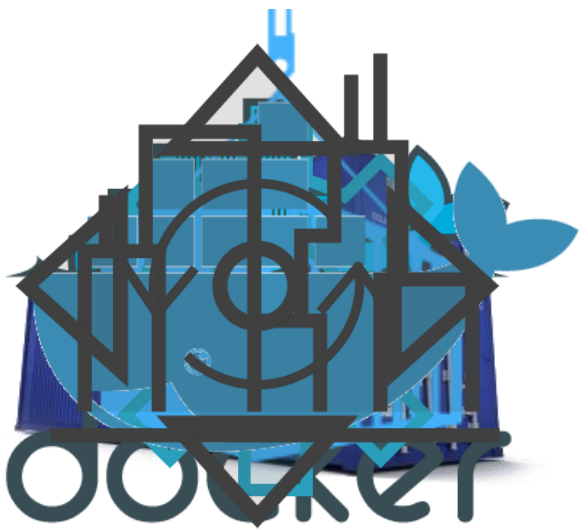
Docker and Containers: The Big Picture

COURSE INTRODUCTION

Course Objective

To bring you up to speed on what all the buzz is around Docker and containers.

Course Agenda



What Are Containers

What Is Docker

Preparing to Thrive in a Container World

What Kind of Work Will Containers Do

Docker Hub and Other Container Registries

Are Docker and Containers Ready for Production and the Enterprise

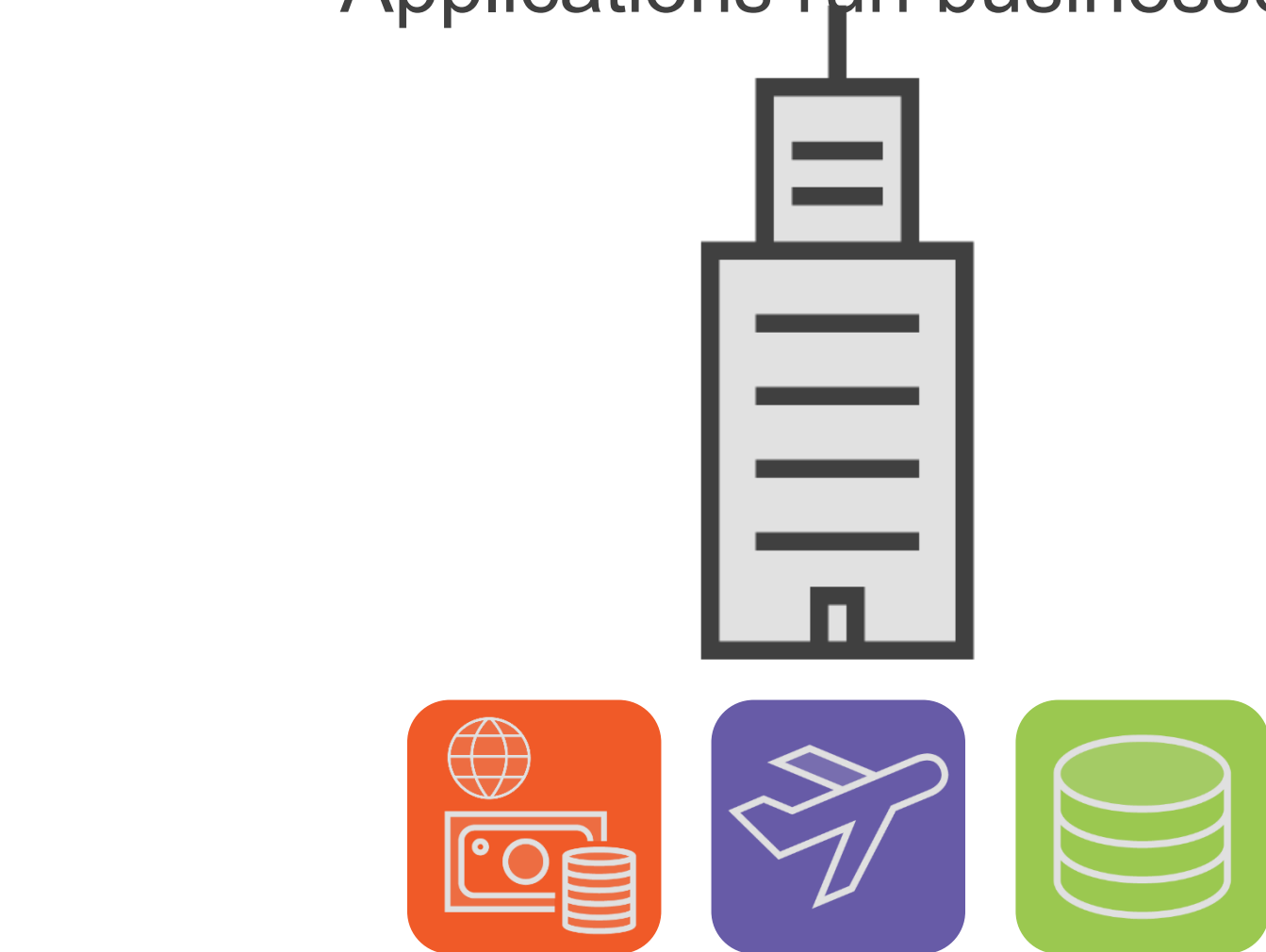
What Is Container Orchestration All About

What Are Containers?

Applications run businesses

Setting the Scene

Applications run businesses



Applications run businesses

Applications run on servers

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Applications run on servers

- Procurement lead times
- Up-front capex
- Ongoing opex

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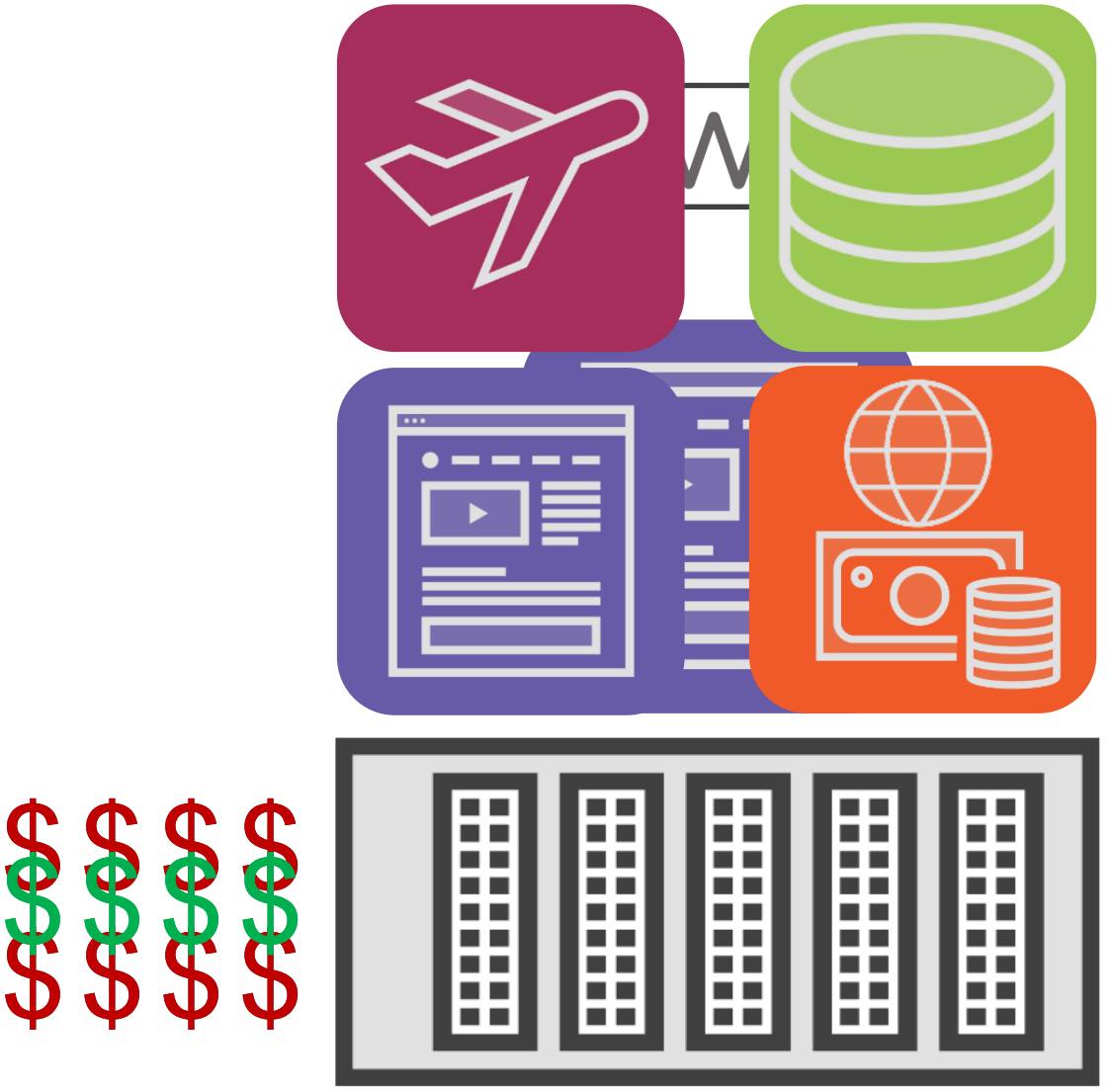
Hypervisors allow multiple apps per server



