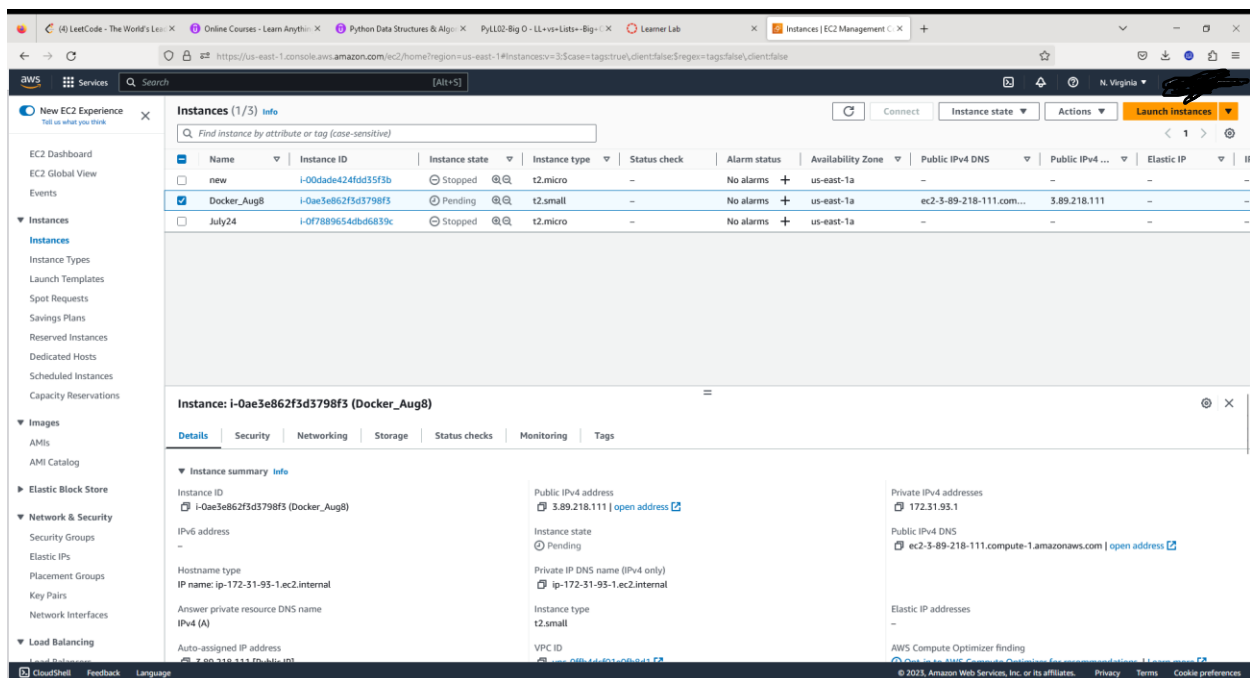# Docker

The goal

Following are the goals of this hands-on:

1. Working knowledge of EC2 instances with Ubuntu

2. Installing docker from scratch

3. Working with images and containers

4. Understanding the docker ecosystem

Create an Ubuntu Instance:

Connecting to the Instance through PUTTY:

Installing Docker on Ubuntu Instance:

Installing busybox:latest Image "Helloworld"


```
Expanded Security Maintenance for Applications is not enabled.

98 updates can be applied immediately.
64 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


Last login: Wed Aug  2 01:28:45 2023 from 72.180.237.154
ubuntu@ip-172-31-93-1:~$ docker version
Client:
 Version:           20.10.21
 API version:       1.41
 Go version:        go1.18.1
 Git commit:        20.10.21-0ubuntu1~22.04.3
 Built:             Thu Apr 27 05:57:17 2023
 OS/Arch:           linux/amd64
 Context:           default
 Experimental:      true

Server:
 Engine:
  Version:          20.10.21
  API version:      1.41 (minimum version 1.12)
  Go version:       go1.18.1
  Git commit:       20.10.21-0ubuntu1~22.04.3
  Built:            Thu Apr 27 05:37:25 2023
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.6.12-0ubuntu1~22.04.3
  GitCommit:
 runc:
  Version:          1.1.4-0ubuntu1~22.04.3
  GitCommit:
 docker-init:
  Version:          0.19.0
  GitCommit:
ubuntu@ip-172-31-93-1:~$ sudo chown ubuntu:ubunt -R /opt
chown: invalid group: 'ubuntu:ubunt'
ubuntu@ip-172-31-93-1:~$ sudo chown ubuntu:ubuntu -R /opt
ubuntu@ip-172-31-93-1:~$ cd /opt
ubuntu@ip-172-31-93-1:/opt$ docker images
REPOSITORY    TAG       IMAGE ID    CREATED    SIZE
ubuntu@ip-172-31-93-1:/opt$ docker run --rm busybox:latest /bin/echo "Hello world"
Unable to find image 'busybox:latest' locally
latest: Pulling from library/busybox
3f4d9009f5b: Pull complete
Digest: sha256:3fbc632167424a6d997e74f52b878d7cc478225cffac6bc977eedfe51c7f4e79
Status: Downloaded newer image for busybox:latest
Hello world
ubuntu@ip-172-31-93-1:/opt$
```

