

# Docker and Containers: The Big Picture

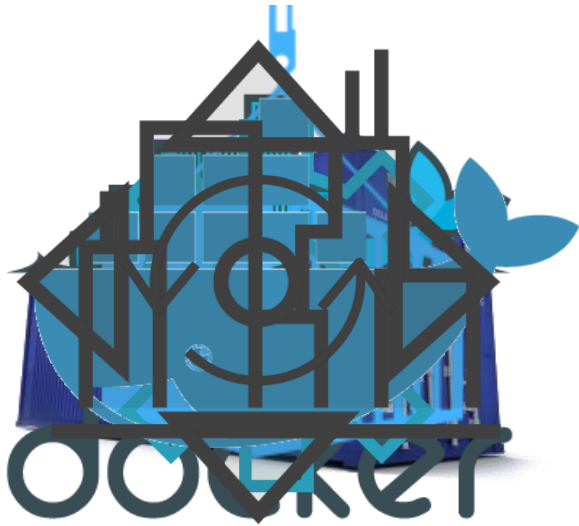
---

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



Applications run  
businesses

Applications run on  
servers

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



Applications run  
businesses

Applications run on  
servers

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

Hypervisors allow  
multiple apps per server





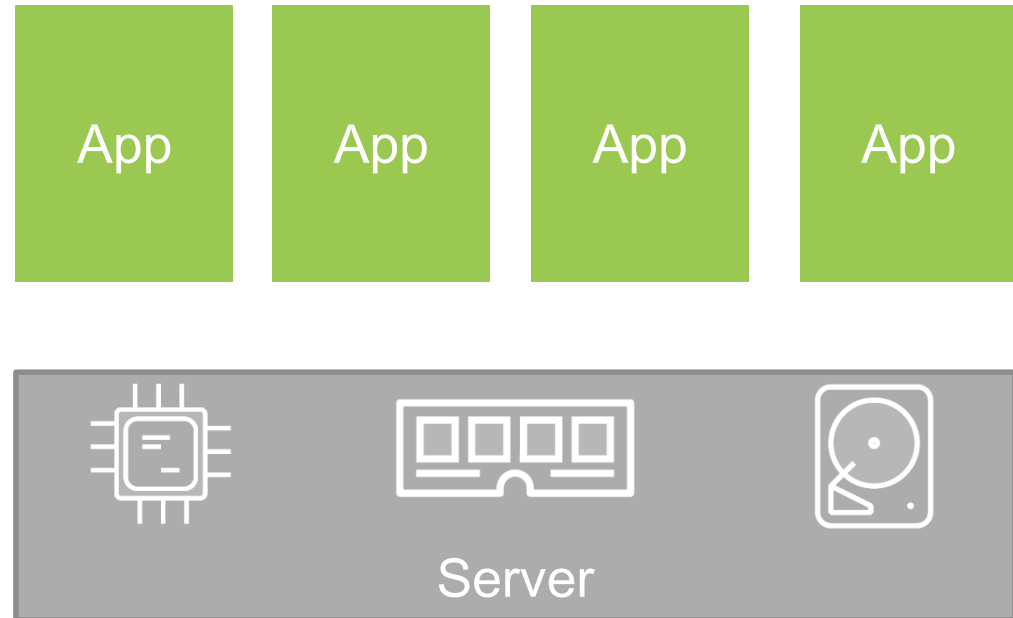
# The Trouble with Hypervisors

Applications run  
businesses

Applications run on  
servers

