

A black and white photograph of two men in business attire. One man in the foreground is smiling and looking down at a dark tablet he is holding. Another man in the background is also smiling and looking at his own tablet. The image has a soft, glowing pink and purple overlay.

Cloud Immersion Experience

Open Source on Azure Workshop

Today's agenda

- Setup Assistance – 1 hour
- Introduction and Overview – 30 min
- Linux on Azure – 1 hour
- Containers and Kubernetes – 30 min
- AKS & OpenShift Pt. 1 – 1 hour
- AKS & OpenShift Pt. 2 – 2 hours
- DevOps – 1 hour

Creating meaningful connections that help businesses run smarter.



Supply Chain Optimization

We help you invest smarter so you can manage today and transform the future.

Connected Workforce

We create a connected workplace so employees can work smarter.

Cloud & Data Center Transformation

We help you prepare for the future and align workloads to the right platforms.

Digital Innovation

We help you innovate smarter so you can make meaningful connections.

Digital Innovation



Empower Workforce

Friction-free tool to maximize employee effectiveness

Engage Customers

Rethinking how companies connect with their customers.

Optimize Business

Operational optimization driven by information



Pillars of Digital Innovation

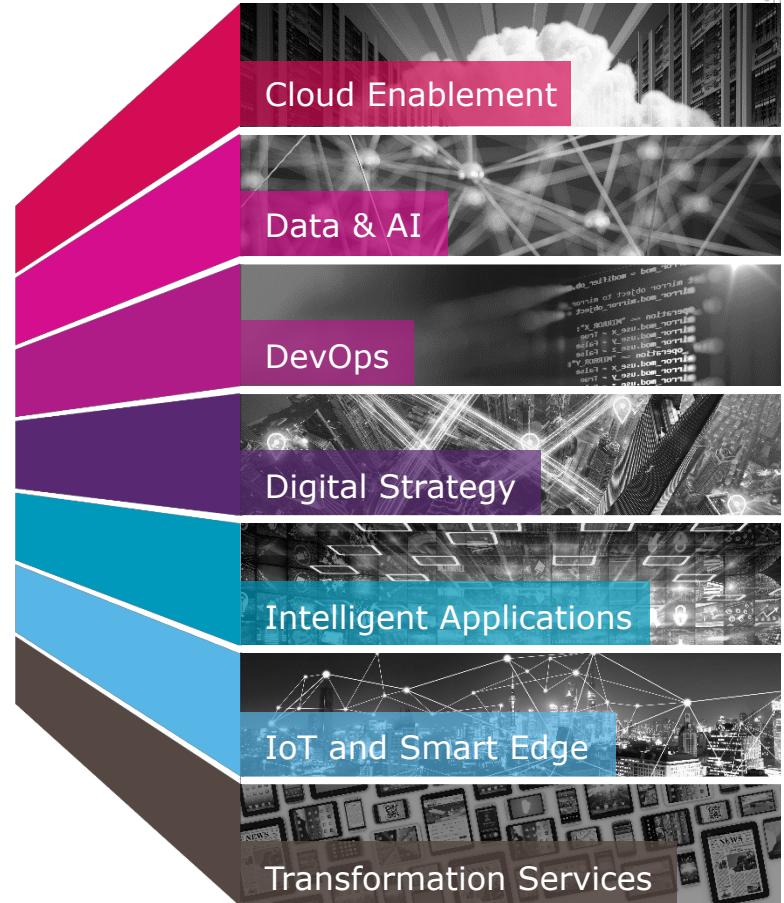
Digital Experience provides winning solutions that engage customers and employees in new, meaningful ways.



DI

Disruptive Technology Innovations, both proven and emerging, captivate customers, empower employees and transform business operations.

Continuous Services sustains innovation with strategy, support, delivery, and data-driven insights.



Awards



Our combined IT industry knowledge and technology expertise have earned us numerous Microsoft honors through the years.

