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Using Volume to persist data of the container

- In some scenarios, you have to access the files on the host system, or if you want to persist the data even if the container is killed, or share data across containers.
- Some Database or Files that container and other applications should access.
- In above scenarios, `Docker Volumes` is used for managing files outside the lifecycle of the container.
- Although this is something where containers are dependent on a compabitible file or DB Mount, its a useful feature.

Access files on Host from within a container

- Use Docker's volume flag to access host files from within the container. illustrates the use of a volume flag to interact with the host's filesystem.
  - Lets create a small script and schedule in crontab in Host Linux to write some content in a file
  - Add below content to Shell Script : `test-cron-job.sh`

```
#!/bin/bash
echo “Cron ran successfully at : $(date)” >> /tmp/test-file.html
```

- Schedule crontab with

```
crontab -e

# Add below in crontab editor
* * * * * bash /home/ec2-user/test-cron-job.sh
```

- The following command shows the host's `/tmp` directory being mounted on `/var/data1`, and it could be run to start the container.

```
docker run -v /tmp:/var/data1 -it ubuntu:20.04 bash
cat /var/data1/test-file.html
cd /var/data1/
echo "written from docker container with Hostname as $HOSTNAME" >> test-file.html
```

- Similarly, even if multiple containers are launched with above same command, the Host directory will be mounted on those containers.

Docker Volumes:

- Creates a new volume that containers can consume and store data in.
- Use below to Create a volume and then configure the container to use it:
- Let's pull the latest nginx image from the docker hub and run the container and load the home page which listens on port 80.

```
docker run -it --name=WebApp -d -p 80:80 nginx
netstat -nltp
```

- Access the nginx home page in the browser
- Go inside the container and edit the content of `/usr/share/nginx/html`

```
docker ps
docker exec -it WebApp bash
cat /usr/share/nginx/html/index.html
echo "Changing the content of the home page from Hostname as $HOSTNAME" >
/usr/share/nginx/html/index.html
```

- We can use `docker stop` and `docker start` to check if content that is changed is accessible.
- If this container is stopped or somehow gets killed, and another container is loaded, the changes made in the previous container are not accessible anymore.

For example uses of this command, refer to the examples section below.

- Mount a same path on Host Directory and creating multiple containers and write the hostname using CMD in a file that is mounted.

Creating Docker Volumes

- Volumes are saved in the host filesystem `/var/lib/docker/volumes/` which is owned and maintained by docker.
- Any other non-docker process can't access it, also as checked above other docker processes/containers can still access the data even container is stopped since it is isolated from the container file system.

```
# Check for any volumes
ls /var/lib/docker/volumes/
#create docker volume
docker volume create datavolume
#list volumes
docker volume ls
#inspect volumes
docker volume inspect datavolume
sudo ls /var/lib/docker/volumes/
##removing docker volumes
docker volume rm datavolume
```

- Stop and remove previously launched containers if any

```
docker container stop ContainerID
docker container rm ContainerID
```

- Now above scenario can be seen using docker volume to persist the changes in one container and access using another

```
docker run -d --name=Container1 --mount
source=datavolume,destination=/usr/share/nginx/html -p 80:80 nginx
```

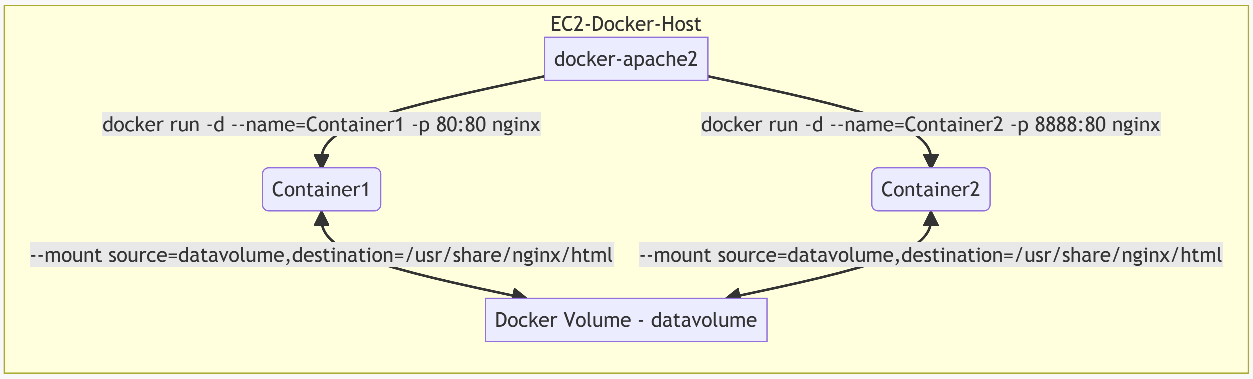
- Access the nginx home page in the browser

```
docker exec -it Container1 bash
ls /usr/share/nginx/html
echo "Changing the content of the home page from Hostname as $HOSTNAME" >
/usr/share/nginx/html/index.html
```

- Check the content of the file from host : `cat /var/lib/docker/volumes/datavolume/_data/index.html`
- Now if we launched another container and check the content, since Volume is shared by both containers the same file is accessible from this container.

```
docker run -d --name=Container2 --mount
source=datavolume,destination=/usr/share/nginx/html -p 8888:80 nginx
```

- Access the container on browser with port 8888 or using `curl localhost:8888`


EC2-Docker-Host
docker-apache2
docker run -d --name=Container1 -p 80:80 nginx
docker run -d --name=Container2 -p 8888:80 nginx
Container1
Container2
--mount source=datavolume,destination=/usr/share/nginx/html
--mount source=datavolume,destination=/usr/share/nginx/html
Docker Volume - datavolume