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

Hypervisors allow  
multiple apps per server

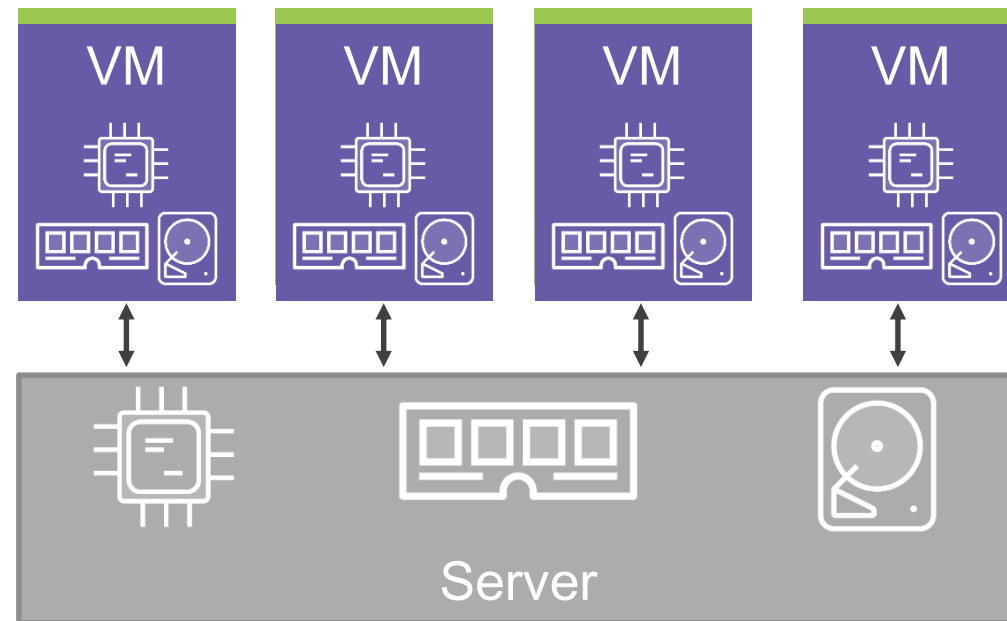


Applications run  
businesses

Applications run on  
servers

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

Hypervisors allow  
multiple apps per server



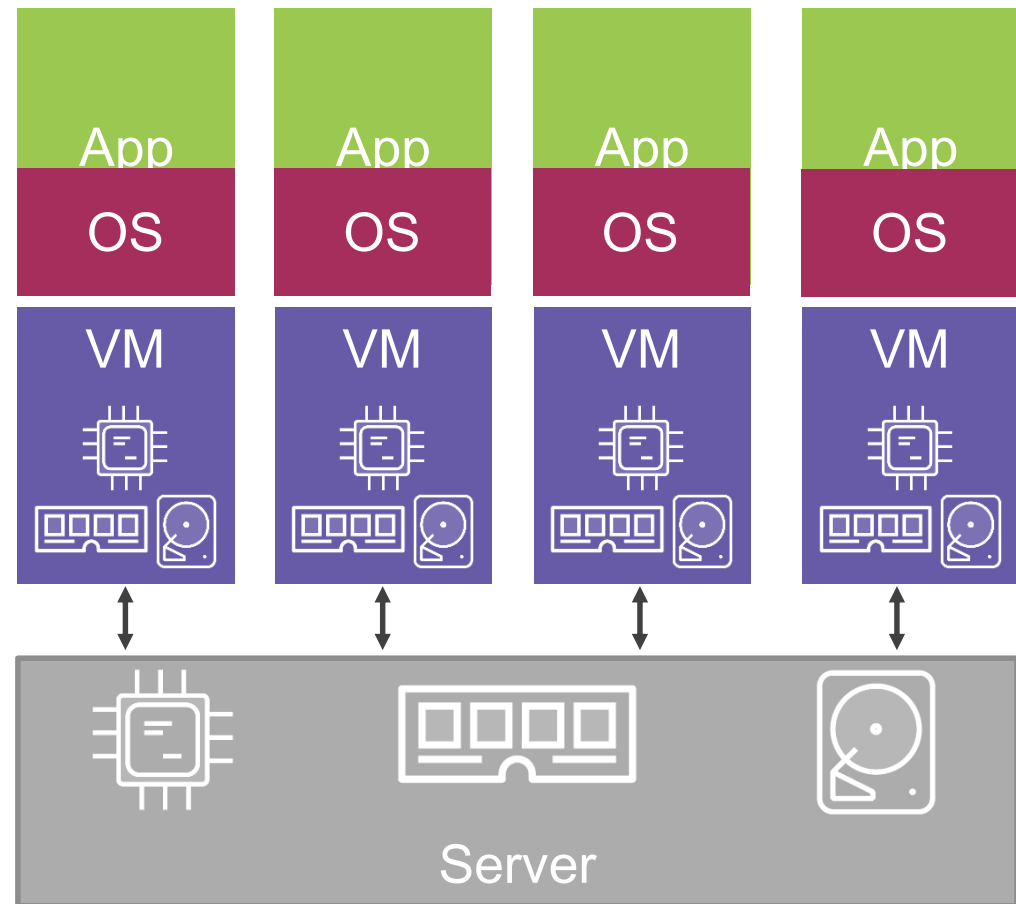
Applications run  
businesses

Applications run on  
servers

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

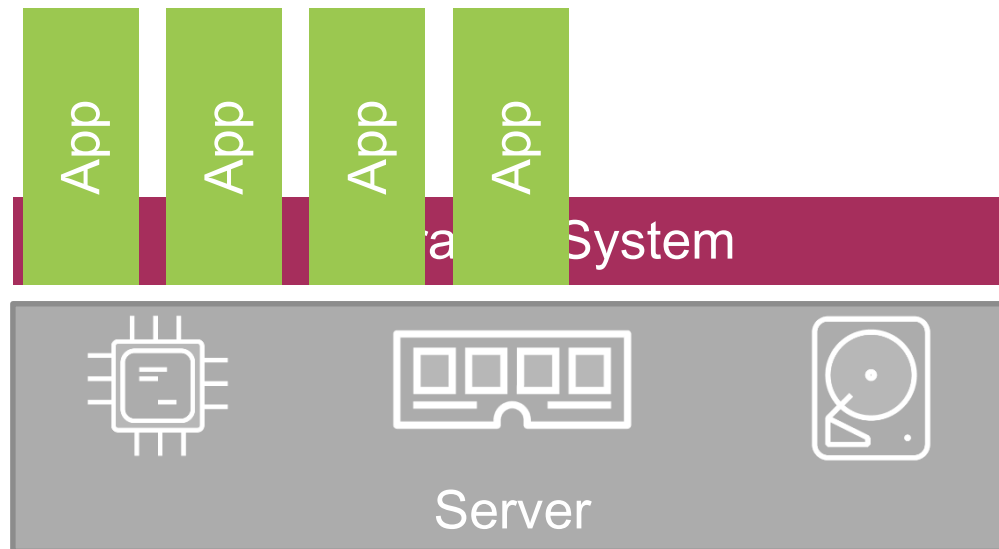
Hypervisors allow  
multiple apps per server  
Each OS:

