

WAD 328



Docker and Microsoft:
How Azure is Bringing the
World of Windows and Linux
Together

Glenn Wong
Partner Business Evangelist
Microsoft Hong Kong

Agenda

- Introduction
- The growing technology challenge
- An analogy: the shipping industry
- Docker Engine Overview
- Docker Hub Overview
- Microsoft and Docker: partnership
- Azure and Docker

Applications Have Fundamentally Changed

~2000	2014
Long lived	Development is iterative and constant
Monolithic and built on a single stack	Built from loosely coupled components
Deployed to a single server	Deployed to a multitude of servers

The Problem in 2014: Distributed Applications

Multiplicity of Stacks

Static website
nginx 1.5 + modsecurity + openssl + bootstrap 2

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

User DB
postgresql + pgv8 + v8

Web frontend
Ruby + Rails + sass + Unicorn

Queue
Redis + redis-sentinel

Analytics DB
hadoop + hive + thrift + OpenJDK

API endpoint client
Python 2.7 + Flask + pyredis + celery + pycopg + postgresql-client

Do services and apps interact appropriately?

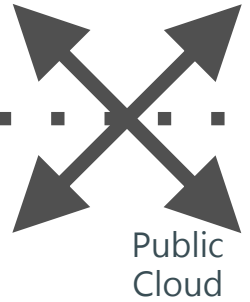
Multiplicity of hardware environments

Development VM



Customer Data Center

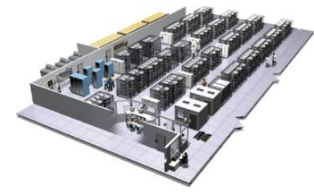
QA server



Public Cloud

Disaster recovery

Production Servers



Production Cluster









Contributor's laptop



Can I migrate smoothly and quickly?

The Matrix From Hell

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

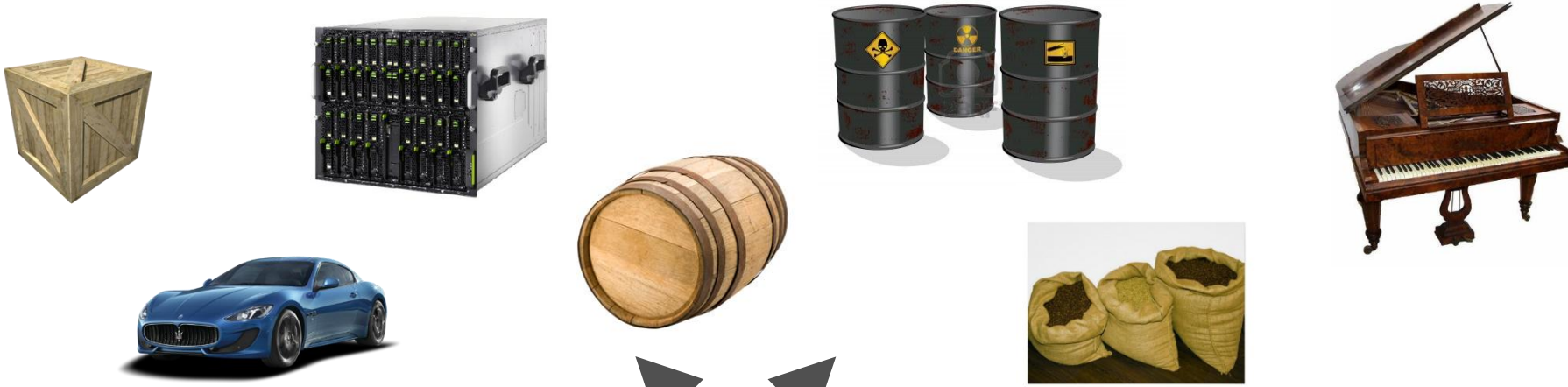


Why Docker?

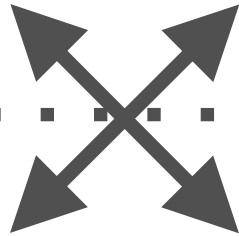
- Conflicting runtimes
- Ports Mapping for different services
- "It works for me..."
- Infra, Dev and DevOps
- What did you do to get the code running?
- Reproducing QUICKLY

An Inspiration: Cargo Transport Pre-1960

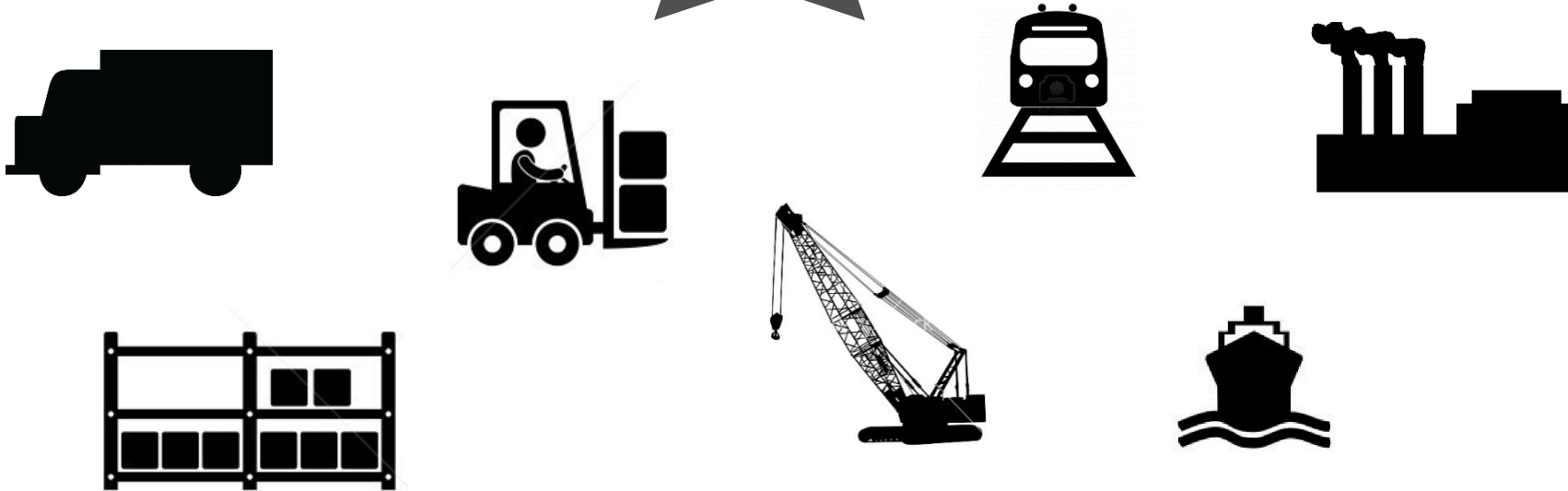
Multiplicity of
Goods



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)

