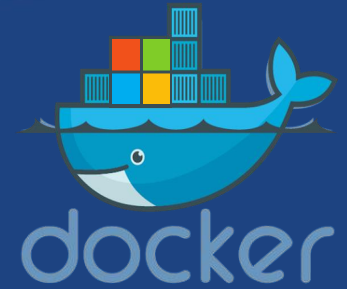


Intro to Docker

Juan Osorio

Premier Field Engineer
Apps



Microsoft Azure

Overview

- Containers vs VMs
- Docker components
- Microsoft and Docker
- Docker on Azure

What Docker resolves?

The Shipping Container analogy brings a solution

Multiplicity of
Stacks

 Static
website
nginx 1.5 + modsecurity + openssl + bootstrap 2

 Queue
Redis + redis-sentinel

Do services and
apps interact
appropriately?


 Web frontend
Ruby + Rails + sass + Unicorn

 Analytics DB
hadoop + hive + thrift + OpenJDK

 User DB

Multiplicity of
hardware
environments


Development
VM



Customer
Data Center


Production Cluster

Can I migrate
smoothly and
quickly


QA server


Public Cloud


Contributor's
laptop

Heterogeneity turns deployment into a nightmare

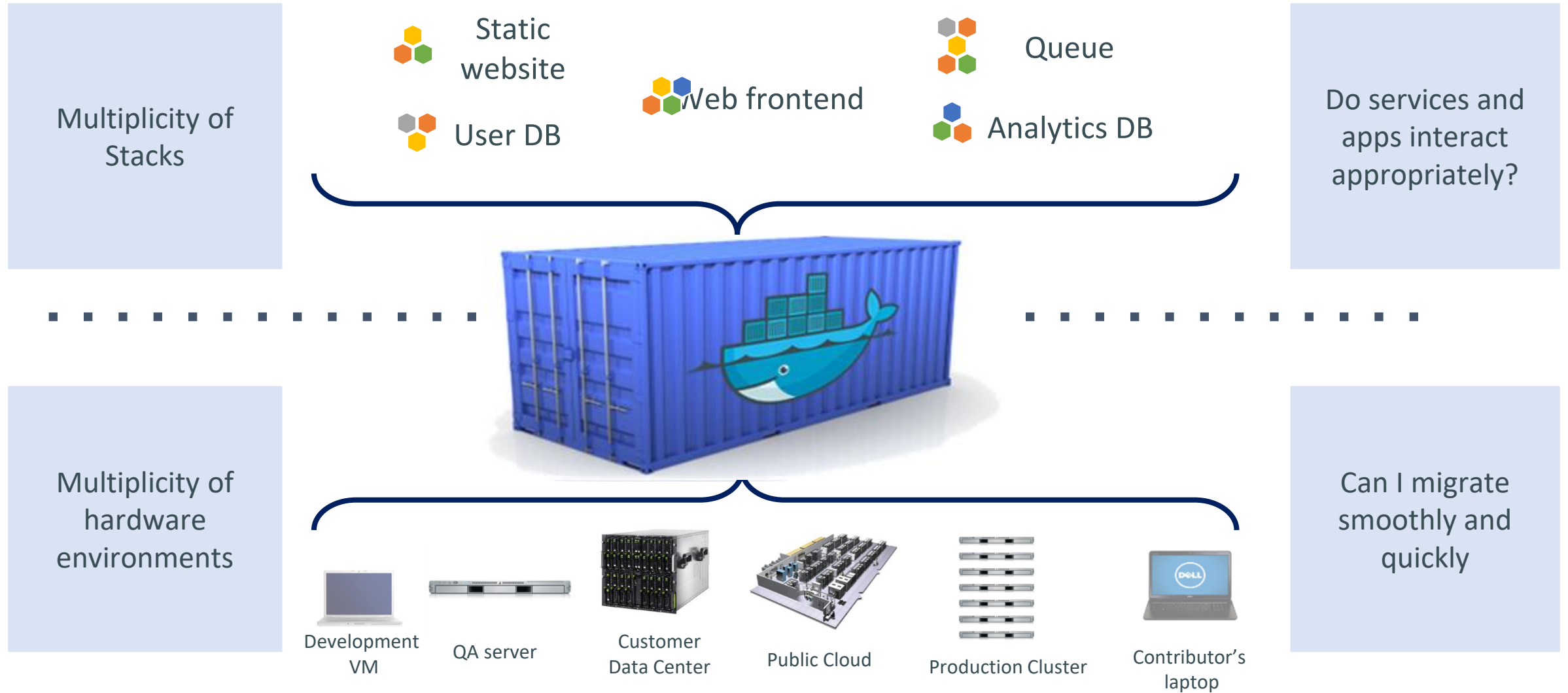


Static website	?	?	?	?	?	?	?
Web frontend	?	?	?	?	?	?	?
Background workers	?	?	?	?	?	?	?
User DB	?	?	?	?	?	?	?
Analytics DB	?	?	?	?	?	?	?
Queue	?	?	?	?	?	?	?
	Dev VM	QA Server	Single Prod Server	Onsite Cluster	Public Cloud	Contributor's laptop	Customer Servers

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The Shipping Container analogy brings a solution



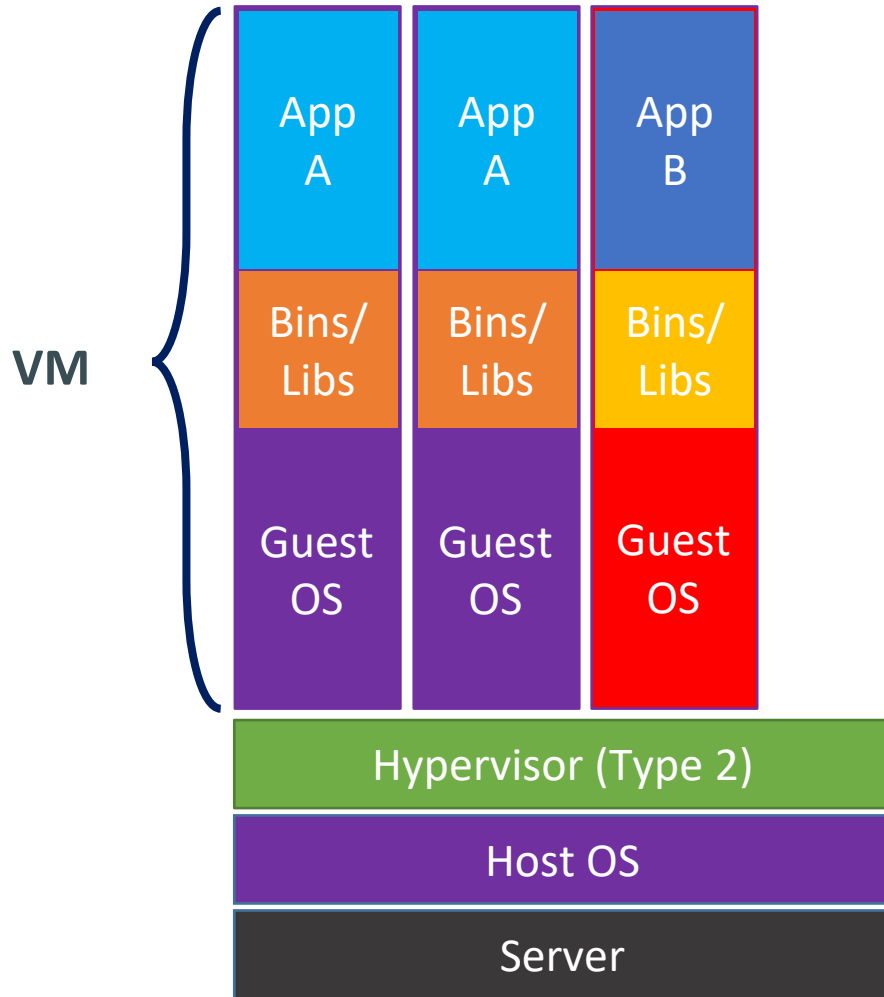
Heterogeneity turns deployment into a nightmare

