

# CS 530 INTERNET WEB AND CLOUD SYSTEMS

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# nginx Compute Engine Guestbook

## Compute Engine VM

cloud-CS-530-karinje-vkar... Search for resources, docs, products, and more

VM instances CREATE INSTANCE IMPORT VM REFRESH START / RESUME STOP SUSPEND RESET DELETE CREATE SCHEDULE

INSTANCES INSTANCE SCHEDULES

Get monitoring and logging insights for your VMs by installing Ops Agent. [Learn more](#)

VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)

Filter Enter property name or value

Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input checked="" type="checkbox"/>	webdev-lab	us-west1-b			10.138.0.11 (nic0)	34.127.10.236 (nic0)	SSH

Related actions

- Explore Backup and DR **NEW**  
Back up your VMs and set up disaster recovery
- View billing report  
View and manage your Compute Engine billing
- Monitor VMs  
View outlier VMs across metrics like CPU and network
- Explore VM logs  
View, search, analyze, and download VM instance logs
- Set up firewall rules  
Control traffic to and from a VM instance
- Patch management  
Schedule patch updates and view patch compliance on VM instances

## Register a DNS name for VM

noip Support English vkarinje@pdx.edu

Hostnames

Create Hostname Search...

Hostname	Last Update	IP / Target	Type
cs410vkarinje.hopto.org	Oct 22, 2022 17:56 PDT	34.127.10.236	A

Help with Hostnames

**Configure Your No-IP Hostname**  
Ever wondered what the difference is between Round Robin, A, CNAME records, and more? A quick guide of each DNS record type as well as how you would use them.

**No-IP Referral Program**  
Ready to Earn \$5 in No-IP Credits For Every Paid Customer That You Refer to No-IP?

## Checkout code

```
ssh.cloud.google.com/v2/ssh/projects/cloud-cs-530-karinje-vkarinje/zones/us-west1-b/instances/webdev-lab?authuser=0&hl=en_U...
SSH-in-browser
UPLOAD FILE
DOWNLOAD FILE

Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1021-gcp x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Sun Oct 23 00:58:21 UTC 2022

System load:  0.24           Processes:            100
Usage of /:   18.9% of 9.51GB Users logged in:             0
Memory usage: 5%           IPv4 address for ens4: 10.138.0.11
Swap usage:   0%

0 updates can be applied immediately.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

vkarinje@webdev-lab:~$ git clone https://github.com/wu4f/cs430-src
Cloning into 'cs430-src'...
remote: Enumerating objects: 893, done.
remote: Counting objects: 100% (19/19), done.
remote: Compressing objects: 100% (4/4), done.
remote: Total 893 (delta 17), reused 15 (delta 15), pack-reused 874
Receiving objects: 100% (893/893), 184.93 KiB | 10.27 MiB/s, done.
Resolving deltas: 100% (461/461), done.
vkarinje@webdev-lab:~$ cd cs430-src/03_nginx_gunicorn_certbot
vkarinje@webdev-lab:~/cs430-src/03_nginx_gunicorn_certbot$
```

## Install the application

```
vkarinje@webdev-lab:~$ cd cs430-src/03_nginx_gunicorn_certbot
vkarinje@webdev-lab:~/cs430-src/03_nginx_gunicorn_certbot$ nano install.sh
vkarinje@webdev-lab:~/cs430-src/03_nginx_gunicorn_certbot$ nano install.sh
vkarinje@webdev-lab:~/cs430-src/03_nginx_gunicorn_certbot$ nano install.sh
vkarinje@webdev-lab:~/cs430-src/03_nginx_gunicorn_certbot$ sudo ./install.sh <cs410vkarinje.hopto.org>
-bash: syntax error near unexpected token `newline'
vkarinje@webdev-lab:~/cs430-src/03_nginx_gunicorn_certbot$ sudo ./install.sh cs410vkarinje.hopto.org
Hit:1 http://us-west1.gce.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://us-west1.gce.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://us-west1.gce.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://us-west1.gce.archive.ubuntu.com/ubuntu focal/universe amd64 Packages [8628 kB]
Get:6 http://us-west1.gce.archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:7 http://us-west1.gce.archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]
Get:8 http://us-west1.gce.archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [144 kB]
Get:9 http://us-west1.gce.archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:10 http://us-west1.gce.archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]
Get:11 http://us-west1.gce.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2191 kB]
Get:12 http://us-west1.gce.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [385 kB]
```

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

cs410vkarinje.hopto.org

## Guestbook

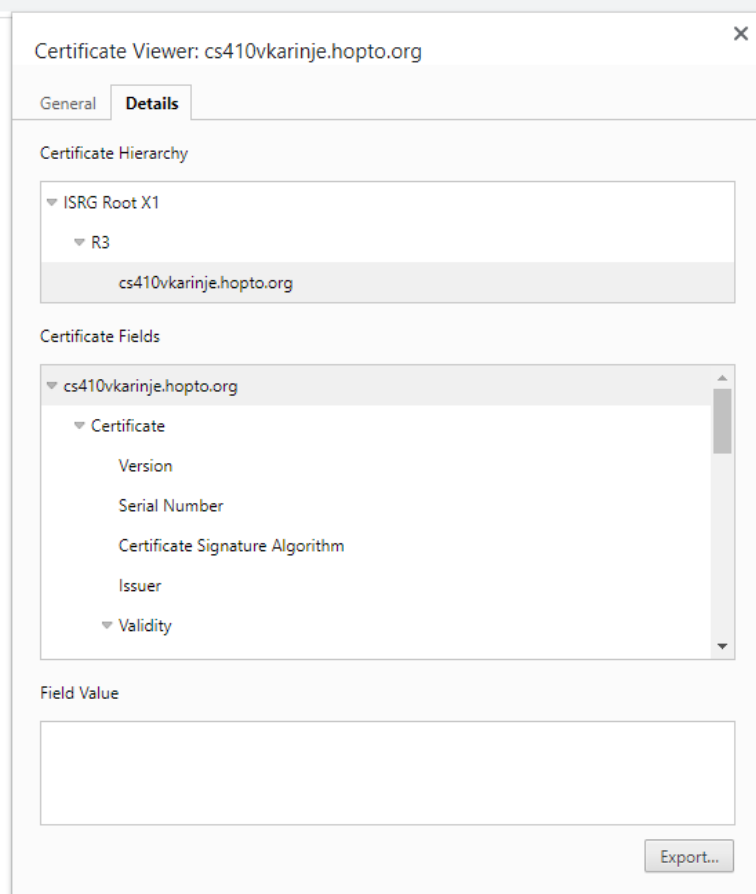
Sign [here](#)

