



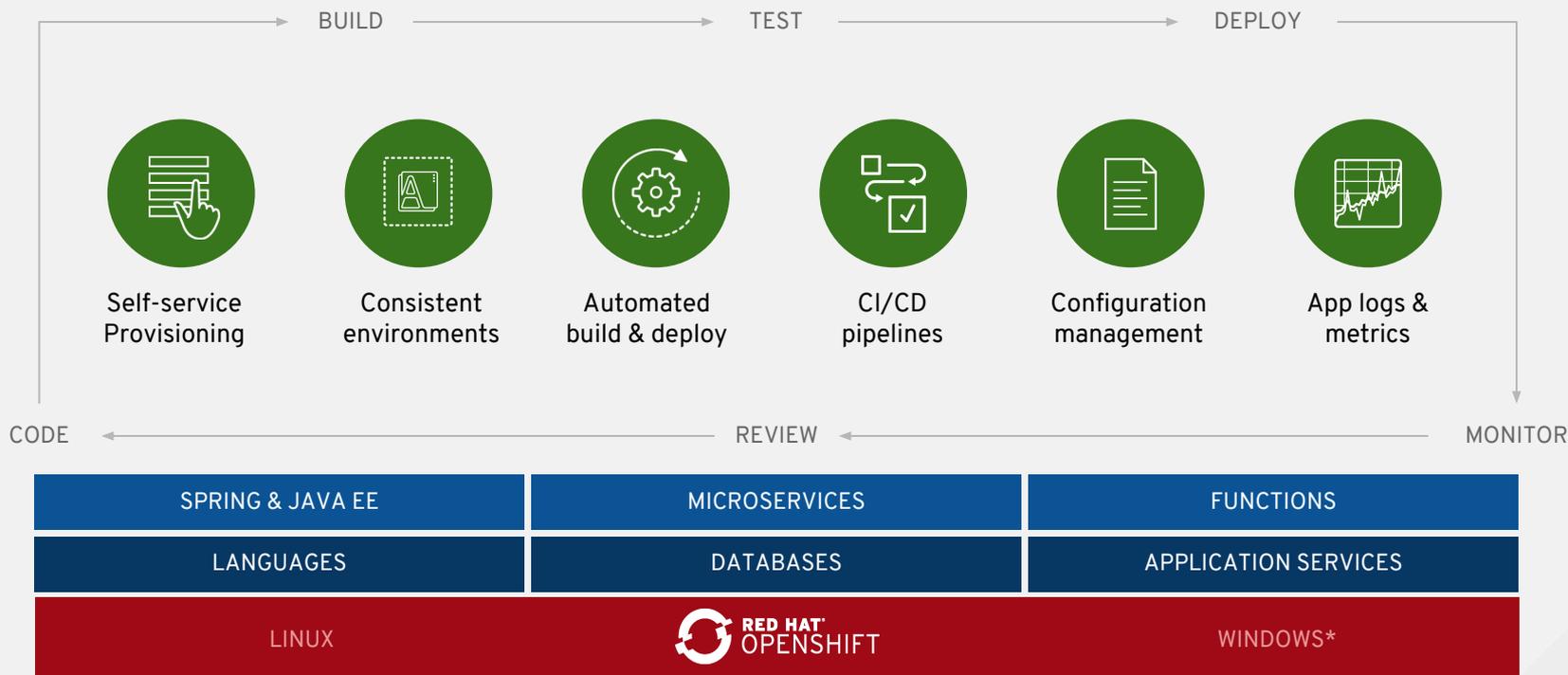
# IT TRANSFORMATION WITH CONTAINERS AND DEVOPS

Johannes Brännström,  
Senior Solutions Architect

# AGENDA

1. Intro to OpenShift
2. Demos
3. HCL Container Application Service
4. Learning more

# HOW OPENSHIFT ENABLES DEVELOPER PRODUCTIVITY



\* coming soon

GENERAL DISTRIBUTION

# 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



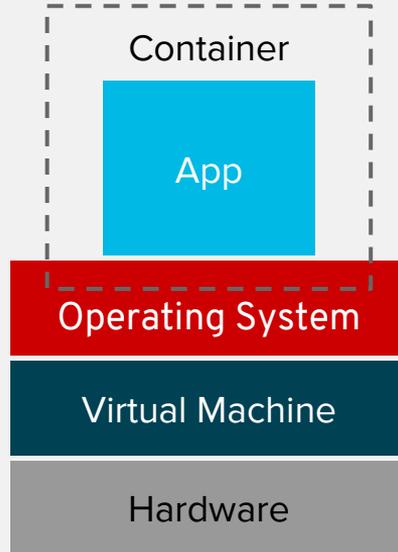
Google Cloud



## RED HAT ENTERPRISE LINUX ECOSYSTEM

Hardware, Virtualization, Cloud and Service Provider Certifications

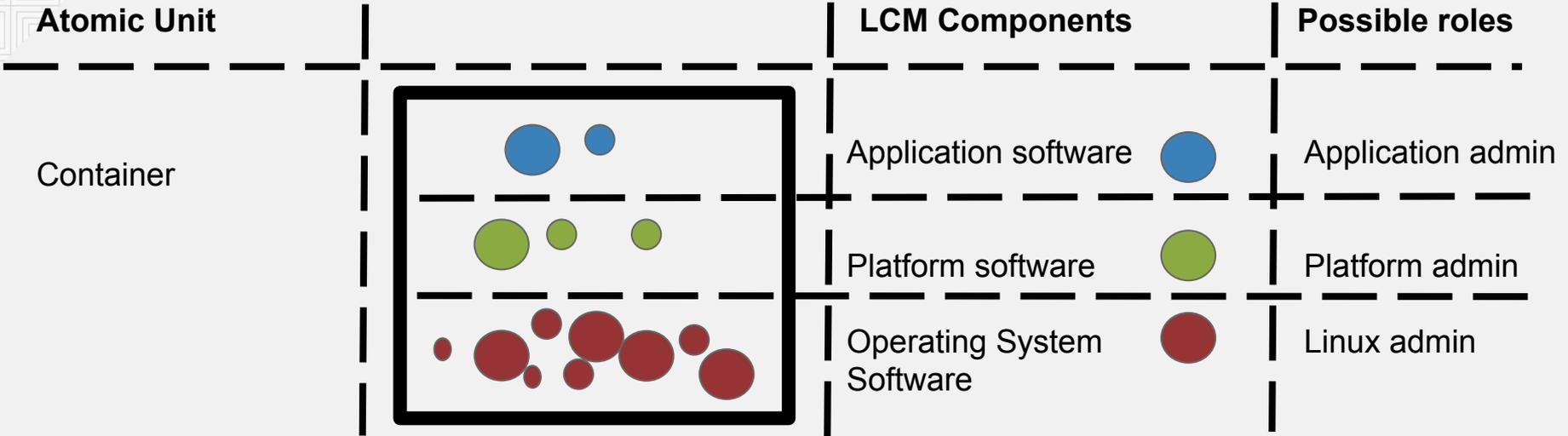
# WHAT ARE CONTAINERS? - LINUX OS TECHNOLOGY



RED HAT CONTAINER TECHNOLOGY CONSISTS OF:

1. KERNEL NAMESPACES
2. CONTROL GROUPS (cgroups)
3. DOCKER PACKAGING FORMAT
4. SELINUX (Red Hat)

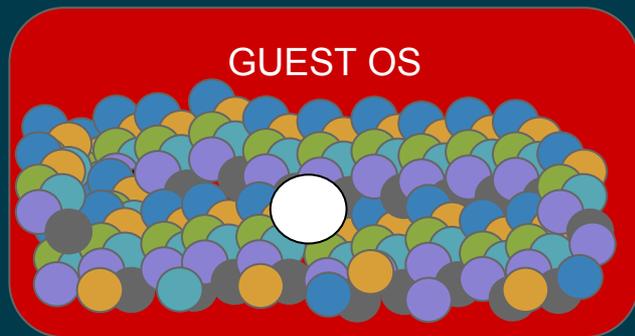
# ENTERPRISE CONTAINER PAAS: Life Cycle Management



- Different layers has different life cycles
- Different layers can have different people and or teams responsible
- Different people have different priorities
- Not only security at stake, also availability
- **Need for synchronization!**

# APPLICATION NEEDS VS WHAT YOU GET

(15-35 GB)



