



THE KUBERNETES PLATFORM FOR BIG IDEAS

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An aerial, black and white photograph of a port. The top half shows a large cargo ship docked at a pier, with several gantry cranes positioned along the quay. The bottom half shows a vast container yard filled with thousands of stacked shipping containers, organized into neat rows. A road with some vehicles and a few buildings is visible between the ship and the container yard.

**... so you want to do
containers and Kubernetes?**



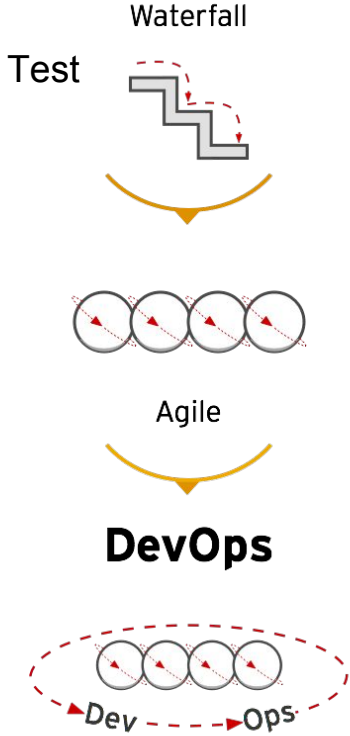
But Why?

SPEED!

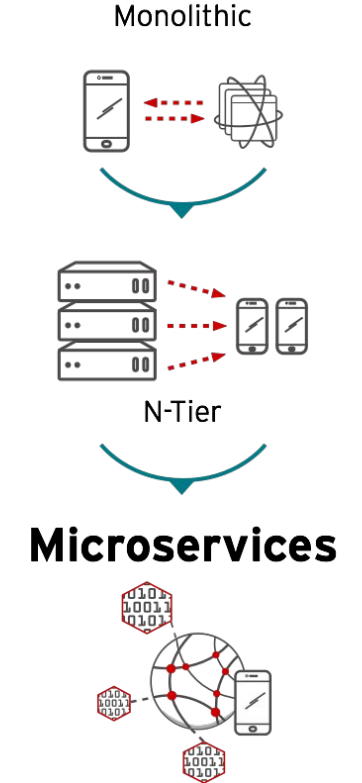
INNOVATION!

IT Must Evolve to Stay Ahead of Demands

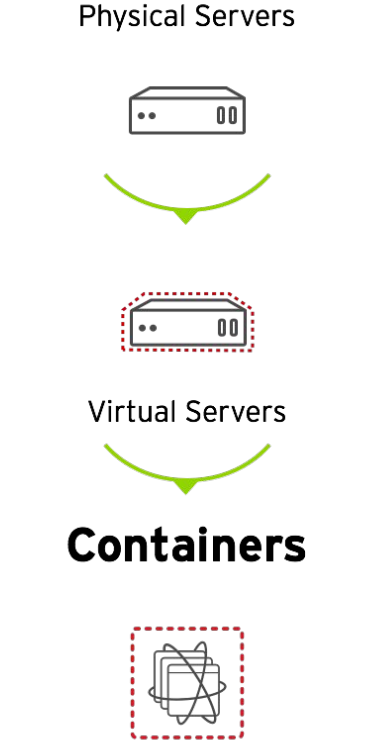
Development Process



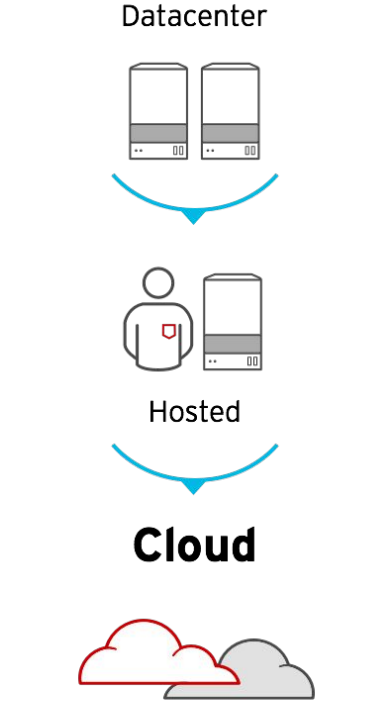
Application Architecture



Deployment & Packaging



Application Infrastructure



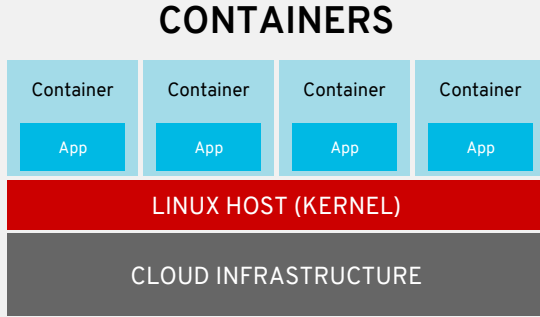


What are containers?



WHAT ARE CONTAINERS?

CONTAINER BENEFITS FOR MULTIPLE TEAMS



Package all app dependencies
Integrated in Linux OS
Fully Open Source
Secure Isolation of Applications
Eliminates need for VM Hypervisor
Runs on Any Cloud Platform

DEVELOPERS

- CLOUD-NATIVE APPS
- SIMPLIFY PACKAGING
- SIMPLIFY TESTING

IT OPERATIONS

- CONSISTENT APP DEPLOYS
- AUTOMATED APP DEPLOYS
- IMPROVED APP PERFORMANCE
- MULTI-CLOUD CONSISTENCY


BUSINESS LEADERS

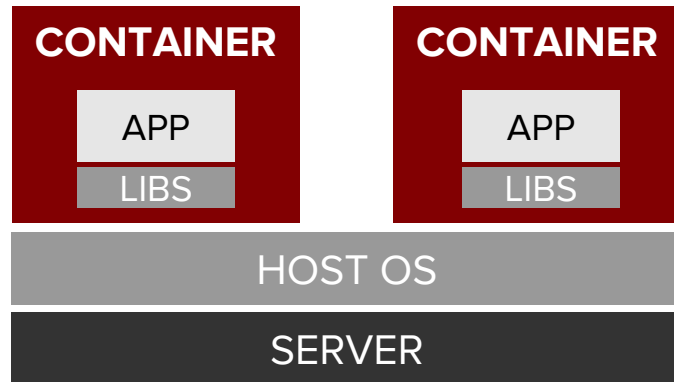
- ENABLE DEVOPS CULTURE
- ENABLE HYBRID CLOUD
- REDUCE VM LICENSING COSTS
- ACCELERATE APP-DEV CYCLES

