redhat.

TECH UPDATE Q1 2018

Stockholm February 15th

Johannes Brännström
Solution Architect

Martin Östmark
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?


RED HAT JBOSS ENTERPRISE
APPLICATION PLATFORM

RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7

ORGANIZATIONS WILL CONTINUE TO RUN ON-PREMISE WORKLOADS

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

CONVERGED INFRASTRUCTURE INSIGHT

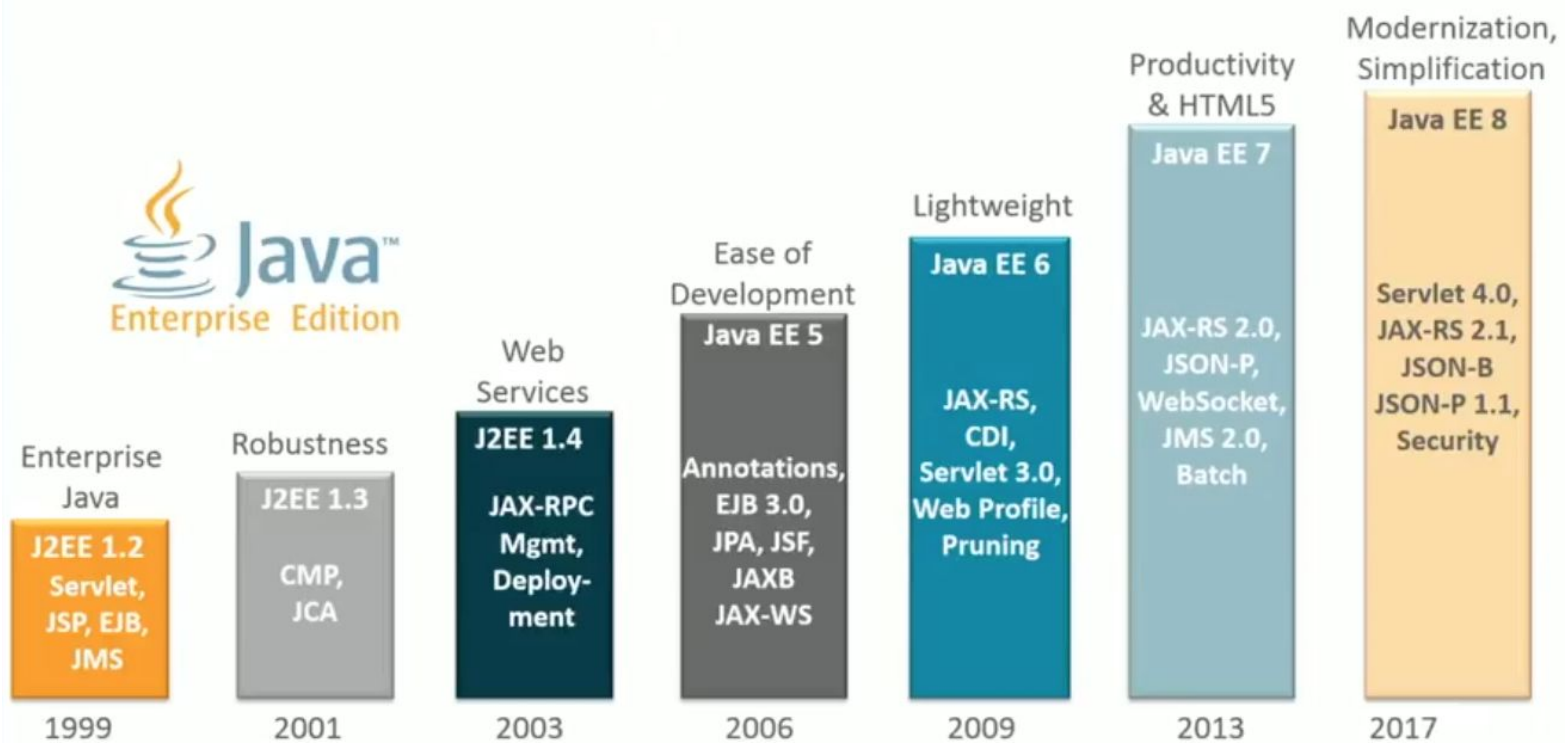
91%

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.


JAVA EE RECAP

Java EE 8 - The Next Step



Eclipse Enterprise for Java - EE4J

Moving Java EE to Eclipse Foundation

Technology

Community and Vendors

Sponsorship

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


RED HAT JBOSS ENTERPRISE
APPLICATION PLATFORM

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

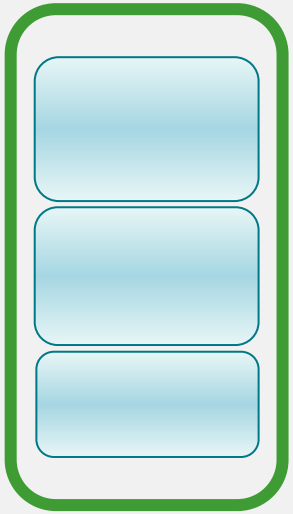
- Built to maximize developer productivity, minimize administrative work
- Flexible, comprehensive subscription
- Simplified and unified security (exists in parallel with legacy sec)

RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7

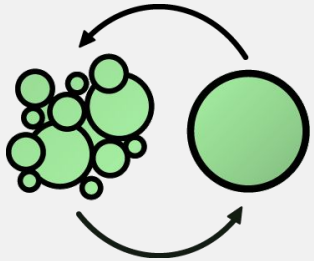
Benefits

- 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

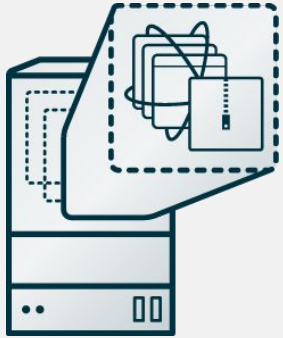
HOW CAN IT HELP YOU?



