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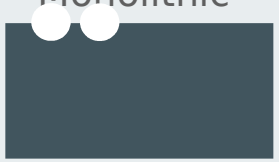
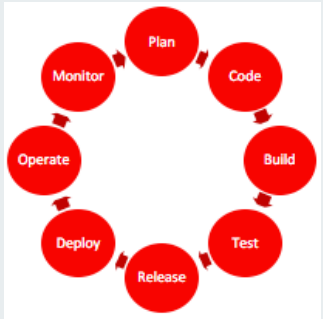
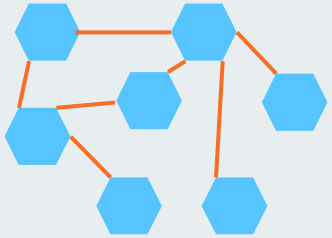
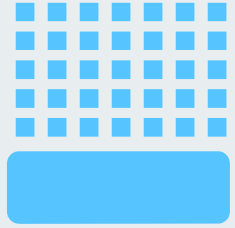
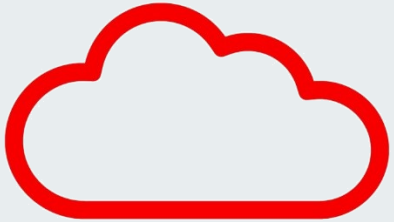
DevOps Workshop – 1

By Zama & Haseeb

Agenda

- Evolution of Software dev process
- What is DevOps
- Waterfall vs Agile
- DevOps Adoption
- Who’s using DevOps?
- Business IT Evolution
- DevOps Market Growth
- DevOps Overview
- DevOps Tools
- What is Docker
- History & Docker Community
- Market Adoption
- Features
- Docker ***vs*** Virtual Machine
- Core concepts
- Docker Registry
- Hands-on

Evolution of Software Dev Process

Development Process	Application Architecture	Deployment and Packaging	Application Infrastructure
Waterfall 	Monolithic 	Physical Server 	Datacenter 
Agile 	N-Tier 	Virtual Servers 	Hosted 
Devops 	Microservices 	Containers 	Cloud 

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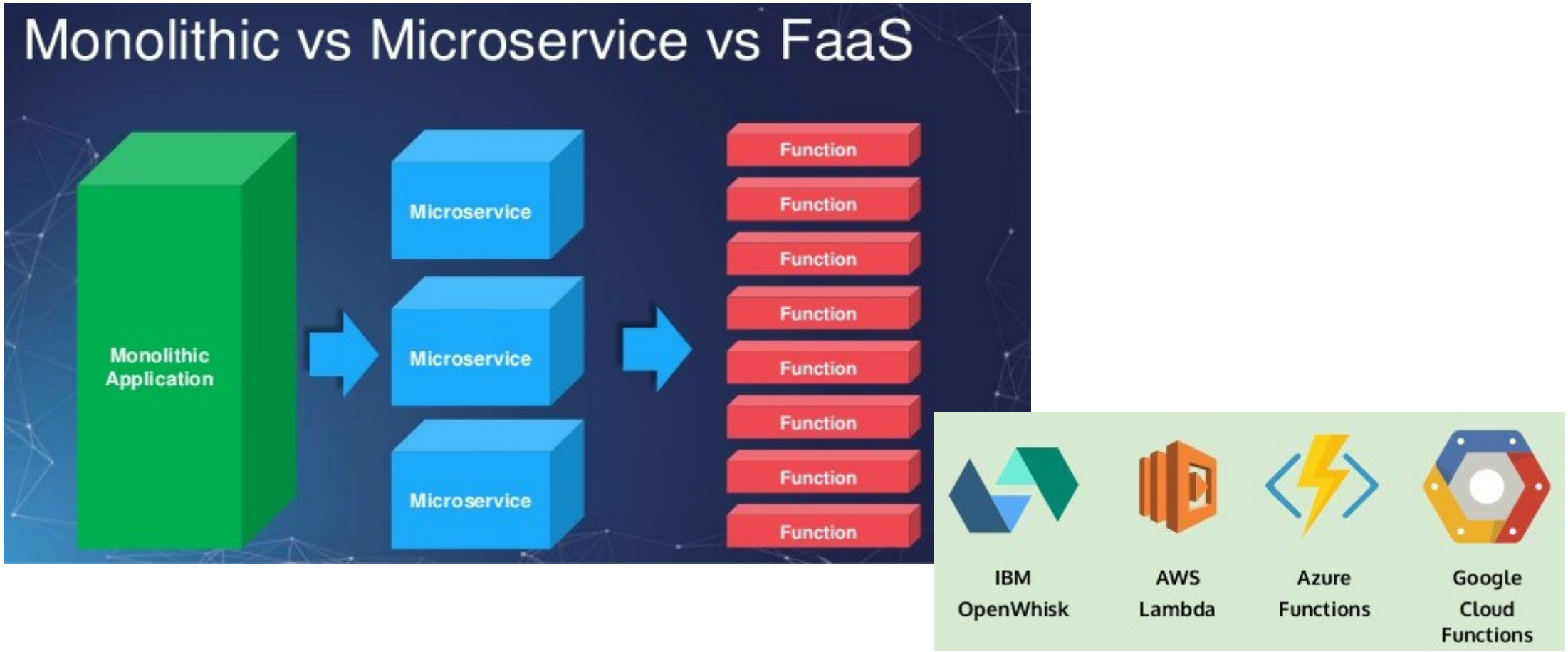
App Dev Future



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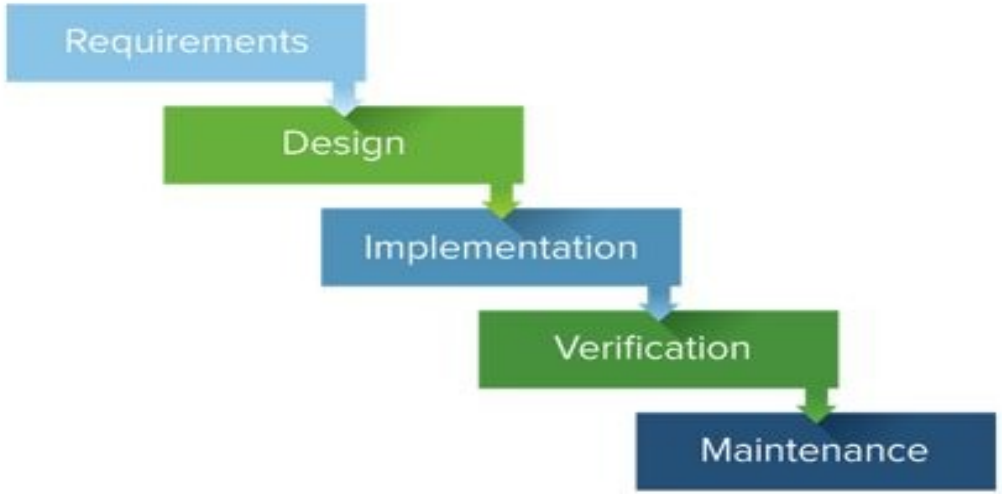
Waterfall vs Agile