The Trouble with Hypervisors

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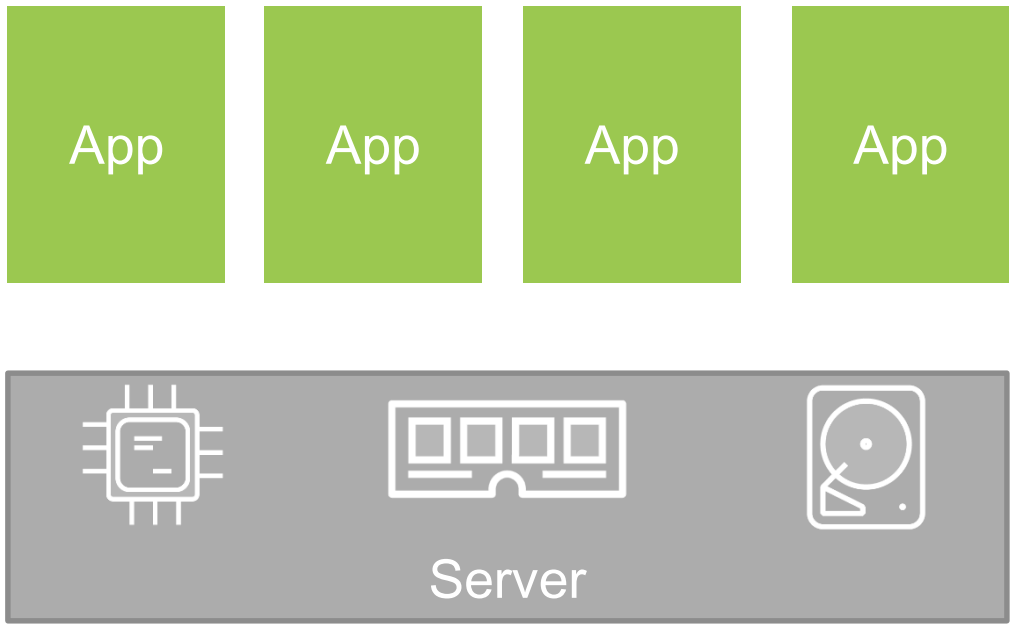

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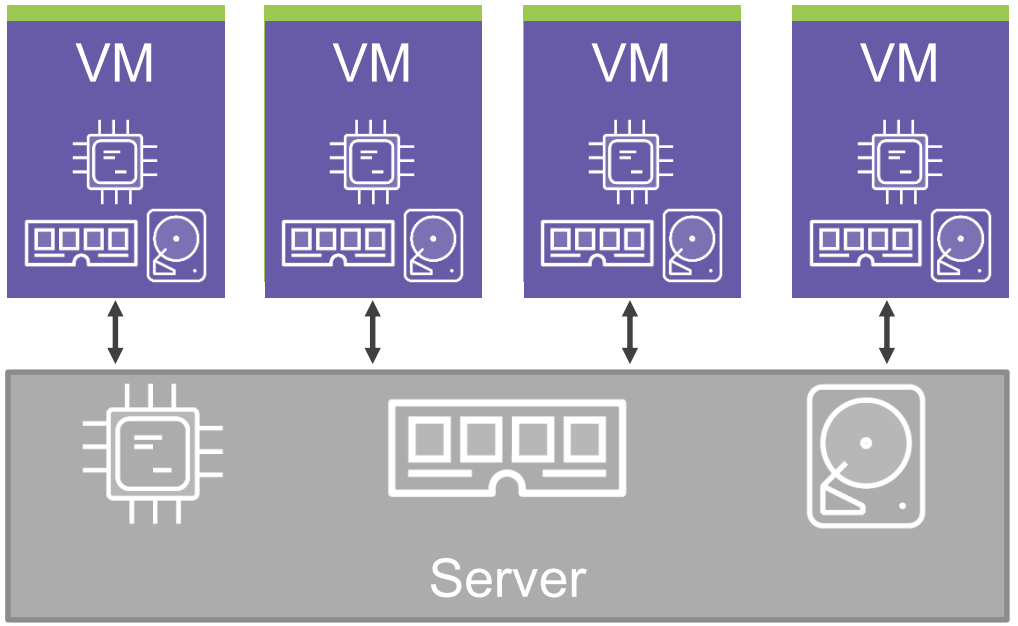