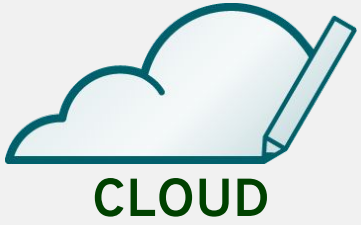
MONOLITHIC



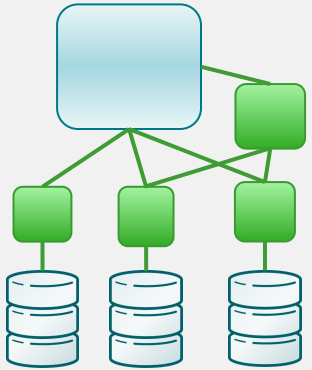
DEVOPS



CONTAINERS

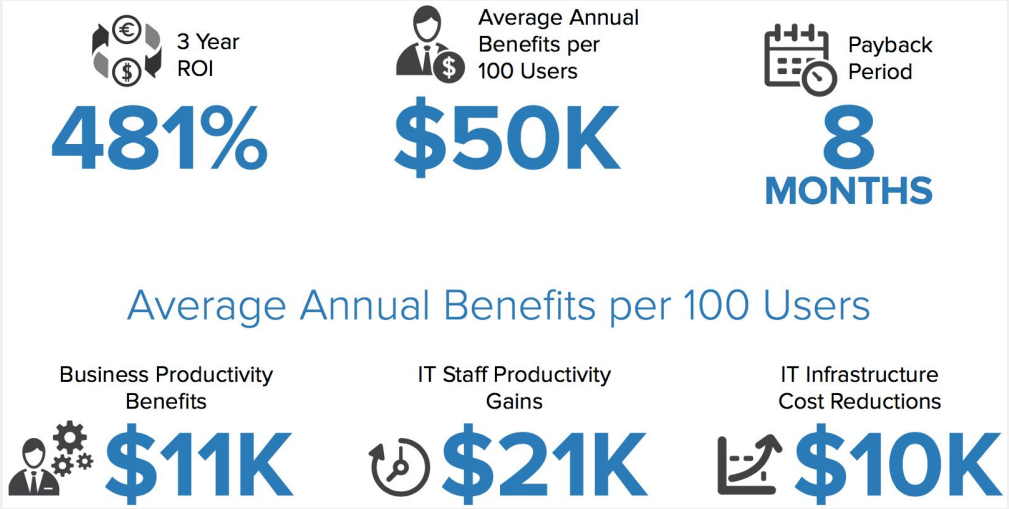


CLOUD



MICROSERVICES

RED HAT JBOSS EAP DELIVERS GREAT VALUE



Source: IDC - The Business Value of Red Hat JBoss EAP white paper - 2018

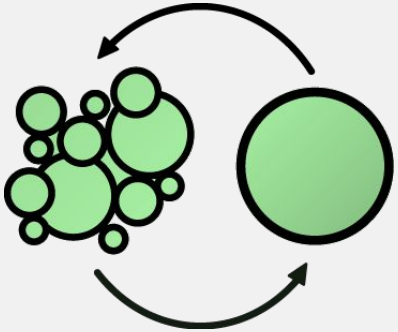
WHAT'S NEW IN EAP 7.1

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



DEVOPS PRODUCTIVITY

Key features

- 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

BUSINESS - FLEXIBLE SUBSCRIPTION

Key features

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

RED HAT JBOSS EAP 7.1

Key features

- HTTP/2 support
- HA 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

JBoss EAP 7.0 tested configuration: https://access.redhat.com/articles/2026253

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

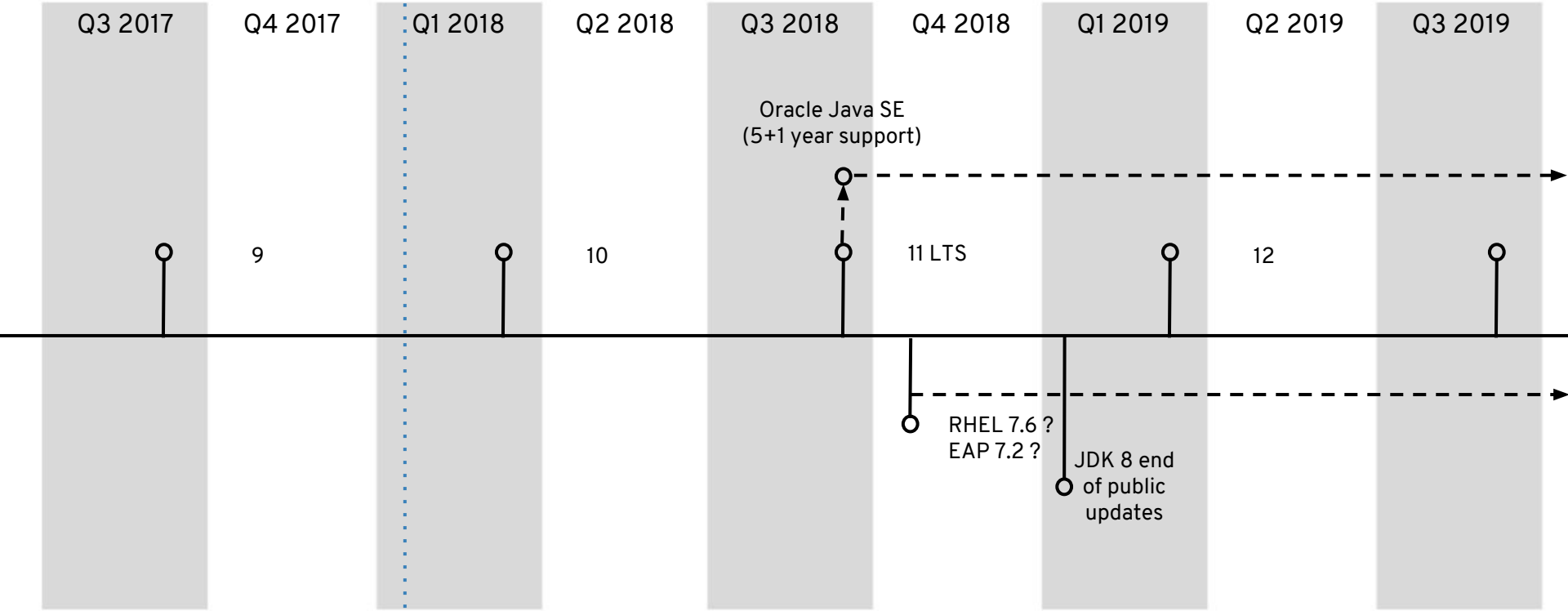
http://www.oracle.com/technetwork/java/eol-135779.html

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 - Sept. 2018)
  - 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***

http://www.oracle.com/technetwork/java/eol-135779.html

JDK ROADMAP



* All dates are calendar years
** Features and dates are subject to change

JDK CUSTOMER Options

JDK 8 (or earlier) - free use

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 11 (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

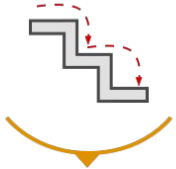
- Determine availability of tools and frameworks
- Choose JDK 8 / 9 accordingly

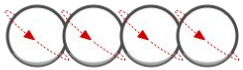

JAVA EE EVOLUTION

IT TRENDS

Development Process

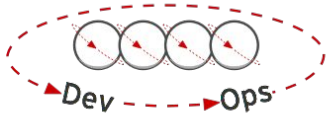
Waterfall





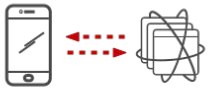
Agile

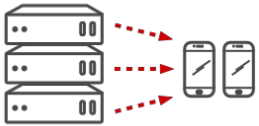
DevOps



Application Architecture

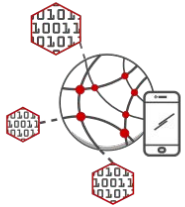
Monolithic





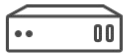
N-Tier

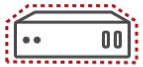
Microservices



Deployment & Packaging

Physical Servers



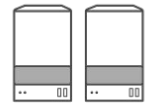


Virtual Servers

Containers

Application Infrastructure

Datacenter



Hosted

Cloud

redhat.