Agile

- Continuous cycles
- Small, high-functioning, collaborative teams
- Multiple methodologies
- Flexible/continuous evolution
- Customer involvement

Waterfall



- Sequential/linear stages
- Upfront planning and in-depth documentation
- Contract negotiation
- Best for simple, unchanging projects
- Close project manager involvement

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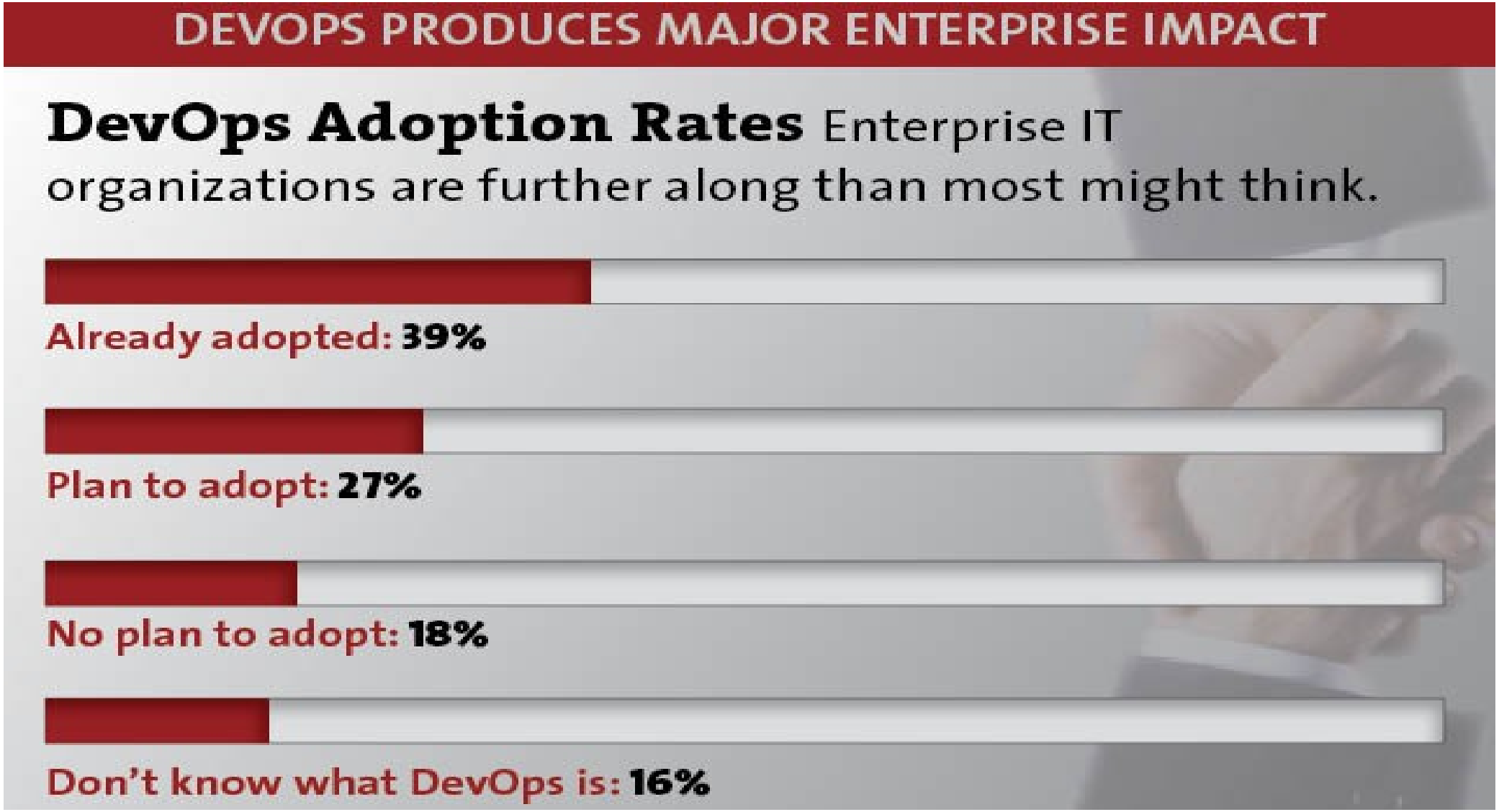
DevOps Market Adoption



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Who’s using DevOps?

Deploy code every 11.6 seconds, on an average

Etsy, Inc.

Company

Deploys More Than 50 Times a Day

NETFLIX

Deploy code thousands of times per day

facebook

Frequency of deployments:

- One minor update on most business days
- One major update on a weekly basis, usually Tuesdays

