spring

by Pivotal™

git

maven

JUnit

HTML5

ANGULARJS

by Google

B

Bootstrap

amazon web services
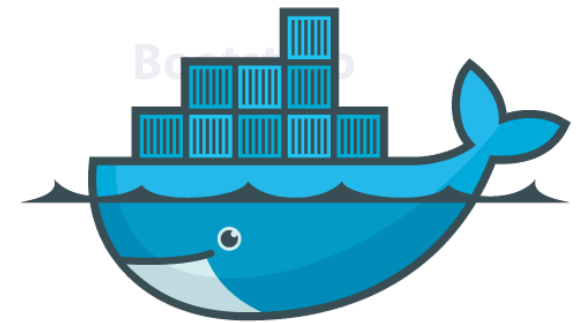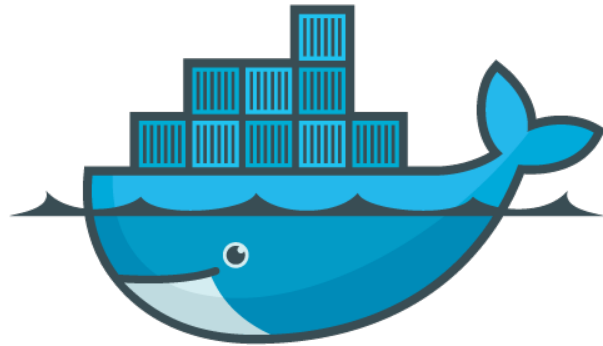
Jenkins

Introduction to Docker

In the 8 months since launched

- >200,000 pulls
- >7,500 github stars
- >200 significant contributors
- >200 projects built on top of docker
  - UIs, mini-PaaS, Remote Desktop….
- 1000's of Dockerized applications
  - Memcached, Redis, Node.js…and Hadoop
- Integration in Jenkins, Travis, Chef, Puppet, Vagrant and OpenStack
- Meetups arranged around the world…with organizations like Ebay, Cloudflare, Yandex, and Rackspace presenting on their use of Docker

David Rousselie @drousselie 2d
Docker community is expending. Really the most exciting project lately.
blog.docker.io/2013/07/docker…
Details

Phil Whelan @philwhln 2d
"Awesome projects from the Docker community | Docker Blog"
bit.ly/16yC72C
Details

Luc Perkins @lucperkins 2d
Somehow I get this weird feeling that I haven't even begun to grasp the implications of @getdocker
Details

John Fink @adr 3d
there are probably a million of these, but this one is mine: generic LAMP stack for @getdocker.
index.docker.io/u/jbfink/lamps…
Details

Phil Plante @pplante 23d
woot! our new @getdocker cluster is performing way better than expected, and is 5x faster than our cloud setup.
Details

Ben Bleything @bleything 5d
you guys, @getdocker. holy shit.
Details

omo @omo2009 6d
blog.docker.io/2013/07/docker…
Docker のなかで X を動かす話。コンテナ作ってから apt-get とか無茶しやがって・・・。

Jake Dahn @jakedahn 6d
every time i use @getdocker it just gets more mind-glowingly amazing
Details

Sandeep @machbio 23d
One of the most Kick-ass Project at this Moment.. credits to @progrium and #docker.io
Details

Damian Gryski @dgryski 3d
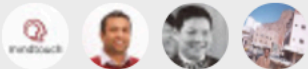. @i_x_s All the cool kids are moving towards @getdocker .
Conversation

Fenn @fennb 24d
Docker (& LXC in general) could be the most important step in virtualization since hypervisors. Impressive stuff: docker.io
Details

docker

A Fast Growing Startup

Funding Rounds (6) - $180.8M

Date	Amount / Round	Valuation	Lead Investor	Investors
Nov, 2015	$18M / Series D	–	–	5
Apr, 2015	$95M / Series D	–	Insight Venture Partners	11
Sep, 2014	$40M / Series C	$400M	Sequoia Capital	5
Jan, 2014	$15M / Series B	–	Greylock Partners	4
Mar, 2011	$12M / Series A	–	–	0
Feb, 2011	$800k / Angel	–	–	9

ADD TO LIST

TOP CONTRIBUTORS

ADD TO THIS PROFILE

Billion-Dollar Valuation

Open-Source Darling Docker Cracks The Billion-Dollar Club With $95 Million Raise

Credit: Chris Ratcliffe/Bloomberg via Getty Images

Why all the excitement?

The Challenge

User DB

postgresql + pgv8 + v8

Static website

nginx 1.5 + modsecurity + openssl + bootstrap 2

Queue

Redis + redis-sentinel

Analytics DB

hadoop + hive + thrift + OpenJDK

Background workers

Python 3.0 + celery + pyredis + libcurl + ffmpeg + libopencv + nodejs + phantomjs

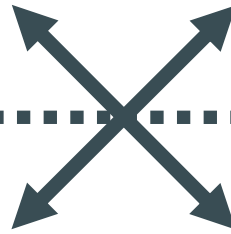**Web frontend**

Ruby + Rails + sass + Unicorn

API endpoint

Python 2.7 + Flask + pyredis + celery + psycopg + postgresql-client

Development VM
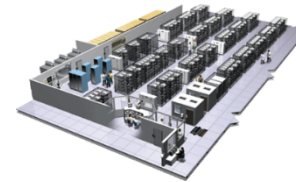
QA server

Customer Data Center

Public Cloud

Disaster recovery

Production Servers

Production Cluster

Contributor's laptop

docker

The Matrix From Hell

	Development VM	QA Server	Single Prod Server	Onsite Cluster	Public Cloud	Contributor's laptop	Customer Servers
Static website	?	?	?	?	?	?	?
Web frontend	?	?	?	?	?	?	?
Background workers	?	?	?	?	?	?	?
User DB	?	?	?	?	?	?	?
Analytics DB	?	?	?	?	?	?	?
Queue	?	?	?	?	?	?	?