HYPERVERSOR

HOST OPERATING SYSTEM

INFRASTRUCTURE



This is what you get

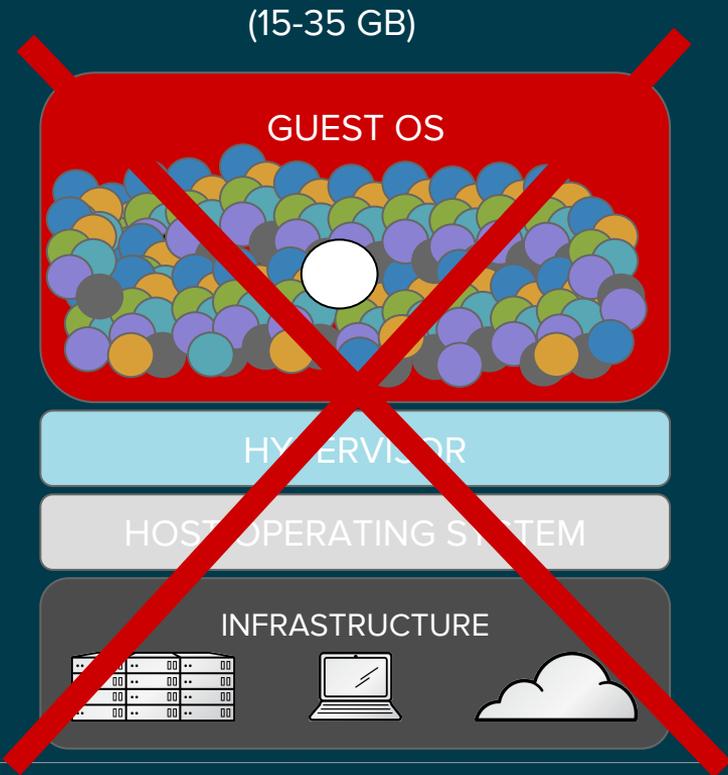
This is what you want

Your app

# APPLICATION NEEDS VS WHAT YOU GET

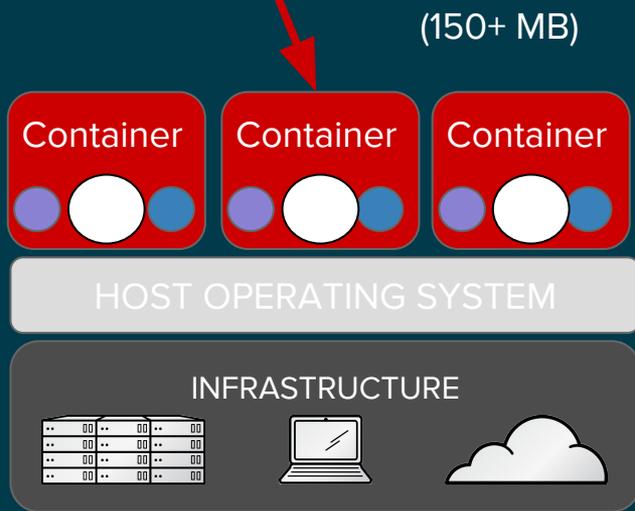
This is what you get

This is what you want

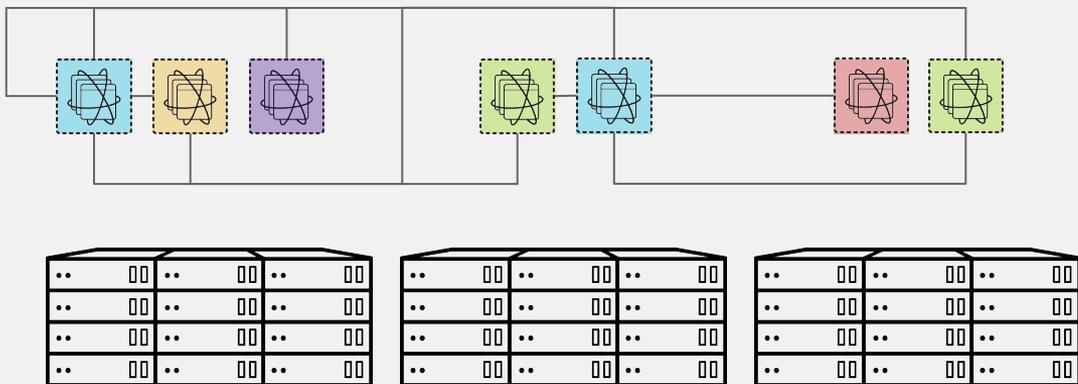


Your app

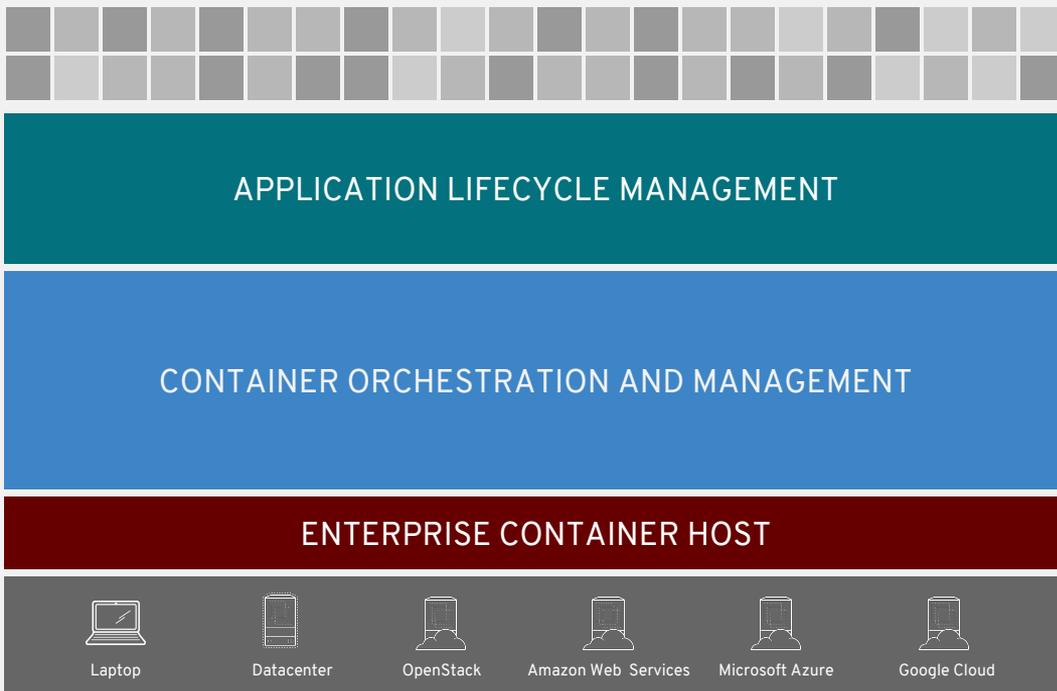
This diagram shows a single white circle representing an application, with a red arrow pointing from the text 'Your app' to it.