Containers package applications with dependencies and isolate the runtime

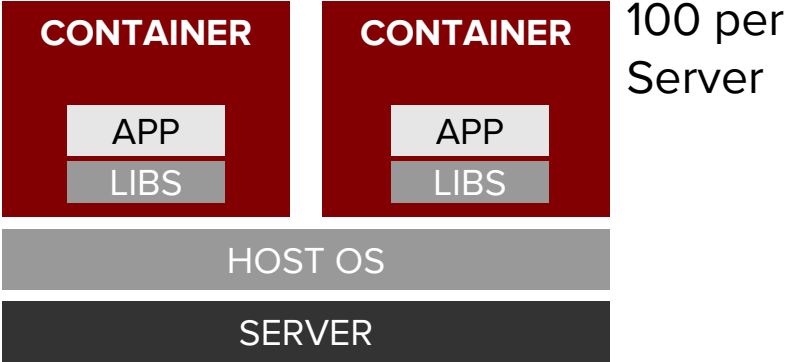
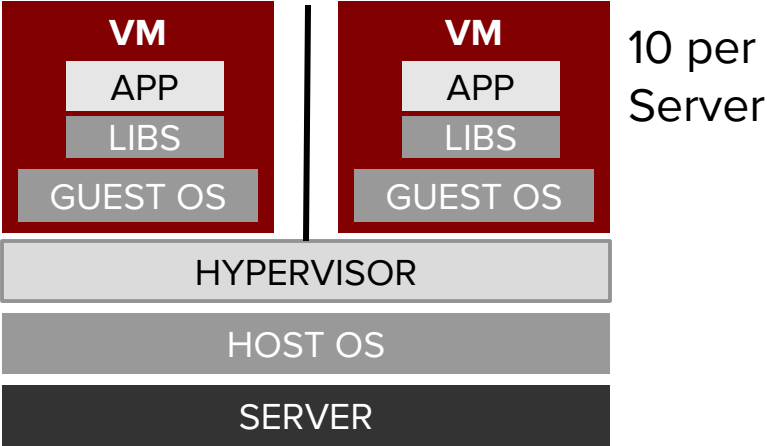
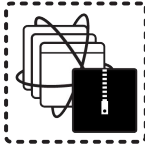
- Easy to deploy and portable across host systems
- Created from immutable, layered images
- Isolated from a host operating system.

In RHEL, this is done through:

- Control Groups (cgroups)
- kernel namespaces
- SELinux, sVirt, iptables
- Docker 



Containers provide high density and efficiency at the expense of isolation



PHYSICAL SERVER



27 HRS

VIRTUAL MACHINE



12 MINS

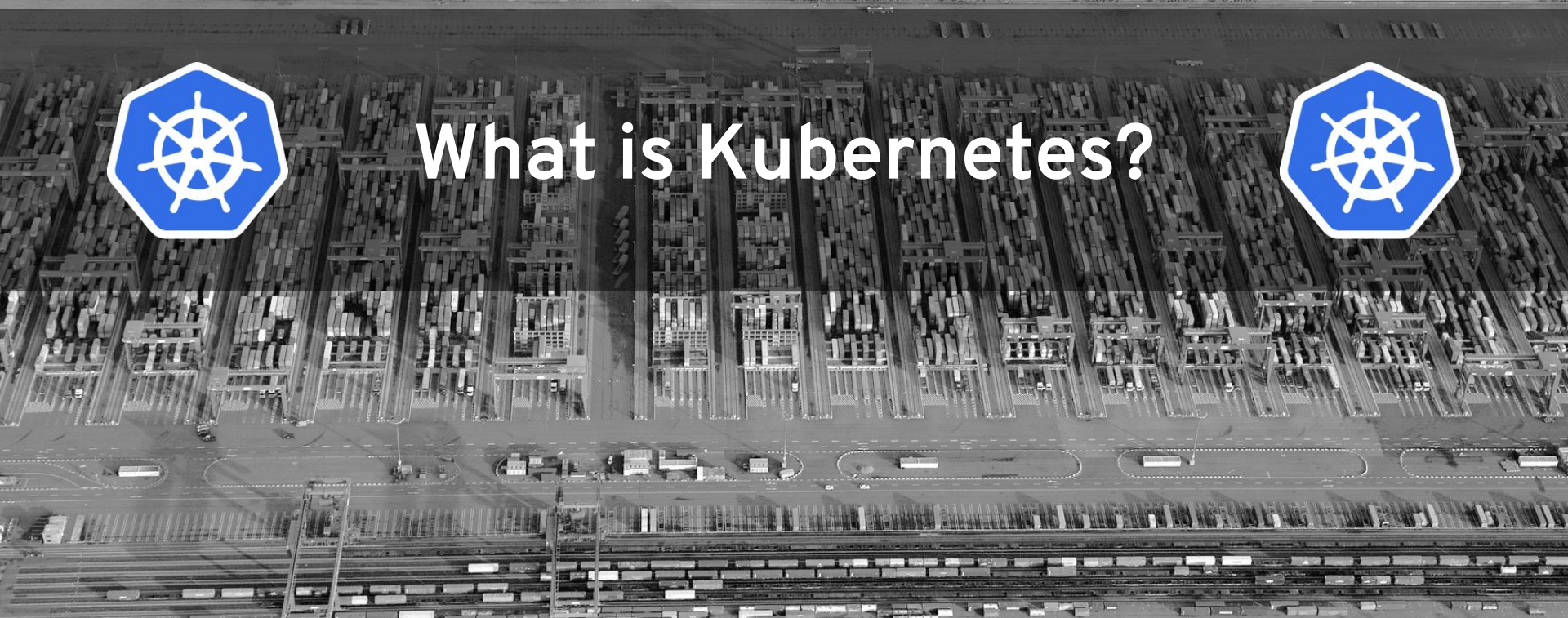
CONTAINER INSTANCE



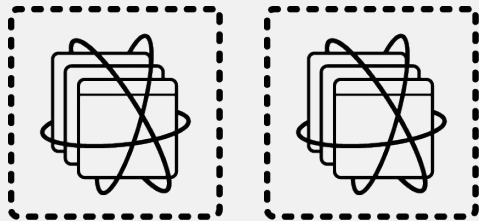
10 SECS



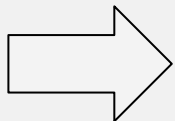
What is Kubernetes?



WHY DO CONTAINERS NEED KUBERNETES?



