



# TECH UPDATE Q1 2018

Copenhagen February 21st

Jacob Borella  
Solution Architect

# AGENDA

08:45 - 09:00

Breakfast and registration

09:00 - 10:00

JBoss EAP - what's new and what's ahead?

10:10 - 11:00

OpenShift Application Runtimes - why, when, what?

The background features a low-angle, upward-looking perspective of several modern skyscrapers with glass facades. The entire image is overlaid with a semi-transparent red filter. A prominent diagonal line, also in red, runs from the top right towards the bottom left, creating a sense of dynamic movement and depth. The text is centered horizontally and vertically within the frame.

# **RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM**

# RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7



User



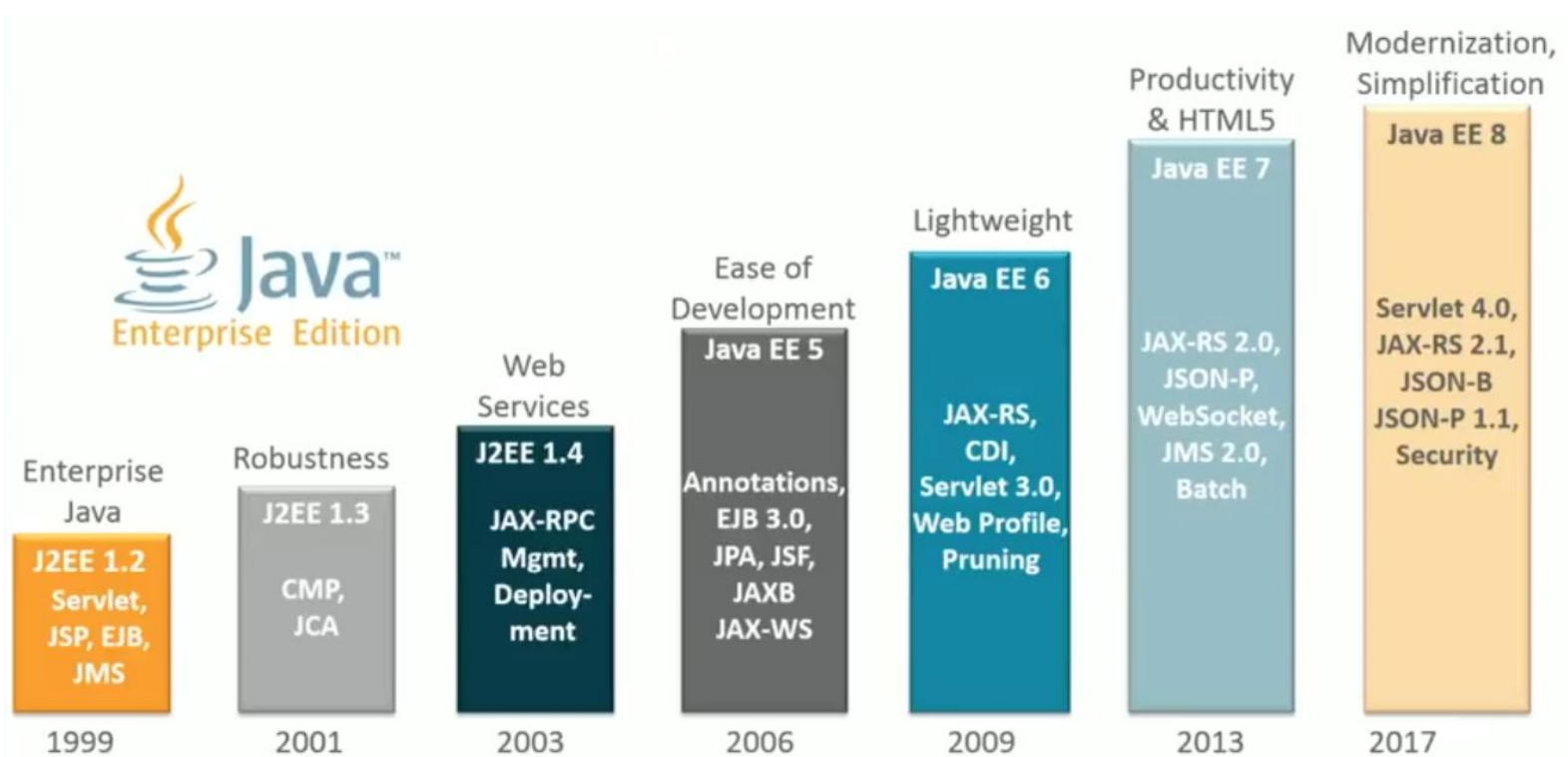
Application Server



Database



# Java EE 8 - The Next Step



# Eclipse Enterprise for Java - EE4J

Moving Java EE to Eclipse Foundation



Community  
and  
Vendors

The Eclipse logo (a blue circle with three white horizontal lines) is followed by the word "eclipse" in a dark blue, lowercase, sans-serif font. Below it, "Enterprise for Java" is written in a smaller, dark blue, sans-serif font. Below the logo and name, there is a list of four features, each preceded by a checkmark:

- ✓ Nimble
- ✓ Flexible
- ✓ Open
- ✓ Compatible

<https://projects.eclipse.org/projects/ee4j/>

# ORGANIZATIONS WILL CONTINUE TO RUN ON-PREMISE WORKLOADS



Enterprise Strategy Group | Getting to the Bigger Truth™ | September 4th, 2017

CONVERGED INFRASTRUCTURE INSIGHT

# 91%

of organizations expect that  
**AT LEAST HALF** of their  
applications and workloads will  
still run on-premises in five years



Source: ESG Brief, *On-premises Infrastructure Is the Key to Hybrid Cloud*, June 2017.

# RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7

## Overview

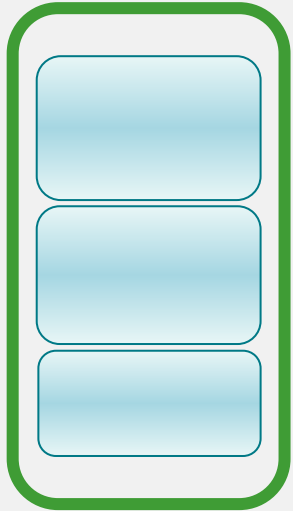
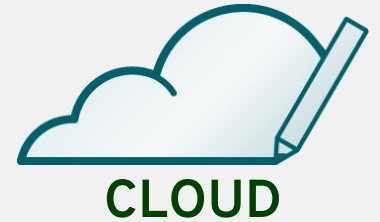
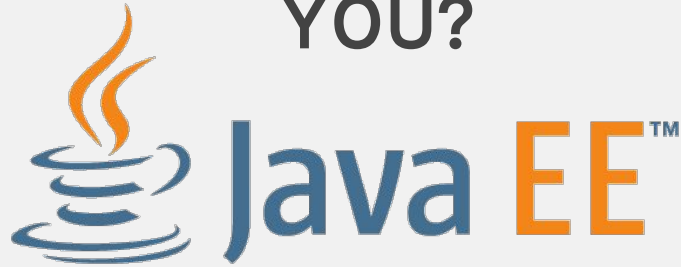
- Full Java EE 7 + enterprise features + open source innovation
- Lightweight footprint
- Seconds to start up
- Optimized for cloud, and containers
- Built to maximize developer productivity, minimize administrative work
- Flexible, comprehensive subscription
- Simplified and unified security (exists in parallel with legacy sec)

# RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7

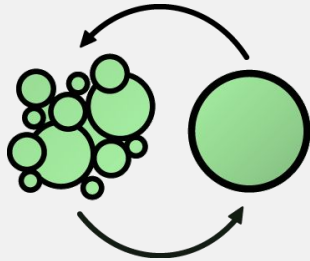
## Benefits

- Reduce, reuse: Free up resources from maintenance
- Meet a diverse range of Java app requirements
- Build once, deploy anywhere - all with a single subscription
- DevOps integrated: Get apps out faster, and more frequently
- Reduce time and effort on maintenance, updates large scale deployments

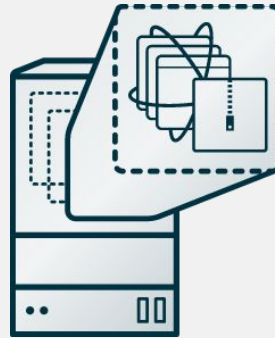
# HOW CAN JEE HELP YOU?



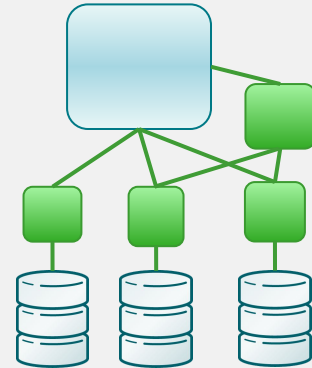
**MONOLITHIC**



**DEVOPS**



**CONTAINERS**



**MICROSERVICES**



# RED HAT JBOSS EAP DELIVERS GREAT VALUE



3 Year  
ROI

**481%**



Average Annual  
Benefits per  
100 Users

**\$50K**



Payback  
Period

**8  
MONTHS**

## Average Annual Benefits per 100 Users

Business Productivity  
Benefits



**\$11K**

IT Staff Productivity  
Gains



**\$21K**

IT Infrastructure  
Cost Reductions



**\$10K**

## Risk Mitigation and Application Development Impact

Number of new  
applications  
released per year

**43%**  
More

Time to  
deliver new  
application

**21%**  
Faster

Number of new  
features released  
per year

**38%**  
More

Productive hours lost  
due to unplanned  
downtime per year

**74%**  
Less

# VERSION CADENCE - JAVA EE / COMMUNITY / PRODUCT

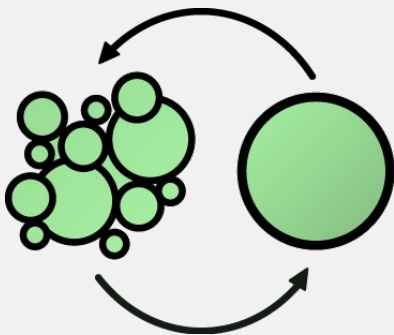
Product		Community project		Java EE specification
JBoss EAP 6.*	→	JBoss AS 7.*	→	Java EE 6
JBoss EAP 7.0	→	WildFly 8,9,10	→	Java EE 7
JBoss EAP 7.1	→	WildFly 11	→	Java EE 7

**RED HAT® JBOSS®**  
ENTERPRISE  
APPLICATION PLATFORM 7



# RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7

## Key features



**DEVOPS  
PRODUCTIVITY**

- World class developer productivity
- Web console, quickstarts, Red Hat Developer ecosystem
- Streamlined administration and maintenance of even large domains
- Seamless and minimally disruptive system updates
- Compatibility and interoperability with previous JBoss Enterprise Application Platform versions

# RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7

## Key features



**BUSINESS -  
FLEXIBLE  
SUBSCRIPTION**

- Business flexibility - build once, deploy everywhere
- Includes JBoss Core Services Collection
- Award-winning support
- Patches, updates, bug fixes

# WHAT'S NEW IN EAP 7.1

# RED HAT JBOSS EAP 7.1

## Key features

- HTTP/2 support
- Clustered Singleton MDBs
- Web console improvements
- Server graceful startup
- Server Suspend / Graceful Shutdown for transactions
- Transaction metrics for JMS and JCA resources
- CLI enhancements
- Remote JBoss AMQ 7 integration



# RED HAT JBOSS EAP 7.1

## Key features

- Domain management fault tolerance enhancements
- Management notifications
- Performance Tuning Guide
- Security Simplifications: New alternative security subsystem: Elytron
  - Remoting Security Context Propagation
  - More Standards Support (SASL, etc.)
  - Unified and consistent SSL configuration
  - Legacy subsystem (PicketBox) still works by default.
    - Compatibility for legacy Security Domains and user login modules
- FIPS 140-2 Compliant Cryptography for
  - SSL/TLS configuration for Web
  - The new Credential Store

# NEW TESTED CONFIGURATIONS

- Operating Systems
  - Windows Server 2016 (and on Azure)
  - RHEL Latest update
- Databases
  - SQL Server 2016 SP1 (and on Azure)
  - Sybase 16
  - MariaDB Galera DB Cluster 10.1
- JMS Provider
  - Red Hat JBoss AMQ 7.0.Latest
  - IBM WebSphere MQ 8

# NEW TESTED CONFIGURATIONS CONT.

- LDAP Directory Services
  - Windows 2016 Active Directory
  - Red Hat Directory Services 10.1
- Frameworks
  - Spring 4.3, Spring Security 4.2, and other Spring minor upgrades
  - JQuery and AngularJS minor upgrades
  - ShrinkWrap and Arquillian minor upgrades

# SECURITY SIMPLIFICATIONS AND ENHANCEMENTS 1(3)

- New alternative security subsystem: **Elytron**
- Goals
  - Unified security framework and subsystem
    - `<subsystem xmlns="urn:wildfly:elytron:1.0" />`
  - Unified consistent SSL configuration
  - Remoting Security Context Propagation
  - More Standards Support (HTTP, SASL mechanisms Kerberos/GSSAPI, JACC etc.)
- Backward Compatibility with legacy security

# SECURITY SIMPLIFICATIONS AND ENHANCEMENTS

## 2(3)

- Authentication
  - HTTP Authentication mechanisms DIGEST, BASIC, FORM etc.
  - SASL Authentication mechanisms DIGEST-MD5, GSSAPI/Kerberos, etc.
- Authorization
- SSL / TLS
- Secure Credential Store

# SECURITY SIMPLIFICATIONS AND ENHANCEMENTS 3(3)

- Backwards compatibility: Legacy subsystem (PicketBox) still works by default
  - Compatibility for legacy Security Domains and user login modules
- WildFly Elytron Tool for create/update new Credential Stores
  - Converts password vaults to credential stores
- FIPS 140-2 Compliant Cryptography for
  - SSL/TLS configuration for Web
  - The new Credential Store
- The management CLI supports using PKCS11 keystores / truststores
- Common Criteria Certification (CCC) (Post-GA)



# TRANSACTIONS

- Graceful Shutdown / Server Suspend implementation for Transactions
  - Once suspended, the server will not accept new transactions, prepared transactions are allowed to continue until they complete or until the timeout period expires.
- Enhanced Transaction Monitoring
  - Metrics / Statistics for transaction resources, datasources and messaging.
  - Metrics such as # of Committed Tx, average commit time, # of transaction system Rollbacks

# HIGH AVAILABILITY AND PERFORMANCE

- New Load Balancing Profile
  - Preconfigured Profile to run EAP / undertow as a load balancer.
  - Standalone: standalone-load-balancer.xml / Domain: load-balancer
- Performance Tuning Guide Documentation
- Sizing Guide (Post-GA)
- HTTP Load balancing of JNDI, EJB invocations (Tech. Preview)

