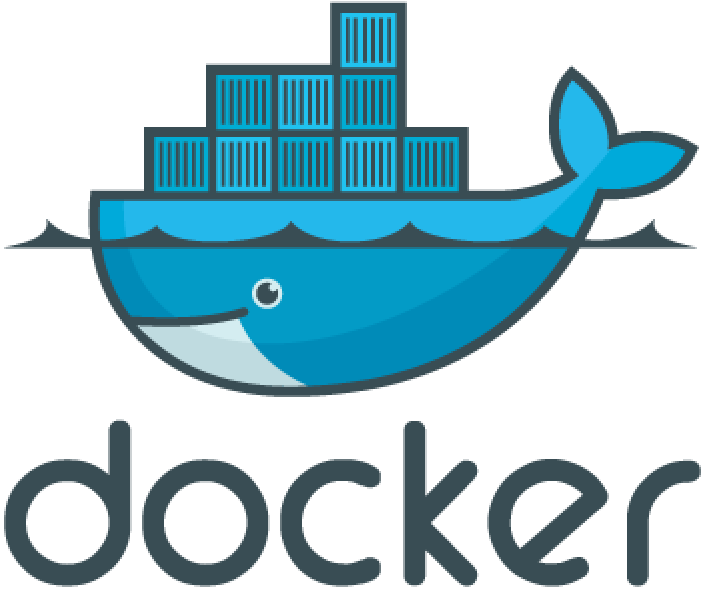
Docker

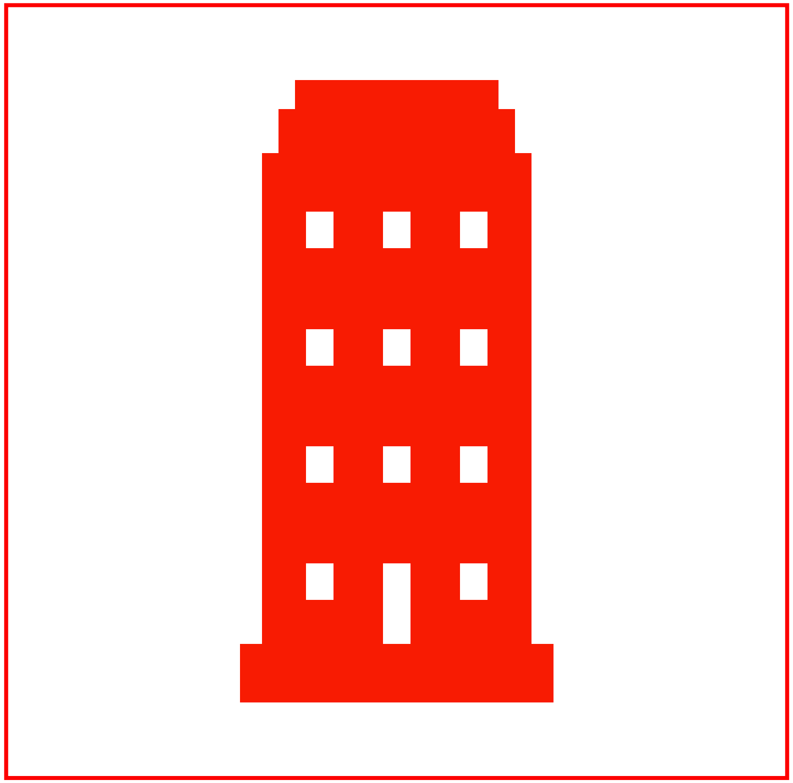
Presented by:
Jospheen Boles

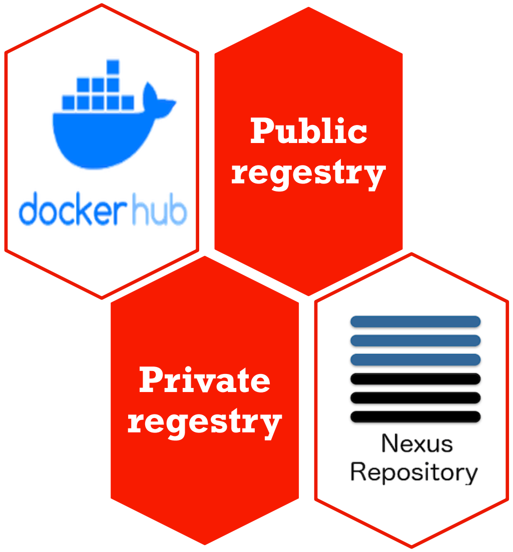


Outline

- Containerization VS Virtualization (Container vs VM)
- What's Docker and its architecture?
- Docker images
- Docker Container
- Docker registry
- Docker components (Client, Host and Daemon)
- Common docker commands
- Dockerfile and its instructions