2018

- Worldwide Artificial Intelligence Partner of the Year
- Worldwide Modern Workplace Partner of the Year
- U.S Partner Award for Apps and Infrastructure – DevOps
- U.S. Partner Award for Data & AI – Internet of Things
- U.S Partner Award for Apps & Infrastructure – Open Source Apps and Infrastructure on Azure

2017

- Worldwide Mobile Application Development Partner of the Year
- Worldwide Open Source on Azure Partner of the Year
- U.S. NSP Partner of the Year (and runner up)
- U.S. FED Partner of the Year
- U.S. EDU Partner of the Year

2016

- Worldwide Internet of Things Partner of the Year
- U.S. FED Partner of the Year
- OEM Device Partner of the Year

Partners



Hewlett Packard
Enterprise



SAMSUNG



cloudera®

Pivotal.



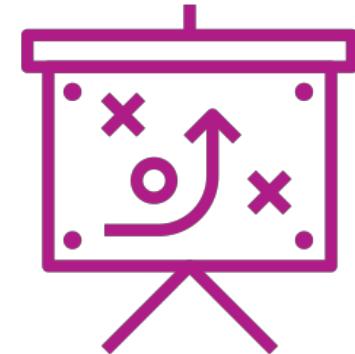


Workshop Overview

What we will cover

Labs

- Provisioning of Azure resources using the CLI
- Using containers and Kubernetes
- DevOps



Let's Get Started!

- Visit the URL written on the whiteboard to obtain your lab environment
- Access to the lab environment is using noVNC which provides an HTML5 interface incase rdesktop/tigervnc is blocked on your laptop
- Most work will be done using the CentOS 7.4 Gnome Desktop provided
- Copy + Paste in and out of noVNC is not possible, however you may open Firefox/Edge in the noVNC desktop to Copy + Paste

Your On Demand Lab is ready (71 hour(s), 15 minute(s) remaining)

Let's Get Started!

This information
is also available
in a text file on
your jump-box
Linux host



Azure Credentials

Here are your credentials to login to Microsoft Azure and access the On Demand Lab

Username

odl_user_13953@gbbossteamoutlook.onmicrosoft.com



Password

pwwe01YUQ*U7



Service Principal Details

Application Id

7c80104e-7cb6-4751-86c0-64f3b14558c2



Application Display Name

https://odl_user_sp_13953



Application Secret Key

fyko15VWH*We



Subscription Id

b23accae-e655-44e6-a08d-85fb5f1bb854



Tenant Id

12c5db39-b62e-4301-b848-09acda2692a5



Tenant Domain Name

gbbossteamoutlook.onmicrosoft.com



Environment Details

Resource Group : ODL_lifshift-13953

VNC SERVER URL

<http://lifshift-vmip-sktimw3w4nh7e.eastus.cloudapp.azure.com>



PASSWORD

Microsoft





Linux on Azure

Microsoft + Open Source: Empowering Customers

Our Products



SQL Server on Linux



HD Insight managed service on Linux



Acquisition

Windows Subsystem for Linux

```
c:\users\markhill> bash  
root@localhost: #
```

Run Linux on Windows natively

Our Partnerships



Partnership



Partnership



Jenkins project on Azure



Microsoft joins Eclipse Foundation



Certification earned
Microsoft CERTIFIED
Solutions Associate
Linux® on Azure

Partnership with the Linux Foundation for Linux on Azure certification

Our Offerings

Azure Marketplace



44% / 1 in 3

60% of all images in Azure Marketplace are based on Linux/OSS

44% of VMs on Azure overall run Linux, and more than half of all new VMs run Linux

Our Employees



Ross Gardler
President Apache SW Foundation



Brendan Burns
Co-Founder of Kubernetes

600 Million+

Lines of open source code
[Microsoft Open Source Hub](#)

Azure is an OPEN Cloud



RED HAT® CLOUDFORMS											
Management	RED HAT® ANSIBLE® Automation	puppet labs	HashiCorp Terraform	CHEF	SALTSTACK	DATADOG	Nagios® Thruk	libcloud	mist.io	MORPHEUS	SCALR CLOUD MANAGEMENT
Infrastructure	Ubuntu	Debian	redhat.	suse	Clear Linux Project for Intel® Architecture	CentOS	ORACLE® LINUX	FreeBSD			
Databases & Middleware	hadoop	Hortonworks	cloudera	mongoDB	PostgreSQL	MySQL®	clearDB	Couchbase	redis		
Development Frameworks / IDE Integration	php	nodeJS	Python	Java	JS	C#	Ruby	IntelliJ IDEA	eclipse	docker	
Applications / CMF	WordPress	Joomla!	Drupal	TYPO3	V	Mobility	Xamarin	APACHE CORDOVA™			
DevOps	Jenkins	Gradle	VAGRANT	GRUNT	PaaS & DevOps	RED HAT® OPENSHIFT Container Platform	Jelastic	apprenda®	Pivotal Cloud Foundry	Cloud Foundry	