Successfully tagged "Helloworld:latest"


```
8000K .......... .......... .......... .......... .......... 83% 25.5M 0s
8050K .......... .......... .......... .......... .......... 84% 45.9M 0s
8100K .......... .......... .......... .......... .......... 84%  262M 0s
8150K .......... .......... .......... .......... .......... 85%  240M 0s
8200K .......... .......... .......... .......... .......... 85%  272M 0s
8250K .......... .......... .......... .......... .......... 86%  274M 0s
8300K .......... .......... .......... .......... .......... 86%  264M 0s
8350K .......... .......... .......... .......... .......... 87%  229M 0s
8400K .......... .......... .......... .......... .......... 87%  273M 0s
8450K .......... .......... .......... .......... .......... 88%  274M 0s
8500K .......... .......... .......... .......... .......... 88%  279M 0s
8550K .......... .......... .......... .......... .......... 89%  248M 0s
8600K .......... .......... .......... .......... .......... 89%  237M 0s
8650K .......... .......... .......... .......... .......... 90%  268M 0s
8700K .......... .......... .......... .......... .......... 90%  271M 0s
8750K .......... .......... .......... .......... .......... 91%  230M 0s
8800K .......... .......... .......... .......... .......... 91%  278M 0s
8850K .......... .......... .......... .......... .......... 92%  238M 0s
8900K .......... .......... .......... .......... .......... 93%  275M 0s
8950K .......... .......... .......... .......... .......... 93% 5.06M 0s
9000K .......... .......... .......... .......... .......... 94% 11.8M 0s
9050K .......... .......... .......... .......... .......... 94% 39.3M 0s
9100K .......... .......... .......... .......... .......... 95%  267M 0s
9150K .......... .......... .......... .......... .......... 95%  215M 0s
9200K .......... .......... .......... .......... .......... 96%  271M 0s
9250K .......... .......... .......... .......... .......... 96%  279M 0s
9300K .......... .......... .......... .......... .......... 97%  279M 0s
9350K .......... .......... .......... .......... .......... 97%  221M 0s
9400K .......... .......... .......... .......... .......... 98%  272M 0s
9450K .......... .......... .......... .......... .......... 98%  278M 0s
9500K .......... .......... .......... .......... .......... 99%  257M 0s
9550K .......... .......... .......... .......... .......... 99%  219M 0s
9600K .......... .......... .                               100%  330M=0.2s

2023-08-02 01:33:05 (38.7 MB/s) - 'HelloWorld.war' saved [9852807/9852807]

openjdk version "11.0.16" 2022-07-19
OpenJDK Runtime Environment 18.9 (build 11.0.16+8)
OpenJDK 64-Bit Server VM 18.9 (build 11.0.16+8, mixed mode, sharing)
Removing intermediate container 3f4206baba0f
 ---> 5236b3e90917
Step 5/7 : WORKDIR /opt/tomcat/webapps
 ---> Running in c0fea8d0ec69
Removing intermediate container c0fea8d0ec69
 ---> c7c0d2305e23
Step 6/7 : EXPOSE 8080
 ---> Running in 84081633bcfd
Removing intermediate container 84081633bcfd
 ---> 8f5853990e68
Step 7/7 : CMD ["/opt/tomcat/bin/catalina.sh", "run"]
 ---> Running in 54c307a9bcb6
Removing intermediate container 54c307a9bcb6
 ---> fb96c22ccd9
Successfully built fb96c22ccd9
Successfully tagged helloworld:latest
ubuntu@ip-172-31-93-1:/opt$
```