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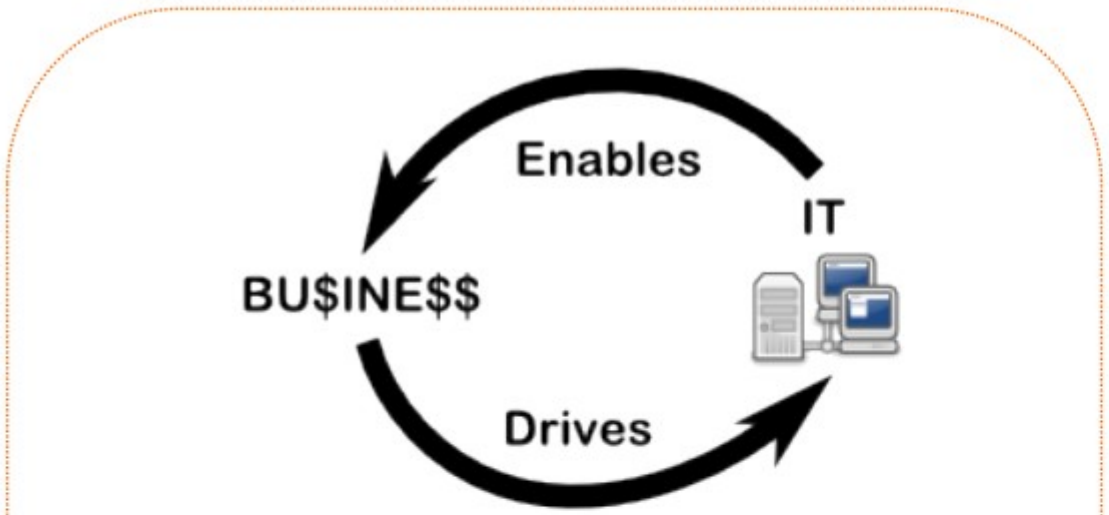
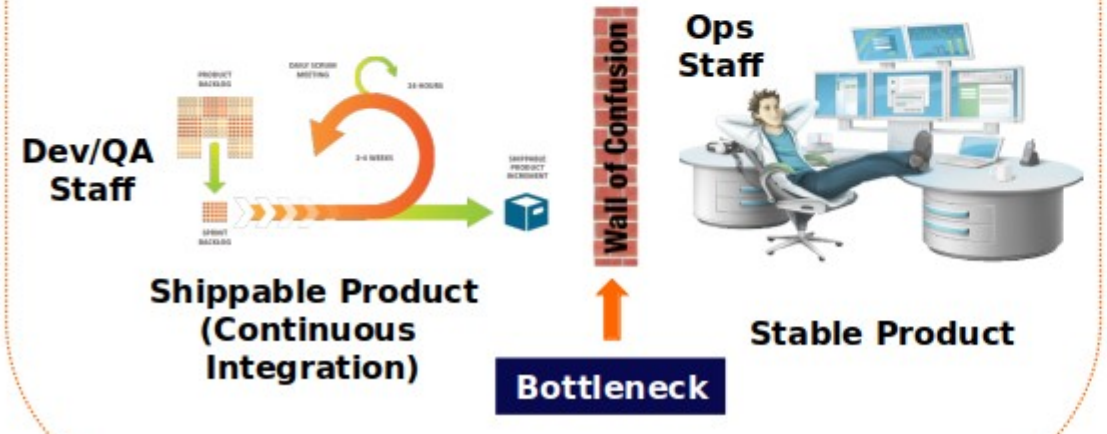
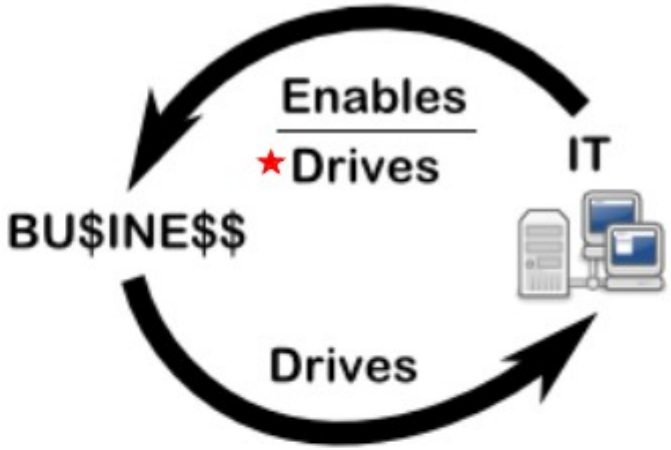
Business IT Evolution







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DevOps Market Growth

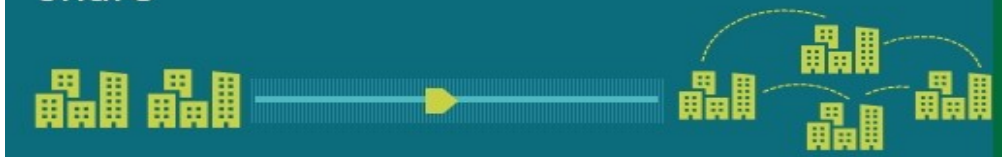
The market will be **ACCELERATING** growing at a **CAGR** of over **20%**

INCREMENTAL GROWTH **$4,319.60 mn**

2017 2022

The year-over-year growth rate for **2018** is estimated at **19.10%**

The market is **FAIRLY FRAGMENTED** with quite a few players who occupy the market share



55% of the growth will come from the **AMERICAS**

One of the **KEY DRIVERS** for this market will be the need to shorten time to market

READ THE REPORT:

GLOBAL DEVOPS PLATFORM MARKET 2018-2022

10,000+ reports covering niche topics

ICT

Read them at:

www.technavio.com

technavio

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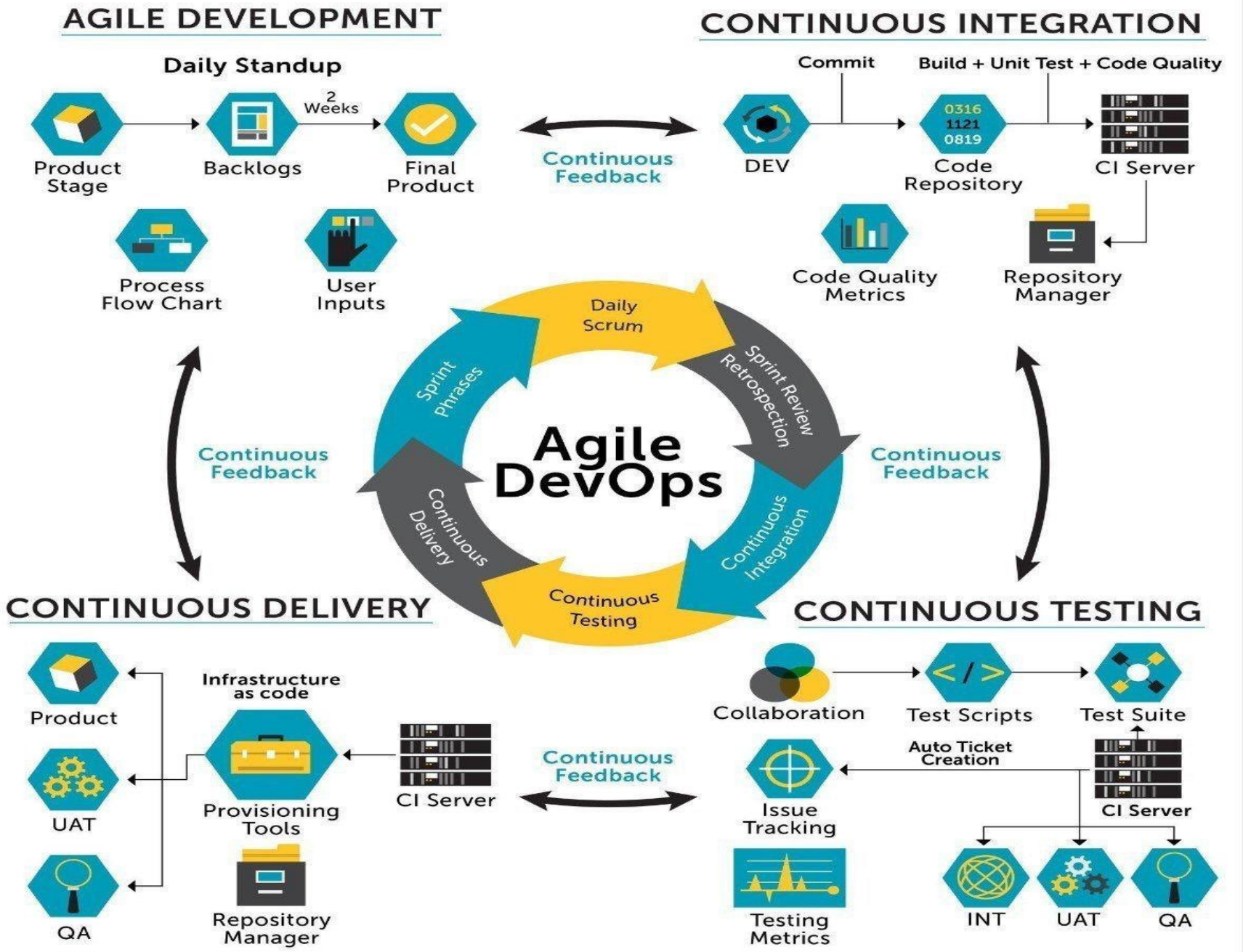
OVERVIEW