Challenges

- Installation of the Azure Linux CLI
- Provisioning / Resizing Azure Resources
- Deploying Azure Virtual Machines using Ansible Playbooks





Containers

The Problem

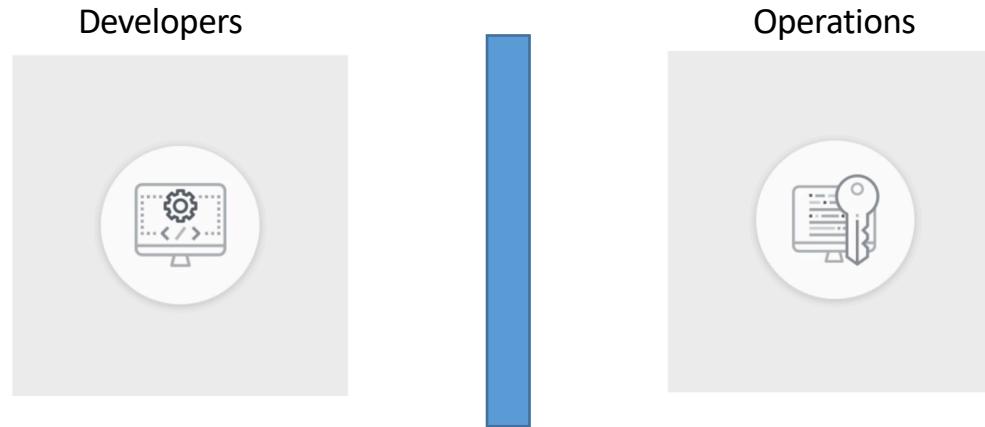
Existing applications require complicated installation and integration every time they are deployed leading to

- Slow service delivery
- Reduced service quality
- Frequent down times



The Problem

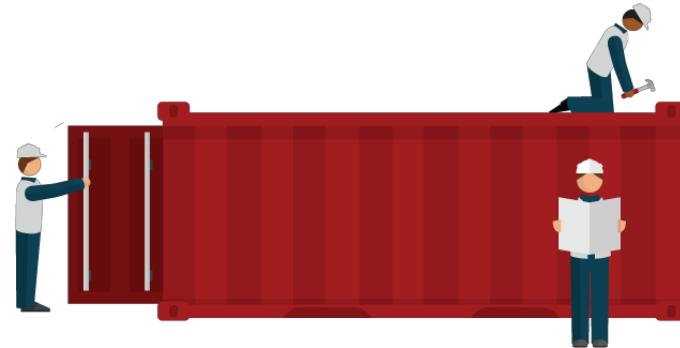
Developers and IT Operations are siloed with lack of transparency and communication



The Solution

Adopting a container strategy will allow applications to be easily shared and deployed

- Consistent environment and tools
- Predictable building blocks
- Faster deployment



What is a container?

Infrastructure

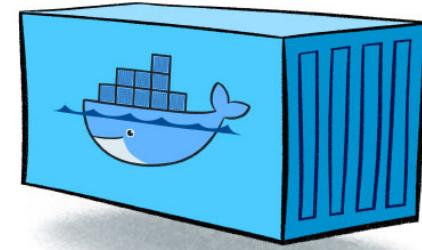
Applications



- Sandboxed application process on a shared Linux OS kernel
- Simpler, lighter, and denser than virtual machines
- Portable across different environments
- Package application and all of its dependencies
- Deploy to any environment in seconds and enable CI/CD
- Access and share containerized components easily