### Entries

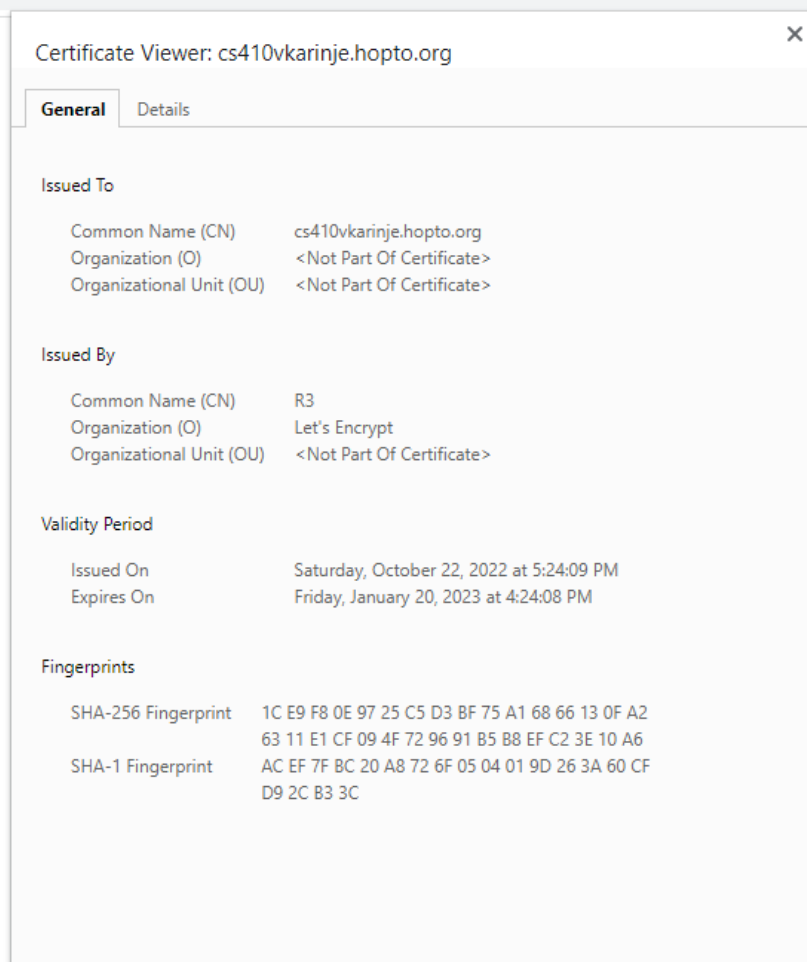
Varsha Karinje <vkarinje@pdx.edu>  
signed on 2022-10-23  
Trying lab