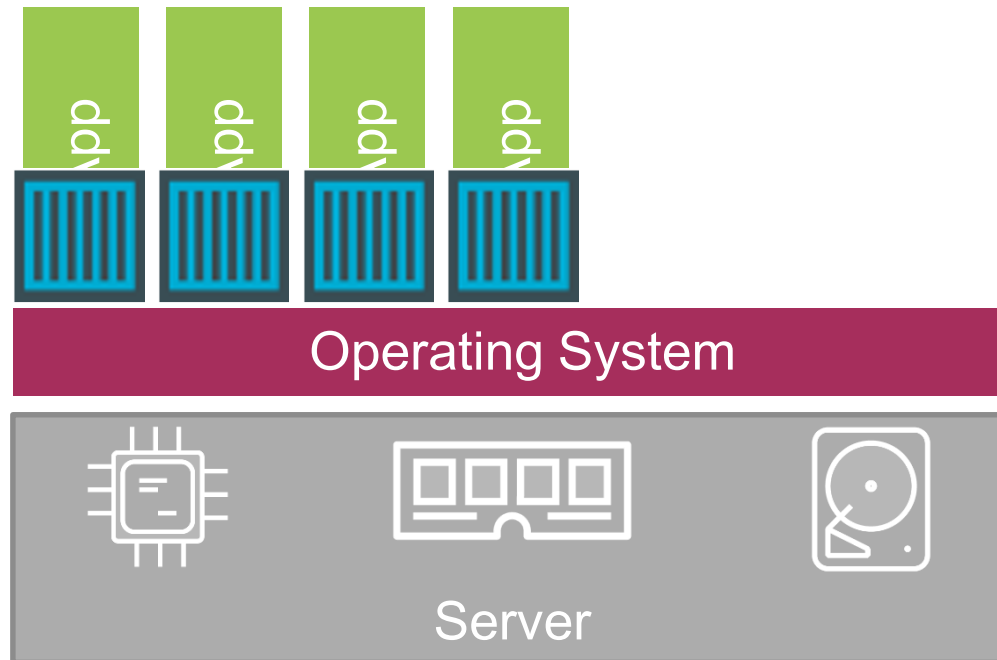
- Uses CPU
- Uses RAM
- Uses disk
- May have license cost
- Requires admin time