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

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

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

redhat.

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

Java EE is a standard

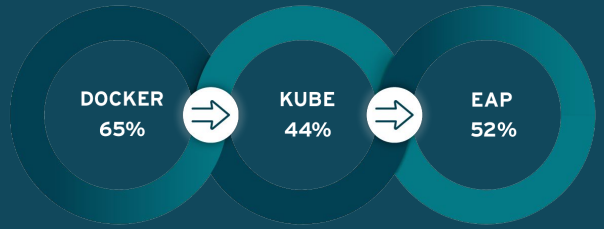
No need to retrain developers

Trusted to run production

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

redhat.

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 [1][2] (framework)	Boot time server only	Boot time including app deployment	Memory usage without load	Memory usage under load	Measured[3] throughput
JBoss EAP (Java EE Web Profile)	2 - 3 sec	**4 - 4.5 sec**	40 - 60 MB	**0.2 - 0.4 GB**	**15K req/sec**
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)	**0 - 1 sec**	8 - 10 sec	40 - 60 MB	0.5 - 1.5 GB	8K req/sec
Fat JAR (Spring Boot)	N/A	4 - 6 sec	**30 - 50 MB**	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.

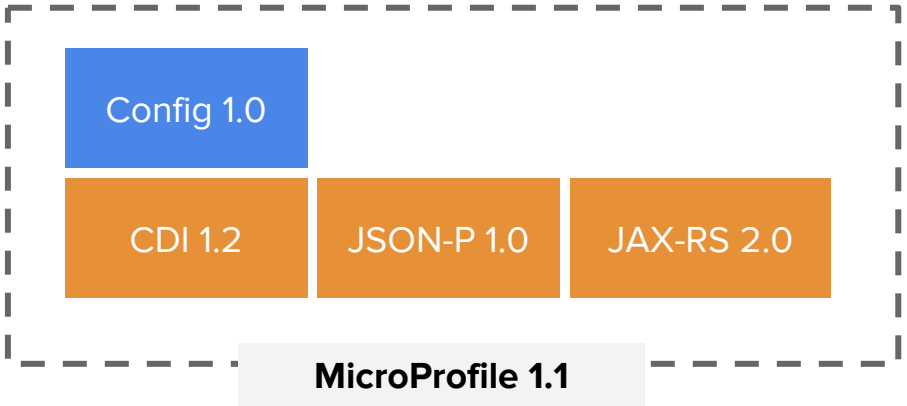
[1] The microservice is a simple hello world REST application.
[2] All runtimes are using their default settings
[3] The performance test was conducted with ApacheBench using 100K request with 50 users and keep-alive enabled.

- 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

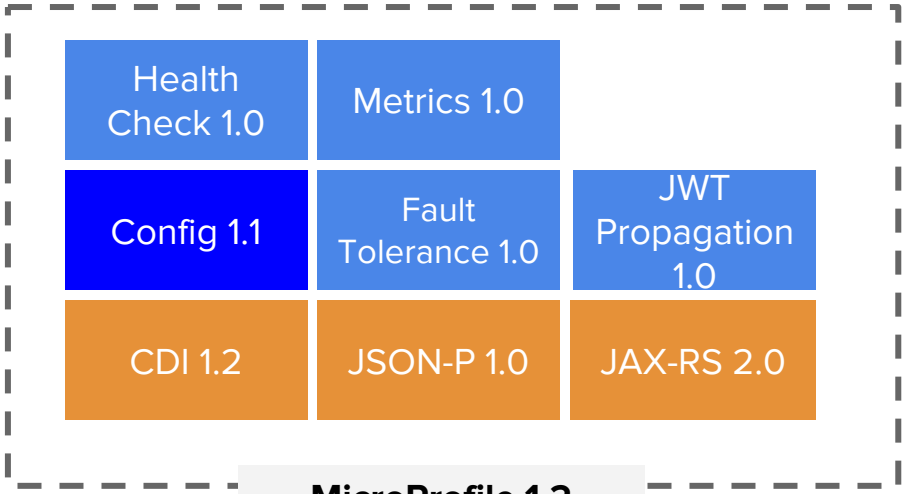
MicroProfile 1.0 (Sep, 2016)

Eclipse MicroProfile 1.1 (Aug, 2017)