---

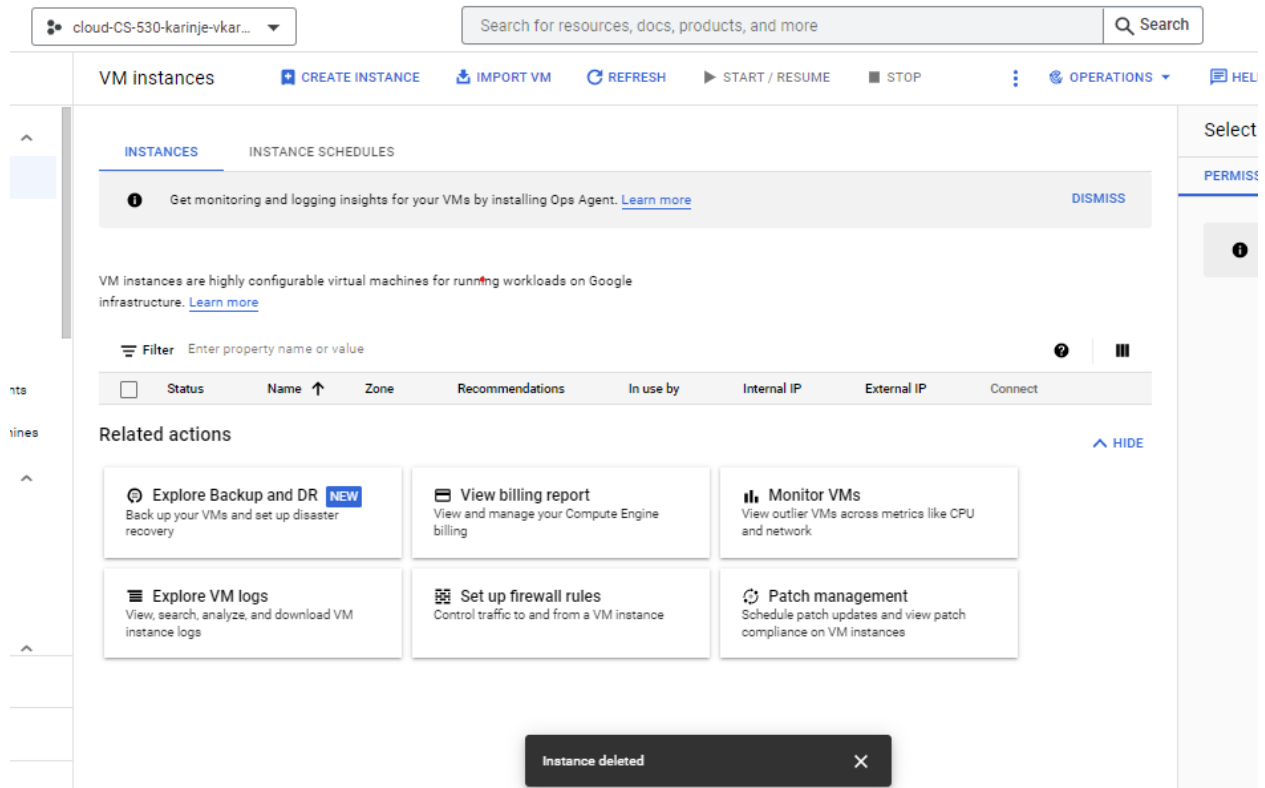
cs410vkarinje.hopto.org



cs410vkarinje.hopto.org



# Clean up



## Docker Guestbook

### Containers

```

vkarinje@vkarinje-VirtualBox: ~/cs430-src/04_container_dock...
vkarinje@vkarinje-VirtualBox:~$ git clone https://github.com/wu4f/cs430-src
fatal: destination path 'cs430-src' already exists and is not an empty directory
vkarinje@vkarinje-VirtualBox:~$ cd cs430-src/04_container_dockerhub
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

### Build and run the Ubuntu-based container

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

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker images
REPOSITORY      TAG         IMAGE ID      CREATED        SIZE
helloubuntu     latest     7ec743bd4b8f  32 seconds ago 460MB
ubuntu          18.04      71cb16d32be4  2 weeks ago   63.1MB
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Then, create a running instance of the `helloubuntu` image and name it `hellou` (`--name`). Have the container run in detached mode (`-d`) without an interactive shell and map the host's port 8000 to the container port 5000 (`-p 8000:5000`).

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker run -p 8000:5000 --name hellou -di helloubuntu
9cb28acad5f1c8dd823f9bd90617d93e5a7aab6a70ed708866eb816ea77bc834
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

## Docker commands

See that it is no longer running via:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS
PORTS         NAMES
9cb28acad5f1  helloubuntu "python app.py"         14 minutes ago Up 14 minutes
0.0.0.0:8000->5000/tcp, :::8000->5000/tcp  hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Then, start the container via its name:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker start hellou
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

To get an interactive shell on the container, perform the following:

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`).



```

root@9cb28acad5f1: /etc
llou
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker exec -it
hellou /bin/bash
root@9cb28acad5f1:/app# ls
Dockerfile.alpine  app.py  index.py  requirements.txt  sign.pyc  templates
Dockerfile.ubuntu  gbmodel  index.pyc  sign.py          static
root@9cb28acad5f1:/app# cd ..
root@9cb28acad5f1:/# ls
app  boot  etc  lib  media  opt  root  sbin  sys  usr
bin  dev  home  lib64  mnt  proc  run  srv  tmp  var
root@9cb28acad5f1:/# cd /etc/lsb-release
bash: cd: /etc/lsb-release: Not a directory
root@9cb28acad5f1:/# cd /etc
root@9cb28acad5f1:/etc# ls
X11                  hostname             mke2fs.conf          rc6.d
adduser.conf         hosts                mtab                 rcS.d
alternatives         init.d              network              resolv.conf
apt                  inputrc             networks             rmt
bash.bashrc          issue               nsswitch.conf        rpc
bindresvport.blacklist  issue.net           opt                  security
ca-certificates      kernel              os-release           security
ca-certificates.conf  ld.so.cache         pam.conf             selinux
cron.daily            ld.so.conf          pam.d                services

```

```

root@9cb28acad5f1: /etc
ca-certificates.conf  ld.so.cache         pam.conf             selinux
cron.daily            ld.so.conf          pam.d                services
dbus-1               ld.so.conf.d        passwd              shadow
debconf.conf         ldap                passwd-             shadow-
debian_version       legal               perl                shells
default              libaudit.conf       profile             skel
deluser.conf         logcheck            profile.d           ssl
dpkg                 login.defs          protocols           subgid
environment          logrotate.d         python              subuid
fstab                lsb-release         python2.7           sysctl.conf
gai.conf             machine-id          rc0.d               sysctl.d
group                magic               rc1.d               systemd
group-               magic.mime          rc2.d               terminfo
gshadow              mailcap             rc3.d               update-motd.d
gshadow-             mailcap.order       rc4.d               xdg
host.conf            mime.types          rc5.d

root@9cb28acad5f1:/etc# cd lsb-release
bash: cd: lsb-release: Not a directory
root@9cb28acad5f1:/etc# cat /etc/lsb-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=18.04
DISTRIB_CODENAME=bionic
DISTRIB_DESCRIPTION="Ubuntu 18.04.6 LTS"
root@9cb28acad5f1:/etc#

```