CONTAINERIZED APPLICATIONS



kubernetes

MANAGE CONTAINERS SECURELY

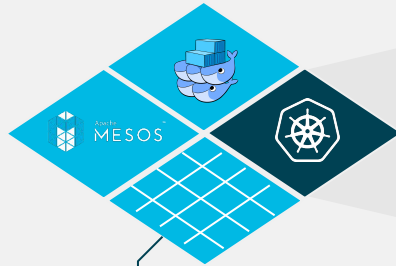
MANAGE CONTAINERS AT SCALE

INTEGRATE IT OPERATIONS

ENABLE HYBRID CLOUD

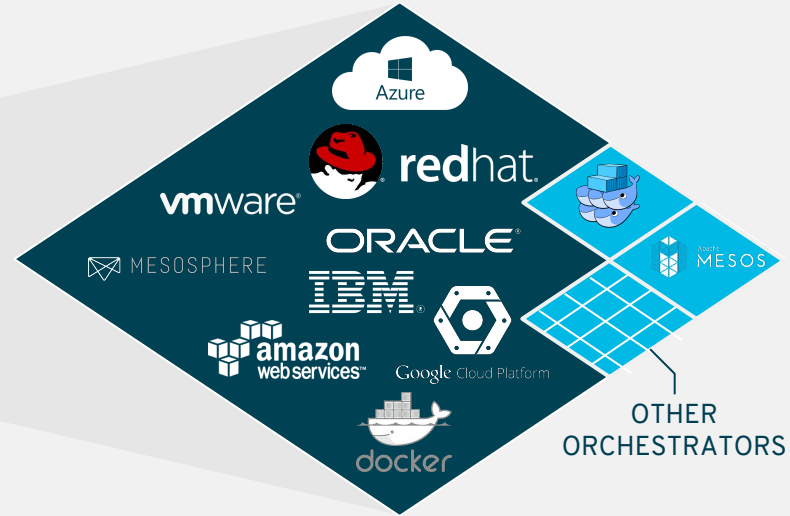
KUBERNETES IS THE CONTAINER ORCHESTRATION STANDARD

2 YEARS AGO
Fragmented landscape



OTHER ORCHESTRATORS
(Cloud Foundry Diego,
Nomad, Blox, etc.)

TODAY
Kubernetes consolidation

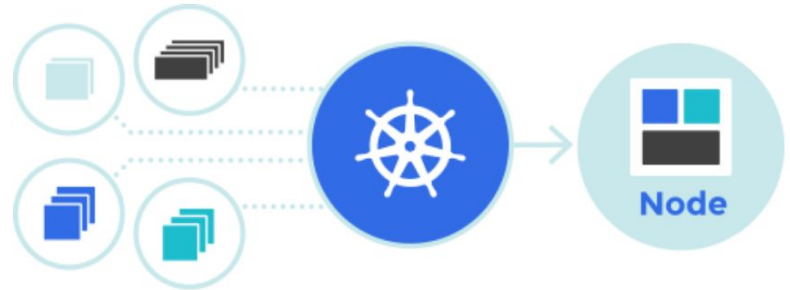


OTHER ORCHESTRATORS

Red Hat bet early on Kubernetes. It has now become the dominant orchestration ecosystem

WHAT IS KUBERNETES?

- Orchestration of large amounts of running containers spread across a lot of hosts.
- “Kubernetes is an open-source platform for automating deployment, scaling, and operations of application containers across clusters of hosts, providing container-centric infrastructure.” [1]
- Open Sourced by google
- Planet Scale



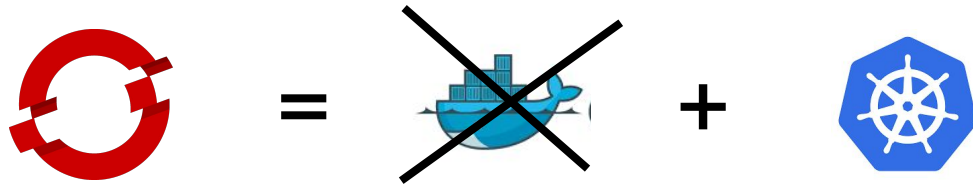


What is OpenShift?





made easy



made easy



made easy

OPENSIFT MAKES DOCKER UND KUBERNETES EASY TO USE



WHAT COMES IN KUBERNETES

- Container Scheduling on Multiple Hosts
- Self-healing

- Scaling
- Service Discovery
- Rolling Deploys and Rollbacks



WHAT OPENSIFT ADDS OVER KUBERNETES

Ops:

- Software Defined Network
- Persistent Storage
- Container Native Storage (CNS / SDS)
- Log Aggregation and Analysis
- Monitoring | Telemetry
- Capacity Management
- Egress Routing for Enterprise integration
- Router Sharding
- Full Stack Support
- System Certifications and Patching
- ...

Security:

- Role Based Access Control
- Container Security and Isolation
- Multi-tenancy

Dev:

- Automatically Triggered Deployments (CICD)
- Integrated Customizable Pipelines (CICD)
- Build and Deployment Configurations
- Weighted AB Testing
- Stateful Workloads (Storage, StatefulSets)
- Workload Containerization
- Self-service
- User Experience
- ...
- Secured Registries
- Automated Deployment Patching
- ...



**DON'T
TRY THIS AT HOME!**

	Databases	Data Warehouse	Streaming	Languages & Frameworks	SCM	Registry Services	Application Definition	CI / CD	Services as Code	API management
Application Definition & Development										
	Scheduling & Orchestration			Coordination & Service Discovery			Service Management			

Orchestration & Management	OS	Cloud-Native Storage	Container Runtime	Cloud-Native Network

Runtime	Infrastructure Automation	Host Management / Tooling	Secure Images

Provisioning

Infrastructure

Platforms	Observability & Analysis
<p>Paas / Container Service</p>	<p>Monitoring</p>
<p>Logging</p>	<p>Event-based compute</p>
<p>Tracing</p>	<p>Tracing</p>

CNCF Projects

github.com/cncf/landscape

OPENSIFT IS KUBERNETES FOR THE ENTERPRISE

Kubernetes
Release



1-3 months
hardening

OpenShift
Release



Security fixes

100s of defect and performance fixes

200+ validated integrations

Middleware integrations

(container images, storage, networking, cloud services, etc)