# WHAT IS KUBERNETES?



# CLOUD-NATIVE CAPABILITIES WITH RED HAT OPENSSHIFT

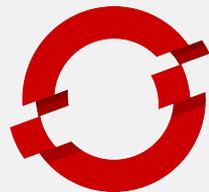


ANY  
CONTAINER



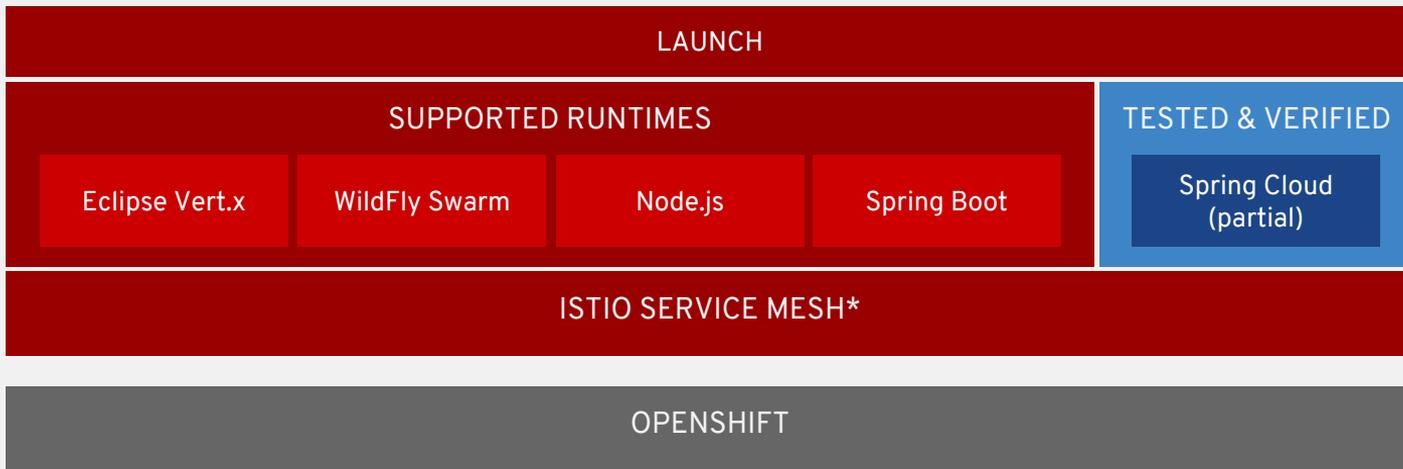
**RED HAT**  
OPENSSHIFT

ANY  
INFRASTRUCTURE



# RED HAT® OPENSIFT

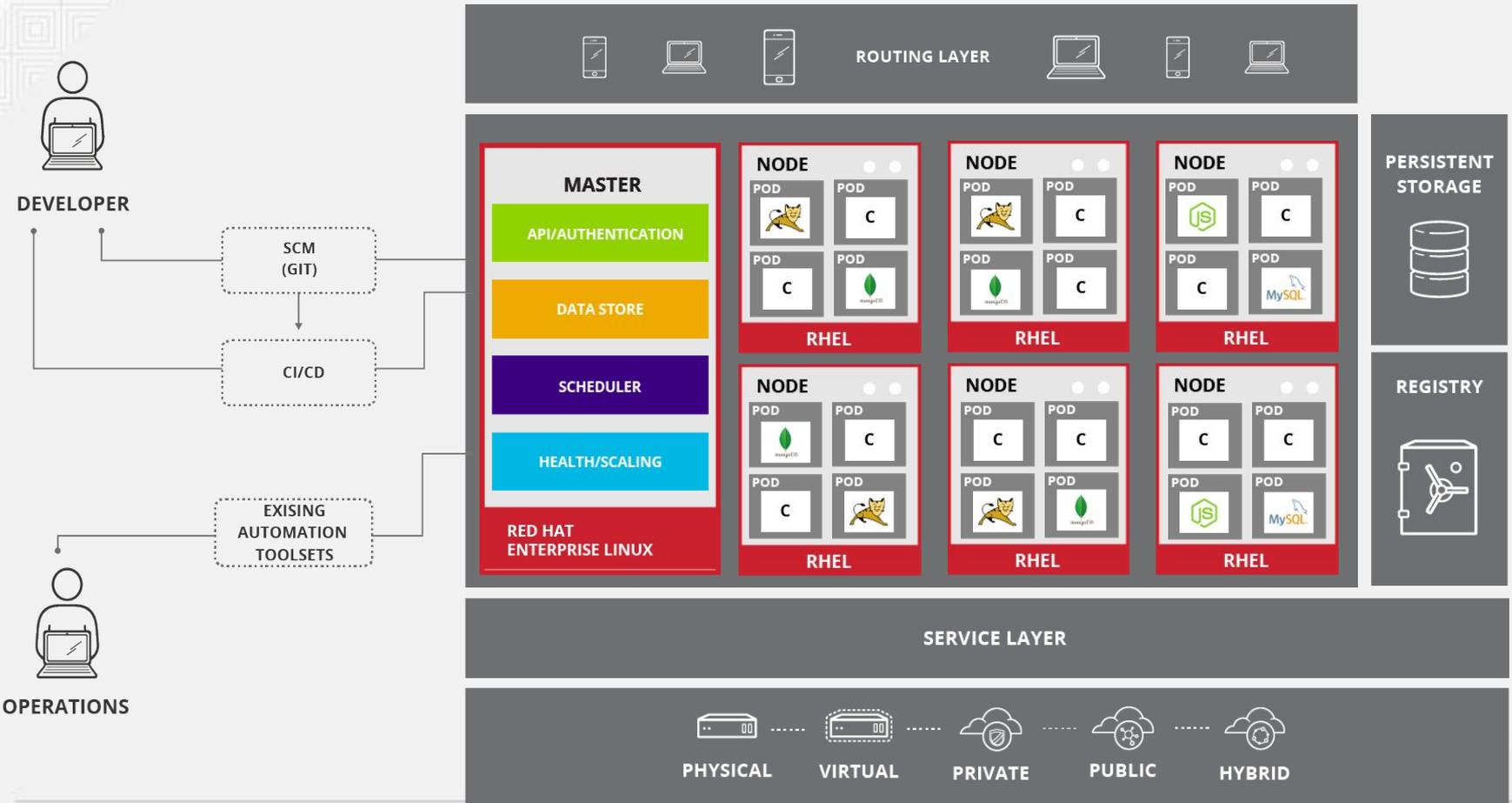
Application Runtimes



Modern, Cloud-Native Application Runtimes and  
an Opinionated Developer Experience

\* coming soon

# Architecture overview



# Source 2 Image Walk Through

Code



DEV

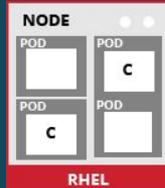
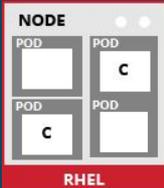
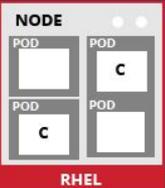
Build



Container Image

Registry

Deploy



OPS

# Source 2 Image Walk Through



DEV

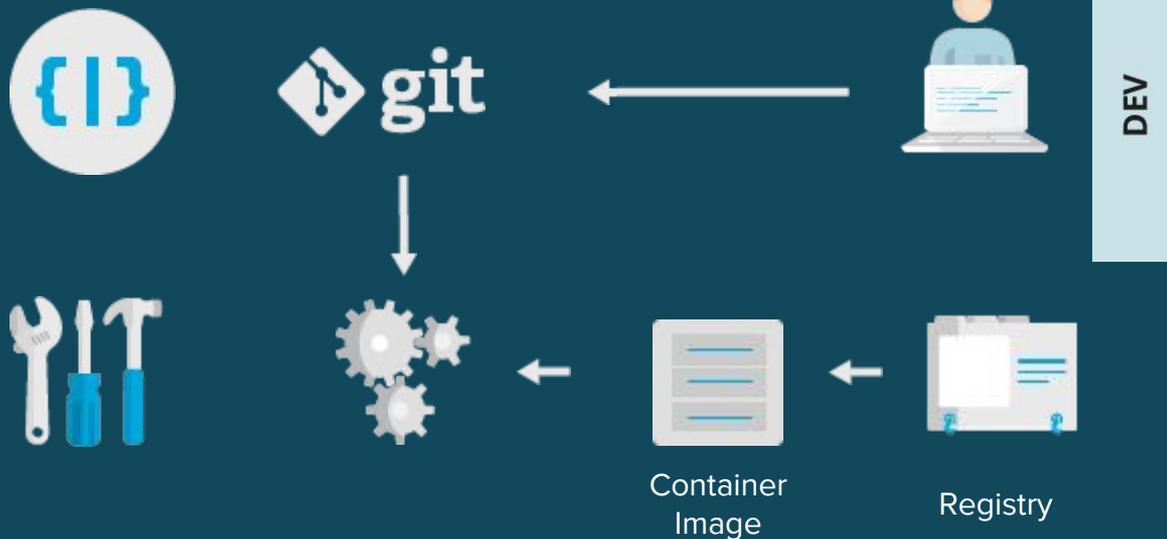
## Code

Developers can leverage existing development tools and then access the OpenShift Web, CLI or IDE interfaces to create new application services and push source code via GIT. OpenShift can also accept binary deployments or be fully integrated with a customer's existing CI/CD environment.

# Source 2 Image Walk Through

## Build

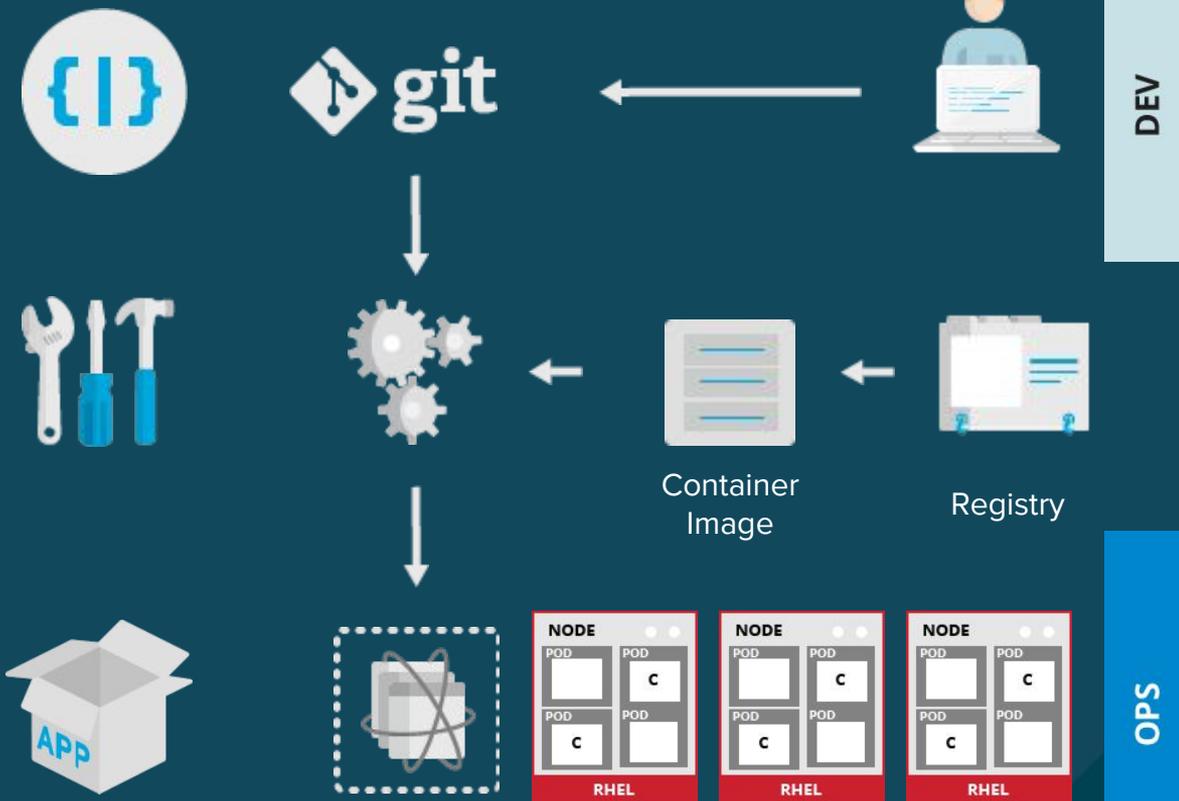
OpenShift automates the Docker image build process with Source-to-Image (S2I). S2I combines source code with a corresponding Builder image from the integrated Docker registry. Builds can also be triggered manually or automatically by setting a Git webhook. Add in Build pipelines



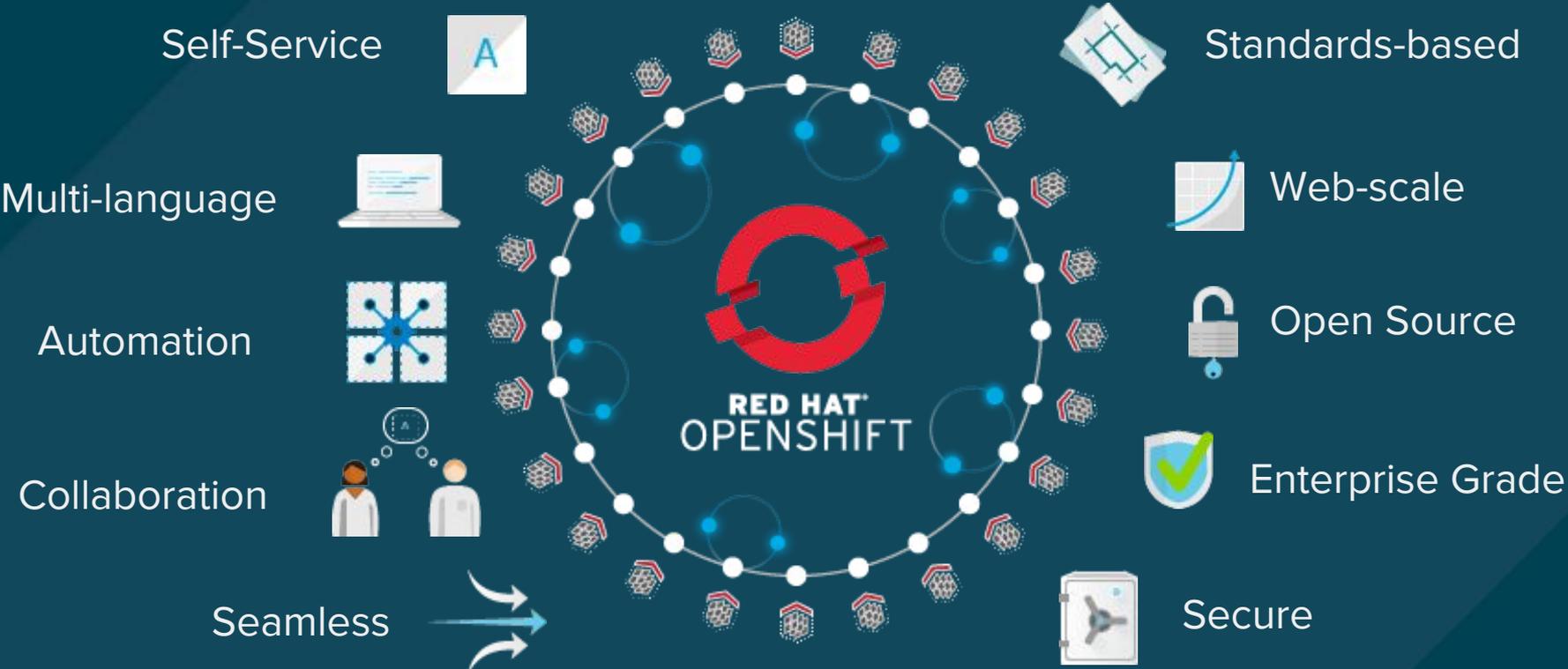
# Source 2 Image Walk Through

## Deploy

OpenShift automates the deployment of application containers across multiple Node hosts via the Kubernetes scheduler. Users can automatically trigger deployments on application changes and do rollbacks, configure A/B deployments & other custom deployment types.



