

INTRODUCTION TO DOCKER

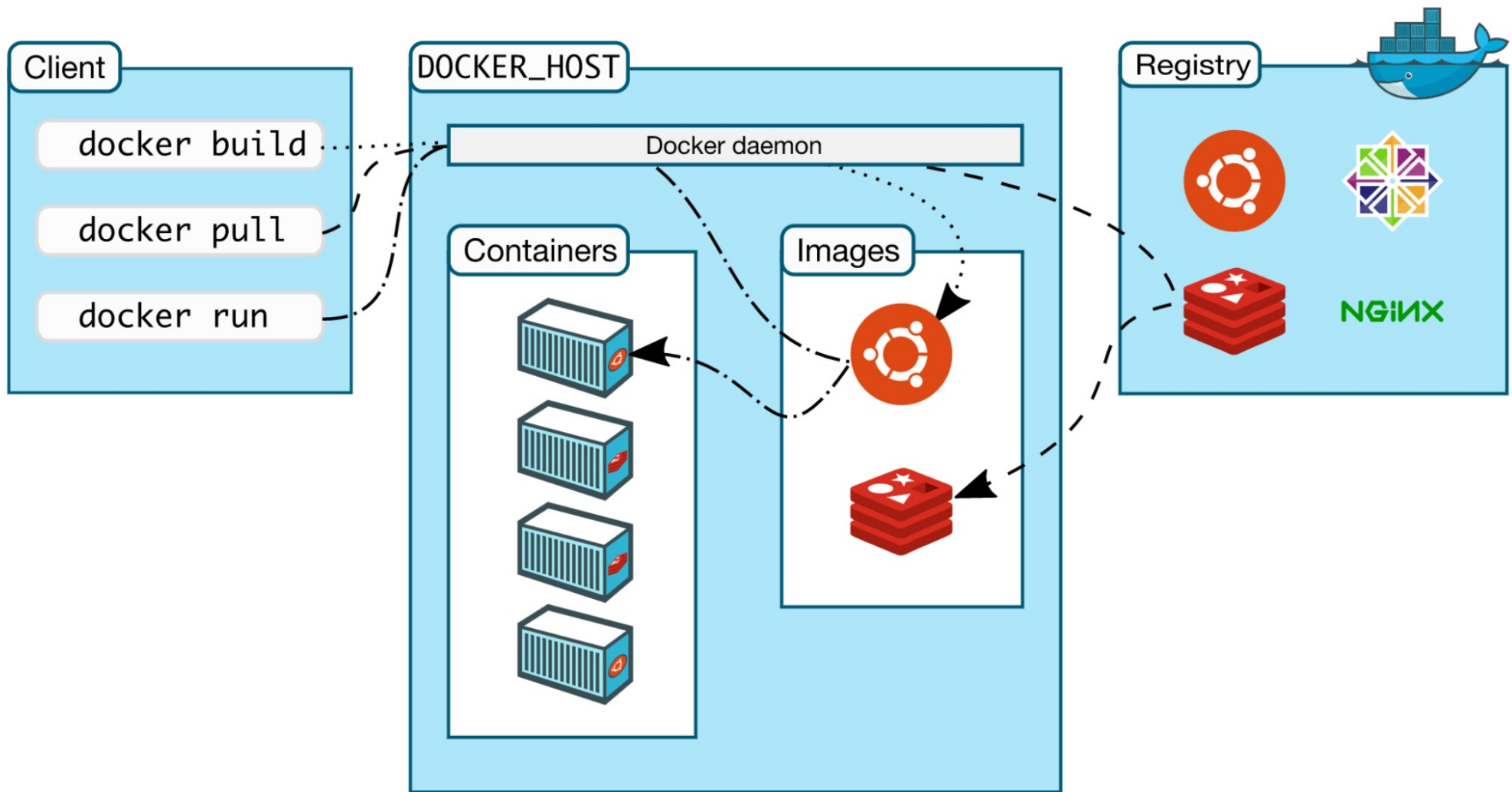
2021-02-13

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**Based on the original material from Abhijit Agarwal, Data
Science Retreat**

What is Docker

- Runs a Linux process in an isolated and controlled environment
- Separates applications from Infrastructure
- Can be used during development and/or production
- Allows reproducible build and execution (no „works on my machine“)
- Available for macOS and Windows using a virtual machine
- (There is also a native Docker for Windows, but is not that common)



Daemon and client

- The daemon (dockerd) is the process that manages all docker resources
- The Docker client (docker) is the primary way that Docker users interact with the Daemon
- In our case, the daemon and the client will be on the same machine: our laptops!

Images and containers


- An image is a template to create containers to run. Most importantly, it contains the files visible to the running app (including libraries and interpreters)
- An image is often based on another, e.g. Ubuntu or Python. You can build images layer by layer
- Public images are on hub.docker.com, including official ones
- A container is a running image, you can have multiple containers from the same image


The Docker Hub


← → ↻


hub.docker.com/_/ubuntu


☆





















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 dockerhub

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ubuntu ☆

Docker Official Images

Ubuntu is a Debian-based Linux operating system based on free software.

↓ 1B+

Container Linux IBM Z PowerPC 64 LE x86-64 ARM 386 ARM 64 Base Images Operating Systems

Official Image


Description Reviews Tags

Quick reference

Google Chrome

Copy and paste to pull this image

```
docker pull ubuntu
```



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List all docker images
docker images

Pull a docker image
docker pull ubuntu:latest

List all running containers
docker ps

List all running and stopped containers
docker ps -a

Start a container from an image
docker run -it --rm --name ubuntu-container ubuntu:16.04 /bin/bash

Execute commands on an already-running container
docker exec -it <container-name-or-id> /bin/bash

Stop a running container, from outside the container
docker stop <container-name-or-id>

Exercise 1

- Find the image for Ubuntu on Docker Hub (use google)
- Start a container with Ubuntu. Version 20.04
- Install wget utility inside this container
- Exit this container
- The container is now stopped. Restart the container
- Install python 3.9 in this container
- Exit this container again
- Delete this container
- Delete the image

Exercise 2

- Find the image for Mysql
- Read instruction on “How to use this image”
- Start a container with Mysql. Version 5.7
- Run a mysql container in the background
- Run mysql client inside the same container, using “root” user
- Run ``SHOW DATABASES``, try creating a table
- Exit the mysql client
- Stop the container
- What happens to the data when the container is gone?