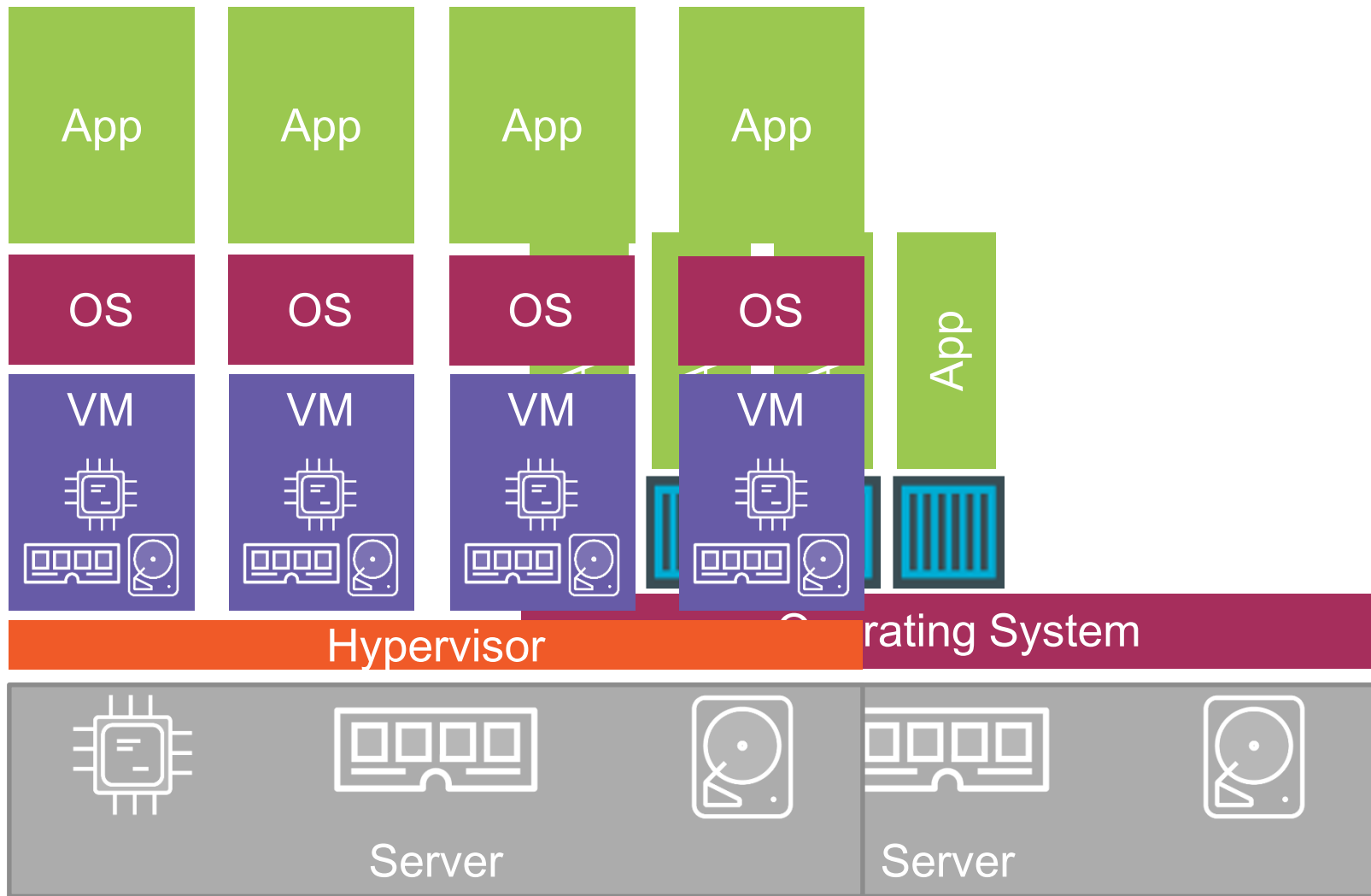


# Containers

---

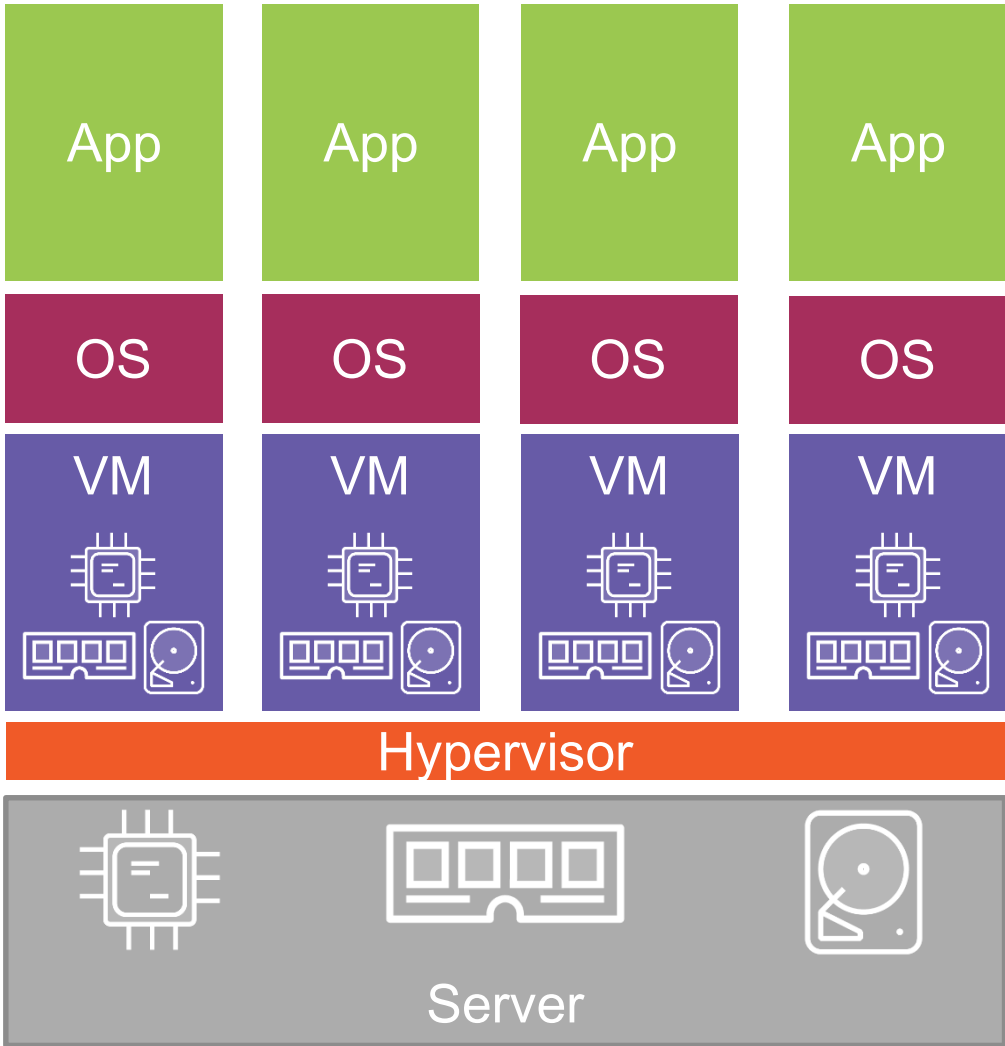




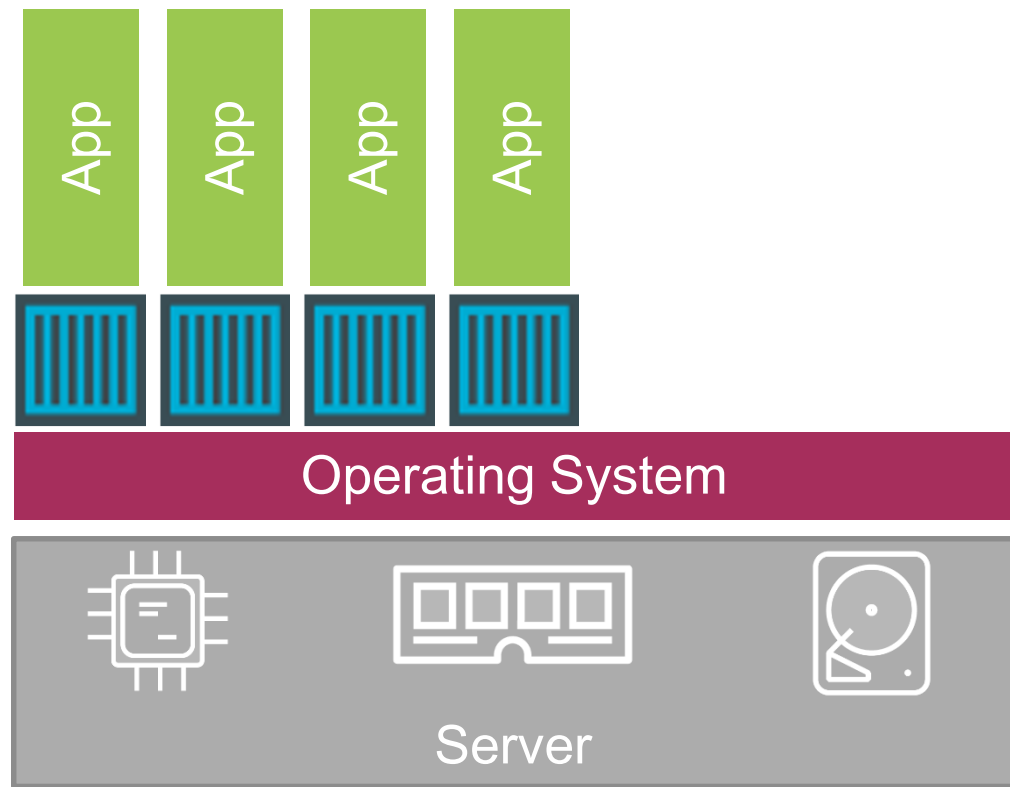


Hypervisor  
Architecture

Container  
Architecture