docker

Cargo Transport Pre-1960

Multiplicity of Goods
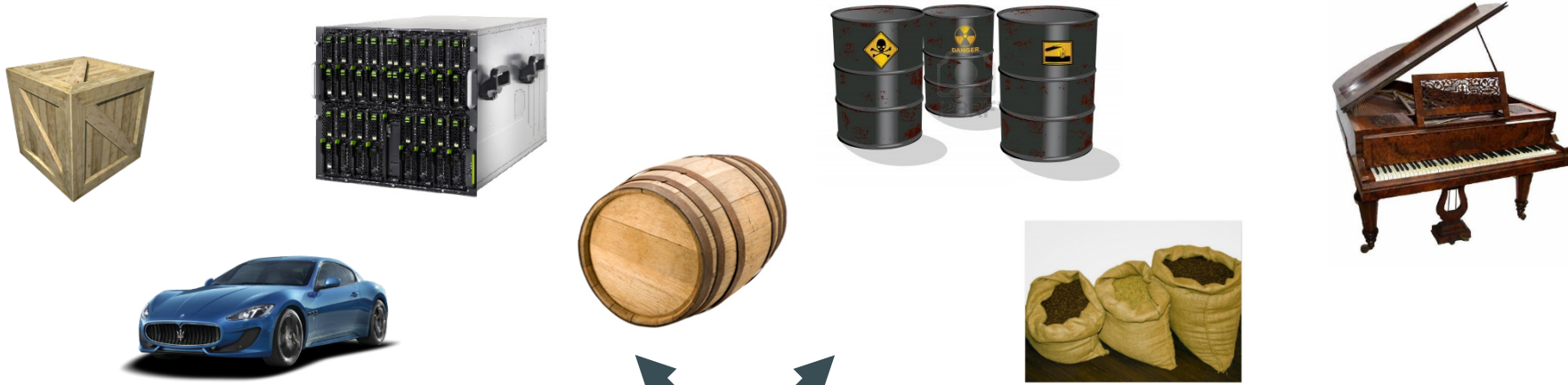
Do I worry about how goods interact (e.g. coffee beans next to spices)
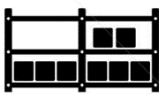
Multiplicity of methods for transporting/storing

Can I transport quickly and smoothly (e.g. from boat to train to truck)

docker

Also a matrix from hell

Solution: Intermodal Shipping Container

Multiplicity of Goods

A standard container that is loaded with virtually any goods, and stays sealed until it reaches final delivery.

Do I worry about how goods interact (e.g. coffee beans next to spices)

…in between, can be loaded and unloaded, stacked, transported efficiently over long distances, and transferred from one mode of transport to another

Multiplicity of methods for transporting/storing

Can I transport quickly and smoothly (e.g. from boat to train to truck)
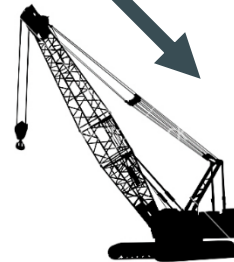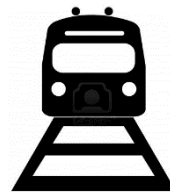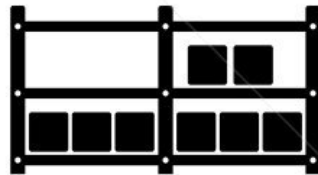
docker

Docker is a shipping container system for code

Multiplicity of Stacks

Static website | User DB | Web frontend | Queue | Analytics DB

An engine that enables any payload to be encapsulated as a lightweight, portable, self-sufficient container…

Do services and apps interact appropriately?

…that can be manipulated using standard operations and run consistently on virtually any hardware platform

Can I migrate smoothly and quickly

Multiplicity of hardware environments

docker

Development VM | QA server | Customer Data Center | Public Cloud | Production Cluster | Contributor's laptop