# MESSAGING

- JDBC Store for messaging journal persistence
  - Oracle 12c, Oracle 12c RAC
  - Other databases (EAP Next)
- Remote JBoss AMQ 7 integration

# OpenShift alignment

- JBoss EAP 7.1 image was released in January 2018
- Additional Performance improvements/slimming is also being added to EAP 6.4, EAP 7.0 images

# SERVER MANAGEMENT

- Start Server in Suspended Mode
- Management and JMX Notifications for Monitoring
  - Ability to register a listener that will be notified of the lifecycle server events (Server Started, Suspended etc.)
  - Users will be able to do custom registration of JMX listeners
- Domain Fault Tolerance
  - Automatic reconnection of Slaves to the DC
  - Performance Improvements

# MONITORING UPDATE

- Tech preview middleware monitoring capabilities have been removed from CloudForms
- JBoss Operations Network will be available until 2020
- 3rd party solutions exist
- For OpenShift, Prometheus and Jaeger will be productized



# JDK UPDATE

# Oracle JDK distribution

- Red Hat will no longer distribute Oracle JDK in Red Hat rpm channels
  - As of November 30, 2017 for new customers
  - As of November 30, 2018 for existing customers
- We will still distribute OpenJDK

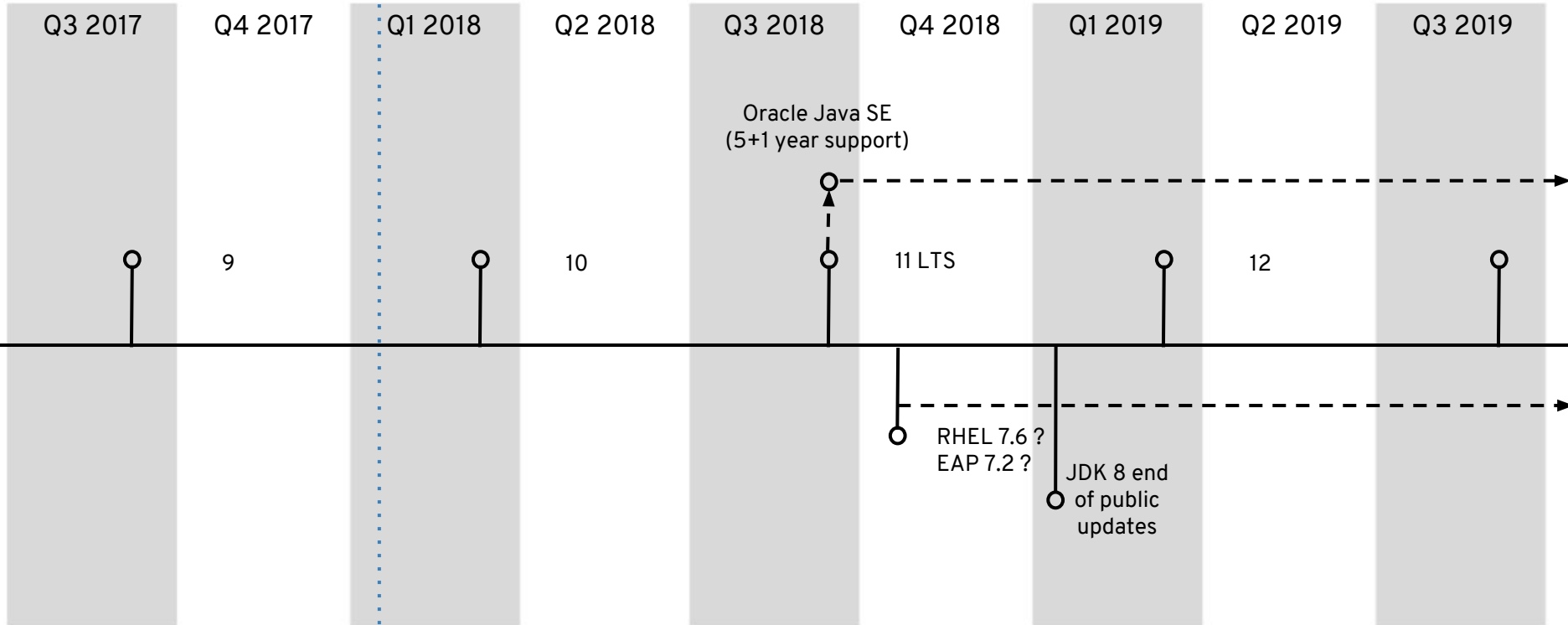
# OpenJDK 9 / Oracle JDK 9 STATUS

- Time-bound (6-month cadence) feature releases
- Non-LTS Releases
  - no public patches after next release
  - no overlapping patches
- LTS Releases (starting with version 11 - 18.9)
  - Oracle JDK only - commercial support
  - Premier - 5 years
  - Extended - 3 years
- Oracle's JDK will have a GPL license so it can be distributed with Linux
- Open Sourcing remaining Java SE add-ons - Flight Recorder, Mission Control - timeline is TBD, free distribution license until then
- Ultimately OpenJDK and Oracle JDK will be *interchangeable*

# JAVA SE / OpenJDK 9 STATUS

- Oracle JDK / OpenJDK announcements :
  - Agile release process - 6 month release cadence with always feature complete main-line
  - Open Sourcing remaining Java SE add-ons - Flight Recorder, Mission Control - timeline is TBD, free distribution license until then
  - Oracle's JDK will have a GPL license so it can be distributed with Linux (in the same way as OpenJDK)
  - Ultimately OpenJDK and Oracle JDK will be *interchangeable*

# JDK ROADMAP



\* All dates are calendar years

\*\* Features and dates are subject to change

# JDK CUSTOMER Options

JDK 8 (or earlier) - community version

January 2019 (end of public updates)

- Move to Oracle JDK (for support until March 2022/25) - \$\$\$-\$\$\$\$
- Move to RHEL / OpenJDK (support until Oct. 2020) - \$-\$\$
- Move to JDK YY.M (free patches for 6 months) - no cost

JDK 8 (or earlier) - with commercial support

- No urgency - continue with commercial support, plan migration to JDK 9

New Projects

- Determine availability of tools and frameworks
- Choose JDK 8 / 9 accordingly

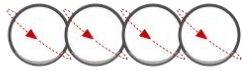
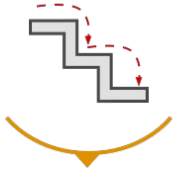


# JAVA EE EVOLUTION

# IT TRENDS

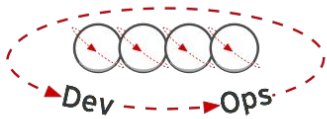
## Development Process

Waterfall



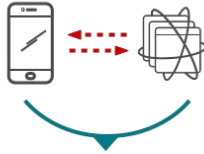
Agile

**DevOps**



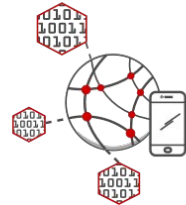
## Application Architecture

Monolithic



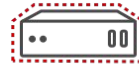
N-Tier

**Microservices**



## Deployment & Packaging

Physical Servers



Virtual Servers

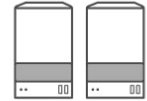


**Containers**



## Application Infrastructure

Datacenter



Hosted



**Cloud**







**Microservices** are being used to  
re-architect existing applications  
as much as for brand new projects

ACCORDING TO **67%** MIDDLEWARE CUSTOMERS  
& **79%** OPENSIFT CUSTOMERS

Source: Red Hat 2017 Microservices Survey.  
Conducted by TechValidate, Nov. 2017.



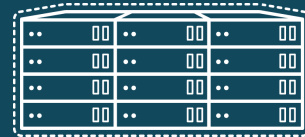
## Top 3 reasons Middleware customers are using or considering Java EE for microservices:



Java EE is a standard



No need to retrain developers



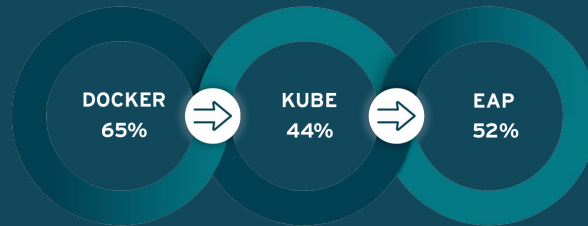
Trusted to run production

Source: Red Hat 2017 Microservices Survey.  
Conducted by TechValidate, Nov. 2017.




# 52%

of Middleware respondents are either using or considering JBoss EAP for microservices.



Source: Red Hat 2017 Microservices Survey.  
Conducted by TechValidate, Nov. 2017.

# RED HAT JBOSS EAP GREAT FOR MICROSERVICES

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 Web Profile) 	2 - 3 sec	<b>4 - 4.5 sec</b>	40 - 60 MB	<b>0.2 - 0.4 GB</b>	<b>15K req/sec</b>
JBoss EAP (Spring)	2 - 3 sec	9 - 12 sec	40 - 60 MB	0.5 - 0.7 GB	6.8K req/sec
JBoss WS/Tomcat (Spring)	<b>0 - 1 sec</b>	8 - 10 sec	40 - 60 MB	0.5 - 1.5 GB	8K req/sec
Fat JAR (Spring Boot)	N/A	4 - 6 sec	<b>30 - 50 MB</b>	0.5 - 1.5 GB	9K req/sec

JBoss EAP with Java EE Web Profile starts the fastest, consumes the least amount of memory under load and yet provides the highest throughput.

[1] The microservice is a simple hello world REST application.

[2] All runtimes are using their default settings

[3] The performance test was conducted with ApacheBench using 100K request with 50 users and keep-alive enabled.



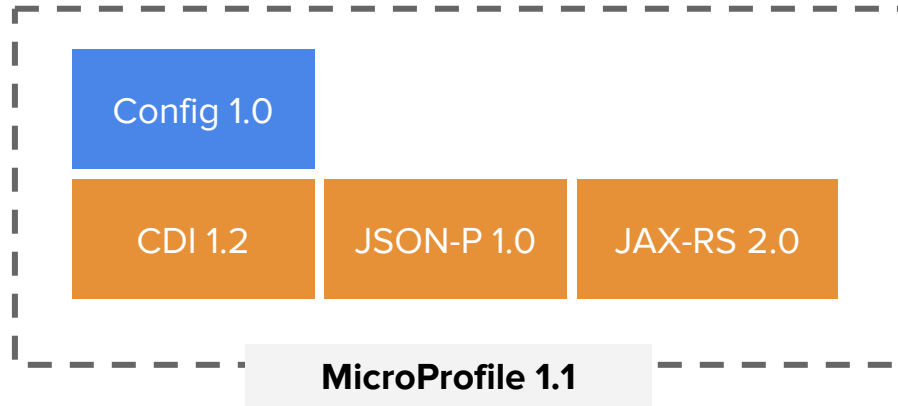
- Announced at DevNation 2016; now an Eclipse Foundation project
- Creates **open source** Java **microservices** specifications
- Just released **MicroProfile 1.3** (Dec, 2017) **1.4 in progress** (Mar)
- **WildFly Swarm** is **Red Hat's** implementation
- John Clingan (Red Hat) & Kevin Sutter (IBM) leads


