# Docker

# ASSIGNMENT


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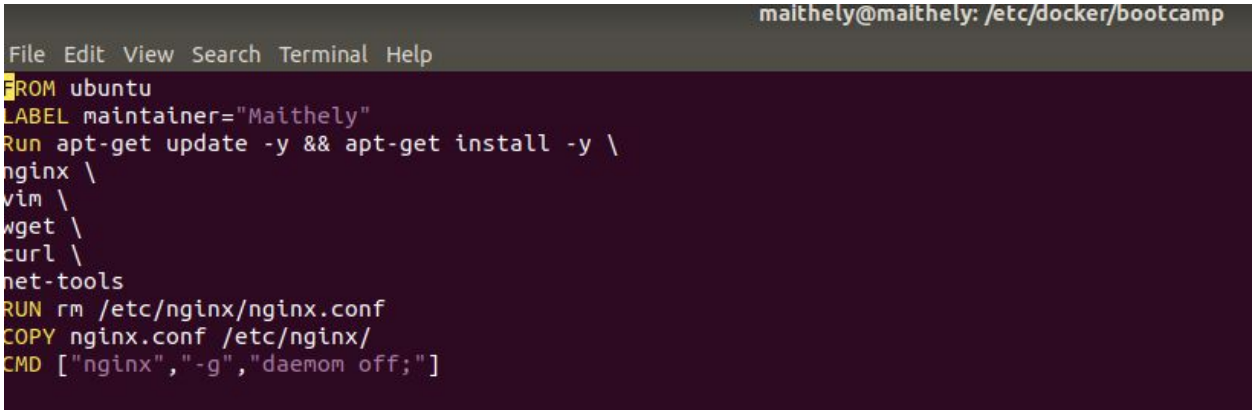
1. Set the base image to Ubuntu
    - Add File Author / Maintainer
    - Install Nginx
    - Install necessary tools: vim wget curl net-tools
    - Remove the default Nginx configuration file
    - Copy a configuration file from the current directory
    - Expose ports (80)
    - Set the default command to execute Nginx when creating a new container

Create a Dockerfile in /etc/docker/bootcamp




Also create a nginx.conf file in bootcamp folder

```
maithely@maithely:/etc/docker/bootcamp$ ls
Dockerfile  nginx.conf
maithely@maithely:/etc/docker/bootcamp$ cat nginx.conf
worker_processes  5;  ## Default: 1
error_log  logs/error.log;
pid        logs/nginx.pid;
worker_rlimit_nofile 8192;

events {
  worker_connections  4096;  ## Default: 1024
}

http {
  include    conf/mime.types;
  include    /etc/nginx/proxy.conf;
  include    /etc/nginx/fastcgi.conf;
  index    index.html index.htm index.php;

  default_type application/octet-stream;
  log_format   main '$remote_addr - $remote_user [$time_local]  $status '
    '"$request" $body_bytes_sent "$http_referer" '
    '"$http_user_agent" "$http_x_forwarded_for"';
  access_log   logs/access.log  main;
  sendfile     on;
  tcp_nopush   on;
  server_names_hash_bucket_size 128; # this seems to be required for some vhosts

  server { # php/fastcgi
    listen       80;
    server_name  domain1.com www.domain1.com;
    access_log   logs/domain1.access.log  main;
    root         html;

    location ~ \.php$ {
      fastcgi_pass   127.0.0.1:1025;
    }
```

```
maithely@maithely:/etc/docker/bootcamp$ docker build -t nginx .
Sending build context to Docker daemon  4.608kB
Step 1/6 : FROM ubuntu
 ---> 72300a873c2c
Step 2/6 : LABEL maintainer="Maithely"
 ---> Using cache
 ---> a62a67271554
Step 3/6 : Run apt-get update -y && apt-get install -y nginx vim wget curl net-tools
 ---> Using cache
 ---> 41cb710bb72b
Step 4/6 : RUN rm /etc/nginx/nginx.conf
 ---> Using cache
 ---> 996582433e4c
Step 5/6 : COPY nginx.conf /etc/nginx/
 ---> e32ecbe2326b
Step 6/6 : CMD ["nginx","-g","daemom off;"]
 ---> Running in ea896abff04e
Removing intermediate container ea896abff04e
 ---> 62e361af0aff
Successfully built 62e361af0aff
Successfully tagged nginx:latest
```

```
maithely@maithely:/etc/docker/bootcamp$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
nginx               latest              62e361af0aff        6 seconds ago       216MB
ubuntu              latest              72300a873c2c        12 days ago         64.2MB
hello-world         latest              fce289e99eb9        14 months ago       1.84kB
```

