

Week #4 Labs

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04.1g: nginx Compute Engine Guestbook

6. Install the application

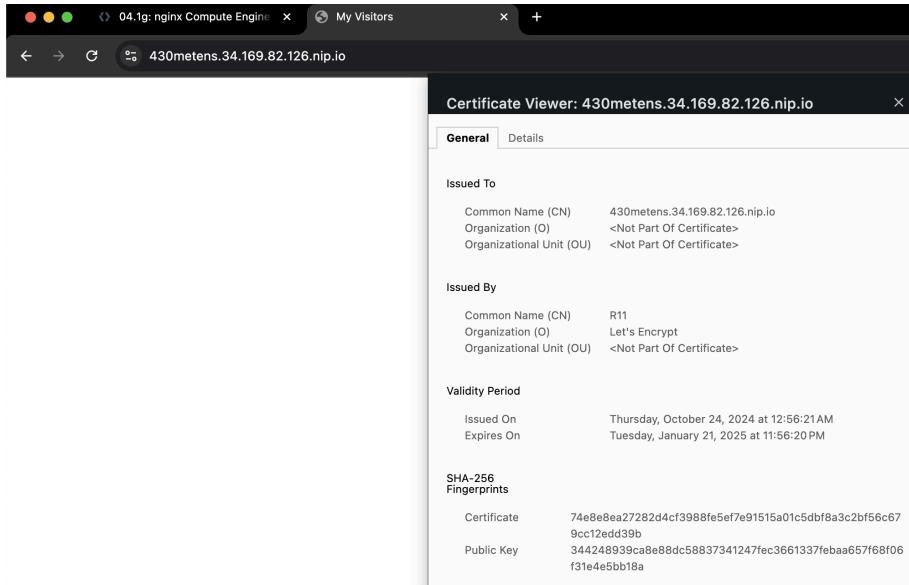
The screenshot shows a web browser window with the title "04.1g: nginx Compute Engine". The address bar contains the URL "430metens.34.169.82.126.nip.io". The page content is a guestbook application titled "Guestbook". It features a "Sign here" button and a list of entries. The first entry is by "Nathan Metens <metens@pdx.edu>" signed on "2024-10-24". A sidebar on the left provides options like "Connection is secure", "Cookies and site data", "Site settings", and "About this page".

Guestbook

[Sign here](#)

Entries

Nathan Metens <metens@pdx.edu>
signed on 2024-10-24
04.1g: nginx Compute Engine Guestbook



04.2g. Docker Guestbook

3. Build and run the Ubuntu-based container

```

--> Running in a667993bd5ce
Removing intermediate container a667993bd5ce
--> 6b1ef4bccb6f
Step 7/9 : RUN pip install -r requirements.txt
--> Running in 56a0c496f874
Collecting flask
  Downloading flask-3.0.3-py3-none-any.whl (101 kB)
Collecting click>=8.1.3
  Downloading click-8.1.7-py3-none-any.whl (97 kB)
Collecting Werkzeug>=3.0.0
  Downloading werkzeug-3.0.6-py3-none-any.whl (227 kB)
Collecting Jinja2>=3.1.2
  Downloading jinja2-3.1.4-py3-none-any.whl (133 kB)
Collecting blinker>=1.6.2
  Downloading blinker-1.8.2-py3-none-any.whl (9.5 kB)
Collecting importlib-metadata>=3.6.0; python_version < "3.10"
  Downloading importlib_metadata-3.6.0-py3-none-any.whl (26 kB)
Collecting itsdangerous>=2.1.2
  Downloading itsdangerous-2.2.0-py3-none-any.whl (16 kB)
Collecting MarkupSafe>=2.1.1
  Downloading MarkupSafe-2.1.5-cp38-cp38-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (26 kB)
Collecting zipp>=3.20
  Downloading zipp-3.20.2-py3-none-any.whl (9.2 kB)
Installing collected packages: click, MarkupSafe, Werkzeug, Jinja2, blinker, zipp, importlib-metadata, itsdangerous, flask
Successfully installed Jinja2-3.1.4 MarkupSafe-2.1.5 Werkzeug-3.0.6 blinker-1.8.2 click-8.1.7 flask-3.0.3 importlib-metadata-3.6.0
Removing intermediate container 56a0c496f874
--> 078212157d00
Step 8/9 : ENTRYPOINT ["python3"]
--> Running in f2af21cf84c
Removing intermediate container f2af21cf84c
--> 0cabdb774793
Step 9/9 : CMD ["app.py"]
--> Running in e1d60324c3ee
Removing intermediate container e1d60324c3ee
--> 3e42bc87ffe5
Successfully built 3e42bc87ffe5
Successfully tagged helloubuntu:latest
metens@course-vml:~/cs430-src/04_container_dockerhub$ docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
helloubuntu    latest   3e42bc87ffe5   9 seconds ago   453MB
ubuntu          20.04   6013aela63c2   2 weeks ago    72.8MB
metens@course-vml:~/cs430-src/04_container_dockerhub$ 
```