# The Community



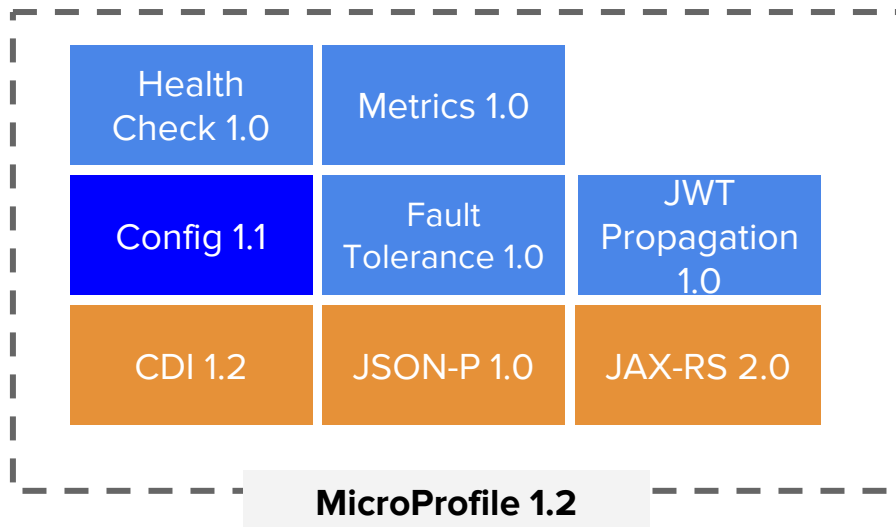





# Eclipse MicroProfile 1.1 (Aug, 2017)

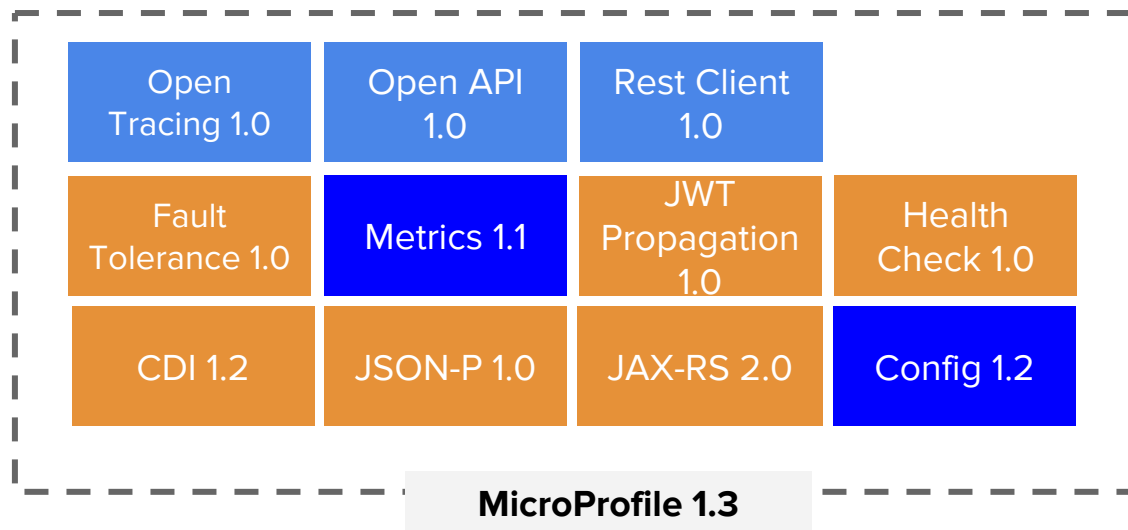





-  = New
-  = No change from last release



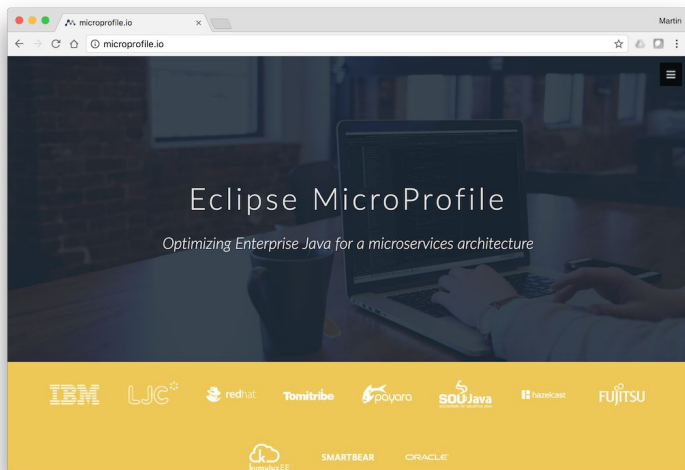


-  = New
-  = Updated
-  = No change from last release

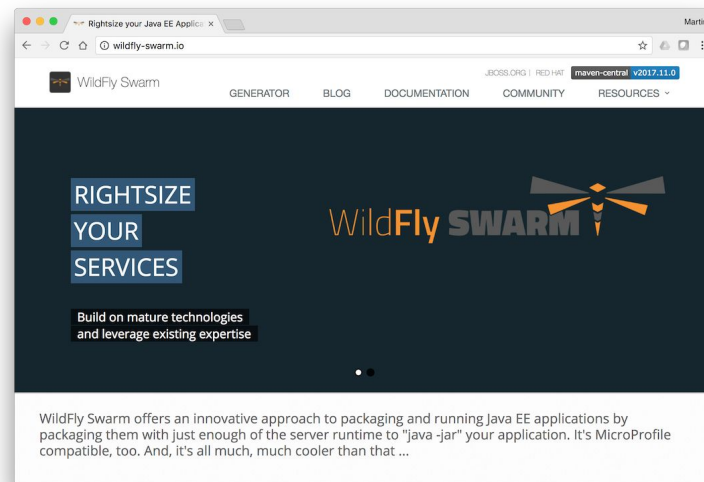


-  = New
-  = Updated
-  = No change from last release

## Resources



<http://microprofile.io/>



<http://wildfly-swarm.io>

# AGENDA

08:45 - 09:00

Breakfast and registration

09:00 - 10:00

JBoss EAP - what's new and what's ahead?

10:10 - 11:00

OpenShift Application Runtimes - why, when, what?

A low-angle, upward-looking photograph of several modern skyscrapers with glass facades. The image is heavily stylized with a semi-transparent red overlay that covers most of the frame. The buildings are arranged in a way that they appear to converge towards the top center, creating a sense of height and scale. The red overlay is not uniform, with some areas being darker than others, and there are some dark, angular shapes in the bottom right corner that look like they might be part of a different building or a shadow.

# OpenShift Application Runtimes

# SOFTWARE DEVELOPMENT IS CHANGING



Waterfall



Agile



DevOps

**Process**



Datacenter



Hosted



Cloud

**Infrastructure**



Monolith



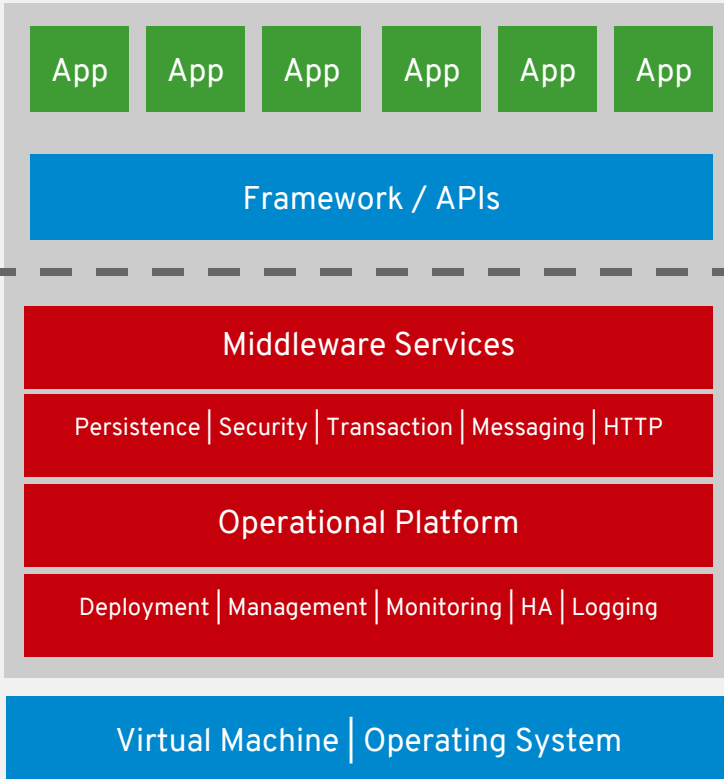
N-Tier



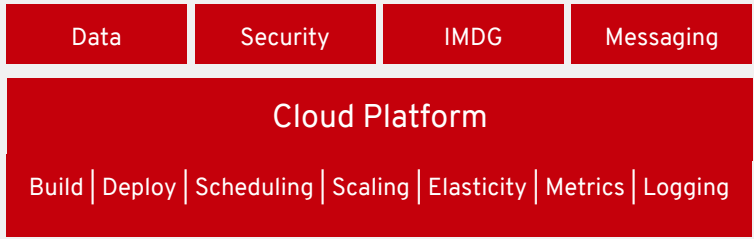
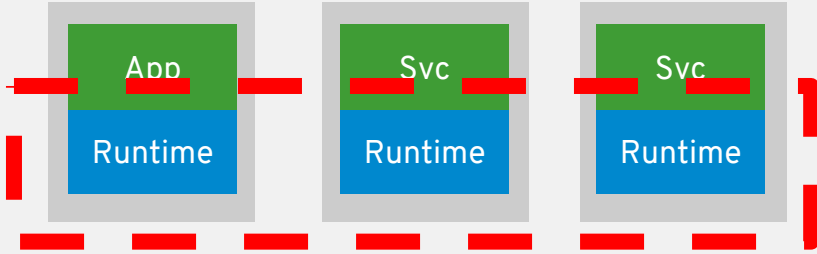
Microservices

**Architecture**

# THE APPSERVER 2000-2014

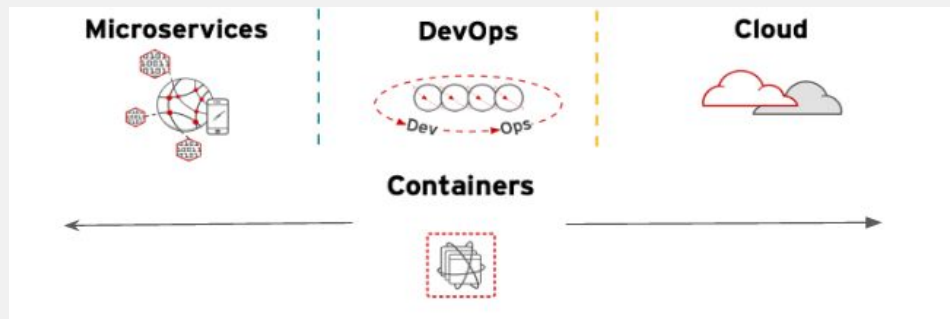


# THE APPSERVER 2014-...





# THE FUTURE PLATFORM REQUIREMENTS

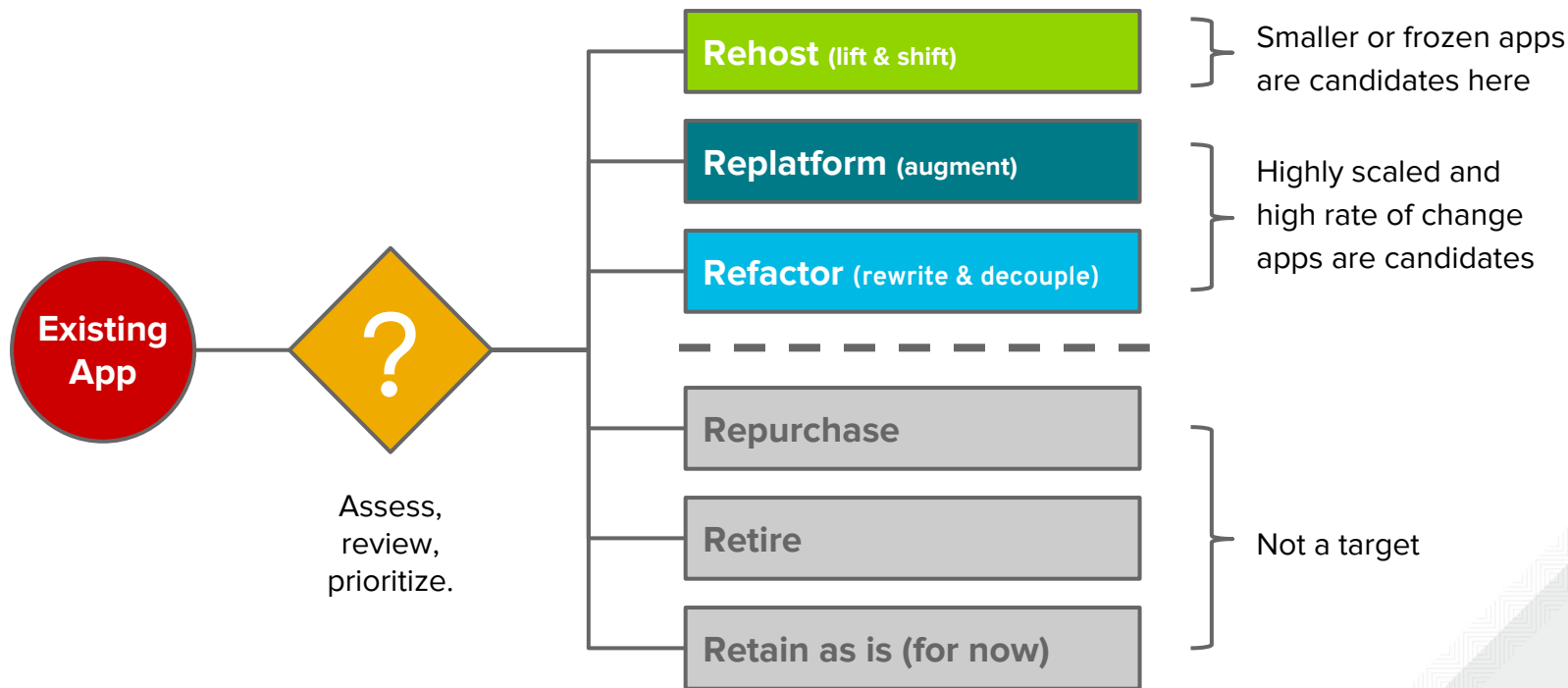


Polyglot  
Async. / reactive  
Resilient  
Mono-micro migration

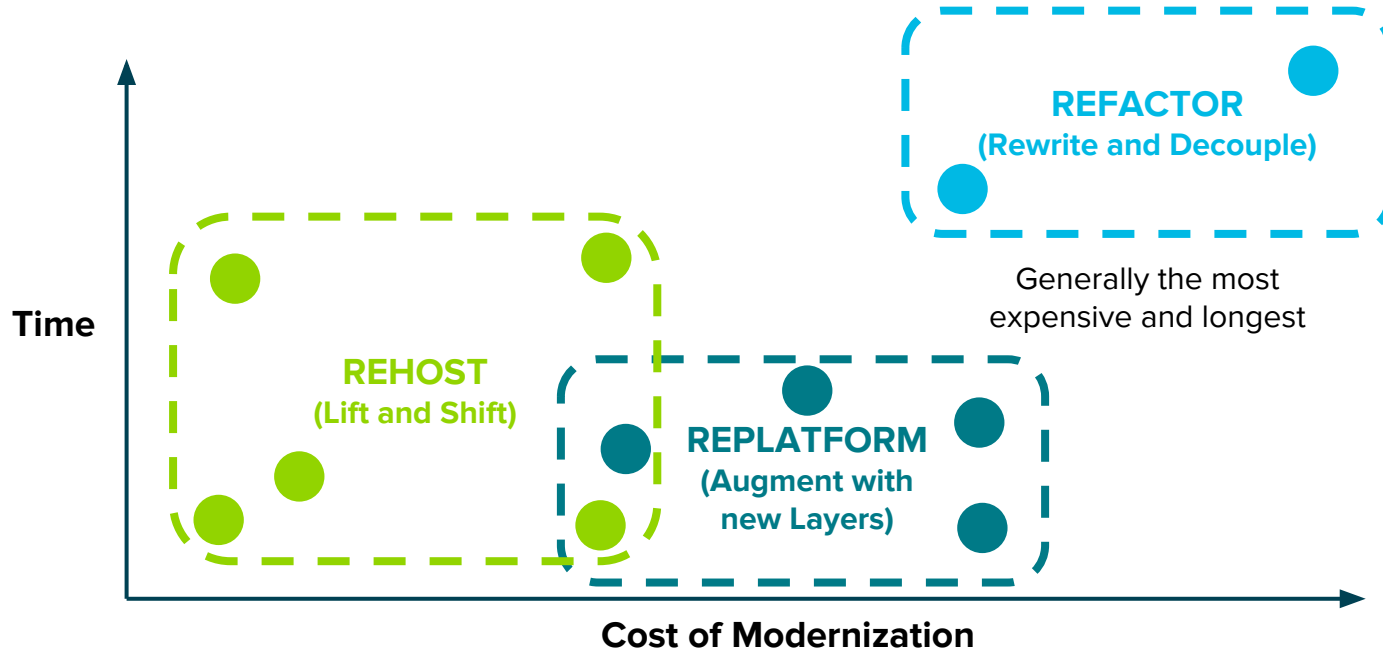
CI / CD  
Containerized  
Automated  
Self-service  
Observable