Solution: Intermodal Shipping Container Ecosystem

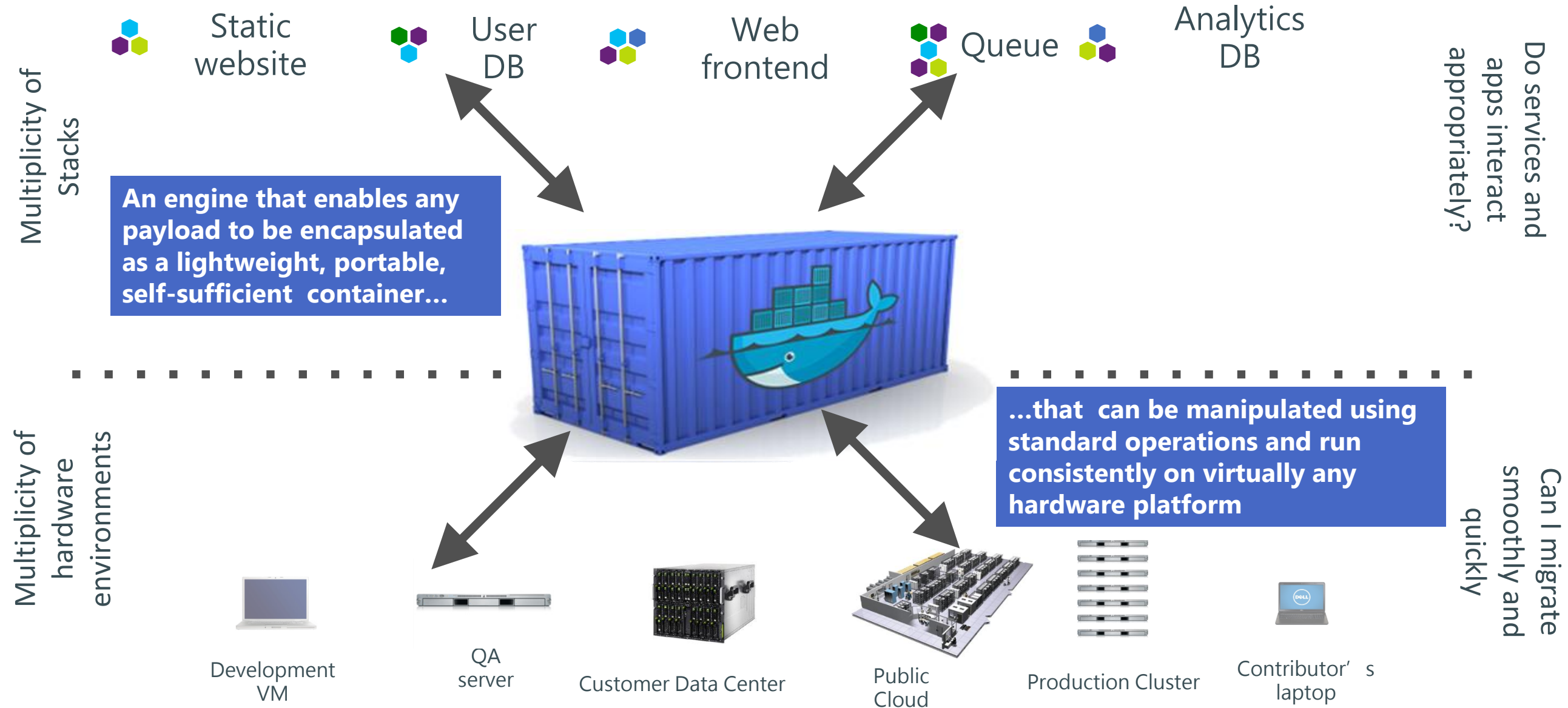


The Intermodal Shipping Container Ecosystem










- 90% of all cargo now shipped in a standard container
- Order of magnitude reduction in cost and time to load and unload ships
- Massive reduction in losses due to theft or damage
- Huge reduction in freight cost as percent of final goods (from >25% to <3%)
- massive globalization
- 5000 ships deliver 200M containers per year