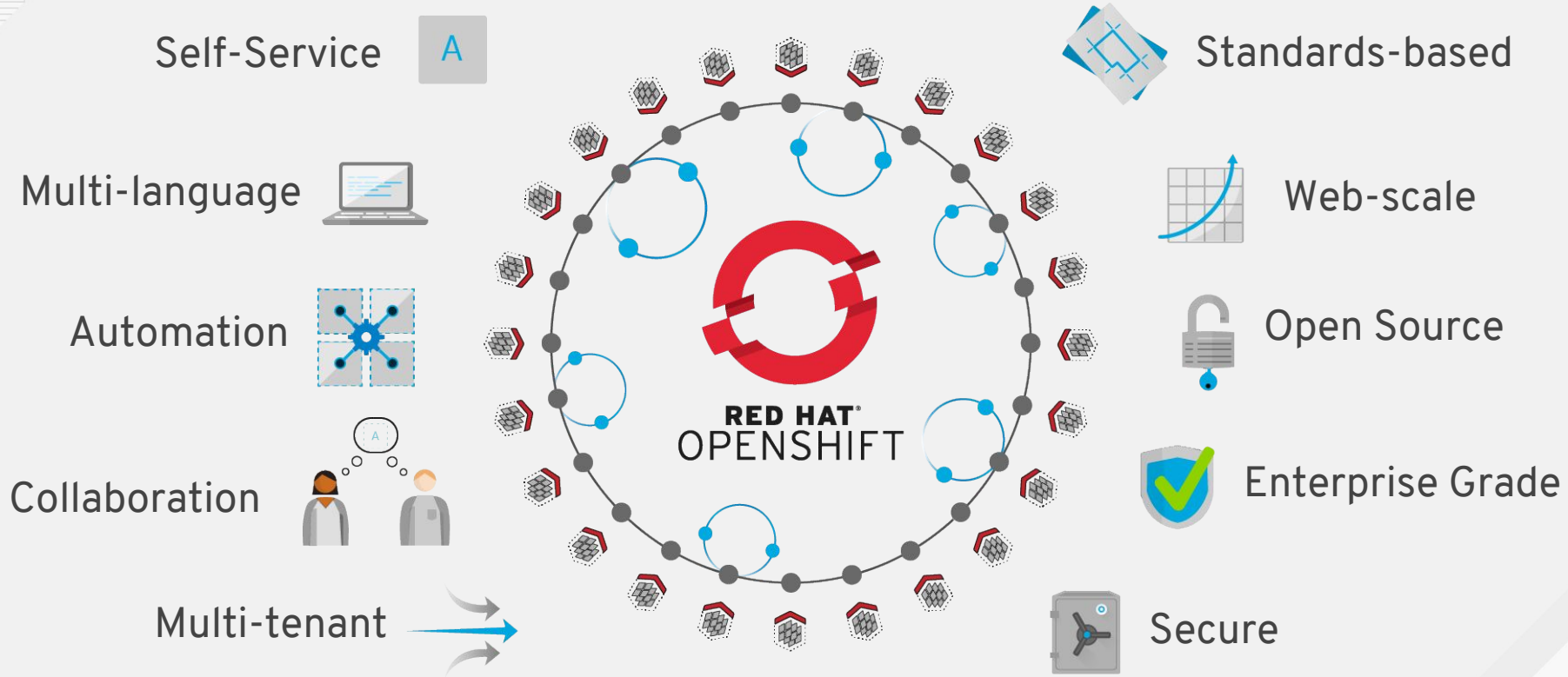
9 year enterprise lifecycle management

Certified Kubernetes

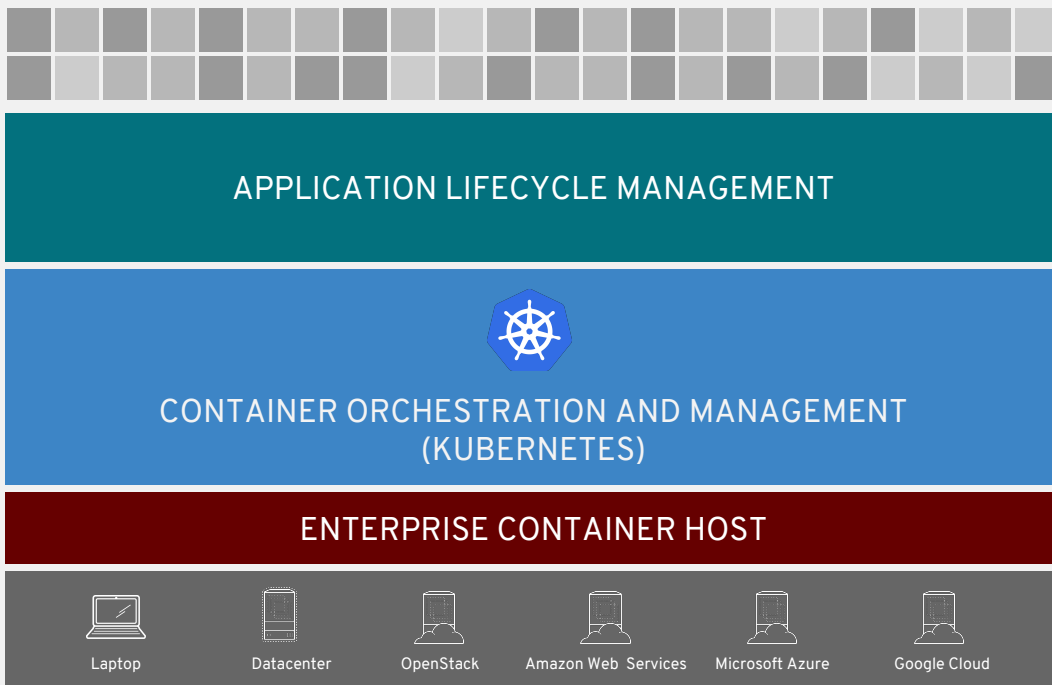


OpenShift Overview

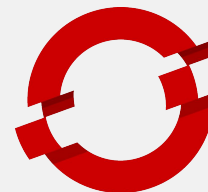




OPENSIFT CONTAINER PLATFORM



ANY
CONTAINER

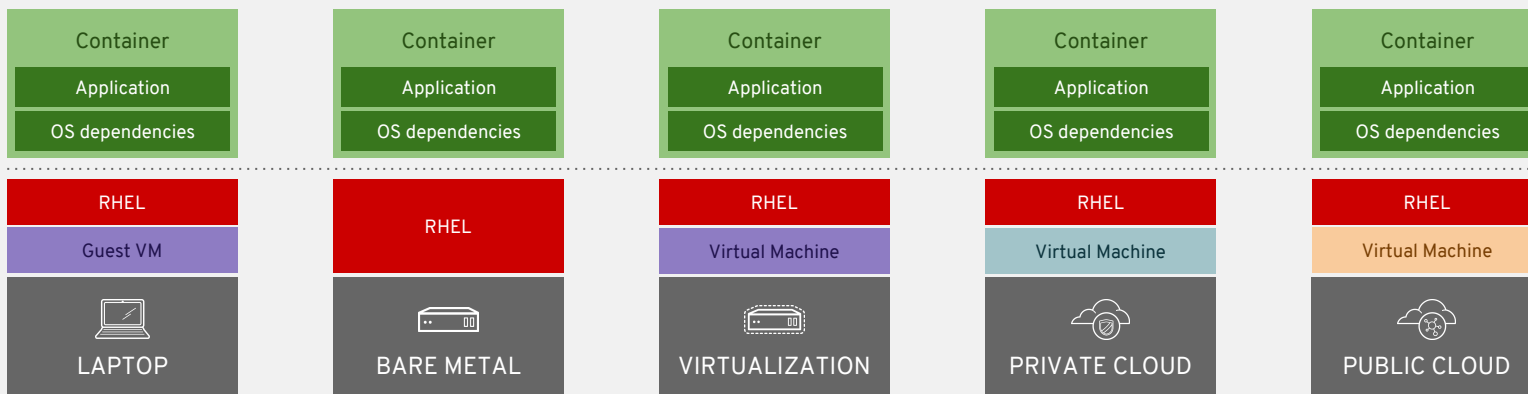


RED HAT
OPENSIFT

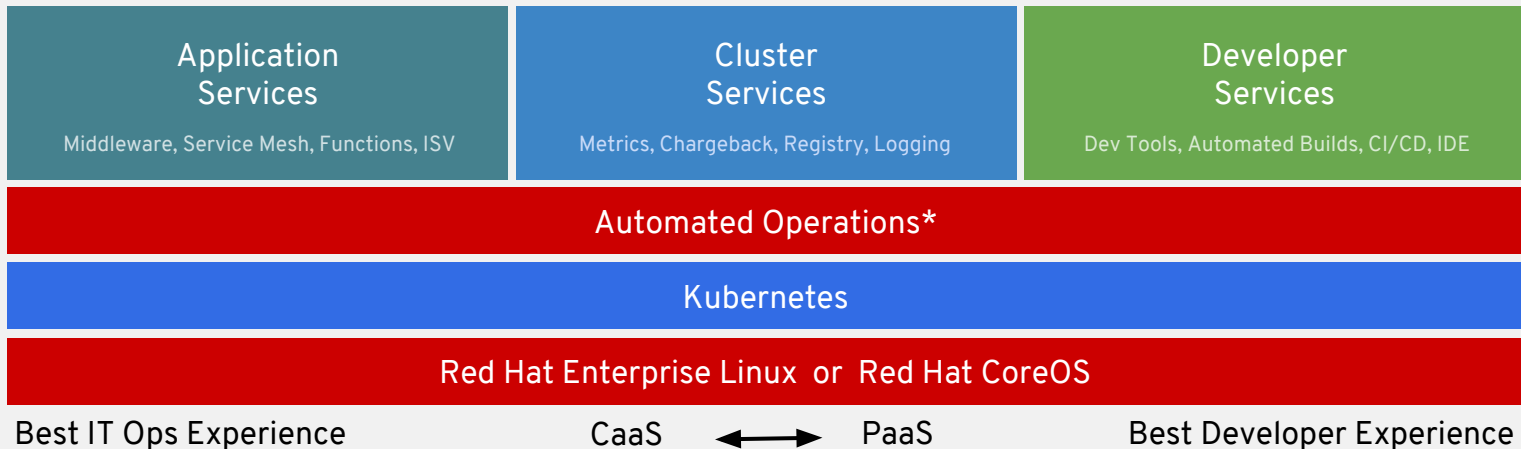
ANY
INFRASTRUCTURE

APPLICATION PORTABILITY WITH CONTAINERS

RHEL Containers + RHEL Host = Guaranteed Portability
Across Any Infrastructure

