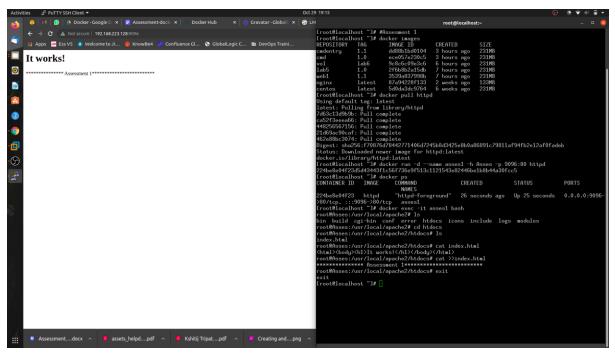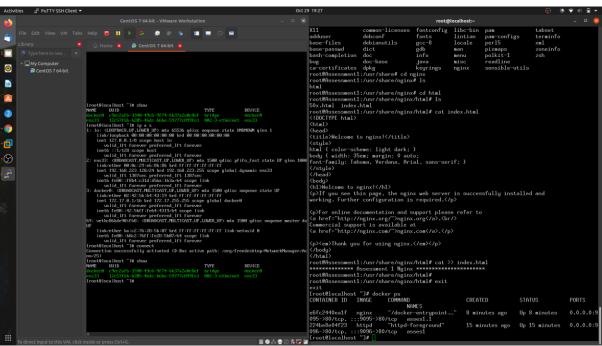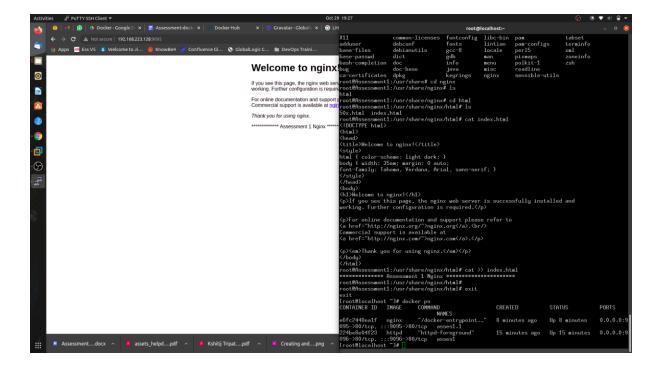# Docker Assessment

Questions 1-4

Prepared By:-
Kshitij Tripathi

Question 1:- On VM install Docker Engg create web application containers provide port number 9095 of nginx and httpd on port number 9096?

Solution:-

Question 2:- What are the features of underlying operating system, explain type of storage that docker can provide and create container provide storage =type =volume, name vol10?

Solution: - Features of the underlying operating system:-

1) Namespace: - Separate namespaces for containers are created by the kernel to ensure process isolation. Namespaces allow you to abstract global system resource and present it to processes within a namespace as a separate instance. It is a combination of PID (process id), mount, network, UTS (unique time sharing), IPC (inter process communication) and, user.
2) Control Group (cgroup):- Control Groups are used by the kernel to organise processes for system resource management. Control Groups distribute CPU time, system memory, network bandwidth, or a mix of these resources among user-defined task groups.
3) SE-Linux: - SE-Linux uses SE-Linux policy and labels to ensure secure container isolation. It acts like a firewall for the same. It has three state: - Enforce, Permissive and, Disable.
4) SE-Comp: - SE-Comp is a kernel feature that allows you to filter system call (syscalls) from container to the kernel. SE-Comp gives an attacker a restricted number of syscalls from the container, allowing for greater fine-grained control.

There are three types of storage that are provided by Docker. Those are:-
1) Bind Mount
2) Volume Mount
3) Tmpfs Mount

1) Bind Mount
   Bind mounts can be kept on the host system in any location. It's possible that they're crucial system files or directories. Non-Docker processes can modify them at any time.
2) Volume Mount
   Volumes are kept in a Docker-managed section of the host filesystem. Is is located at '/var/lib/docker/volumes' on Linux OS. Non-Docker processes should not modify this part of the filesystem.
3) Tmpfs Mount
   Tmpfs mount are only saved in memory of the host system and are never written on the filesystem.

Qusetion 3:- Create docker file for httpd, build image out of that, create container, make that

Image publically available [upload on docker hub]?