Docker eliminates the matrix from Hell

	Development VM	QA Server	Single Prod Server	Onsite Cluster	Public Cloud	Contributor's laptop	Customer Servers
Static website	🐳	🐳	🐳	🐳	🐳	🐳	🐳
Web frontend	🐳	🐳	🐳	🐳	🐳	🐳	🐳
Background workers	🐳	🐳	🐳	🐳	🐳	🐳	🐳
User DB	🐳	🐳	🐳	🐳	🐳	🐳	🐳
Analytics DB	🐳	🐳	🐳	🐳	🐳	🐳	🐳
Queue	🐳	🐳	🐳	🐳	🐳	🐳	🐳
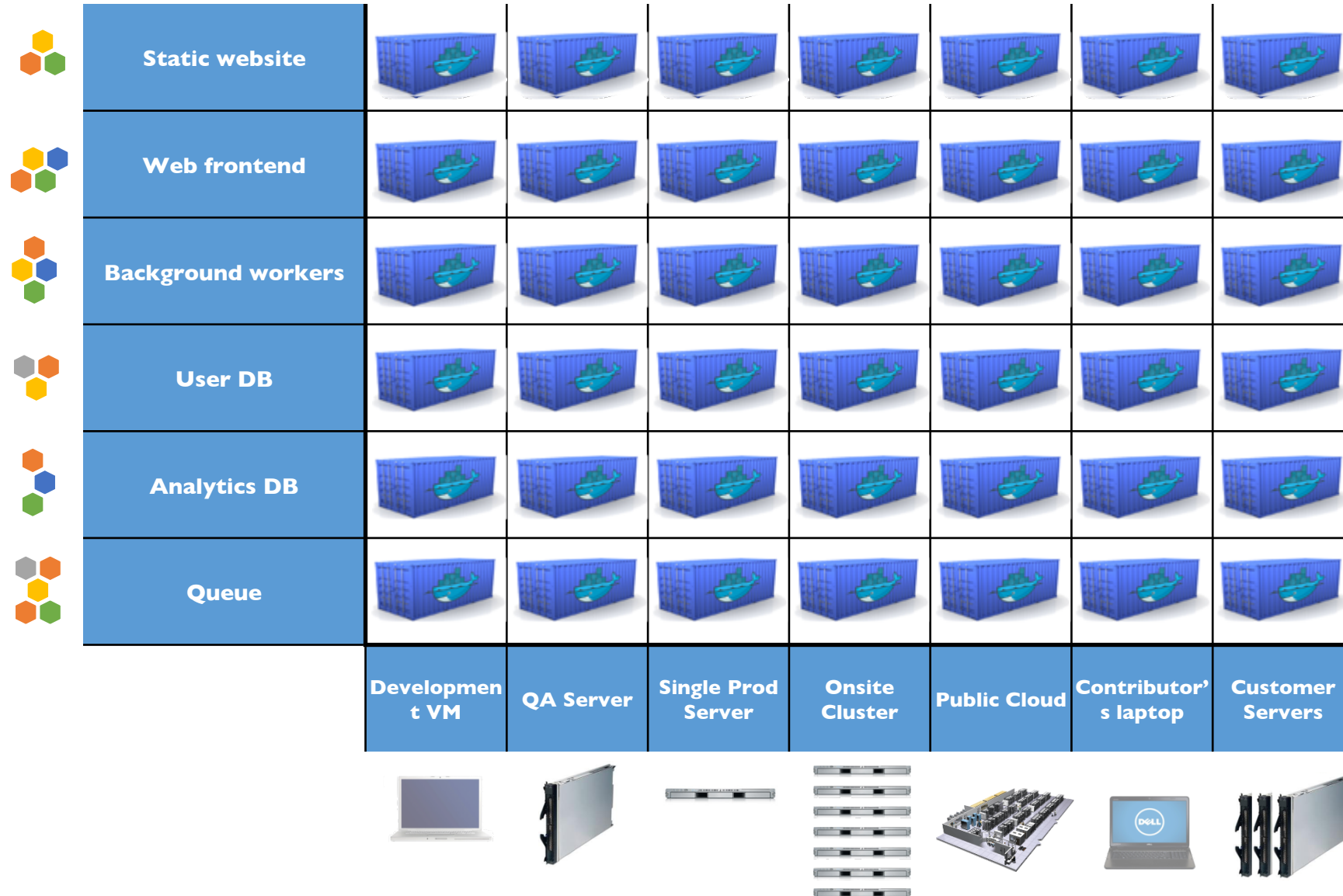
Why Devops Cares?

- Configure once...run anything
  - Make the entire lifecycle more efficient, consistent, and repeatable
  - Increase the quality of code produced by developers.
  - Eliminate inconsistencies between development, test, production, and customer environments
  - Support segregation of duties
  - Significantly improves the speed and reliability of continuous deployment and continuous integration systems
  - Because the containers are so lightweight, address significant performance, costs, deployment, and portability issues normally associated with VMs

Why Developers Care

- ## Build once…(finally) run anywhere*
  - A clean, safe, hygienic and portable runtime environment for your app.
  - No worries about missing dependencies, packages and other pain points during subsequent deployments.
  - Run each app in its own isolated container, so you can run various versions of libraries and other dependencies for each app without worrying
  - Automate testing, integration, packaging…anything you can script
  - Reduce/eliminate concerns about compatibility on different platforms, either your own or your customers.
  - Cheap, zero-penalty containers to deploy services? A VM without the overhead of a VM? Instant replay and reset of image snapshots? That's the power of Docker

  * With the 0.7 release, we support any x86 server running a modern Linux kernel (3.2+ generally. 2.6.32+ for RHEL 6.5+, Fedora, & related)

Why it works—separation of concerns

- Dan the Developer
  - Worries about what's "inside" the container
    - His code
    - His Libraries
    - His Package Manager
    - His Apps
    - His Data
  - All Linux servers look the same
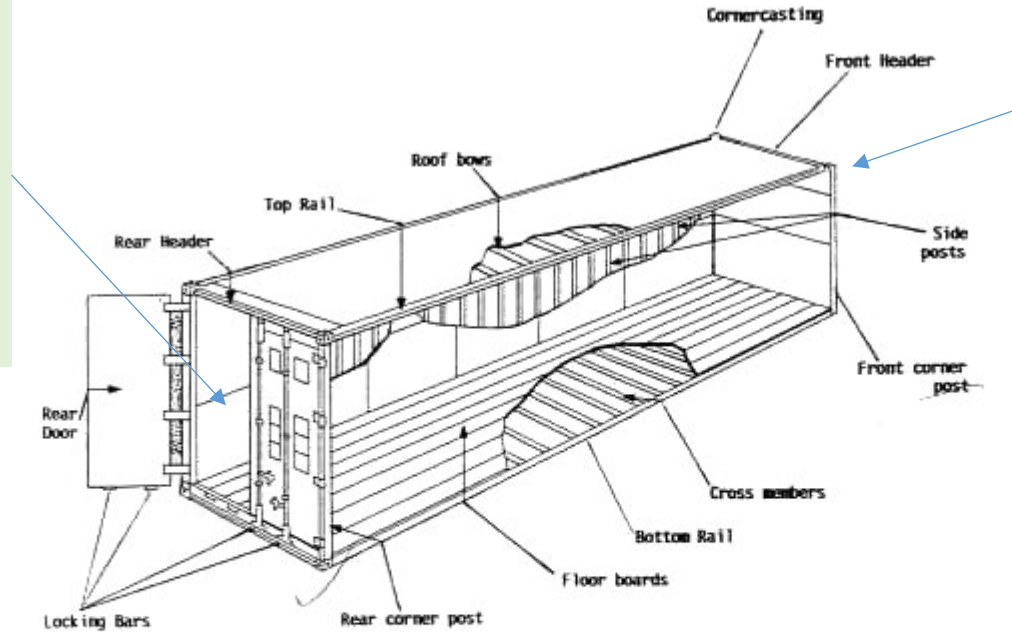
- Oscar the Ops Guy
  - Worries about what's "outside" the container
    - Logging
    - Remote access
    - Monitoring
    - Network config
  - All containers start, stop, copy, attach, migrate, etc. the same way