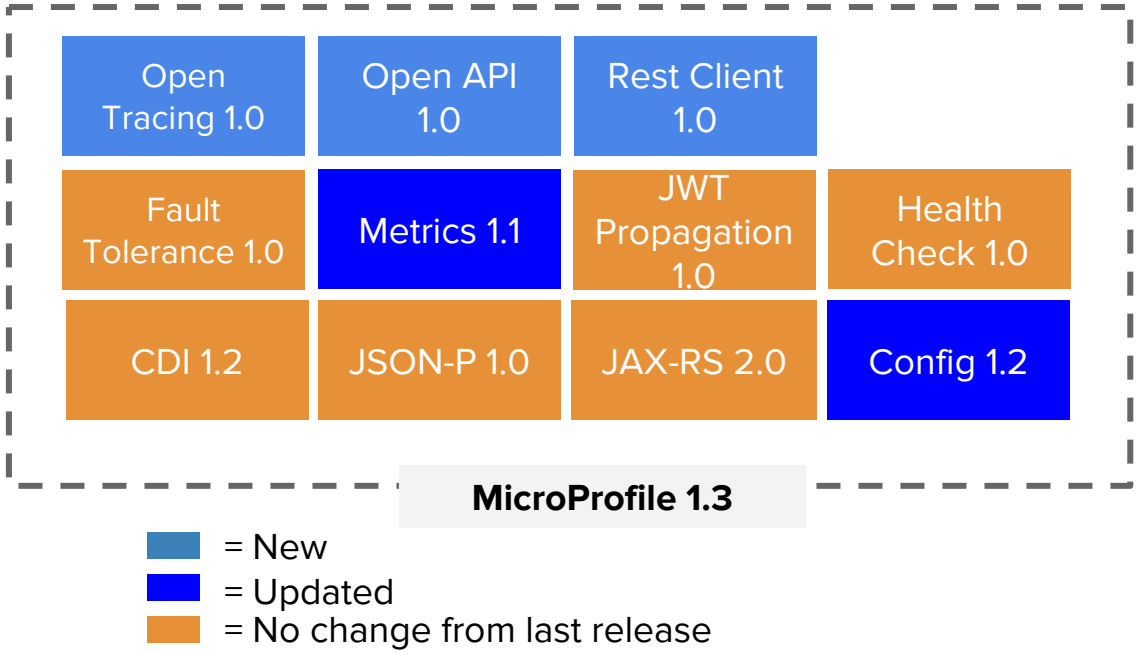


= New
= No change from last release

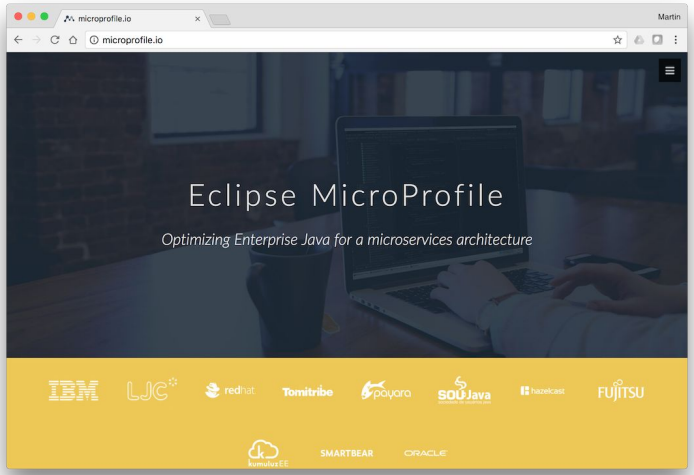
Eclipse MicroProfile 1.2 (Sep, 2017)



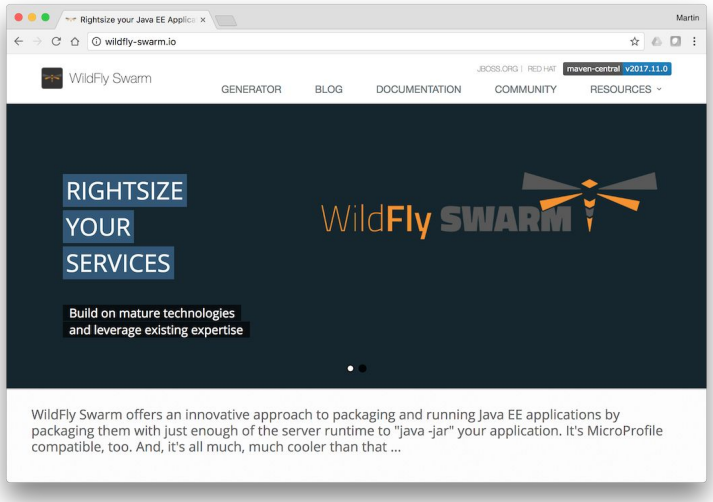
Eclipse MicroProfile 1.3 (Dec, 2017)



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?


OpenShift Application Runtimes

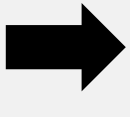
THE CIO DILEMMA

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

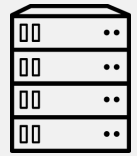
Resources

Time

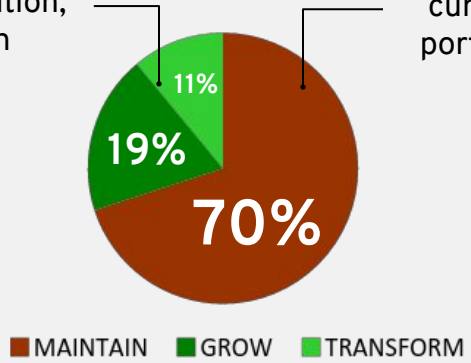
Budgets



Innovation, Differentiation, Growth



Maintain current portfolio

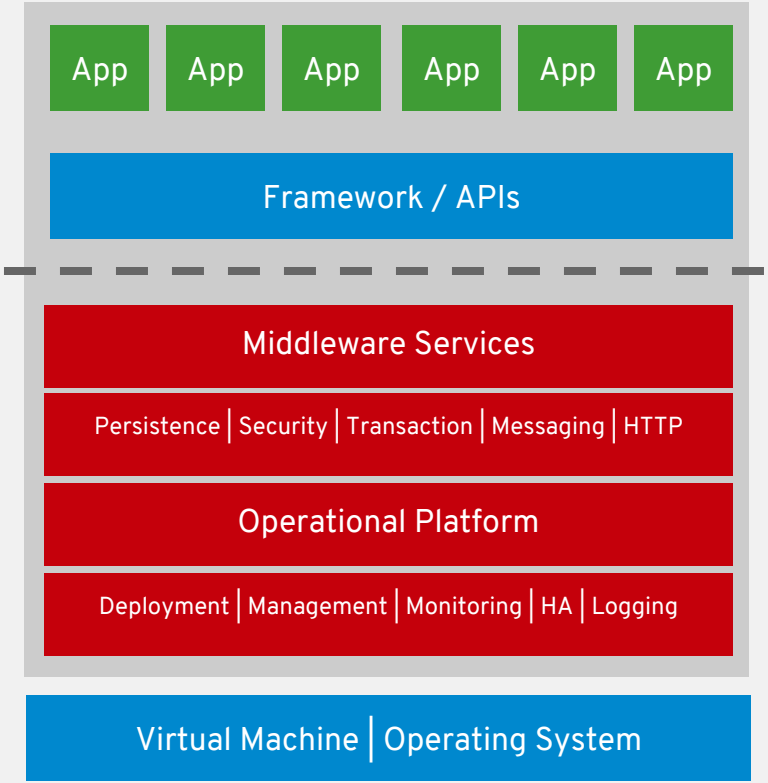


Three tactics that work:

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

Source: Graph created by Red Hat based on Gartner research. Potter, Kurt, Sanil Solanki, and Ken McGee, *Run, Grow and Transform the Business IT Spending: Approaches to Categorization and Interpretation.* Gartner G00308477, 27 June 2016