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

Microsoft Azure

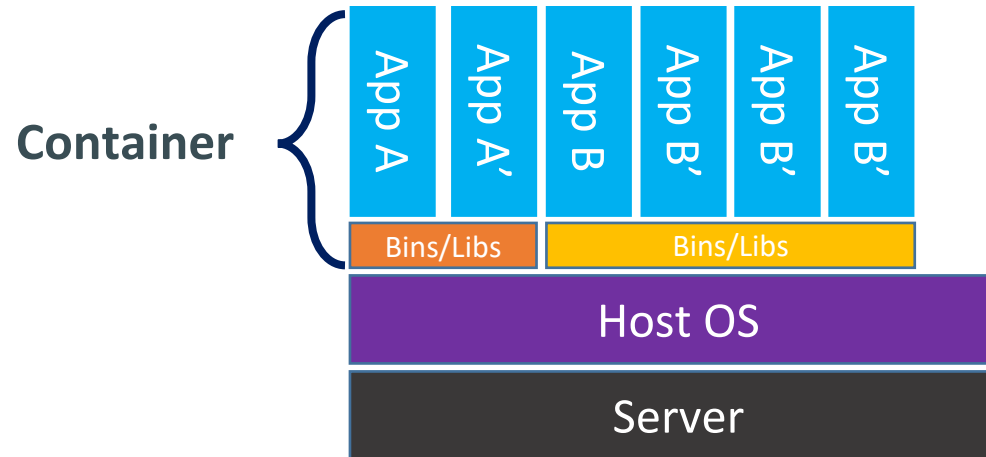


Comparison: Containers vs. VMs

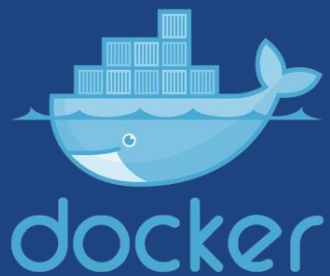


Containers are isolated, but share OS kernel and, where appropriate, bins/libraries

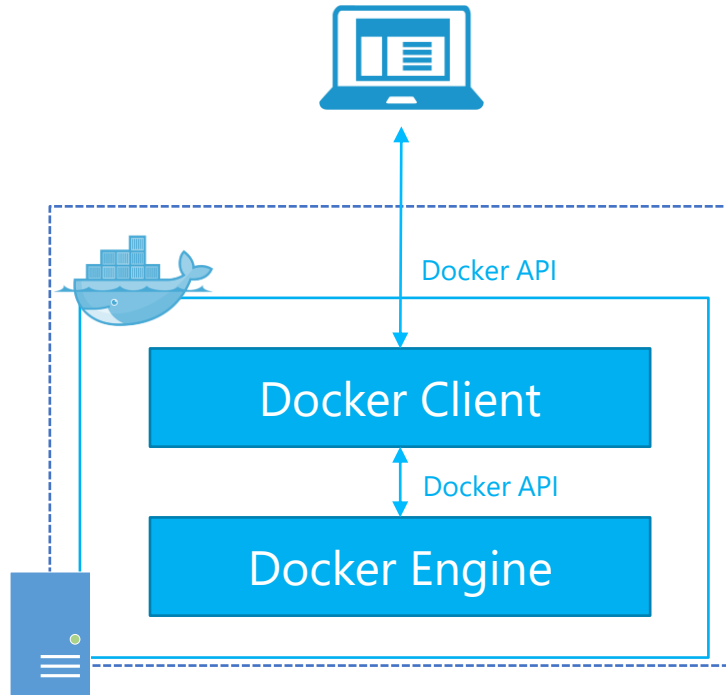
...result is significantly faster deployment, much less overhead, easier migration, faster restart