Cornercasting

Front Header

Roof bows

Top Rail

Rear Header

Side posts

Rear/Door

Front corner post

Locking Bars

Rear corner post

Cross members

Bottom Rail

Floor boards

Major components of the container:

Docker Adoption Behavior

Percent of Datadog Customers

Legend: ADOPTED | DABBLING | ABANDONED

DOCKER ADOPTION UP 30% IN ONE YEAR

30% GROWTH

ONE YEAR

15%

10%

5%

0%

JUL 2014 | SEPT 2014 | NOV 2014 | JAN 2014 | MAR 2015 | MAY 2015 | JUL 2015 | SEPT 2015 | NOV 2015 | JAN 2015 | MAR 2016 | MAY 2016
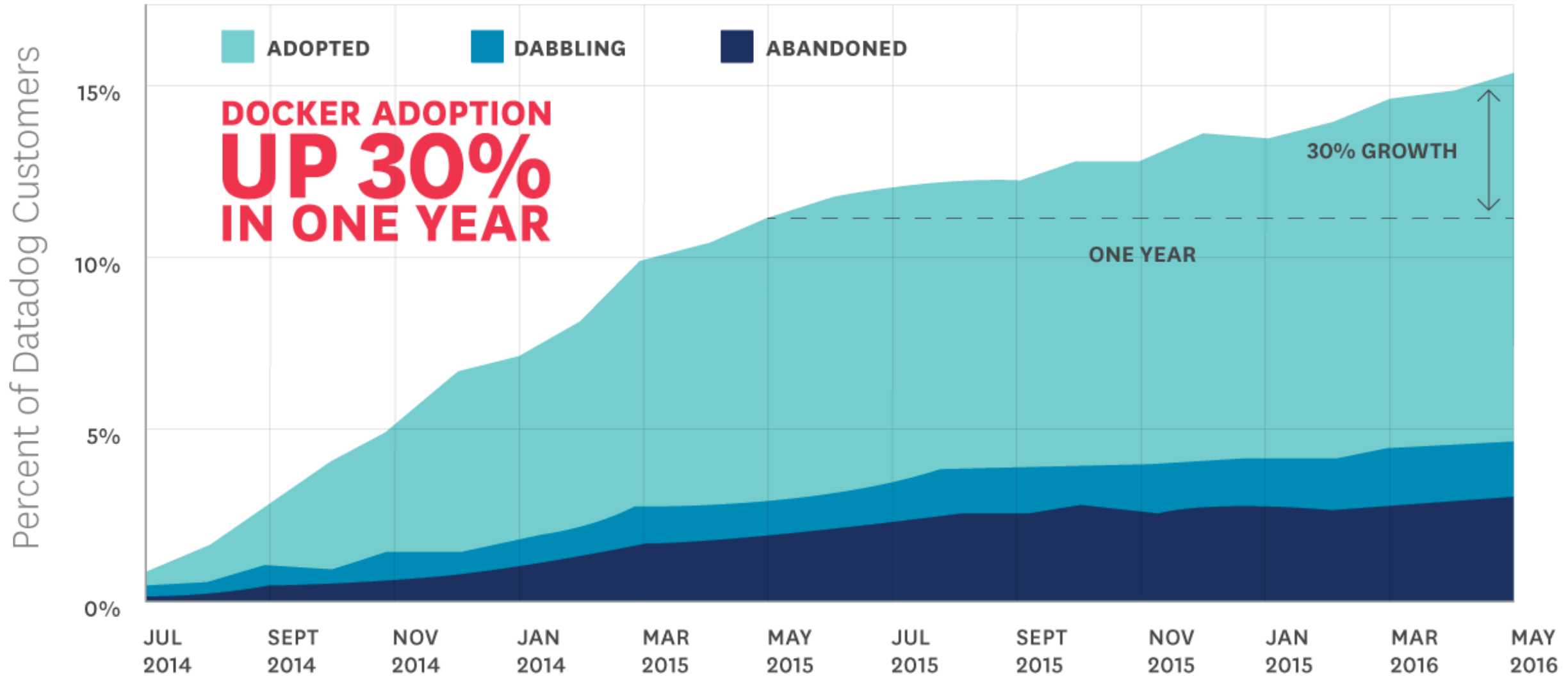
Source: Datadog

Docker Tutorial from the Industry

Zach Kysar

Containers vs. VMs

VM

App A
Bins/Libs
Guest OS

App A'
Bins/Libs
Guest OS

App B
Bins/Libs
Guest OS

Hypervisor (Type 2)