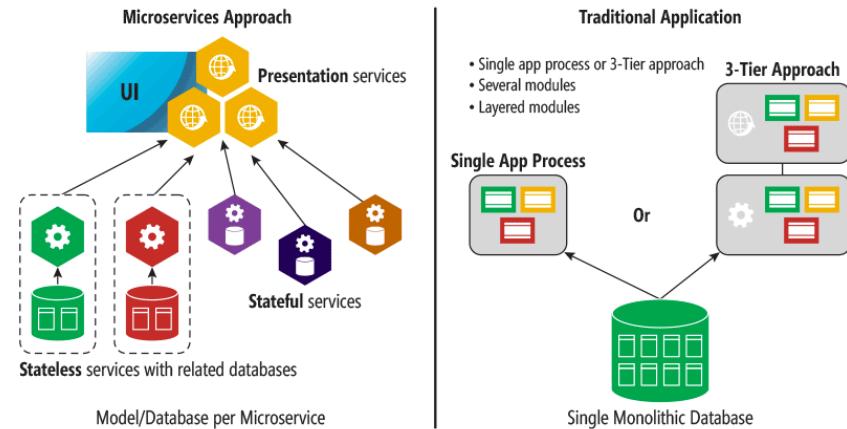
What is a container?

- Slice up the OS to run multiple apps on a single VM
- Every container has an isolated view
- Shared kernel, very fast start-up, and repeatable execution
- Cannot mix OS types on hosts and containers

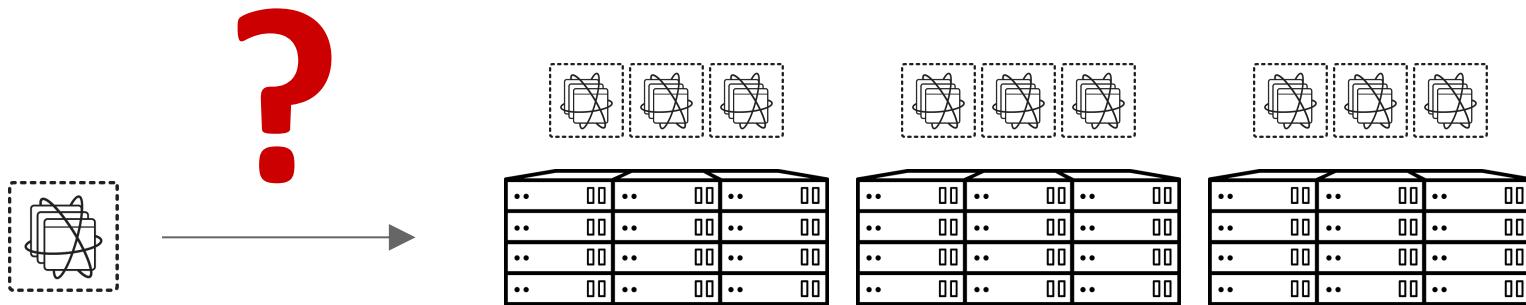


What is a microservice?

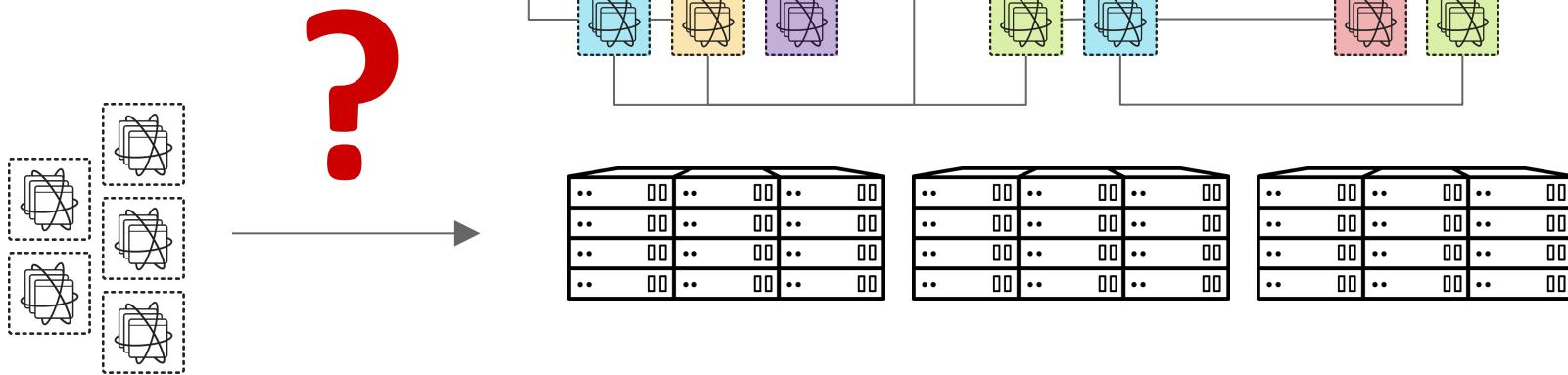
- Architecture style
- Structures an application as a collection of loosely coupled services, which implement business
- Each service is running in its own process and communicating with lightweight mechanisms like REST



