

Lab Exercise 2: Working with Docker Volumes

Objective:

- Learn how to create and manage Docker volumes.
- Understand how Docker volumes can be used to persist data across container restarts.
- Practice mounting Docker volumes to containers.

Prerequisites:

- Docker installed on your system.
- Basic understanding of Docker commands and container concepts.

Step 1: Create a Docker Volume

Create a new Docker volume:

```
docker volume create my_data_volume
shaad@shaadiso:~$ docker volume create my_data_volume
my_data_volume
shaad@shaadiso:~$ 
```

This command creates a Docker volume named my_data_volume.

Verify that the volume was created:

```
docker volume ls
shaad@shaadiso:~$ docker volume ls
DRIVER      VOLUME NAME
local      my_data_volume
shaad@shaadiso:~$ 
```

You should see my_data_volume listed among the volumes.

Step 2: Run a Container with the Volume Mounted

Run an Nginx container with the volume mounted:

```
docker run -d --name my_nginx -v my_data_volume:/usr/share/nginx/html -p 8008:80 nginx
```

```
shaad@shaadiso:~$ docker run -d --name my_nginx -v my_data_volume:/usr/share/nginx/html -p 8008:80 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
d989100b8a84: Pull complete
10b68cfefee1: Pull complete
700146c8ad64: Pull complete
500799c30424: Pull complete
57f0dd1befe2: Pull complete
eaf8753feae0: Pull complete
e2dd2dbe6277: Download complete
785250c9bf9e: Download complete
Digest: sha256:c881927c407710ac4b1da63b83aa163937fb47457950c267d92f7e4dedf4aec
Status: Downloaded newer image for nginx:latest
0bc84e55b3366aa1018789d1b5692af9095833db0bcfe39364c2a2f755ea1429
shaad@shaadiso:~$
```

This command starts an Nginx container named my_nginx and mounts the my_data_volume volume to the /usr/share/nginx/html directory inside the container.

Verify that the container is running:

```
docker ps
```

```
shaad@shaadiso: $ docker ps
CONTAINER ID   IMAGE     COMMAND      CREATED      STATUS      PORTS          NAMES
0bc84e55b336   nginx    "/docker-entrypoint..."   34 seconds ago   Up 34 seconds   0.0.0.0:8008->80/tcp, [::]:8008->80/tcp   my_nginx
shaad@shaadiso: $
```

You should see my_nginx listed as one of the running containers.

Step 3: Interact with the Volume

Create a simple HTML file in the volume:

```
docker exec -it my_nginx bash  
  
echo "<h1>Hello, Docker Volume</h1>" >  
/usr/share/nginx/html/index.html  
  
exit  
shaad@shaadiso:~$ docker exec -it my_nginx bash  
echo "<h1>Hello, Docker Volume</h1>" > /usr/share/nginx/html/index.html  
exit  
root@0bc84e55b336:/# 
```

This command creates an HTML file inside the `/usr/share/nginx/html` directory, which is backed by `my_data_volume`.

Access the Nginx server to see your file: Open a browser and navigate to `http://localhost:8008`. You should see the message "Hello, Docker Volume!" displayed on the page.

Step 4: Test Data Persistence

Stop and remove the container:

```
docker stop my_nginx  
  
docker rm my_nginx  
  
shaad@shaadiso:~$ docker stop my_nginx  
docker rm my_nginx  
my_nginx  
my_nginx  
shaad@shaadiso:~$ 
```

Run a new Nginx container using the same volume:

```
docker run -d --name my_nginx -v my_data_volume:/usr/share/nginx/html -p 8008:80 nginx
```

```
shaad@shaadiso:~$ docker run -d --name my_nginx -v my_data_volume:/usr/share/nginx/html -p 8008:80 nginx  
09a8434e1leaf4cca13e84ec854ce6daebdd38d8b7244278c9ec30af1bde9e4e1  
shaad@shaadiso:~$ 
```

Access the Nginx server again: Navigate to <http://localhost> in your browser. You should still see the "Hello, Docker Volume!" message, demonstrating that the data persisted across container instances.

Step 5: Clean Up

Stop and remove the container:

```
docker stop my_nginx
```

```
docker rm my_nginx
```

```
shaad@shaadiso:~$ docker stop my_nginx  
docker rm my_nginx  
my_nginx  
my_nginx  
shaad@shaadiso:~$ 
```

Remove the Docker volume:

```
docker volume rm my_data_volume
```

```
shaad@shaadiso:~$ docker volume rm my_data_volume  
my_data_volume  
shaad@shaadiso:~$ 
```

Verify that the volume is removed:

```
docker volume ls
```

```
shaad@shaadiso:~$ docker volume ls
DRIVER      VOLUME NAME
shaad@shaadiso:~$ 
```

Ensure that my_data_volume is no longer listed.