Let's create an ecosystem for distributed applications



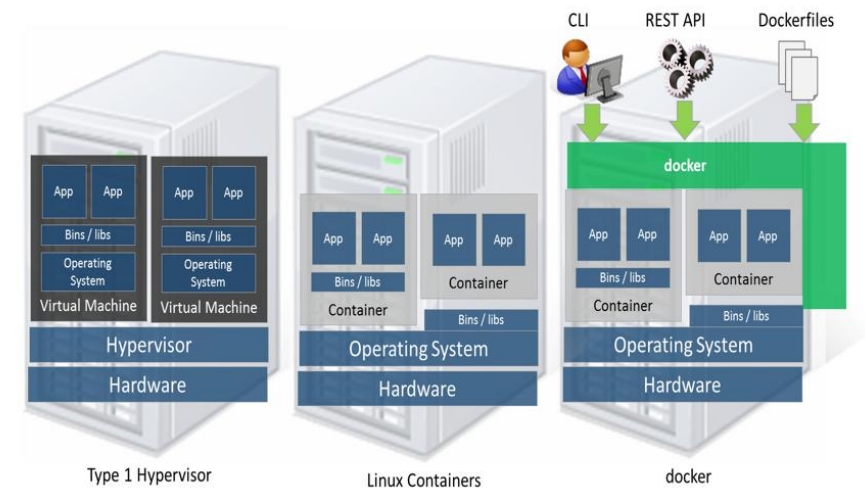
And eliminate the matrix from Hell

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

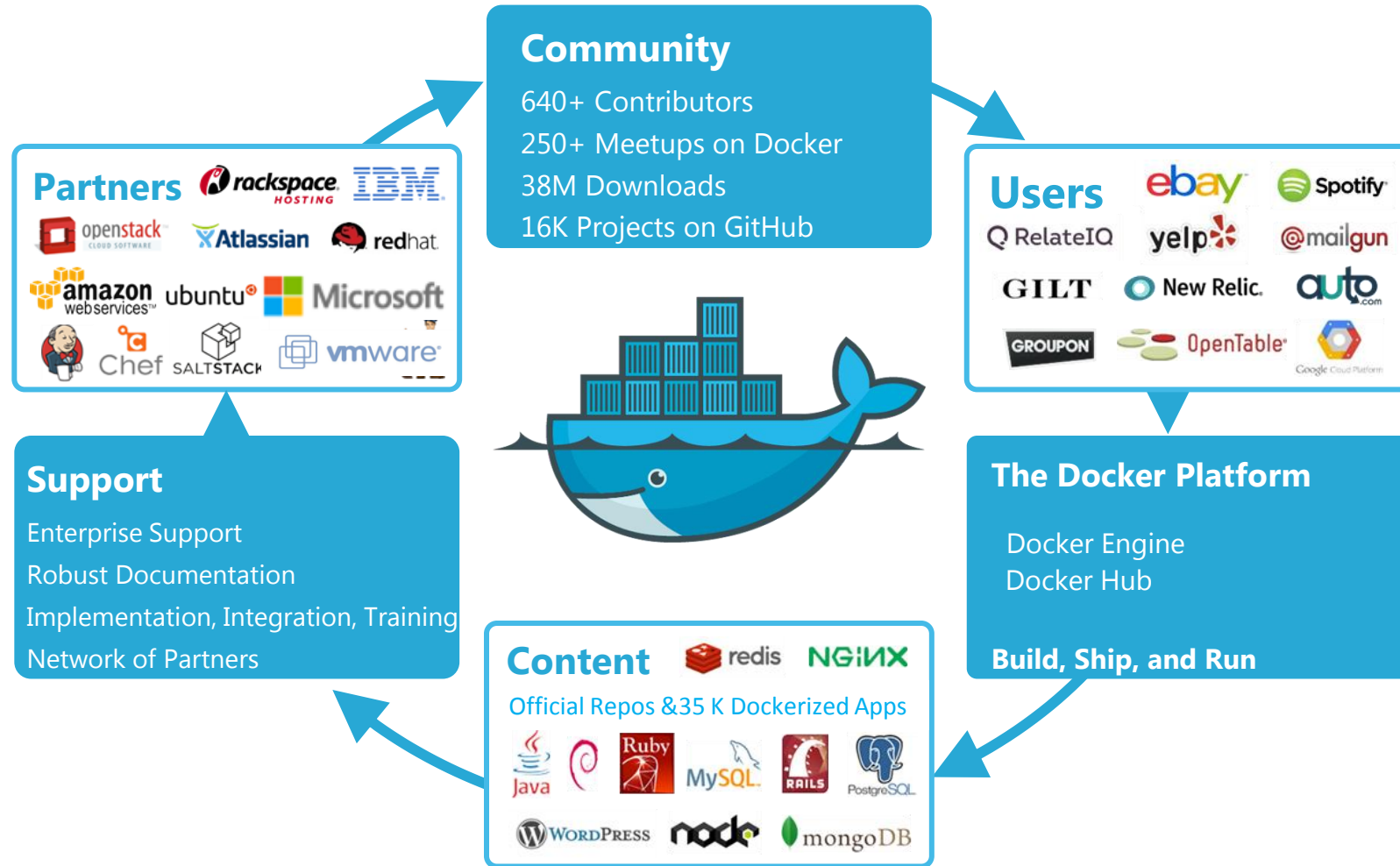


Importance of an Ecosystem

- Container technology has been around for a while (LXC, Solaris Zones, BSD Jails)
- Analogy: Shipping containers are not just steel boxes
- With Docker, low level containers get the following:
 - Re-usable components
 - Ability to run on any Linux server today: physical, virtual, VM, cloud, OpenStack, +++
 - Ability to move between any of the above in a matter of seconds-no modification or delay
 - Ability to share containerized components
 - Self contained environment—no dependency hell
 - Tools for how containers work together: linking, nesting, discovery, orchestration
- “Containerization” is really “Dockerization”



Snapshot: The Docker Ecosystem



Agenda

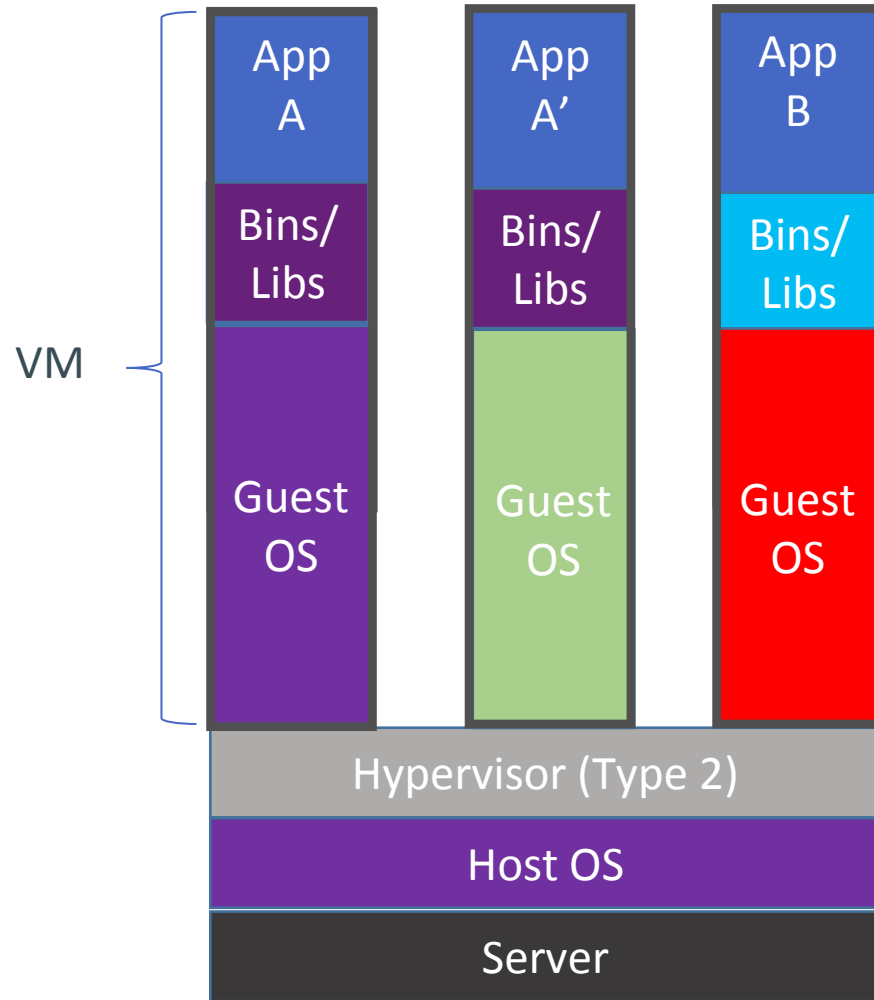
- Introduction
- The growing technology challenge
- An analogy: the shipping industry
- **Docker Engine Overview**
- Docker Hub Overview
- Microsoft and Docker
- Azure and Docker