Applications run businesses

Applications run on servers

- Procurement lead times
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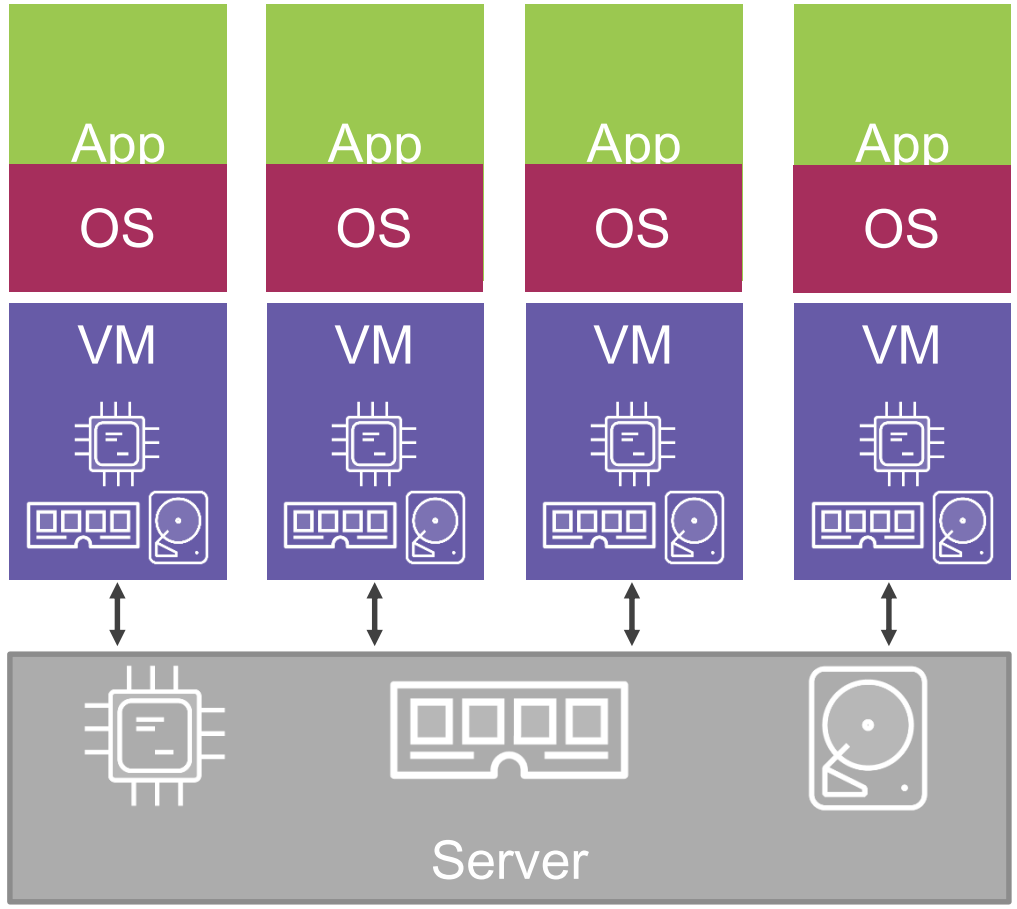
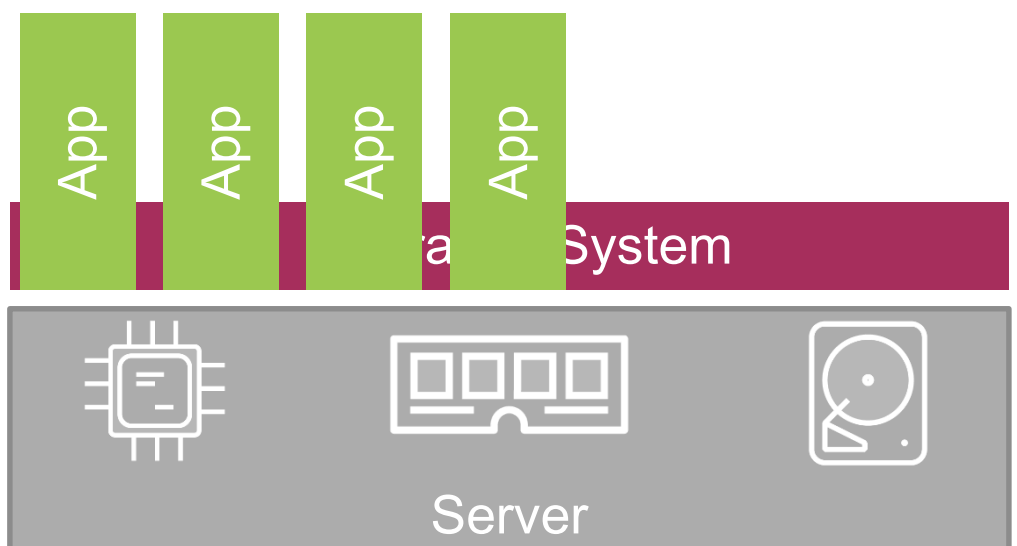
Hypervisors allow multiple apps per server

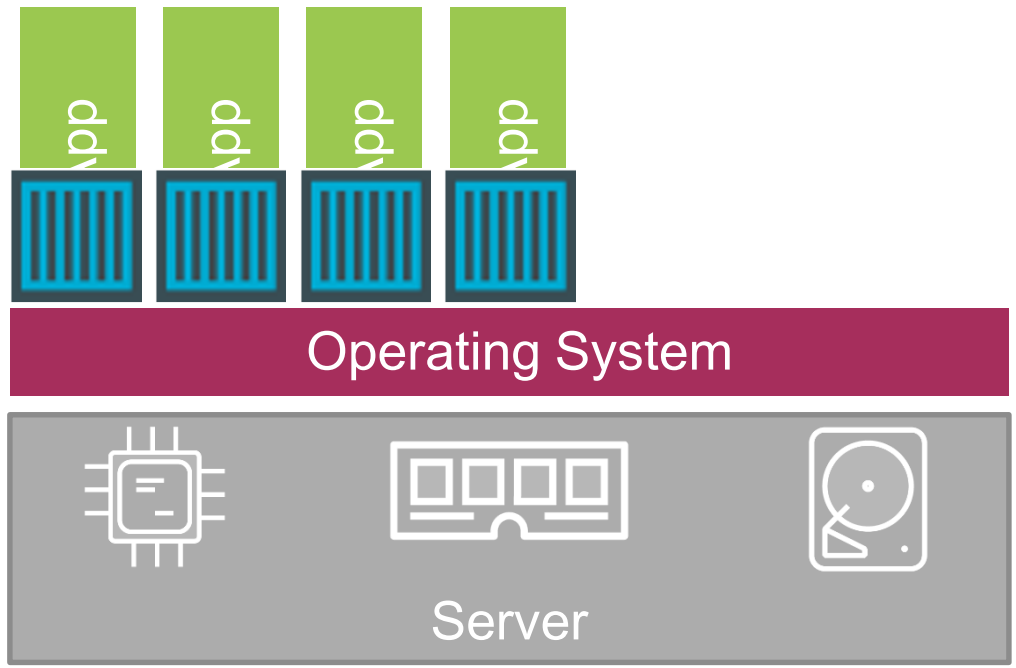
Each OS:

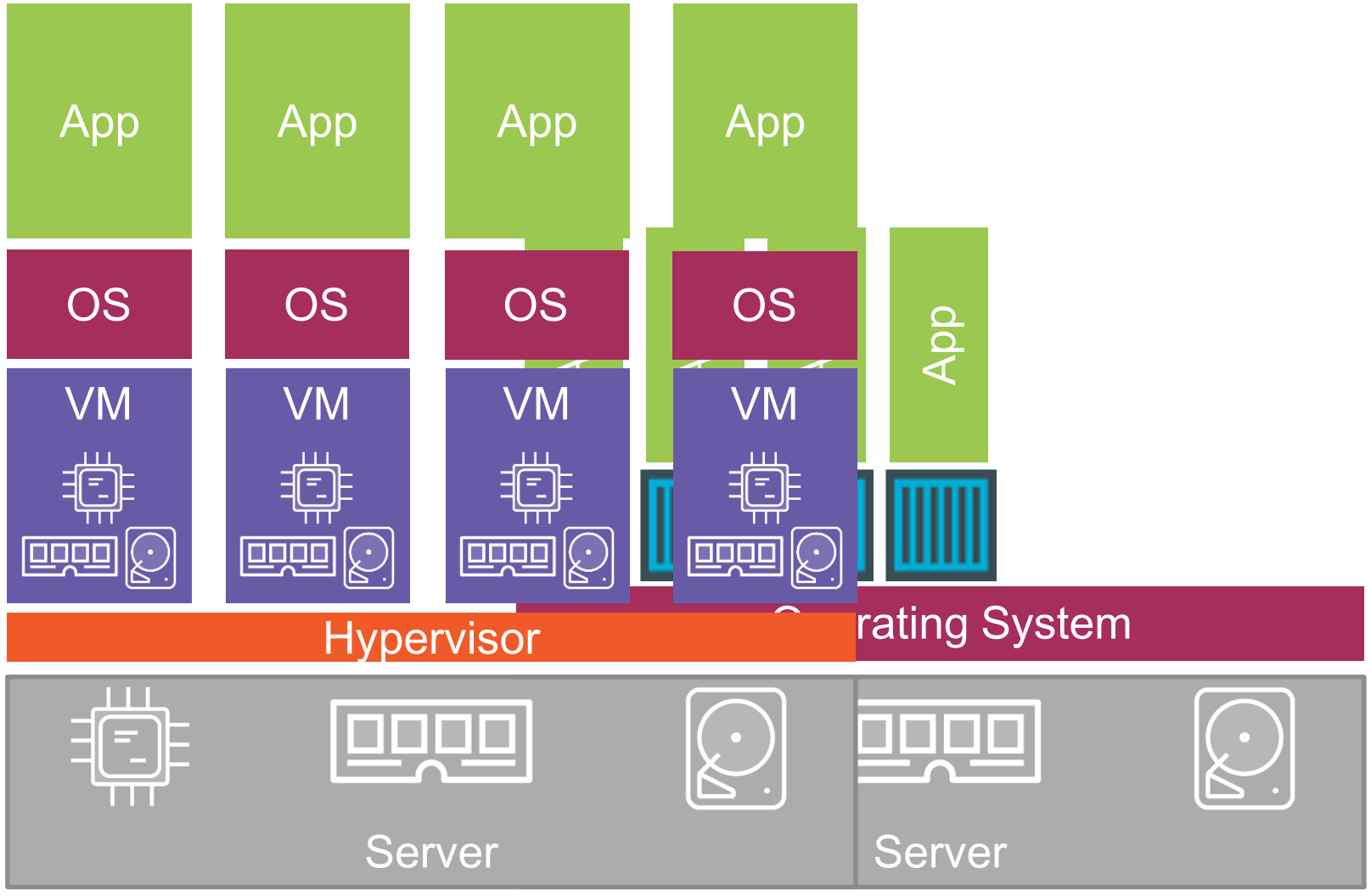
- Uses CPU
- Uses RAM
- Uses disk
- May have license cost
- Requires admin time