Docker components

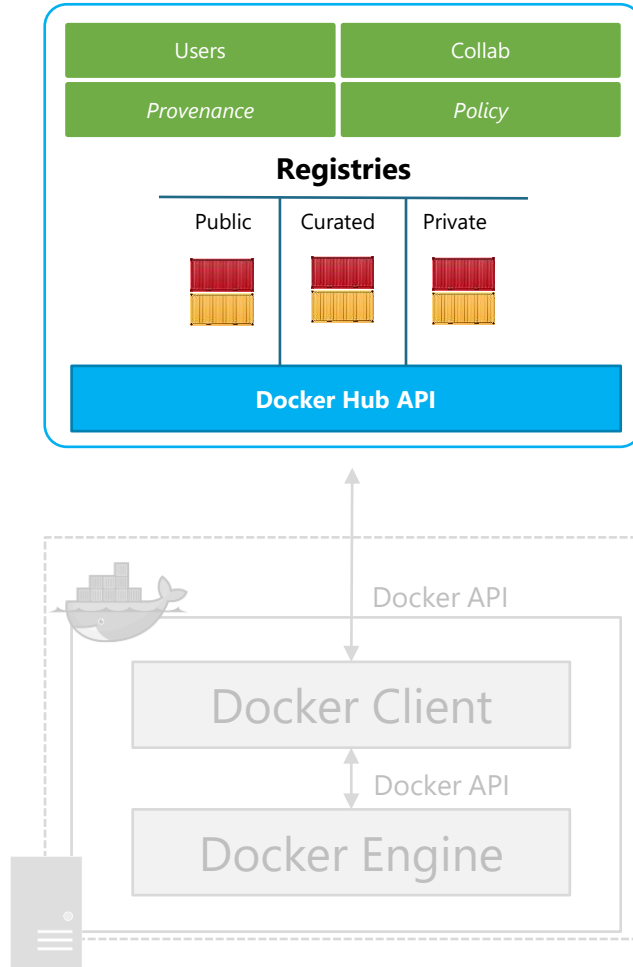


Docker Engine - Client



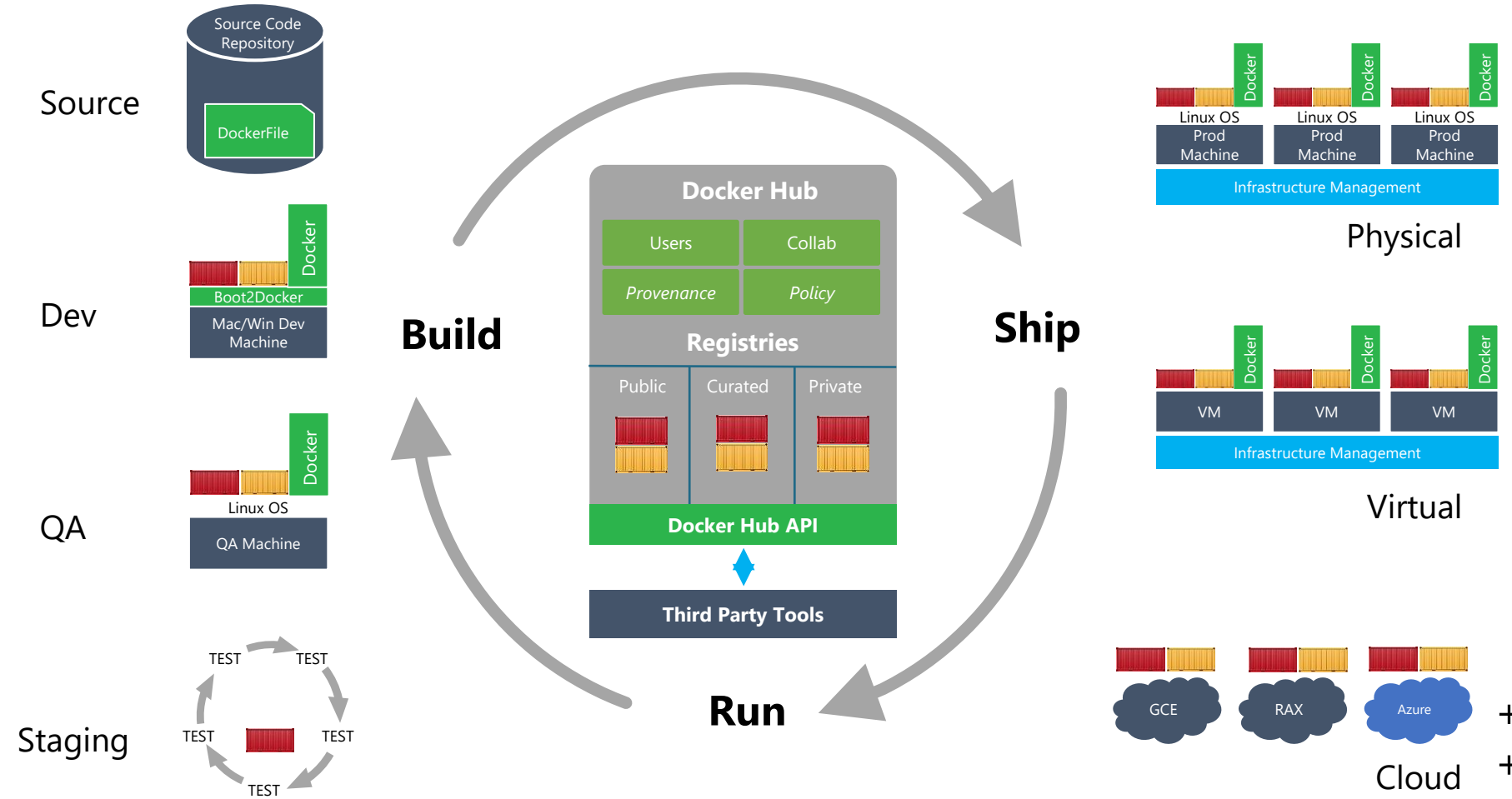
- Open Source Project written in Go
- Released March, 2013
- Provides the Docker Container
 - Repeatable Runtimes, Sandboxing, Network, and Storage
- Linux and Windows CLI tools for Developers
- Local and Remote REST API for further integration
- Low level API for Runtime, Storage, and Network extension

