

Week#4 Labs

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04.1a: nginx EC2 Guestbook

1. EC2 VM

No screenshots required

2. Register a DNS name for VM



Create a dns record for an IP address instantly

The record *cs430-agrawal.ipq.co*

resolves to IP address *174.129.115.235*

Follow [@ipq_co](#) on twitter, [email us](#), or read [the blog](#)
[Terms of the use of this service.](#)

3. Checkout code

No screenshots required

4. Examine code

No screenshots required

5. Install the application

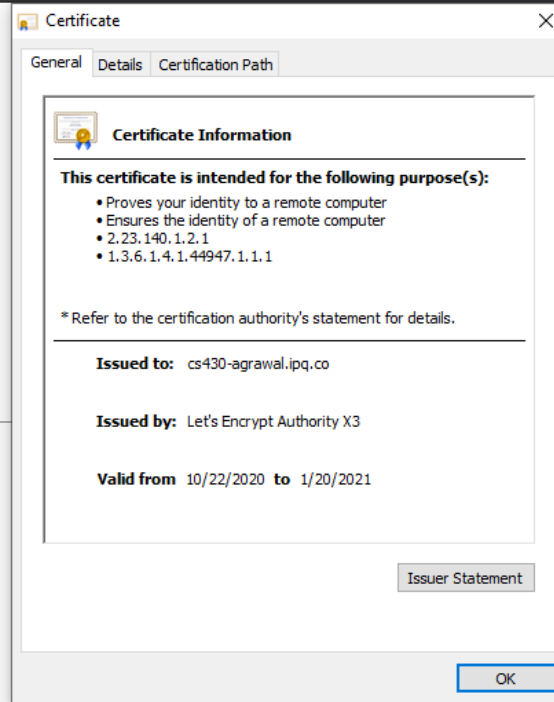
Bring the site up in a browser and note it's valid certificate. Add an entry to the guestbook, then show a screenshot of the site along with its Let's Encrypt certificate.

Guestbook

Sign [here](#)

