

Lab Exercise 2: Working with Docker Volumes

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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.

```
C:\Users\ASUS>docker volume create my_data_volume
my_data_volume
```

Verify that the volume was created:

```
docker volume ls
```

You should see my_data_volume listed among the volumes.

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

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
```

```
C:\Users\ASUS>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
eaf8753feae0: Pull complete
57f0dd1bef2: Pull complete
500799c30424: Pull complete
700146c8ad64: Pull complete
d989100b8a84: Pull complete
10b68cfefee1: Pull complete
119d43eec815: Pull complete
Digest: sha256:c881927c4077710ac4b1da63b83aa163937fb47457950c267d92f7e4dedf4aec
Status: Downloaded newer image for nginx:latest
eb3e0205526d138d0c457055dc8e41e774d6a20ee5fc83bc032726f305bc0dac
```

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
```

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

```
C:\Users\ASUS>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS
eb3e0205526d   nginx    "/docker-entrypoint...." 30 seconds ago Up 29 seconds 0.0.0.0:8008->80/tcp, [::]:8008->80/tcp
cp    my_nginx
```

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\ASUS>docker exec -it my_nginx bash
root@eb3e0205526d:/# echo "<h1>Hello, Docker Volume</h1>" > /usr/share/nginx/html/index.html
root@eb3e0205526d:/# 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.

Hello, Docker Volume

Step 4: Test Data Persistence

Stop and remove the container:

```
docker stop my_nginx

docker rm my_nginx
```

```
C:\Users\ASUS>docker stop my_nginx
my_nginx
```

```
C:\Users\ASUS>docker rm my_nginx
my_nginx
```

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
```

```
C:\Users\ASUS>docker run -d --name my_nginx -v my_data_volume:/usr/share/nginx/html -p 8008:80 nginx
3ac2a31fd33d211f1d8146eb8c8620e9f04c9fa0fef0f91c806f4e0180c91dc4
```

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.

Hello, Docker Volume

Step 5: Clean Up

Stop and remove the container:

```
docker stop my_nginx
```

```
docker rm my_nginx
```

```
C:\Users\ASUS>docker stop my_nginx
my_nginx

C:\Users\ASUS>docker rm my_nginx
my_nginx
```

Remove the Docker volume:

```
docker volume rm my_data_volume
```

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

Verify that the volume is removed:

```
docker volume ls
```

```
C:\Users\ASUS>docker volume ls
DRIVER      VOLUME NAME
```

Ensure that my_data_volume is no longer listed.