Aim: To study and Implement Containerization using Docker

2. Theory:

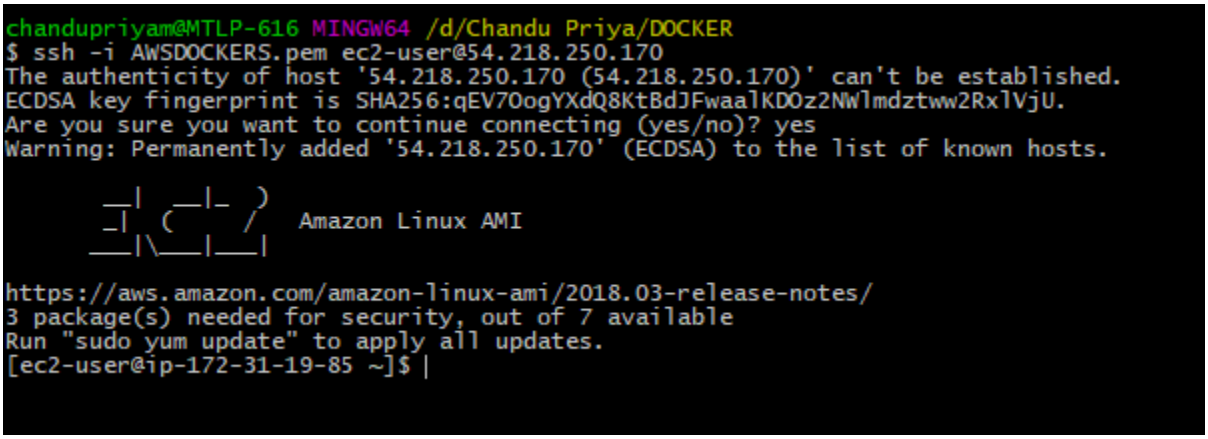
- Docker is a tool designed to make it easier to create, deploy and run applications by using containers, which are formed with the help of Docker Engine.
- Docker containers are light-weight alternatives to virtual machines and use host OS.
- With dockers, there is no need to pre-allocate the RAM or disk space, it takes RAM and disk space according to the requirement.

3. Procedure:

Step1: How to install Docker on EC2 instance.

To install Docker on the EC2 Instance. Go to the location path where your Key Pair is saved, open terminal and type the following command:

ssh -i keypair.pem ec2-user@<EC2-INSTANCE-PUBLIC-IP-ADDRESS>



You have connected to your EC2 instance, Now you can install docker by using the below command:

sudo yum install -y docker

```
 Package                                 Arch                                 Version
Installing:
 docker                                  x86_64                               18.06.1ce-10.32.amzn1
Installing for dependencies:
 libseccomp                              x86_64                               2.3.1-2.4.amzn1
 libtool-ltdl                            x86_64                               2.4.2-20.4.8.5.32.amzn1
 pigz                                    x86_64                               2.3.3-1.6.amzn1
 xfsprogs                                x86_64                               4.5.0-18.23.amzn1

Transaction Summary
Install  1 Package (+4 Dependent packages)

Total download size: 47 M
Installed size: 154 M
Downloading packages:
(1/5): libseccomp-2.3.1-2.4.amzn1.x86_64.rpm
(2/5): libtool-ltdl-2.4.2-20.4.8.5.32.amzn1.x86_64.rpm
(3/5): pigz-2.3.3-1.6.amzn1.x86_64.rpm
(4/5): xfsprogs-4.5.0-18.23.amzn1.x86_64.rpm
(5/5): docker-18.06.1ce-10.32.amzn1.x86_64.rpm
Total
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : pigz-2.3.3-1.6.amzn1.x86_64
  Installing : libtool-ltdl-2.4.2-20.4.8.5.32.amzn1.x86_64
  Installing : libseccomp-2.3.1-2.4.amzn1.x86_64
  Installing : xfsprogs-4.5.0-18.23.amzn1.x86_64
  Installing : docker-18.06.1ce-10.32.amzn1.x86_64
  Verifying  : xfsprogs-4.5.0-18.23.amzn1.x86_64
  Verifying  : docker-18.06.1ce-10.32.amzn1.x86_64
  Verifying  : libseccomp-2.3.1-2.4.amzn1.x86_64
  Verifying  : libtool-ltdl-2.4.2-20.4.8.5.32.amzn1.x86_64
  Verifying  : pigz-2.3.3-1.6.amzn1.x86_64

Installed:
  docker.x86_64 0:18.06.1ce-10.32.amzn1

Dependency Installed:
  libseccomp.x86_64 0:2.3.1-2.4.amzn1          libtool-ltdl.x86_64 0:2.4.2-20.4.8.5.32.amzn1          pigz.x86_64 0:2.3.3-1.6.amzn1
```