Docker Engine

- Open Source Project written in Go
- Released March, 2013
- Provides the Docker Container - Repeatable Runtimes, Sandboxing, Network, and Storage
- Linux and (soon) Windows CLI tools for Developers
- Local and Remote REST API for further integration
- Low level API for Runtime, Storage, and Network extension

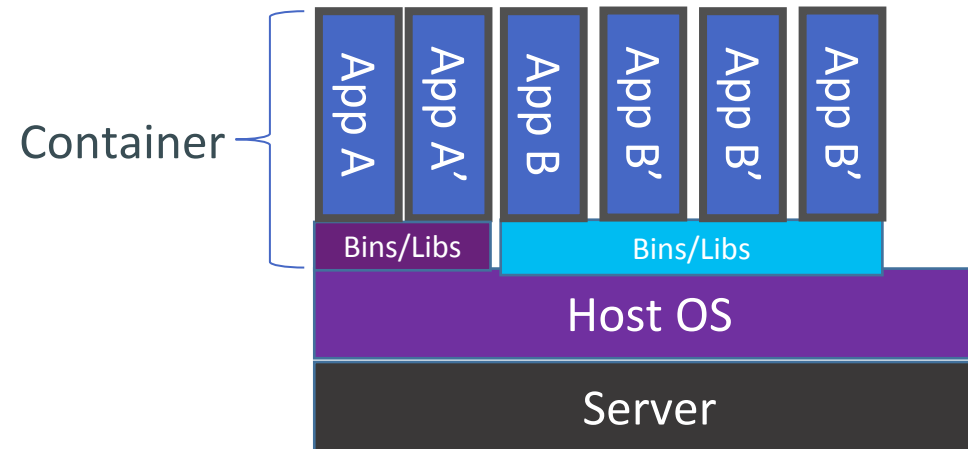
Docker Engine: Demo

Comparison: Containers vs. VMs



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

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



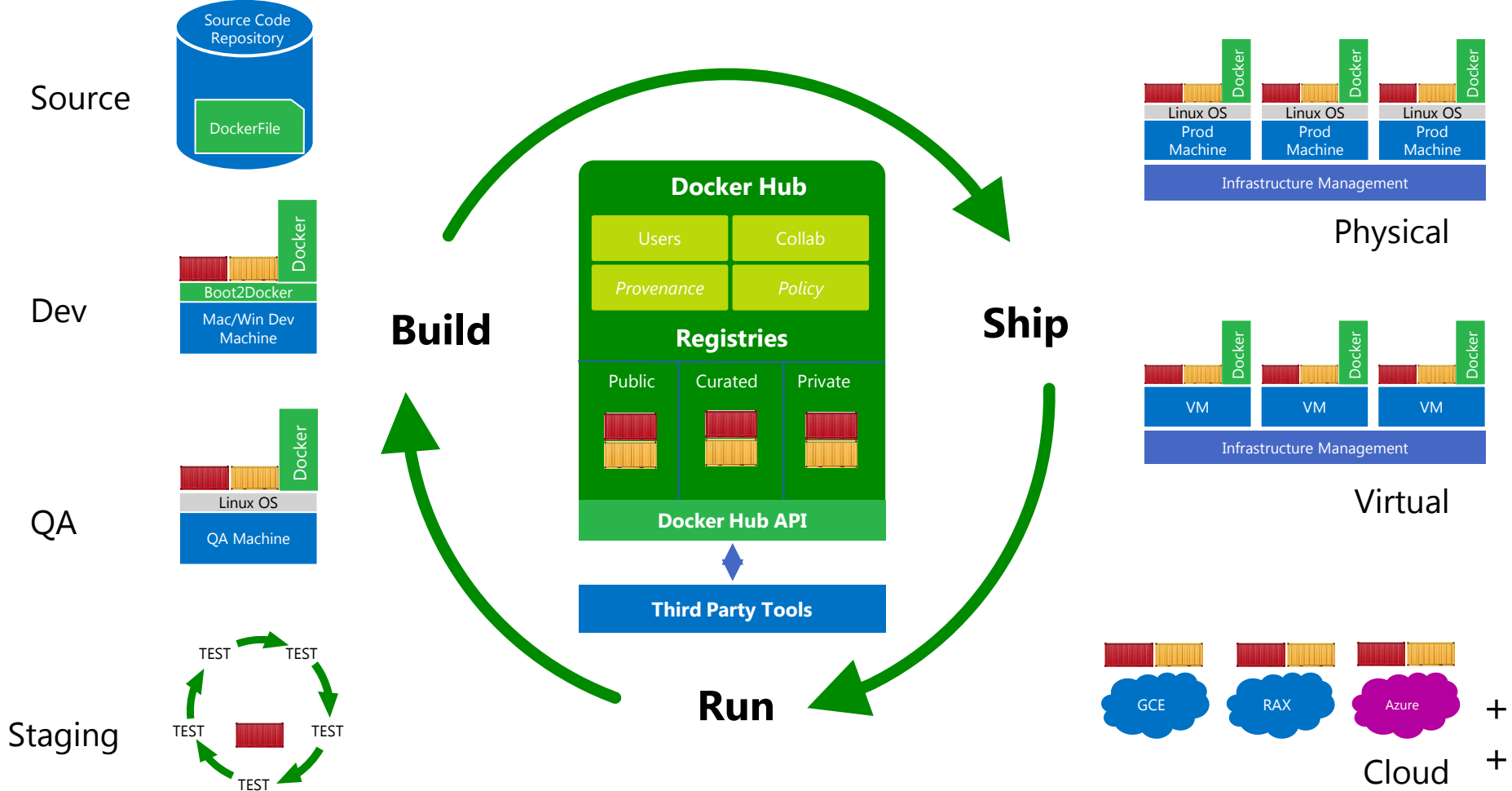
Agenda

- Introduction
- The growing technology challenge
- An analogy: the shipping industry
- Docker Engine Overview
- **Docker Hub Overview**
- Microsoft and Docker
- Azure and Docker