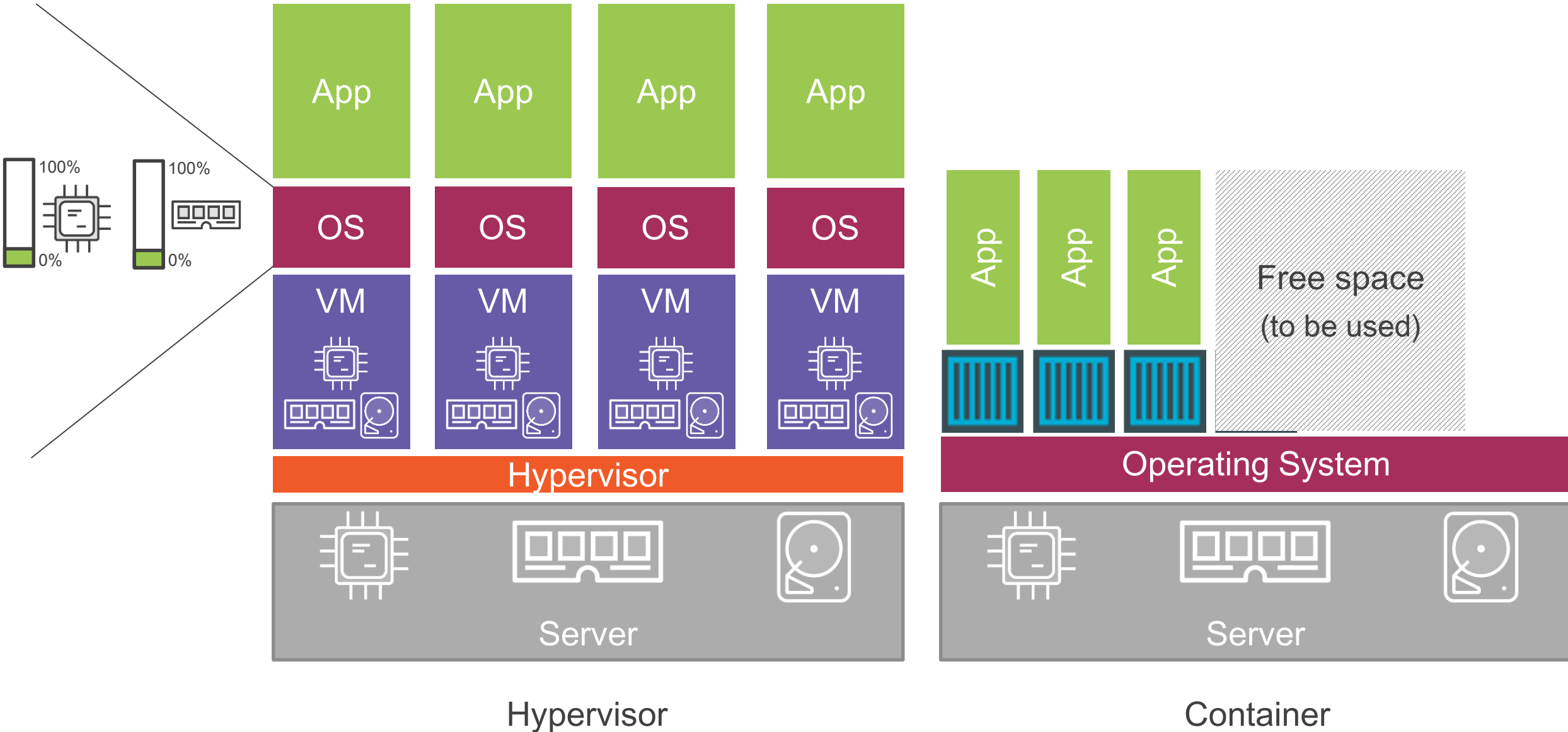


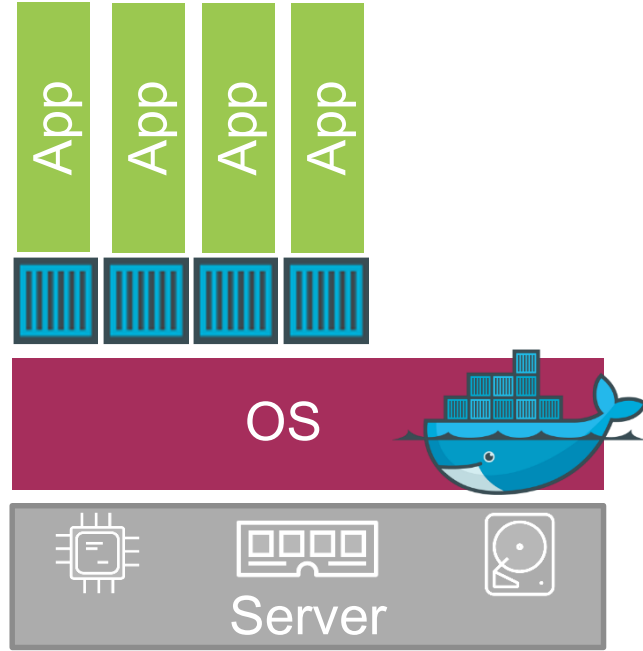
Hypervisor  
Architecture



Container  
Architecture







# Summary

Past  
(physical servers)



Wasted!



