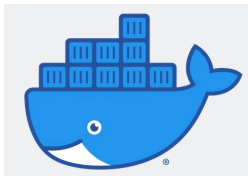


CS200

Software Tools & Technologies Lab II

Session 8

Docker Basics

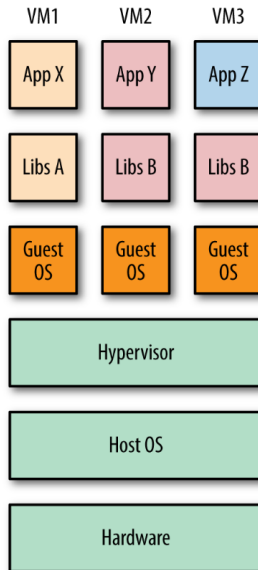
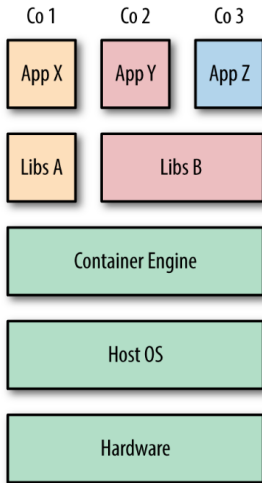


Instructor
Dr. Dhiman Saha

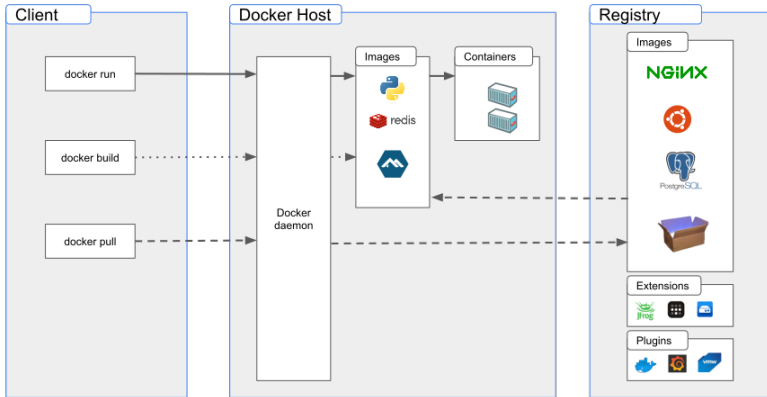
Containers

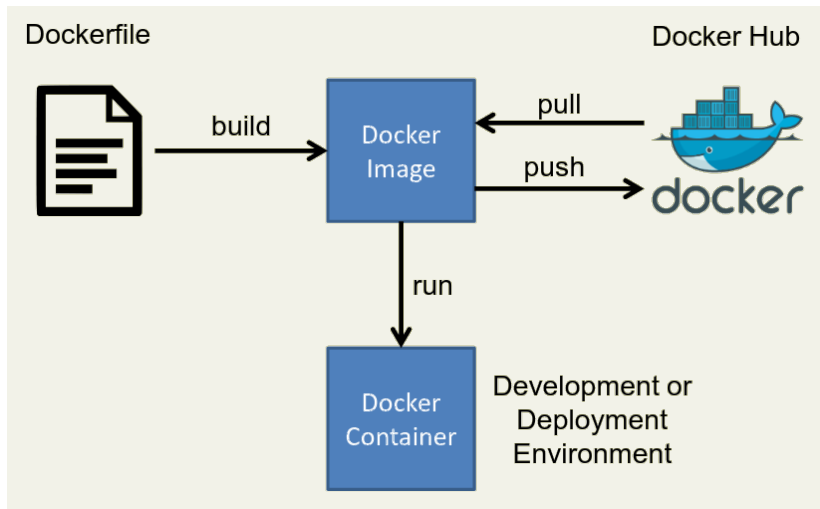
Vs

Virtual Machines



Docker Architecture





```
docker run debian echo "Hello World"
```

Point-to-Ponder

- ▶ Can you elaborate what happened in the above command?
 - ▶ How fast was it?
 - ▶ What about doing the same in a VM?
-
- ▶ Now study the output of the following
 - ▶ `docker run debian ls -l`
 - ▶ `docker run debian ping google.com`
 - ▶ Is the ping command working?

```
docker run -i -t debian /bin/bash
```

- ▶ Can you interpret the command-line switches?
- ▶ Can you run the ping command now?
- ▶ Let us install ping then from iputils-ping

```
apt-get update && apt-get install iputils-ping
```

- ▶ Now ping google.com

```
docker run -h CONTAINER -i -t debian /bin/bash
```

- ▶ Do you notice any change in the container prompt?
- ▶ What is the purpose of `-h` switch?
- ▶ Now execute the following

```
mv /bin /basket
```

```
ls
```

```
docker inspect Command
```

```
docker inspect <Container-Name>
```

- Can you find the IP address of this container?

How much did the container deviate from the image?

```
docker diff
```

I know what you did inside the container?

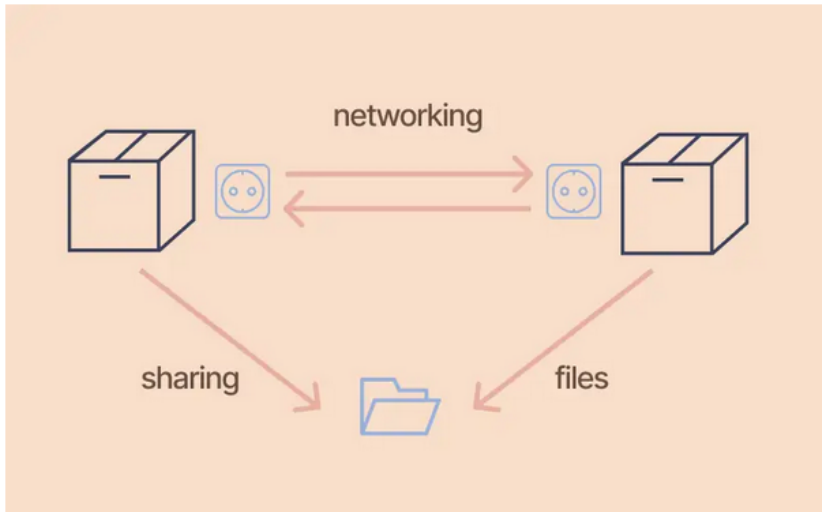
```
docker logs <Container-Name>
```

An exited container can be restarted by issuing `docker start`
`docker rm <Container-Name>`

Cleaning Up Stopped Containers

- ▶ `docker ps -aq -f status=exited` gets the IDs of all stopped containers
- ▶ `docker rm -v $(docker ps -aq -f status=exited)`
- ▶ Alternative
 - ▶ `docker run --rm` will delete the container and associated file system when the container exits

How do containers communicate?



docker virtual networks

Docker creates virtual networks which let your containers talk to each other. In a network, a container has an IP address, and optionally a hostname.

Network Types:

- ▶ **Default bridge network**

- ▶ Allows simple container-to-container communication by IP address,
- ▶ Created by default

- ▶ **User-defined bridge network,**

- ▶ Allows user containers to communicate with each other, by using their container name as a hostname
- ▶ Create by user

```
docker network ls
```

- ▶ Let us create two containers from debian image
- ▶ Install ping and tcpdump commands
- ▶ Find their IP Addresses
- ▶ ping one container from another

- ▶ Find another way to demonstrate communication between containers using docker networks
- ▶ Demonstrate how containers can communicate via shared folders