Host OS

Server
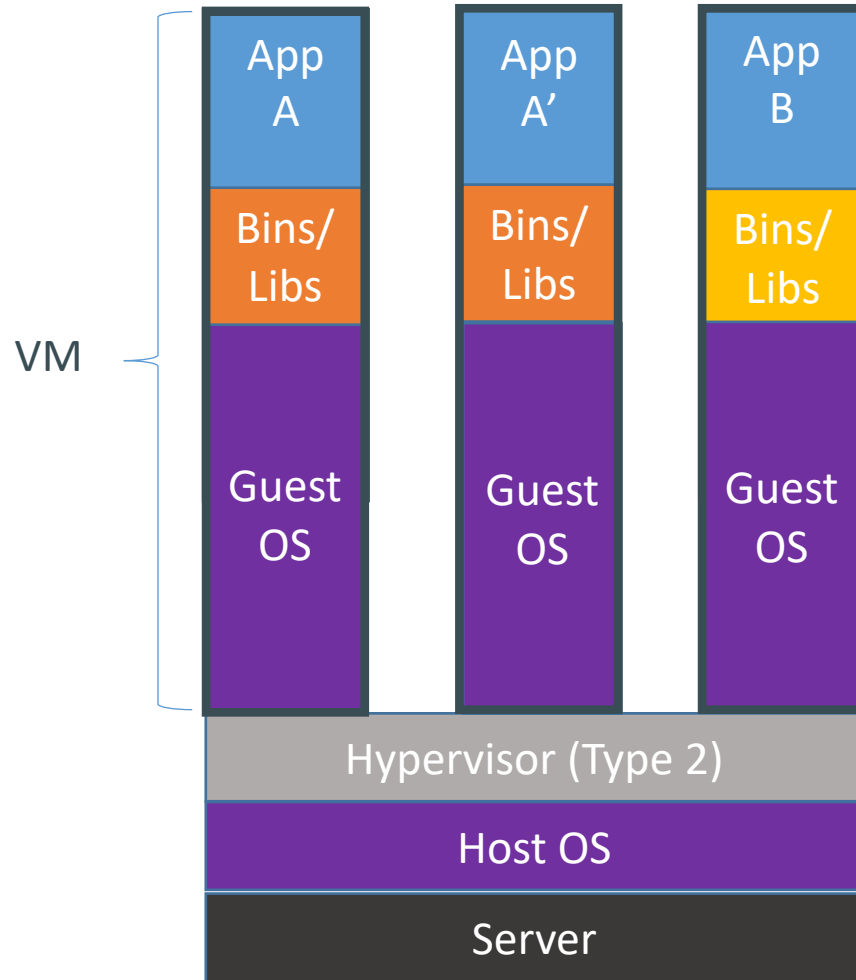
Containers are isolated, but share OS and, where appropriate, bins/libraries

...result is significantly faster deployment, much less overhead, easier migration, faster restart

Container

App A | App A' | App B | App B' | App B' | App B' | Docker

Bins/Libs | Bins/Libs

Host OS
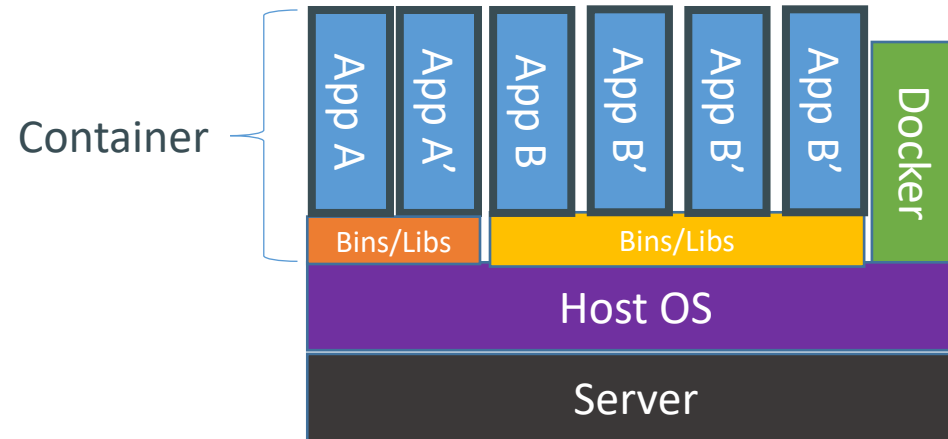
Server

docker

Why are Docker containers lightweight?

VMs

App A	App A	App A'
Bins/Libs	Bins/Libs	Bins/Libs
Guest OS	Guest OS	Guest OS
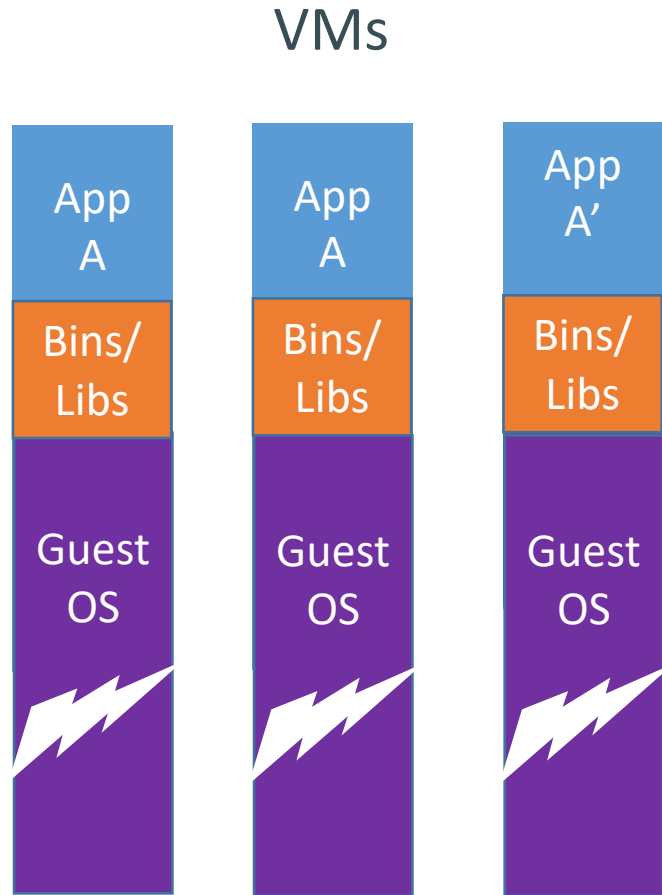
VMs

Every app, every copy of an app, and every slight modification of the app requires a new virtual server

Containers

App A
Bins/Libs

Original App
(No OS to take up space, resources, or require restart)