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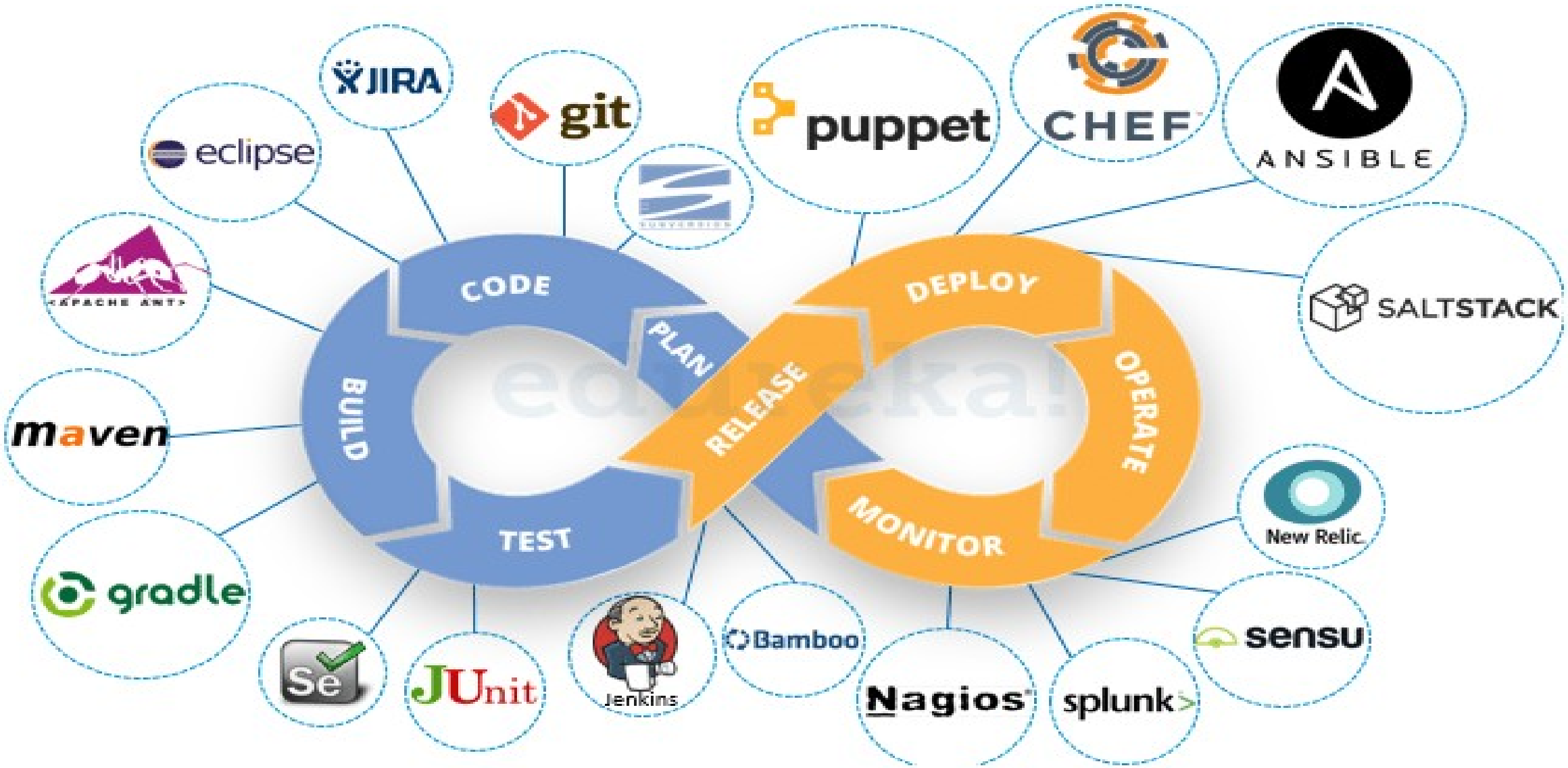
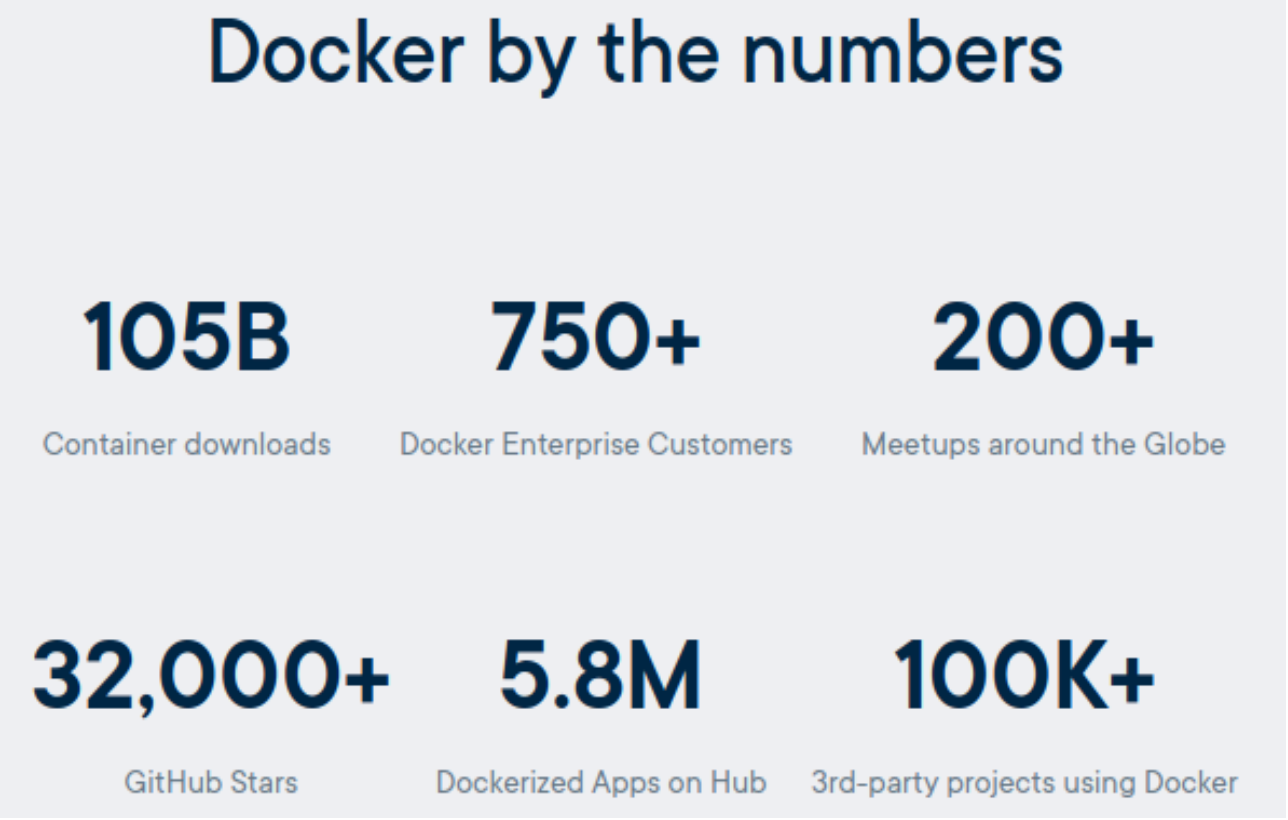
DevOps Tools

