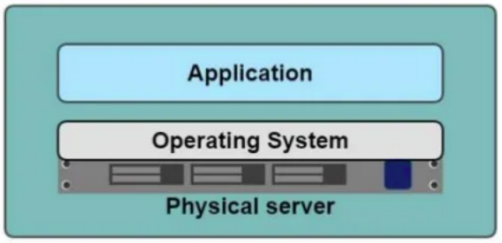
One application on one physical server

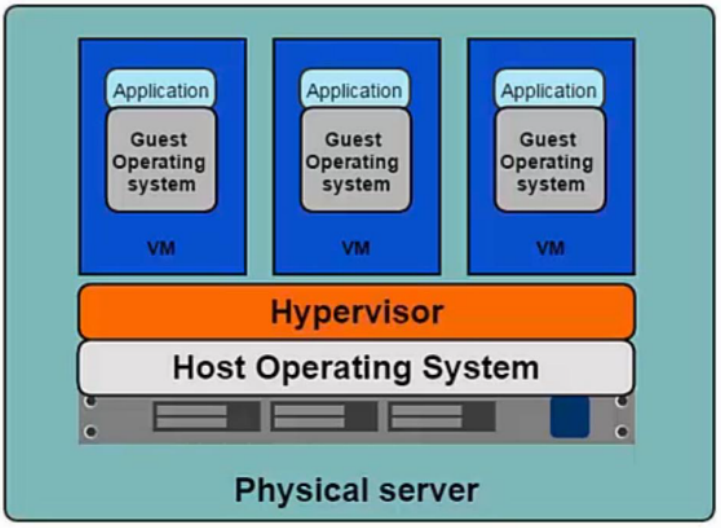


application deployment problem in History

- **Slow deployment**
- **Huge costs**
- **Wested resources**
- **Difficult to scale**
- **Vendor lock in**

Introduction to Virtualization

- One physical server can contain multiple applications
- Each application runs in a virtual machine



Limitation of VM

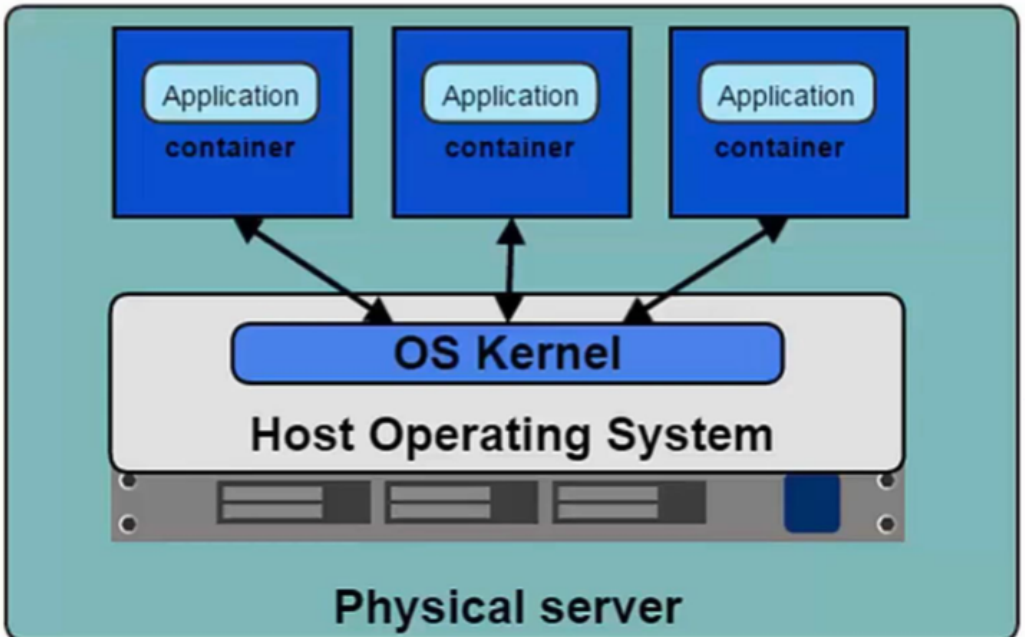
- Each VM still requires
    - CPU Allocation
    - Storage
    - RAM
- The more VM the More resources

