Docker Deep Dive

Chapter #1

Why What Where

Docker

FROM 10,000 FEETS

WHY

Why do we have containers

WHAT

What containers do for us

WHERE

Where can we use containers

Old Days

APPLICATIONS RUN BUSINESS

If application breaks, business suffers. Its true even today.

APPLICATIONS RUN ON SERVERS

Windows & Linux were not capable to run multiple applications on one server.

NEW APPLICATION NEW SERVER

Every time the business needs a new application. IT team has to purchase new server.

BIG SERVERS BIG WASTAGE

Large number of servers operating at 10-20% of their potential capacity.

Welcome VMware

VIRTUAL MACHINES

Technology that would safely & securely run multiple business applications on a single server.

NO OVERSIZED SERVER

No need to purchase new server for new application.

LOT OF SAVINGS

Companies started saving a lot as they are running multiple virtual servers on a single physical server.

Virtual machines were not flawless

MORE VM. MORE OS

Every virtual machines needed its own OS. Which is a major drawback.

PATCHING & MONITORING

Every virtual machine need patching & monitoring. Which makes it difficult for admins to manage.

NOT PORTABLE & SLOW

Virtual machines are slow to boot and not easy to migrate and do lift & shift operations.

Welcome Containers

NO FULL OS

Containers doesn't requires a full blown operating system. All containers on a host share the host's single operating system.

HUGE COST SAVING

This free up huge compute resources, licensing cost and lot of patching work overload.

ULTRA PORTABLE

Moving a container from physical to vm and to cloud is super easy.

Remember, a running container uses the kernel of the host machine it is running on.

This means that a container designed to run on a host with a Windows kernel will not run on a Linux host.

Windows containers require a Windows Host, and Linux containers require a Linux host.

Windows containers vs Linux containers

Docker what?

DOCKER INC

Docker the company

CONTAINER RUNTIME

Docker the container runtime and orchestration technology

OPEN SOURCE PROJECT

Docker the open source project (called moby)

Docker Inc.

San Francisco based technology startup founded by Salomon Hykes.

Docker, Inc. started its life as a platform as a service (PaaS) provider called dotCloud.

Behind the scenes, the dotCloud platform leveraged Linux containers. To help them create and manage these containers they built an internal tool that they nick-named “Docker”. And that’s how Docker was born!

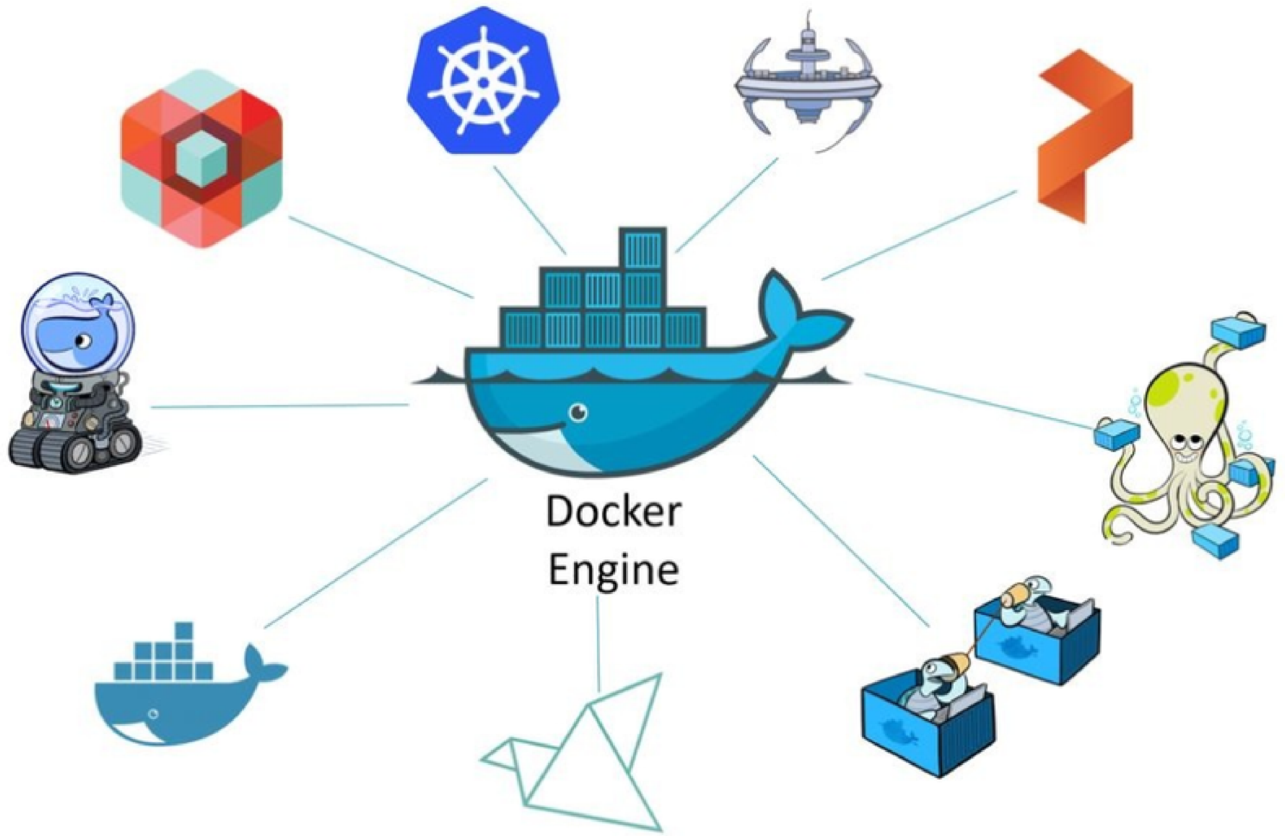
In 2013 rebranded the company as “Docker, Inc.”, got rid of the dotCloud PaaS platform, and started a new journey with a mission to bring Docker and containers to the world.