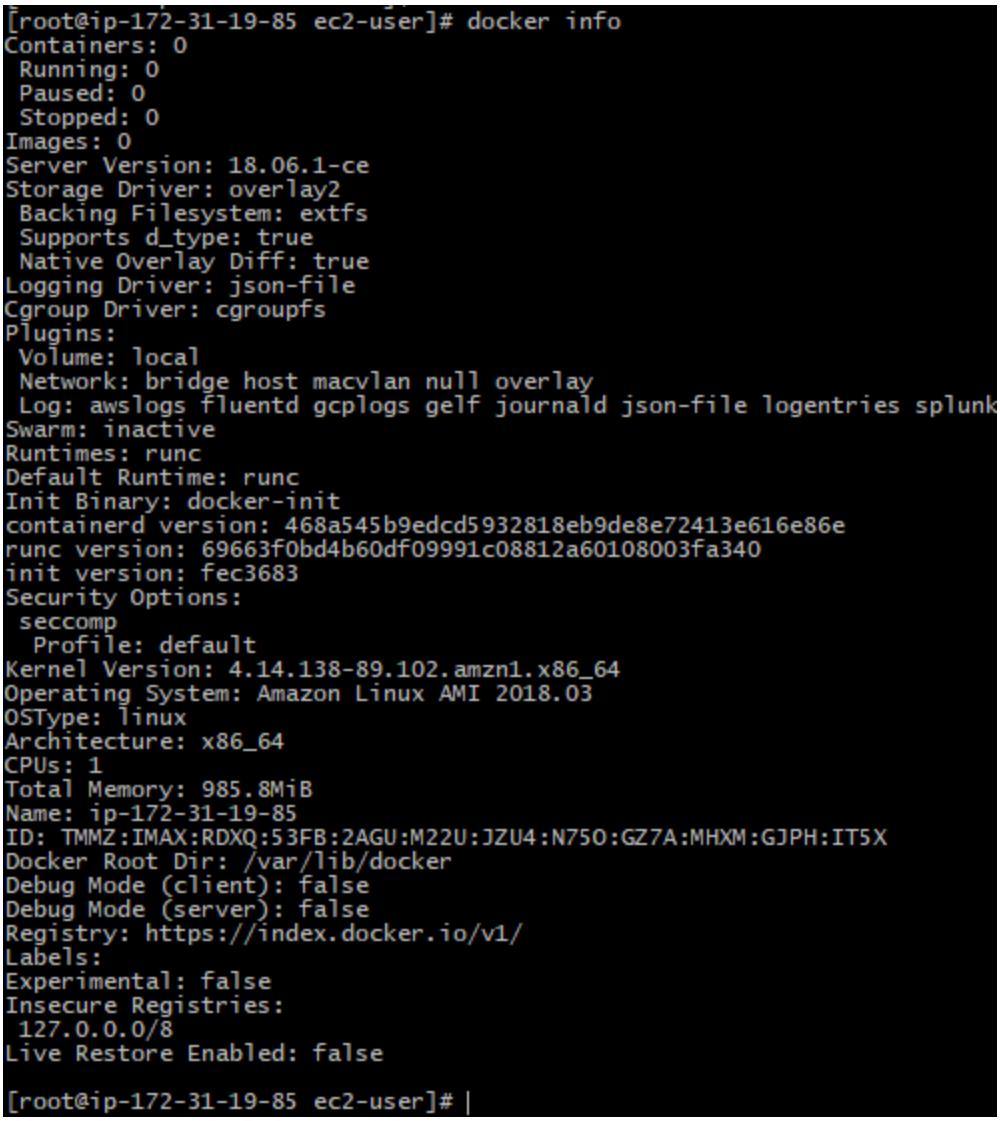
Use this command to start the docker:

sudo service docker start

```
[ec2-user@ip-172-31-19-85 ~]$ sudo service docker start
Starting cgconfig service:                                 [  OK  ]
Starting docker:        .                                  [  OK  ]
[ec2-user@ip-172-31-19-85 ~]$
```

docker info

If you done everything right, the above command will shows info about Docker installation without showing any errors.



Now you can run your image. In this case, I will show you the sample node app to get something like this:

docker run -d -p 80:8080 chandupriya/nodedemo:0.1

```
[root@ip-172-31-19-85 ec2-user]#
[root@ip-172-31-19-85 ec2-user]# docker run -d -p 80:8080 chandupriya/nodedemo:0.1
Unable to find image 'chandupriya/nodedemo:0.1' locally
0.1: Pulling from chandupriya/nodedemo
3d77ce4481b1: Pull complete
7d2f32934963: Pull complete
0c5cf711b890: Pull complete
9593dc852d6b: Pull complete
4e3b8a1eb914: Pull complete
ddcf13cc1951: Pull complete
2e460d114172: Pull complete
d94b1226fbf2: Pull complete
4e89ff8419a9: Pull complete
Digest: sha256:c2d53dea92f14e73455ac4f88a14d296cb3c2cde65ae189417d552832488f3c5
Status: Downloaded newer image for chandupriya/nodedemo:0.1
be3f9e88bc9754602e2bfb0280c3f21e8909cfd2cdffbfdd67aa2806e69bed3b
```

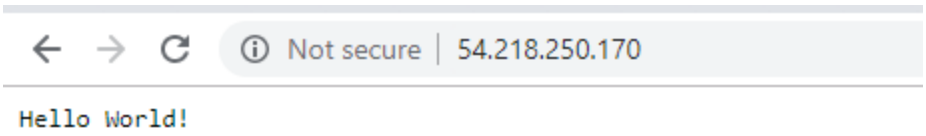
You will note the "-p 80:8080" text which commands Docker on your Container to link port 8080 to port 80 located on the EC2 Instance. Test whether the process has gone through using the following command:

```
[ec2-user@ip-172-31-19-85 ~]$
[ec2-user@ip-172-31-19-85 ~]$ curl http:///localhost
Hello World![ec2-user@ip-172-31-19-85 ~]$
```

If you get the message **"Hello world!"** then your Docker container is running in the AWS cloud.

The last step is to visit the public DNS name in your browser, you get the message like this:


```
Hello World!
```



Now that you have successfully deployed Docker Container on AWS EC2 everything looks perfect.

To stop all Docker containers, simply run the following command in your terminal:

```
docker kill $(docker ps -q)
```

How to Remove All Docker Containers

If you don't just want to stop containers and you'd like to go a step further and remove them, simply run the following command:

```
docker rm $(docker ps -a -q)
```

How To Remove All Docker Images

To remove all Docker images, run this command:

```
docker rmi $(docker images -q)
```

Conclusion:

Implementation of Docker containers with AWS EC2 Instance has been done successfully.