2. What is the difference between 'RUN', 'CMD', & 'ENTRYPOINT' in dockerfile?

RUN

- executes the command(s) that you give in a new layer and creates a new image.
- This is mainly used for installing a new package.

CMD

- is the default command to be run by the entrypoint.
- It sets default command and/or parameters, however, we can overwrite those commands or pass in and bypass the default parameters from the command line when docker runs

ENTRYPOINT

- is the program to run the given command.
- It is used when you want to run a container as an executable.

3. How to connect docker client to docker daemon running on other host?

For reference :[https://nickjanetakis.com/blog/docker-tip-73-connecting-to-a-remote-docker-daemon](https://nickjanetakis.com/blog/docker-tip-73-connecting-to-a-remote-docker-daemon)

Create an ubuntu instance and install docker on it

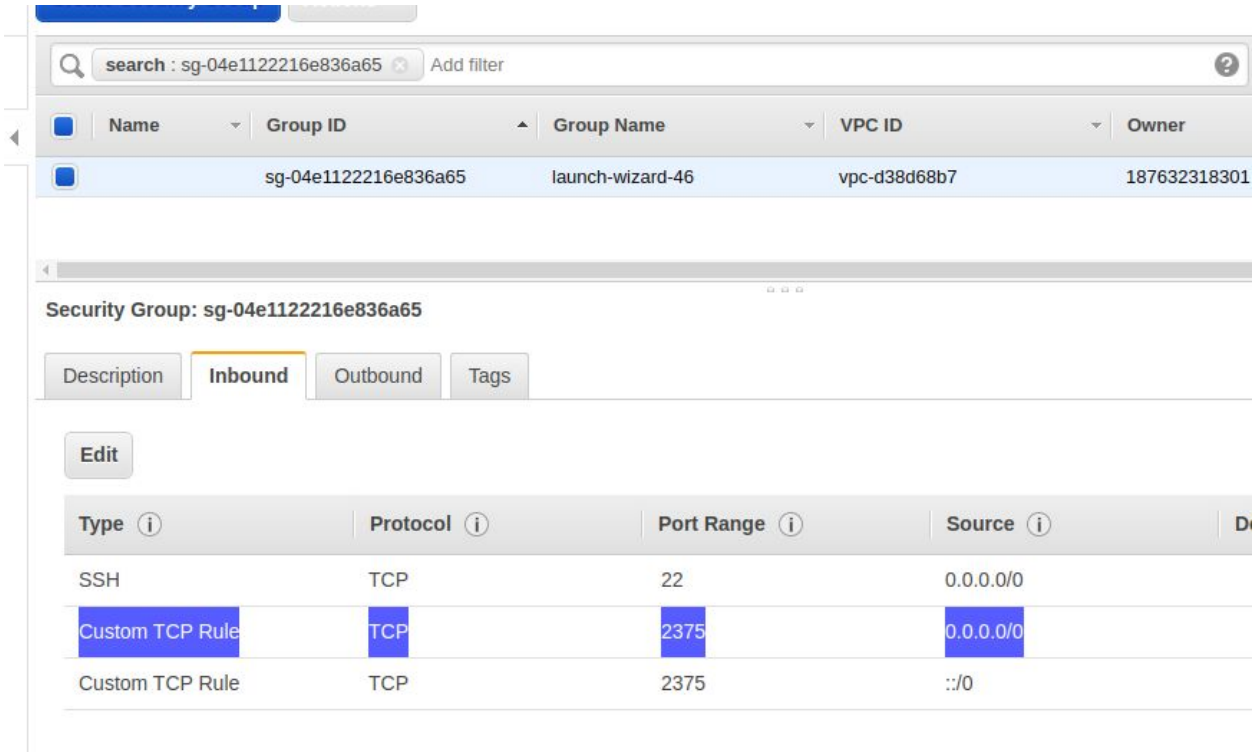
```
maithely@maithely:~/Downloads$ ssh -i "maithely.pem" ubuntu@ec2-54-88-132-185.compute-1.amazonaws.com
The authenticity of host 'ec2-54-88-132-185.compute-1.amazonaws.com (54.88.132.185)' can't be established.
ECDSA key fingerprint is SHA256:MqzcjX/jRg1wqyXL5TKKmx4xocH+dKWJfKN3FgdDEUk.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-54-88-132-185.compute-1.amazonaws.com,54.88.132.185' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)

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

  System information as of Thu Mar  5 09:59:24 UTC 2020

  System load:  0.0               Processes:           88
  Usage of /:   13.6% of 7.69GB   Users logged in:     0
  Memory usage: 15%               IP address for eth0: 172.31.225.82
  Swap usage:   0%

0 packages can be updated.
0 updates are security updates.



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.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

