Module 3: Case Study - Containerization using Docker Part 1

Problem Statement:-

You work as a DevOps Engineer in a leading software company. You have been asked to Dockerize the applications on the production server. The company uses custom software. Therefore, there is no pre-built container which can be used.

Assume the following things:

1.Assume the software to be installed is Apache

2.Use an Ubuntu container

The company wants the following things:

1.Push a container to Docker Hub with the above config

2.The developers will not be working with Docker, hence from their side you will just get the code. Write a Dockerfile which could put the code in the custom image that you have built.

Solution:-

```
#  vi Dockerfile
```

```
root@ip-172-31-84-192:/home/ubuntu# vi Dockerfile
```

* Dockerfile content:-

```
FROM ubuntu

RUN apt update
RUN apt install -y apache2
RUN apt install -y apache2-utils
RUN apt clean

EXPOSE 85

CMD ["apache2ctl", "-D", "FOREGROUND"]
```

```
FROM ubuntu

RUN apt update
RUN apt install -y apache2
RUN apt install -y apache2-utils
RUN apt clean

EXPOSE 85

CMD ["apache2ctl", "-D", "FOREGROUND"]
~
~
~
~
~
~
~
~
```

docker build -t my_apache_image .

```
root@ip-172-31-84-192:/home/ubuntu# docker build -t my_apache_image .
Sending build context to Docker daemon  17.41kB
Step 1/7 : FROM ubuntu
 ---> 5a81c4b8502e
Step 2/7 : RUN apt update
 ---> Running in 0b293c740a75

WARNING: apt does not have a stable CLI interface. Use with caution in scri

Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy InRelease [270 kB]
```

docker images

```
root@ip-172-31-84-192:/home/ubuntu# docker images
REPOSITORY        TAG       IMAGE ID       CREATED          SIZE
my_apache_image   latest    865e0f8b5c2a   9 seconds ago    228MB
img frm df html   latest    17dd99a5e036   43 minutes ago   186MB
```

docker run -d -p 85:80 my_apache_image

```
root@ip-172-31-84-192:/home/ubuntu# docker run -d -p 85:80 my_apache_image
8c59530ca2d532e21f2887e209b2c86e959e97eeb1920fd68f9c3c233d354073
root@ip-172-31-84-192:/home/ubuntu# docker ps
CONTAINER ID   IMAGE             COMMAND                  CREATED         STATUS
         PORTS                                     NAMES
8c59530ca2d5   my_apache_image   "apache2ctl -D FOREG…"   8 seconds ago   Up 7 s
econds   85/tcp, 0.0.0.0:85->80/tcp, :::85->80/tcp   busy_shirley
c34f69a15e34   ubuntu            "/bin/bash"              9 minutes ago   Up 9 m
inutes                                               vigorous_kapitsa
```

docker tag my_apache_image dhaccamitiwari/my_apache_image_cs:latest

```
root@ip-172-31-84-192:/home/ubuntu# docker tag my_apache_image dhaccamitiwari/my
_apache_image_cs:latest
root@ip-172-31-84-192:/home/ubuntu# 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: dhaccamitiwari
Password:
```

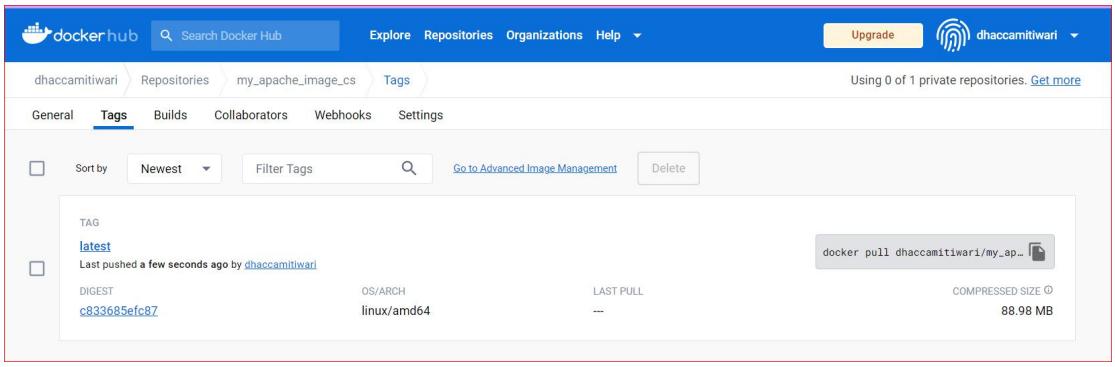
Docker login
docker push dhaccamitiwari/my_apache_image_cs:latest

```
root@ip-172-31-84-192:/home/ubuntu# 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: dhaccamitiwari
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@ip-172-31-84-192:/home/ubuntu# docker push dhaccamitiwari/my_apache_image_c
s:latest
The push refers to repository [docker.io/dhaccamitiwari/my_apache_image_cs]
87ac36cb789b: Pushed
f7a747ce3119: Pushed
efd2ba6f8d20: Pushed
14808bc8a7f8: Pushed
59c56aee1fb4: Mounted from dhaccamitiwari/assignment-3
latest: digest: sha256:c833685efc87225be900b6dff8f1f4450adee0123864cec028ff7996c
16df40a size: 1367
```