Public / Private  
Open Hybrid  
Elastic  
“Everything aaS”  
Utility pricing

# OPTIONS FOR APPLICATION MODERNIZATION

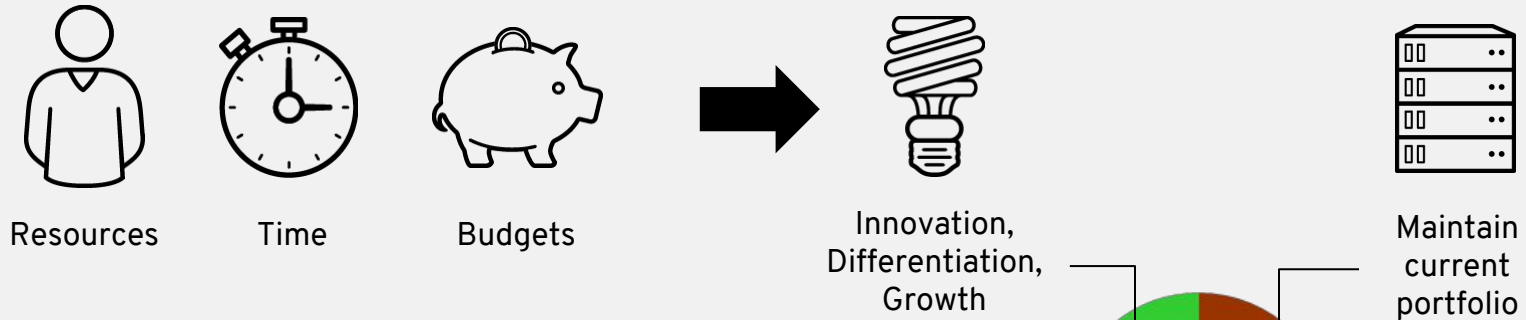


# PATTERNS IN MODERNIZING WORKLOADS



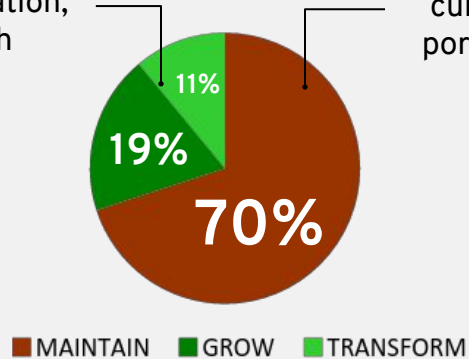
# THE CIO DILEMMA

Modernize existing Apps (Brownfield) AND Build new Apps (Greenfield)



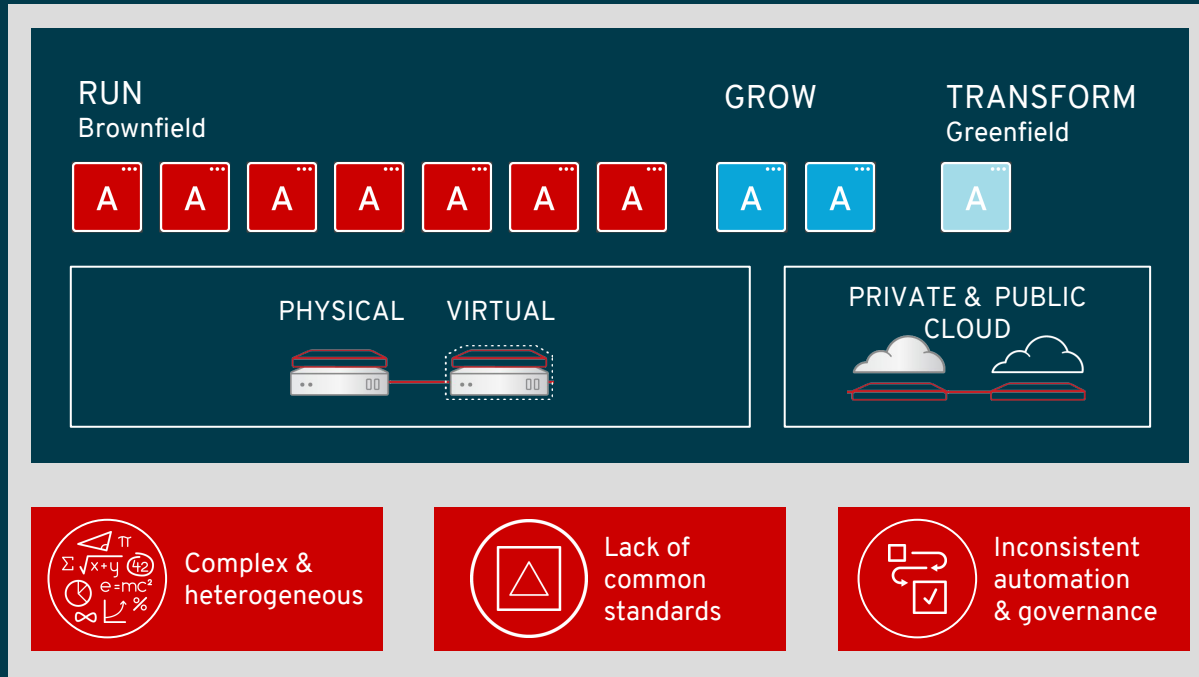
## Three tactics that work:

1. Re-aligning business strategies with application strategies
2. DevOps provides the process for how it's done
3. Application Runtimes, Containers and Cloud provide the foundation



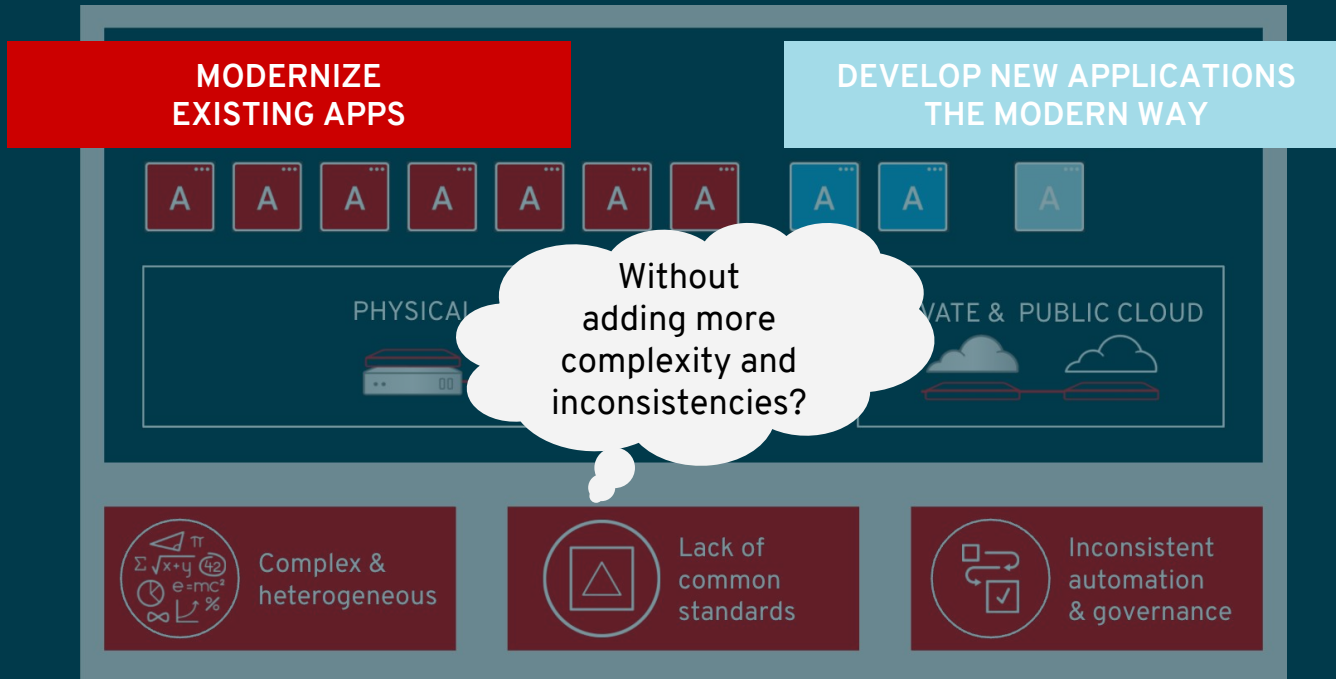
# TYPICAL CUSTOMER LANDSCAPE TODAY

Where the journey starts...



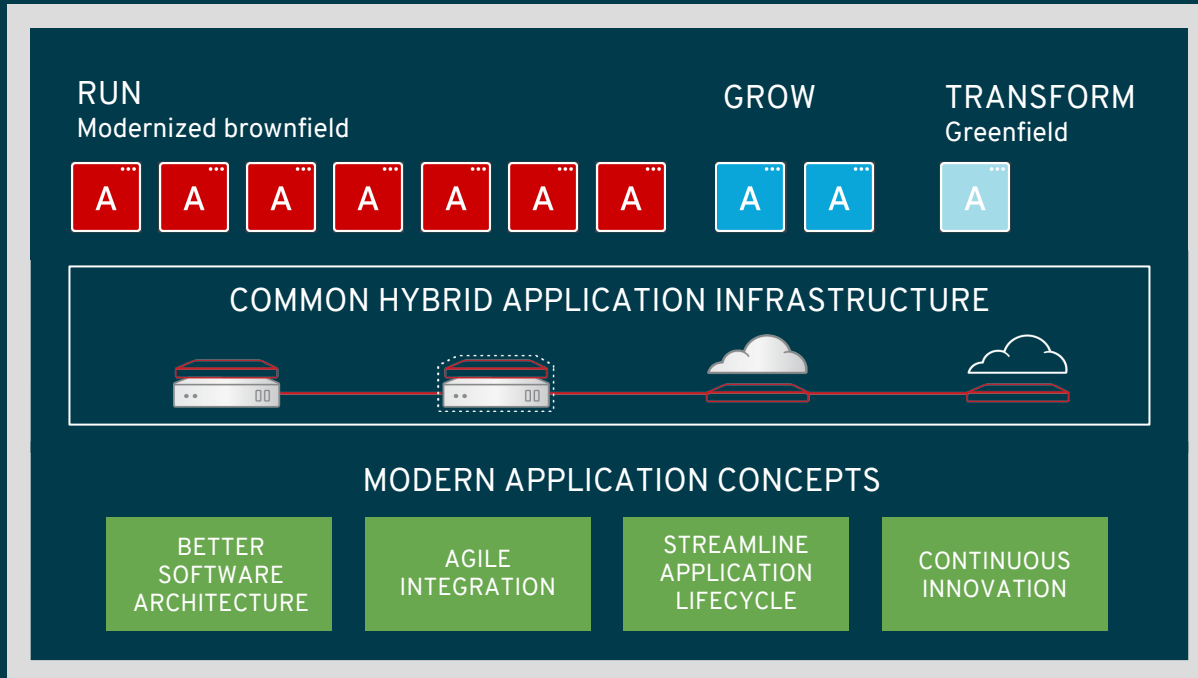
# TYPICAL CUSTOMER LANDSCAPE TODAY

Where the journey starts...



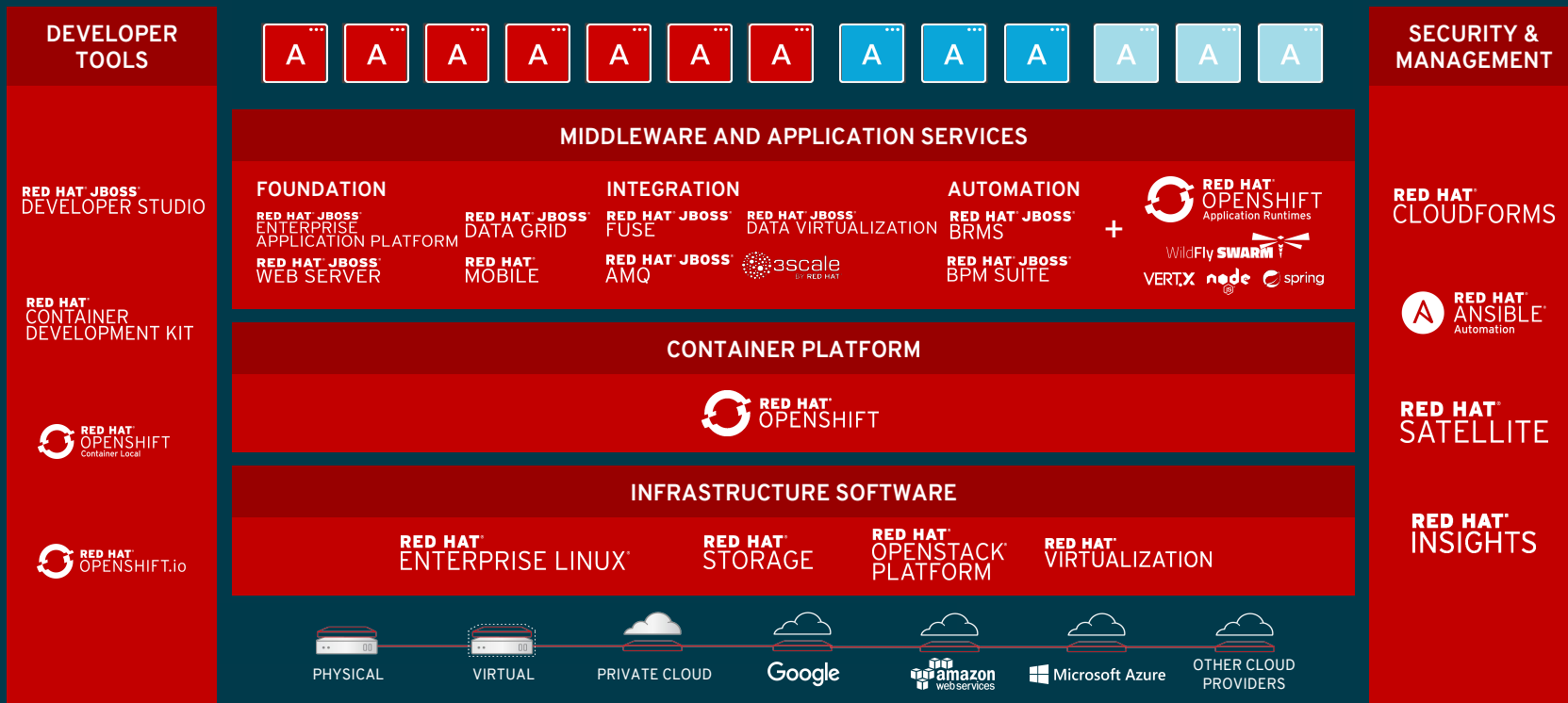
# APPLICATION PORTFOLIO MODERNIZATION

One platform to support you today and tomorrow



# IT'S ALL THERE!

## COMPLETE TECHNOLOGY STACK FOR HYBRID CLOUD





# OPPORTUNITIES FOR CHANGE

## Application Modernization and Migration

### CORE MIGRATION

EXISTING & NEW  
WORKLOADS

APPLICATION  
SERVERS

ESB & INTEGRATION  
PLATFORMS

BPM & DECISION  
MANAGEMENT

APPLICATION  
INFRASTRUCTURE

### MODERNIZATION INITIATIVES

ENABLING BUSINESS  
VELOCITY

BETTER  
SOFTWARE  
ARCHITECTURE

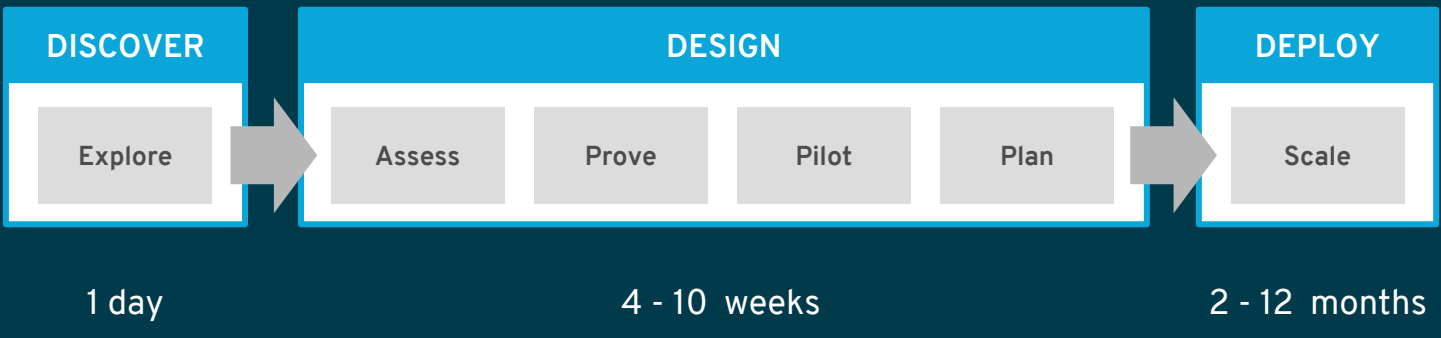
AGILE  
INTEGRATION

STREAMLINE  
APPLICATION  
LIFECYCLE

CONTINUOUS  
INNOVATION

# METHODOLOGY

Iterative, managed service, factory scale up.