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



Snapshot: The Docker Ecosystem

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

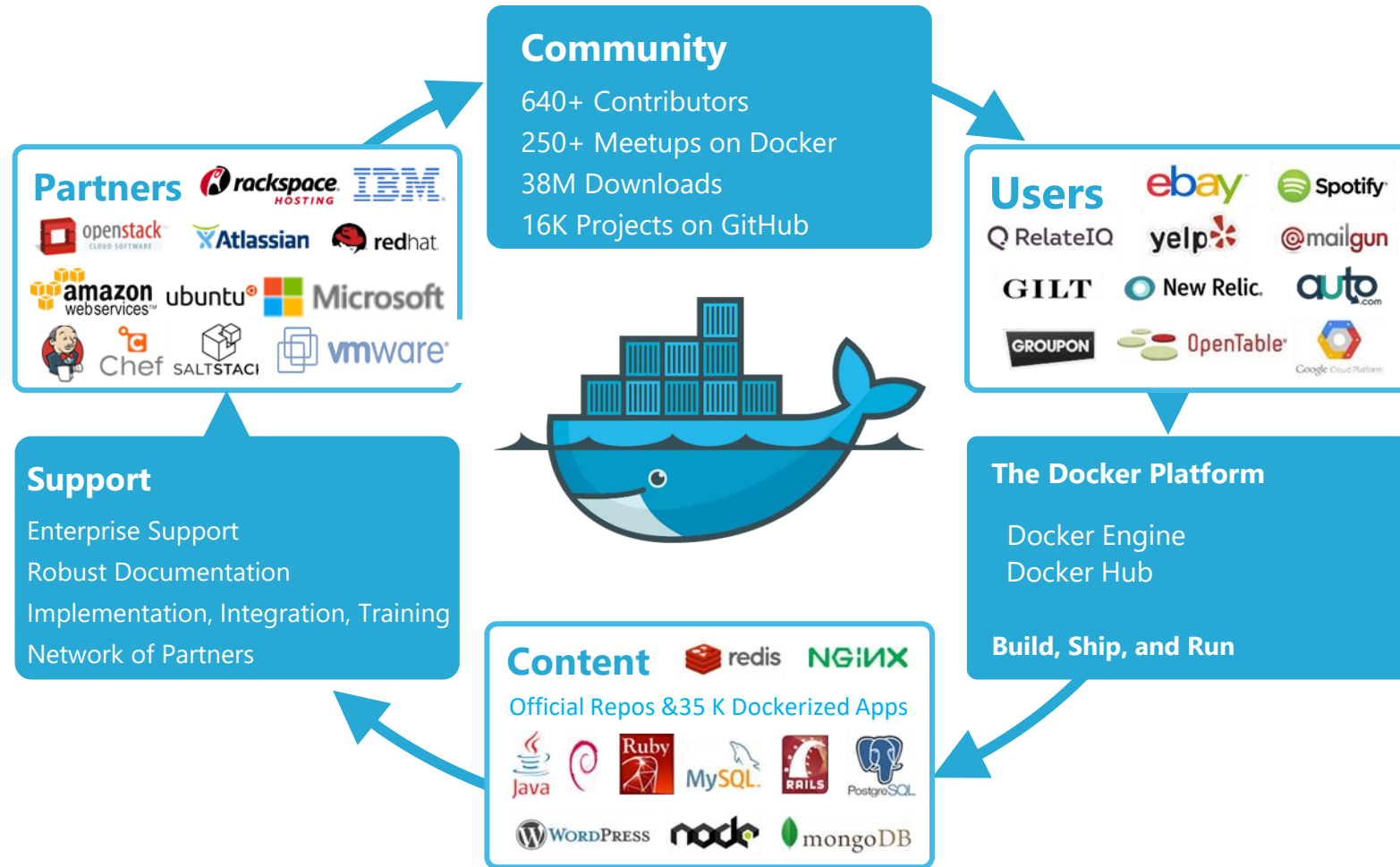
Any infrastructure

- Physical
- Virtual cloud



Microsoft Azure

Snapshot: The Docker Ecosystem



Demo

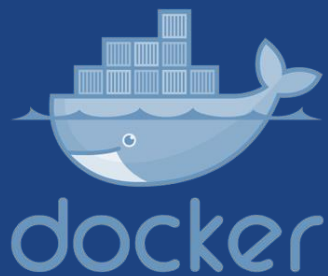
- Docker Hub

<https://hub.docker.com/>

- Docker Desktop



Microsoft and Docker



Docker & Microsoft Agreement

Docker Engine

Docker Hub

Docker's
Orchestration APIs

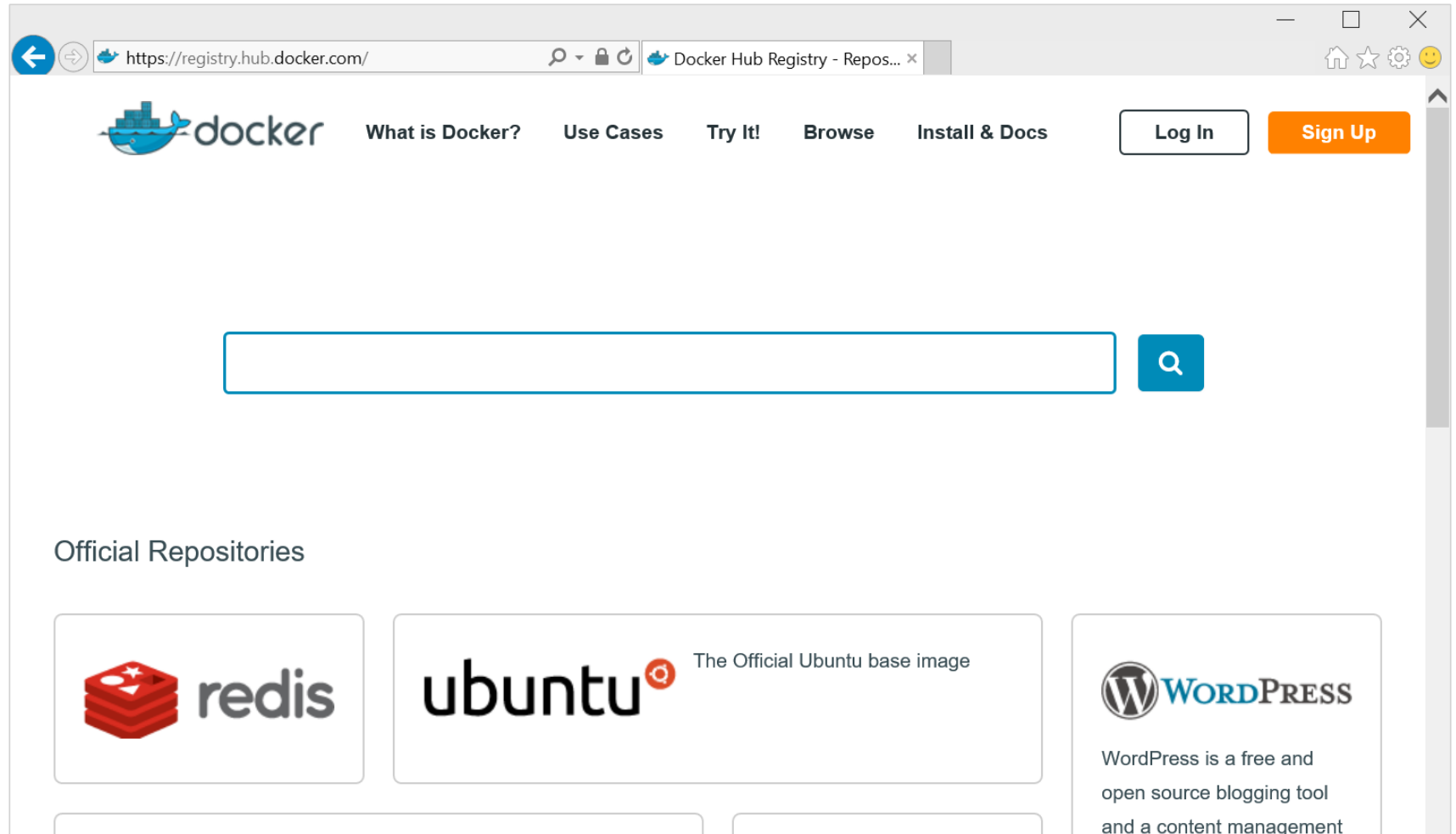
“To build the ‘button’ that enables any application to be built and deployed on any server, anywhere.”