DevOps with Containers



DevOps with Containers



We need more than just Containers

Scheduling

Decide where to deploy containers

Lifecycle and health

Keep containers running despite failures

Discovery

Find other containers on the network

Monitoring

Visibility into running containers

Security

Control who can do what

Scaling

Scale containers up and down

Persistence

Survive data beyond container lifecycle

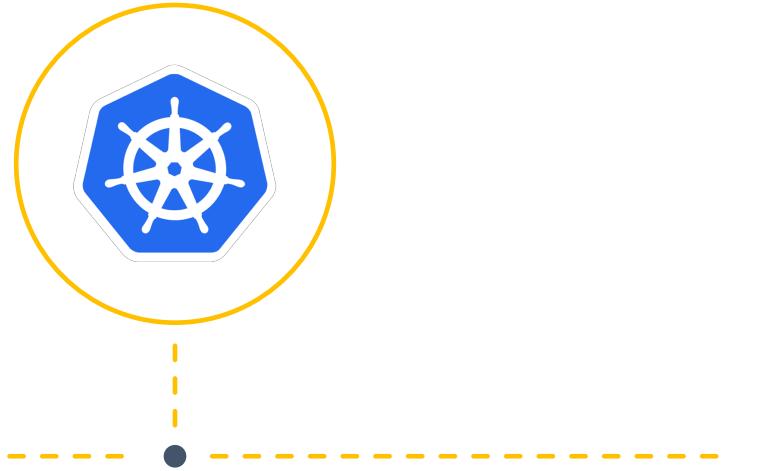
Aggregation

Compose apps from multiple containers



AKS and OpenShift

Kubernetes: the industry leading orchestrator



Portable

Public, private, hybrid,
multi-cloud

Extensible

Modular, pluggable,
hookable, composable

Self-healing

Auto-placement, auto-restart,
auto-replication, auto-scaling

What is Kubernetes?

- Background
 - "Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications"
 - Schedules and runs application containers across a cluster of machines
 - Kubernetes v1.0 released on July 21, 2015. Joe Beda, Brendan Burns, & Craig McLuckie
- Key features
 - Declarative infrastructure
 - Self-healing
 - Horizontal scaling
 - Automated rollouts and rollbacks
 - Service discovery and load balancing
 - Storage orchestration
 - Secret and configuration management