- Standard, proven, modular, repeatable, pragmatic methodology
- Step by step, low risk and highly efficient
- Scale up by leveraging collaboration with clients and partners

# MAIN DISCUSSIONS

Application Modernization and Migration

Migration



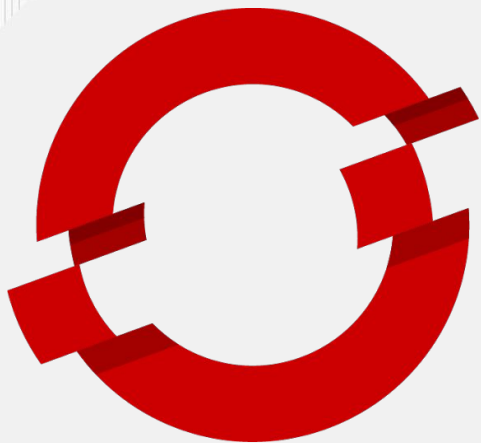
Modernization



Making old  
apps new again



Modern app  
development

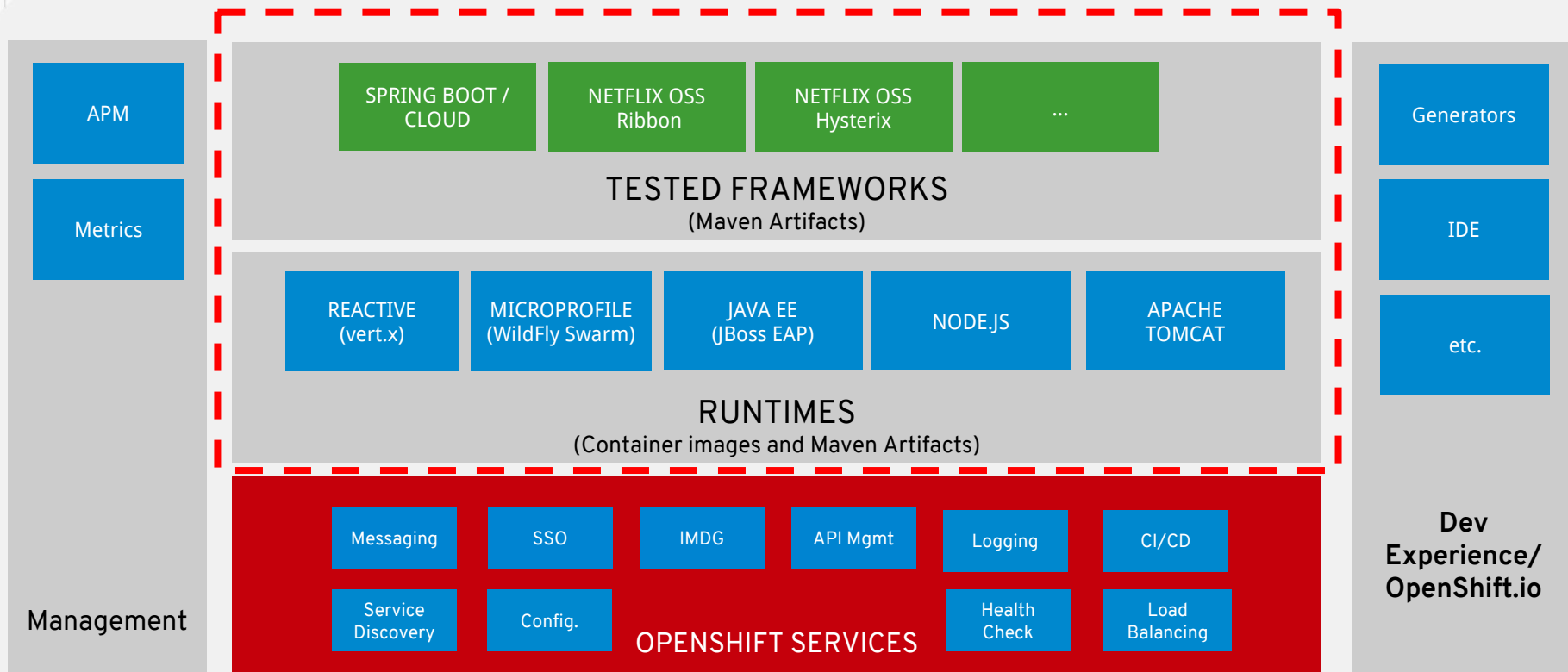


# RED HAT® OPENSIFT

## Application Runtimes

Modern, cloud-native application runtimes and an opinionated developer experience for organizations that are moving beyond 3-tier architectures and embracing cloud-native application development.

# OpenShift Application Runtimes

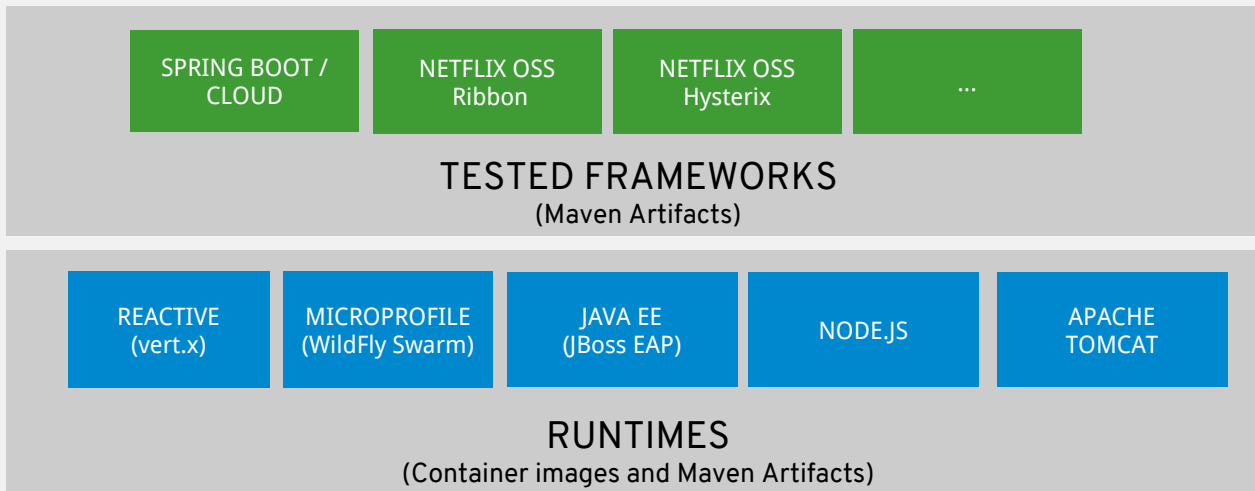


# OpenShift Application Runtimes (RHOAR)

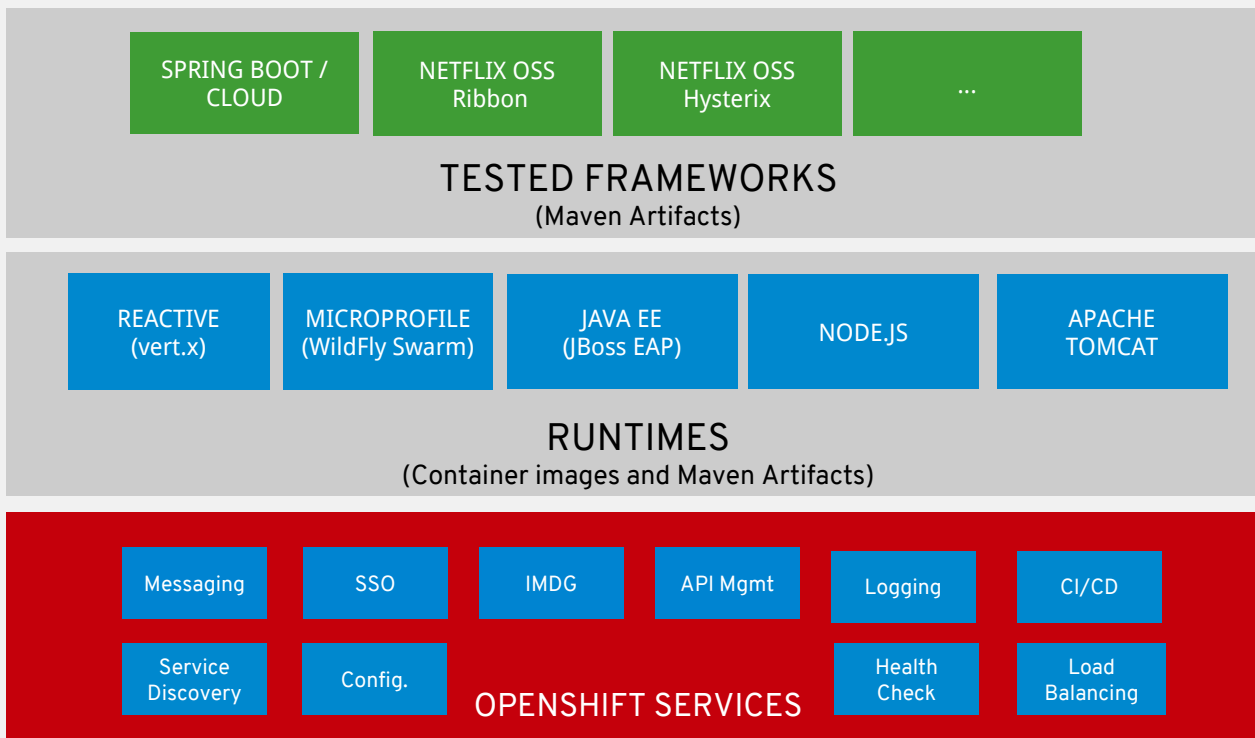
## Benefits

- Polyglot/Polytech
  - Multiple languages.
    - Initial focus on Java & JavaScript
  - Multiple runtimes, framework
- Poly-architecture
  - Fast monoliths (existing Java EE, Spring MVC)
  - Mini and micro-services
  - Serverless in the future
- Polycloud
  - Run on multiple cloud infrastructure and support hybrid options
- Best in class OSS
  - Container, Kubernetes, Java, JavaScript, Spring