Types of Docker registries





Manipulating Containers with the Docker Client

Docker Basic Commands

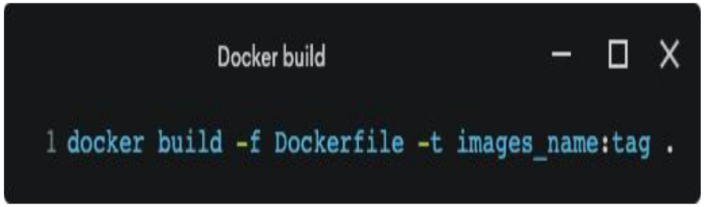
Build Image	• $ docker build –f Dockerfile -t <image-name:tag-name>
Overriding default command	• $ docker run <image-name> <command!>
Attached and Detached	• $ docker run –d <image-name> • $ docker attach <container ID>
Interactive mode	• $ docker run -i <image-name>
Port mapping	• $ docker run –p host:container <image-name>

Docker Basic Commands

Volume mapping	• $ docker run –v host:container <image-name>
Inspect container	• $ docker inspect <container-name>
Stop container	• $ docker stop CONTAINER
List all images	• $ docker images -a
List all containers	• $ docker ps -a

- docker build

Creates Docker images from a Dockerfile



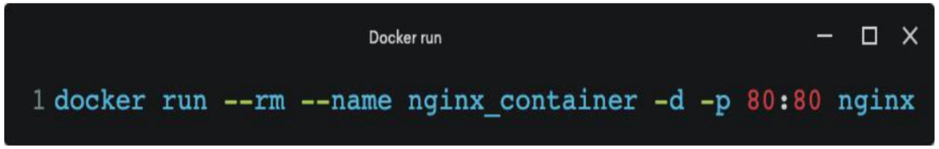
```
docker build -f Dockerfile -t images_name:tag .
```

Detail:

- -f : Specifies the name or location of the Dockerfile
- -t : Assigns the name of the image with its respective tag

- docker run

Allows you to run a container from an image



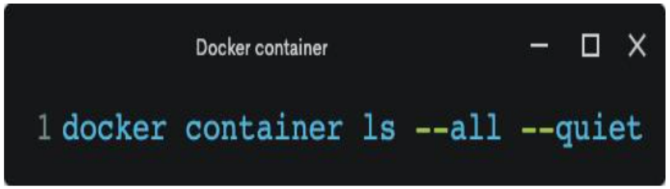
```
docker run --rm --name nginx_container -d -p 80:80 nginx
```

Detail:

- --rm : Allows the container to be removed once it stops.
- --name : Allows you to assign a name to a container
- -d : Allows to run a container in detached mode
- -p : Allows ports to be exposed to the host interface

- docker container ls

Allows to list containers



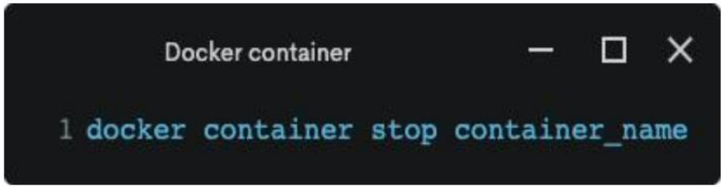
```
docker container ls --all --quiet
```

Detalle:

- --all, -a : List all containers up to the detainees
- --quiet, -q : Lists container IDs only

- docker container stop

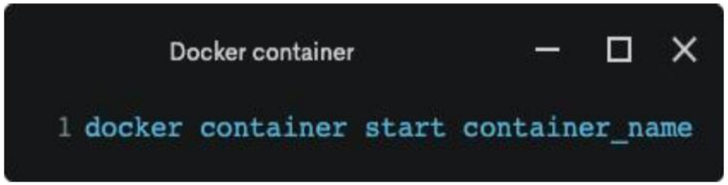
Allows to stop a container



```
docker container stop container_name
```