Kubernetes Resources

pod

deployment

service

replica set

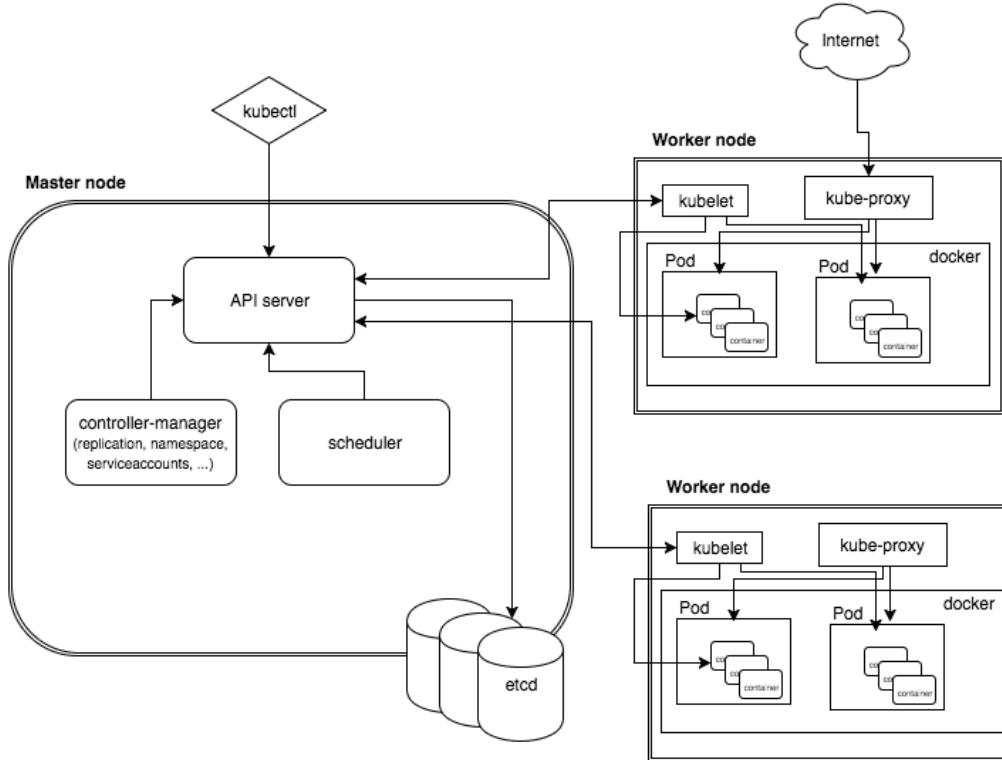
ingress

daemon set, job

namespace

secret, config-map

Kubernetes Architecture



From infrastructure to innovation



Managed Kubernetes
empowers you to do more

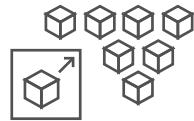
Focus on your containers and code, not the plumbing of them.

Responsibilities	DIY with Kubernetes	Managed Kubernetes on Azure
Containerization		
Application iteration, debugging		
CI/CD		
Cluster hosting		
Cluster upgrade		
Patching		
Scaling		
Monitoring and logging		

