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Lab Exercise 3: 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:

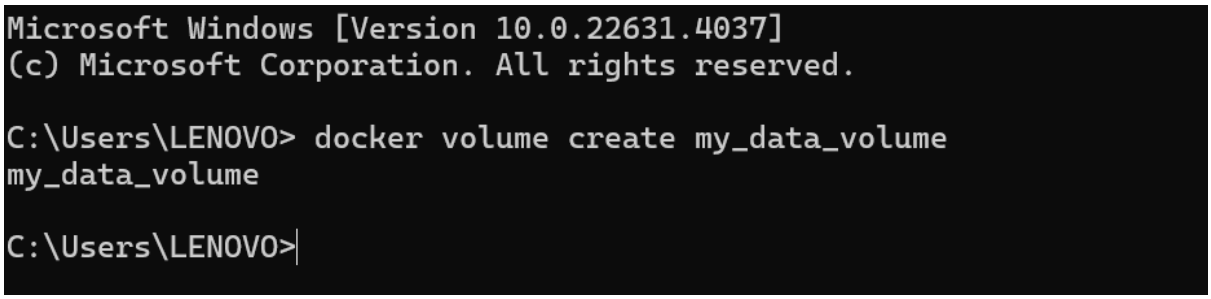
- Docker installed on your system.
- Basic understanding of Docker commands and container concepts.

Step 1: Create a Docker Volume

Create a new Docker volume:

```
docker volume create my_data_volume
```

This command creates a Docker volume named my_data_volume.



Verify that the volume was created:

```
docker volume ls
```

You should see my_data_volume listed among the volumes.

```
C:\Users\LENOVO>docker volume ls
DRIVER    VOLUME NAME
local     my_data_volume

C:\Users\LENOVO>
```

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
```

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.

```
C:\Users\LENOVO>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
e4fff0779e6d: Pull complete
2a0cb278fd9f: Pull complete
7045d6c32ae2: Pull complete
03de31afb035: Pull complete
0f17be8dcff2: Pull complete
14b7e5e8f394: Pull complete
23fa5a7b99a6: Pull complete
Digest: sha256:447a8665cc1dab95b1ca778e162215839ccbb9189104c79d7ec3a81e14577add
Status: Downloaded newer image for nginx:latest
02615ce2fa6b5a6b51704a3f03bf23e45d0db559bbf2bd6cb0e10934fc1a1990

C:\Users\LENOVO>
```

Verify that the container is running:

```
docker ps
```

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

```
C:\Users\LENOVO>
C:\Users\LENOVO>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED              STATUS              PORTS                  NAMES
02615ce2fa6b   nginx     "/docker-entrypoint.…"   About a minute ago   Up About a minute   0.0.0.0:8008->80/tcp   my_ngi
nx

C:\Users\LENOVO>
```

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
```

```
C:\Users\LENOVO>docker exec -it my_nginx bash
root@02615ce2fa6b:/# echo "<h1>Hello, Docker Volume!</h1>" > /usr/share/nginx/html/index.html
bash: !: event not found
root@02615ce2fa6b:/# echo"<h1>Hello, Docker Volume!</h1>">/usr/share/nginx/html/index.html
bash: !: event not found
root@02615ce2fa6b:/# echo "<h1>Hello, Docker Volume</h1>" > /usr/share/nginx/html/index.html
root@02615ce2fa6b:/# exit
exit
```

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

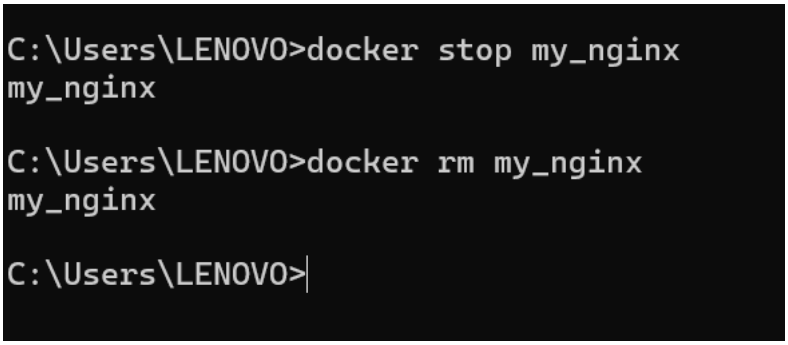
Access the Nginx server to see your file: Open a browser and navigate to http://localhost:8008. You should see the message "Hello, Docker Volume!" displayed on the page.

Step 4: Test Data Persistence

Stop and remove the container:

```
docker stop my_nginx

docker rm my_nginx
```



Run a new Nginx container using the same volume:

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

```
C:\Users\LENOVO>docker run -d --name new_nginx -v my_data_volume:/usr/share/nginx/html
 -p 8008 nginx
1137dbbac3a785e942fcb0b68ed2df0bac8a4b28ec2f3d13df343c249c2a2dd3
```

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 new_nginx

docker rm new_nginx
```

```
C:\Users\LENOVO>docker stop new_nginx
new_nginx

C:\Users\LENOVO>docker rm new_nginx
new_nginx
```

Remove the Docker volume:

```
docker volume rm my_data_volume
```

```
C:\Users\LENOVO>docker volume rm my_data_volume
my_data_volume
```

Verify that the volume is removed:

```
docker volume ls
```

Ensure that my_data_volume is no longer listed.