Solution:-

Browser tabs (top window): Docker - Google D × | Assessment-docl × | Docker Hub × | Gravatar - Global × | LM

hub.docker.com/repository/docker/kshitij34/docker_prac1

Apps | Ess V5 | Welcome to Ji... | KnowBe4 | Confluence Gl... | GlobalLogic C... | DevOps Traini...

Docker is updating and extending our product subsc

docker hub   Q Search for great content (e.g., mysql)   Explore   Reposito

kshitij34   Repositories   docker_prac1

General   Tags   Builds   Collaborators   Webhooks   Settings

Advanced Image Management
View all your images and tags in this repository, clean up unused content, recover unta

kshitij34 / docker_prac1

This repository does not have a description

Last pushed: a few seconds ago

Tags and Scans   VULNERABILITY SCANNING -

This repository contains 2 tag(s).

TAG	OS	PULLED
httpdkshitij		9 hours ago	11
httpd_Kshitij		a few seconds ago	a few

See all

Terminal (top right):

```
[root@localhost ~]# # Assessment 3
[root@localhost ~]# ls
100               a.txt            data          file2.sh    logs
anaconda-ks.cfg   bind             docker_image  linux       pipeline.txt
assignment        copy_remove_move file1.sh      log         sha1.sh
[root@localhost ~]# mkdir assessment3
[root@localhost ~]# cd assessment3
[root@localhost assessment3]# ls
[root@localhost assessment3]# vi file.df
[root@localhost assessment3]# ls
file.df
[root@localhost assessment3]# cat >>index.html
******* THIS IS MY ASSESSMENT 3 of DOCKER. ********
[root@localhost assessment3]# ls
file.df  index.html
[root@localhost assessment3]# cat file.df
#Docker FILE
FROM centos:latest

RUN yum install httpd -y

RUN systemctl enable httpd

COPY index.html /var/www/html

CMD ["httpd","-D","FOREGROUND"]

EXPOSE 80
[root@localhost assessment3]# cat index.html
******* THIS IS MY ASSESSMENT 3 of DOCKER. ********
[root@localhost assessment3]# docker build . -f file.df -t dhub:v1
Sending build context to Docker daemon  3.072kB
Step 1/6 : FROM centos:latest
 ---> 5d0da3dc9764
Step 2/6 : RUN yum install httpd -y
 ---> Running in ca9328e7e3d6
CentOS Linux 8 - AppStream           2.0 MB/s | 9.5 MB    00:04
CentOS Linux 8 - BaseOS              1.2 MB/s | 7.5 MB    00:06
CentOS Linux 8 - Extras              5.5 kB/s |  10 kB    00:01
Dependencies resolved.
================================================================
 Package         Arch      Version                        Repo        Size
================================================================
Installing:
 httpd           x86_64    2.4.37-39.module_el8.4.0+950+0577e6ac.1 appstream  1.4 M
Installing dependencies:
 apr             x86_64    1.6.3-11.el8                   appstream   125 k
 apr-util        x86_64    1.6.1-6.el8                    appstream   105 k
 brotli          x86_64    1.0.6-3.el8                    baseos      323 k
```