THE APPSERVER 2000-2014



Java™ COMPATIBLE ENTERPRISE EDITION

spring by Pivotal

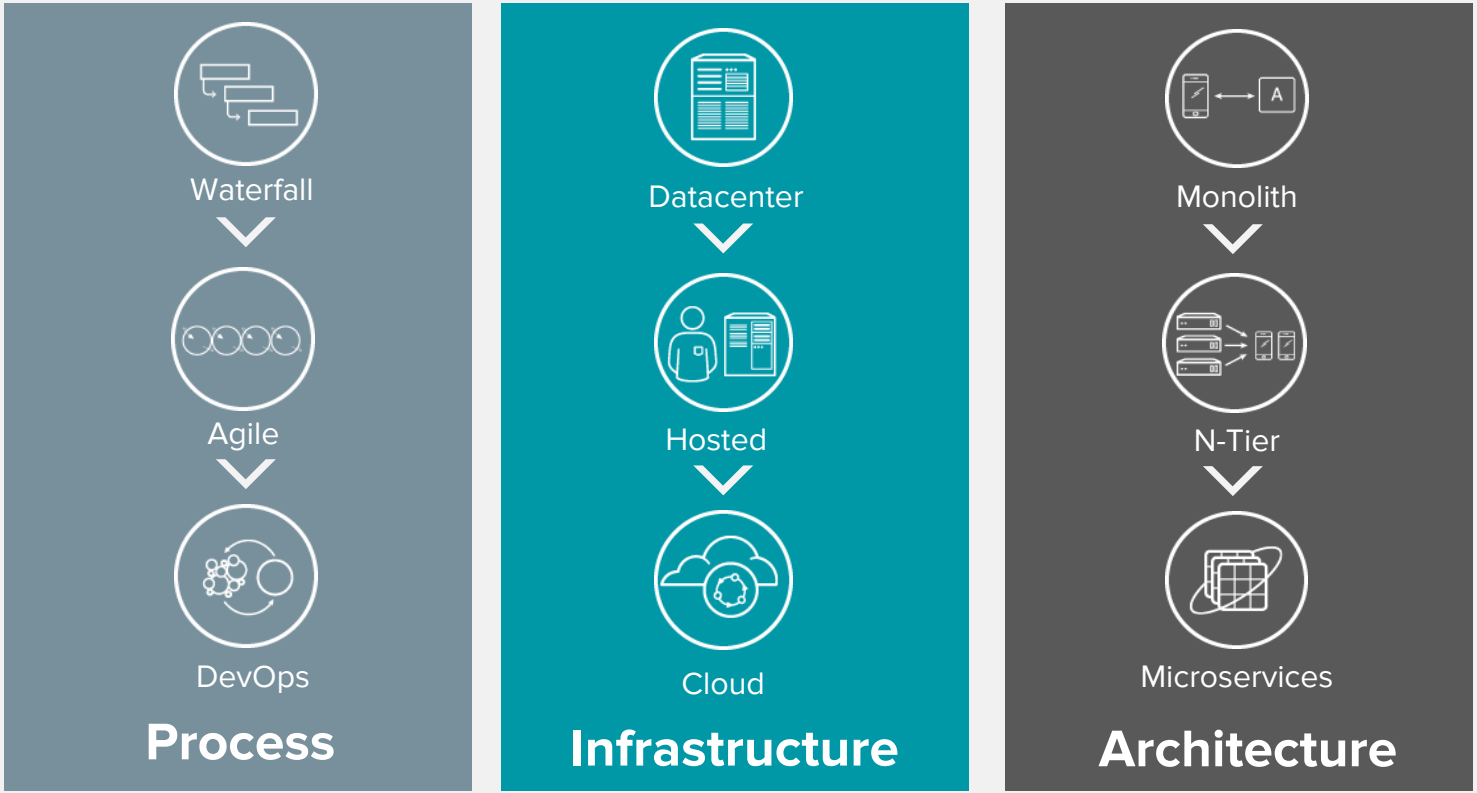
JBoss® by Red Hat

ORACLE®

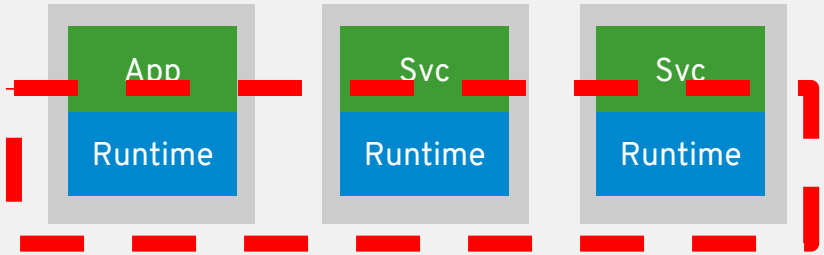
WebSphere® software

redhat.

SOFTWARE DEVELOPMENT IS CHANGING



THE APPSERVER 2014-...



