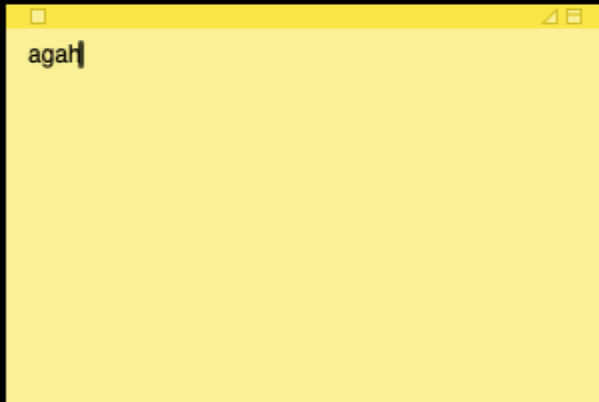
- Show the output of this command in a screenshot for your lab notebook. What might have happened?

```
ahmadagah@course-vm:~/Desktop/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/bash
OCI runtime exec failed: exec failed: unable to start container process: exec: "/bin/bash": stat /bin/bash: no such file or directory
: unknown
```

Error is occurring because Alpine Linux does not include bash by default. Instead, it uses sh as its default shell.


- Take a screenshot of the output of each

```
/app # cat /etc/alpine-release
3.20.3
/app # ps -ef
PID   USER     TIME   COMMAND
    1  root      0:00   python3 app.py
     7  root      0:01  /usr/local/bin/python3 app.py
    15  root      0:00   /bin/sh
    26  root      0:00   ps -ef
/app #
```



4.2.9. Docker Hub Alpine

- Take a screenshot of the container image and its size.



ahmadpsu/helloalpine:latest

Delete Tag

MANIFEST DIGEST sha256:5622baca2671f4ea3428def397db1e57f503694718772e32be3b8a90b5ebefc6

OS/ARCH	COMPRESSED SIZE	LAST PUSHED	TYPE	MANIFEST DIGEST
linux/amd64	20.45 MB	3 minutes ago by ahmadpsu	Image	sha256:5622baca...

Image Layers

Vulnerabilities

Image Layers

1 ADD file ... in / 3.46 MB

2 CMD ["/bin/sh"] 0 B

3 ENV PATH=/usr/local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/... 0 B

4 RUN /bin/sh -c set -eux; 444.46 KB

5 ENV GPG_KEY=7169605F62C751356D0854A26A821E680E5FA6305 0 B

6 ENV PYTHON_VERSION=3.13.0 0 B

7 ENV PYTHON_SHA256=086de5882e3cb310d4dca48457522e2e48018ecd43da9cdf827f... 0 B

8 RUN /bin/sh -c set -eux; 11.81 MB

9 RUN /bin/sh -c set -eux; 248 B

10 CMD ["python3"] 0 B

11 LABEL maintainer=agah@pdx.edu 0 B

12 COPY dir:794217660841bd1d2aec8341ba5b1ae7ebdfe695c83d979edd1d51c3... 3.01 KB

13 WORKDIR /app 0 B

14 /bin/sh -c pip install --no-cache 4.75 MB

15 ENTRYPOINT ["python3"] 0 B

16 CMD ["app.py"] 0 B

Command

ADD file:5758b97d8301c84a204a6e516241275d785a7cade40b2fb99f01fe122482e283 in /

0:45

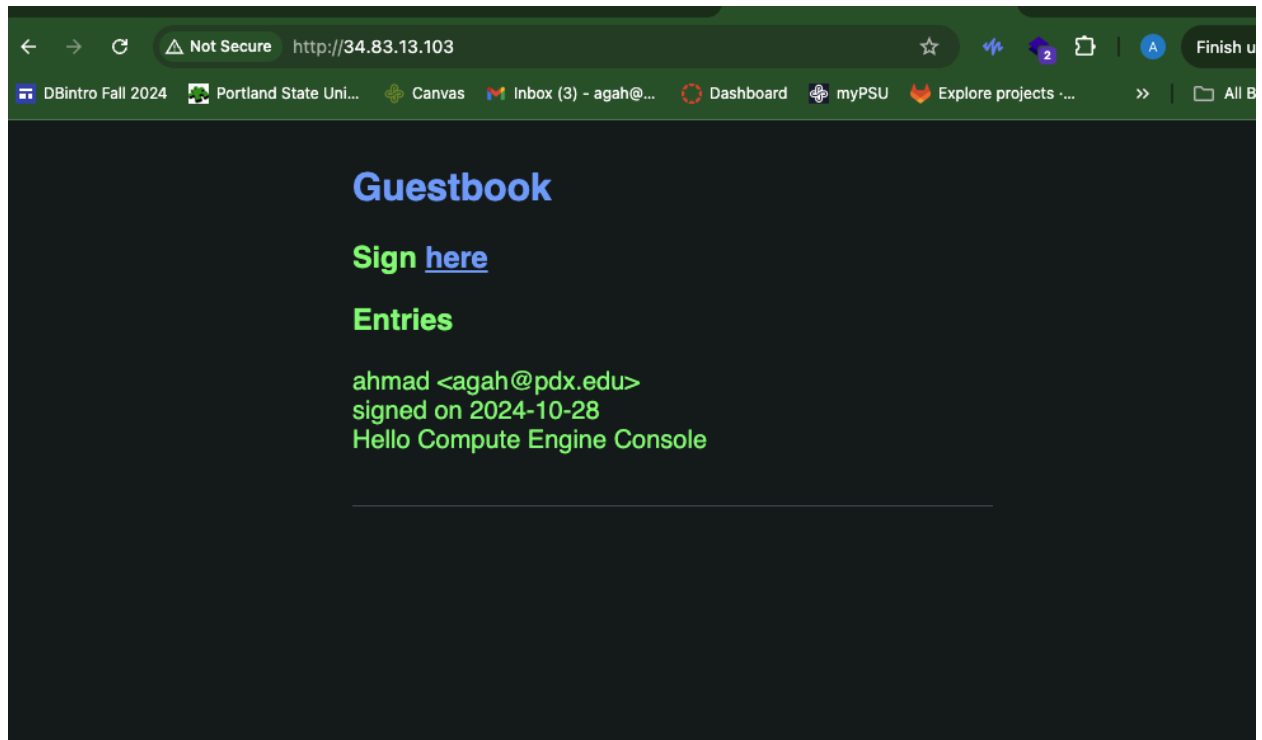
▶

⌕

⌕

4.2.10 Compute Engine Ubuntu VM deployment

- Take a screenshot of the entry that includes the VM's external IP address for your lab notebook



4.2.13

- Take a screenshot of the entry that includes the VM's external IP address for your lab notebook

