ASSESSMENT ON : DOCKER
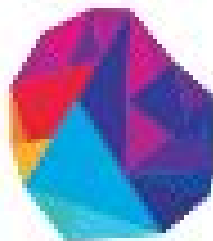
Q 1. Write a Dockerfile

- **Set the base image to Ubuntu**
- **Add File Author / Maintainer**
- **Install Nginx**
- **Install necessary tools: vim , wget, curl and net-tools**
- **Remove the default Nginx configuration file**
- **Copy a custom configuration file from the current directory**

- **Nginx should listen on 8080 port in container.**

- **Set the default command to execute Nginx when creating a new container**
- **Push the image to your dockerhub .**

Step 1: Make a Dockerfile with all the specification given above

```
FROM ubuntu
MAINTAINER diksha
RUN apt-get update
RUN apt-get install -y vim wget curl net-tools
RUN apt-get install -y nginx
RUN rm -v /etc/nginx/nginx.conf
ADD new.conf /etc/nginx/
EXPOSE 8080
CMD ["nginx"]
```

Step 2: Build and give tagname to the image


```
diksha@diksha:~/temp$ docker build -t assignment .
Sending build context to Docker daemon  9.216kB
Step 1/9 : FROM ubuntu
 ---> 4c108a37151f
Step 2/9 : MAINTAINER diksha
 ---> Running in 88cf6488b070
Removing intermediate container 88cf6488b070
 ---> fa237dee80a1
Step 3/9 : RUN apt-get update
 ---> Running in 278be730ea7c
Get:1 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:2 http://archive.ubuntu.com/ubuntu bionic InRelease [242 kB]
Get:3 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages
[721 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Package
s [5436 B]
Get:5 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Package
s [4169 B]
Get:6 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [575
 kB]
Get:7 http://archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
```

```
Setting up nginx (1.14.0-0ubuntu1.2) ...
Processing triggers for libc-bin (2.27-3ubuntu1)
Removing intermediate container 34252765c6e9
 ---> 9ba5433cbc49
Step 6/9 : RUN rm -v /etc/nginx/nginx.conf
 ---> Running in d43684436c56
removed '/etc/nginx/nginx.conf'
Removing intermediate container d43684436c56
 ---> ac72a1c714d6
Step 7/9 : ADD new.conf /etc/nginx/
 ---> 86ce93df1530
Step 8/9 : EXPOSE 8080
 ---> Running in ec894b66d486
Removing intermediate container ec894b66d486
 ---> 29c058aef50e
Step 9/9 : CMD ["nginx"]
 ---> Running in 07cd21e0c9ed
Removing intermediate container 07cd21e0c9ed
 ---> 5b54a831bd05
Successfully built 5b54a831bd05
Successfully tagged assignment:latest
diksha@diksha:~/temp$
```

```
diksha@diksha:~/temp$ docker images
REPOSITORY            TAG          IMAGE ID         CREATED              SIZE
assignment            latest       5b54a831bd05     About a minute ago   216MB
201998/repository1    nuild1       70022a41bc40     11 hours ago         131MB
myfirstbuild          latest       70022a41bc40     11 hours ago         131MB
ubuntu                nginx        cd46facfe1f3     21 hours ago         151MB
expose                latest       a7e693ba1135     22 hours ago         109MB
```

Step 3: Push the image to your dockerhub.

```
diksha@diksha:~/temp$ docker push 201998/assign1
The push refers to repository [docker.io/201998/assign1]
d238d0d35c30: Pushed
4c953a304b1f: Pushed
aee424430b13: Pushed
30f5f53d3066: Pushed
55e012434969: Pushed
75e70aa52609: Pushed
dda151859818: Pushed
fbd2732ad777: Pushed
ba9de9d8475e: Pushed
latest: digest: sha256:2ccff314f87859a1e680275f4aa5a14f0e0d315d1f98bef2202b7965082567f5 size: 2202
```

Q 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.