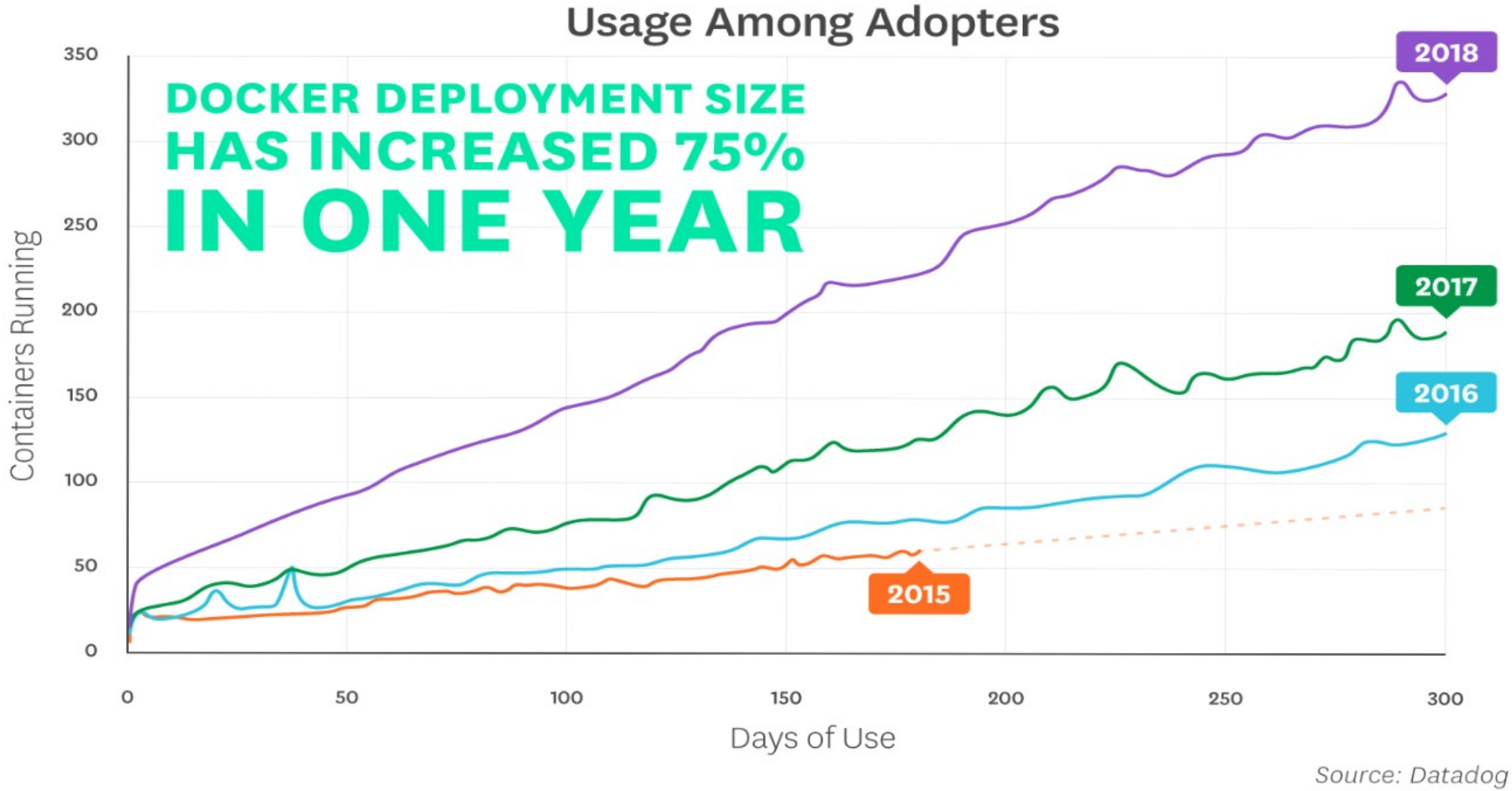


History & Docker Community

- March 2013: PyCon Lightning talk by *Solomon Hykes* introduces Docker
- Community



Market Adoption



Source: Datadog

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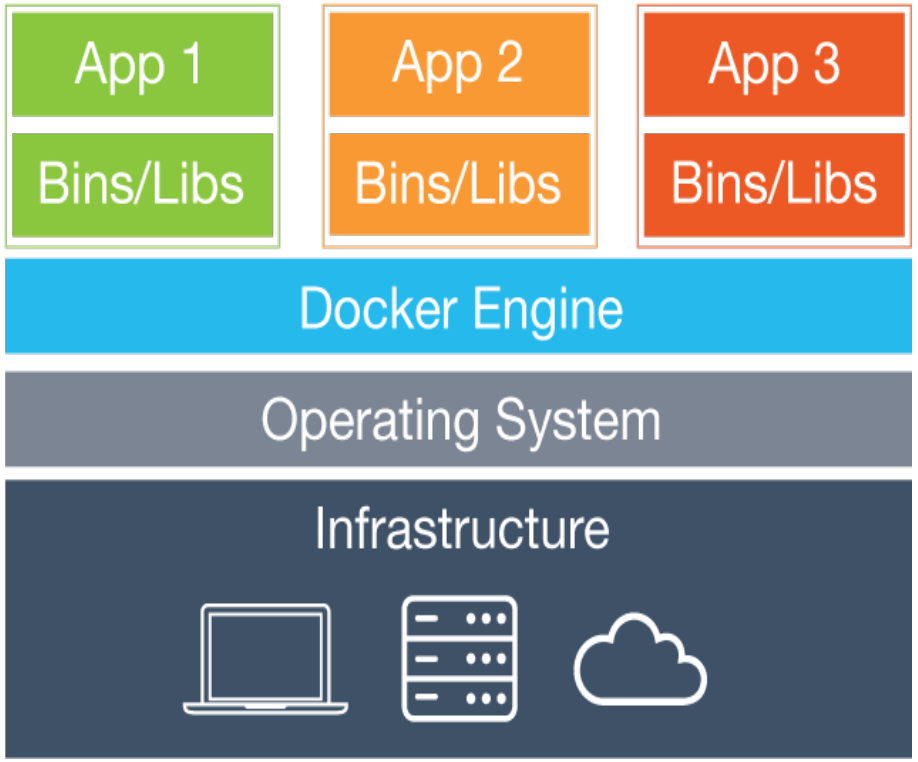
Definition