Entries

Neha Agrawal <agrawal@pdx.edu>
signed on 2020-10-22
cs430-agrawal



6. Clean up

No screenshots required

04.1g: nginx Compute Engine Guestbook

1. Compute Engine VM

No screenshots required

2. Register a DNS name for VM



Create a dns record for an IP address instantly

The record **cs430-agrawal-psu.ipq.co**

resolves to IP address **34.83.34.162**

3. Checkout code

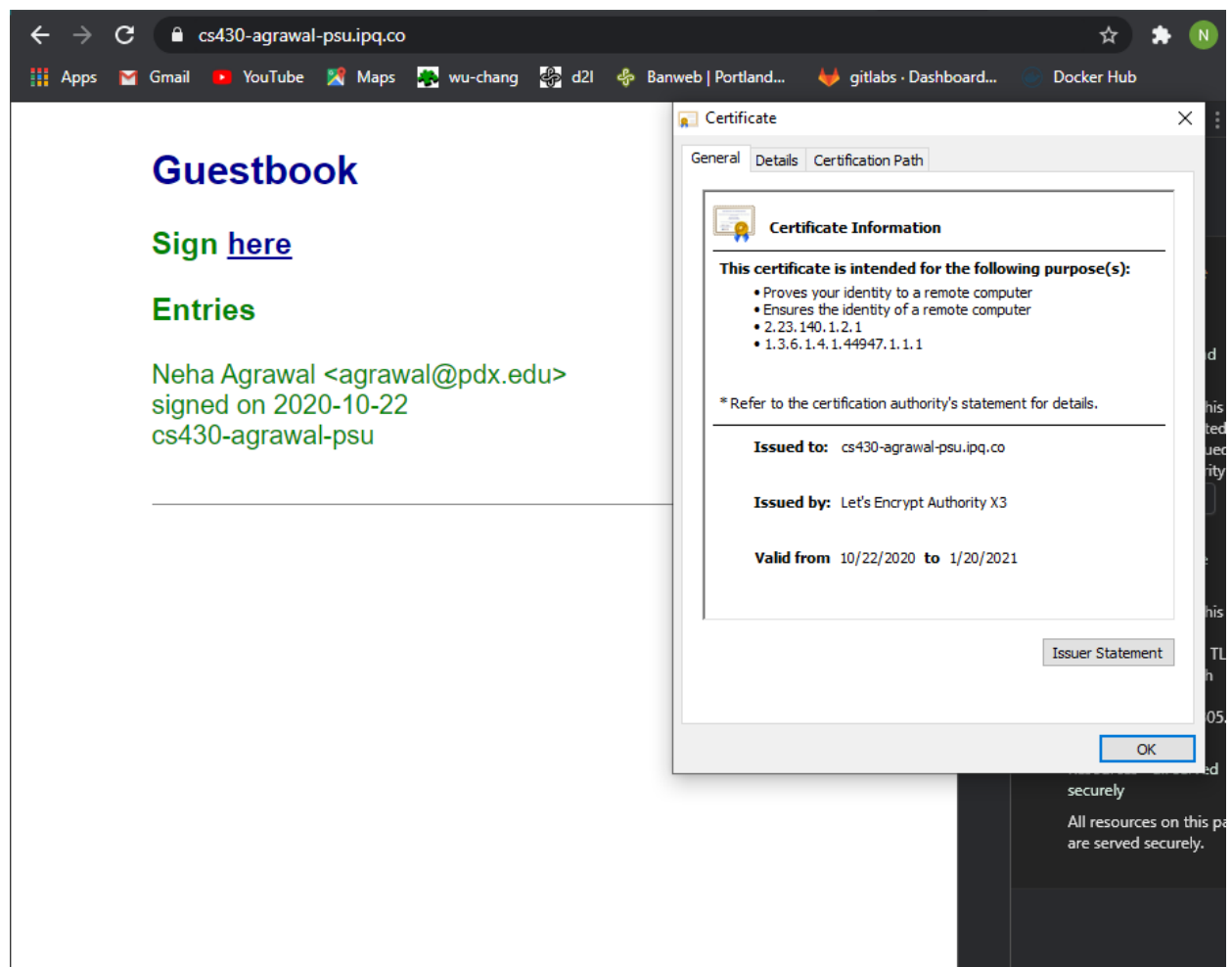
No screenshots required

4. Examine code

No screenshots required

5. Install the application

Bring the site up in a browser and note its valid certificate. Add an entry to the guestbook, then show a screenshot of the site along with its Let's Encrypt certificate



6. Clean up

No screenshots required

04.2g: Docker Guestbook

1. Containers

No screenshots required

2. Version 1: Ubuntu

No screenshots required

3. Build and run the Ubuntu-based container

Show the image generated and its size in a screenshot for your lab notebook using the command:

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
helloubuntu	latest	a0f304f2e5bd	28 seconds ago	446MB
ubuntu	18.04	56def654ec22	3 weeks ago	63.2MB

4. Docker commands

Within the container, show the contents of the current directory via `ls`, the contents of the file specifying the Linux standard base being used (`/etc/lsb-release`), and the output of the process listing command (`ps -ef`). Exit out of the shell and container.