Wasted!



Wasted!

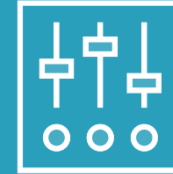
Present  
(Hypervisor virtualization)



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

▼ Docker

OverviewTimelineFollowersContributors



★ FOLLOW

STATISTICS

★ 493

👁 10K

OverviewUPDATE

Acquisitions

**5 Acquisitions**

Funding Received

**\$180M in 5 Rounds from 10 Investors**

Headquarters:

**San Francisco, California**

Description:

Docker is an open platform for distributed applications that allows developers and sysadmins to build, ship & run distributed applications.

Founders:

**Solomon Hykes**

Categories:

**Software, Open Source, Development Platforms**

Website:

**<https://www.docker.com>**


Docker

← → ↻ GitHub, Inc. [US] <https://github.com/docker>

🐙

Search GitHub

Pull requests



Docker

<http://www.docker.com>

📁 Repositories

👤 People 223

👥 Teams 2

Filters ▼

🔍 Find a repository...

**machine**


Machine management for a container-centric world

Updated 7 minutes ago



**docker**

Docker - the open-source application container engine



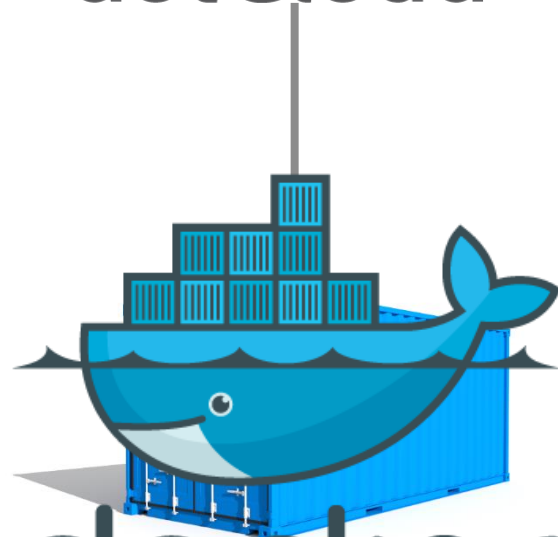


OPEN CONTAINER INITIATIVE

# Docker Inc.



dotCloud



docker

Docker Inc.