# OpenShift Application Runtimes

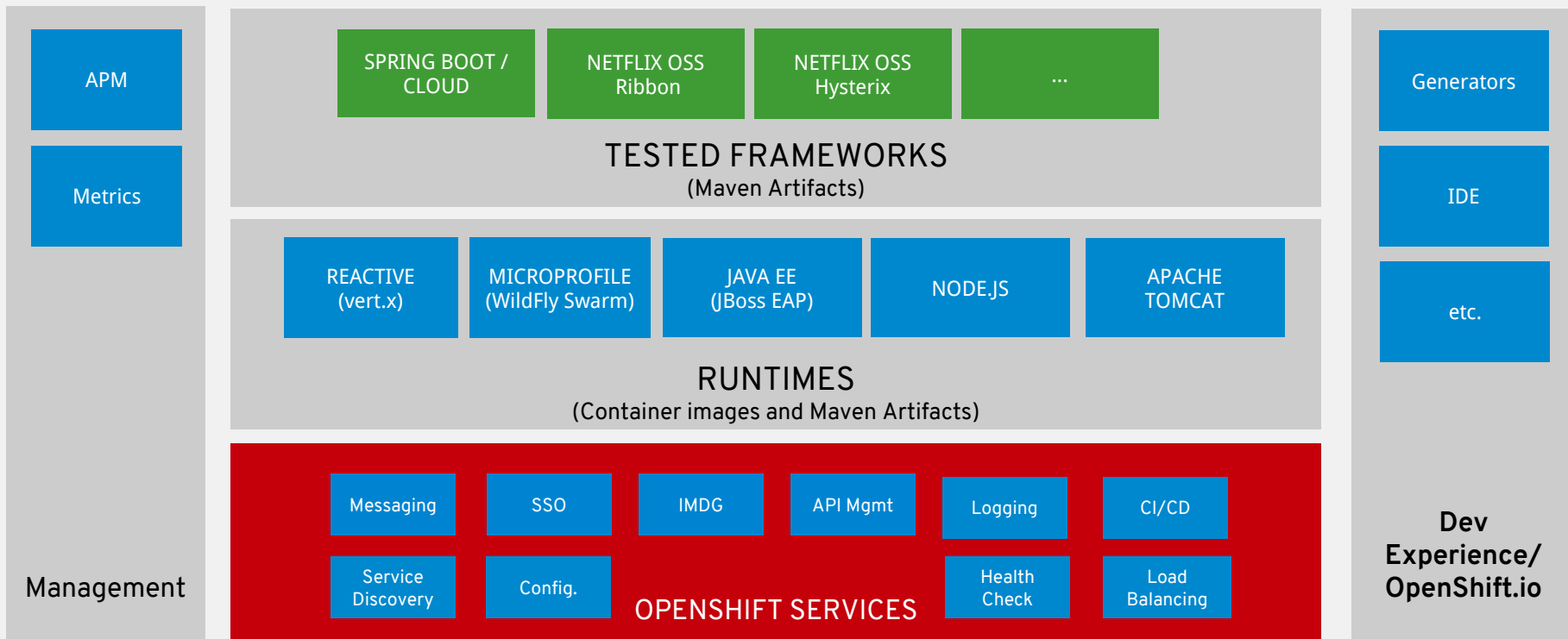


# OpenShift Application Runtimes





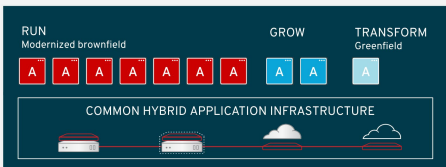
# OpenShift Application Runtimes



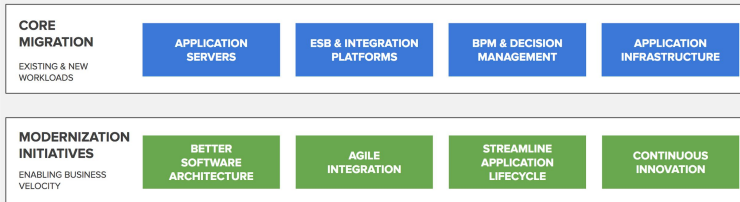
# WRAP-UP

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

**TODAY and TOMORROW**



## COMBINE TRANSFORMATION



Migration → Modernization

Making old apps new again ← Modern app development

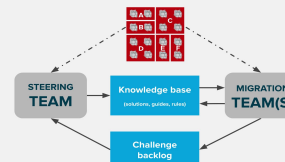
## BENEFITS



## APPROACH



## FACTORY



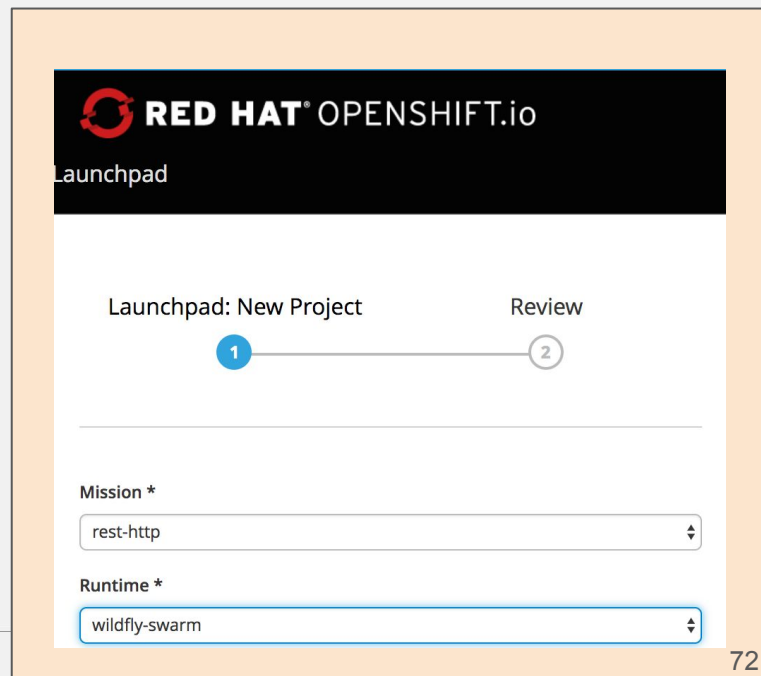
# DEMO - PART I



# Launcher

## 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), connected by a horizontal line. Below the progress indicator, the text 'Launchpad: New Project' and 'Review' are shown. The form includes two dropdown menus: 'Mission \*' with 'rest-http' selected, and 'Runtime \*' with 'wildfly-swarm' selected. The page number '72' is located in the bottom right corner.

# WILDFLY SWARM



# Wildfly Swarm



- **Microservices offering for Java EE developers**
  - Wildfly Swarm components come from wildfly.
- **Repackaging exercise**
  - Package only what you need
  - Packaging the app server with your app
- **Implementation of microprofile**
  - Combines Java EE and microservices technologies
- **Built from WildFly**
  - Trusted and Reliable



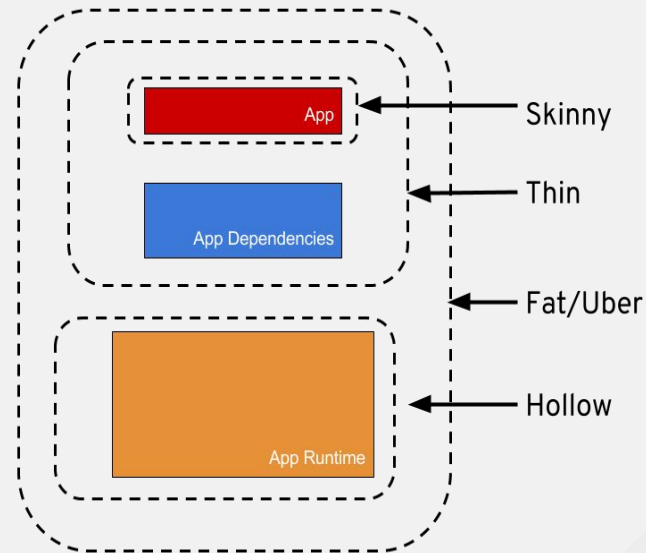
OPENSIFT



# Wildfly Swarm

## Concepts & Terminology

- Fraction
  - A runtime capability.
  - In some cases, a fraction maps directly to a subsystem from WildFly,
  - In other cases (e.g. Jolokia) a fraction may involve different functionality.
- Package your application as
  - An uber-jar - A self-contained, executable Java archive.
  - Unique hollow JAR - A container capable of deploying a particular type of application.



<https://developers.redhat.com/blog/2017/08/24/the-skinny-on-fat-thin-hollow-and-uber/>

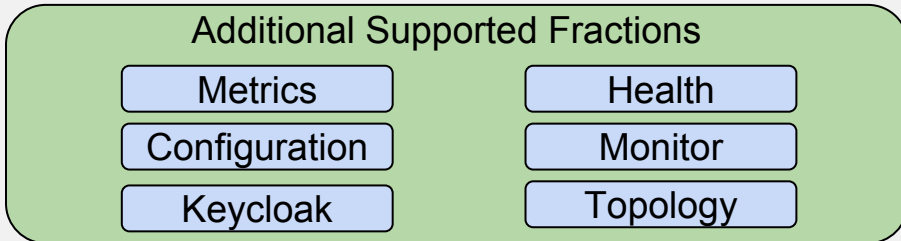
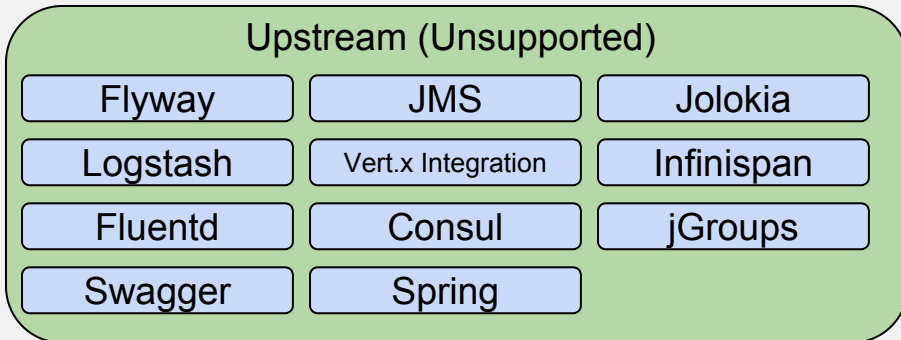
# Wildfly Swarm

In RHOAR



## Build microservices

- Embeddable (Fat Jar)
- Lightweight
- Modular & extensible
- Built from WildFly  
(Trusted and Reliable)



\* Planned





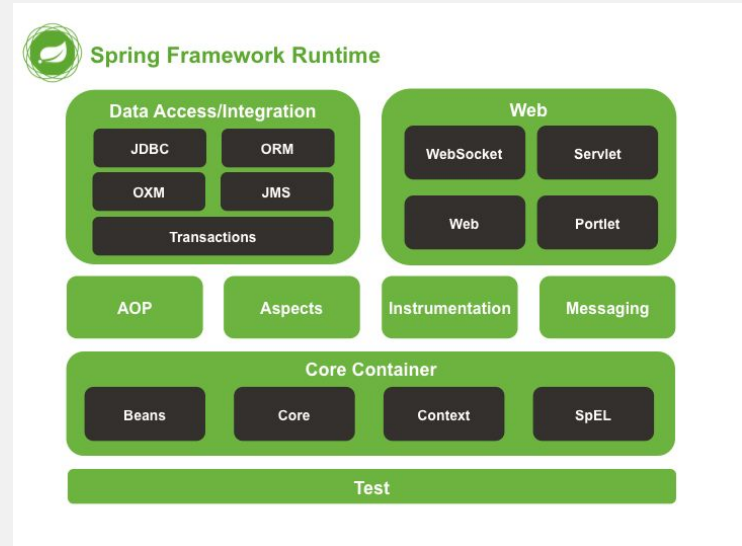
# SPRING



# What is Spring ?



- First release of Rod Johnson's work - June 2003
- Collection of Frameworks, Patterns & Templates
  - IoC (Beans, Context, Core), ORM, Persistence/Tx, AOP, Web (MVC), Messaging, testing
- Mainly used as replacement of EJB (1.0, 2.0)



# What is Spring Boot?

- Path for developers already developing to the Spring Framework
  - Microservices for Developers using Spring Framework
- An opinionated approach to developing Spring-based microservices
- Getting started experience
- Already Red Hat Certified with:
  - OpenShift Java S2I Image
  - JBoss Web Server Embedded Tomcat Container



# Spring Cloud Kubernetes

- Service Discovery
  - Spring Discovery Client using Kubernetes Service Discovery
- ConfigMap Property Source
  - How to use Kubernetes ConfigMap as Spring Property source
- Archaius Config Management
  - Using Netflix Archaius with Kubernetes Config Map
- Ribbon Service Discovery
  - Using Netflix Ribbon with Kubernetes Service Discovery
- Zipkin Distributed Tracing
  - Using Zipkin with Kubernetes for distributed tracing

<https://github.com/spring-cloud-incubator/spring-cloud-kubernetes>

# Spring Boot

In RHOAR

- It's the same Spring you know and love
- Tested and Verified by Red Hat QE
  - Spring Boot, Spring Cloud Kubernetes, Ribbon, Hystrix
- Red Hat components fully supported
  - Tomcat, Hibernate, CXF, SSO (Keycloak), Messaging (AMQ), ...
- Native Kubernetes/OpenShift integration (Spring Cloud)
  - Service Discovery via k8s (DNS), Ribbon
  - Spring Config via ConfigMap
- Developer Tooling
  - [launch.openshift.io](https://launch.openshift.io), starters

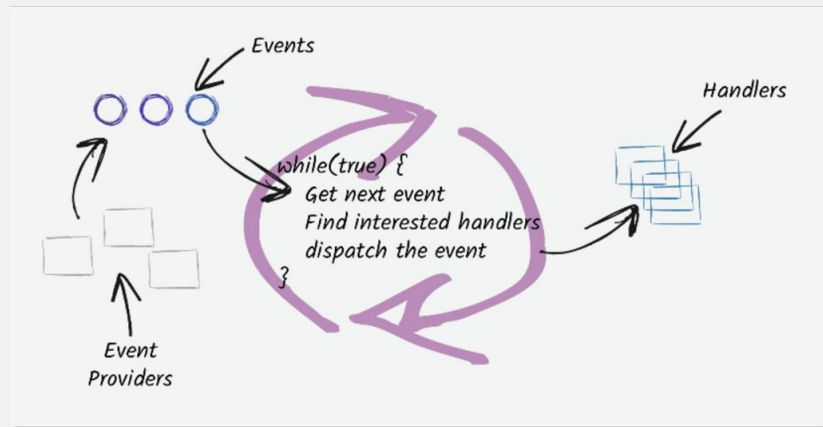


# ECLIPSE VERT.X



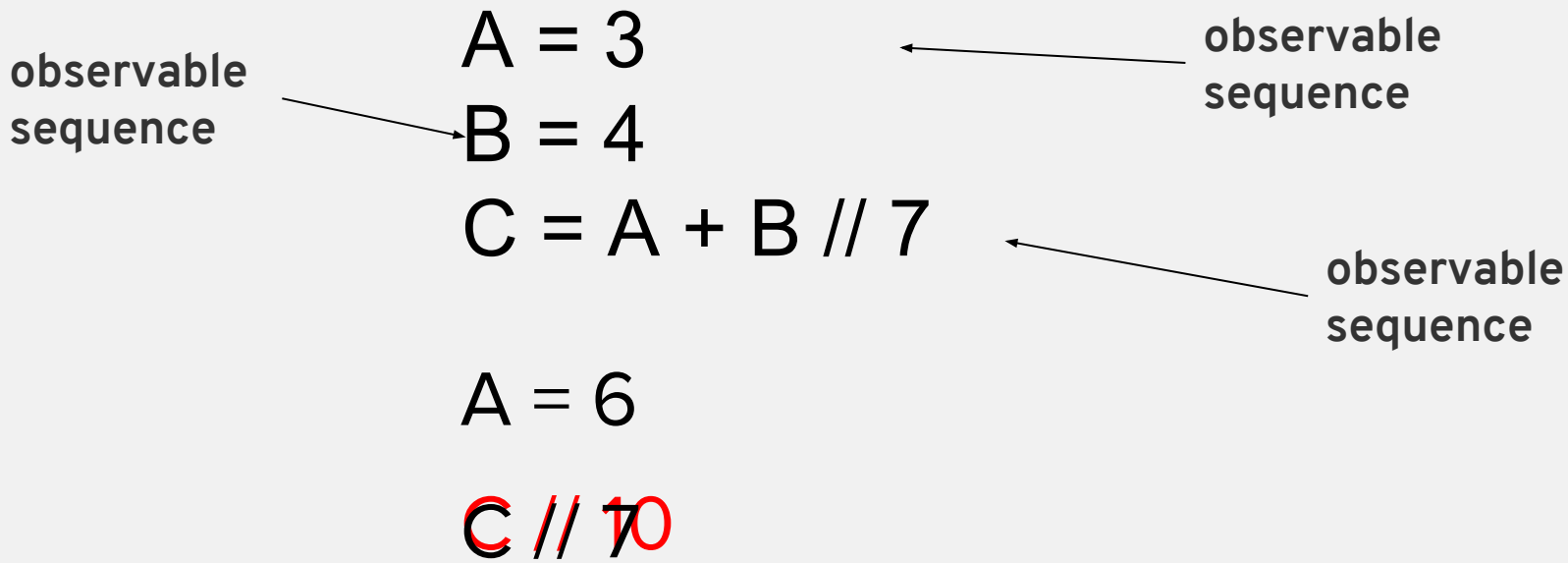
# Reactive Programming

- Is about adopting an asynchronous development model
- The environment asynchronously sends events, which the program can react to