According to Wikipedia:

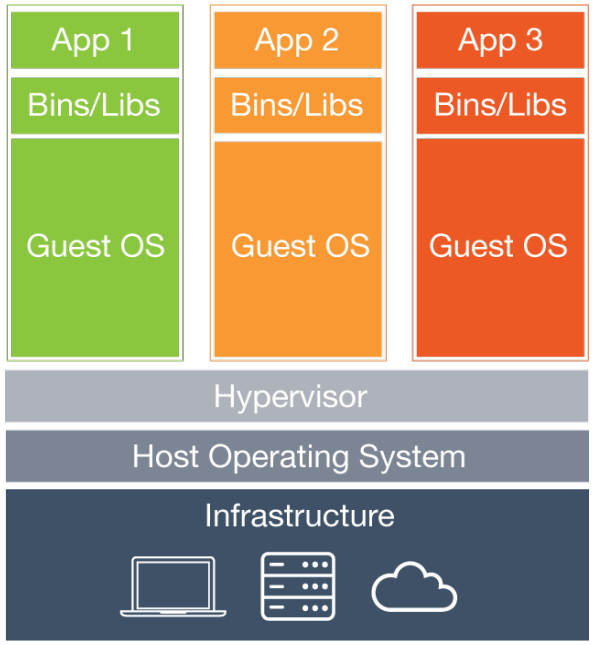
*an open-source project that automates the deployment of software applications inside **containers** by providing an additional layer of abstraction and automation of **OS-level virtualization** on Linux*

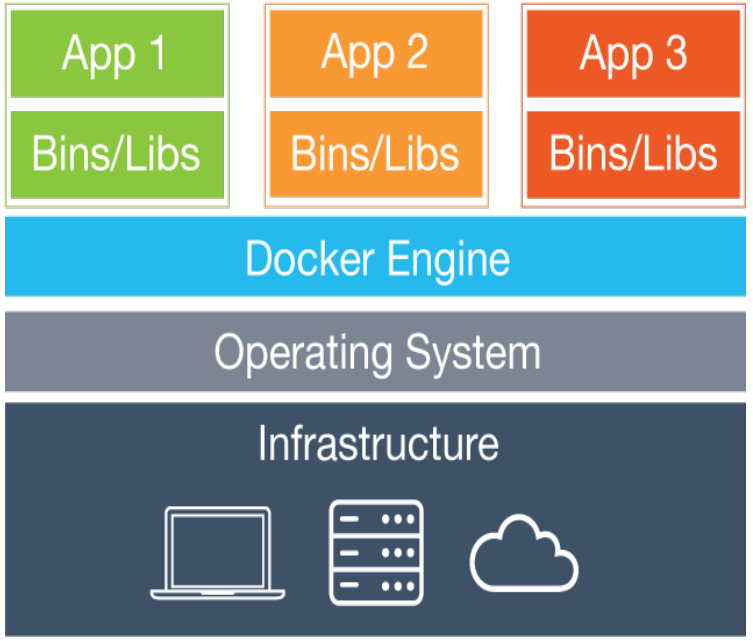
Simplified version:

Docker is a tool that allows developers, sys-admins etc. to easily deploy their applications in a sandbox (called containers) to run on the host operating system



Docker vs Virtual Machine





Virtual Machines

- Each virtual machine (VM) includes the app, the necessary binaries and libraries and an **entire guest operating system**

Containers

- Containers include the app & all of its dependencies, but **share the kernel** with other containers
- Run as an isolated process in userspace on the host OS
- Not tied to any specific infrastructure – containers run on any computer, infrastructure and cloud.

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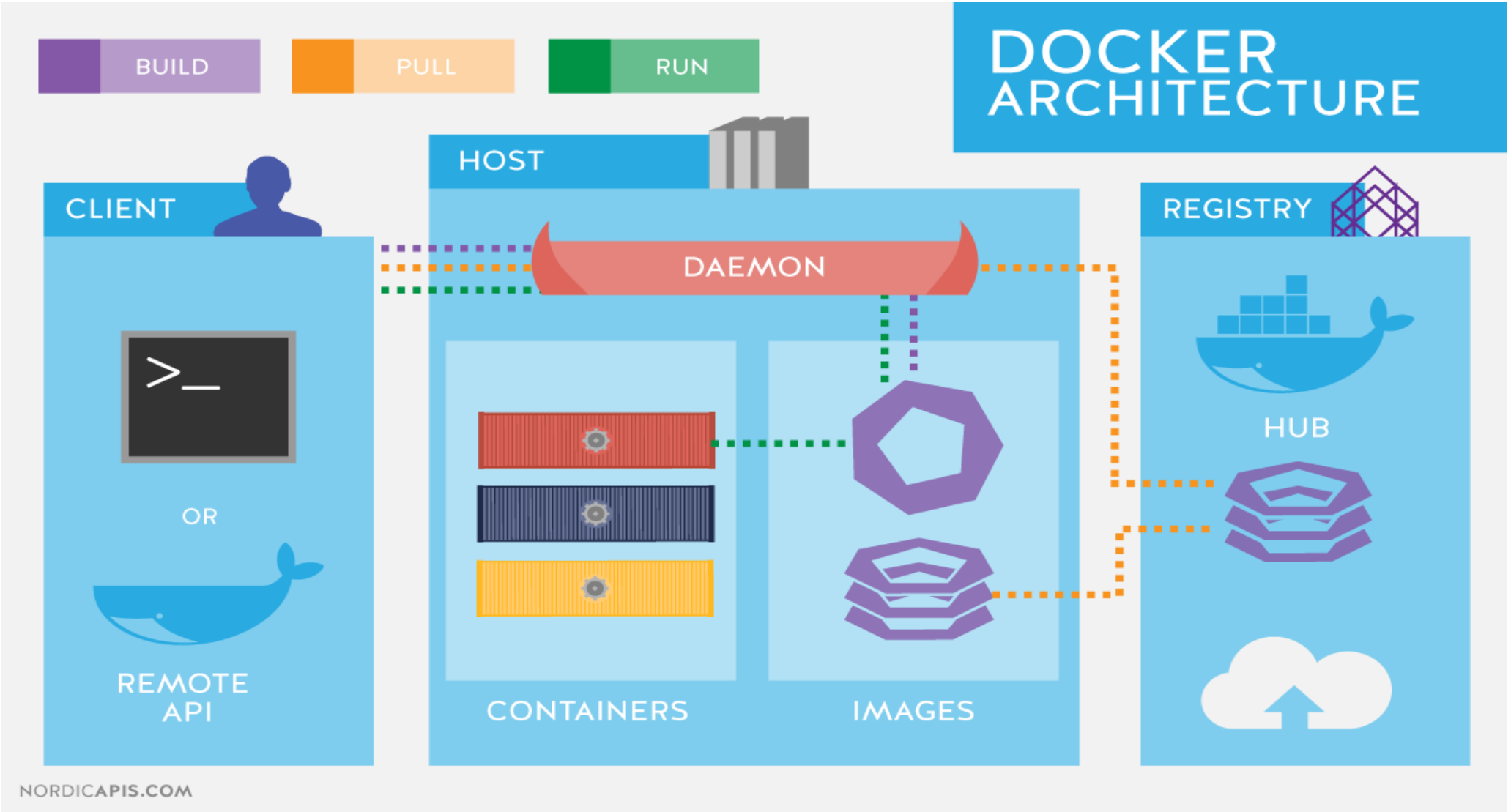
Core Concepts: Architecture