```
ubuntu@ip-172-31-225-82:~$ sudo apt install docker-ce
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  aufs-tools cgroupfs-mount containerd.io docker-ce-cli libltdl7 p
The following NEW packages will be installed:
  aufs-tools cgroupfs-mount containerd.io docker-ce docker-ce-cli
0 upgraded, 7 newly installed, 0 to remove and 53 not upgraded.
Need to get 85.8 MB of archives.
After this operation, 385 MB of additional disk space will be used
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic/univers
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic/univers
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic/univers
Get:4 https://download.docker.com/linux/ubuntu bionic/stable amd64
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic/main a
Get:6 https://download.docker.com/linux/ubuntu bionic/stable amd64
Get:7 https://download.docker.com/linux/ubuntu bionic/stable amd64
Fetched 85.8 MB in 2s (51.0 MB/s)
Selecting previously unselected package pigz.
(Reading database ... 56558 files and directories currently instal
Preparing to unpack .../0-pigz_2.4-1_amd64.deb ...
Unpacking pigz (2.4-1) ...
Selecting previously unselected package aufs-tools.
Preparing to unpack .../1-aufs-tools_1%3a4.9+20170918-1ubuntu1_amd
```

Configure the Docker daemon in the VM to allow remote connections

```
# These commands get run inside of your VM.

# Create the directory to store the configuration file.
sudo mkdir -p /etc/systemd/system/docker.service.d

# Create a new file to store the daemon options.
sudo nano /etc/systemd/system/docker.service.d/options.conf

# Now make it look like this and save the file when you're done:
[Service]
ExecStart=
ExecStart=/usr/bin/dockerd -H unix:// -H tcp://0.0.0.0:2375

# Reload the systemd daemon.
sudo systemctl daemon-reload

# Restart Docker.
sudo systemctl restart docker
```

In the inbound add the port




From local machine

```
maithely@maithely:~/Downloads$ DOCKER_HOST=tcp://54.88.132.185:2375 docker info
Client:
 Debug Mode: false

Server:
 Containers: 0
  Running: 0
  Paused: 0
  Stopped: 0
 Images: 0
 Server Version: 19.03.7
 Storage Driver: overlay2
  Backing Filesystem: <unknown>
  Supports d_type: true
  Native Overlay Diff: true
 Logging Driver: json-file
 Cgroup Driver: cgroupfs
 Plugins:
  Volume: local
  Network: bridge host ipvlan macvlan null overlay
```