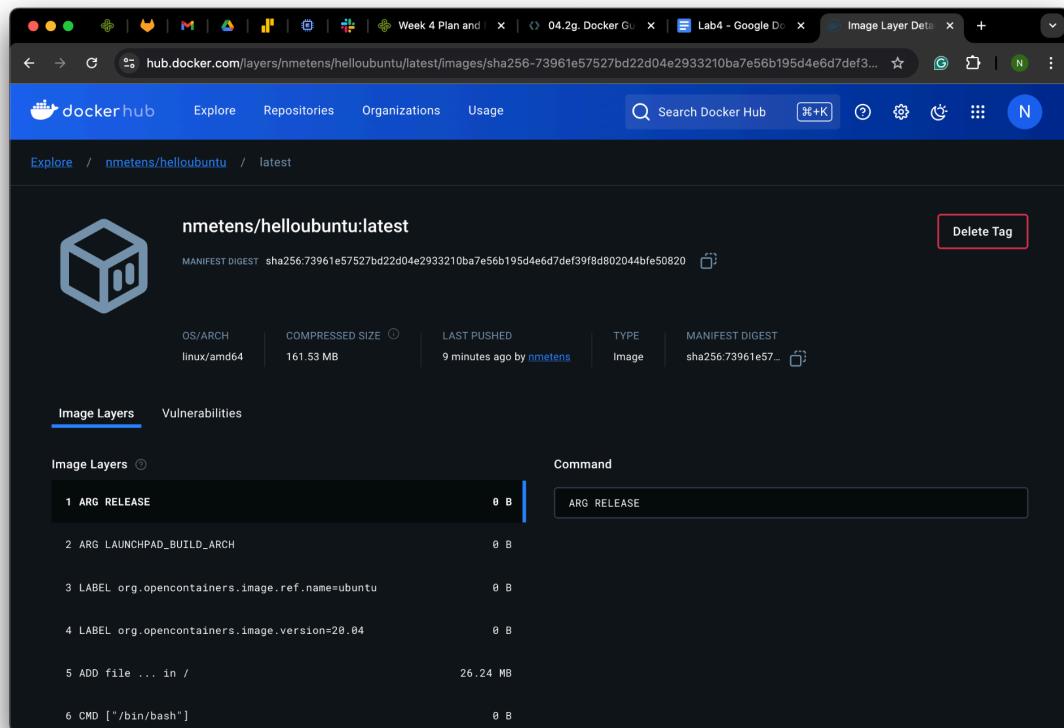
6. Running from Docker Hub

```
metens@course-vml:~/cs430-src/04_container_dockerhub$ docker images
REPOSITORY          TAG      IMAGE ID   CREATED             SIZE
helloubuntu        latest   3e42bc87ffe5  16 minutes ago  453MB
nmetens/helloubuntu latest   3e42bc87ffe5  16 minutes ago  453MB
ubuntu              20.04   6013aela163c2  2 weeks ago   72.8MB
metens@course-vml:~/cs430-src/04_container_dockerhub$ docker rmi helloubuntu nmetens/helloubuntu
Untagged: helloubuntu:latest
Untagged: nmetens/helloubuntu:latest
Untagged: nmetens/helloubuntu@sha256:73961e57527bd22d04e2933210ba7e56b195d4e6d7def39f8d802044bfe50820
Deleted: sha256:3e42bc87ffef54bf5049fb3dc1a1ce1ed6c611c3c28da8cee5a52bdab42c73b
Deleted: sha256:ocabdb7747931e3c5f96165fa2d731ab8dd5190b50df90f291aaaebff05ab019
Deleted: sha256:07821215e003e2e123c52187e009736686c608baca00fdb2733733794bb37e0
Deleted: sha256:f6749a4f2e3ce04e05f7b588c501e5a80a5005f967623bde15aa0a8cfb3c46
Deleted: sha256:b4f1eb42bc6b7ff1241cb73a5d5b9fb0f58eb8947bdc8c0505748cfcdff7e6560e
Deleted: sha256:d4f52e9c05edd492104c089bba467924199ffda40aff963d28f3dedaf4858f0
Deleted: sha256:ebcc4425c8e3b7ff01eeacf565eb30345d9cf1cf3fa9b46fcfc28d27e3aa2eda465
Deleted: sha256:0b8d4715076364760f617ac0b45b7e90e272a4cd3d3a6780f42cb366b9ee994