# Reactive Programming

pseudocode example





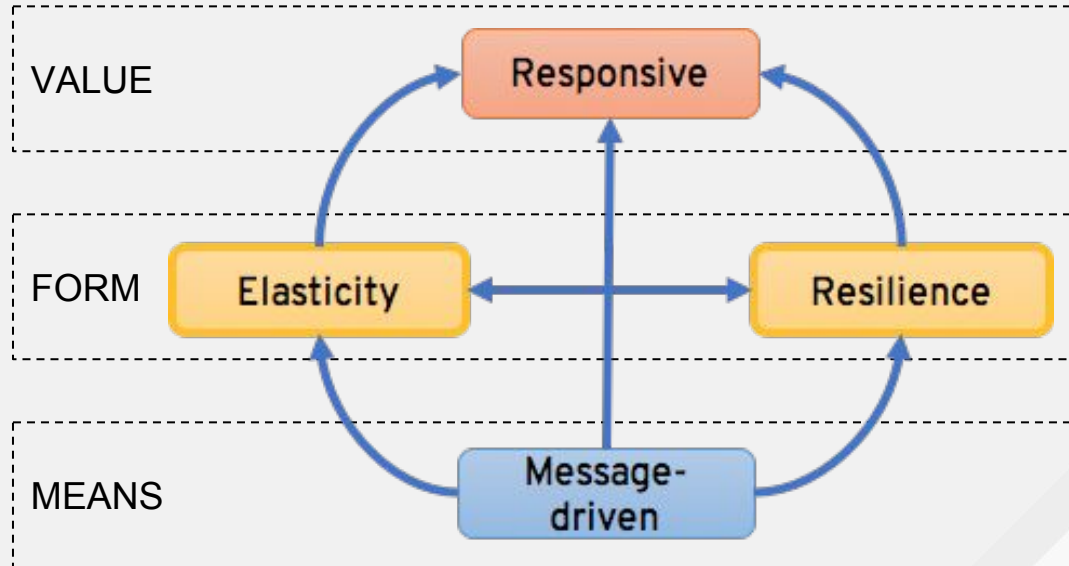
# Reactive system

Reactive Systems are an architecture style focusing on **responsiveness** :

- React to events (message-driver)
- React to load (scalable)
- React to failures (resilient)
- React to users (responsive)

## Reactive Manifesto

<http://www.reactivemanifesto.org/>

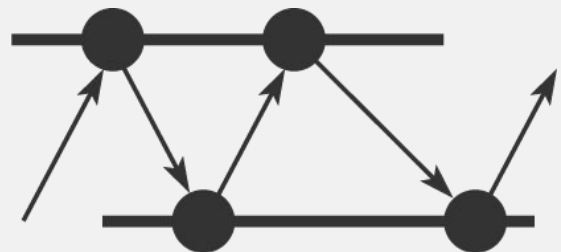


# Eclipse Vert.x

In RHOAR



- Reactive Microservices toolkit to build distributed and reactive systems
- Polyglot - **Java, JavaScript**, jRuby, Python, Groovy, Scala
- Asynchronous Non-Blocking development model
  - Simplified concurrency (event loop)
- Ideal high-volume, low-latency applications



Home - <http://www.vertx.io>

# Books - Free Download



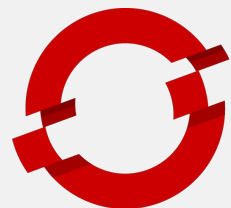
<http://vertx.io/docs/>

# WRAP UP



# OpenShift Application Runtimes

- **Multiple runtime options**
  - JBoss EAP - existing Java EE / Spring apps.
  - WildFly Swarm / MicroProfile - Java EE centric MSA
  - Spring Boot / Cloud - Spring centric MSA
  - Vert.x - greenfield reactive Java
  - Node.js - greenfield reactive JavaScript
- **OpenShift**
  - Public, Dedicated Public & Enterprise
- **Tightly integrated with**
  - OpenShift & Kubernetes
  - Red Hat Developer Experience
- **3rd-party Integrations - eg. Netflix Ribbon, Hystrix, etc.**
- **Opinionated DevX starting with Openshift Launcher**

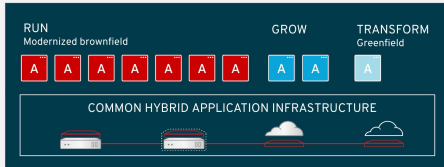


**RED HAT®**  
**OPENS SHIFT**  
Application Runtimes

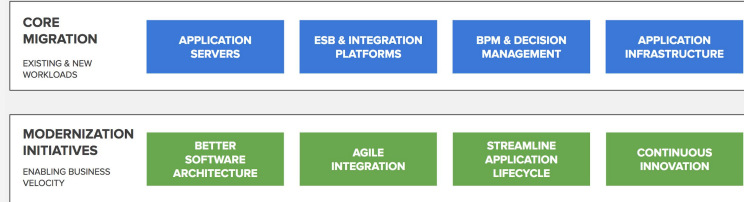
# Application Modernization & Migration

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

**TODAY and TOMORROW**



## COMBINE TRANSFORMATION



Migration Modernization

Making old apps new again Modern app development

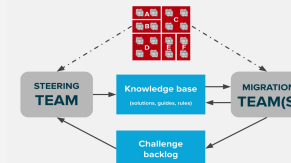
## BENEFITS



## APPROACH



## FACTORY



[redhat.com/en/events/nordic-events](https://redhat.com/en/events/nordic-events)



**DEV**

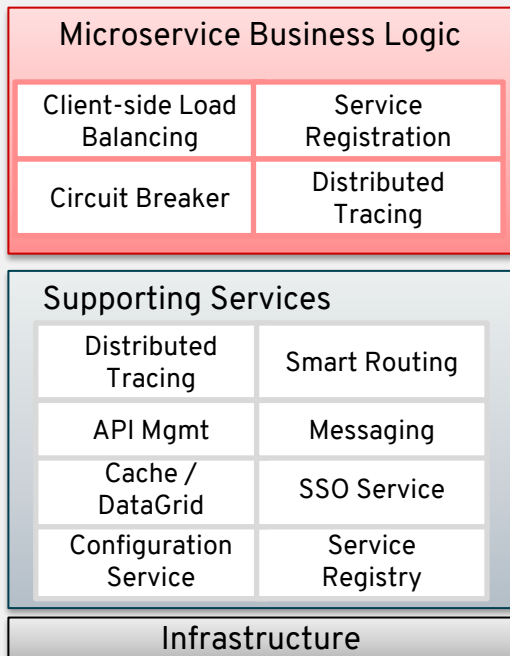


**OPS**

# THE CONTAINERS & CLOUD-NATIVE ROADSHOW, PRESENTED BY RED HAT

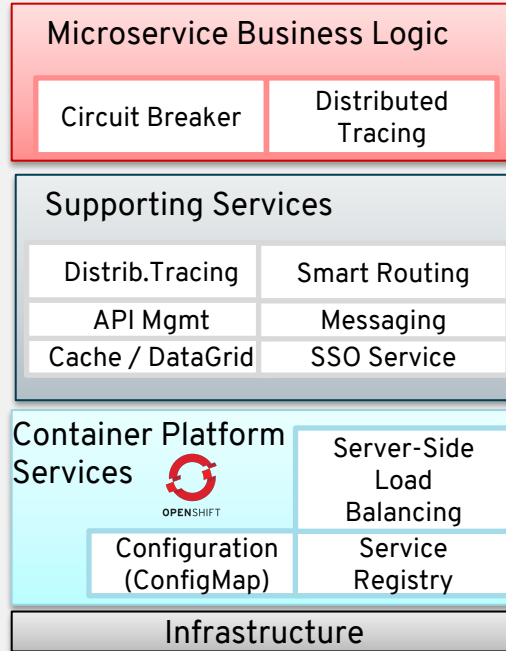
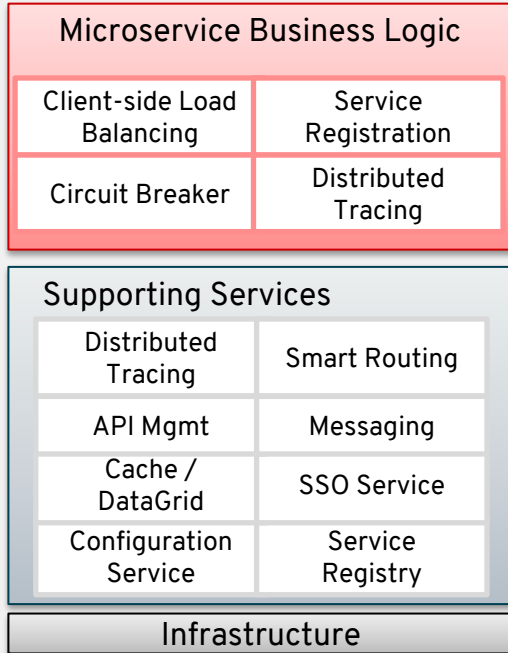
A hands-on experience for Ops and Dev professionals

# EVOLUTION OF MICROSERVICES





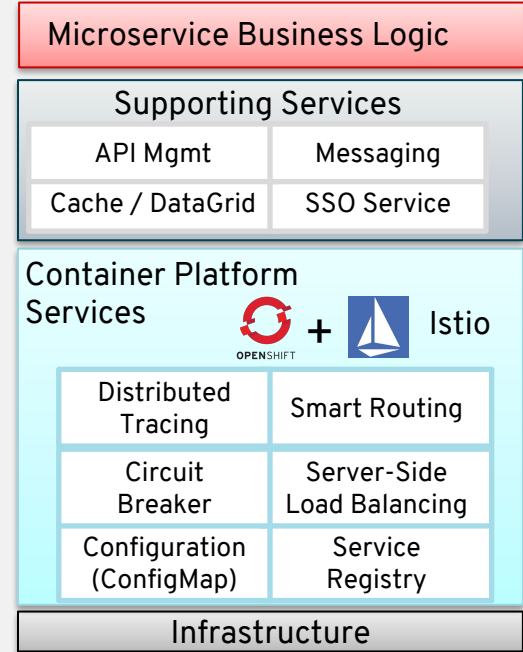
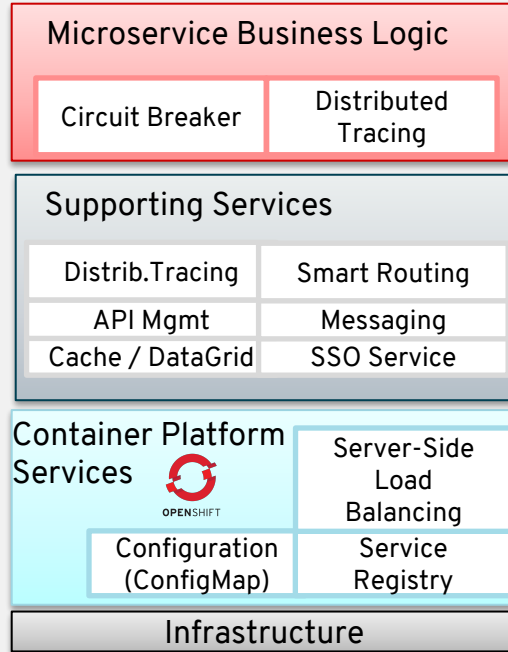
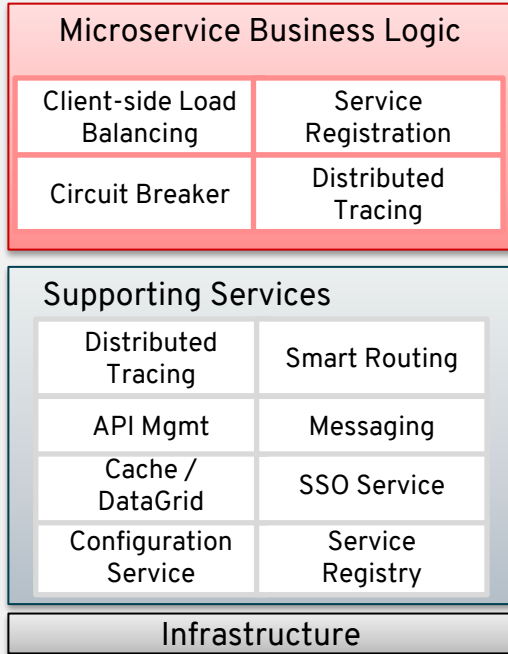
# EVOLUTION OF MICROSERVICES