```

root@9cb28acad5f1: /etc
deluser.conf    logcheck        profile.d        ssl
dpkg            login.defs      protocols       subgid
environment     logrotate.d     python          subuid
fstab           lsb-release     python2.7       sysctl.conf
gai.conf        machine-id      rc0.d           sysctl.d
group           magic           rc1.d           systemd
group-          magic.mime      rc2.d           terminfo
gshadow         mailcap         rc3.d           update-motd.d
gshadow-        mailcap.order   rc4.d           xdg
host.conf       mime.types      rc5.d

root@9cb28acad5f1:/etc# cd lsb-release
bash: cd: lsb-release: Not a directory
root@9cb28acad5f1:/etc# cat /etc/lsb-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=18.04
DISTRIB_CODENAME=bionic
DISTRIB_DESCRIPTION="Ubuntu 18.04.6 LTS"
root@9cb28acad5f1:/etc# ps -ef
UID          PID    PPID  C STIME TTY          TIME CMD
root           1         0  0  02:30 ?        00:00:00 python app.py
root           7         1  1  02:30 ?        00:00:07 /usr/bin/python /app/app.py
root          10         0  0  02:31 pts/0    00:00:00 /bin/bash
root          23        10  0  02:42 pts/0    00:00:00 ps -ef
root@9cb28acad5f1:/etc#

```

Stop the container again.

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker stop hel
lou
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Then remove the container from the system.

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker stop hel
lou
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker rm hello
u
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

## Docker Hub Ubuntu

Using your credentials setup at the beginning of the course, login to Docker Hub.

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't
have a Docker ID, head over to https://hub.docker.com to create one.
Username: vkarinje
Password:
WARNING! Your password will be stored unencrypted in /home/vkarinje/.docker/conf
ig.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Similar to git, docker can upload the image to the registry using a push command:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker push vka
rinje/helloubuntu
Using default tag: latest
The push refers to repository [docker.io/vkarinje/helloubuntu]
99ede0f5a732: Pushed
444516ea2318: Pushed
5164bb1883bc: Pushed
fc38954422fa: Pushed
b9b23e654574: Mounted from library/ubuntu
latest: digest: sha256:b6b12565a5acc973d37192f8606bae12bdcc4d2ada0625e5ec0d447cd
620655a size: 1373

```

## Running from Docker Hub

We will now look to run the container image straight from Docker Hub. Examine the container images you've created and tagged so far:

```

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

```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
helloubuntu	latest	7ec743bd4b8f	About an hour ago	460MB
vkarinje/helloubuntu	latest	7ec743bd4b8f	About an hour ago	460MB
ubuntu	18.04	71cb16d32be4	2 weeks ago	63.1MB

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Then delete both of them via their names with the remove image command:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker rmi hell
oubuntu vkarinje/helloubuntu
Untagged: helloubuntu:latest
Untagged: vkarinje/helloubuntu:latest
Untagged: vkarinje/helloubuntu@sha256:b6b12565a5acc973d37192f8606bae12bdcc4d2ada
0625e5ec0d447cd620655a
Deleted: sha256:7ec743bd4b8f9147bba938b76a157bda718dfbe77e6e22c2128bc45bdf268db5
Deleted: sha256:75f5c9470d4e6419749d84d9d967a6d0f747be72863effc3a717fb4fdb87e75e
Deleted: sha256:b935f23e9e51701fa62f2563cf6bfeed4a042d7958467a5363ee98790fb89c0b
Deleted: sha256:7929758153619f33dab7b8fc81993e30cd8d442acf605e354ecbea72894db16f
Deleted: sha256:9e45781c238cfa40550a676a21e2742769aada1cc6a808ea41b6824bfc2de439
Deleted: sha256:5b5a93a2cc213b941ced580edc9e951216b24018c21f2f558ff1658eb20318ce
Deleted: sha256:bcac10a8ad8567a51c9f6ffd9f97014b3391c2420df4c7ce88ef4b0bb90990d3
Deleted: sha256:b03b36caaf4c1b2d43e41c7c23b30085cc3cdfb3006b0c640a6cf23644dc6346
Deleted: sha256:68fb5d99dff24518acf11947161e5147a1032fde967c65531f7b127870009008
Deleted: sha256:1696ac88dd679158b0028b1275ac694939bbe15fb2037bec929fb1e24179ddf3
Deleted: sha256:0cbc77c51ff887daf865d398aeefb55584504668e19ef87e5512065b69141fe5
Deleted: sha256:0d4b1e651096f4ffe36ca9e9526771cf8a03f9fde23c207a551248b6e8da7878
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

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

Test the container by retrieving <http://127.0.0.1:8000> using a browser on the VM, wget, or curl.

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker run -di -p 8000:5000 --name hellou vkarinje/helloubuntu
Unable to find image 'vkarinje/helloubuntu:latest' locally
latest: Pulling from vkarinje/helloubuntu
e706e0a9f423: Already exists
a1f25fcb8157: Pull complete
f5d836d1fd60: Pull complete
b9e80594a23e: Pull complete
82a2d602c4e4: Pull complete
Digest: sha256:b6b12565a5acc973d37192f8606bae12bdcc4d2ada0625e5ec0d447cd620655a
Status: Downloaded newer image for vkarinje/helloubuntu:latest
a6c86e166fd7a3c4ffeb82cf124a97b667dc701386b36fee019d1912f1ec13d0
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ wget http://127.0.0.1:8000
--2022-10-22 20:19:33-- http://127.0.0.1:8000/
Connecting to 127.0.0.1:8000... connected.
HTTP request sent, awaiting response... 200 OK
Length: 243 [text/html]
Saving to: 'index.html'

```

Saving to: 'index.html'