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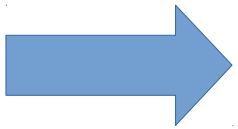
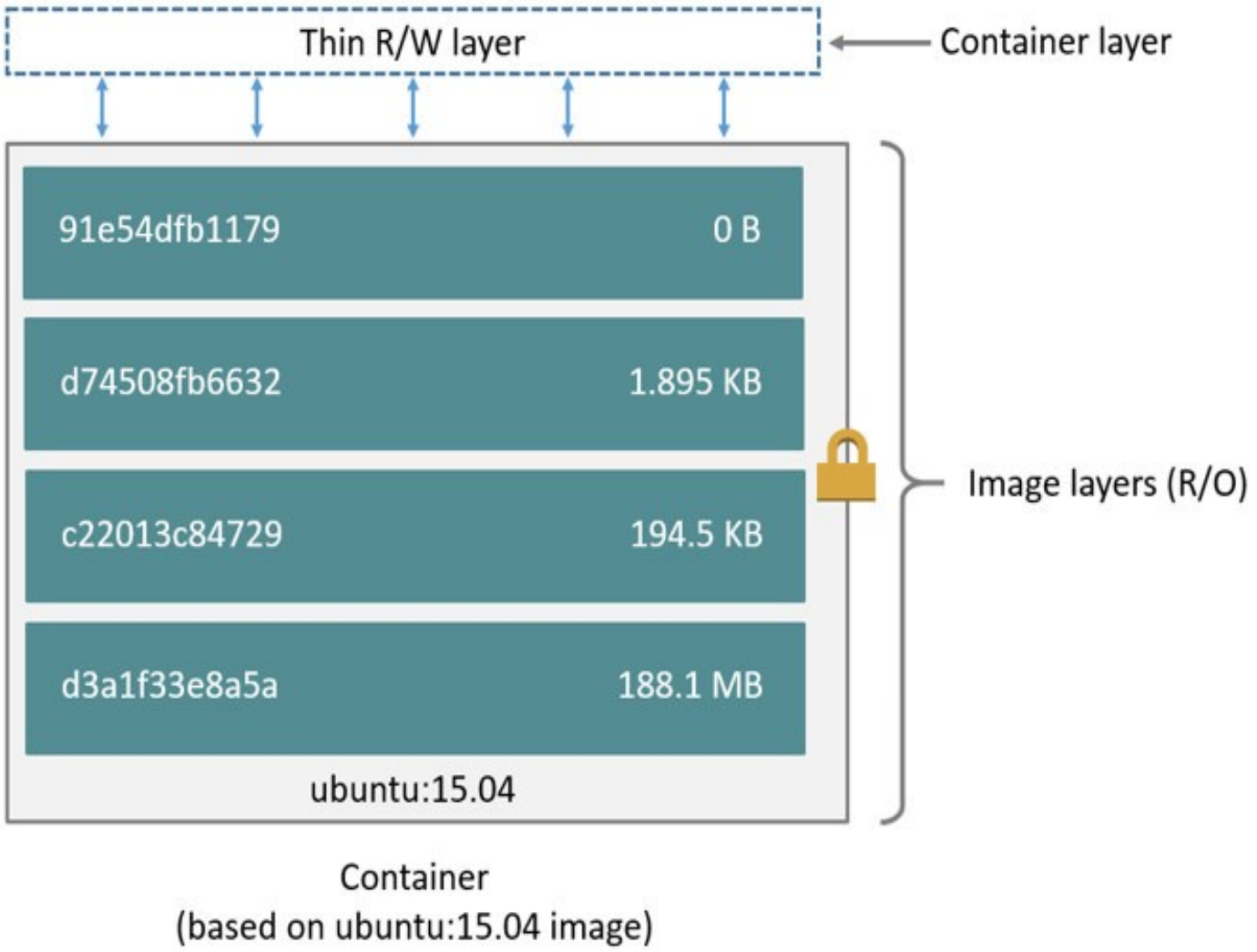
Core Concepts: Image

Dockerfile

```
FROM ubuntu:15.04
COPY . /app
RUN make /app
CMD python /app/app.py
```





Container
(based on ubuntu:15.04 image)

Images are stored at this location:

sudo ls -l /var/lib/docker/image/overlay2/layerdb/mounts

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Core concepts: Container Life-cycle

- Conception: BUILD an Image from a Dockerfile
- Birth: RUN (create and start) a container
- Sleep: STOP a running container
- Wake: START a stopped container
- Death: RM (delete) a stopped container

Docker: Registry

- A central place to store and distribute docker images
- Stores the layers and the description of how they make up an image
- Implements a common API agreed upon by Docker clients

Public:

Docker Hub

Private / Cloud:

Amazon Elastic Container Registry (ECR)
Azure Container Registry (ACR)
Google Container Registry (GCR)