Deleted: sha256:301c6dcacf2588f27f544362930577dadeff066c3e2895139010284285fe50
Deleted: sha256:79bd9c6bb5f7b3976ff24a6ed7844f0258b5d3e9bf40586fc621b31b63ec1fb
Deleted: sha256:88d3c6edc054ba47cf3632c7f84ec85fb120d37f44c8aa3b237472276999f6
Deleted: sha256:86f50d778a1962aa722cbe8d16843e19f2f055cbbad2aa2613d902154975a7b8
metens@course-vml:~/cs430-src/04_container_dockerhub$ docker run -di -p 8000:5000 --name hellou nmetens/helloubuntu
Unable to find image 'nmetens/helloubuntu:latest' locally
latest: Pulling from nmetens/helloubuntu
d9802f03d67: Already exists
ebb1a6d44c3: Pull complete
e96e4ef2d2c9b: Pull complete
068ff3463e61: Pull complete
4eb08630bb5c5: Pull complete
Digest: sha256:73961e57527bd22d04e2933210ba7e56b195d4e6d7def39f8d802044bfe50820
Status: Downloaded newer image for nmetens/helloubuntu:latest
1b43f8206180441ff248ee88e5f60f2fb92ba2392f80f0701c379bc3234cca24
metens@course-vml:~/cs430-src/04_container_dockerhub$ curl http://127.0.0.1:8000
<!doctype html>
<html>
<title>My Visitors</title>
<link rel="stylesheet" type="text/css href="/static/style.css">
<div class=page>

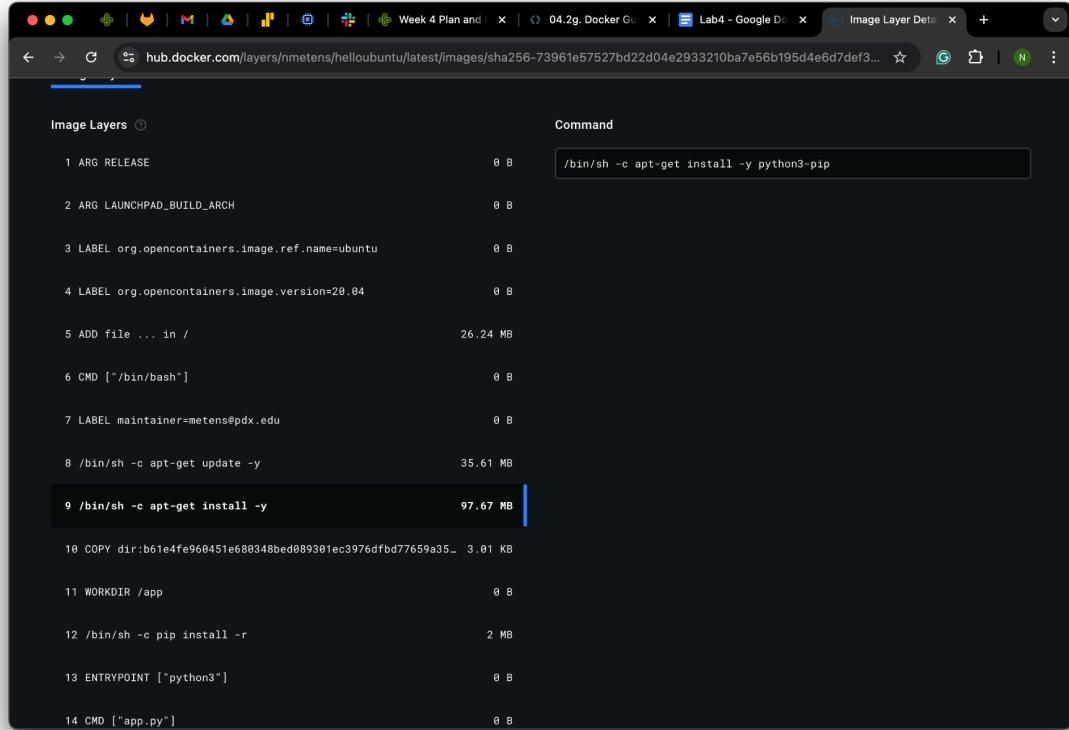
    <h2>Guestbook</h2>

    <h3>Sign <a href="/sign/">here</a></h3>
    <h3>Entries</h3>

</div>
</html>metens@course-vml:~/cs430-src/04_container_dockerhub$
```