1. `ls`
2. `cat /etc/lsb-release`
3. `ps -ef`

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker exec -it hellou /bin/bash
root@552f04263cb2:/app# ls
Dockerfile.alpine  app.py  index.py  requirements.txt  sign.pyc  templates
Dockerfile.ubuntu  gbmodel  index.pyc  sign.py          static
root@552f04263cb2:/app# cat /etc/lsb-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=18.04
DISTRIB_CODENAME=bionic
DISTRIB_DESCRIPTION="Ubuntu 18.04.5 LTS"
root@552f04263cb2:/app# ps -ef
```

UID	PID	PPID	C	STIME	TTY	TIME	CMD
root	1	0	0	23:04	?	00:00:00	python app.py
root	7	1	0	23:04	?	00:00:03	/usr/bin/python /app/app.py
root	23	0	0	23:11	pts/0	00:00:00	/bin/bash
root	34	23	0	23:11	pts/0	00:00:00	ps -ef

5. Docker Hub Ubuntu

No screenshots required

6. Running from Docker Hub

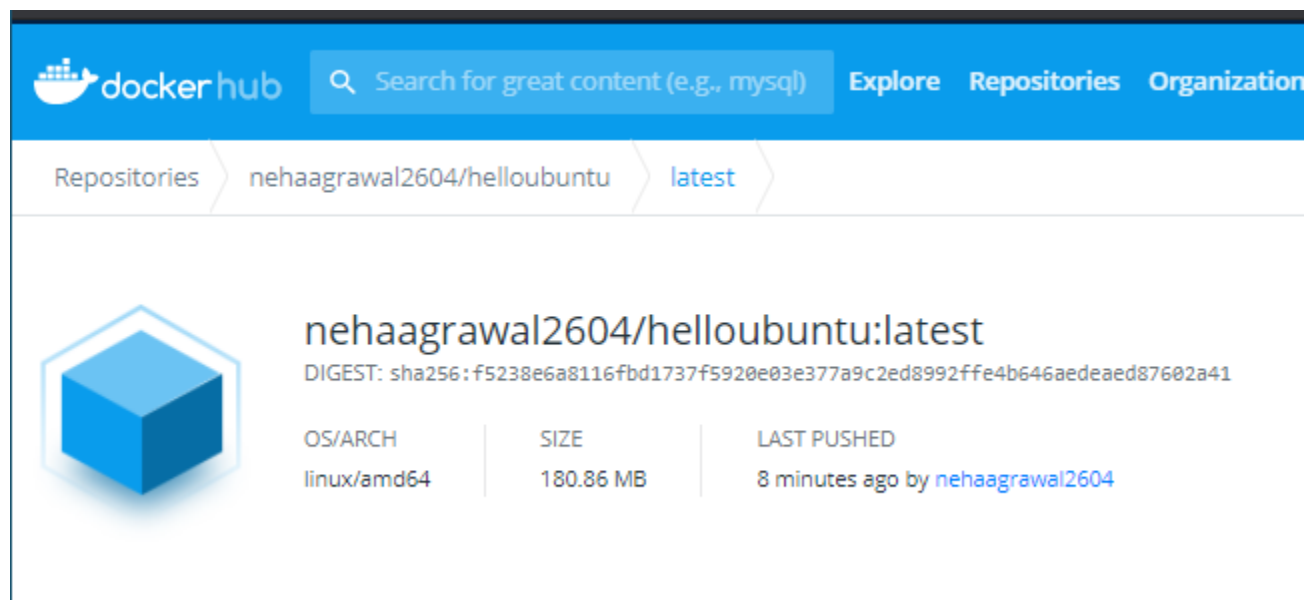
- Run the image directly from Docker Hub and show a screenshot of the output of the command in your lab notebook.

```
docker run -di -p 8000:5000 --name hellou <dockerhub_id>/helloubuntu
```

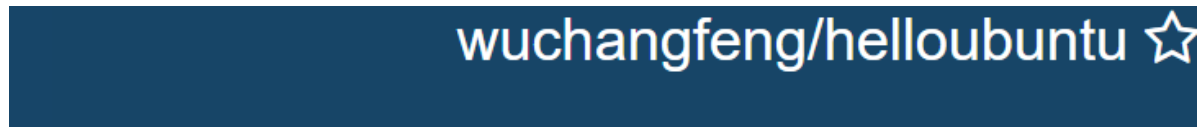
Output:

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker run -di -p 8000:5000 --name hellou
nehaagrawal2604/helloubuntu
Unable to find image 'nehaagrawal2604/helloubuntu:latest' locally
latest: Pulling from nehaagrawal2604/helloubuntu
171857c49d0f: Already exists
419640447d26: Already exists
61e52f862619: Already exists
05f3f4883fef: Pull complete
8d960613ebf8: Pull complete
676f0d0a82cb: Pull complete
33260fa4dcdd: Pull complete
Digest: sha256:f5238e6a8116fbd1737f5920e03e377a9c2ed8992ffe4b646aedeaed87602a41
Status: Downloaded newer image for nehaagrawal2604/helloubuntu:latest
25855b8511decccdd30e9d3697a56dee070a244c03d23a07087e7fd9a2b5cd85
```

- Then, log into Docker Hub with a web browser, navigate to the container image, and take a screenshot of the container image and its size.



- Finally, visit <https://microbadger.com/> and show the container image metadata using MicroBadger that describes the individual layers of the container. Note that if this site takes too long to return a result, you may visit the same container image name under the `wuchangfeng` account.



Metadata from image wuchangfeng/helloubuntu

Last inspected about a year ago.

Versions ▾

Tags	latest
Created	October 21, 2018 at 09:12 PM
ID	2105bc87d5d2
Maintainer	Your Name "yourname@[hidden]"
Download Size	186.1 MB
Labels	No labels
Layers	14

30.3 MB

ubuntu

bionic-20180821

What's this? -

30.3 MB

ADD file:3df374a69ce696c21058366678c1ceb89e11349e52d...

849 bytes

RUN set -xe && echo '#!/bin/sh' > /usr/sbin/policy...