Containers

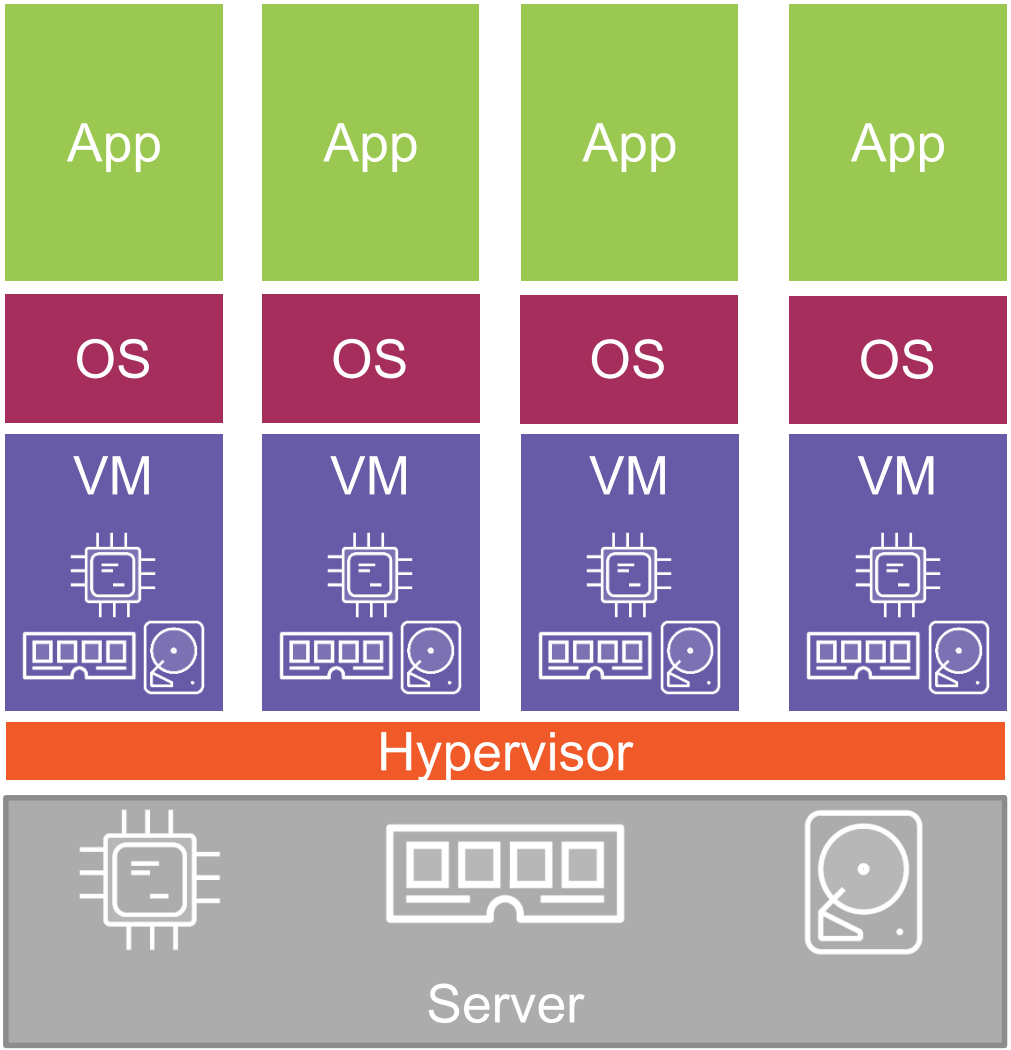

App
App
App
App
System
Server


App
App
App
App
Operating System
Server



Hypervisor Architecture

Container Architecture



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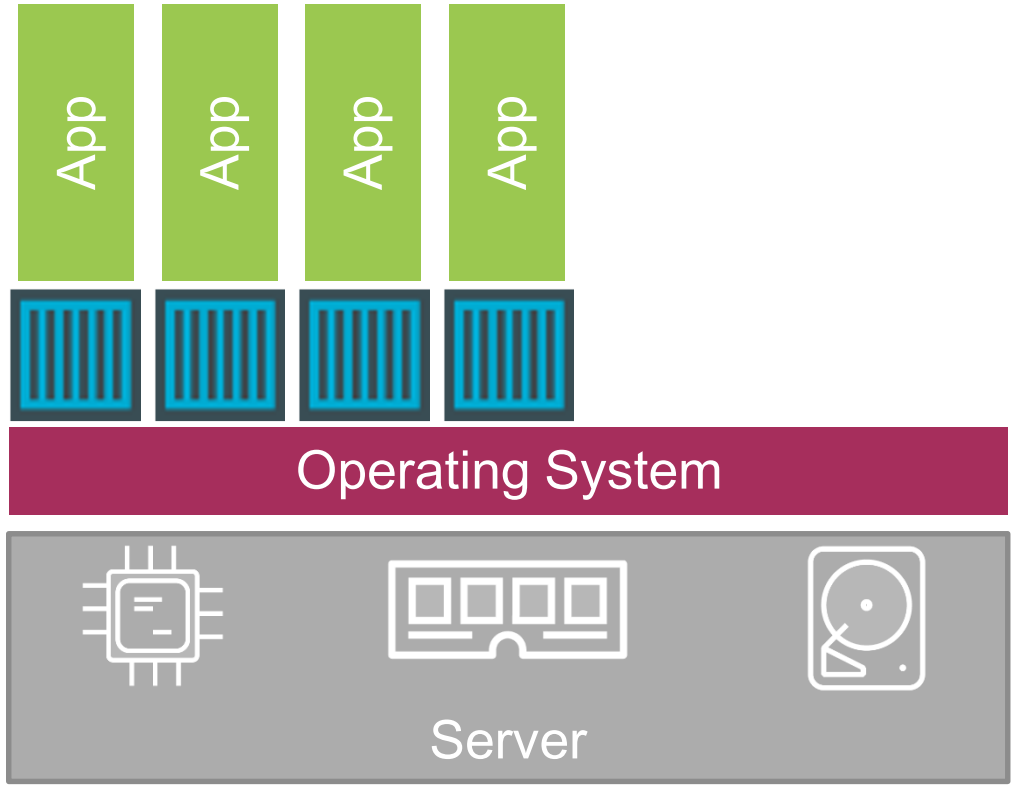
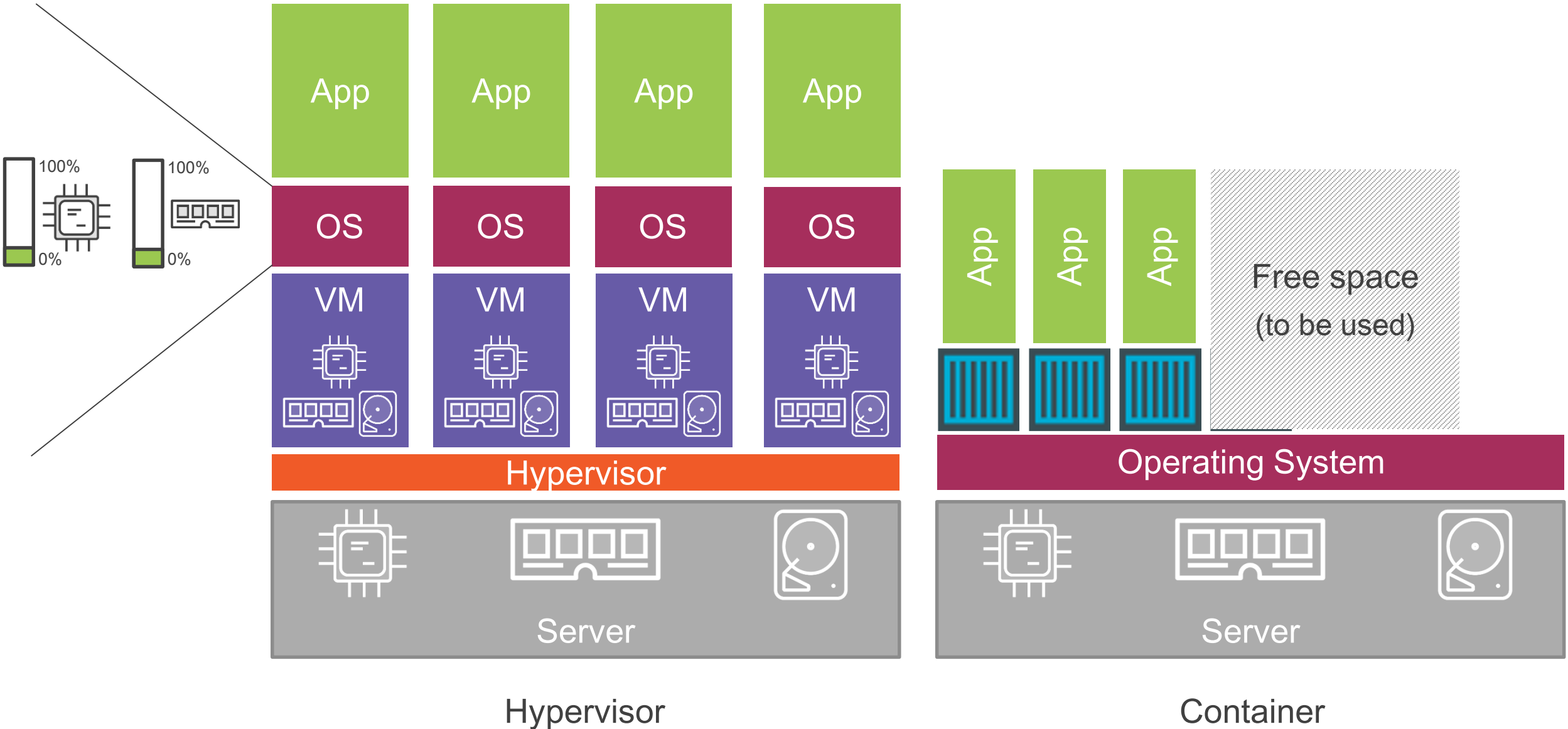
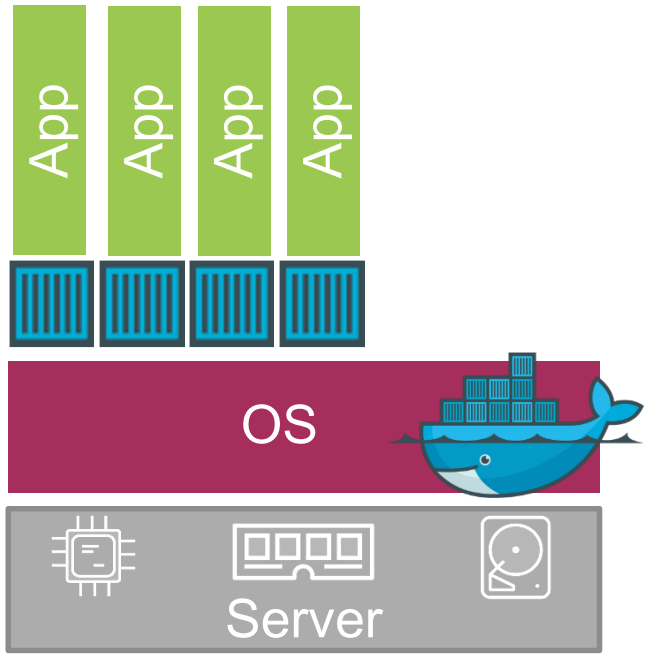


Container Architecture


100%
0%
100%
0%
App
App
App
App
OS
OS
OS
OS
VM
VM
VM
VM
Hypervisor
Server
App
App
App
Free space
(to be used)
Operating System
Server
Hypervisor
Container


App
App
App
App
OS
Server

Summary

Past
(physical servers)

Wasted!

Wasted!

Wasted!

Present
(Hypervisor virtualization)

More efficient than physical servers

Could be better!

Present/Future
(Containers)