App A

Copy of App

No OS. Can Share bins/libs

App Δ

Modified App

Copy on write capabilities allow us to only save the diffs Between container A and container A'
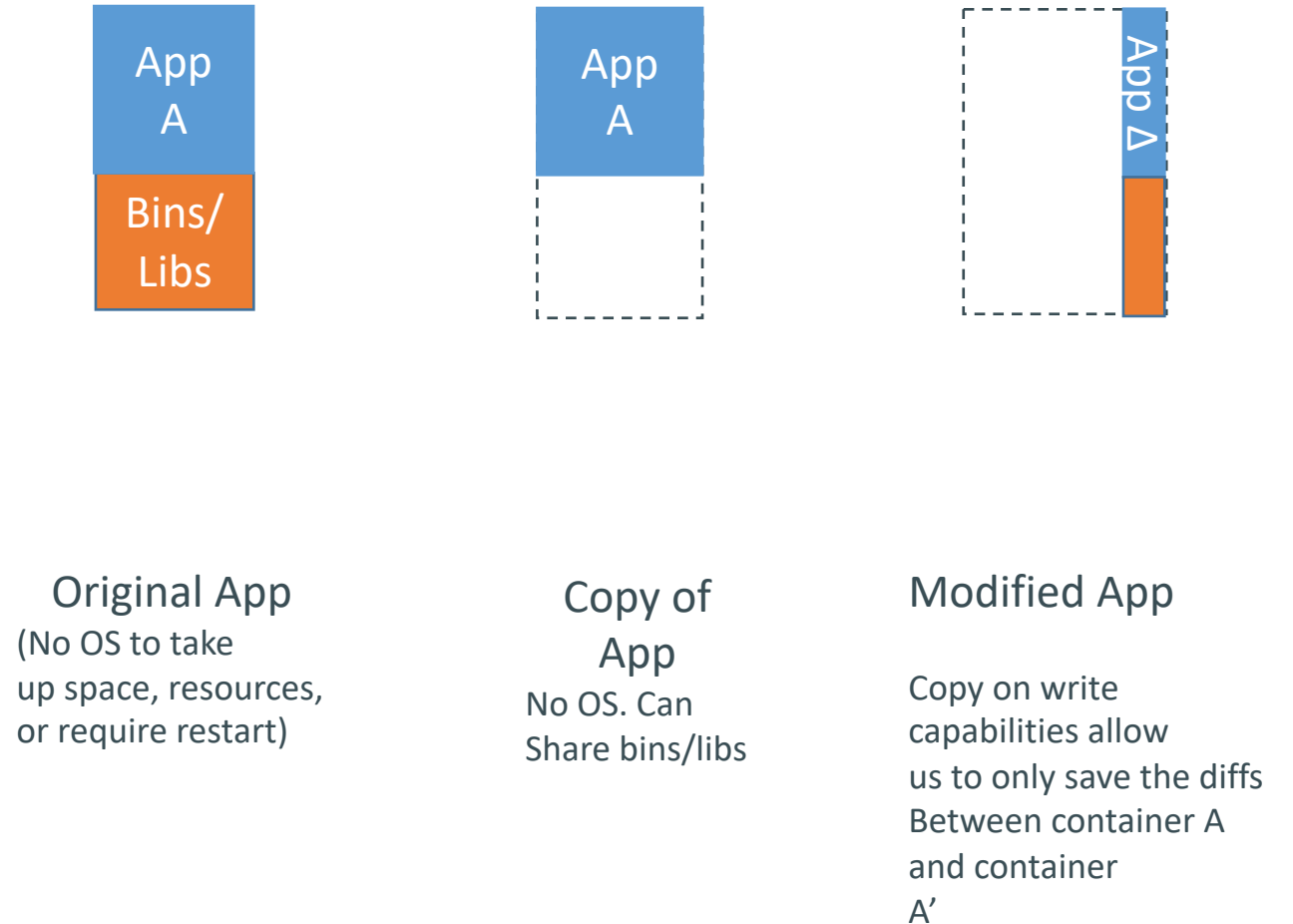
What are the basics of the Docker system?

Changes and Updates

App
A

Bins/
Libs

Base
Container
Image

App Δ

Container
Mod A'

Container
Mod A''

Push

Docker
Container
Image
Registry

App Δ

Update

App
A

Bins/
Libs

Docker Engine

Host running A wants to upgrade to A''.
Requests update. Gets only diffs

App
A''