# Critical features for both Dev and Ops

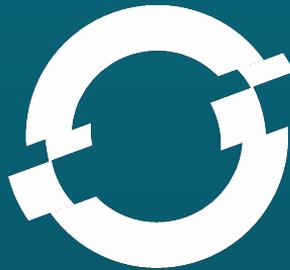
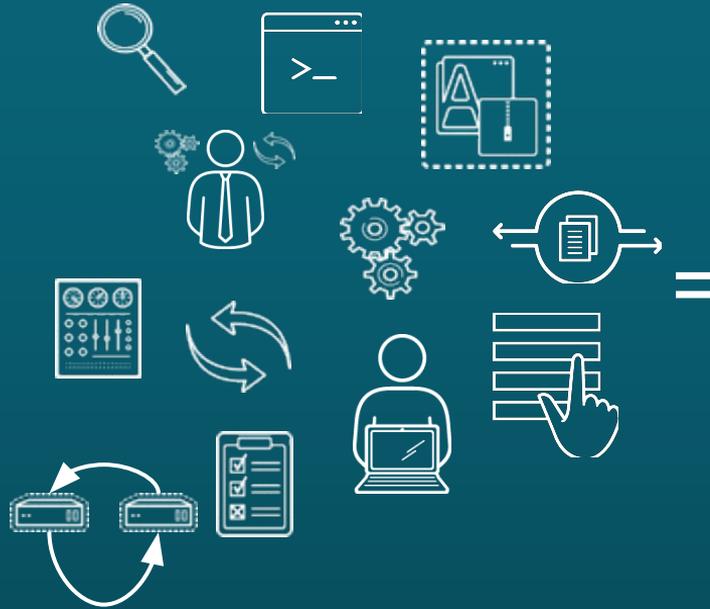


# A COMPLETE CONTAINER PLATFORM

YOU NEED A COMPLETE AND INTEGRATED CONTAINER PLATFORM TO SCALE

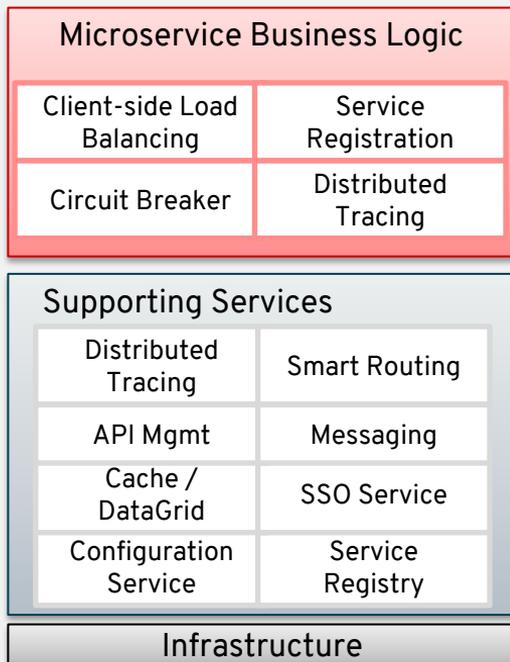


- Orchestration
- Build Automation
- Test Automation
- Deployment Automation
- Change management
- Self Service
- Logs & Metrics
- Security & Compliance
- Vulnerability scanning
- Monitoring
- Chargeback
- A secure Linux-OS

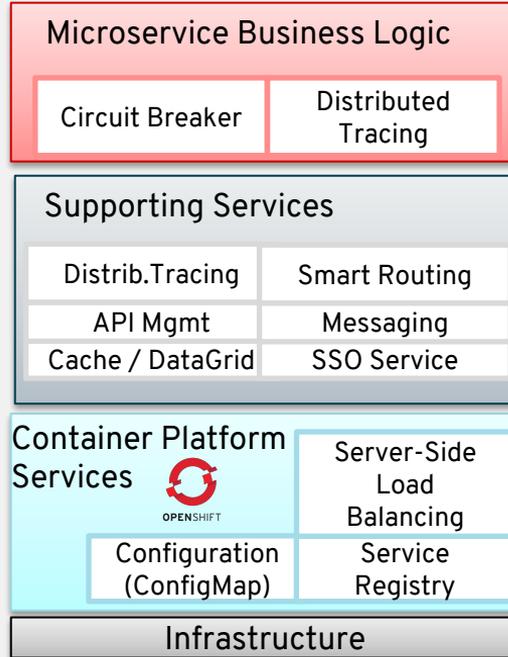
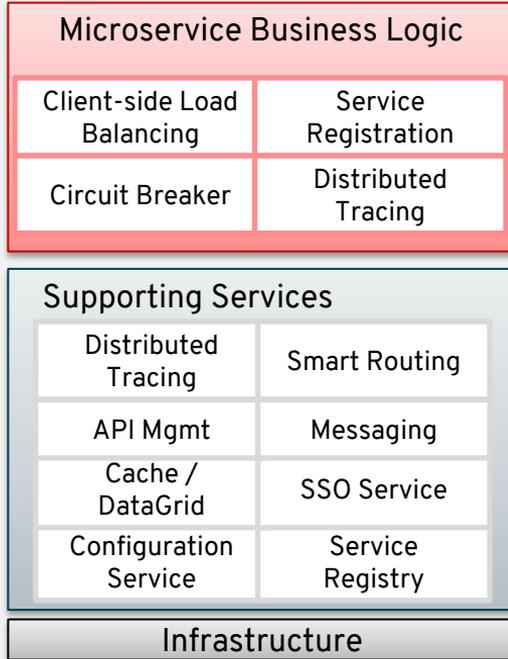


**RED HAT**  
OPENSHIFT

# EVOLUTION OF MICROSERVICES



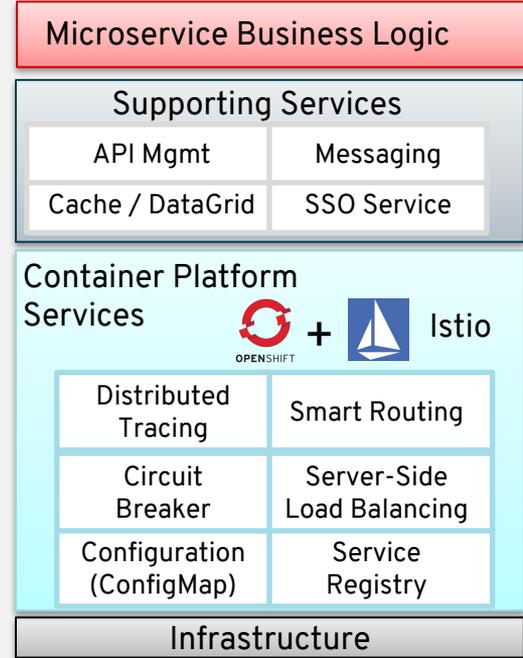
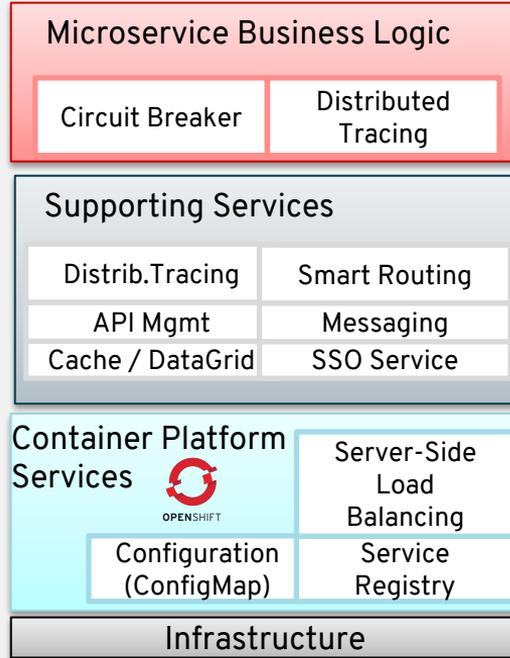
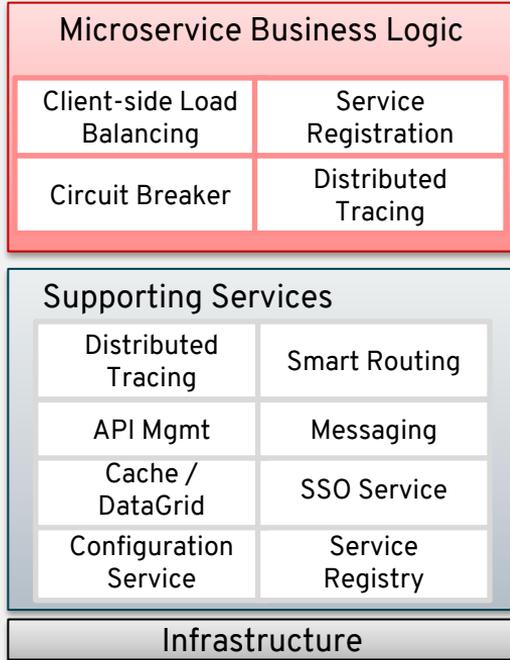
# EVOLUTION OF MICROSERVICES



2014

Current

# EVOLUTION OF MICROSERVICES



2014

Current

Future

**DEMO TIME**

# SCENARIOS

1. **Explore**
2. Get cloud-ready!
3. A new microservice?
4. Pipeline as code

# <https://learn.openshift.com>



**RED HAT**  
OPENSHIFT

## Interactive Learning Portal

Our Interactive Learning Scenarios provide you with a pre-configured OpenShift instance, accessible from your browser without any downloads or configuration. Use it to experiment, learn OpenShift and see how we can help solve real-world problems.