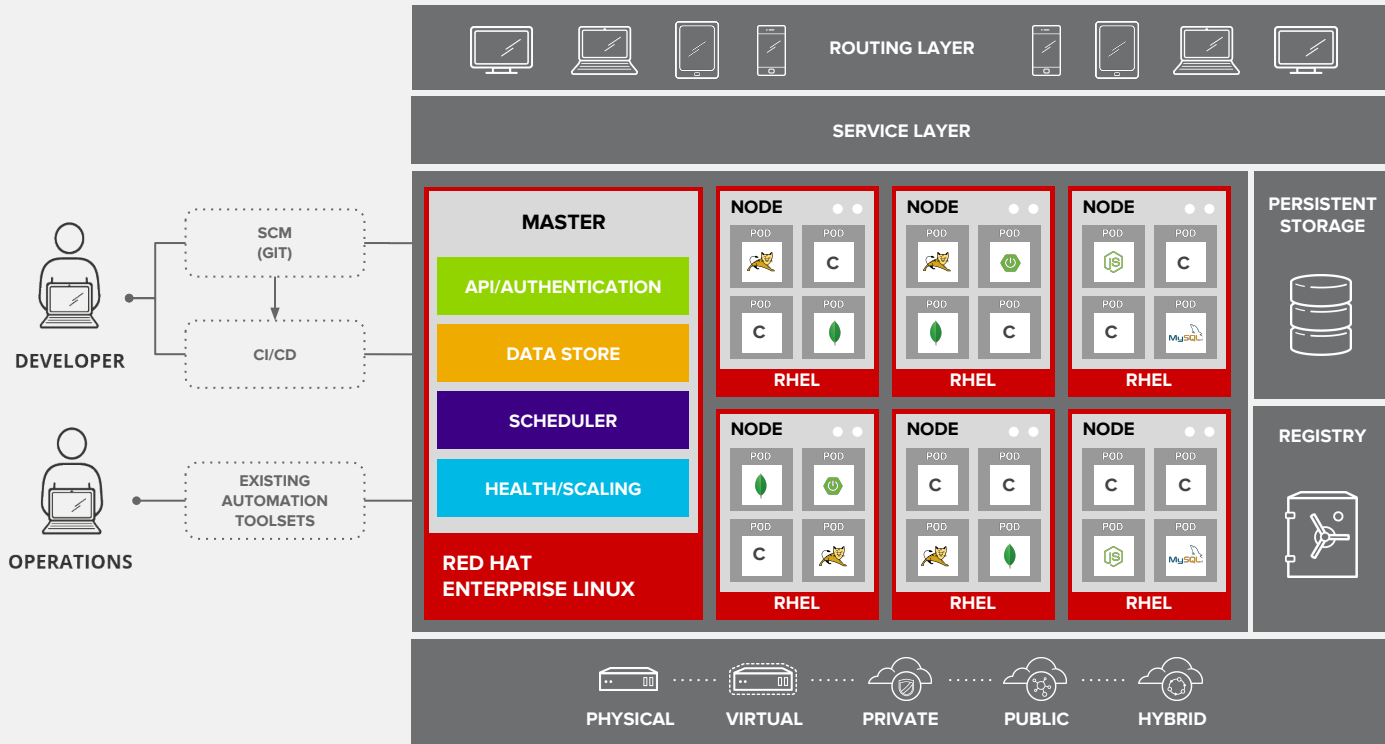


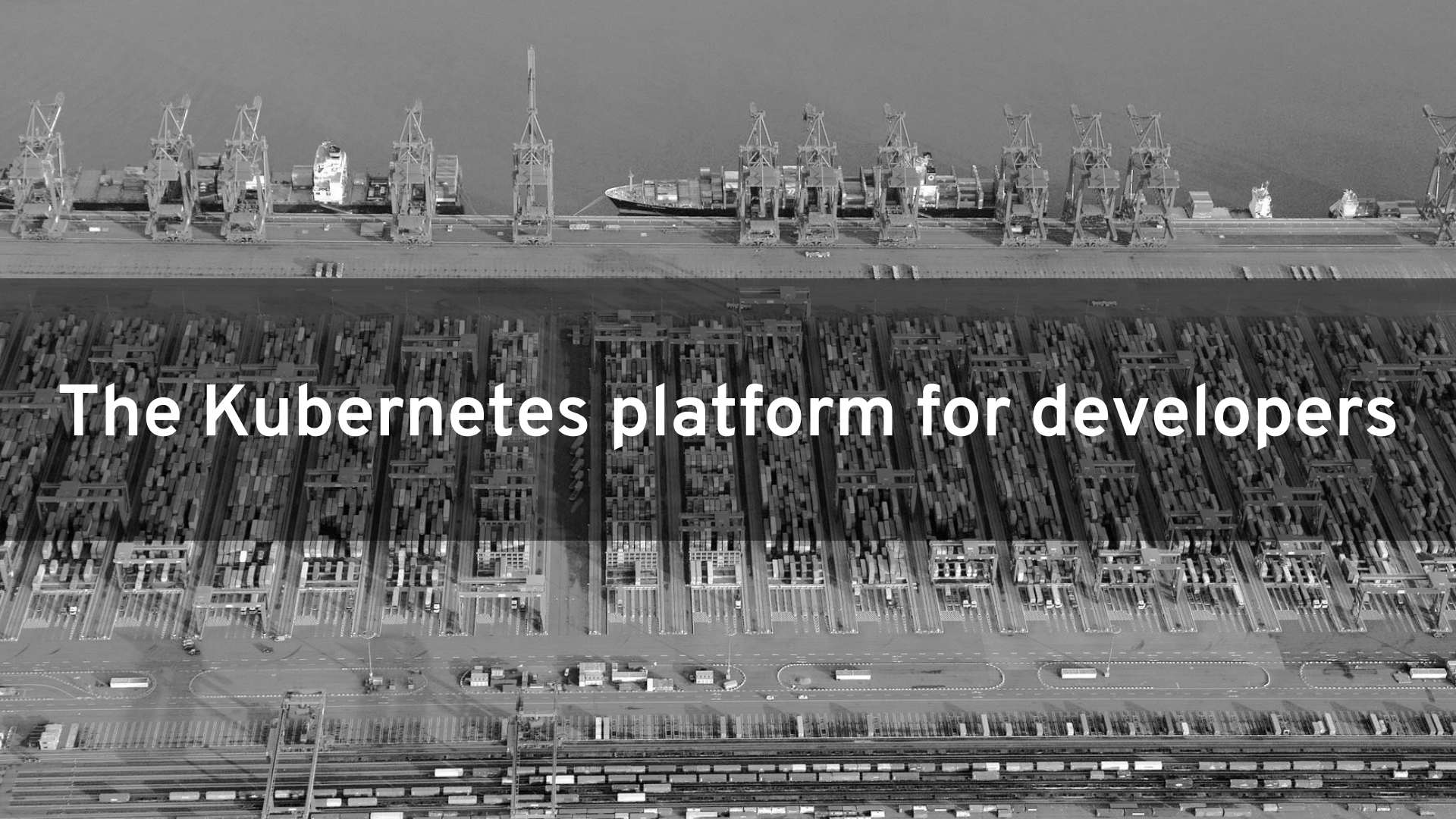
OPENSIFT CONTAINER PLATFORM



*coming soon

OPENSIFT ARCHITECTURE





The Kubernetes platform for developers



Developers want to be **productive** and **have choice**

- Choice of architectures
- Choice of programming languages
- Choice of databases
- Choice of application services
- Choice of development tools
- Choice of build and deploy workflows

They don't want to have to worry
about the infrastructure.

THE POWER OF THE **OPENSHIFT ECOSYSTEM**

RED HAT PORTFOLIO

Optimized for Containers

RED HAT
OPENSHIFT
Application Runtimes

RED HAT
JBOSS
WEB SERVER

RED HAT
JBOSS
ENTERPRISE
APPLICATION PLATFORM

RED HAT
DATA GRID

RED HAT
AMQ

RED HAT
FUZE

RED HAT
MOBILE

RED HAT
ANSIBLE
Engine

RED HAT
QUAY
CONTAINER
REGISTRY

RED HAT
DECISION
MANAGER

RED HAT
PROCESS AUTOMATION
MANAGER

RED HAT
3SCALE
API MANAGEMENT

RED HAT
OPENSHIFT
Container Storage

THIRD-PARTY ISV

Red Hat Container Catalog (100s certified)