Docker Hub

- Launched June, 2014
- Enables any Docker Host to run any application in seconds
- Provides Official, Public, and Private Docker Application Repositories
- Workflow management: Automated Builds, Webhooks
- Distribution Channel: Get vendor supported and provided Software

Docker Hub: Build, Ship, Run Applications



Any App

+ 45K apps
+ 16K projects



API

Engine

open source software at the heart
of the Docker platform

Hub

cloud-based platform services for
distributed applications

API

Any infrastructure

- Physical
- Virtual cloud

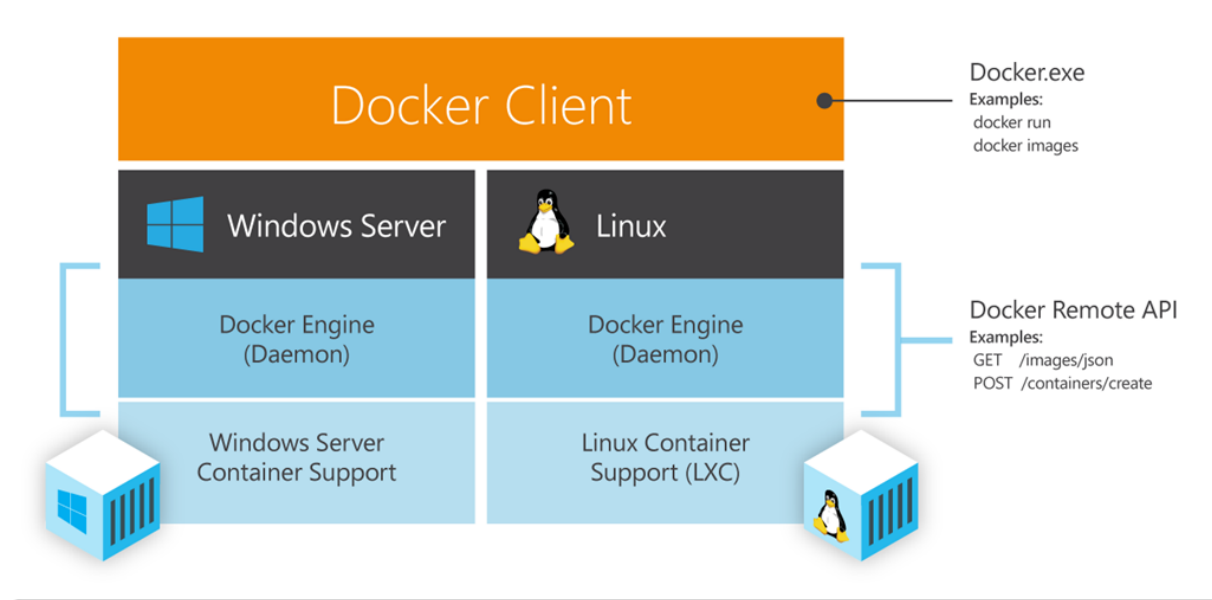


Agenda

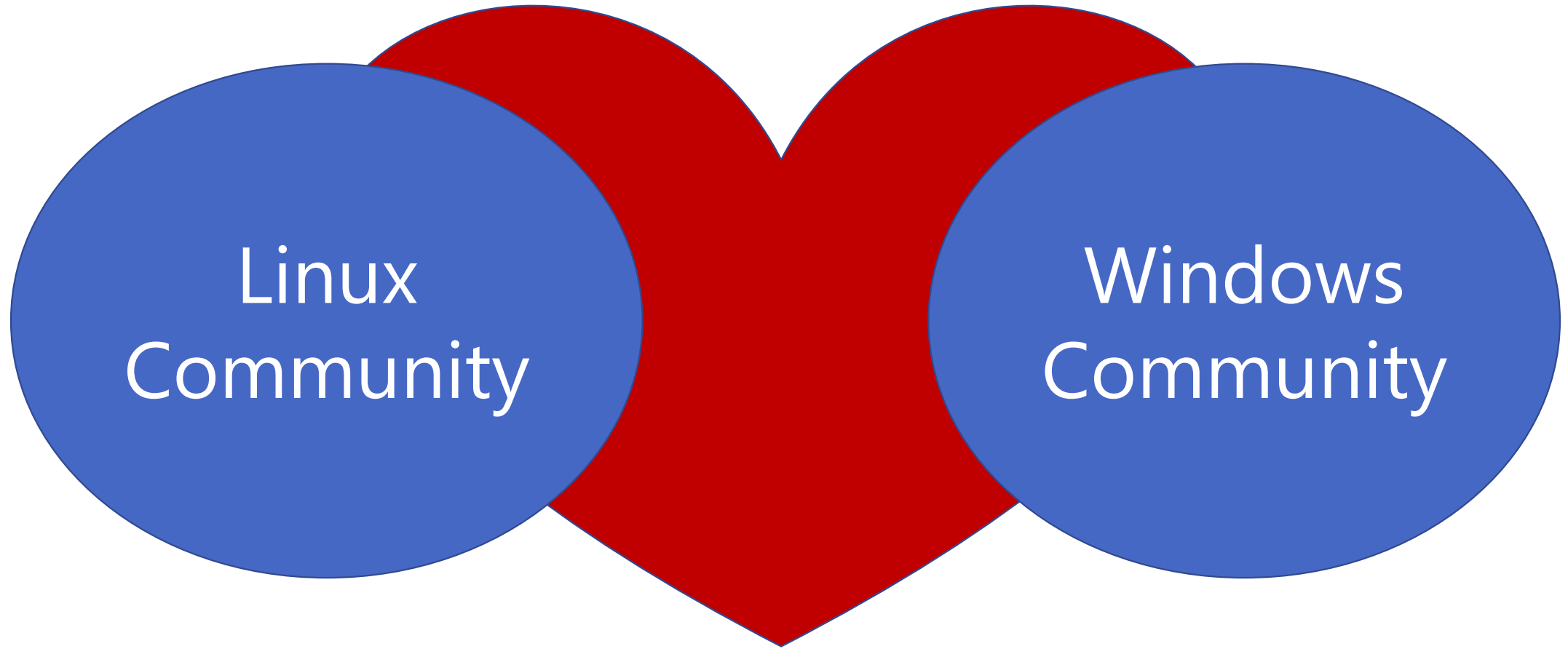
- Introduction
- The growing technology challenge
- An analogy: the shipping industry
- Docker Engine Overview
- Docker Hub Overview
- **Microsoft and Docker**
- Azure and Docker