Getting Started  
with OpenShift for  
Developers

START SCENARIO

Logging in to an  
OpenShift Cluster

START SCENARIO

Deploying  
Applications From  
Images

START SCENARIO

Deploying  
Applications From  
Source

START SCENARIO

Using the CLI to  
Manage Resource  
Objects

START SCENARIO

Connecting to a  
Database Using  
Port Forwarding

START SCENARIO

Transferring Files  
in and out of  
Containers

START SCENARIO

**DEMO**

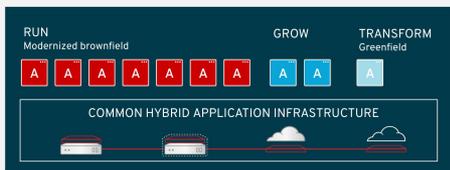
# SCENARIOS

1. Explore
2. **Get cloud-ready!**
3. A new microservice?
4. Pipeline as code

# RED HAT APPLICATION MIGRATION & MODERNIZATION PROGRAM

Red Hat provides the most comprehensive technologies, tools and services to support you

**TODAY** and **TOMORROW**



## COMBINE TRANSFORMATION

### CORE MIGRATION

EXISTING & NEW WORKLOADS

APPLICATION SERVERS

ESB & INTEGRATION PLATFORMS

BPM & DECISION MANAGEMENT

APPLICATION INFRASTRUCTURE

### MODERNIZATION INITIATIVES

ENABLING BUSINESS VELOCITY

BETTER SOFTWARE ARCHITECTURE

AGILE INTEGRATION

STREAMLINE APPLICATION LIFECYCLE

CONTINUOUS INNOVATION

Migration  Modernization

Making old apps new again  Modern app development

## BENEFITS



## APPROACH



## FACTORY



# http://bit.ly/mono-to-micro-labs

The screenshot shows a GitHub repository page for 'RedHat-Middleware-Workshops / modernize-apps-katacoda'. The repository has 8 watchers, 18 stars, and 21 forks. The current branch is 'master'. The file list includes:

File Name	Description	Last Commit
..		
01-moving-existing-apps.md	random typos	4 months ago
02-developer-intro.md	minor fixes for md syntax	a month ago
03-mono-to-micro-part-1.md	Removed all the hashbangs causing an issue with Katacoda.	7 days ago
04-mono-to-micro-part-2.md	minor fixes for md syntax	a month ago
05-reactive-microservices.md	Removed all the hashbangs causing an issue with Katacoda.	7 days ago
06-resilient-apps.md	Removed all the hashbangs causing an issue with Katacoda.	7 days ago
README.md	updated docs for use with cdk/rhps	5 months ago

The README.md file is expanded, showing the following content:

## Scenario Index

- Scenario 1 - [Moving existing apps to the cloud](#)
- Scenario 2 - [A Developer Introduction to OpenShift](#)

# PERFORMANCE MATTERS

Runtime <sup>[1][2]</sup> (framework)	Boot time server only	Boot time including app deployment	Memory usage without load	Memory usage under load	Measured <sup>[3]</sup> throughput
JBoss EAP (Java EE)	2 - 3 sec	<b>3 sec</b>	40 MB	<b>200 - 400 MB</b>	<b>23K req/sec</b>
JBoss EAP (Spring)	2 - 3 sec	7 sec	40 MB	500 - 700 MB	9K req/sec
JBoss WS/Tomcat (Spring)	<b>0 - 1 sec</b>	8 sec	40 MB	0.5 - 1.5 GB	8K req/sec
Fat JAR (Spring Boot)	N/A	<b>3 sec</b>	<b>30 MB</b>	0.5 - 2.0 GB	11K req/sec

Don't believe it? Try it out yourself <http://bit.ly/modern-java-runtimes>

[1] The microservice is a simple REST application.

[2] All runtimes are using their default settings

[3] The performance test was conducted with ApacheBench using 500K request with 50 users and keep-alive enabled.

**DEMO**

# SCENARIOS

1. Explore
2. Get cloud-ready!
- 3. A new microservice?**
4. Pipeline as code

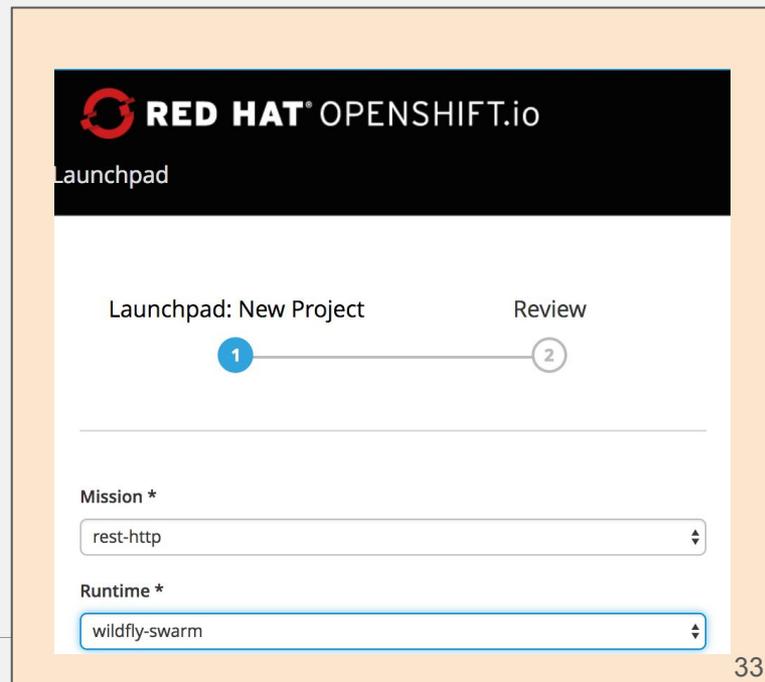
# CLOUD-NATIVE RUNTIMES



<http://developers.redhat.com/launch>

## Cloud Native Samples in the Cloud

- Accelerate the learning / evaluation experience
- Collection of cloud native examples
- Leverage the platform
- Runs entirely in OpenShift
  - On Desktop or OpenShift Online
- Spring Boot, Vert.x, WildFly Swarm



The screenshot shows the 'Launchpad: New Project' interface on the Red Hat OpenShift.io platform. At the top, the Red Hat logo and 'RED HAT® OPENSIFT.io' are displayed. Below the logo, the word 'Launchpad' is visible. The main content area features a progress indicator with two steps: '1' (highlighted in blue) and '2' (in a grey circle). Below the progress indicator, there are two dropdown menus: 'Mission \*' with 'rest-http' selected, and 'Runtime \*' with 'wildfly-swarm' selected. The interface is framed by a light orange border.

**DEMO**

# SCENARIOS

1. Explore
2. Get cloud-ready!
3. A new microservice?
4. **Pipeline as code**

<https://github.com/jbrannst/ola>



**DEMO**

# **Container Application Platform Service**

## **HCL Global Shared Services**

**Fredrik Björkman – Technical Service Component Lead**

# Container Application Platform Service

## Fully managed

Includes everything from hardware to supported middleware, making up a complete platform for building and running containerized applications.

## Metrics

Infrastructure and application metrics as part of the service

## Registry

Includes both cluster internal and external container registry services

## Logging

Aggregated logging and analytics of data for your workloads included

## Lifecycle

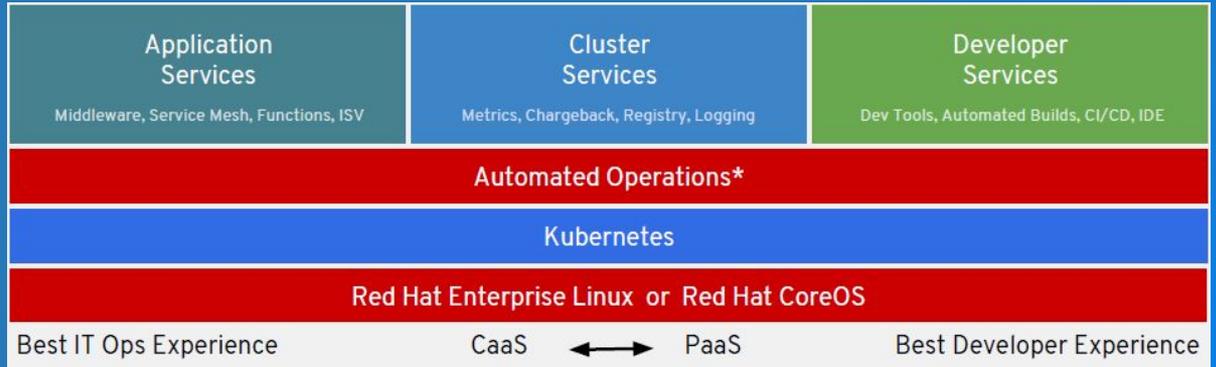
Following Red Hat 4 month release cycles

## Freedom of choice

CaaS and PaaS, bring you own containers or build them on the platform

## Red Hat Stack

Using RHV, Ansible, Cloudforms and Satellite to benefit from integrations and have one support path