2014

Current

# EVOLUTION OF MICROSERVICES



2014

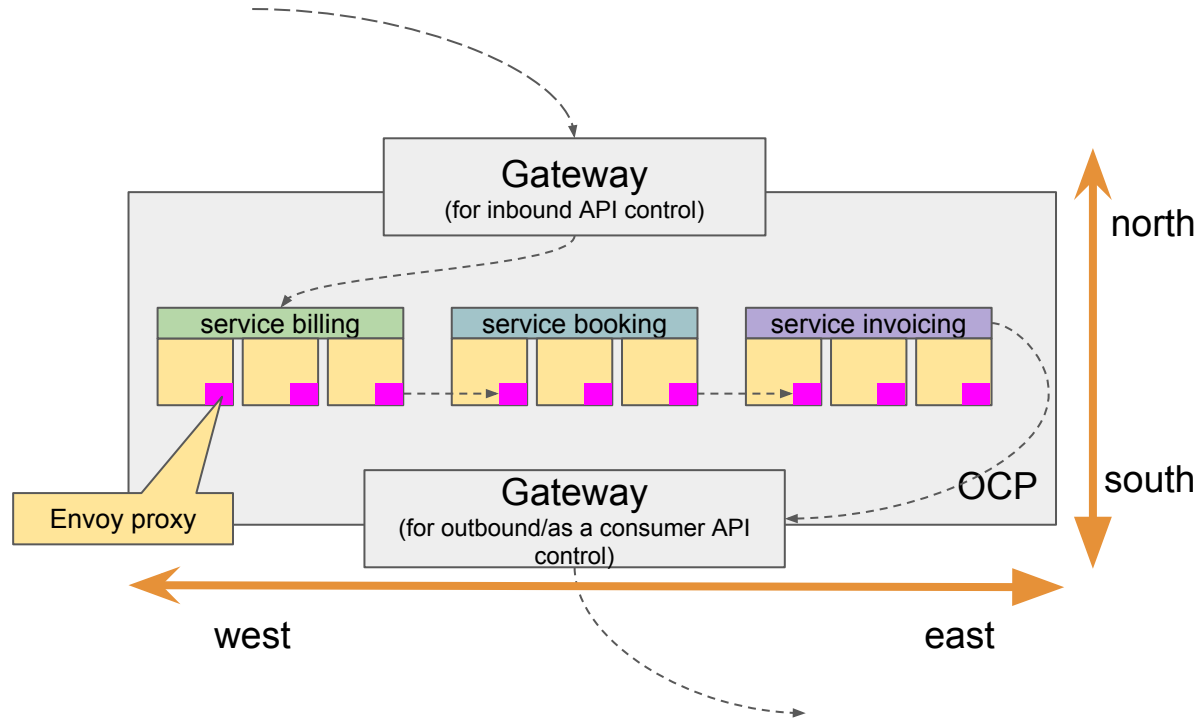
Current

Future



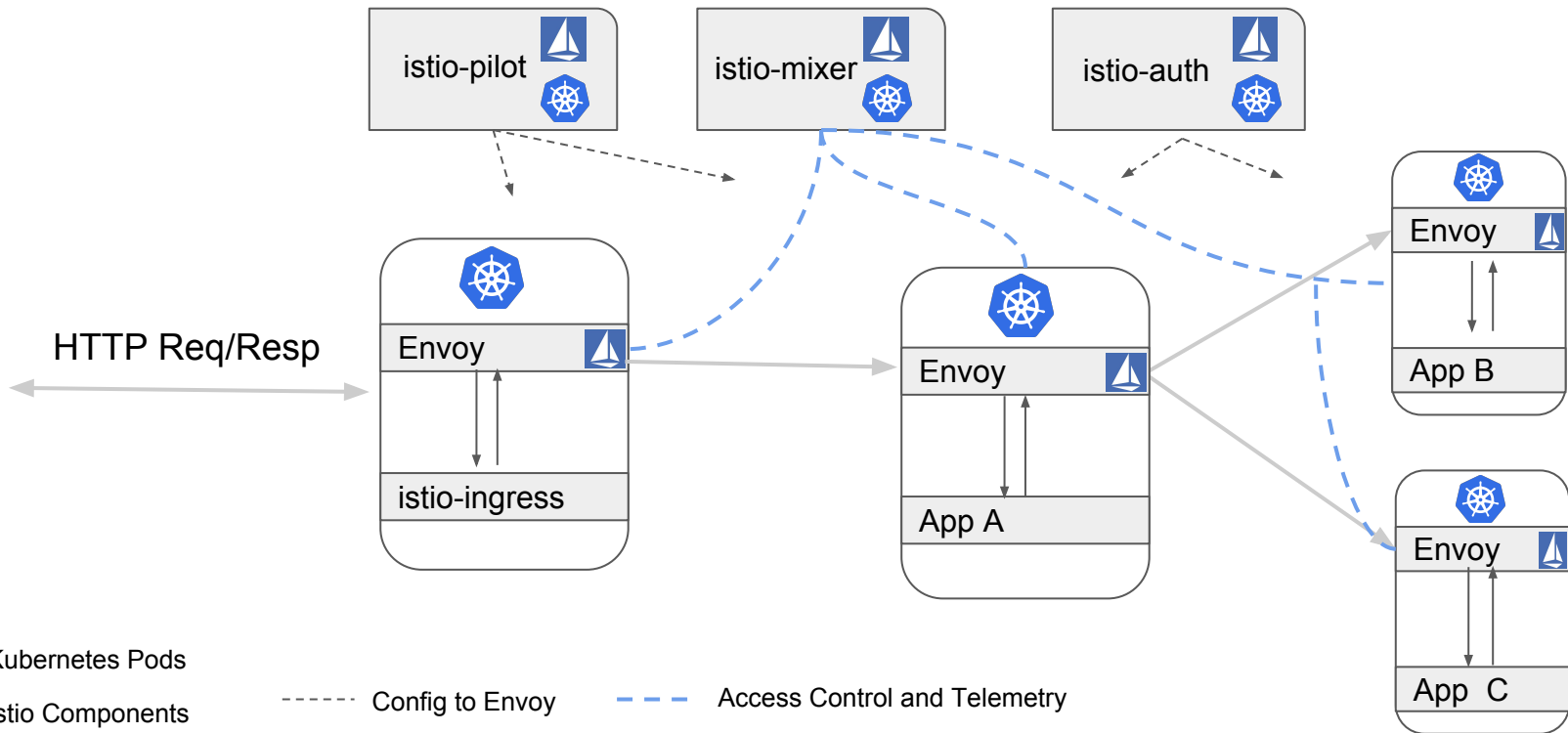
# Istio

- **Intelligent Routing and Load Balancing**
- **Resilience Across Languages and Platforms**
- **Telemetry and Reporting**
- **Policy Enforcement**

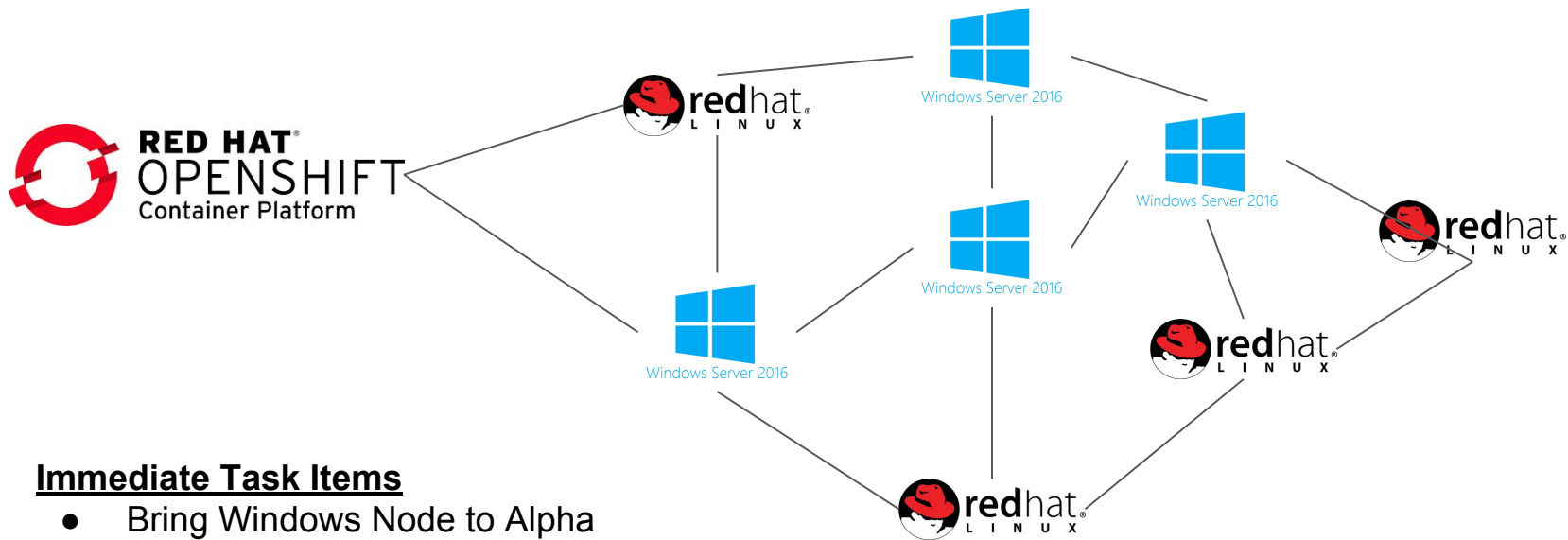


Next Generation Microservices with RHOAR

# Istio Service Mesh



# OpenShift Windows Containers



## Immediate Task Items

- Bring Windows Node to Alpha
- Networking
- Bootstrapping to OpenShift
- cgroup translation
- cAdvisor for scheduling
- Cluster DNS Integration
- Persistent Storage

# OpenShift Roadmap

## OpenShift Container Platform 3.6 (August)

- Kubernetes 1.6 & Docker 1.12
- New Application Services - 3Scale API Mgt OnPrem, SCL 2.4
- Web UX Project Overview enhancements
- Service Catalog/Broker & UX (Tech Preview)
- Ansible Service Broker (Tech Preview)
- Secrets Encryption (3.6.1)
- Signing/Scanning + OpenShift integration
- Storage - CNS Gluster Block, AWS EFS, CephFS
- OverlayFS with SELinux Support (RHEL 7.4)
- User Namespaces (RHEL 7.4)
- System Containers for docker

## OpenShift Online & Dedicated

- OpenShift Online Paid Tier GA (June)

## OpenShift Container Platform 3.9 (Mar/Apr)

- Kubernetes 1.9
- Windows Server Containers (Tech Preview)
- Prometheus Metrics and Alerts (GA)
- Logging & Metrics Correlation
- Multi-version upgrades
- Istio (Tech Preview)
- CRI-O (Full Support)
- OVN Networking (Tech Preview)
- CNS Geo Replication
- CNS 2DC Stretch Cluster Reference Architecture
- OCP + CNS integrated monitoring/Mgmt (Tech Preview)

## OpenShift Online & Dedicated

- Additional self-service: RBAC, templates, LB, egress
- OpenShift Dedicated on Azure

Q4 CY2017

Q2 CY2018

Q3 CY2017

## OpenShift Container Platform 3.7 (November)

- Kubernetes 1.7 & Docker 1.12
- Red Hat OpenShift Application Runtimes (GA)
- Service Catalog/Broker & UX (GA)
- OpenShift Ansible Broker (GA)
- AWS Service Broker
- Network Policy (GA)
- CRI-O (Tech Preview)
- CNS for logging & metrics (iSCSI block), registry
- CNS 3X density of PV's (1000+ per 3 node, Integrated Install)
- Cluster Federation (Tech Preview)
- Prometheus Metrics and Alerts (Tech Preview)

## OpenShift Online & Dedicated

- OpenShift Dedicated upgrade scheduling
- OpenShift Online Europe and Australia regions

Q1 CY2018

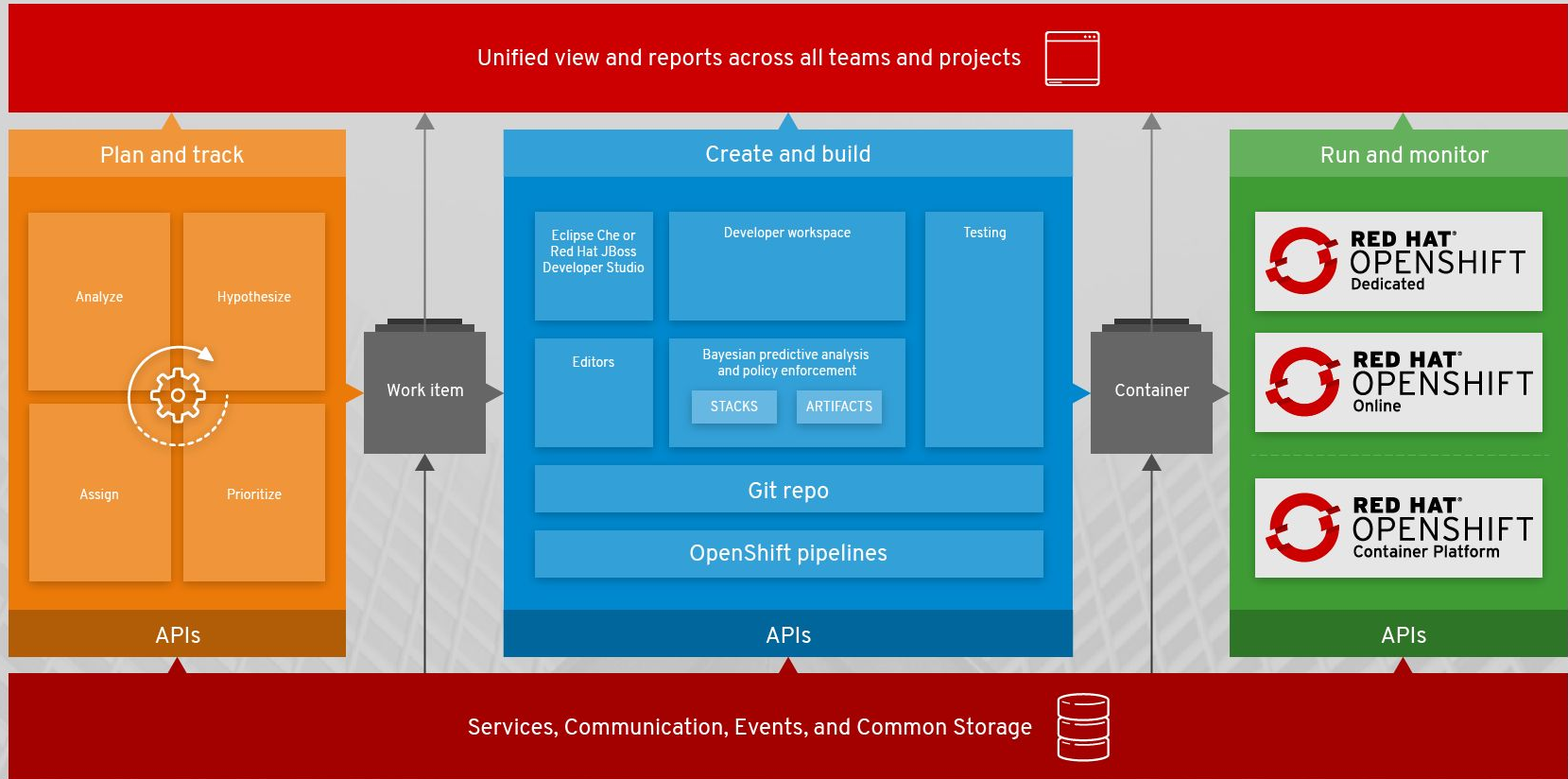
## OpenShift Container Platform 3.10 (August)

- Kubernetes 1.10
- System Containers (GA)
- Import signatures from upstream images
- Automatic Egress IP
- Istio (GA?)
- Windows Server Containers (GA?)
- TBC

## OpenShift Online & Dedicated

- TBC

# Developer Tools-aaS : OpenShift.io



<http://learn.openshift.com>



SIGN UP TO OPENSIFT ONLINE FOR FREE



## 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



<https://www.openshift.com/dedicated/test-drive.html>

## OpenShift 3 TestDrive Lab

The Red Hat OpenShift TestDrive Lab on Amazon Web Services (AWS) provides a free, hands-on experience. You'll be able to explore the features and simplicity of OpenShift 3 in real-time. It's a quick and easy way to test OpenShift 3's functionality in less than an hour.

### Test Drive OpenShift In The Cloud Now!

Deploy OpenShift Container Platform in minutes on the public cloud and enjoy the test drive. Try deploying your applications using [application](#) and [database images](#) and experiment with OpenShift administration.



**TEST DRIVE OPENSIFT ON  
GOOGLE CLOUD**



**TEST DRIVE OPENSIFT ON  
MICROSOFT AZURE**



**TEST DRIVE OPENSIFT FOR  
OPS**

<https://www.openshift.org/minishift/>

OPENSHIFT  
**origin**

# Minishift

Develop Applications Locally in a Containerized OpenShift Cluster

ABOUT

GET STARTED

RESOURCES

Minishift is a tool that helps you run OpenShift locally by launching a single-node OpenShift cluster inside a virtual machine. With Minishift you can try out OpenShift or develop with it, day-to-day, on your local machine.

You can run Minishift on Windows, Mac OS, and GNU/Linux operating systems. Minishift uses [libmachine](#) for provisioning virtual machines, and [OpenShift Origin](#) for running the cluster.

**THANKS**