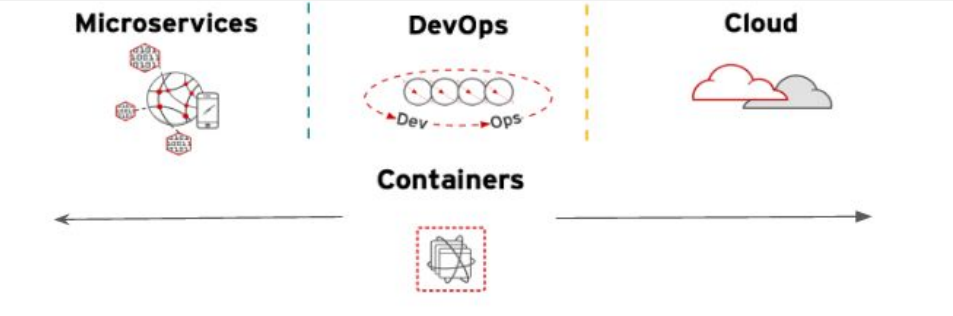
Data | Security | IMDG | Messaging

Cloud Platform

Build | Deploy | Scheduling | Scaling | Elasticity | Metrics | Logging

Cloud Provider

THE FUTURE PLATFORM REQUIREMENTS

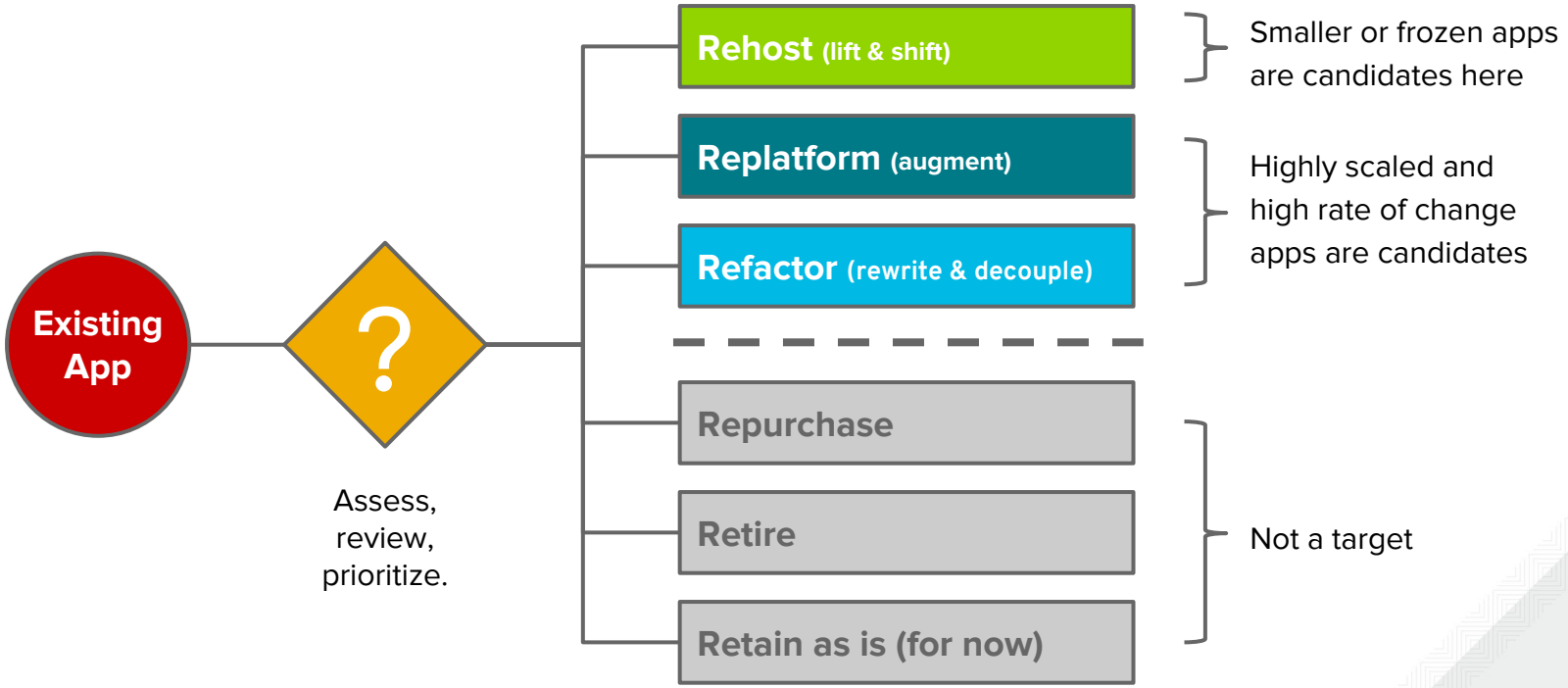


Polyglot
Async. / reactive
Resilient
Mono-micro migration

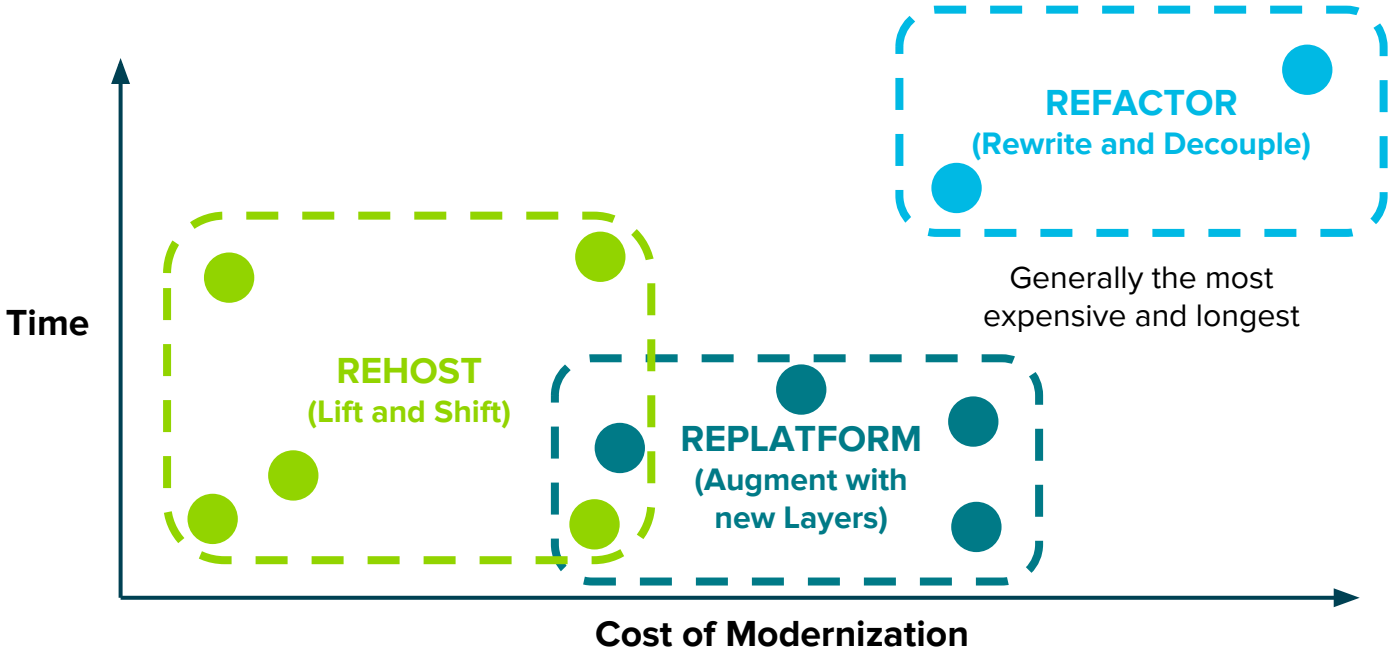
CI / CD
Containerized
Automated
Self-service
Observable