Bins/
Libs

Docker Engine

Host is now running A''
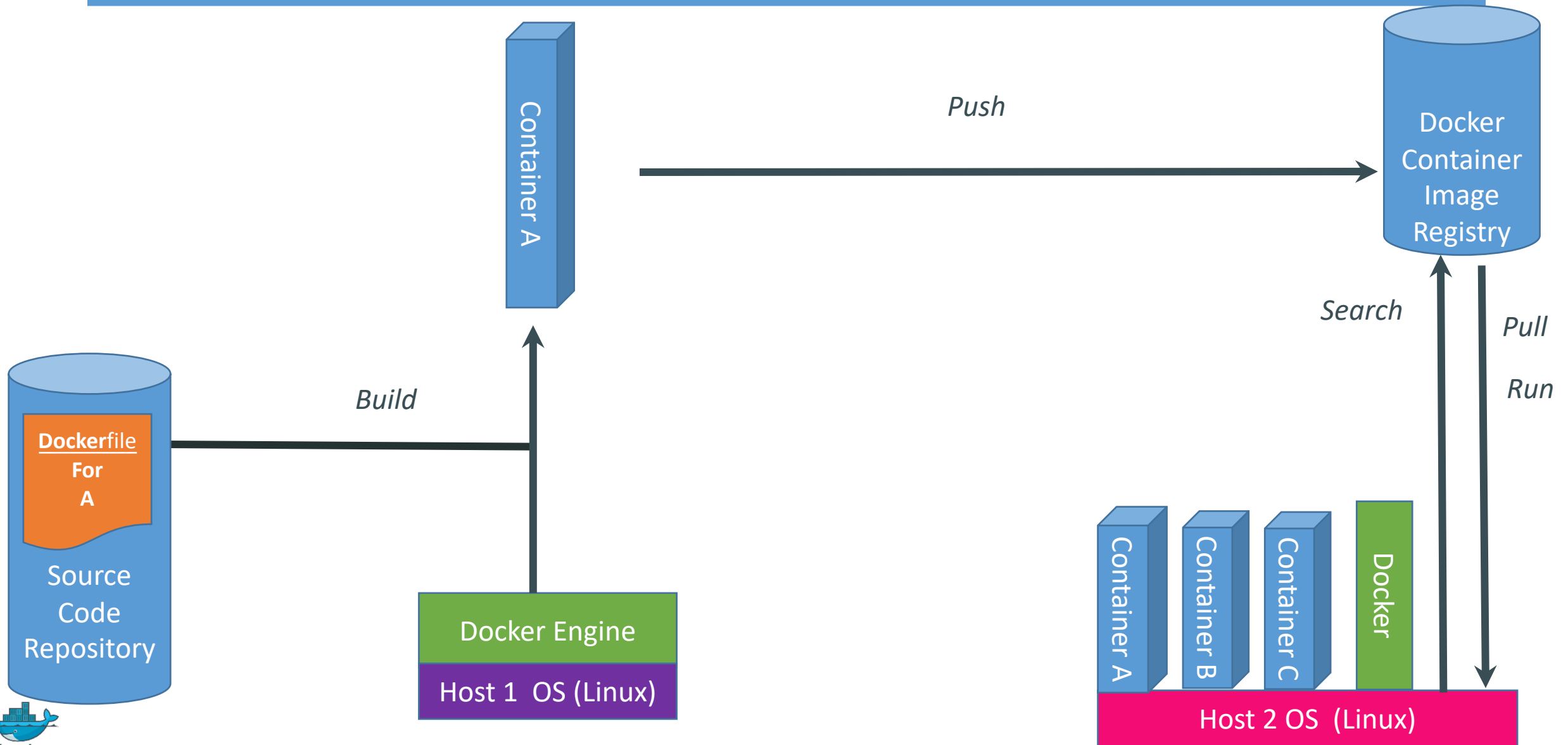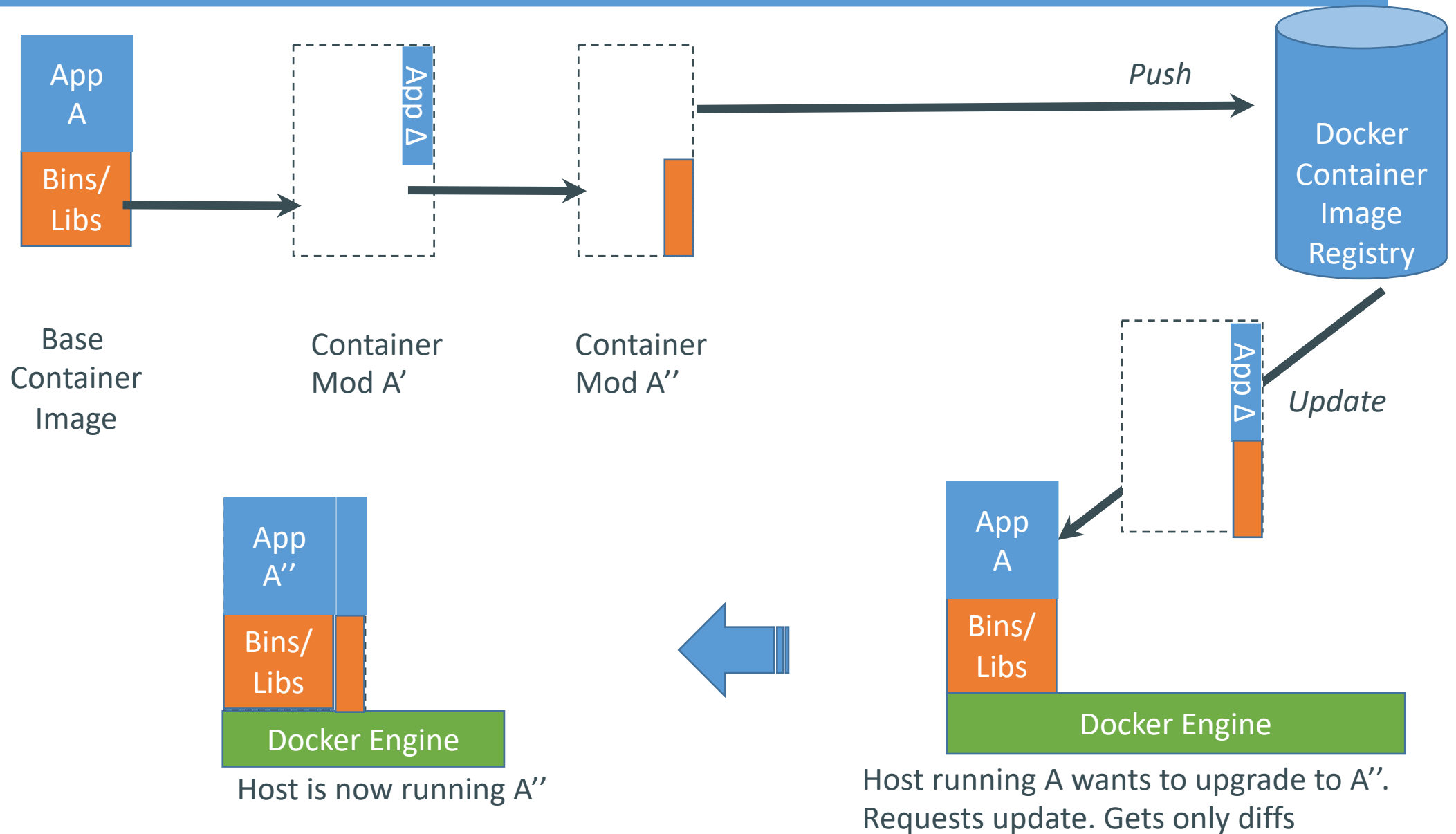
docker