```

index.html          100%[=====>]          243  --.-KB/s    in 0s
2022-10-22 20:19:33 (25.9 MB/s) - 'index.html' saved [243/243]

```

Stop and remove the container, then remove the container image.

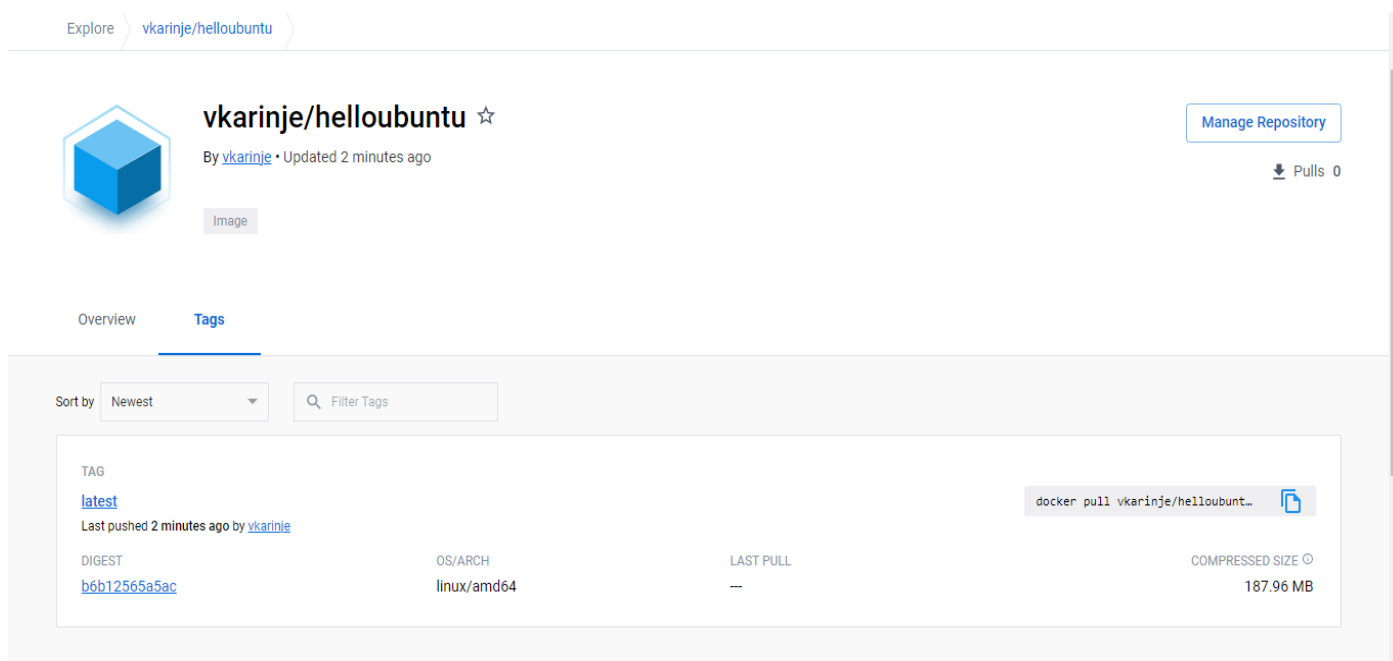
```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker stop hellou
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker rm hellou
hellou
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker rmi vkarinje/helloubuntu
Untagged: vkarinje/helloubuntu:latest
Untagged: vkarinje/helloubuntu@sha256:b6b12565a5acc973d37192f8606bae12bdcc4d2ada0625e5ec0d447cd620655a
Deleted: sha256:7ec743bd4b8f9147bba938b76a157bda718dfbe77e6e22c2128bc45bdf268db5
Deleted: sha256:7929758153619f33dab7b8fc81993e30cd8d442acf605e354ecbea72894db16f
Deleted: sha256:bcac10a8ad8567a51c9f6ffd9f97014b3391c2420df4c7ce88ef4b0bb90990d3
Deleted: sha256:68fb5d99dff24518acf11947161e5147a1032fde967c65531f7b127870009008
Deleted: sha256:0cbc77c51ff887daf865d398aeefb55584504668e19ef87e5512065b69141fe5
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$


```

Then, log into Docker Hub with a web browser, navigate to the container image.

- Take a screenshot of the container image and its size for your lab notebook.



Explore > vkarinje/helloubuntu >

 **vkarinje/helloubuntu** ☆

By [vkarinje](#) • Updated 2 minutes ago

[Manage Repository](#)

↓ Pulls 0

Overview **Tags**

Sort by Newest Filter Tags

TAG	DIGEST	OS/ARCH	LAST PULL	COMPRESSED SIZE
<a href="#">latest</a>	<a href="#">b6b12565a5acc973d37192f8606bae12bdcc4d2ada0625e5ec0d447cd620655a</a>	linux/amd64	—	187.96 MB

docker pull vkarinje/helloubunt...

## Version 2: Alpine

As before, make a single edit to this file before using it. Specify your name and PSU e-mail address as the maintainer for the container image that will be built.



```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ cat Dockerfile.alpine
# Use the Python version of alpine as the base image
FROM python:alpine

# Specify your e-mail address as the maintainer of the container image
MAINTAINER Varsha "vkarinje@pdx.edu"

# Copy the contents of the current directory into the container directory /app
COPY . /app

# Set the working directory of the container to /app
WORKDIR /app

# Install the Python packages specified by requirements.txt into the container
RUN pip install --no-cache -r requirements.txt

# Set the program that is invoked upon container instantiation
ENTRYPOINT ["python"]

# Set the parameters to the program
CMD ["app.py"]
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

## Build and run the Alpine-based container

Examine the container images you now have

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

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker images
REPOSITORY      TAG          IMAGE ID       CREATED        SIZE
helloalpine     latest      06dde268928d   About a minute ago   59.6MB
python          alpine      880fc229346e   9 days ago       48.7MB
ubuntu          18.04       71cb16d32be4   2 weeks ago       63.1MB
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

**Ans:** The size of my alpine image is 59.6 MB. The size of the Ubuntu image is 460 MB. The alpine image is 400.4 MB smaller than the Ubuntu one.