dock work er



# Docker Inc.



Leading technology company

dotCloud

Billion dollar valuation

Raised over \$150M in venture capital

Made millions of their own



docker

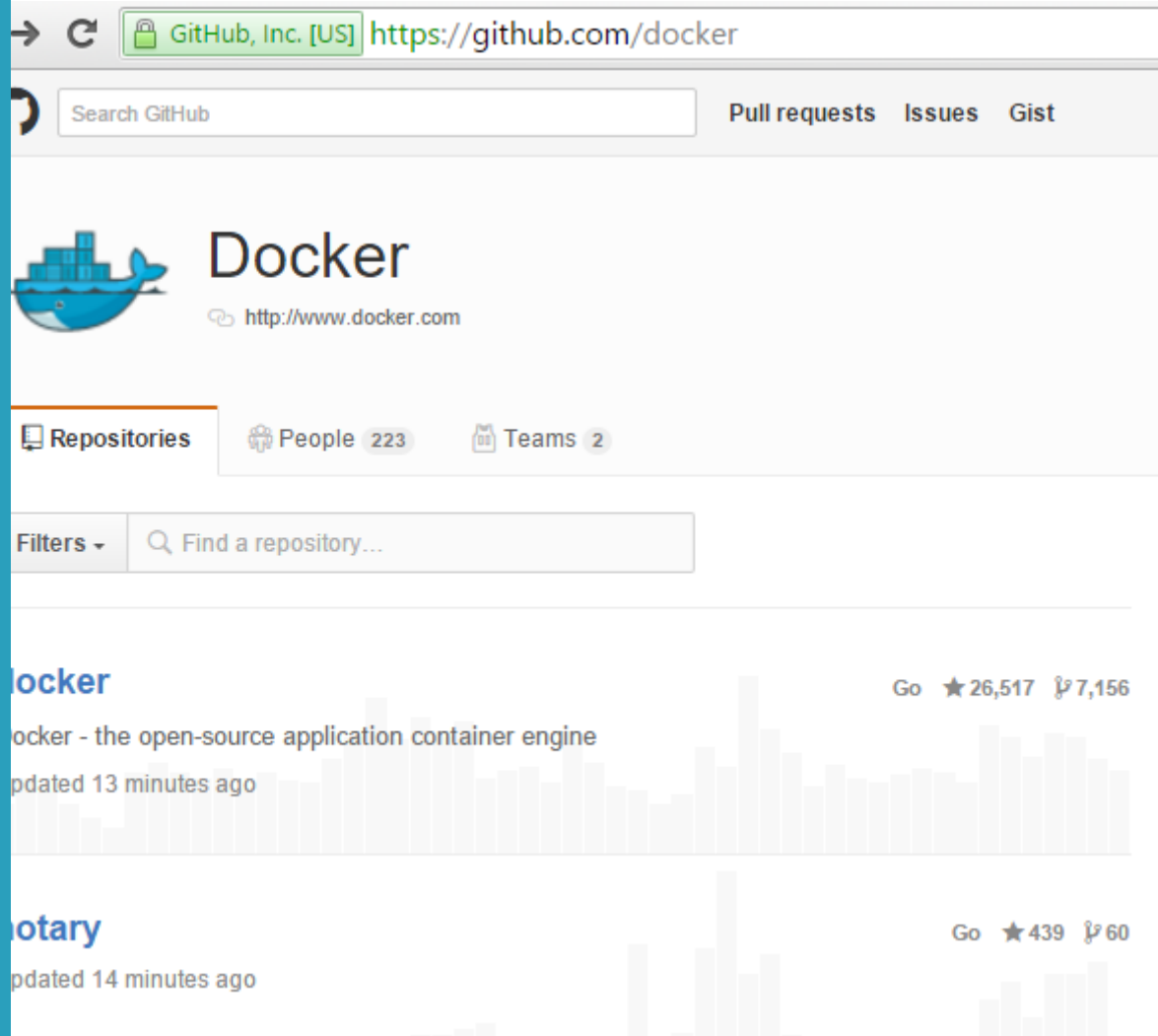
Open source

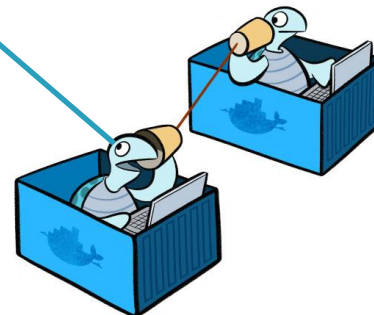
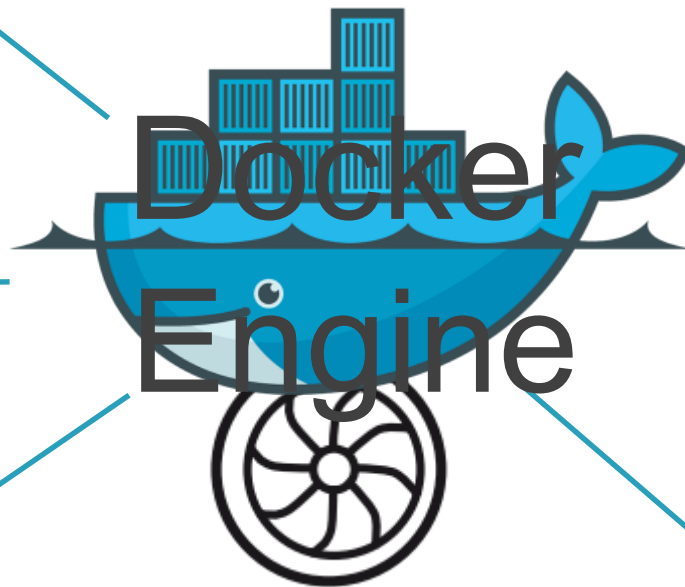
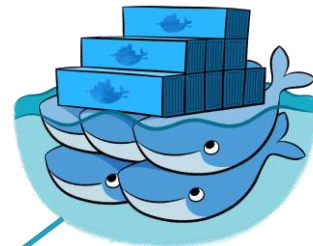
- Apache License 2.0

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

Multiple tools in the  
project

# 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

Some of the biggest  
names in the industry  
involved

# 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

Some of the biggest  
names in the industry  
involved

# The Docker Project

The screenshot displays the Docker Project's GitHub repository. At the top, the repository name 'docker / docker' is shown alongside statistics: 2,337 watches, 26,517 stars, and 7,156 forks. Below this, navigation tabs for 'Code', 'Issues' (1,103), 'Pull requests' (86), 'Wiki', 'Pulse', and 'Graphs' are visible. The current branch is 'master', and the file path 'docker / daemon / graphdriver / overlay / overlay.go' is displayed. A commit by 'rhatdan' titled 'Relabel BTRFS Content on container Creation' is shown, dated 13 days ago. Below the commit, 18 contributors are listed. The main content area shows the Go code for 'overlay.go', which includes imports for 'bufio', 'fmt', 'io/ioutil', 'os', 'os/exec', 'path', 'sync', and 'syscall', along with several GitHub repository URLs.

docker / **docker** Watch 2,337 Star 26,517 Fork 7,156

<> Code Issues 1,103 Pull requests 86 Wiki Pulse Graphs

Branch: master docker / daemon / graphdriver / overlay / **overlay.go** Find file Copy path

rhatdan Relabel BTRFS Content on container Creation 1716d49 13 days ago

18 contributors

474 lines (396 sloc) 13.7 KB Raw Blame History

```
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"
```

Open source

- Apache License 2.0

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

Multiple tools in the  
project

Some of the biggest  
names in the industry  
involved

# The Docker Project

← → ↺

GitHub, Inc. [US]

https://github.com/docker/docker/wiki

🔍 ☆

## Engine Project Planning

The Docker follows a **time-based** release process, currently aiming at releasing a new major version every two months. We issue a **code freeze** several weeks before the scheduled release date during which nothing but bugfixes can be added to the release.

Even though the process is time-based, the Docker Engine sets short-term goals for the upcoming release(s). However, time will always win over features: the code freeze will happen regardless of our goals being met.