Docker & Microsoft Agreement

Docker Engine

Docker Hub

Docker's
Orchestration APIs



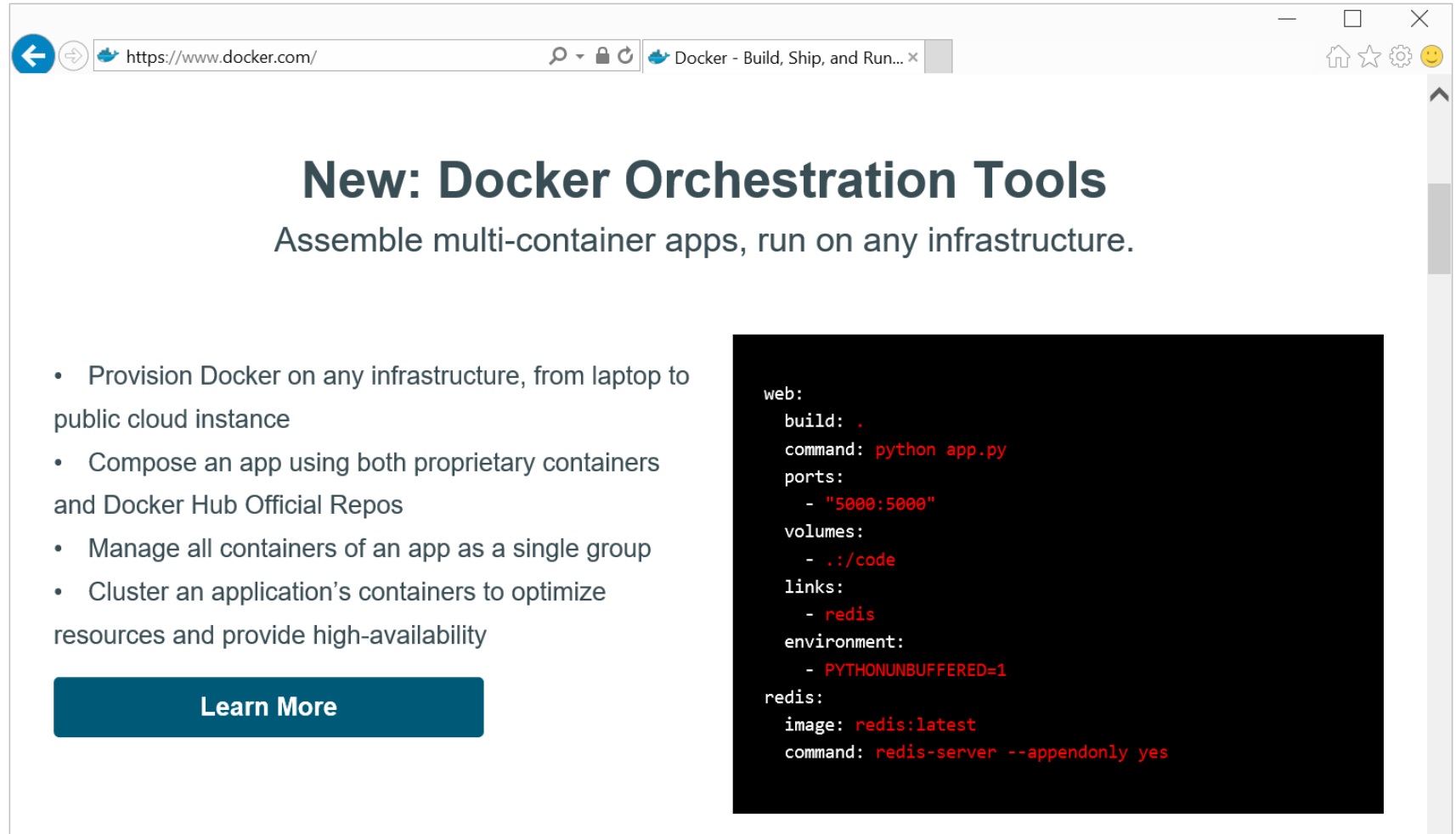
Microsoft Azure

Docker & Microsoft Agreement

Docker Engine

Docker Hub

Docker's
Orchestration APIs

A screenshot of the Docker website homepage. The browser address bar shows 'https://www.docker.com/'. The main heading is 'New: Docker Orchestration Tools' with the subtitle 'Assemble multi-container apps, run on any infrastructure.' Below this is a list of four bullet points describing Docker's capabilities. A 'Learn More' button is positioned below the list. To the right, a dark-themed code block displays a Docker Compose configuration for a web application and a Redis database.

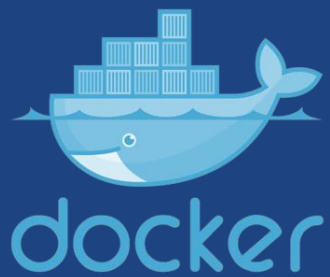
New: Docker Orchestration Tools
Assemble multi-container apps, run on any infrastructure.

- Provision Docker on any infrastructure, from laptop to public cloud instance
- Compose an app using both proprietary containers and Docker Hub Official Repos
- Manage all containers of an app as a single group
- Cluster an application's containers to optimize resources and provide high-availability

[Learn More](#)

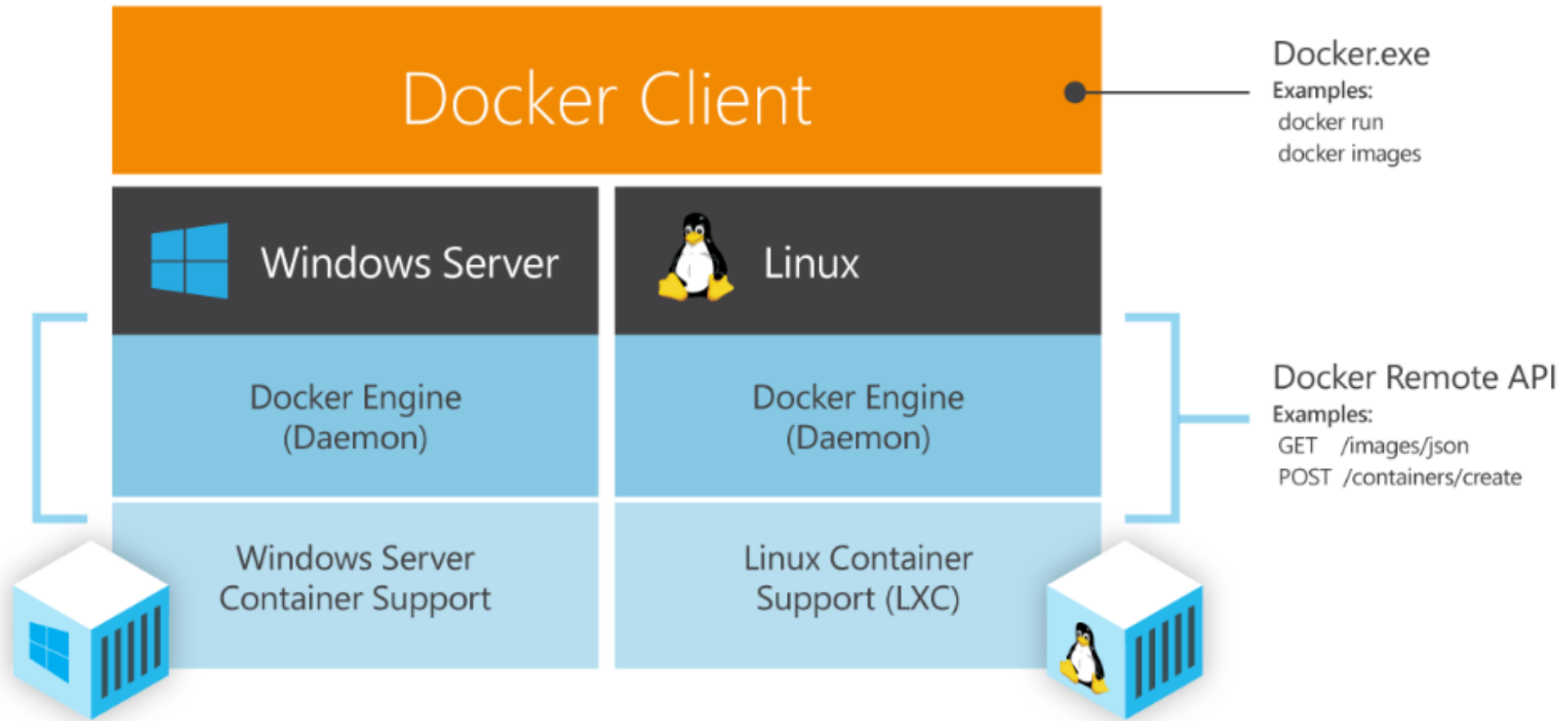
```
web:
  build: .
  command: python app.py
  ports:
    - "5000:5000"
  volumes:
    - ./code
  links:
    - redis
  environment:
    - PYTHONUNBUFFERED=1
redis:
  image: redis:latest
  command: redis-server --appendonly yes
```

How?