Recent News: Docker for Windows

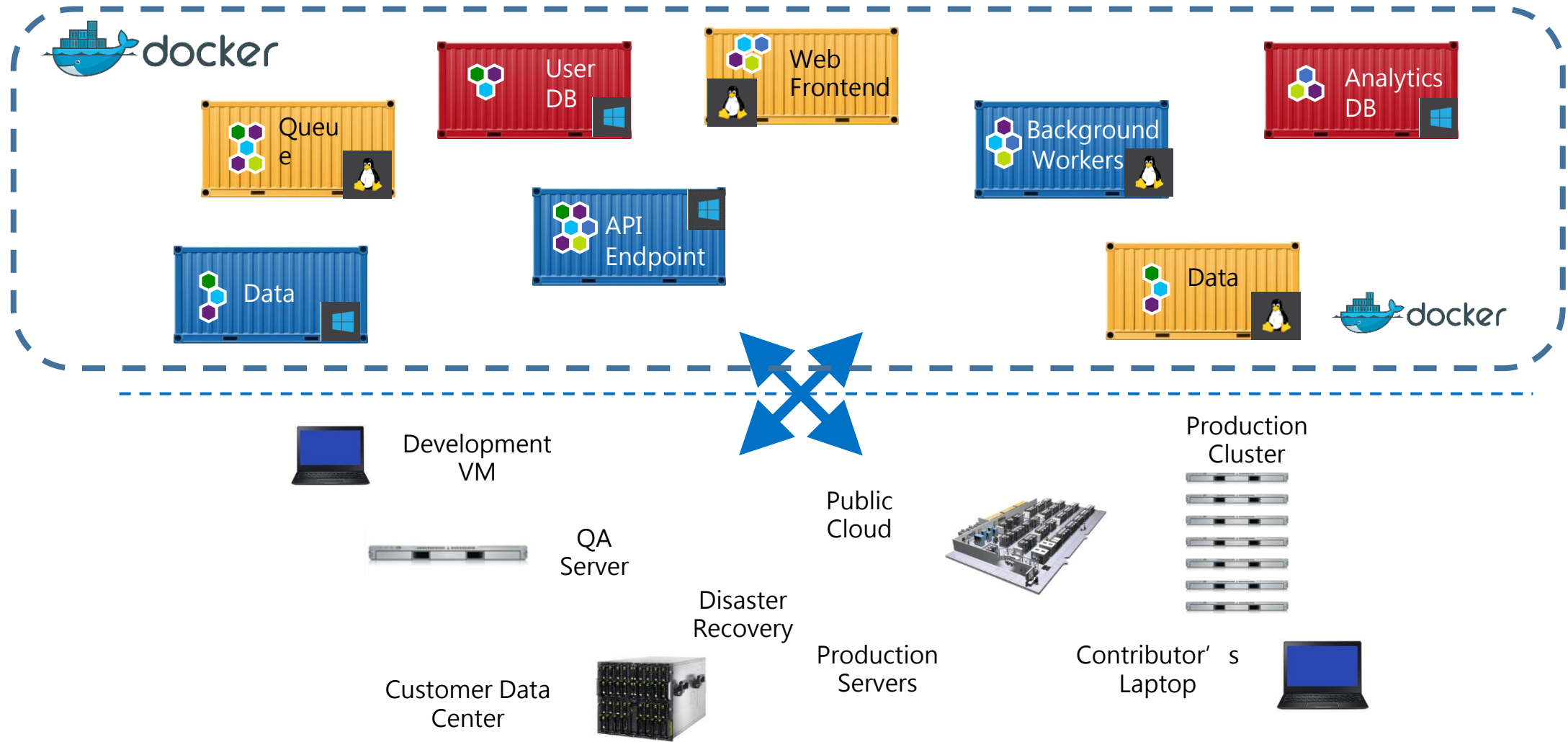
- Bring Docker and Containers to Windows
- Contribute to open source Docker Engine to support Windows
- Local box support on Hyper-V