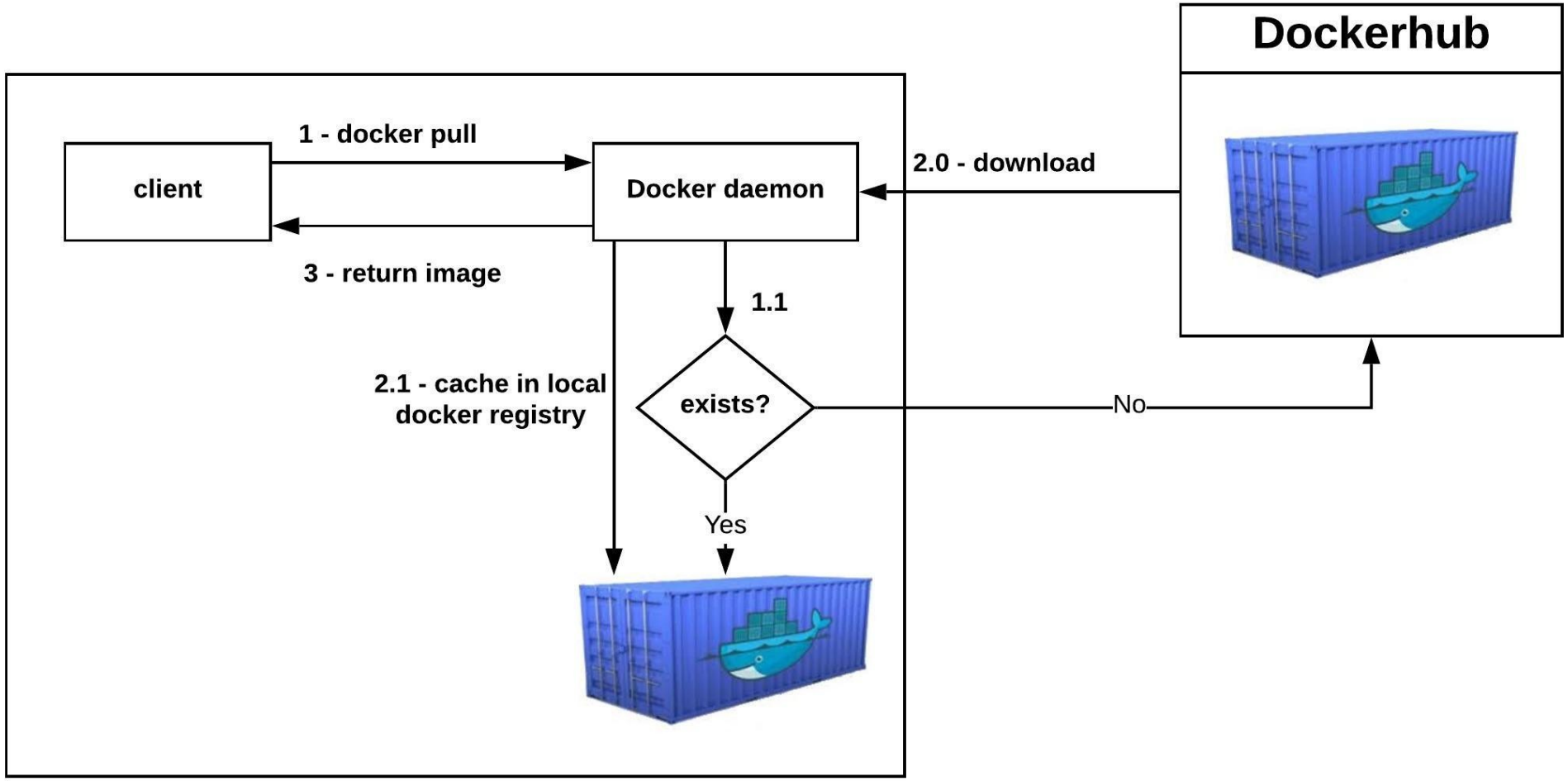
Private / Self-hosted:

Docker Private Registry
Nexus artifactory
JFROG
GitLab

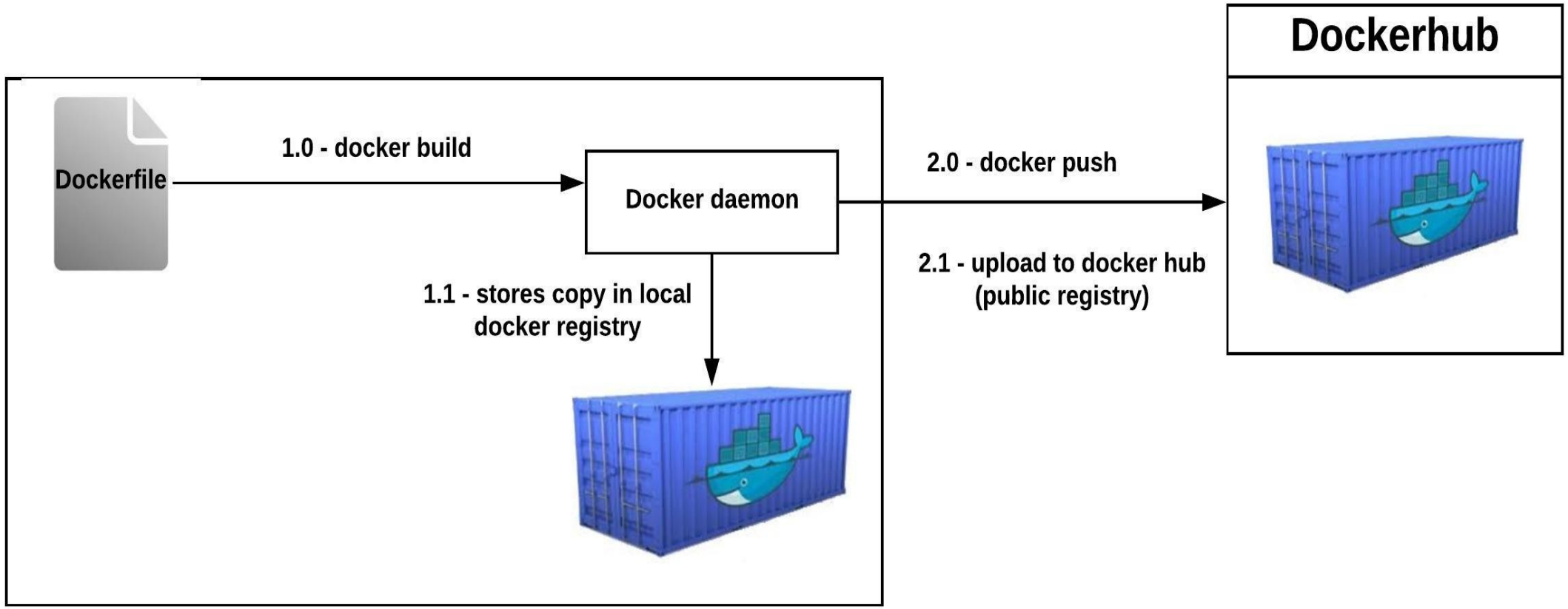
Hands-on: Assignment 1 – Runnable jar

- Run the app without docker
- Dockerize the runnable jar
- Build docker image
- Run the app with docker
- Push the image to Docker Hub (Public docker registry)
- Verify in another machine

Hands-on: Download docker image



Hands-on: Upload docker image



Resources

- Instructions and source code for the hands-on is available at this location: https://github.com/mbzama/docker-training-java

Thank You

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