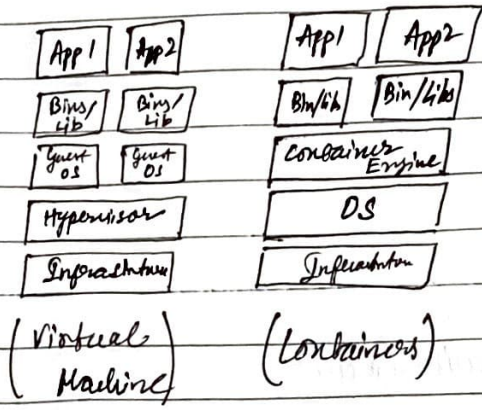
Docker

Before Docker → Initially, only one application on one server.
Every time we need to run new application we need to buy new server. (Not appropriate) X

* Vmware solve this problem by using Virtual Machine.
↳ it require its own OS. (operating system)

Containers → An engine that enables any payload to be encapsulated as a lightweight, portable, self sufficient, container that can be manipulated using standard operations and runs consistently on virtually any hardware platform.



- Hypervisor → Is used to create multiple machines on a host operating system and manage virtual machine

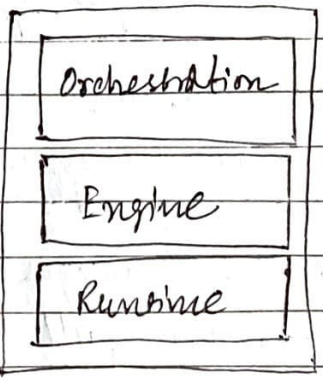
* Container run on top of virtual machine, it's n/a.

What is Docker?
↳ Docker is a container platform that allows you to build, test and deploy applications quickly.

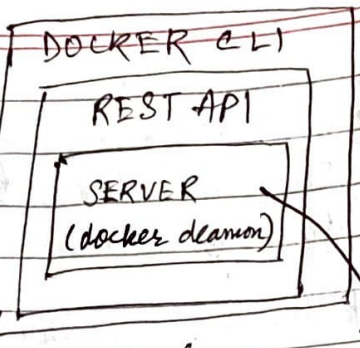
Runtime → It allow us to start and stop containers.

low-level Runtime - runc
(it work with O.S. and start and stop the container)

containerd - Managing runc
also help in managing container.
How to interact with your container to the network. Also used in K8 runtime



Engine → • Docker Deamon



Eg → used to create a class → Docker file → Image (Class) → Container (object)

Docker file: List of instructions

Image: can be shared to others.

$ docker run hello-world
- run: Run an image to create a container
- hello-world: image name

$ docker run -it ubuntu ← it will run ubuntu after you enter this command.
- -it → interactive environment

How to see all the images on Docker?
↳ $ docker images

- Registry → online repository Eg → Docker Hub.
- Container → Isolated environment in which we can run our application

Directly download images (without running)
↳ docker pull mysql

To see container what are currently running
↳ docker ps
↳ docker container ls (see all containers)

↳ docker container exec -it [CONTAINER ID] bash
↑ this shell should be attach to the container

To show all the container are stopped
↳ docker ps -a

To remove a container
↳ docker remove [CONTAINER_NAME]

To see all the details of the container
↳ docker inspect [CONTAINER_NAME]

To see logs
↳ docker logs []

To delete all the stop container
↳ docker container prune -f

docker run alpine ping www.megaverse.co.in
↳ If we want this to run it in the background.

Something container run for a very long time use case - server

docker run -d alpine ping www.megaverse.co.in
↳ detach mode
(It will return id of the container)

* Alpine → A minimal docker image based on alpine linux with a complete package index and only 5mb in size.

`docker run ubuntu` `echo Hey` — This work will put in the terminal

It will run it

`docker logs --since 5s [ID]`

Time

↳ Access the data just for 5s.

`docker stop []` — To stop the container

`docker rm []` — To remove the stop container

`docker rmi [] -f` — To remove image

Accessing a container locally

`docker run -d -p 8080:80 nginx`

port

nginx default port is port 80.

You made some changes in the container and want to share with someone, and make that particular change visible.

① `docker run -it ubuntu`

`docker ps` ↳ copy id.

② `touch names.txt`

③ `echo "Hey my name is Arpan Mondal" >> names.txt`

If I want to download ubuntu image that contain this file.

We can use commit messages

* To login into docker
↳ docker login.

To start a container → docker start []

(4) docker exec -it [] bash

(5) docker commit -m "added names.txt file" [] names_ubuntu:1.01 → Tags → version
↖ image name

To get image id → docker image -a
To remove all the image at once → docker rmi $(docker image -a)

* Images are build in layers. Each layer is immutable file, but is a collection of files and directories.

How to create Docker Image?

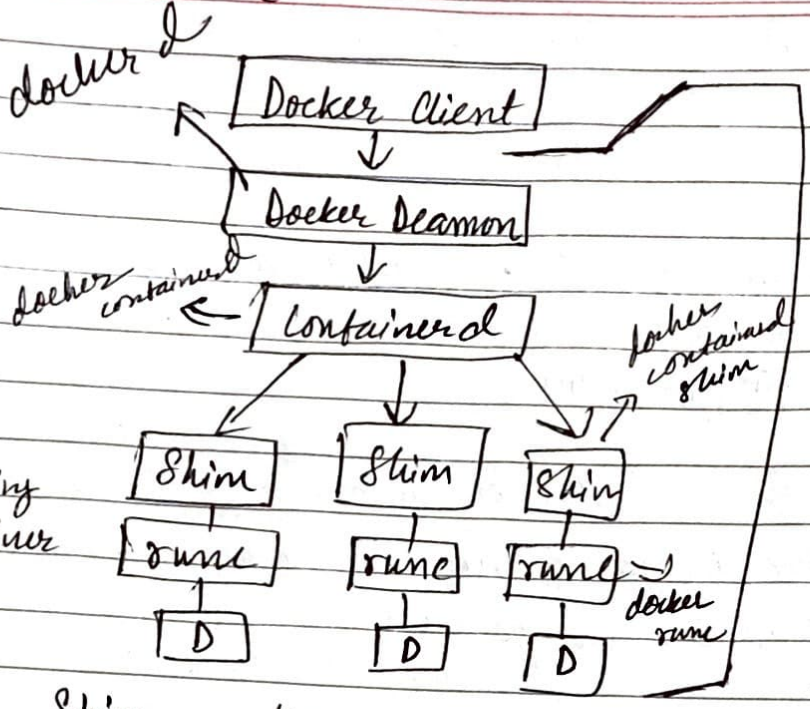
(1) ~ touch Dockerfile
vi Dockerfile

(2) FROM ubuntu → Base Image
MAINTAINER arpan mondal <aliestoarpan@gmail.com>
RUN apt-get
CMD ["echo", "Hello World"] !*
~ vi Dockerfile
↳ docker build -t myImage:1.01 . ← current directory

mkdir project
mv Dockerfile project
cd project
docker build -t myImage .

Ping Me!
If you want live tutorial

(Linux) → Name of the binaries. (Binary files)



Docker Engine

D - Running container

When we give docker run command it talks to docker deamon talks to containerd over grpc

Shim - deamon less containers

Client $\xrightarrow[(2375)]{HTTP}$ Server

Docker allow to only accept the connection are secure.

Most to cover

- Images
- Advance Docker files
- How to containerized your own app.
- Docker networking security
- Docker volume, compose, connecting various docker containers together
- Swarm