Running helloworld container on detached mode (-d) and mapping to port 80:8080(-p)

Docker ps -a showing the container is up and running

Docker container stopped


```
ubuntu@ip-172-31-93-1: /opt
openjdk version "11.0.16" 2022-07-19
OpenJDK Runtime Environment 18.9 (build 11.0.16+8)
OpenJDK 64-Bit Server VM 18.9 (build 11.0.16+8, mixed mode, sharing)
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 ---> c7c0d2305e23
Step 6/7 : EXPOSE 8080
 ---> Running in 84081633bcfd
Removing intermediate container 84081633bcfd
 ---> 8f5853990e68
Step 7/7 : CMD ["/opt/tomcat/bin/catalina.sh", "run"]
 ---> Running in 54c307a9bcb6
Removing intermediate container 54c307a9bcb6
 ---> fb96c22cc1d9
Successfully built fb96c22cc1d9
Successfully tagged helloworld:latest
ubuntu@ip-172-31-93-1:/opt$ docker run -d -p 80:8080 helloworld
135dc776dbd0a64d7aeb3e514297eb4ea46b90a997a45e52ee43cbd5460a450
ubuntu@ip-172-31-93-1:/opt$ docker ps -a
CONTAINER ID   IMAGE        COMMAND             CREATED        STATUS         PORTS                                          NAMES
135dc776dbd0   helloworld   "/opt/tomcat/bin/cat…"   14 seconds ago   Up 13 seconds   0.0.0.0:80->8080/tcp, :::80->8080/tcp   sleepy_antonelli
ubuntu@ip-172-31-93-1:/opt$ docker rm [^C
ubuntu@ip-172-31-93-1:/opt$ docker rm [135dc776dbd0]
Error: No such container: [135dc776dbd0]
ubuntu@ip-172-31-93-1:/opt$ docker rm 135dc776dbd0
Error response from daemon: You cannot remove a running container 135dc776dbd04a64d7aeb3e514297eb4ea46b90a997a45e52ee43cbd5460a450. Stop the container before attempting
 removal or force remove
ubuntu@ip-172-31-93-1:/opt$ docker images
REPOSITORY   TAG       IMAGE ID       CREATED        SIZE
helloworld   latest    fb96c22cc1d9   2 minutes ago   710MB
busybox      latest    a416a98b71e2   2 weeks ago     4.26MB
openjdk      11        47a932d998b7   12 months ago   654MB
ubuntu@ip-172-31-93-1:/opt$ docker rmi fb96c22cc1d9
Error response from daemon: conflict: unable to delete fb96c22cc1d9 (cannot be forced) - image is being used by running container 135dc776dbd0
ubuntu@ip-172-31-93-1:/opt$ docker build -t helloworld
"docker build" requires exactly 1 argument.
See 'docker build --help'.

Usage:  docker build [OPTIONS] PATH | URL | -

Build an image from a Dockerfile
ubuntu@ip-172-31-93-1:/opt$ docker containers
docker: 'containers' is not a docker command.
See 'docker --help'
ubuntu@ip-172-31-93-1:/opt$ docker ps -a
CONTAINER ID   IMAGE        COMMAND             CREATED        STATUS         PORTS                                          NAMES
135dc776dbd0   helloworld   "/opt/tomcat/bin/cat…"   3 minutes ago   Up 3 minutes   0.0.0.0:80->8080/tcp, :::80->8080/tcp   sleepy_antonelli
ubuntu@ip-172-31-93-1:/opt$ docker stop 135
135
ubuntu@ip-172-31-93-1:/opt$ docker ps -a
CONTAINER ID   IMAGE        COMMAND             CREATED        STATUS                PORTS   NAMES
135dc776dbd0   helloworld   "/opt/tomcat/bin/cat…"   4 minutes ago   Exited (143) 9 seconds ago           sleepy_antonelli
ubuntu@ip-172-31-93-1:/opt$
```

Docker started once again

Accessing the Apache Tomcat webpage through the publicIP