The total size of the image is 161.53 MB. Layer 9 adds the most to the container image. The command on layer 9: /bin/sh -c apt-get install -y python3-pip adds 97.67 MB to the image.



Layer	Command	Size
1	ARG RELEASE	0 B
2	ARG LAUNCHPAD_BUILD_ARCH	0 B
3	LABEL org.opencontainers.image.ref.name=ubuntu	0 B
4	LABEL org.opencontainers.image.version=20.04	0 B
5	ADD file ... in /	26.24 MB
6	CMD ["/bin/bash"]	0 B
7	LABEL maintainer=metens@pdx.edu	0 B
8	/bin/sh -c apt-get update -y	35.61 MB
9	/bin/sh -c apt-get install -y python3-pip	97.67 MB
10	COPY dir:b61e4fe960451e680348bed089301ec3976dfbd77659a35.. 3.01 KB	
11	WORKDIR /app	0 B
12	/bin/sh -c pip install -r	2 MB
13	ENTRYPOINT ["python3"]	0 B
14	CMD ["app.py"]	0 B

8. Build and run the Alpine-based container

```
metens@course-vml:~/cs430-src/04_container_dockerhub$ docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
helloalpine     latest   9e1c1d26d257  7 seconds ago  57.3MB
python          alpine   408c9504056e  7 days ago   44.6MB
ubuntu          20.04   6013ae1a63c2  2 weeks ago  72.8MB
metens@course-vml:~/cs430-src/04_container_dockerhub$
```

The `docker images` command shows that the **helloalpine** image is **57.3 MB**. In the previous `docker images` command ran in step 6 above, the **helloubuntu** image was **453 MB**, about 8 times larger than the alpine image.

```
metens@course-vml:~/cs430-src/04_container_dockerhub$ docker run -p 8000:5000 --name helloa -di helloalpine
202c7838ea9f051c84e98241ef8d0a0dfb7df7af7a4c99ef73e6b962acdd
metens@course-vml:~/cs430-src/04_container_dockerhub$ curl http://127.0.0.1:8000
<!DOCTYPE html>
<html>
<title>My Visitors</title>
<link rel="stylesheet" type="text/css" href="/static/style.css">
<div class="page">

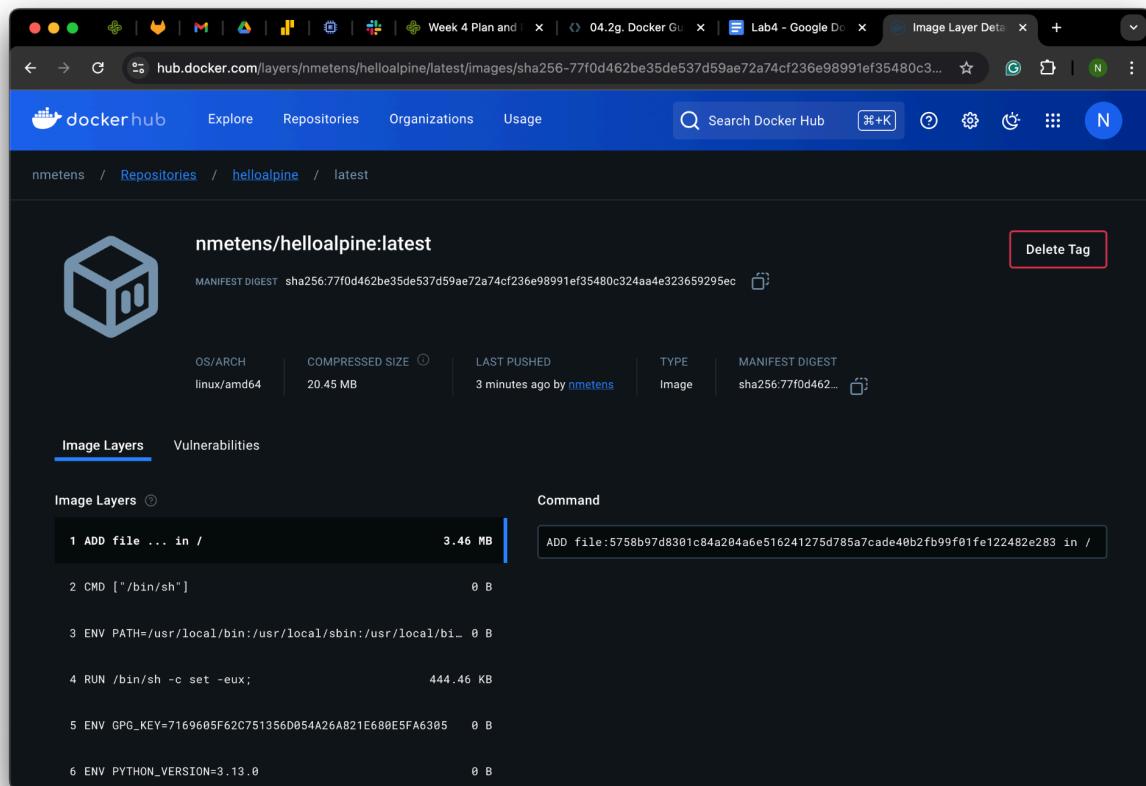
<h2>Guestbook</h2>
<h3>Sign <a href="/sign/">here</a></h3>
<h3>Entries</h3>

</div>
</html>metens@course-vml:~/cs430-src/04_container_dockerhub$ docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
202c7838ea9f        "python3 app.py"   23 seconds ago    Up 22 seconds    0.0.0.0:8000->5000/tcp, :::8000->5000/tcp   helloa
metens@course-vml:~/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
```