Then, as before, create a running instance of the helloalpine image and name it helloa.

Test the container by retrieving <http://127.0.0.1:8000> using a browser on the VM, wget, or curl.

See that the container is running:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker run -p 8000:5000 --name helloa -di helloalpine
c77f67d2a51199fdafb7243767efc913700eafa02a5f0719aecfae3c372ddf2e
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ wget http://127.0.0.1:8000
--2022-10-22 20:48:40-- http://127.0.0.1:8000/
Connecting to 127.0.0.1:8000... connected.
HTTP request sent, awaiting response... 200 OK
Length: 243 [text/html]
Saving to: 'index.html.1'

index.html.1          100%[=====]          243  --.-KB/s   in 0s

2022-10-22 20:48:40 (35.4 MB/s) - 'index.html.1' saved [243/243]

```

See that the container is running:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                               NAMES
c77f67d2a511   helloalpine   "python app.py"         About a minute ago    Up About a minute    0.0.0.0:8000->5000/tcp, :::8000->5000/tcp    helloa
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Attempt to get an interactive shell on the container by performing the following:

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

**Ans:** The bash does not exist on the alpine image container

```

vkarinje@vkarinje-VirtualBox:~/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
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Replace `/bin/bash` with `/bin/sh` and repeat the command.

Finally, within the container, examine the file specifying the Alpine release being used (`/etc/alpine-release`) and perform a process listing command (`ps -ef`).

- Take a screenshot of the output of each

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/sh
/app # ls
Dockerfile.alpine  __pycache__      gbmodel          index.html.1     requirements.txt  static
Dockerfile.ubuntu  app.py           index.html       index.py         sign.py          templates
/app # ls /etc/
alpine-release      hostname          modules           periodic          shells
apk                 hosts            modules-load.d   profile           ssl
bindresvport.blacklist  init.d          motd             profile.d         sysctl.conf
ca-certificates     inittab         mtab            protocols        sysctl.d
ca-certificates.conf inputrc         netconfig       resolv.conf      terminfo
conf.d              issue          network         secfixes.d       udhcpd.conf
crontabs            krb5.conf       opt             securetty
fstab               logrotate.d     os-release      services
group              modprobe.d      passwd         shadow
/app # ls /etc/alpine-release
/etc/alpine-release
/app # ps -ef
PID   USER     TIME   COMMAND
    1  root      0:00   python app.py
    7  root      0:00   /usr/local/bin/python /app/app.py
   15  root      0:00   /bin/sh
   24  root      0:00   ps -ef
/app #

```

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/sh
/app # cat /etc/alpine-release
3.16.2
/app # ps -ef
PID   USER     TIME   COMMAND
    1  root      0:00   python app.py
    7  root      0:05   /usr/local/bin/python /app/app.py
   16  root      0:00   /bin/sh
   22  root      0:00   ps -ef
/app #

```

Exit out of the shell and container. Then, stop the container and remove it from the system

```

24 root      0:00 ps -ef
/app # exit
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker stop helloa
helloa
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker rm helloa
helloa
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

## Docker Hub Alpine

Login to Docker Hub again

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker login
Authenticating with existing credentials...
WARNING! Your password will be stored unencrypted in /home/vkarinje/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Then push the image to Docker Hub using the command:



```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker tag helloalpine vkarinje/helloalpine
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker push vkarinje/helloalpine
Using default tag: latest
The push refers to repository [docker.io/vkarinje/helloalpine]
e599e2bab291: Pushed
09fdd56692c1: Pushed
4da53ae893e1: Mounted from library/python
b9a7a7381abe: Mounted from library/python
2306fb7a5a47: Mounted from library/python
6666686122fd: Mounted from library/python
994393dc58e7: Mounted from library/python
latest: digest: sha256:819873464fc14e6bb9ec91925e73b6202fa6b12ffea94c5a07e4257e3f953f6a size: 1787
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Examine the container images you've created and tagged so far:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker images
REPOSITORY          TAG          IMAGE ID          CREATED          SIZE
vkarinje/helloalpine latest       aa563b2e51dd     9 minutes ago   59.6MB
helloalpine         latest       aa563b2e51dd     9 minutes ago   59.6MB
<none>              <none>      06dde268928d     44 minutes ago   59.6MB
python              alpine      880fc229346e     9 days ago      48.7MB
ubuntu              18.04       71cb16d32be4     2 weeks ago     63.1MB
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Then delete them via their names:

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker rmi helloalpine vkarinje/helloalpine
Untagged: helloalpine:latest
Untagged: vkarinje/helloalpine:latest
Untagged: vkarinje/helloalpine@sha256:819873464fc14e6bb9ec91925e73b6202fa6b12ffea94c5a07e4257e3f953f6a
Deleted: sha256:aa563b2e51dd13bce62687c8300771333f63b65aff497f0d666abcb30375643
Deleted: sha256:e7f857c852afbf4d92aea7071203dfa2526f4fe08d9a758bbad114896eaf3880
Deleted: sha256:b05c124be228b06a4009cadac8b7ab8d7ea32d5dcd7e1ac9fc025338bc0dcaa7
Deleted: sha256:9c176a65141720d7847d045003dc1fcf452b1910fd8cadb173fb0fbbdb9d3c60e
Deleted: sha256:c9671c574aa600982594200c9a938398775f63d9f16008f3bb6959a62da465eb
Deleted: sha256:fcabdf81e9a55fa8b5e4a1a6367360465ca87ec66d078307bff74e99c0ce5e4c
Deleted: sha256:5bb738c3ca899744805170db1f693b9e606a1bd3cce24abfaa8b2c650487f133
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Run the image directly from Docker Hub. You should see the individual layers of the container being downloaded separately.

```

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ docker run -di -p 8000:5000 --name helloa vkarinje/helloalpine
Unable to find image 'vkarinje/helloalpine:latest' locally
latest: Pulling from vkarinje/helloalpine
213ec9aee27d: Already exists
47858aee13bf: Already exists
cfe0d6c6d05c: Already exists
2df617b3dcd9: Already exists
38da16a6ebe8: Already exists
0160eae94a97: Pull complete
280953dbd65d: Pull complete
Digest: sha256:819873464fc14e6bb9ec91925e73b6202fa6b12ffea94c5a07e4257e3f953f6a
Status: Downloaded newer image for vkarinje/helloalpine:latest
2dc2d3942eed63abefc72521dc5ae52930a94bd9d3f19cd0a4c039c3bd0418b7
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$ wget http://127.0.0.1:8000/
--2022-10-22 21:28:29-- http://127.0.0.1:8000/
Connecting to 127.0.0.1:8000... connected.
HTTP request sent, awaiting response... 200 OK
Length: 243 [text/html]
Saving to: 'index.html.2'

index.html.2          100%[=====] 243  --.-KB/s  in 0s


2022-10-22 21:28:29 (35.2 MB/s) - 'index.html.2' saved [243/243]

vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_dockerhub$

```

Take a screenshot of the container image and its size

Explore [vkarinje/helloalpine](#)



**vkarinje/helloalpine** ☆  
 By [vkarinje](#) • Updated 8 minutes ago

[Manage Repository](#)  
 Pulls 2

Image

Overview **Tags**

Sort by: Newest

TAG	DIGEST	OS/ARCH	LAST PULL	COMPRESSED SIZE
<a href="#">latest</a> Last pushed 8 minutes ago by <a href="#">vkarinje</a>	<a href="#">819873464fc1</a>	linux/amd64	—	21.91 MB

`docker pull vkarinje/helloalpine`

## Compute Engine Ubuntu VM deployment

cloud-CS-530-karinje-vkar...

VM instances [CREATE INSTANCE](#) [IMPORT VM](#) [REFRESH](#) [START / RESUME](#) [STOP](#) [OPERATIONS](#)

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Filter Enter property name or value

Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
✓	<a href="#">instance-1</a>	us-west1-b			10.138.0.12 (nic0)	<a href="#">34.127.10.236</a> (nic0)	SSH

Then, run the helloalpine container image, but map the host's port 80 to the container's port 5000.

```
vkarinje@instance-1:~$ docker run -di -p 80:5000 --name helloa vkarinje/helloalpine
Unable to find image 'vkarinje/helloalpine:latest' locally
latest: Pulling from vkarinje/helloalpine
213ec9aee27d: Pull complete
47858aee13bf: Pull complete
cfe0d6c6d05c: Pull complete
2df617b3dcd9: Pull complete
38da16a6ebe8: Pull complete
0160eae94a97: Pull complete
280953dbd65d: Pull complete
Digest: sha256:819873464fc14e6bb9ec91925e73b6202fa6b12ffea94c5a07e4257e3f953f6a
Status: Downloaded newer image for vkarinje/helloalpine:latest
e798abf535b14510bd5fe6923a47419ed89dfcf3ccc8313eb639f2c624e6addc
vkarinje@instance-1:~$
```

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

Not secure | 34.127.10.236

# Guestbook

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## Entries

Varsha Karinje <vkarinje@pdx.edu>  
signed on 2022-10-23  
Hello Testing

vkarinje [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Oct 22 21:47

```
vkarinje@vkarinje-VirtualBox: ~/cs43...  
helloalpine latest aa563b2e51dd 9 minutes  
59.6MB  
<none> <none> 06dde268928d 44 minute  
o 59.6MB  
python alpine 880fc229346e 9 days ag  
48.7MB  
ubuntu 18.04 71cb16d32be4 2 weeks a  
63.1MB  
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_container_doc  
ub$ docker rmi helloalpine vkarinje/helloalpine  
Untagged: helloalpine:latest  
Untagged: vkarinje/helloalpine:latest  
Untagged: vkarinje/helloalpine@sha256:819873464fc14e6bb9e  
25e73b6202fa6b12ffea94c5a07e4257e3f953f6a  
Deleted: sha256:aa563b2e51dd13bce62687c8300771333f63b65af  
f0d666abcb30375643  
Deleted: sha256:e7f857c852afbf4d92aea7071203dfa2526f4fe08  
58bbad114896eaf3880  
Deleted: sha256:b05c124be228b06a4009cadac8b7ab8d7ea32d5dc  
ac9fc025338bc0dcaa7  
D Show Applications 9c176a65141720d7847d045003dc1fcf452b1910f  
db1737d07d0d9d3c60e  
Deleted: sha256:aa563b2e51dd13bce62687c8300771333f63b65af  
f0d666abcb30375643
```