- docker container start

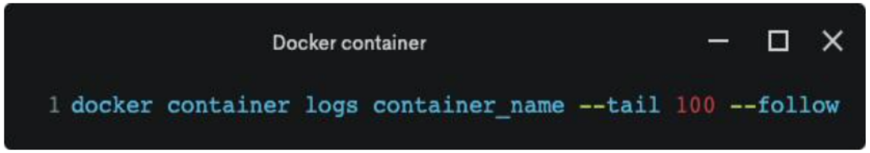
Allows you to start a container



```
docker container start container_name
```

- docker container logs

Allows you to view the logs of a container



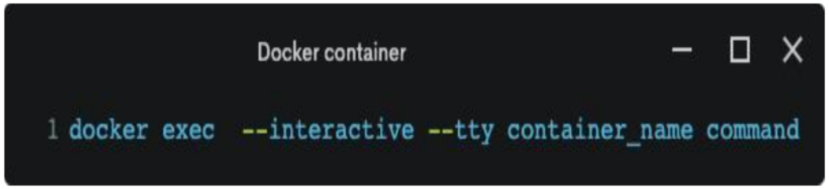
```
docker container logs container_name --tail 100 --follow
```

Detalle:

- --tail, -n : Number of lines to display
- --follow, -f : Keeps track of the output being generated

- docker container exec

Allows to execute a command in a running container



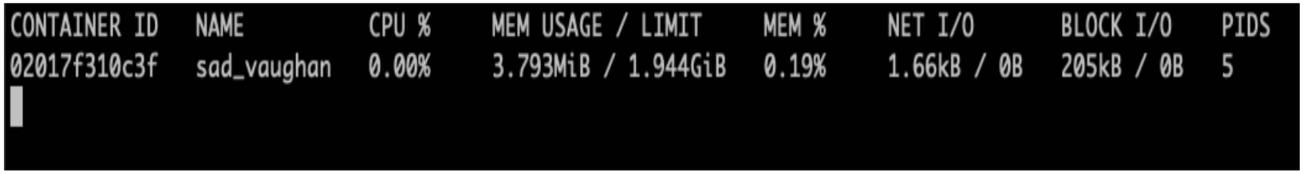
```
docker exec  --interactive --tty container_name command
```

Detalle:

- --interactive, -i : Connect to STDIN
- --tty, -t : Assign pseudo-TTY terminal

- docker stats

The docker stats command returns container consumption statistics such as memory, cpu and networking usage.



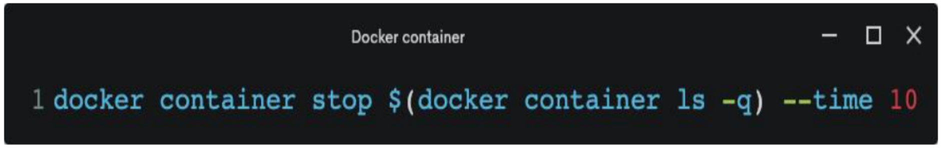
```
CONTAINER ID   NAME          CPU %     MEM USAGE / LIMIT     MEM %     NET I/O       BLOCK I/O    PIDS
02017f310c3f   sad_vaughan   0.00%     3.793MiB / 1.944GiB   0.19%     1.66kB / 0B   205kB / 0B   5
```

Detalle:

- --all -a: Displays statistics of all running containers.

- Concatenated commands

This CLI allows concatenated commands to simplify management tasks.



```
docker container stop $(docker container ls -q) --time 10
```

Details:

- First, the command found in $() is executed, which outputs the container IDs
- Subsequently a docker container stop will be executed for each of the IDs with the --time flag to stop after 10 minutes.

Lab2

Problem 1

- Run the container hello-world
- Check the container status
- Start the stopped container
- Remove the container
- Remove the image

Problem 2

- Run container centos in an interactive mode
- Run the following command in the container “echo docker ”
- Open a bash shell in the container and touch a file named hello-docker
- Stop the container and remove it. Write your comment about the file hello-docker
- Remove all stopped containers

Problem 4

- Run the image httpd again without attaching any volumes
- Add html static files to the container and make sure they are accessible
- Commit the container with image name IMAGE_NAME
- Push it to docker hub