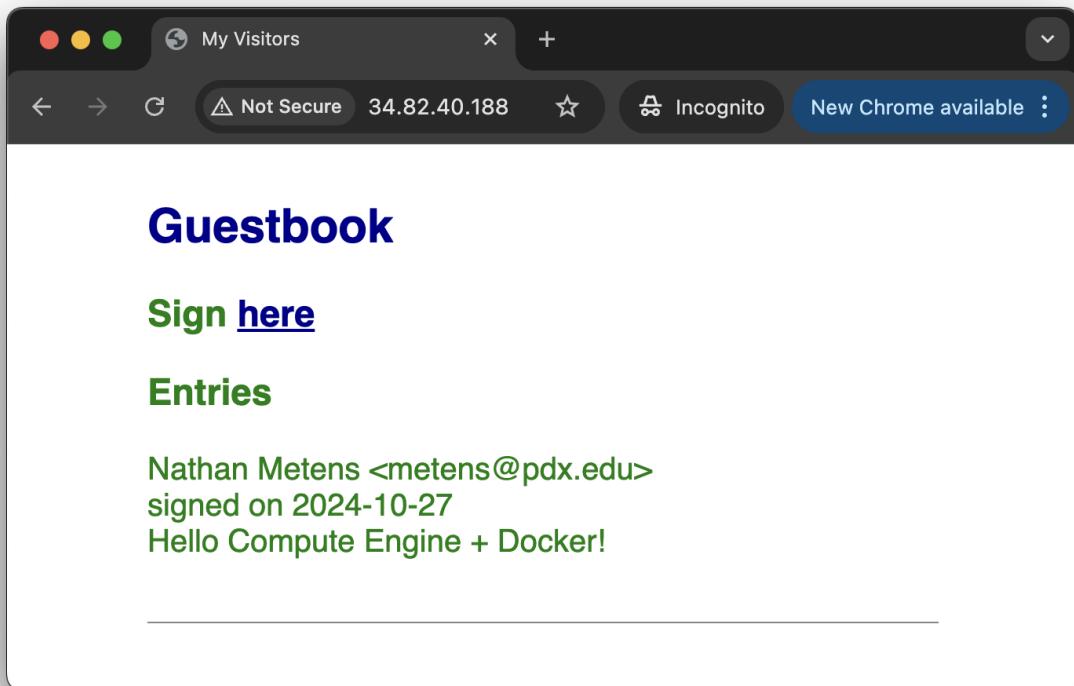
After running the `docker exec -it helloa /bin/bash` command, we see an OCI runtime exec fail. The directory `/bin/bash` doesn't exist.

```
mtenes@course-vml:~/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
mtenes@course-vml:~/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/sh
/app # /etc/alpine-release
/bin/sh: /etc/alpine-release: Permission denied
/app # /etc/alpine-release
/bin/sh: /etc/alpine-release: Permission denied
/app # ps -ef
PID  USER      TIME  COMMAND
  1 root      0:00  python3 app.py
  7 root      0:01  /usr/local/bin/python3 app.py
 57 root      0:00  /bin/sh
 66 root      0:00  ps -ef
/app #
```

9. Docker Hub Alpine



10. Compute Engine Ubuntu VM deployment



13. -