More efficient than Hypervisor virtualization

Virtualization 2.0

Less mature than Hypervisor virtualization

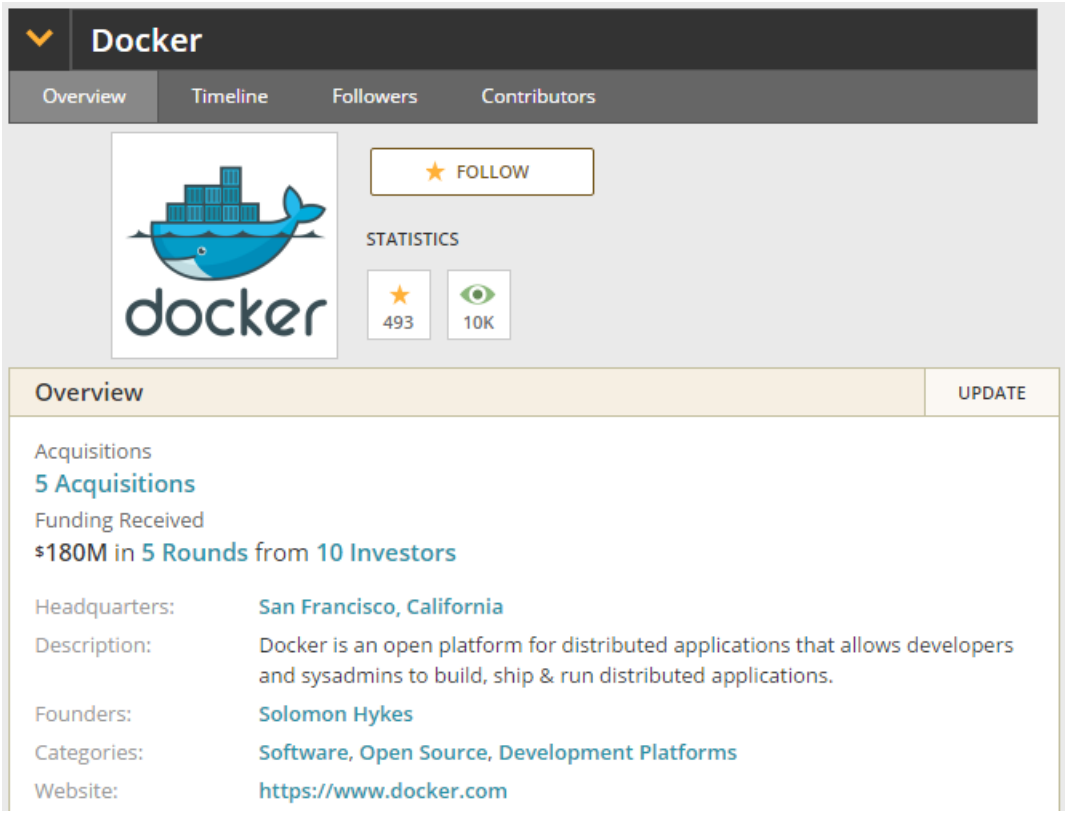
Less mature than Hypervisor ecosystem

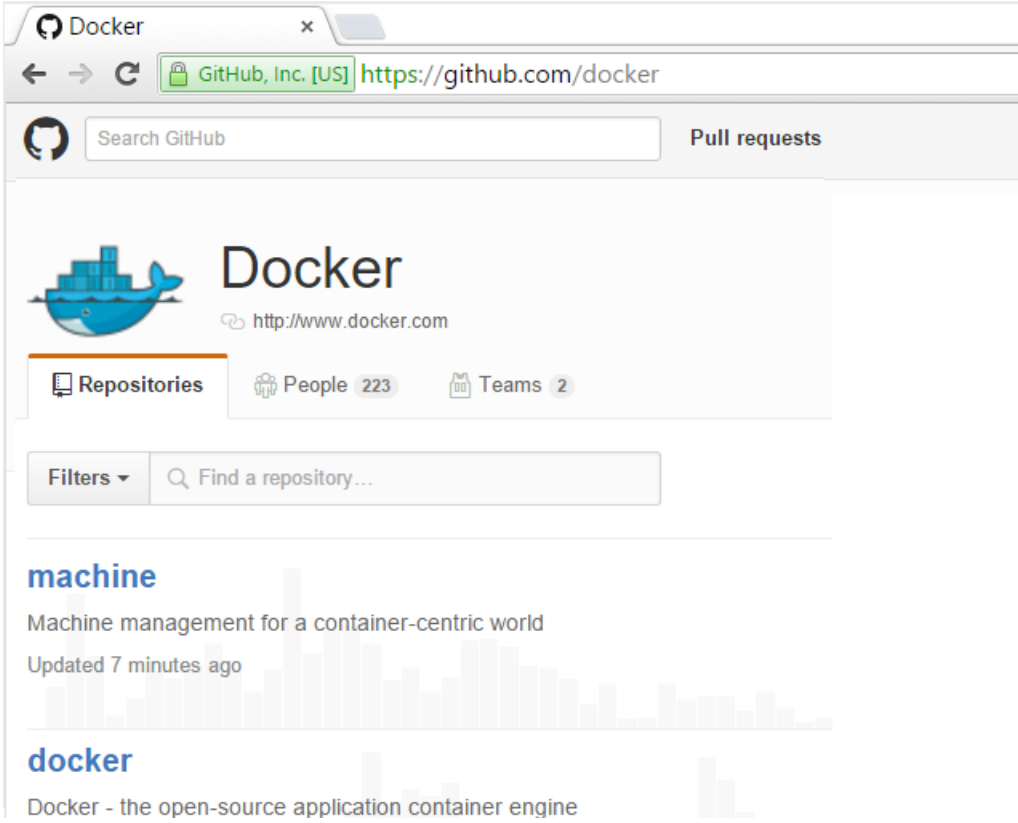
Coming Up Next…

Docker Docker Docker…

What Is Docker?

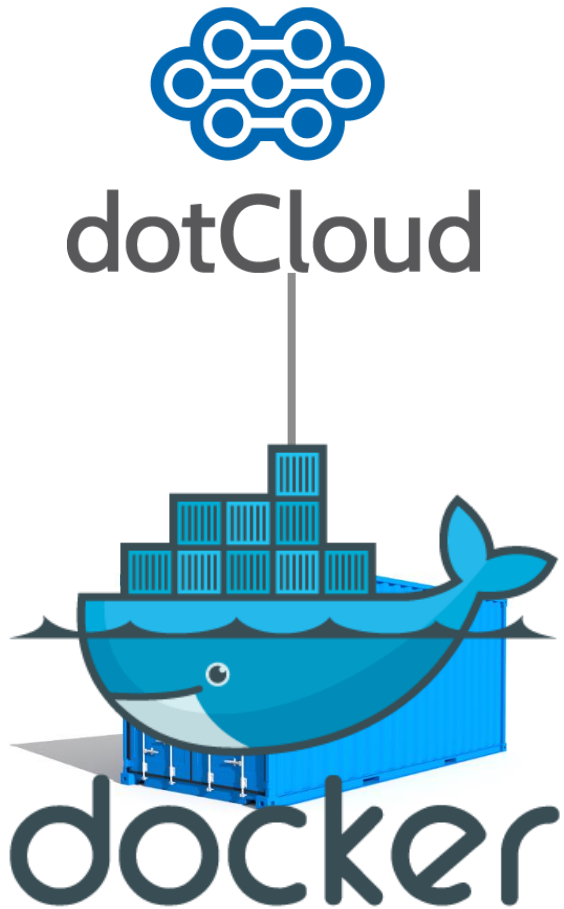
Agenda





OPEN CONTAINER INITIATIVE

Docker Inc.



Docker Inc.

dock work er

Docker Inc.