Bringing Communities Together



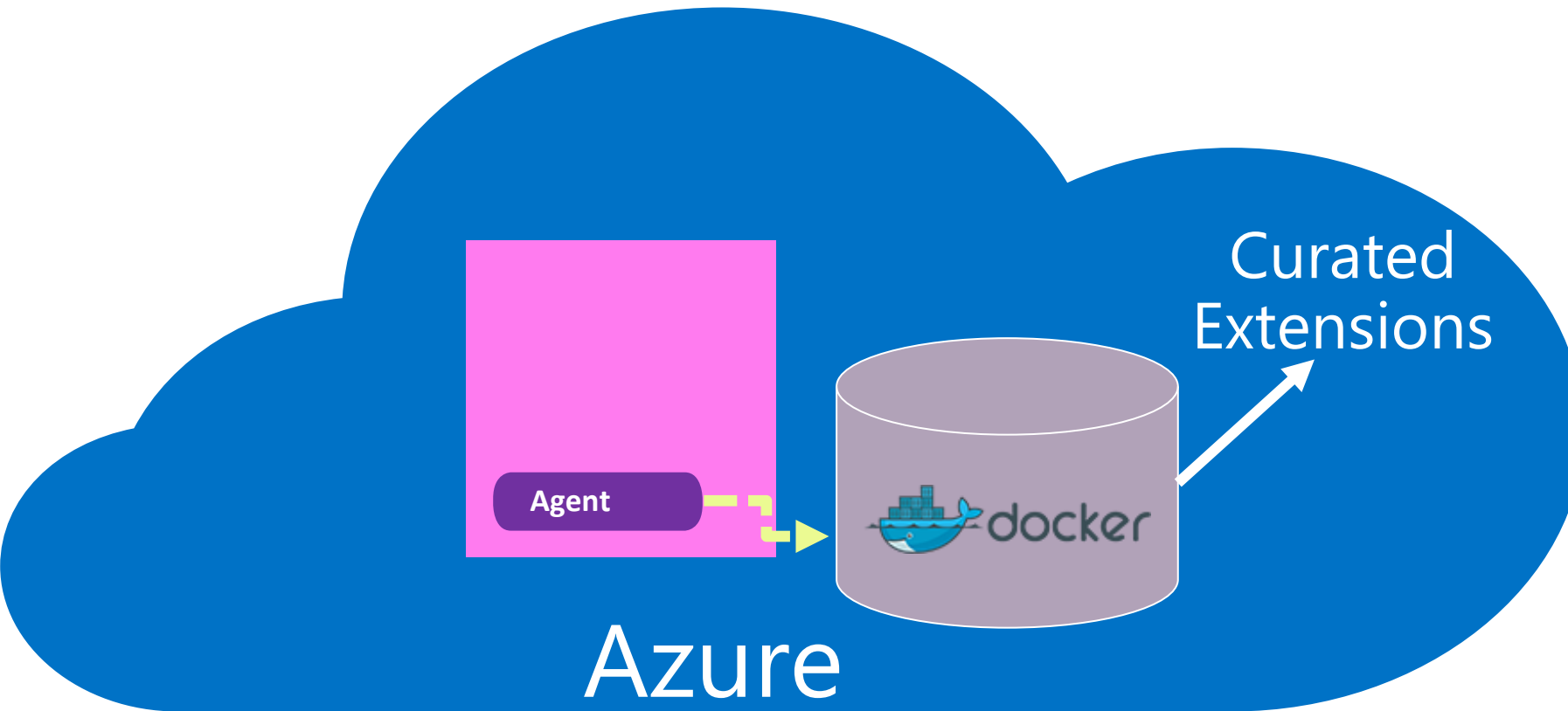
Distributed Applications With Both Linux and Windows Components



Agenda

- Introduction
- The growing technology challenge
- An analogy: the shipping industry
- Docker Engine Overview
- Docker Hub Overview
- Microsoft and Docker
- **Azure and Docker**

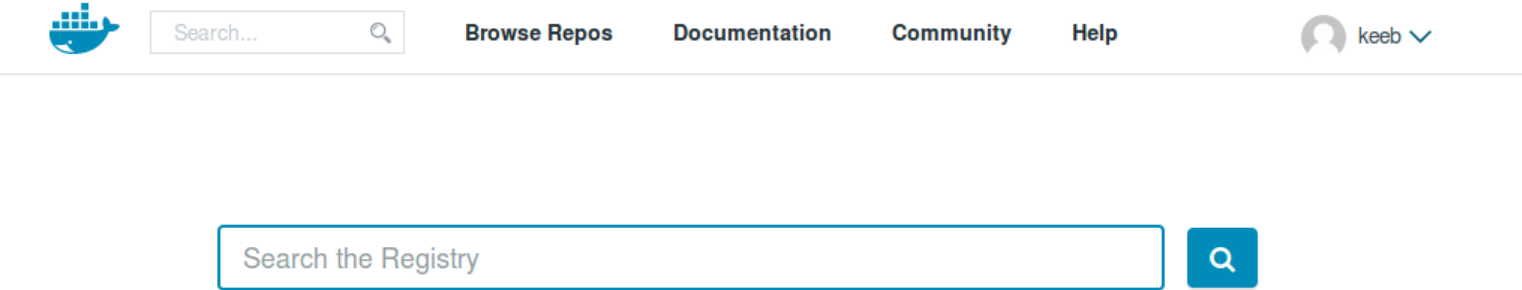
Extension Model and Docker



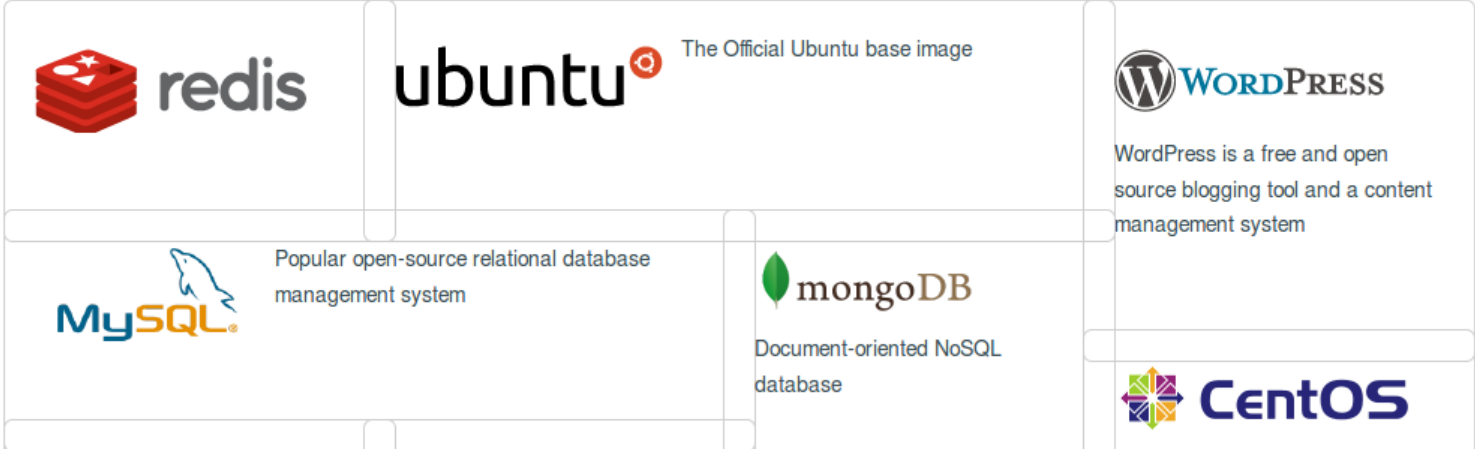
- DockerCon Announce
- Curated Extensions
- Updated with latest