469 bytes

RUN rm -rf /var/lib/apt/lists/*

853 bytes

RUN sed -i 's/^#s*(deb.*universe\)\$/\1/g' /etc/apt...

163 bytes

RUN mkdir -p /run/systemd && echo 'docker' > /run/sy...

CMD ["/bin/bash"]

30.3 MB

westwing/ubuntu-python

latest

What's this? -

30.3 MB

ADD file:3df374a69ce696c21058366678c1ceb89e11349e52d...

849 bytes

RUN set -xe && echo '#!/bin/sh' > /usr/sbin/policy...

469 bytes

RUN rm -rf /var/lib/apt/lists/*

853 bytes

RUN sed -i 's/^#s*(deb.*universe\)\$/\1/g' /etc/apt...

163 bytes

RUN mkdir -p /run/systemd && echo 'docker' > /run/sy...

CMD ["/bin/bash"]

7. Version 2: Alpine

No screenshots required

8. Build and run the Alpine-based container

- Show the image generated and its size in a screenshot for your lab notebook. How much smaller is the image?

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
helloalpine	latest	2f9586a036ca	33 seconds ago	54.4MB
python	alpine	dc68588b1801	19 hours ago	44.3MB
ubuntu	18.04	56def654ec22	3 weeks ago	63.2MB

The size of alpine-based docker image has reduced to 54.4 MB as compared to our previous ubuntu based docker image whose size was 446 MB

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

```
docker exec -it helloa /bin/bash
```

Output:

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/bash
OCI runtime exec failed: exec failed: container_linux.go:349: starting container process caused "exec: \"/bin/bash\": stat /bin/bash: no such file or directory": unknown
```

The reason for above output is: Our alpine-based docker image does not have the binary /bin/bash installed to reduce the image size. This facilitates quick startup and efficient storage.

- Then, replace /bin/bash with /bin/sh and repeat the command. Within the container, show the contents of the file specifying the Alpine release being used (/etc/alpine-release) and the output of the process listing command (ps -ef)

1. *cat /etc/alpine-release*

2. *ps -ef*

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/sh
/app # cat /etc/alpine-release
3.12.1
/app # ps -ef
PID   USER     TIME   COMMAND
    1  root      0:00   python app.py
     6  root      0:05   /usr/local/bin/python /app/app.py
    21  root      0:00   /bin/sh
    27  root      0:00   ps -ef
```


9. Docker Hub Alpine

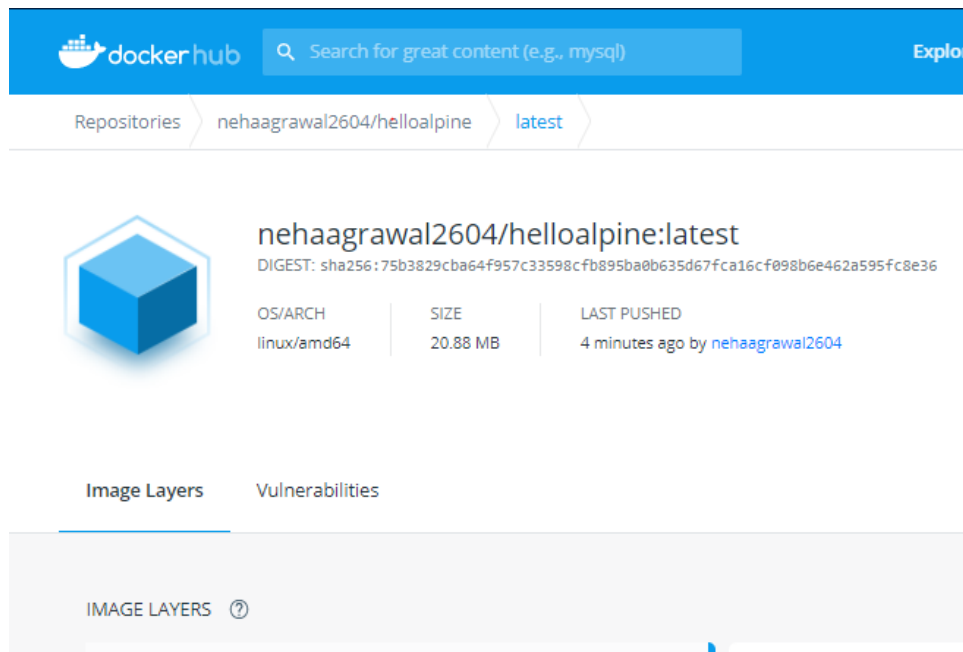
- Run the image directly from Docker Hub and show a screenshot of the output of the command in your lab notebook.

```
docker run -di -p 8000:5000 --name helloa <dockerhub_id>/helloalpine
```