# Delivery Model

## Self-service

ServiceNow integration for ordering of projects

## Flexible price model

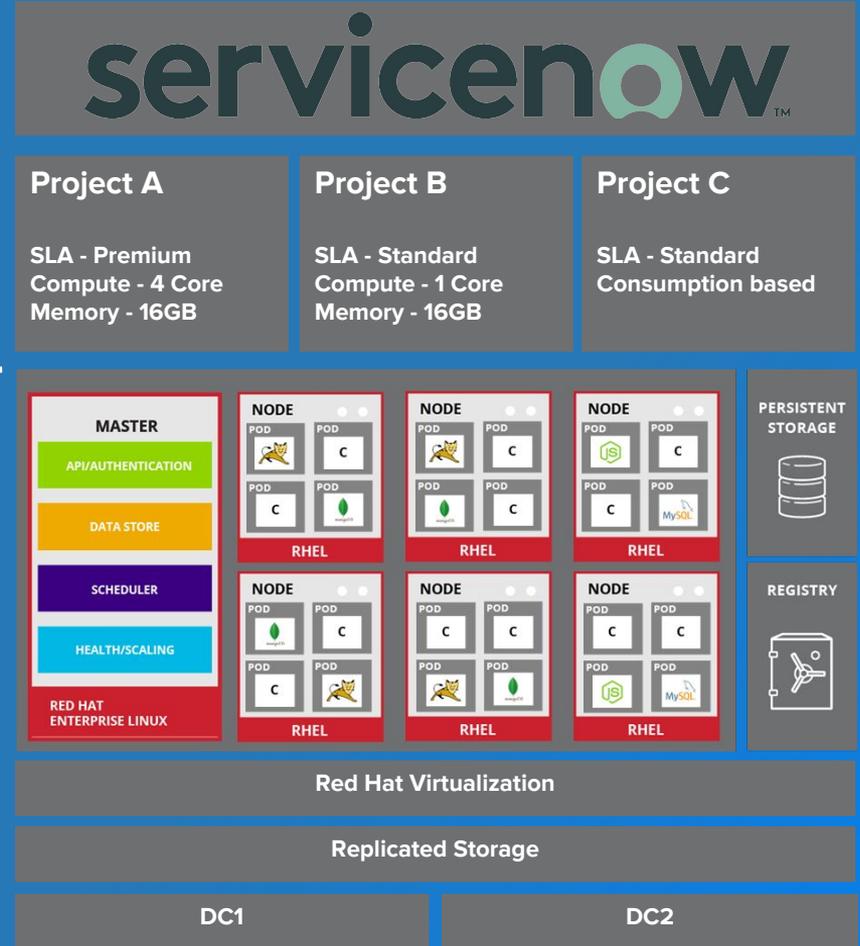
Allocation of resources per project or consumption of memory and millicore of cpu. SLA not connected to capacity

## Middleware included

JBoss EAP subscriptions included. More coming in the roadmap

## Managed stack

No need for users to be aware of integrated components



# Delivery Model

## Projects for Multitenancy

Projects bring isolation for communication and user access. Splitting staging environments, applications, organizations etc

### SLA

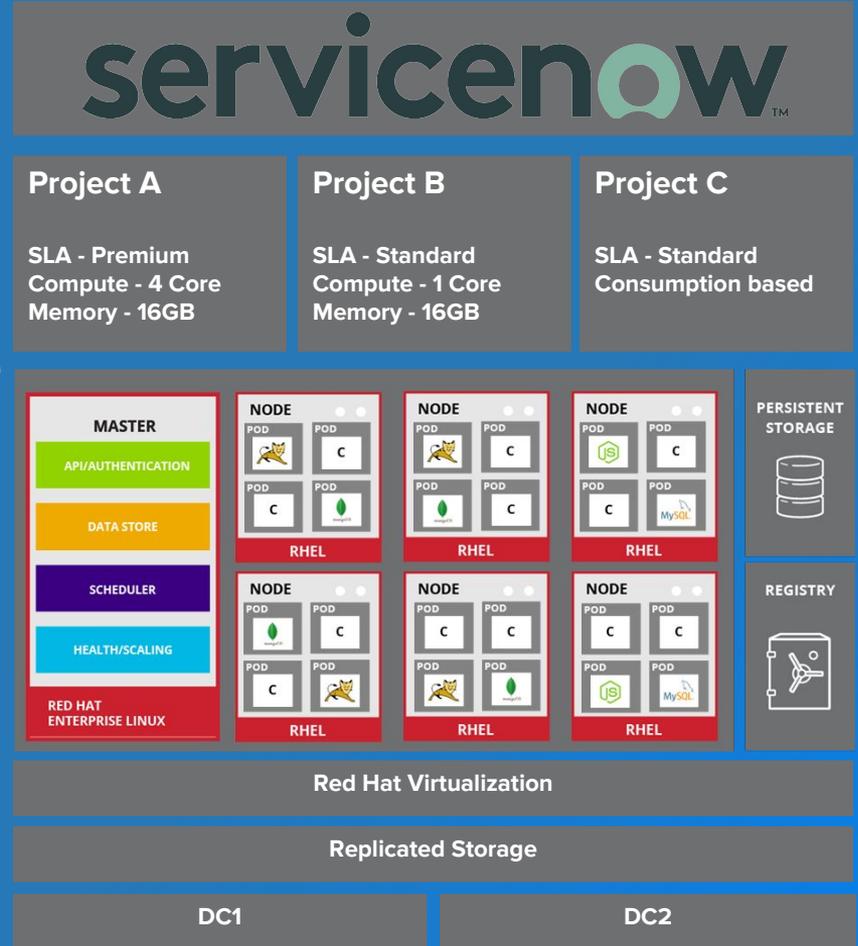
Basic 98% Availability  
Standard 99,7% Availability  
Premium 99,9% Availability  
and two zones

## Storage on-demand

Persistent storage is provided in storage classes and provisioned directly by the user inside the platform

## Managed stack

No need for users to be aware of integrated components



# Current Volumes

## Launch

- Platform been available for about one year for selected development teams
- Official launch in July

## Applications

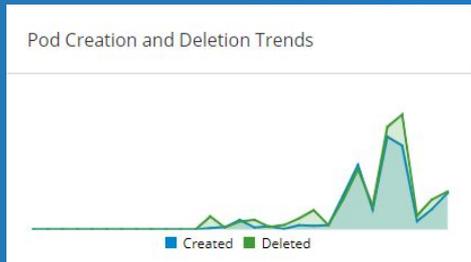
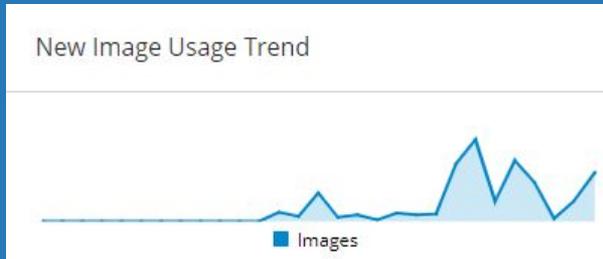
- 25 different applications

## Resources

- 250 cores and 800Gb Allocated to projects

## Projects

- 70 active projects, increasing every week
- Typically we see one project per app and staging environment



	 922 Pods	 1655 Containers	 15 Registries	 77 Projects
		 491 Services	 8183 Images	 399 Routes

# Some of the Current use cases

## Splitting application

- Service and parts framework
- Developing in python and java on spring boot
- Running Jenkins inside platform to build containers
- Using opens source projects like rabbitmq, Apache Camel and Karaf
- Using Netflix Hystrix Circuit Breaker

## Lift and shift

- Multiple
- Developing in java on JBoss EAP
- Using external jenkins to build containers

## New Build

- Mobile app backend
- Developing in smalltalk and c++
- Using open source projects nginx, redis, and elastic as supporting services
- Running “pilot production”

## Monolith to Micro services

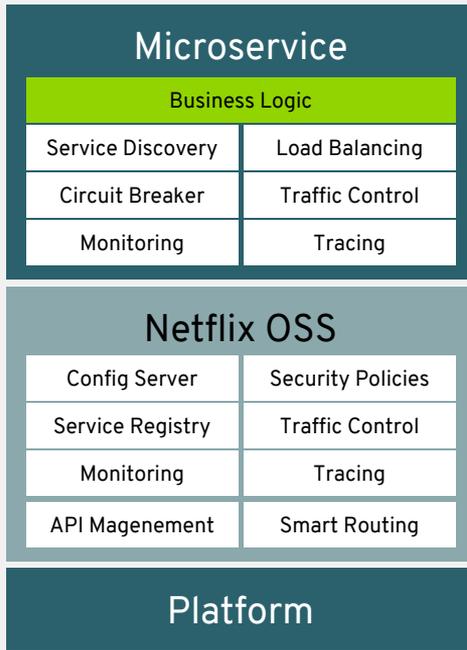
- Sales and order system
- Developing in .net core
- Using s2i, building containers in Openshift from a TFS pipeline
- First application to get into production
- 3 services is going into production this week

## Application backend services

- Platform for application portfolio, providing things like auth, tracing, metrics and monitoring
- Developing in java on spring boot and go
- Using many open source projects such as MongoDB, PostgreSQL, Jaeger, Jenkins, Prometheus/Grafana and Artemis
- First application using this backend services is planned for production in March