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

OPTIONS FOR APPLICATION MODERNIZATION

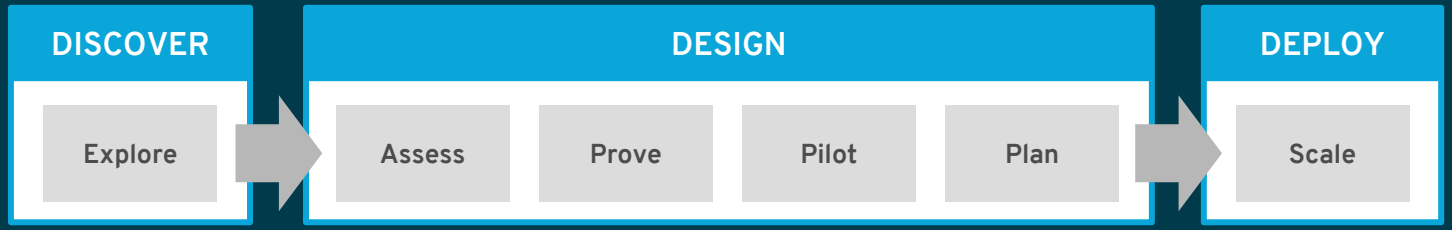


PATTERNS IN MODERNIZING WORKLOADS



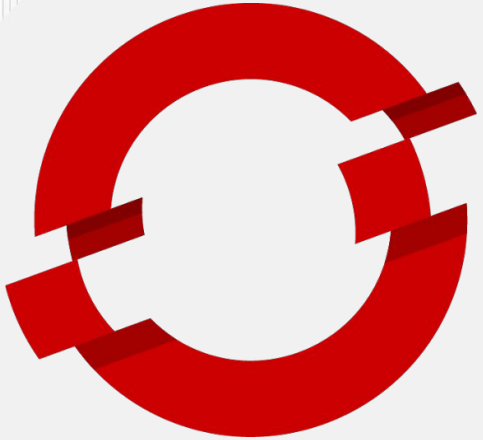
METHODOLOGY

Iterative, managed service, factory scale up.



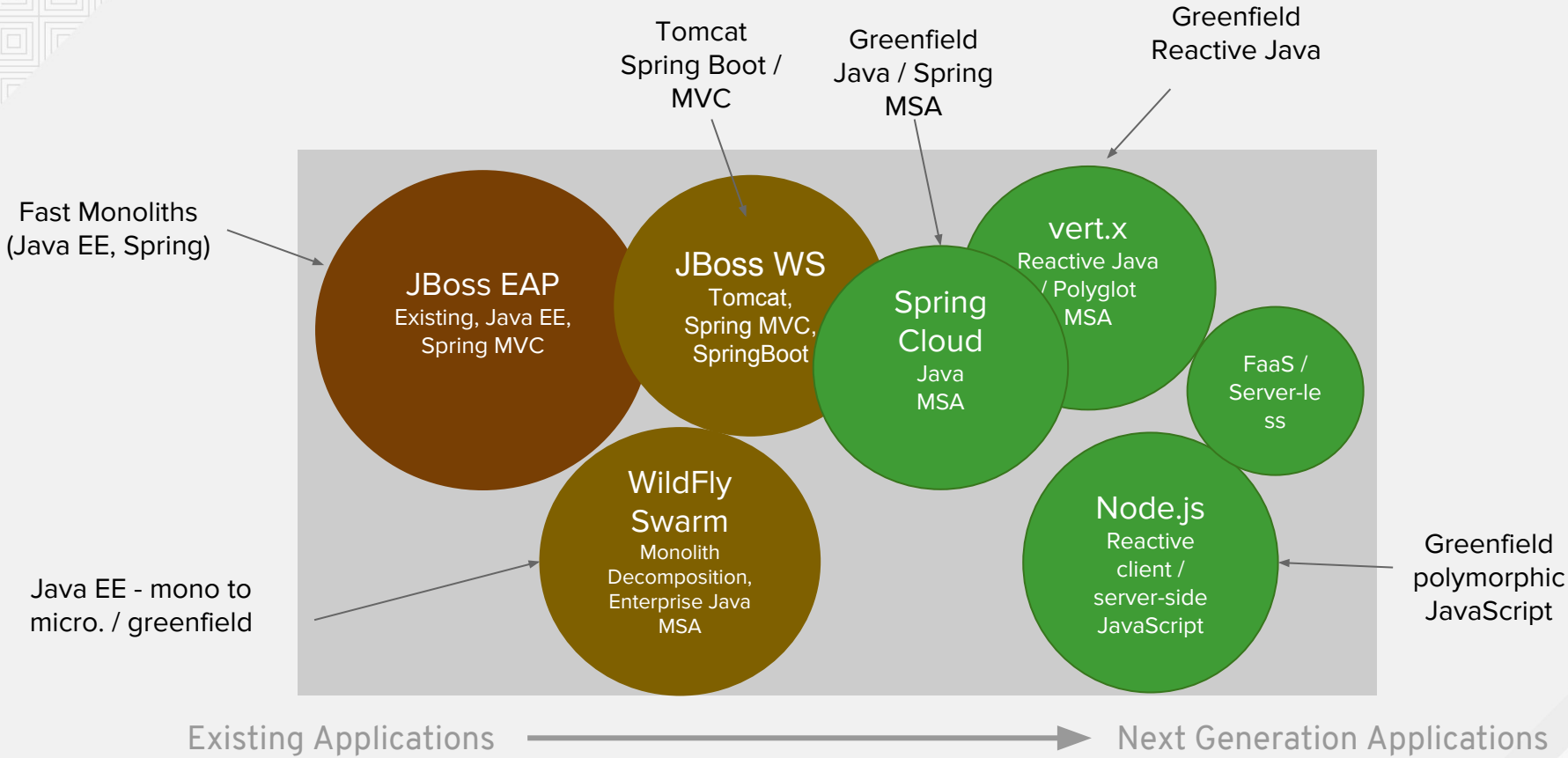
Typical duration	1 day	4 - 10 weeks	2 - 12 months

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



RED HAT® OPENSHIFT 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.