Leading technology company

dotCloud

Billion dollar valuation

Raised over $150M in venture capital

Ma[illegible]ons of their own

docker

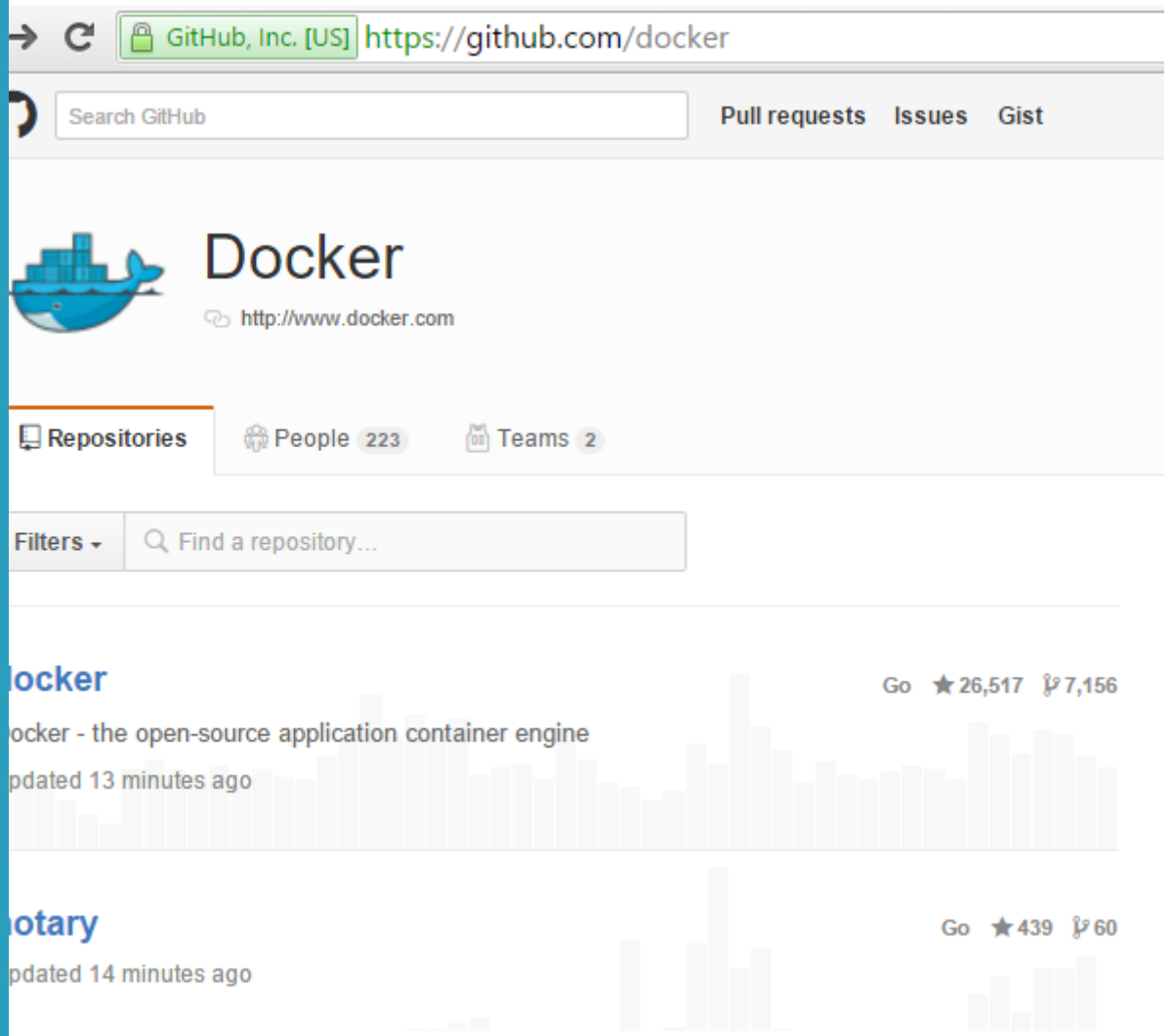
The Docker Project

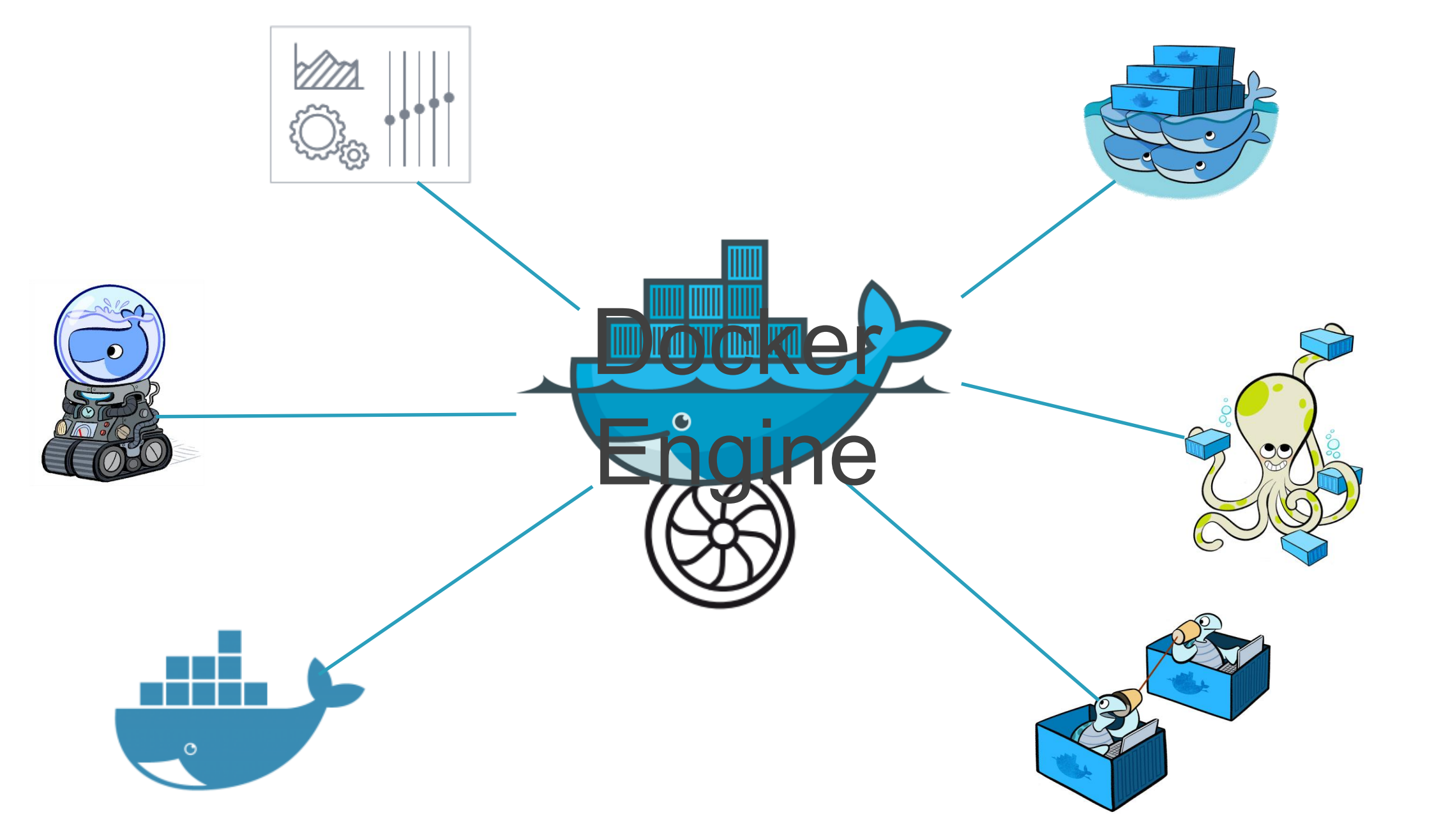
Open source

- Apache License 2.0

All about making awesome tools that enable us to do things **better**

Multiple tools in the project




Docker
Engine

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Multiple tools in the project

Some of the biggest names in the industry involved

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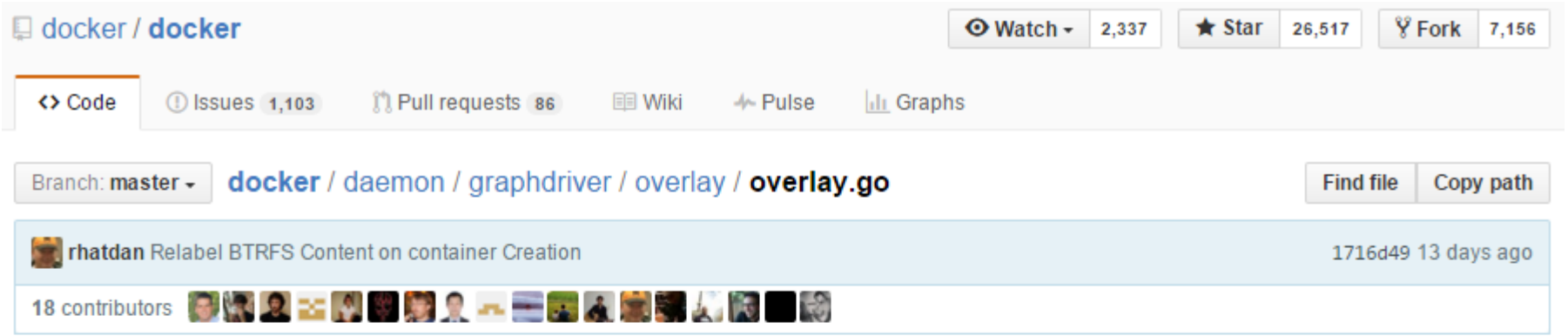


```
1  // +build linux
2
3  package overlay
4
5  import (
6          "bufio"
7          "fmt"
8          "io/ioutil"
9          "os"
10         "os/exec"
11         "path"
12         "sync"
13         "syscall"
14
15         "github.com/Sirupsen/logrus"
16
17         "github.com/docker/docker/daemon/graphdriver"
18         "github.com/docker/docker/pkg/archive"
19         "github.com/docker/docker/pkg/chrootarchive"
```