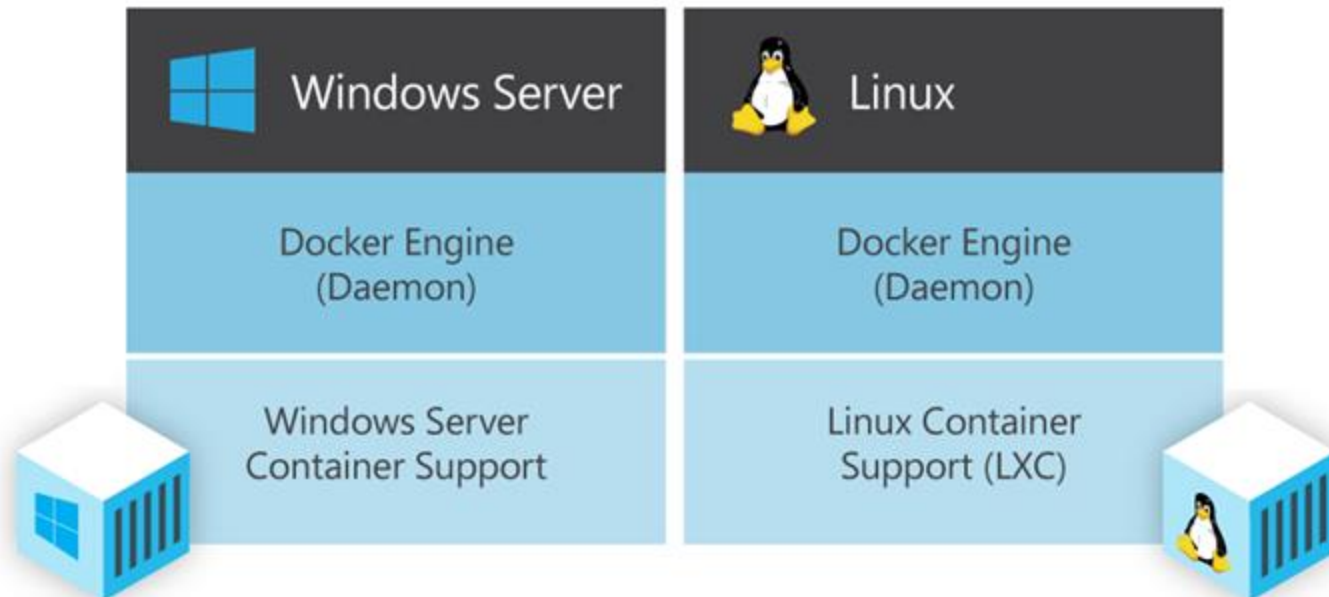


Microsoft Azure

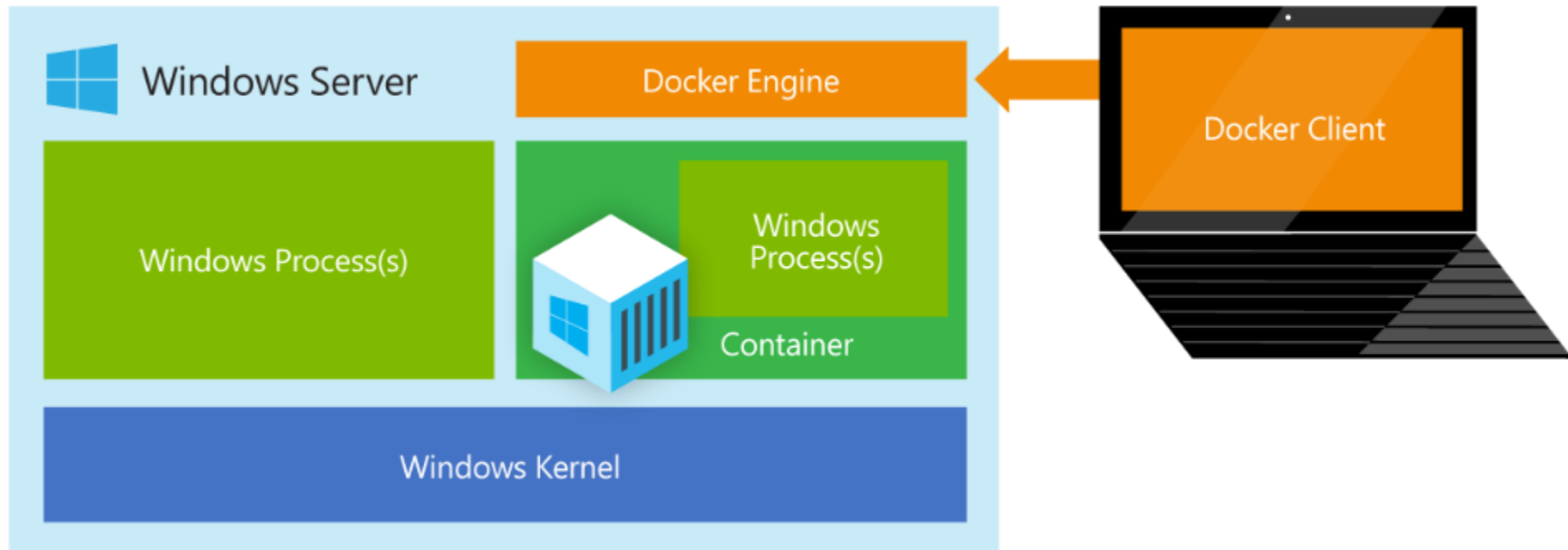
Docker Engine for Windows



Combining Windows and Linux on Azure



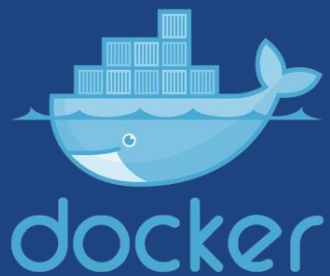
Windows Server Containers



Docker & Microsoft Azure



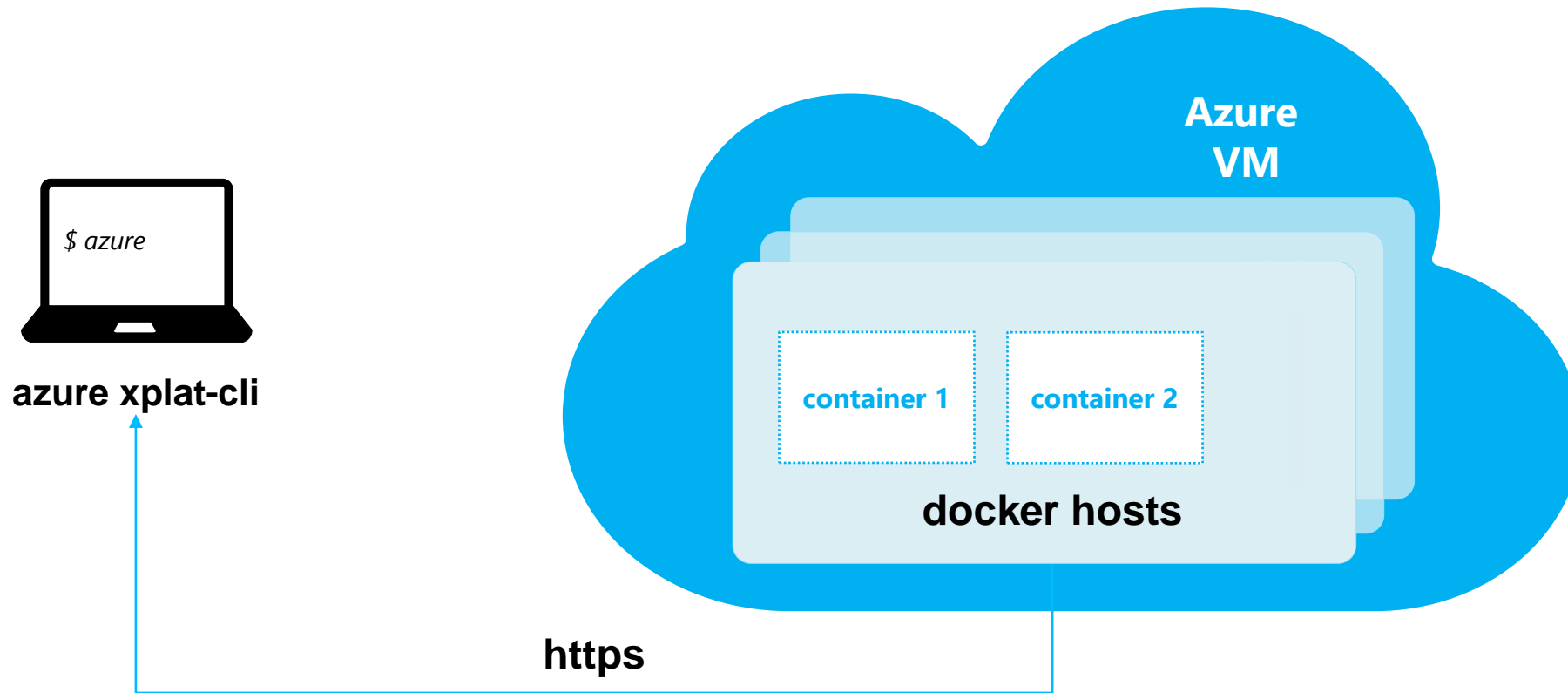
How Docker is integrated on Microsoft Azure?