Introduction to Containers

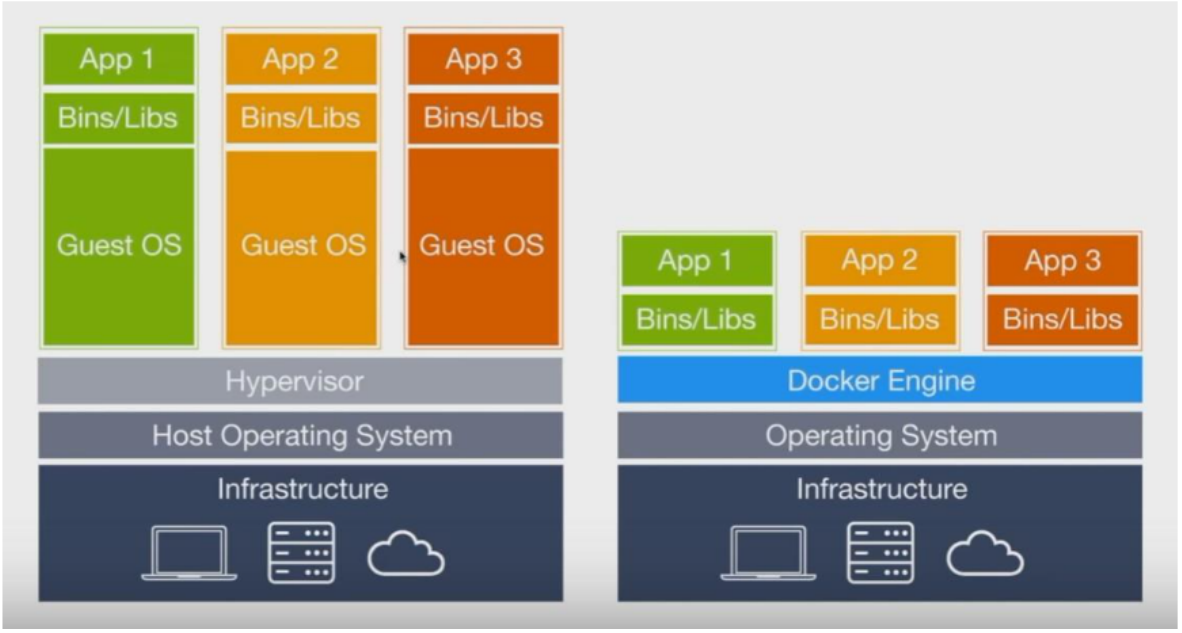
Container based virtualization uses the kernel on the host's operating system to run multiple guest instances

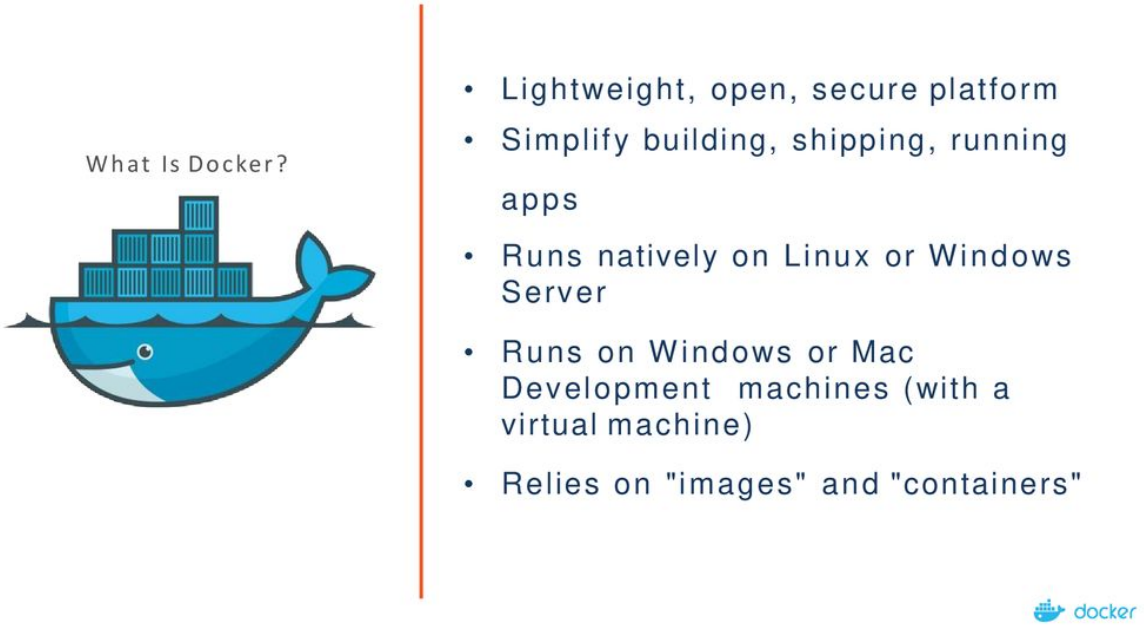
- Each guest instance is called a container
- Each container has its own
    - Root file system
    - Processes
    - Memory
    - Devices