Ecosystem Support

- Operating systems
  - Virtually any distribution with a 2.6.32+ kernel
  - Red Hat/Docker collaboration to make work across RHEL 6.4+, Fedora, and other members of the family (2.6.32 +)
  - CoreOS—Small core OS purpose built with Docker

- OpenStack
  - Docker integration into NOVA (& compatibility with Glance, Horizon, etc.) accepted for Havana release

- Private PaaS
  - OpenShift
  - Solum (Rackspace, OpenStack)
  - Other TBA

- Public PaaS
  - Deis, Voxoz, Cocaine (Yandex), Baidu PaaS

- Public IaaS
  - Native support in Rackspace, Digital Ocean,+++
  - AMI (or equivalent) available for AWS & other

- DevOps Tools
  - Integrations with Chef, Puppet, Jenkins, Travis, Salt, Ansible +++

- Orchestration tools
  - Mesos, Heat, ++
  - Shipyard & others purpose built for Docker

- Applications
  - 1000's of Dockerized applications available at index.docker.io

Use Cases

- Ted Dziuba on the Use of Docker for Continuous Integration at Ebay Now
  - https://speakerdeck.com/teddziuba/docker-at-ebay
  - http://www.youtube.com/watch?feature=player_embedded&v=0Hi0W4gX--4

- Sasha Klizhentas on use of Docker at Mailgun/Rackspace
  - http://www.youtube.com/watch?feature=player_embedded&v=CMC3xdAo9RI

- Sebastien Pahl on use of Docker at CloudFlare
  - http://www.youtube.com/watch?feature=player_embedded&v=-Lj3jt_-3r0

- Cambridge HealthCare
  - http://blog.howareyou.com/post/62157486858/continuous-delivery-with-docker-and-jenkins-part-i
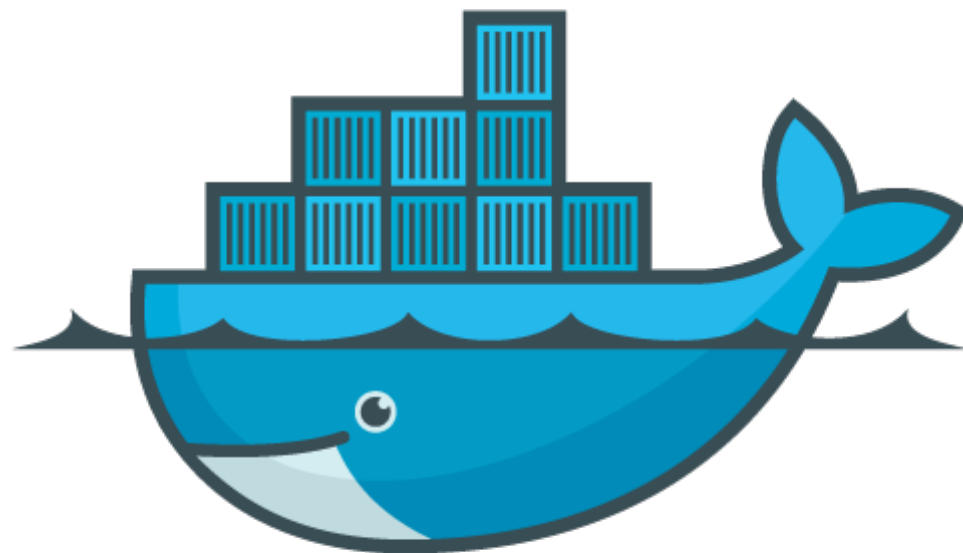
- Red Hat Openshift and Docker
  - https://www.openshift.com/blogs/technical-thoughts-on-openshift-and-docker

Use Cases—From Our Community

Use Case	Examples	Link
Clusters	Building a MongoDB cluster using docker	http://bit.ly/1acbjZf
	Production Quality MongoDB Setup with Docker	http://bit.ly/15CaiHb
	Wildfly cluster using Docker on Fedora	http://bit.ly/1bClX0O
Build your own PaaS	OpenSource PaaS built on Docker, Chef, and Heroku Buildpacks	http://deis.io
Web Based Environment for Instruction	JiffyLab – web based environment for the instruction, or lightweight use of, Python and UNIX shell	http://bit.ly/12oaj2K
Easy Application Deployment	Deploy Java Apps With Docker = Awesome	http://bit.ly/11BCvvu
	How to put your development environment on docker	http://bit.ly/1b4XtJ3
	Running Drupal on Docker	http://bit.ly/15MJS6B
	Installing Redis on Docker	http://bit.ly/16EWOKh
Create Secure Sandboxes	Docker makes creating secure sandboxes easier than ever	http://bit.ly/13mZGJH
Create your own SaaS	Memcached as a Service	http://bit.ly/11nL8vh
Automated Application Deployment	Multi-cloud Deployment with Docker	http://bit.ly/1bF3CN6
Continuous Integration and Deployment	Next Generation Continuous Integration & Deployment with dotCloud's Docker and Strider	http://bit.ly/ZwTfoy
	Testing Salt States Rapidly With Docker	http://bit.ly/1eFBtcm
Lightweight Desktop Virtualization	Docker Desktop: Your Desktop Over SSH Running Inside Of A Docker Container	http://bit.ly/14RYL6x

Want to learn more?

- www.docker.io:
  - Documentation
  - Getting started: interactive tutorial, installation instructions, getting started guide,
  - About: Introductory whitepaper: http://www.docker.io/the-whole-story/
- Github: dotcloud/docker
- IRC: freenode/#docker
- Google groups: groups.google.com/forum/#!forum/docker-user
- Twitter: follow @docker
- Meetups: Scheduled for Boston, San Francisco, Austin, London, Paris, Boulder…and Nairobi. https://www.docker.io/meetups/

www.docker.io