IBM

Microsoft

SAP

New Relic

Couchbase

CRUNCHY
Enterprise PostgreSQL

Sysdig

f5

VERITAS

ZABBIX

NetApp

Sonatype

Jfrog

dynatrace

nuagenetworks

CLOUD SERVICES

Open Service Broker

amazon
web services

Microsoft Azure



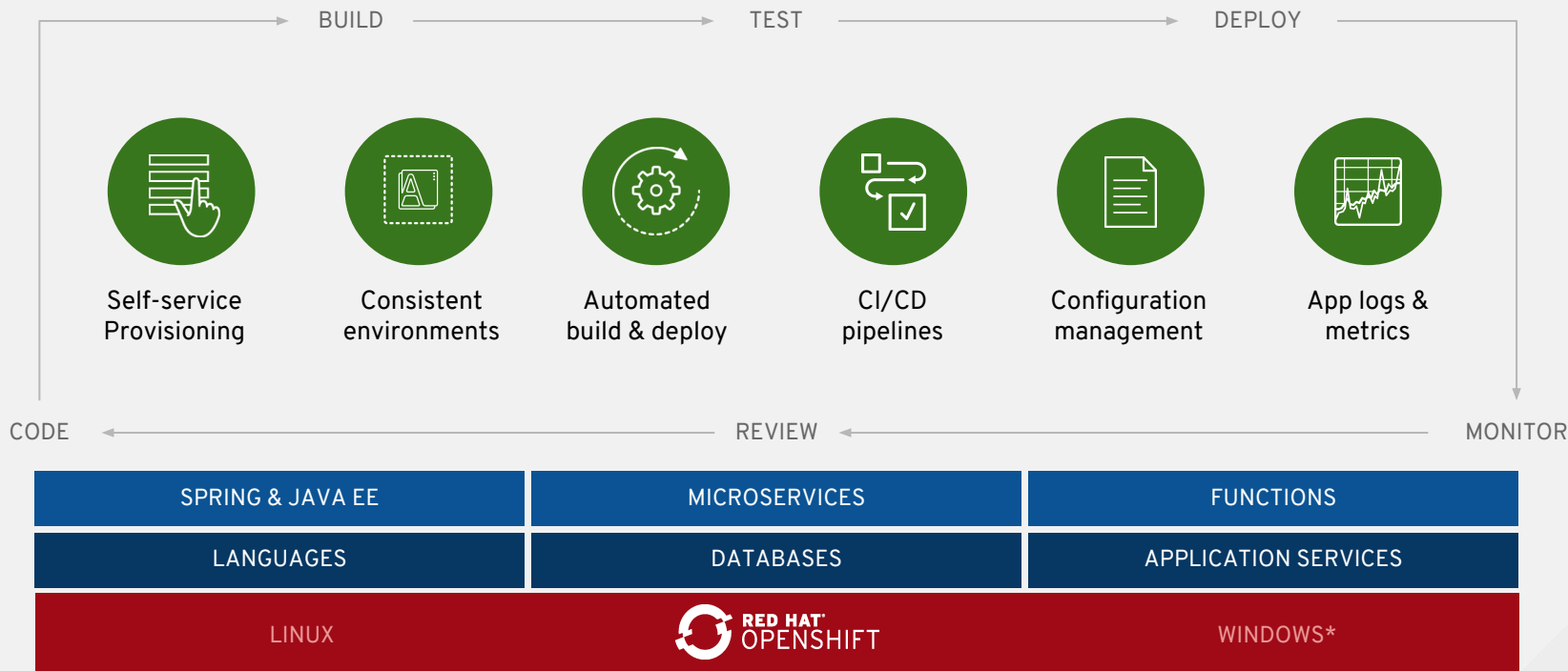
Google Cloud



RED HAT ENTERPRISE LINUX ECOSYSTEM

Hardware, Virtualization, Cloud and Service Provider Certifications

HOW OPENSHIFT ENABLES DEVELOPER PRODUCTIVITY



* coming soon

GENERAL DISTRIBUTION



An aerial, high-angle photograph of a massive container port. The image shows a dense grid of shipping containers stacked in neat rows, separated by narrow aisles. Several large gantry cranes are visible, positioned over the stacks. The overall scene is one of intense industrial activity and organized chaos. The text is overlaid on a semi-transparent dark band across the middle of the image.

The Kubernetes platform for IT Operations



IT Operations needs **secure, efficient** and **controlled** processes

- Automated* provisioning
- Automated installations
- Automated security scanning
- Automated upgrades
- Automated backups

And it needs to integrate with what
you already have.

*coming soon

AUTOMATED CONTAINER OPERATIONS

Fully automated day-1 and day-2 operations

INSTALL	DEPLOY	HARDEN	OPERATE
AUTOMATED OPERATIONS			
Infra provisioning	Full-stack deployment	Secure defaults	Multi-cluster aware
Embedded OS	On-premises and cloud	Network isolation	Monitoring and alerts
	Unified experience	Audit and logs	Full-stack patch & upgrade
		Signing and policies	Zero downtime upgrades
			Vulnerability scanning

A CONSISTENT CONTAINER APPLICATION PLATFORM

FROM YOUR DATACENTER TO THE CLOUD



Automated operations



Multi-tenant



Secure by default



Network traffic control



Over-the-air updates



Monitoring & chargeback



Pluggable architecture



BARE METAL, VSPHERE, RHV, OPENSTACK, AWS, AZURE, GOOGLE

COMPREHENSIVE CONTAINER SECURITY



CONTROL

Application Security

Container Content

CI/CD Pipeline

Container Registry

Deployment Policies



DEFEND

Infrastructure

Container Platform

Container Host Multi-tenancy

Network Isolation

Storage

Audit & Logging

API Management



EXTEND

Security Ecosystem

KUBERNETES OPERATOR FRAMEWORK

AN INNOVATIVE, MORE EFFICIENT WAY TO MANAGE CONTAINERIZED APPLICATIONS AT SCALE

AUTOMATED LIFECYCLE MANAGEMENT

Installation

Upgrade

Backup

Failure
recovery

Metrics
& insights

Tuning

Operators codify operational knowledge and workflows to automate lifecycle management of containerized applications with Kubernetes

MORE THAN JUST A KUBERNETES PLATFORM

RED HAT® QUAY CONTAINER REGISTRY

Enterprise image registry with geo-replication, time machine and security scanning

