

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
```

```
PS C:\Users\Devanshi> docker volume create djvolume
djvolume
PS C:\Users\Devanshi> docker volume ls
DRIVER      VOLUME NAME
local       djvolume
```

This command creates a Docker volume named my_data_volume.

Verify that the volume was created:

```
docker volume ls
```

```
PS C:\Users\Devanshi> docker volume ls
DRIVER      VOLUME NAME
local       djvolume
```

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
```

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
```

```
PS C:\Users\Devanshi> docker run -d --name djnginx -v djvolume:/usr/share/nginx/html -p 8008:80 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
eaf8753feae0: Pull complete
700146c8ad64: Pull complete
10b68cfefee1: Pull complete
500799c30424: Pull complete
57f0dd1befe2: Pull complete
d989100b8a84: Pull complete
119d43eec815: Pull complete
Digest: sha256:c881927c4077710ac4b1da63b83aa163937fb47457950c267d92f7e4dedf4aec
Status: Downloaded newer image for nginx:latest
7dc3e965ae3ba45e791e9a5ba03fe7078341451ff7bbd807a5446394ed63779e
PS C:\Users\Devanshi> docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
7dc3e965ae3b	nginx	"/docker-entrypoint..."	13 seconds ago	Up 12 seconds	0.0.0.0:8008->80/tcp, [::]:8008->80/tcp
cp	djnginx				

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
```

```
PS C:\Users\Devanshi> docker exec -it djnginx bash
root@7dc3e965ae3b:/# echo "<h1>Hello, Docker Volume</h1>" > /usr/share/nginx/html/index.html
root@7dc3e965ae3b:/# 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
```

```
PS C:\Users\Devanshi> docker stop djnginx
djnginx
PS C:\Users\Devanshi> docker rm djnginx
djnginx
```

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
```

```
PS C:\Users\Devanshi> docker run -d --name djnginx -v djvolume:/usr/share/nginx/html -p 8008:80 nginx
81f461bc9c946b1442f907e5b12f5c9b1bb15b381888e46b9046417f4106a602
```

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
```

```
PS C:\Users\Devanshi> docker stop djnginx  
djnginx  
PS C:\Users\Devanshi> docker rm djnginx  
djnginx
```

Remove the Docker volume:

```
docker volume rm my_data_volume
```

Verify that the volume is removed:

```
docker volume ls
```

```
PS C:\Users\Devanshi> docker volume rm djvolume  
djvolume  
PS C:\Users\Devanshi> docker volume ls  
DRIVER      VOLUME NAME
```

Ensure that my_data_volume is no longer listed.