Docker Hub Integration

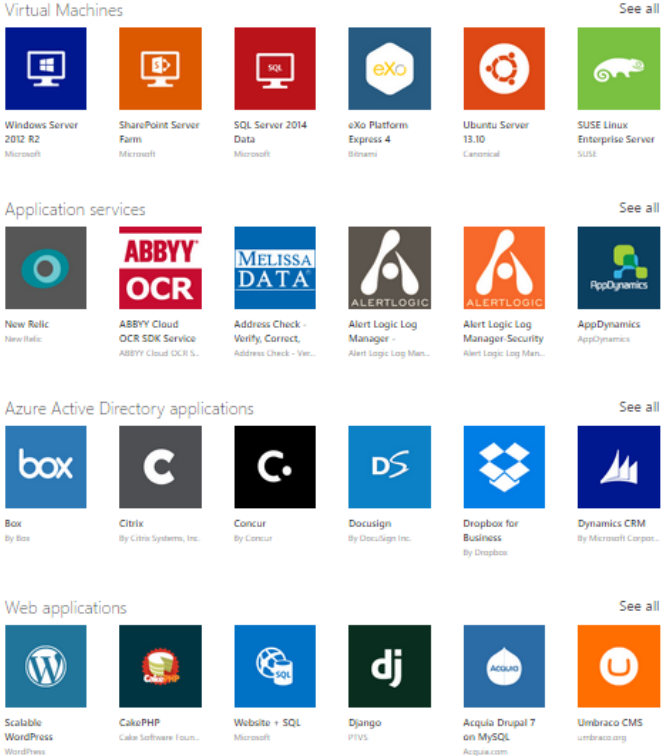
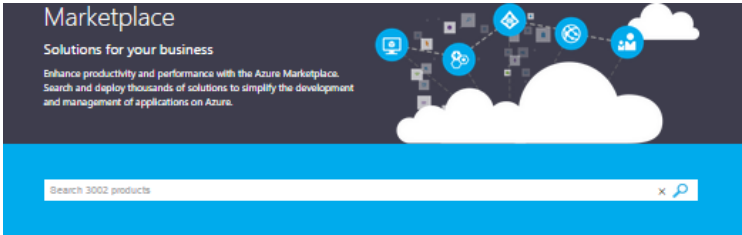
Docker Hub



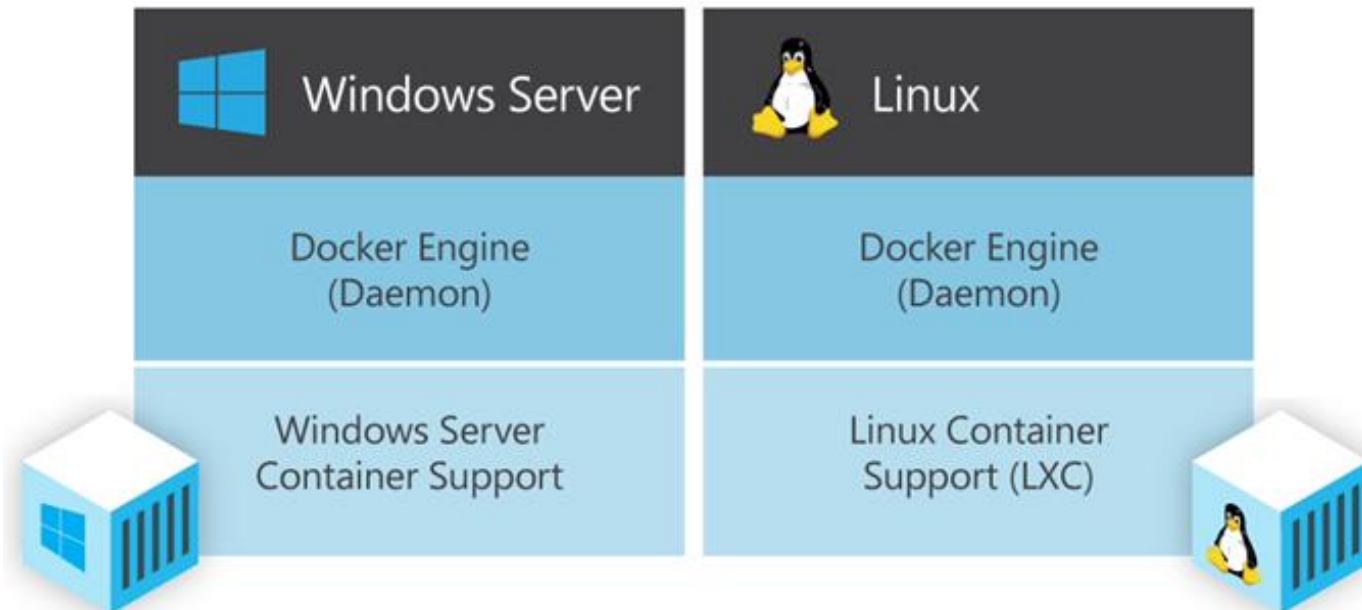
Official Repositories



Azure Marketplace



Combining Windows and Linux on Azure



Recap

- Docker has great momentum building an ecosystem to build, ship, and run applications
- Docker and Microsoft have partnered to bring the success of Docker on Linux to Windows
- Now, virtually any workload can be deployed and run anywhere

Learn More

- All Videos and Talks from DockerCon: <http://bit.ly/1AnvHFz>
- Demo of DockerHub: see Ben Golub keynote from DockerCon, <http://bit.ly/1xHqUL8> demo starts at 29:00
- Sign up for a DockerHub account: <https://hub.docker.com/>
- Security & Isolation: see above, also blog.docker.io
- Use Cases: <https://docker.com/resources/usecases/>
- Docker project: www.docker.com/
- Follow Docker on Twitter: twitter.com/docker
- Take the Docker interactive tutorial: <https://docker.com/tryit/>
- Join Docker on IRC: botbot.me/freenode/docker/
- Go to the Docker repository on GitHub: github.com/docker/docker/



Microsoft

© 2015 Microsoft Corporation. All rights reserved. Microsoft, Windows, and other product names are or may be registered trademarks and/or trademarks in the U.S. and/or other countries.

The information herein is for informational purposes only and represents the current view of Microsoft Corporation as of the date of this presentation. Because Microsoft must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information provided after the date of this presentation. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AS TO THE INFORMATION IN THIS PRESENTATION.

Session Evaluation



<http://aka.ms/WAD328>