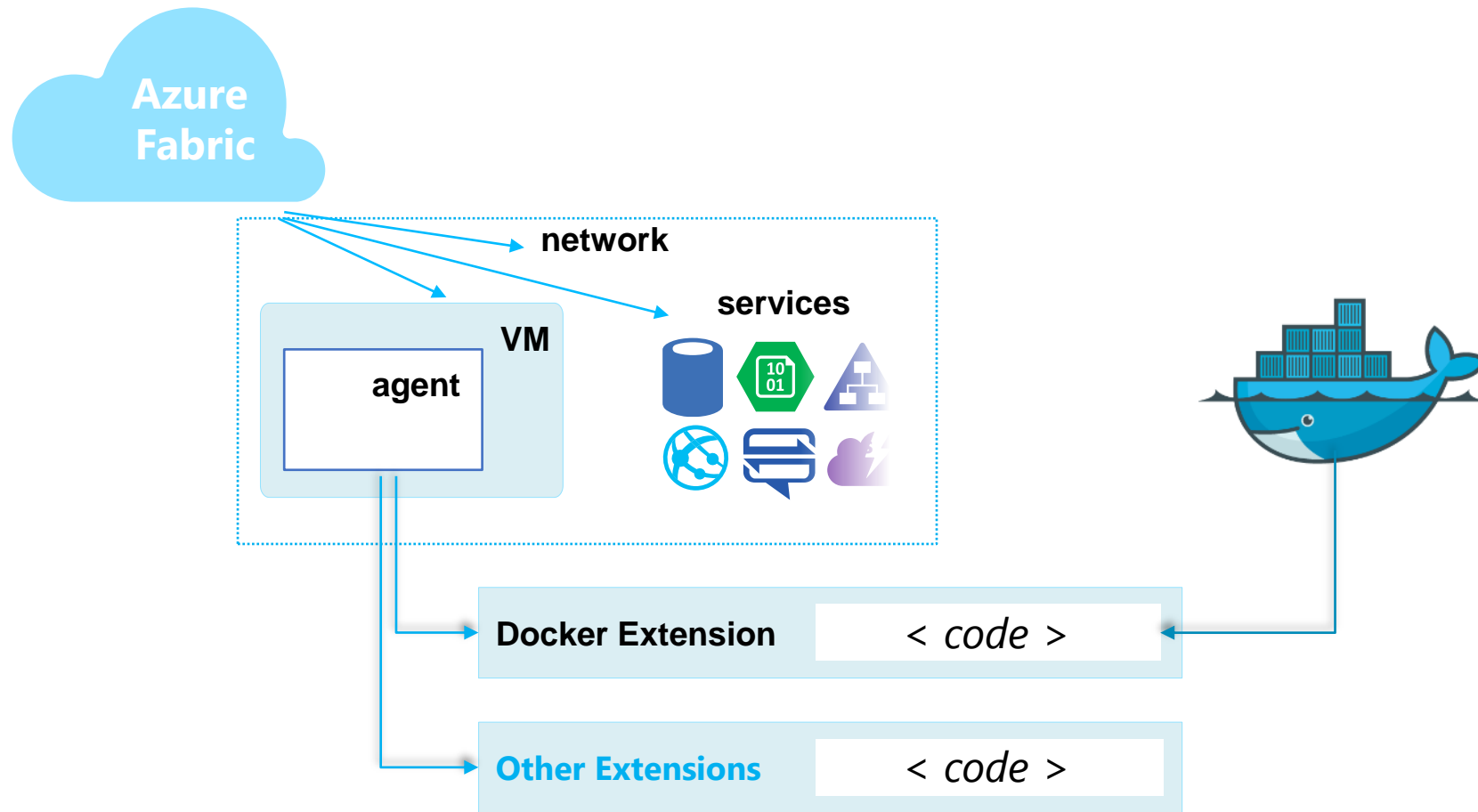
Microsoft Azure

Azure CLI

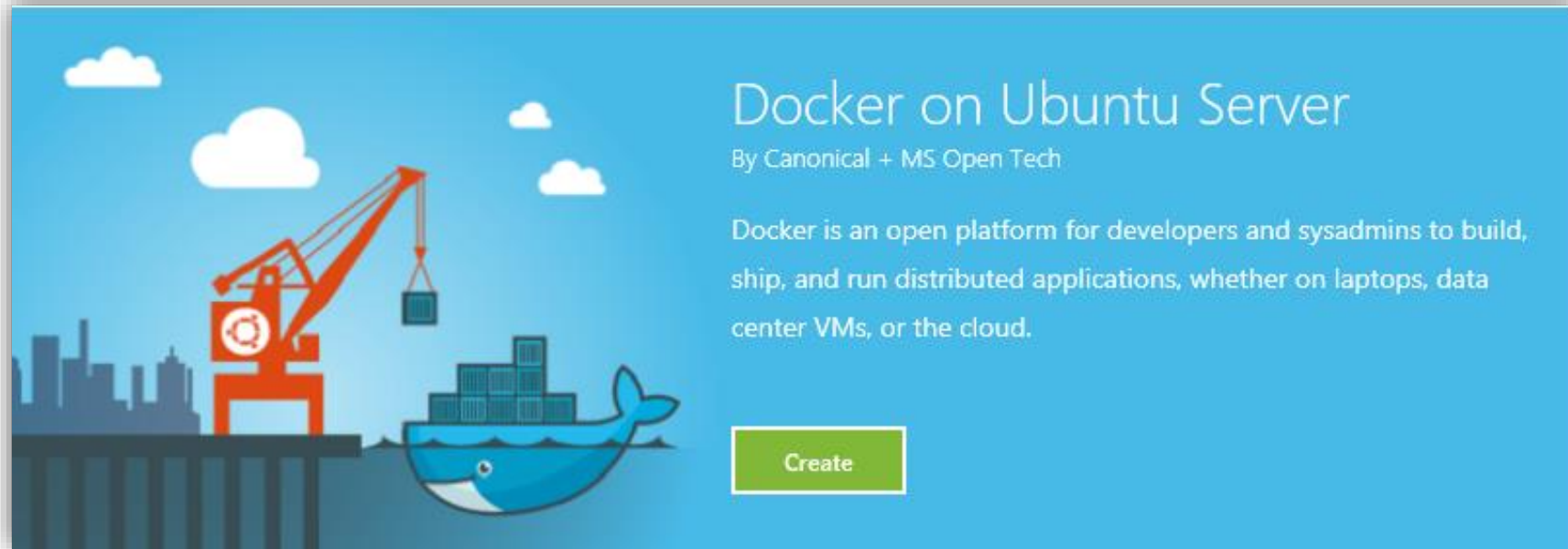
The Azure Cross-Platform Command-Line Interface (xplat-cli) provides a set of open source, cross-platform commands for working with the Azure Platform



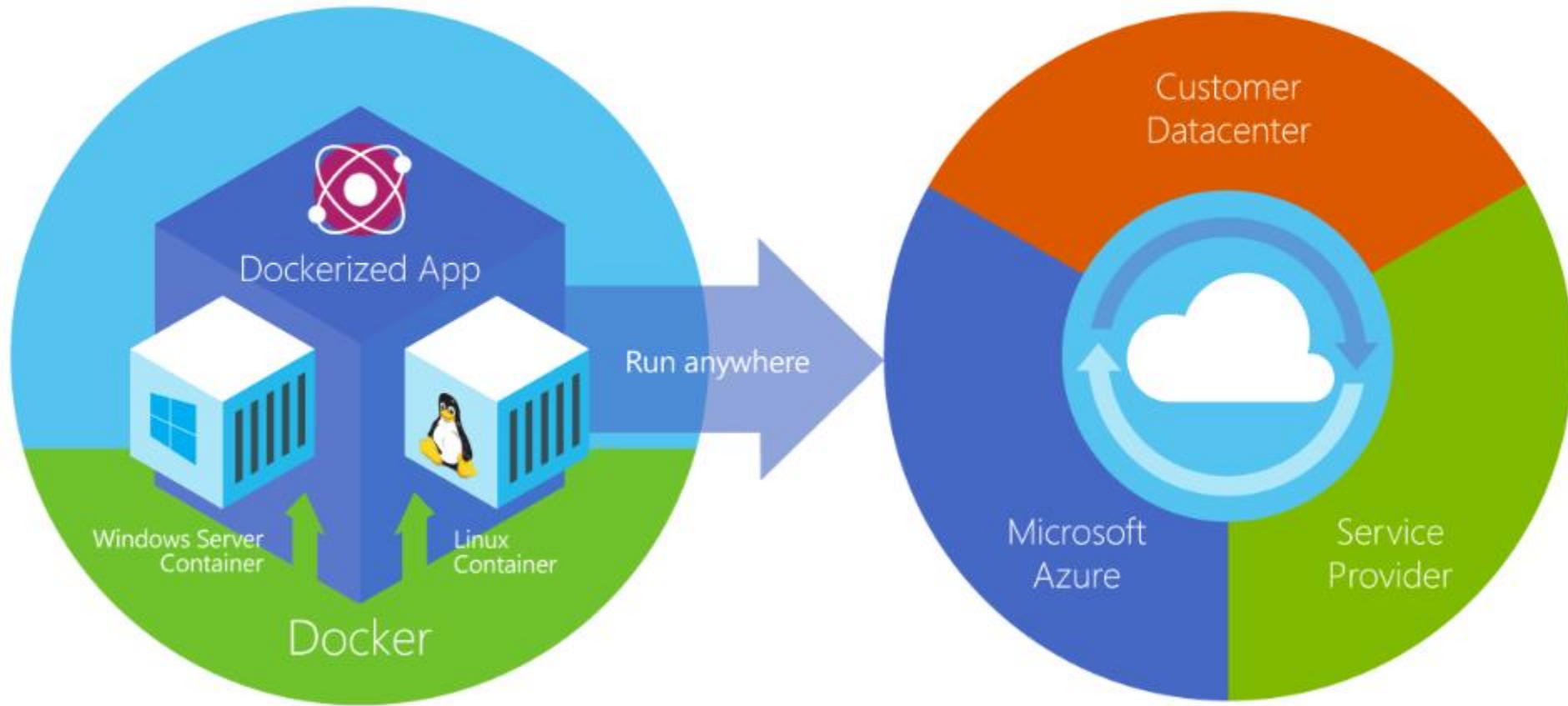
Docker Extensions



Docker enabled VMs



Any App , Any OS , Any Cloud



Knowledge Check

1. What is Docker?
2. Name two Docker components
3. What type of containers can Docker build?

Lab 2

- Running your first container

45 mins



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