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

Step 1: Make changes in docker.service file

Top terminal (vim editor):

```
Activities    Terminal                                          Mon 15:50

                          ubuntu@ip-172-31-86-61: /lib/systemd/system

File Edit View Search Terminal Help
[Unit]
Description=Docker Application Container Engine
Documentation=https://docs.docker.com
BindsTo=containerd.service
After=network-online.target firewalld.service containerd.service
Wants=network-online.target
Requires=docker.socket

[Service]
Type=notify
# the default is not to use systemd for cgroups because the delegate issues still
# exists and systemd currently does not support the cgroup feature set required
# for containers run by docker
ExecStart=/usr/bin/dockerd -H fd:// -H tcp://0.0.0.0:2375
ExecReload=/bin/kill -s HUP $MAINPID
TimeoutSec=0
RestartSec=2
Restart=always

# Note that StartLimit* options were moved from "Service" to "Unit" in systemd 229.
# Both the old, and new location are accepted by systemd 229 and up, so using the old location
# to make them work for either version of systemd.
StartLimitBurst=3

# Note that StartLimitInterval was renamed to StartLimitIntervalSec in systemd 230.
# Both the old, and new name are accepted by systemd 230 and up, so using the old name to make
# this option work for either version of systemd.
StartLimitInterval=60s

# Having non-zero Limit*s causes performance problems due to accounting overhead
# in the kernel. We recommend using cgroups to do container-local accounting.
LimitNOFILE=infinity
LimitNPROC=infinity
LimitCORE=infinity

# Comment TasksMax if your systemd version does not supports it.
# Only systemd 226 and above support this option.
TasksMax=infinity

# set delegate yes so that systemd does not reset the cgroups of docker containers
Delegate=yes

# kill only the docker process, not all processes in the cgroup
KillMode=process

[Install]
WantedBy=multi-user.target
~
~
~
-- INSERT -- W10: Warning: Changing a readonly file                    14,60          All
```

Middle terminal:

```
ubuntu@ip-172-31-86-61:/lib/systemd/system$ sudo vim docker.service
ubuntu@ip-172-31-86-61:/lib/systemd/system$ sudo systemctl daemon-reload
ubuntu@ip-172-31-86-61:/lib/systemd/system$ sudo systemctl restart docker.service
ubuntu@ip-172-31-86-61:/lib/systemd/system$
```

Bottom terminal:

```
                              diksha@diksha-VirtualBox: /lib/systemd/system

File Edit View Search Terminal Tabs Help
         ubuntu@ip-172-31-86-61: ~           x    diksha@diksha-VirtualBox: /lib/systemd/system
diksha@diksha-VirtualBox:~/Downloads$ cd /l
lib/       lib64/      lost+found/
diksha@diksha-VirtualBox:~/Downloads$ cd /lib/systemd/system
diksha@diksha-VirtualBox:/lib/systemd/system$ export DOCKER_HOST='tcp://34.230.71.178:2375'
diksha@diksha-VirtualBox:/lib/systemd/system$ docker ps -a
CONTAINER ID        IMAGE          COMMAND          CREATED        STATUS          PORTS          NAMES
diksha@diksha-VirtualBox:/lib/systemd/system$ sudo  systemctl restart docker.service
[sudo] password for diksha:
diksha@diksha-VirtualBox:/lib/systemd/system$ docker ps -a
CONTAINER ID        IMAGE          COMMAND          CREATED        STATUS          PORTS          NAMES
diksha@diksha-VirtualBox:/lib/systemd/system$ docker ps -a
CONTAINER ID        IMAGE          COMMAND          CREATED        STATUS          PORTS          NAMES
diksha@diksha-VirtualBox:/lib/systemd/system$ sudo  systemctl restart docker.service
diksha@diksha-VirtualBox:/lib/systemd/system$ docker ps -a
CONTAINER ID        IMAGE          COMMAND            CREATED           STATUS          PORTS          NAMES
76f5516d8a14        nginx          "nginx -g 'daemon of…"   13 seconds ago    Up 12 seconds   80/tcp         musing_panini
diksha@diksha-VirtualBox:/lib/systemd/system$
```

```
diksha@diksha-VirtualBox:~/Downloads$ ssh -i "dockerq3.pem" ubuntu@ec2-34-230-71-178.compute-1.amazonaws.com
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-1087-aws x86_64)

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

10 packages can be updated.
3 updates are security updates.

New release '18.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Mon Jul  8 09:31:26 2019 from 61.246.36.24
ubuntu@ip-172-31-86-61:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
ubuntu@ip-172-31-86-61:~$ docker run -itd nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
fc7181108d40: Pull complete
d2e987ca2267: Pull complete
0b760b431b11: Pull complete
Digest: sha256:96fb261b66270b900ea5a2c17a26abbfabe95506e73c3a3c65869a6dbe83223a
Status: Downloaded newer image for nginx:latest
76f5516d8a14113d1f11c005b471e78dd9b1effccb0154da1c67674d5e7d1f25
ubuntu@ip-172-31-86-61:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS               NAMES
76f5516d8a14        nginx               "nginx -g 'daemon of…"   6 seconds ago       Up 5 seconds        80/tcp              musing_panini
ubuntu@ip-172-31-86-61:~$
```