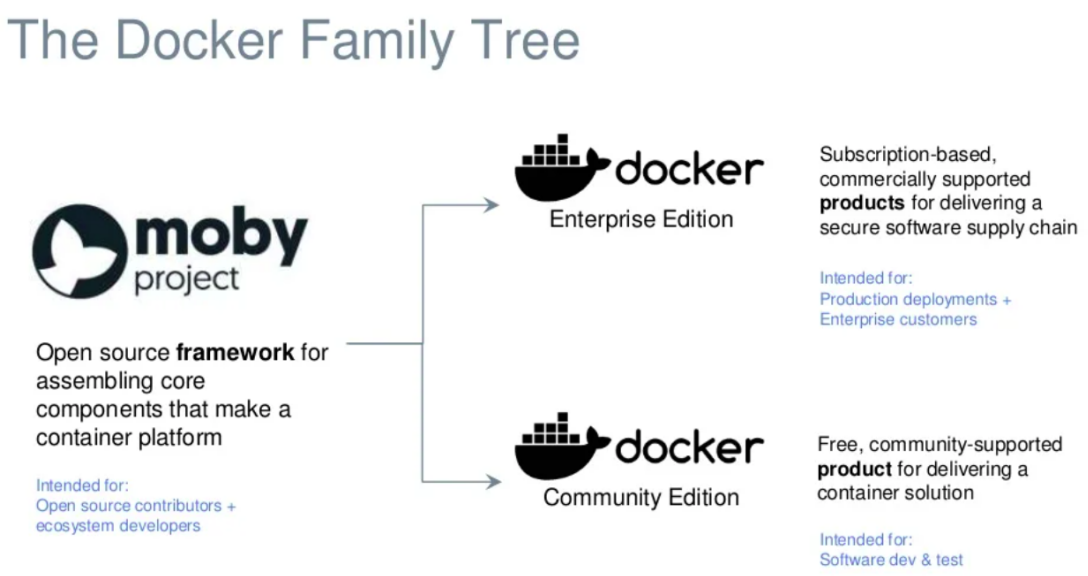
Introduction to Containers



VM Vs Containers







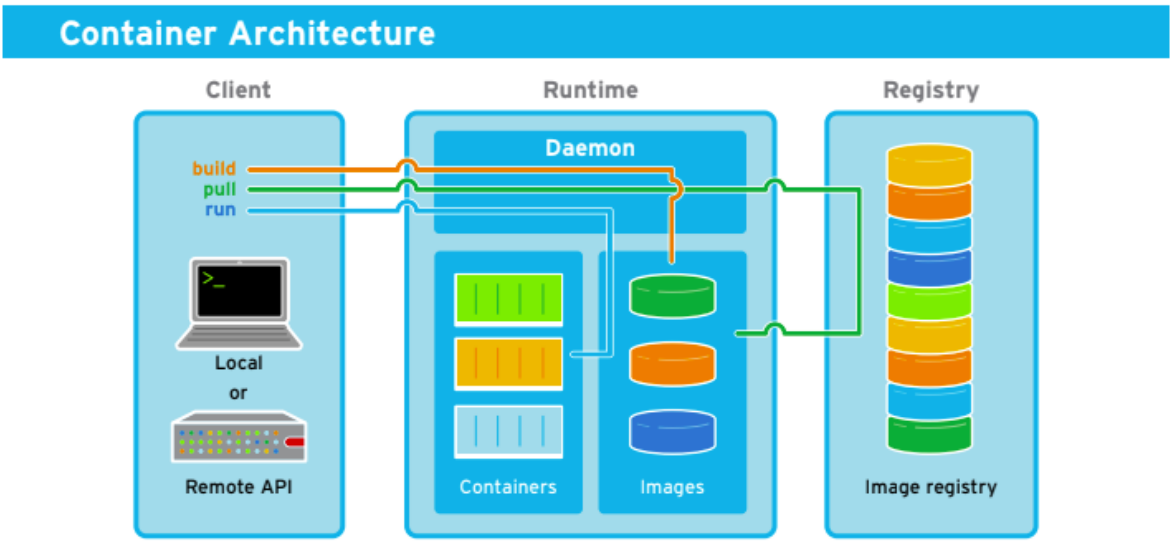
Container runtime engine

- Docker
- Cri-o
- PodDocker
- Cri-o
- Podman
- Rktlet

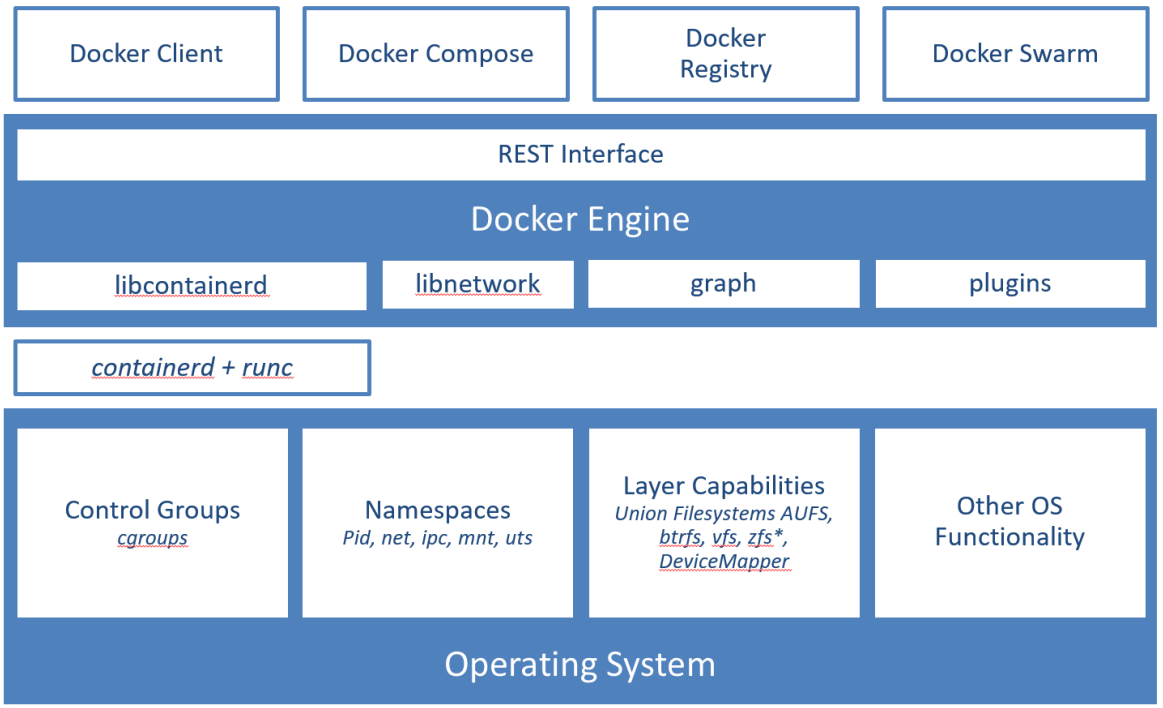
- Microsoft Containers

Container Ecosystem

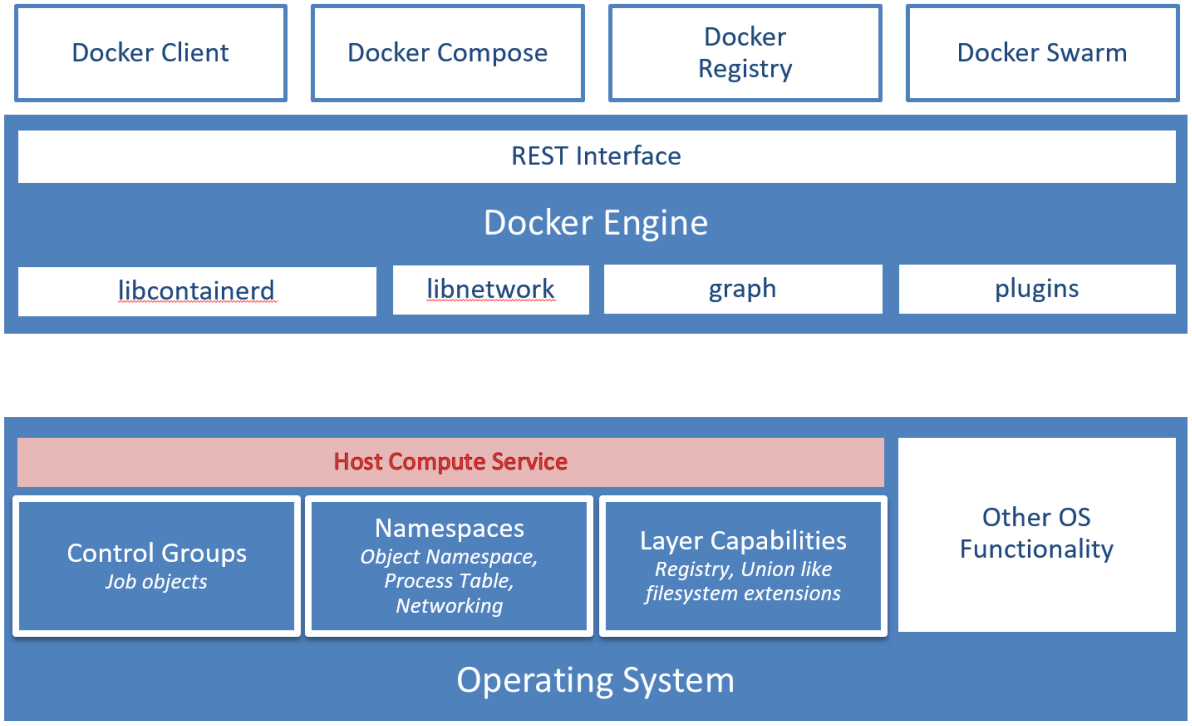
- Container
- Container image
- Container Runtime
- Container Registries



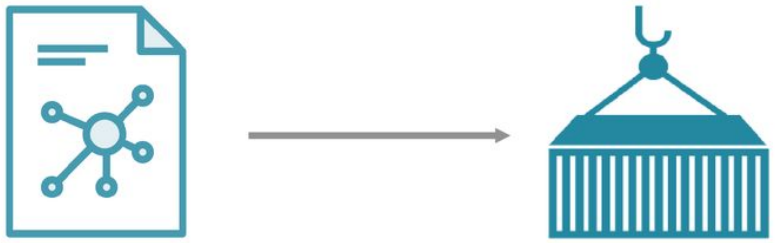
Architecture In Linux



Architecture In Windows



The Role of Images and Containers



Docker Image

Example: Ubuntu with Node.js and Application Code

Docker Container

Created by using an image. Runs your application.

docker

Some Docker vocabulary

Docker Image

The basis of a Docker container. Represents a full application

Docker Container

The standard unit in which the application service resides and executes

Docker Engine

Creates, ships and runs Docker containers deployable on a physical or virtual, host locally, in a datacenter or cloud service provider

Registry Service (Docker Hub(Public) or Docker Trusted Registry(Private))

Cloud or server based storage and distribution service for your images

docker

Sudo apt update
Sudo apt install docker.io
Sudo systemctl start docker
Sudo systemctl enable docker
https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-18-04