Output:

```
agrawal@agrawal-VirtualBox:~/cs430-src/04_container_dockerhub$ docker run -di -p 8000:5000 --name
helloa nehaagrawal2604/helloalpine
Unable to find image 'nehaagrawal2604/helloalpine:latest' locally
latest: Pulling from nehaagrawal2604/helloalpine
188c0c94c7c5: Already exists
55578f60cda7: Already exists
692da2fcb614: Already exists
599e2857d4f0: Already exists
4b3bflabad55: Already exists
c3298040f4c3: Pull complete
5ce60546cddf: Pull complete
Digest: sha256:75b3829cba64f957c33598cfb895ba0b635d67fca16cf098b6e462a595fc8e36
Status: Downloaded newer image for nehaagrawal2604/helloalpine:latest
542bbae783f56c8106f64bec512ff2da6cc52b92f88135cddf61160619e75347
```

- Then, log into Docker Hub with a web browser, navigate to the container image, and take a screenshot of the container image and its size.



- Finally, visit <https://microbadger.com/> and show the container image metadata using MicroBadger that describes the individual layers of the container. Note that if this site takes too long to return a result, you may visit the same container image name under the wuchangfeng account.

Metadata from image wuchangfeng/helloalpine

Last inspected about a year ago.

Versions ▾

Tags	latest
Created	August 07, 2018 at 04:32 PM
ID	b6670a9eae0f
Maintainer	Your Name "yourname@[hidden]"
Download Size	32.7 MB
Labels	No labels
Layers	18

28.7 MB

python Untagged version created on August 03, 2018

What's this?

2.1 MB

ADD file:25f61d70254b9807a40cd3e8d820f6a5ec0e1e596de...

CMD ["/bin/sh"]

ENV PATH=/usr/local/bin:/usr/local/sbin:/usr/local/b...

ENV LANG=C.UTF-8

301.8 kB

RUN apk add --no-cache ca-certificates

ENV GPG_KEY=8096DF4D4110E5C43F8FB17F2D347EA6AA65421D

ENV PYTHON_VERSION=3.7.0

24.6 MB

RUN set -ex && apk add --no-cache --virtual .fetch-...

233 bytes

RUN cd /usr/local/bin && ln -s idle3 idle && ln -s...

ENV PYTHON_PIP_VERSION=18.0

1.7 MB

RUN set -ex; wget -O get-pip.py 'https://bootstrap...

CMD ["python3"]

5.2 kB

MAINTAINER Your Name "yourname@[hidden]"

COPY dir:a6be75f6b88f374fd23e62125e702b7741a7567f172c11a487ca7c53386...

WORKDIR /app

4.0 MB

RUN pip install -r requirements.txt

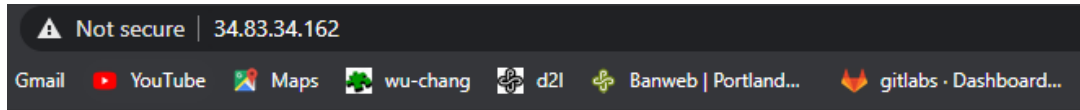
ENTRYPOINT ["python"]

32 bytes

CMD ["app.py"]

10. Compute Engine Ubuntu VM deployment

Show in a screenshot that the site is running via the VM's external IP address with a guestbook entry with the message "Hello Compute Engine + Docker!"



Guestbook

Sign [here](#)

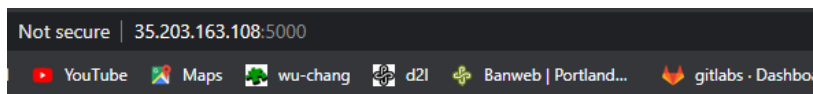
Entries

Neha Agrawal <agrawal@pdx.edu>
signed on 2020-10-23
"Hello Compute Engine + Docker!"

11. Compute Engine ContainerOS VM deployment (1)

No screenshots required

12. Compute Engine ContainerOS VM deployment (2)



Guestbook

Sign [here](#)

Entries

Neha Agrawal <agrawal@pdx.edu>
signed on 2020-10-23
Hello ContainerOS!

13. Clean up

No screenshots required