Terminal (middle right):

```
[root@localhost assessment3]# docker images
REPOSITORY     TAG      IMAGE ID       CREATED           SIZE
dhub           v1       43900114000f   About a minute ago 286MB
cmdentry       1.1      dd88b1bd0104   4 hours ago       231MB
cmd            1.0      ece057e230c5   4 hours ago       231MB
vol            lab6     9c8c6c09e3c6   7 hours ago       231MB
lab5           1.0      2f6b8b2a15db   8 hours ago       231MB
web1           1.1      3539a837998b   8 hours ago       231MB
httpd          latest   1132a4fc88fa   7 days ago        143MB
nginx          latest   87a94228f133   2 weeks ago       133MB
centos         latest   5d0da3dc9764   6 weeks ago       231MB
[root@localhost assessment3]# docker run -d --name asses2 -p 9095:80 dimage:v1
Unable to find image 'dimage:v1' locally
^C
[root@localhost assessment3]# docker run -d --name asses2 -p 9095:80 dhub:v1
0e35ba24df6d1c7272e4493509af81e705423b51baaa81610815b9f3d6ff21a1
[root@localhost assessment3]# docker exec -it asses2 bash
[root@0e35ba24df6d /]# cd
[root@0e35ba24df6d ~]# ls
anaconda-ks.cfg  anaconda-post.log  original-ks.cfg
[root@0e35ba24df6d ~]# cd /var/www
[root@0e35ba24df6d www]# ls
cgi-bin  html
[root@0e35ba24df6d www]# cd html
[root@0e35ba24df6d html]# ls
index.html
[root@0e35ba24df6d html]# cat >>index.html
** It's my second docker repository on docker hub. Keep an eye on this repository for more u
pdates. **
[root@0e35ba24df6d html]#
[root@0e35ba24df6d html]# exit
exit
[root@localhost assessment3]# docker images
REPOSITORY     TAG      IMAGE ID       CREATED           SIZE
dhub           v1       43900114000f   3 minutes ago     286MB
cmdentry       1.1      dd88b1bd0104   4 hours ago       231MB
cmd            1.0      ece057e230c5   4 hours ago       231MB
vol            lab6     9c8c6c09e3c6   7 hours ago       231MB
lab5           1.0      2f6b8b2a15db   8 hours ago       231MB
web1           1.1      3539a837998b   8 hours ago       231MB
httpd          latest   1132a4fc88fa   7 days ago        143MB
nginx          latest   87a94228f133   2 weeks ago       133MB
centos         latest   5d0da3dc9764   6 weeks ago       231MB
[root@localhost assessment3]# docker tag dhub:v1 kshitij34
[root@localhost assessment3]# /
-bash: /: Is a directory
[root@localhost assessment3]# docker tag dhub:v1 kshitij34/docker_prac1:httpd_Kshitij
[root@localhost assessment3]# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docke
r ID, head over to https://hub.docker.com to create one.
```

Terminal (bottom right):

```
[root@localhost assessment3]# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docke
r ID, head over to https://hub.docker.com to create one.
Username: Kshitij34
Password:
Error response from daemon: Get "https://registry-1.docker.io/v2/": unauthorized: incorrect
username or password
[root@localhost assessment3]# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docke
r ID, head over to https://hub.docker.com to create one.
Username: Kshitij34
Password:
Error response from daemon: Get "https://registry-1.docker.io/v2/": unauthorized: incorrect
username or password
[root@localhost assessment3]# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docke
r ID, head over to https://hub.docker.com to create one.
Username: kshitij34
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@localhost assessment3]# docker images
REPOSITORY              TAG            IMAGE ID       CREATED         SIZE
kshitij34/docker_prac1  httpd_Kshitij  43900114000f   8 minutes ago   286MB
dhub                    v1             43900114000f   8 minutes ago   286MB
kshitij34               latest         43900114000f   8 minutes ago   286MB
cmdentry                1.1            dd88b1bd0104   4 hours ago     231MB
cmd                     1.0            ece057e230c5   4 hours ago     231MB
vol                     lab6           9c8c6c09e3c6   7 hours ago     231MB
lab5                    1.0            2f6b8b2a15db   8 hours ago     231MB
web1                    1.1            3539a837998b   8 hours ago     231MB
httpd                   latest         1132a4fc88fa   7 days ago      143MB
nginx                   latest         87a94228f133   2 weeks ago     133MB
centos                  latest         5d0da3dc9764   6 weeks ago     231MB
[root@localhost assessment3]# docker push kshitij34/docker_prac1
Using default tag: latest
The push refers to repository [docker.io/kshitij34/docker_prac1]
tag does not exist: kshitij34/docker_prac1:latest
[root@localhost assessment3]# docker push kshitij34/docker_prac1:httpd_Kshitij
The push refers to repository [docker.io/kshitij34/docker_prac1]
5deaf9f1ed5f: Pushed
74e6b772f59a: Pushed
cdbe69e65ca4: Pushed
74ddd0ec08fa: Layer already exists
httpd_Kshitij: digest: sha256:84ecaa6568879c001ea419e367c4515a530e38014c63794f89ba39715202f1
5b size: 1155
[root@localhost assessment3]#
```

Question 4:- What is difference between Entrypoint and CMD?

Solution: - The main difference between these two is that, if we are executing any command through ENTRYPOINT then it will concatenate it with the previous executed command with the latest command. Whereas if we are using CMD then it will consider the latest over the previous and execute the latest command only. It will overwrite the previous commands.