## Roadmap

Docker Engine roadmap items are filed on the issue tracker with the `roadmap` label. They are open to community participation: join us on the [usual communication channels](#) to contribute!

Milestone	Target date	Release captain	Goals
Docker 1.9.0	10/29/2015	<a href="#">@tiborvass</a>	<a href="#">Engine 1.9.0</a>
Docker 1.8.0	08/11/2015	<a href="#">@calavera</a>	<a href="#">Engine 1.8.0</a>
Docker 1.7.0	06/18/2015	<a href="#">@vieux</a>	<a href="#">Engine 1.7.0</a>
Docker 1.6.0	04/16/2015	<a href="#">@jfrazelle</a>	

▶ Pages 20

### Resources

- [Engine Roadmap](#)
- [Project Pages](#)
  - [Engine 1.9.0](#)
  - [Engine 1.8.0](#)
  - [Engine 1.7.0](#)

### Process

- [Contributing guide](#)
- [Maintainers list](#)

Clone this wiki locally

<https://github.com/docker/c> 📄

📄 Clone in Desktop

Open source

- Apache License 2.0

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

Multiple tools in the  
project

Some of the biggest  
names in the industry  
involved

# The Docker Project

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





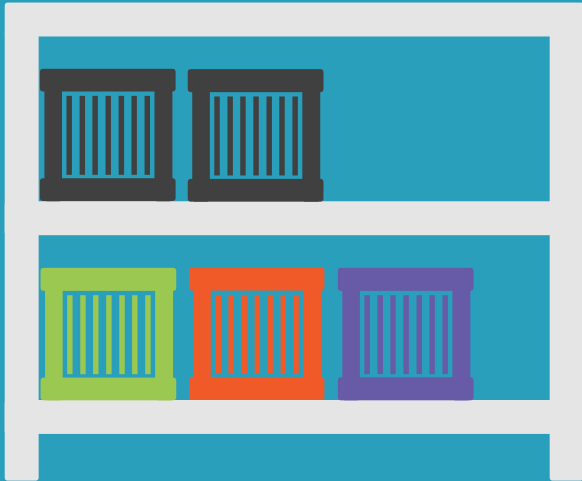
# Docker Hub and Other Container Registries

---

# Agenda

## Container Registries

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

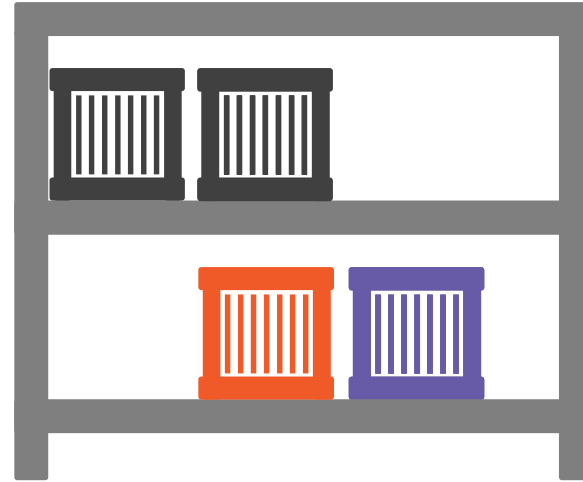


Places to store and retrieve container images

Docker Hub is the official Docker registry

3<sup>rd</sup> party registries exist

# Container Registries



Places to store and retrieve container images

Docker Hub is the official Docker registry

3<sup>rd</sup> party registries exist

Registries contain repositories

Repositories can be public or private

# Container Registries



# 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

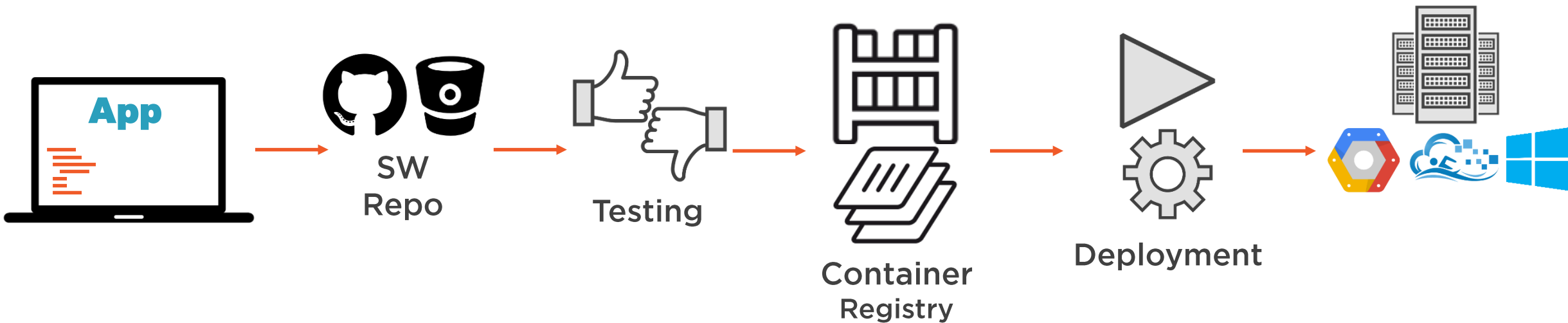
Private registries are available

- 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

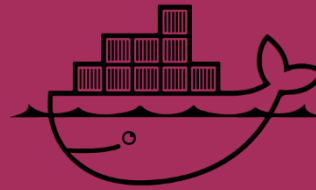


# Summary

Registries are the  
enterprise IT App Store



Lots of registries exist



Registries contain  
repositories



Private Registries exist