Customer Microsoft

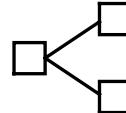
Top scenarios for Kubernetes on Azure

Lift and shift
to containers



Cost saving
without refactoring your app

Microservices



Agility
Faster application
development

Machine
learning



Performance
Low latency processing

IoT



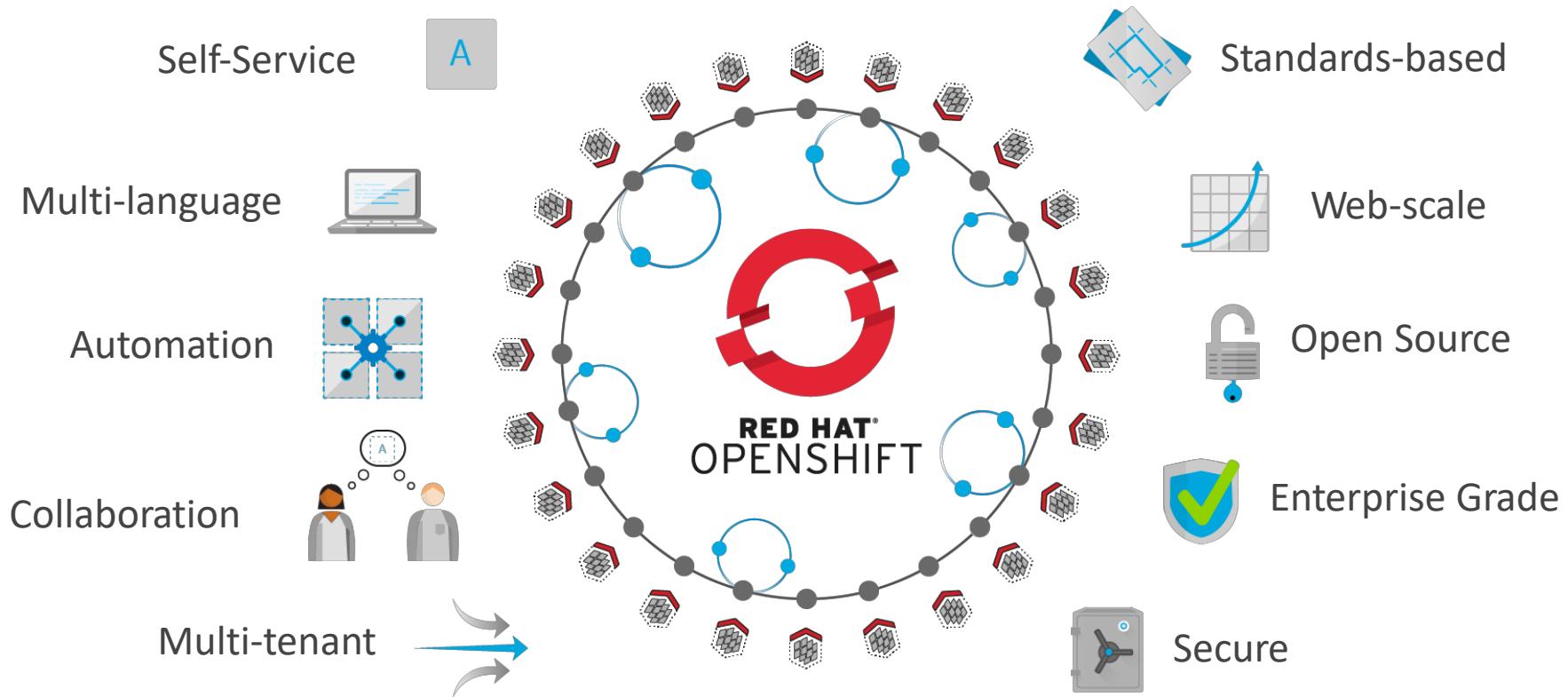
Portability
Build once, run
anywhere



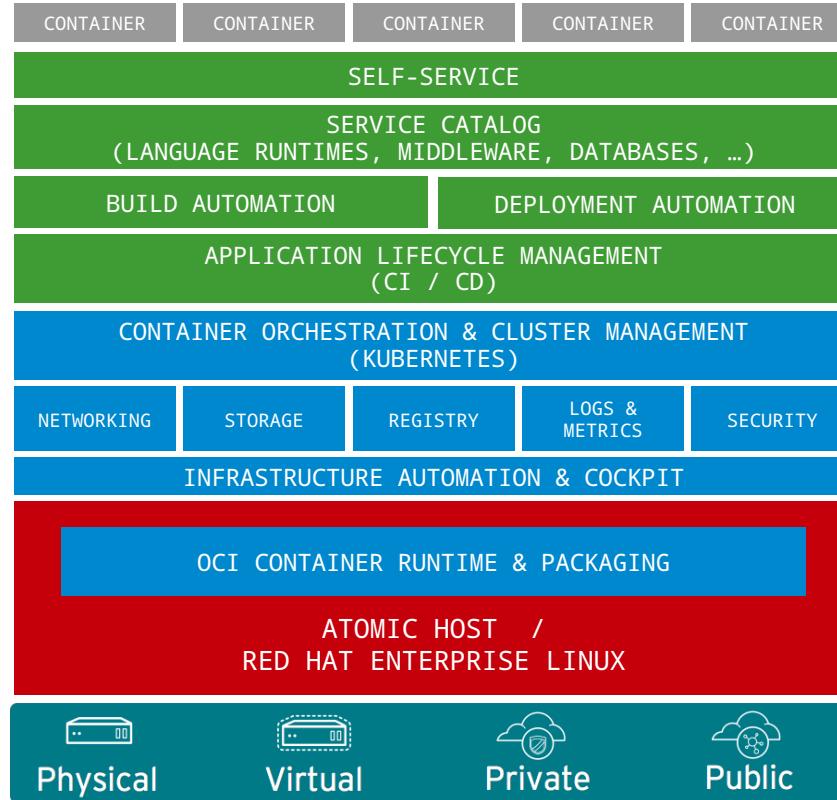
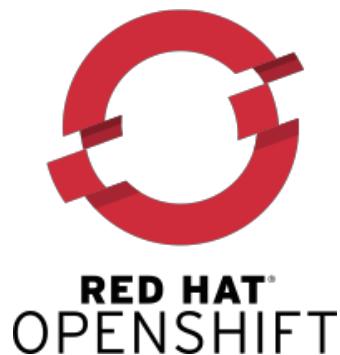
OpenShift