RED HAT® OPENSIFT Container Storage

Container-optimized software-defined storage on OpenShift

CONTAINER-NATIVE VIRTUALIZATION*

Single workflow for containers and virtual machines running on OpenShift

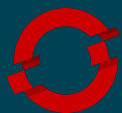
* coming soon

ONE PLATFORM FLEXIBLE CONSUMPTION MODELS



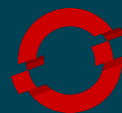
RED HAT®
OPENSHIFT
Online

SaaS offering to build, deploy,
and scale container applications
in the cloud



RED HAT®
OPENSHIFT
Dedicated

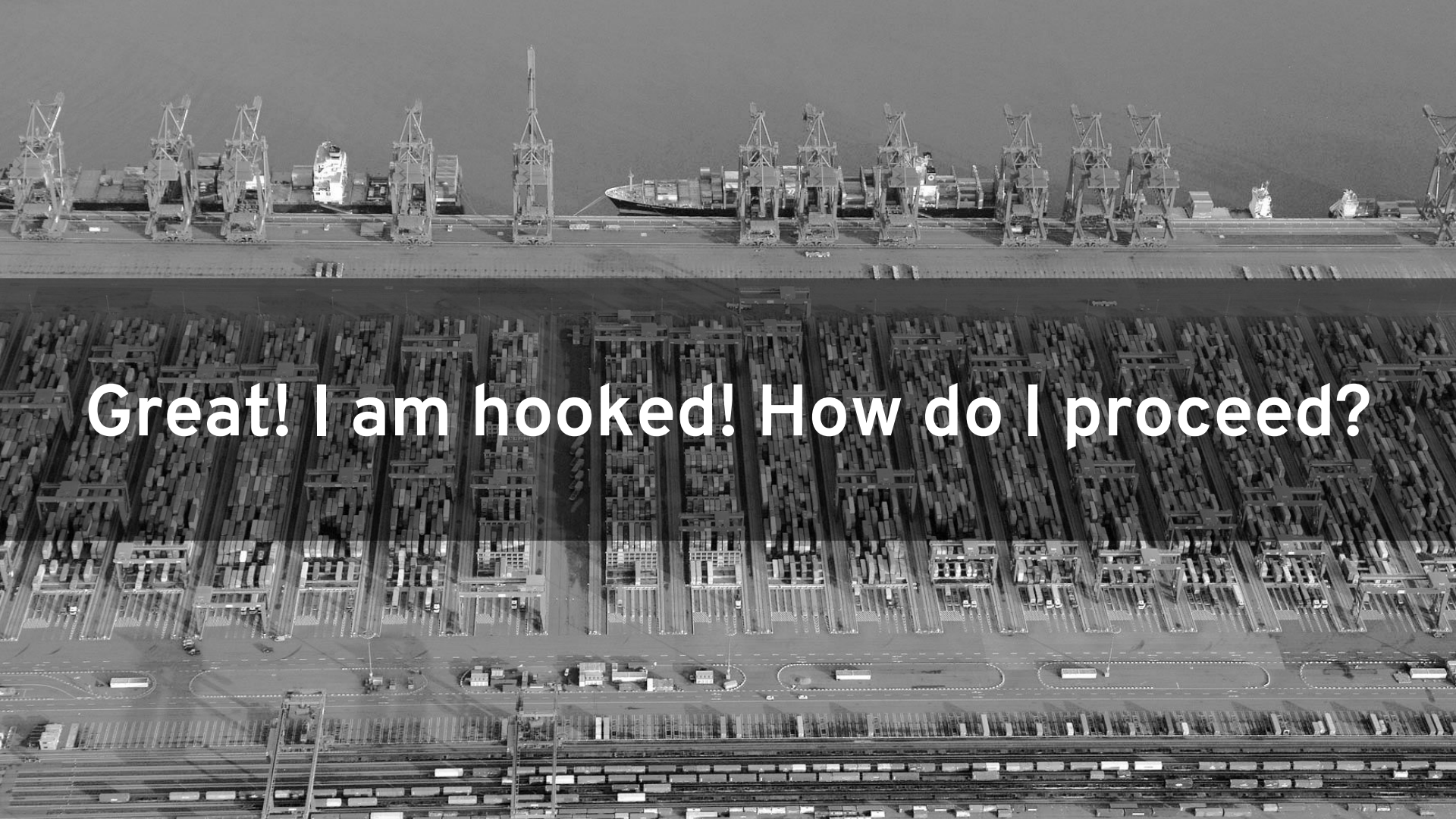
Managed service offering on
your choice of AWS, Azure* or
Google



RED HAT®
OPENSHIFT
Container Platform

Manage your own secure,
enterprise-grade Kubernetes
platform

* announced for general availability in late 2018



Great! I am hooked! How do I proceed?

LEARN.OPENSIFT.COM

Foundations of
OpenShift

START COURSE

Building
Applications On
OpenShift

START COURSE

Subsystems,
Components, and
Internals

START COURSE

OpenShift
Playgrounds

START COURSE

Service Mesh
workshop with Istio

START COURSE

Serverless scenarios
with OpenShift
Cloud Functions

START COURSE

Interactive Learning Scenarios provide you with a pre-configured OpenShift instance, accessible from your browser without any downloads or configuration.

RED HAT SERVICES FOR OPENSIFT ADOPTION

RED HAT OPEN INNOVATION LABS



EXPERIMENT

Rapidly build prototypes, do DevOps, and be agile.



CATALYZE INNOVATION

Bring modern application development back to your team.



IMMERSE YOUR TEAM

Work side-by-side with experts in a residency-style engagement.

TO SHOW YOUR TEAMS HOW OPENSIFT AND MODERN DEVELOPMENT PRACTICES CAN DRIVE INNOVATION: START WITH A 4- TO 12-WEEK LABS RESIDENCY

RED HAT CONTAINER ADOPTION PROGRAM



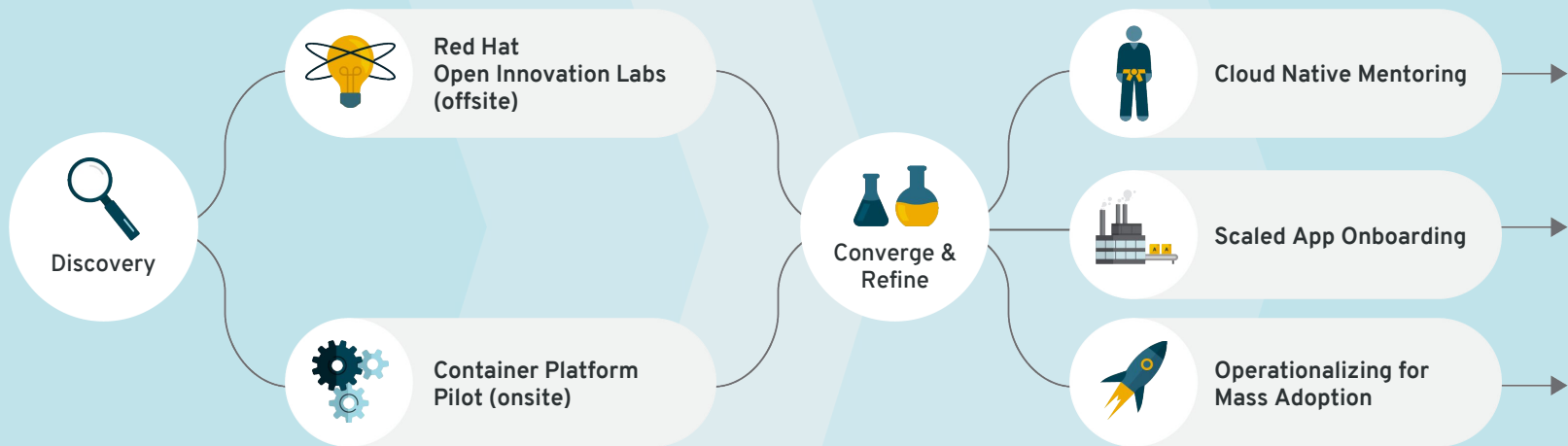
FRAMEWORK FOR SUCCESSFUL CONTAINER ADOPTION AND IT TRANSFORMATION:

Mentoring, training, and side-by-side collaboration to:

- Create a production platform and team to run it
- Create end-to-end container-driven deployment automation
- Scale application onboarding expertise
- Guide new Kubernetes-native development
- Align business with IT through included **Red Hat Open Innovation Labs**

TO BEGIN A COMPREHENSIVE PROGRAM (INCLUDING OPEN INNOVATION LABS): START WITH THE 12-WEEK RED HAT CONSULTING CONTAINER PLATFORM PILOT

CONTAINER ADOPTION PROGRAM



ESTIMATED PAYBACK TIME: 17 months [1]
TOTAL THREE-YEAR BENEFITS NPV: \$10.1 M (USD) [1]

[1] [The Total Economic Impact of Red Hat Consulting's Container Adoption Program and Open Innovation Labs](#), Forrester, 2018.

THANK YOU