Not secure | 34.127.10.236

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## Entries

Varsha Karinje <vkarinje@pdx.edu>  
signed on 2022-10-23  
Hello Testing

vkarinje [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Oct 22 22:24

```
vkarinje@vkarinje-VirtualBox: ~/cs43...  
helloalpine latest aa563b2e51dd  
59.6MB  
<none> <none> 06dde268928d  
o 59.6MB  
python alpine 880fc229346e  
48.7MB  
ubuntu 18.04 71cb16d32be4  
63.1MB  
vkarinje@vkarinje-VirtualBox:~/cs430-src/04_con  
ub$ docker rmi helloalpine vkarinje/helloalpine  
Untagged: helloalpine:latest  
Untagged: vkarinje/helloalpine:latest  
Untagged: vkarinje/helloalpine@sha256:819873464  
25e73b6202fa6b12ffea94c5a07e4257e3f953f6a  
Deleted: sha256:aa563b2e51dd13bce62687c83007713  
f0d666abcb30375643  
Deleted: sha256:e7f857c852afbf4d92aea7071203dfa  
58bbad114896eaf3880  
Deleted: sha256:b05c124be228b06a4009cadac8b7ab8  
ac9fc025338bc0dcaa7  
D Show Applications 9c176a65141720d7847d045003dc1fc  
db1737d07d0d9d3c60e  
Deleted: sha256:aa563b2e51dd13bce62687c8300771333f63b65af  
f0d666abcb30375643
```

## Compute Engine ContainerOS VM deployment (1)

cloud-CS-530-karinje-vkar...

vpc

×

Search

Firewall

CREATE FIREWALL POLICY

CREATE FIREWALL RULE

HIDE INFO PANEL

<input type="checkbox"/>	Name	Type	Targets	Filters	Protocols / ports	Action	Priority	Network ↑	Logs	
<input type="checkbox"/>	<a href="#">default-allow-http</a>	Ingress	http-server	IP ranges: 0.0.0.0/0	tcp:80	Allow	1000	<a href="#">default</a>	Off	▼
<input type="checkbox"/>	<a href="#">default-allow-https</a>	Ingress	https-server	IP ranges: 0.0.0.0/0	tcp:443	Allow	1000	<a href="#">default</a>	Off	▼
<input type="checkbox"/>	<a href="#">tcp-allow-5000</a>	Ingress	http-5000	IP ranges: 0.0.0.0/0	tcp:5000	Allow	1000	<a href="#">default</a>	Off	▼
<input type="checkbox"/>	<a href="#">default-allow-icmp</a>	Ingress	Apply to all	IP ranges: 0.0.0.0/0	icmp	Allow	65534	<a href="#">default</a>	Off	▼
<input type="checkbox"/>	<a href="#">default-allow-internal</a>	Ingress	Apply to all	IP ranges: 10.0.0.0/8	tcp:0-65535 udp:0-65535 icmp	Allow	65534	<a href="#">default</a>	Off	▼
<input type="checkbox"/>	<a href="#">default-allow-rdp</a>	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:3389	Allow	65534	<a href="#">default</a>	Off	▼
<input type="checkbox"/>	<a href="#">default-allow-ssh</a>	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:22	Allow	65534	<a href="#">default</a>	Off	▼

Network firewall policies

REFRESH

DELETE

Filter Enter property name or value

☐

Policy name ↑

Firewall rules

Description

Deployment scope

Associated with

No rows to display

Successfully created firewall rule "tcp-allow-5000".

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Filter Enter property name or value

Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
✓	contain	us-west1-b			10.138.0.13 (nic0)	34.145.80.11 (nic0)	SSH
✓	instance-1	us-west1-b			10.138.0.12 (nic0)	34.127.10.236 (nic0)	SSH

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- View billing report**  
View and manage your Compute Engine billing
- Monitor VMs**  
View outlier VMs across metrics like CPU and network
- Explore VM logs**  
View, search, analyze, and download VM instance logs
- Set up firewall rules**  
Control traffic to and from a VM instance
- Patch management**  
Schedule patch updates and view patch compliance on VM instances

Not secure | 34.145.80.11:5000

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### Entries

Varsha Karinje <vkarinje@pdx.edu>  
signed on 2022-10-23  
HelloContainer0S!

vkarinje [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Oct 22 22:44

vkarinje@vkarinje-VirtualBox: ~/cs43...

```

helloalpine      latest      aa563b2e51dd   9 minutes
59.6MB
<none>           <none>      06dde268928d   44 minutes
59.6MB
python           alpine      880fc229346e    9 days ago
48.7MB
ubuntu           18.04       71cb16d32be4    2 weeks ago
63.1MB
vkarinje@vkarinje-VirtualBox: ~/cs430-src/04_container_doc
ub$ docker rmi helloalpine vkarinje/helloalpine
Untagged: helloalpine:latest
Untagged: vkarinje/helloalpine:latest
Deleted: sha256:aa563b2e51dd13bce62687c8300771333f63b65af
f0d666abcb30375643
Deleted: sha256:e7f857c852afbf4d92aea7071203dfa2526f4fe08
58bbad114896eaf3880
Deleted: sha256:b05c124be228b06a4009cadac8b7ab8d7ea32d5dc
ac9fc025338bc8dcaa7
D Show Applications 9c176a65141720d7847d045003dc1fcf452b1910f
db173f007d0p0d3c60e
  
```

# Clean up

cloud-CS-530-karinje-vkar...

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VM instances

CREATE INSTANCEIMPORT VMREFRESHSTART / RESUMESTOPOPERATIONSHEL

INSTANCES

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Filter

Enter property name or value

?

⌵

<input type="checkbox"/>	Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
--------------------------	--------	------	------	-----------------	-----------	-------------	-------------	---------

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Instance deleted