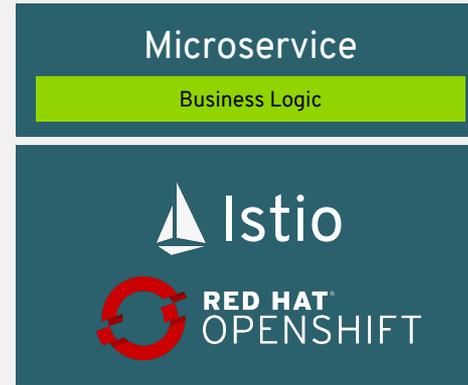
**Thank You!**

# CLOUD-NATIVE EVOLUTION



2012

Connect, Manage, and Secure Microservices with Istio on OpenShift

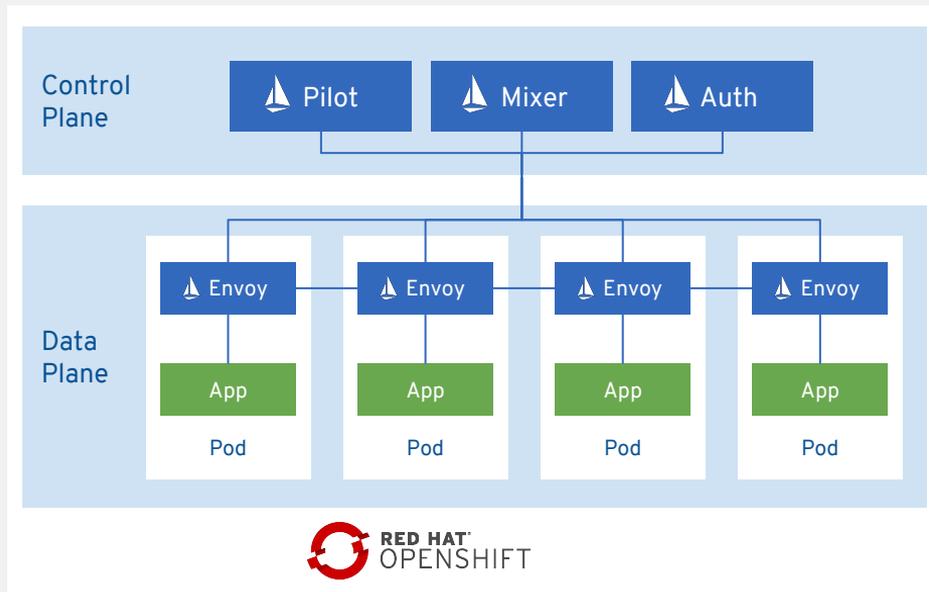


2018

# ISTIO SERVICE MESH

A Service Mesh to Connect, Manage, and Secure Microservices, transparently

- Intelligent Routing
- Load Balancing
- Service Resilience
- Telemetry and Reporting
- Policy Enforcement



**WANT MORE?**

# <https://blog.openshift.com/>



PRODUCTS ▾

LEARN ▾

COMMUNITY ▾

SUPPORT ▾

FREE TRIAL

SIGN IN >

## Blog

### [Podcast] PodCTL #47 – VM Admin vs Container Admin

AUGUST 30, 2018 BY BRIAN GRACELY



This week, we were watching as fall trade show season got started and we noticed that one of the Container 101 sessions had a packed room. This led to a discussion about how many people were still at the 101 stages of container knowledge. TL;DR – it's still a lot! So we thought it would [...]

[Read More...](#)

### Providing Applications and Services Worldwide Easily and Quickly at Porsche Informatik

AUGUST 24, 2018

BY CHRISTIAN KÖBERL, SOFTWARE ARCHITECT, PORSCHE INFORMATIK AND JOHANNES CRUMBÖCK, INFRASTRUCTURE ARCHITECT

Search the blog



#### CATEGORIES

Containers (78)

CoreOS (3)

Educators (14)

Events (318)

Kubernetes (93)

News (415)

OpenShift Commons (151)

OpenShift Ecosystem (246)

Operator Framework (2)

Products (714)

<https://docs.openshift.com/>

The screenshot shows the OpenShift Documentation website. At the top is a dark navigation bar with the Red Hat OpenShift logo on the left and menu items: PRODUCTS, LEARN, COMMUNITY, SUPPORT, FREE TRIAL, and SIGN IN. Below the navigation bar is a large hero image of a mountain range with a search bar overlaid in the center. The search bar contains the text "Search Documentation" and a magnifying glass icon. Below the hero image are four columns of content:

- OpenShift Online**: Red Hat's public cloud application deployment and hosting platform. Includes a button labeled "Online".
- OpenShift Container Platform**: Red Hat's private, on-premise cloud application deployment and hosting platform. Includes a button labeled "Select Version".
- OpenShift Dedicated**: Red Hat's managed public cloud application deployment and hosting service. Includes a button labeled "Dedicated".
- OKD**: OpenShift's open source, upstream project. Includes a button labeled "OKD Documentation" with an external link icon.

<https://developers.redhat.com/topics/microservices/>

redhat CUSTOMER PORTAL **DEVELOPER** OPENSIFT OPENSIFT.IO PARTNERS STORE Log In

RED HAT<sup>®</sup> DEVELOPER EVENTS TRAINING HELP PRODUCTS Q

Service Mesh Kubernetes **Microservices** DevOps Secure Coding Linux All Topics ▶

# Build Microservices

Microservices and microservice architecture is the modern approach to building cloud-native applications as independent services.

[DevNation Live] - Advanced Microservice Tracing with Jaeger

**Advanced Microservices Tracing with Jaeger**

One of the greatest challenges of moving from traditional monolithic application design to a microservices architecture is being able to

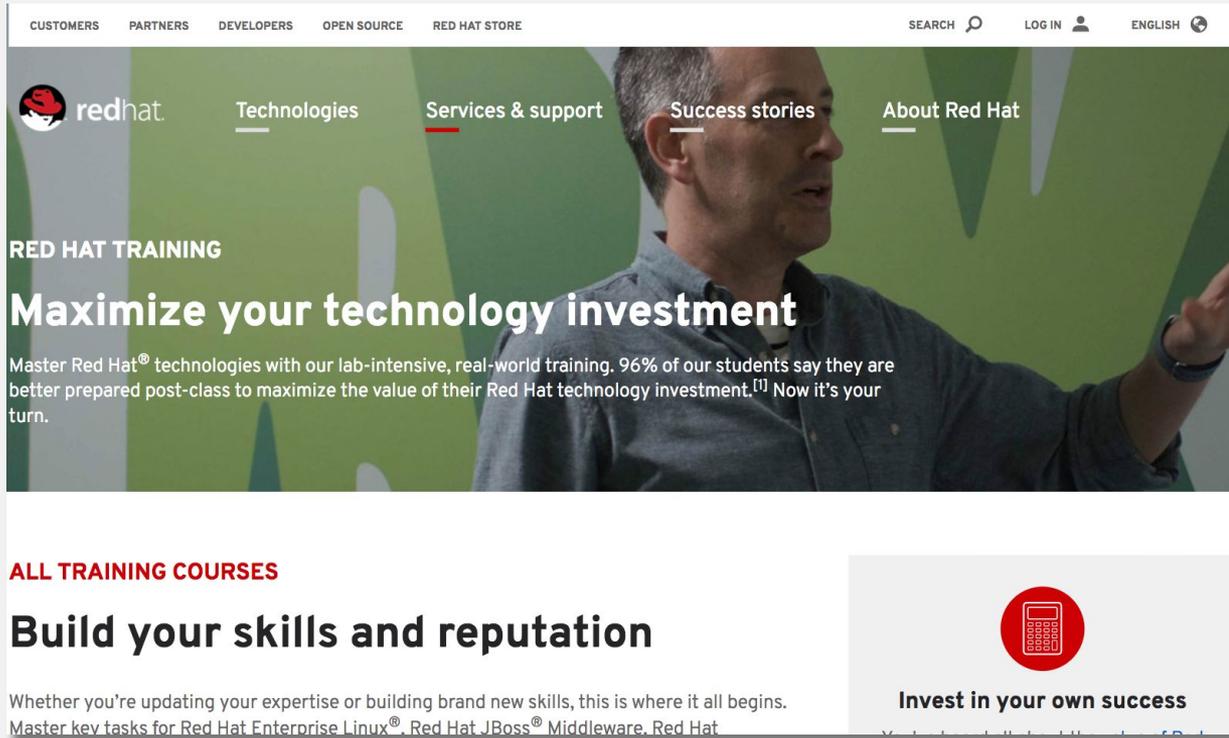
**ADVANCED MICROSERVICES TRACING WITH**

<https://developers.redhat.com/blog/tag/devnation-live/>



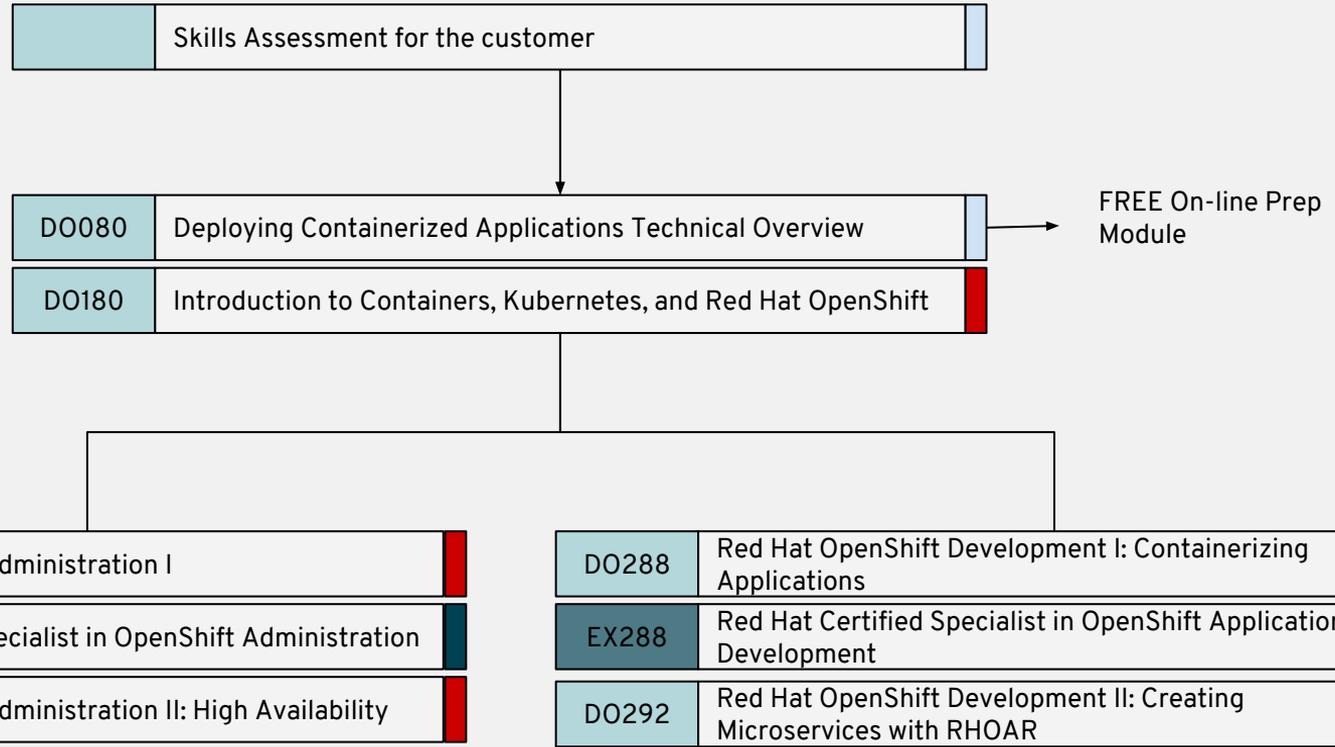
A collage of three overlapping blog post snippets from the DevNation Live series. The top snippet is titled "Next DevNation Live: Your Journey to a Serverless World—An Introduction to Serverless, June 7th, 12pm EDT" and includes a small "DEVNATION LIVE" logo with the tagline "Your journey to a serverless world—an introduction to serverless". The middle snippet is titled "Next DevNation Live: Jakarta EE: The Future of Java EE, May 3rd, 12pm EDT" and features a "DEVNATION LIVE" logo. The bottom snippet is titled "Next DevNation Live: Advanced Microservices Training with Jaeger, June 21st, 12pm EDT" and includes a small photo of a man in a cap and glasses speaking into a microphone.