Container application platform
based on Docker and Kubernetes
for building, distributing and
running containers at scale

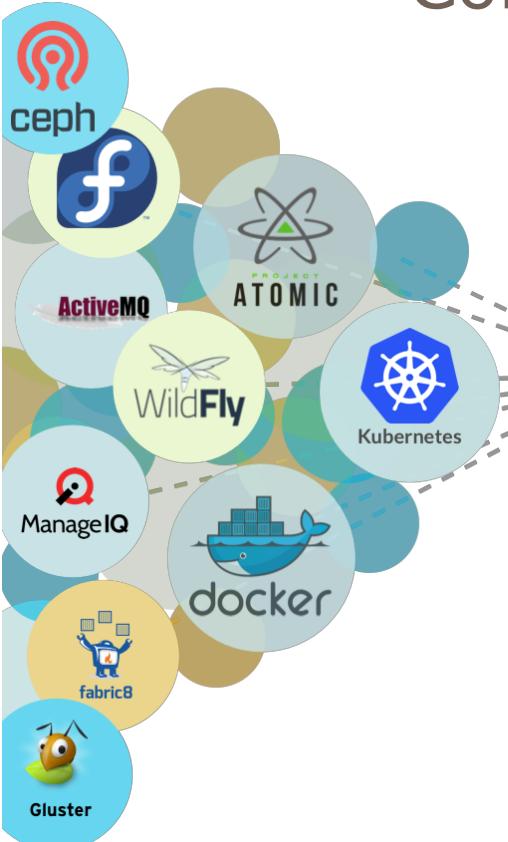




OPENSHIFT = ENTERPRISE KUBERNETES+



Community Powered Innovation



OPENSHIFT
origin

 **OPENSIFT ENTERPRISE**
by Red Hat®

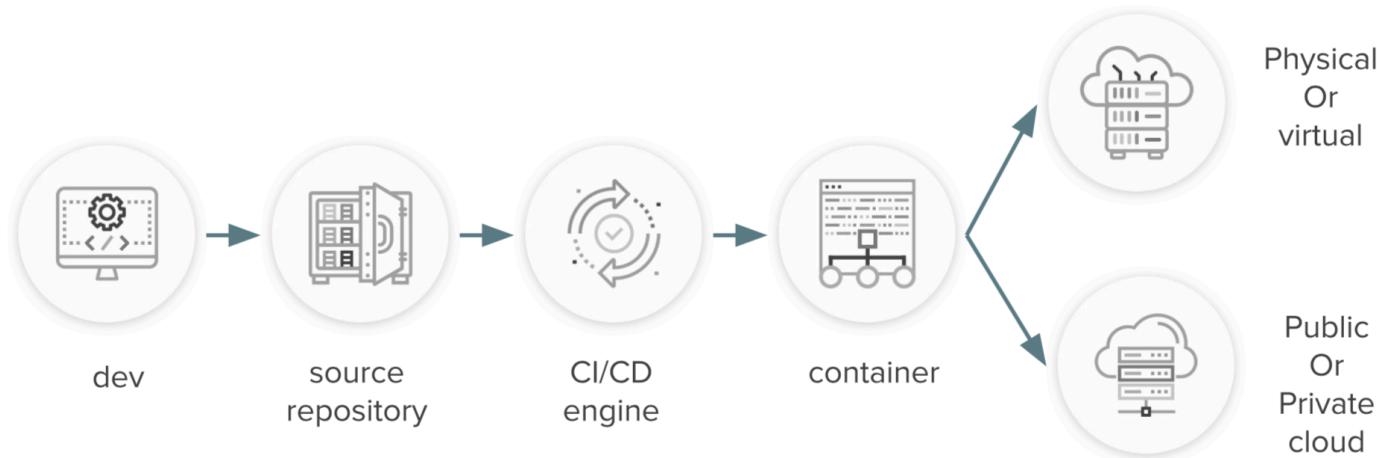
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DevOps

DevOps with containers



Thank You