The word “Docker” comes from a British colloquialism meaning dock worker - somebody who loads and unloads ships.

Docker runtime & orchestration engine

The Docker Engine is the infrastructure plumbing software that runs and orchestrates containers. Like Vmware ESXi is the core hypervisor technology that runs virtual machines, the Docker Engine is the core container runtime that runs containers.

All other Docker, Inc. and 3rd party products plug into the Docker Engine & build around it.



Docker runtime & orchestration engine

It’s available on Linux and Windows, with open-source and commercially supported offerings. There are two main editions:

Enterprise Edition (EE)
Community Edition (CE)

The Enterprise Edition and the Community Edition both have a stable release channel with quarterly releases. Each Community Edition will be supported for 4 months and each Enterprise Edition will be supported for 12 months.

Docker open-source project: moby

“Docker” is also used to refer to the open-source Docker project. This is the set of tools that get combined into things like the Docker daemon and client you can download and install from docker.com.

Officially renamed as the Moby project at DockerCon 2017 in Austin, Tx.

The goal of the Moby project is to break Docker down into more modular components, and to do this in the open.

moby
project

Open Containers Initiative (OCI)

No discussion of Docker and the container ecosystem is complete without mentioning "Open Containers Initiative (OCI).

The OCI is a relatively new governance council responsible for standardizing the most fundamental components of container infrastructure such as image format and container runtime.

Legend says, "a company called CoreOS didn’t like the way Docker did certain things. They created a new open standard called appc that defined things like image format & container runtime. They also created an implementation of the spec called rkt (pronounced “rocket”)."

This put the container ecosystem in an awkward position with two competing standards.

Open Containers Initiative (OCI)

While competition is usually a good thing, competing standards are not. They cause confusion and slowdown user adoption. Not good for anybody.

With this in mind, everybody did their best to act like adults and came together to form the OCI - a lightweight agile council to govern container standards.

The OCI is organized under the auspices of the Linux Foundation and both Docker, Inc. and CoreOS, Inc. are major contributors.

WHAT WE LEARNED

Docker, Inc. They’re a startup tech company out of San Francisco with an ambition to change the way we do software.

They were arguably the first-movers and instigators of the container revolution. But a huge ecosystem of partners and competitors now exists.

The Docker project is open-source and lives in the moby/moby repo on GitHub.

The Open Container Initiative (OCI) has been instrumental in standardizing the container runtime format and container image format.