* Docker hub link pushed dhaccamitiwari/my_apache_image_cs images.

https://hub.docker.com/repository/docker/dhaccamitiwari/my_apache_image_cs/tags?page=1&ordering=last_updated



ls

```
root@ip-172-31-84-192:/home/ubuntu/DOCFL# ls
Dockerfile  index.html
```

vi index.html

```
root@ip-172-31-84-192:/home/ubuntu/DOCFL# vi index.html
```

* index.html file content (It is a developer side code it will deploy in previously pushed into docker hub and created our custom image dhaccamitiwari/my_apache_image_cs and now create new image and adding this code into this newly image.) :-

```
<html>
        <head>
                <title>
                        Jay Shree Hari
                </title>
        </head>
        <body>
                <b> Jay Shree SitaRam </b>
        </body>
</html>
```

```
<Html>
<Head>
<title>
Jay Shree Hari
</title>
</Head>
<Body>
<b> Jay Shree SitaRam </b>
</Body>
</Html>
~
~
~
~
~
~
~
~
~
~
~
~
"index.html" 10L, 127B                                    1,1           All
```

vi Dockerfile

```
root@ip-172-31-84-192:/home/ubuntu/DOCFL# vi Dockerfile
```

* Dockerfile content:-

```
#  Use the custom image that you have built previously, which already includes Apache
FROM dhaccamitiwari/my_apache_image_cs

#  Copy the application code from the host into the container
COPY . /var/www/html/

#  (Optional) Set any necessary permissions for the copied files
#  RUN chown -R www-data:www-data /var/www/html/

#  (Optional) If any additional configurations are required, copy them to appropriate locations
#  COPY config_files/some_config.conf /etc/apache2/sites-available/

#  (Optional) Enable additional Apache modules if required
#  RUN a2enmod some_module

#  (Optional) If there are additional dependencies required, install them here
```

Start Apache service in the foreground (Already present in the base image)
CMD ["apachectl", "-D", "FOREGROUND"]

```
#  Use the custom image that you have built previously, which already includes A
pache
FROM dhaccamitiwari/my_apache_image_cs

#  Copy the application code from the host into the container
COPY . /var/www/html/

#  (Optional) Set any necessary permissions for the copied files
#  RUN chown -R www-data:www-data /var/www/html/

#  (Optional) If any additional configurations are required, copy them to approp
riate locations
#  COPY config_files/some_config.conf /etc/apache2/sites-available/

#  (Optional) Enable additional Apache modules if required
#  RUN a2enmod some_module

#  (Optional) If there are additional dependencies required, install them here

#  Start Apache service in the foreground (Already present in the base image)
#  CMD ["apachectl", "-D", "FOREGROUND"]
~
~
"Dockerfile" 19L, 777B                                        19,40         All
```

docker build -t my_apache_image_html .

```
root@ip-172-31-84-192:/home/ubuntu/DOCFL# docker build -t my_apache_image_html .
Sending build context to Docker daemon  3.584kB
Step 1/2 : FROM dhaccamitiwari/my_apache_image_cs
 ---> 865e0f8b5c2a
Step 2/2 : COPY . /var/www/html/
 ---> ef74753c3f1a
Successfully built ef74753c3f1a
Successfully tagged my_apache_image_html:latest
```

docker run -d -p 86:80 my_apache_image_html
docker exec -it 1c3548ef483e /bin/bash
service apache2 status

```
root@ip-172-31-84-192:/home/ubuntu/DOCFL# docker run -d -p 86:80 my_apache_image
_html
1c3548ef483ebc654b96eab5d70fff7ad1ebefd47a3262011fe9baea0a8b3789
root@ip-172-31-84-192:/home/ubuntu/DOCFL# docker ps
CONTAINER ID   IMAGE                  COMMAND                  CREATED         S
TATUS         PORTS                                    NAMES
1c3548ef483e   my_apache_image_html   "apache2ctl -D FOREG…"   7 seconds ago   U
p 6 seconds   85/tcp, 0.0.0.0:86->80/tcp, :::86->80/tcp   magical_kalam
root@ip-172-31-84-192:/home/ubuntu/DOCFL# docker exec -it 1c3548ef483e /bin/bash
root@1c3548ef483e:/# service apache2 status
 * apache2 is running
```

* Web page view of index.html file code provided by developers:-

http://18.212.64.82:86/