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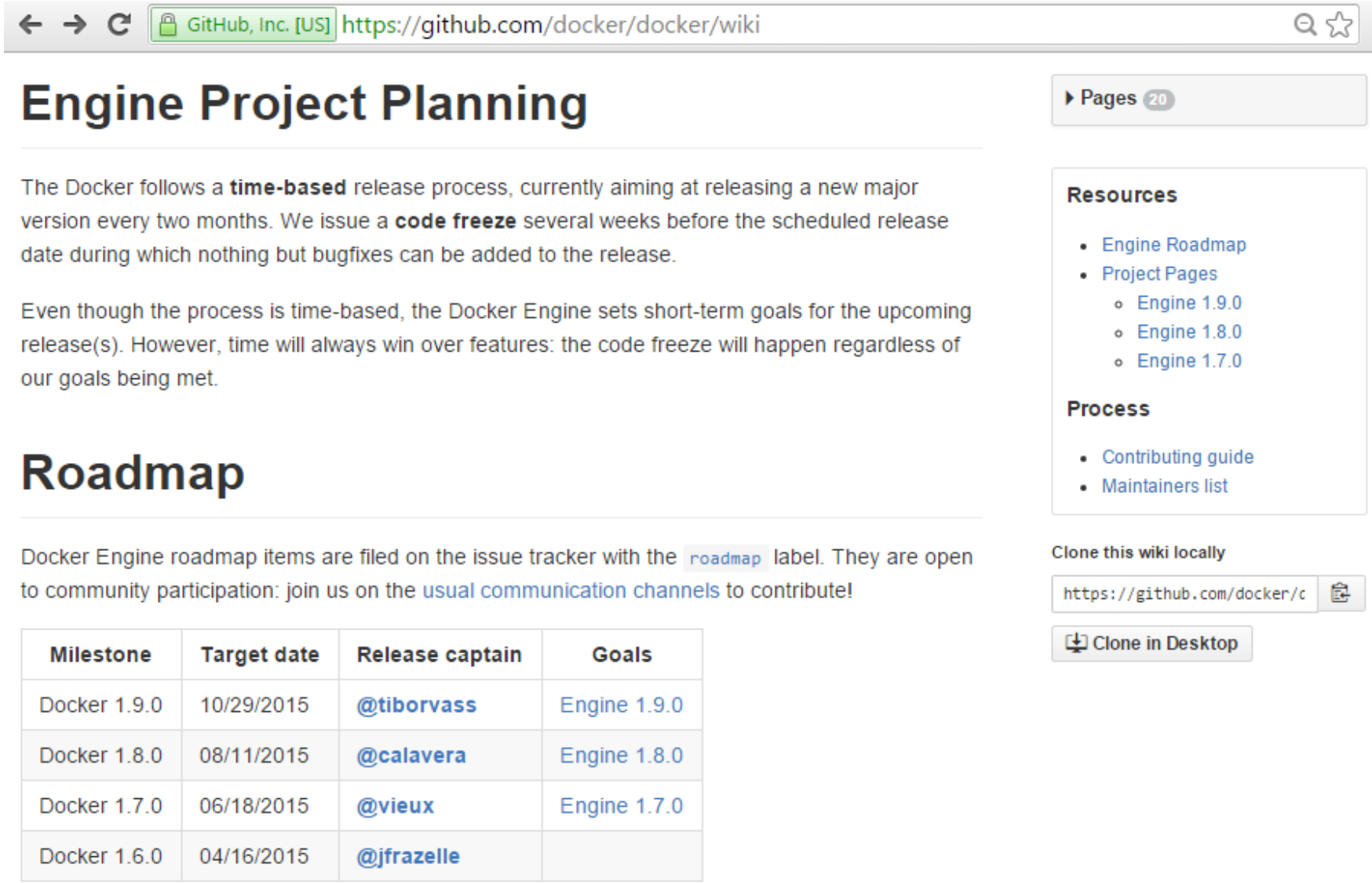

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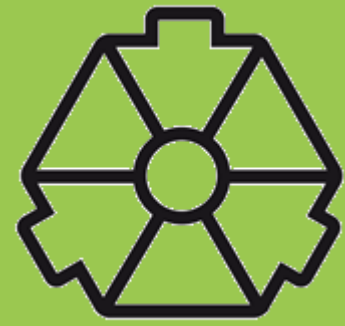
Docker Hub



Over 1 billion image pulls

Over 240K repositories

Over 5 million image pulls per day

Summary

Docker Inc.

Silicon valley startup

Raised $180M

Made several acquisitions

The Docker Project

Open source

- Apache license 2.0

>240K repositories

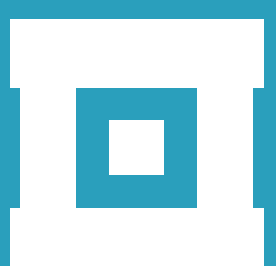
Billions of downloaded images

Support from major industry leaders

The Open Container Initiative

Lightweight governance

Open standards



Docker Hub and Other Container Registries

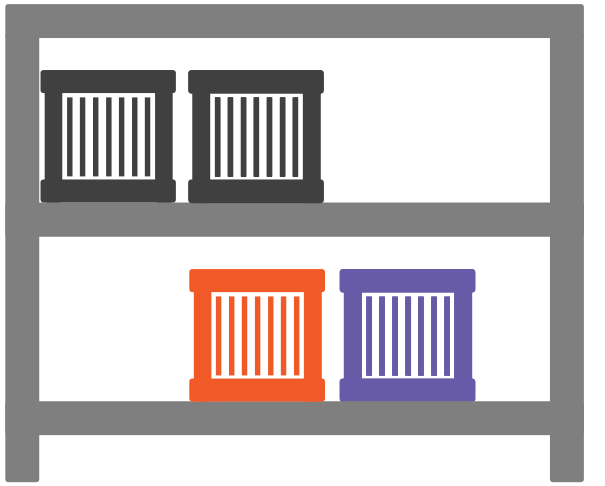
Agenda

Container Registries

- What they are
- How they work
- Why they're soooooooo important

Container Registries

- Places to store and retrieve container images
- Docker Hub is the official Docker registry
- 3rd party registries exist



Container Registries

- Places to store and retrieve container images
- Docker Hub is the official Docker registry
- 3rd party registries exist
- Registries contain repositories
- Repositories can be public or private

Registry Security

Are public repositories wide open to the world?

- Yes for pulling (downloading)
- No for pushing (uploading changes)

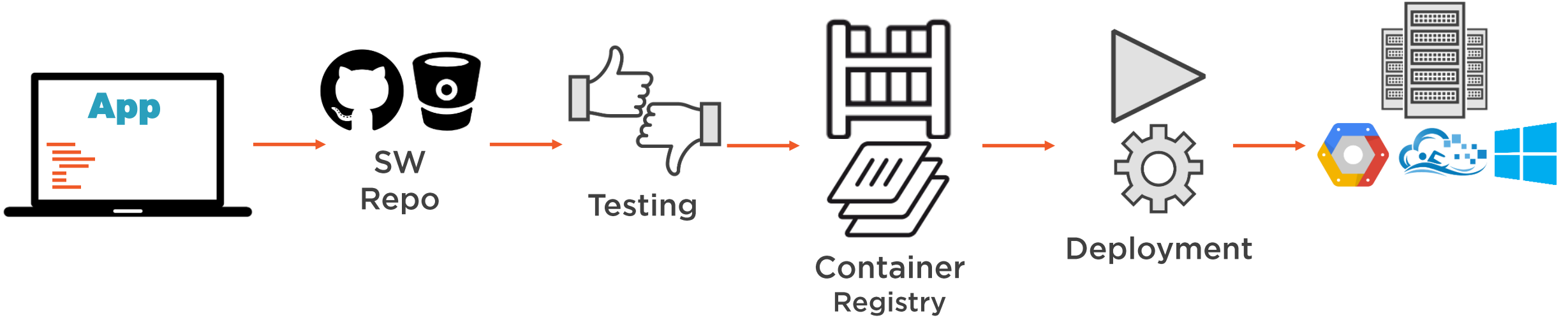
Private repositories are not open to the world

Private **registries** are available

- Run inside of your corporate network
- Docker Trusted Registry (DTR)
- Quay Enterprise
- etc.

Container registries are becoming central to application infrastructure and application delivery

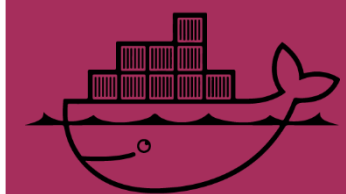
Automated Workflow



Summary

Registries are the enterprise IT App Store

Lots of registries exist



Quay.io

Registries contain repositories

Private Registries exist