<https://www.redhat.com/en/services/training>



The screenshot shows the Red Hat Training page. At the top, there is a navigation bar with links for CUSTOMERS, PARTNERS, DEVELOPERS, OPEN SOURCE, and RED HAT STORE. On the right side of the navigation bar, there are links for SEARCH, LOG IN, and ENGLISH. Below the navigation bar, the Red Hat logo is on the left, followed by a menu with links for Technologies, Services & support (which is underlined), Success stories, and About Red Hat. The main content area features a large image of a man in a blue shirt pointing. Overlaid on the image is the text 'RED HAT TRAINING' and 'Maximize your technology investment'. Below this, a paragraph reads: 'Master Red Hat® technologies with our lab-intensive, real-world training. 96% of our students say they are better prepared post-class to maximize the value of their Red Hat technology investment.<sup>[1]</sup> Now it's your turn.' Below the main text, there is a section titled 'ALL TRAINING COURSES' and 'Build your skills and reputation'. A sub-section on the right is titled 'Invest in your own success' and features a red circular icon with a white grid pattern.

# Red Hat OpenShift Training Roadmap



# MULTIPLE WAYS TO LEARN TO FIT DIFFERENT LEARNING STYLES



## ON-SITE TRAINING

Private, on-site training and exams delivered at your location, at one of our training centers, or online.



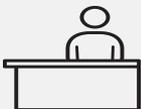
## VIRTUAL TRAINING

Live, instructor-led online training with the same high-quality, hands-on labs you'd find in our classrooms.



## On-line/VIDEO CLASSROOM

Interactive “in-classroom” access to Red Hat’s most popular courses, presented by experienced instructors, and recorded in high definition (HD) video.



## OE CLASSROOM TRAINING

Train and test in a professional classroom environment led by Red Hat certified instructors.



## RED HAT LEARNING SUBSCRIPTION

One year of access to all of our online learning content (more than 42 courses), high-definition (HD) video courses on select titles, and up to 400 hours of lab time, all from a single service at a low price.

# JUMPSTART YOUR MODERNIZATION WITH RED HAT OPEN INNOVATIONS LABS

## MODERNIZE TRADITIONAL APPS

- Extend applications
- Optimize applications
- Scale applications
- Expose to orchestration

## INNOVATION ACCELERATED

## DEVELOP CONTEMPORARY APPS

- Develop on PaaS environment
- Transform how you design and develop apps
- Adopt lean and agile principles
- Master DevOps practices



### COLLABORATION

Space to work,  
innovate, and discuss



### RESIDENCY

An eight-week accelerated  
teaming engagement



### COMMUNITY INCUBATION

Communities  
supporting innovation

# INNOVATION LABS PROCESS

PRE-WORK

Discovery session

RESIDENCY

Agile, Lean, DevOps

CONTINUOUS LEARNING

RETROSPECTIVE

Backlog and roadmap

PUSH-BUTTON  
INFRASTRUCTURE

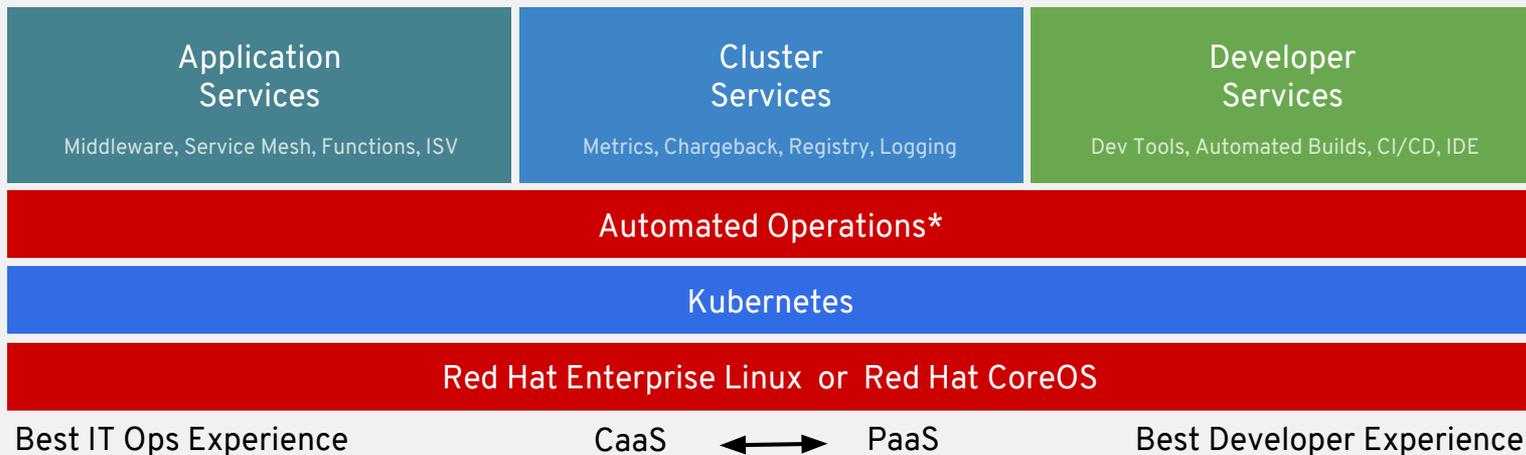


DEMO DAY



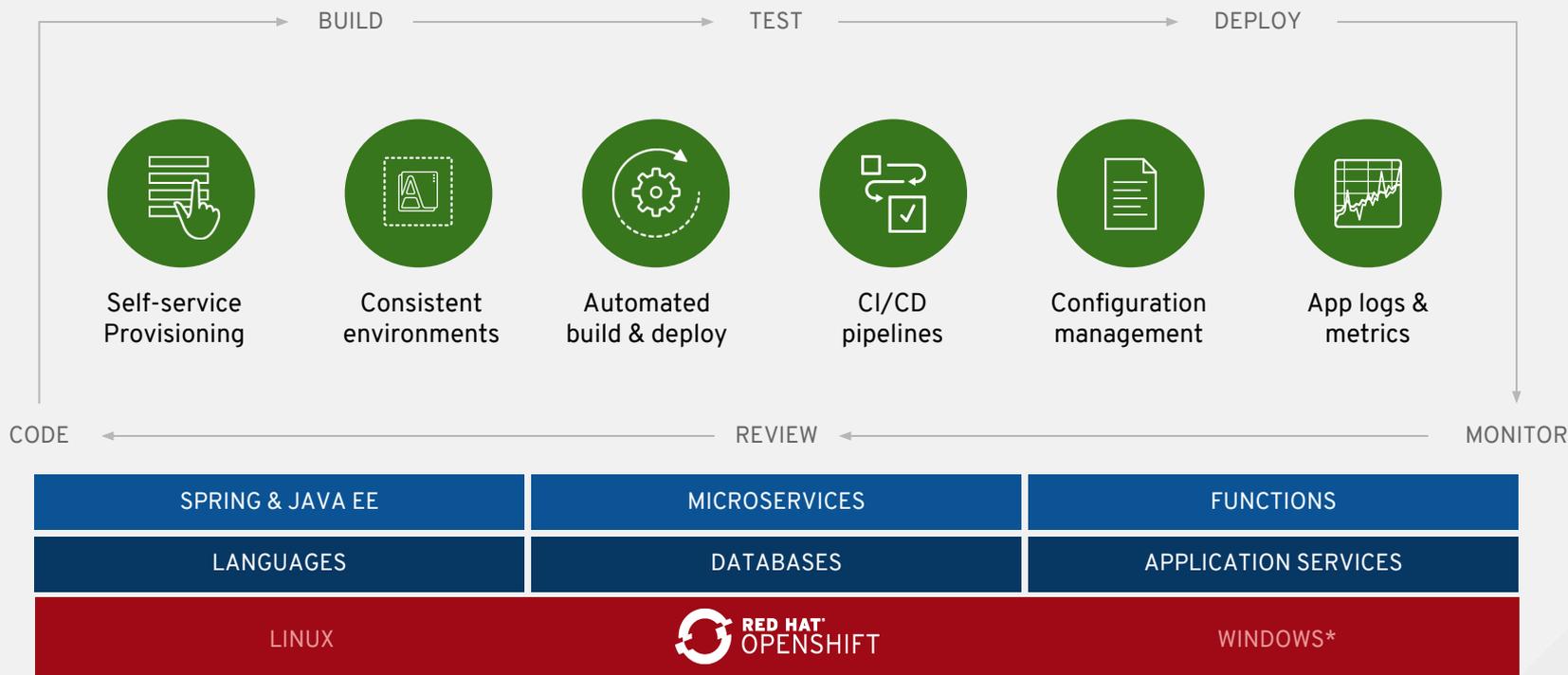
**THANKS!**

# REFERENCE ARCHITECTURE FOR ENTERPRISE KUBERNETES



\*coming soon

# HOW OPENSHIFT ENABLES DEVELOPER PRODUCTIVITY



\* coming soon

GENERAL DISTRIBUTION