Tomcat
Spring Boot / MVC
Greenfield
Java / Spring MSA
Greenfield
Reactive Java
Fast Monoliths
(Java EE, Spring)
JBoss EAP
Existing, Java EE, Spring MVC
JBoss WS
Tomcat, Spring MVC, SpringBoot
Spring Cloud
Java MSA
vert.x
Reactive Java / Polyglot MSA
FaaS / Server-less
WildFly Swarm
Monolith Decomposition, Enterprise Java MSA
Node.js
Reactive client / server-side JavaScript
Java EE - mono to micro. / greenfield
Greenfield polymorphic JavaScript
Existing Applications
Next Generation Applications

OpenShift Application Runtimes (RHOAR)

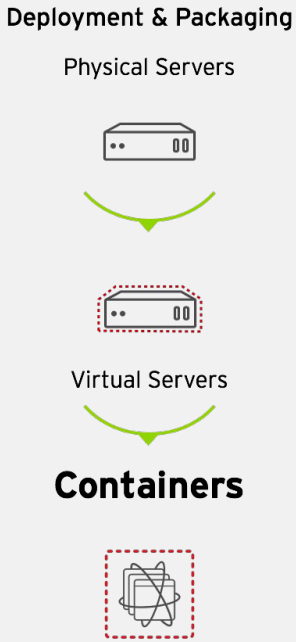
Benefits

- 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

Best in class OSS

Linux Containers

- Resource efficiency
- Enable application portability across 4 infrastructure footprints: Physical, Virtual, Private & Public Cloud
- Package my application and all of its dependencies
- Deploy to any environment in seconds and enable CI/CD

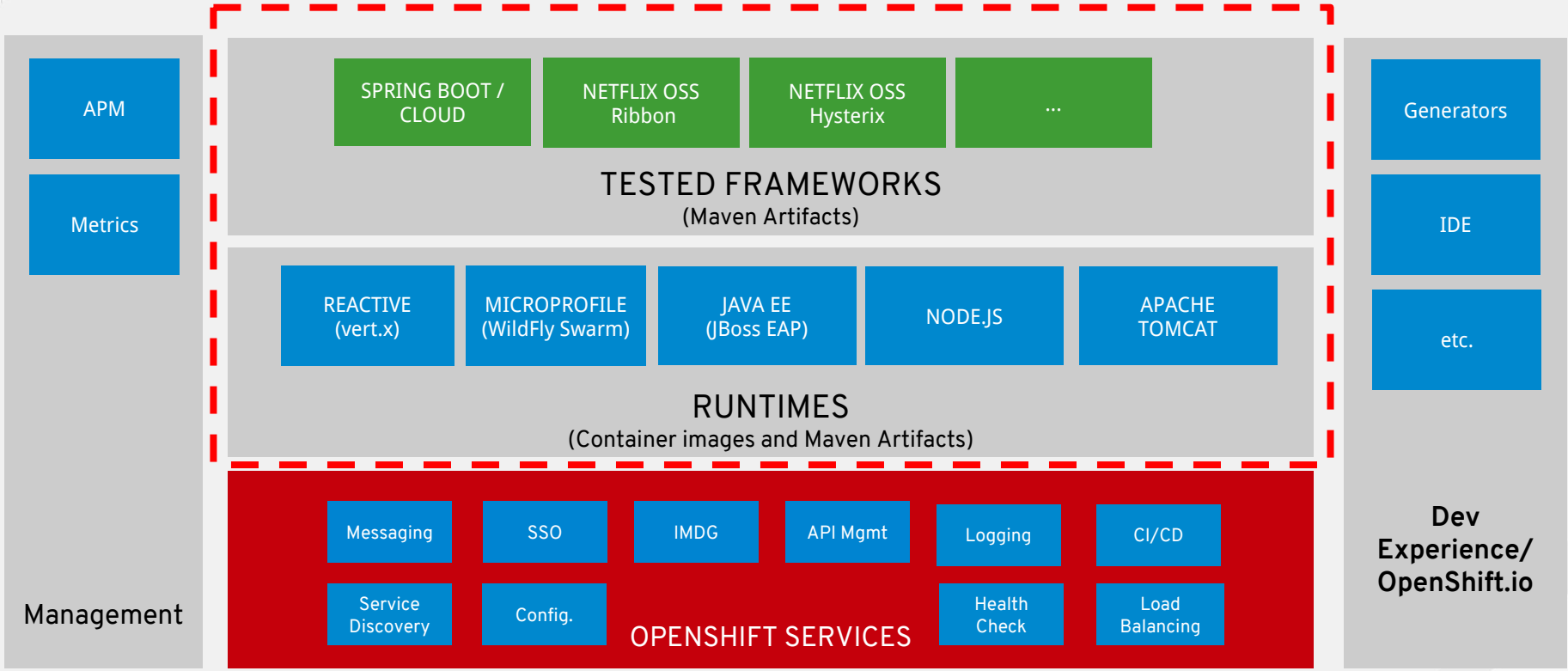


Best in class OSS

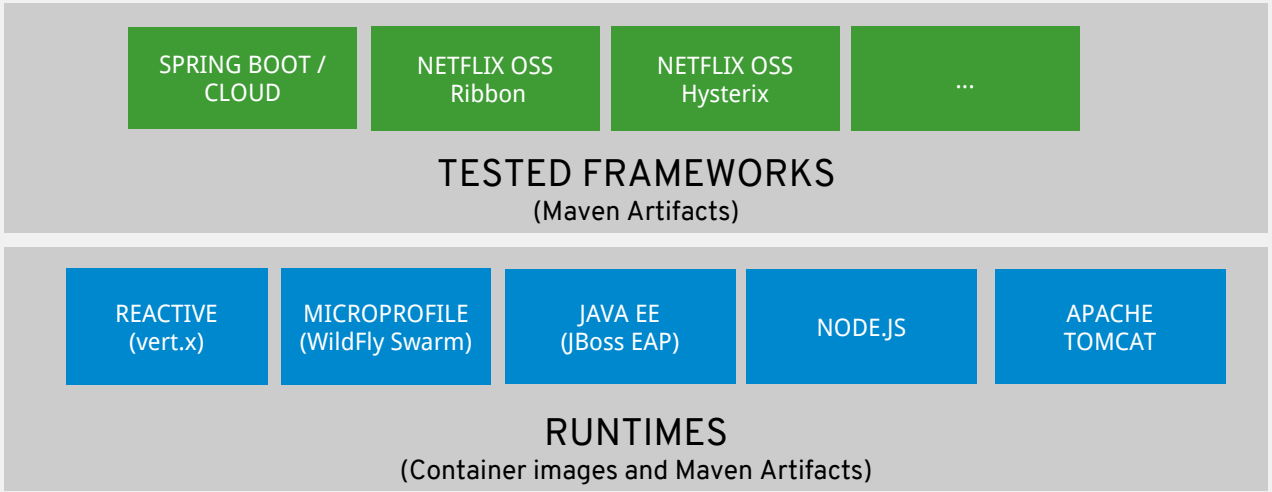
Kubernetes

- Set of features that are relevant to developer
  - Support 12-factor / cloud-native design-patterns :
    - Healthcheck / load-balancing / proxying
    - Registry / config.
    - Rolling upgrades / retries / failover
    - Separation of concerns
  - Cloud-scale design
    - Networking, storage, auto-scaling, logs, alerting
- Multiple Application Runtimes
  - Integrated with Kubernetes (openshift).

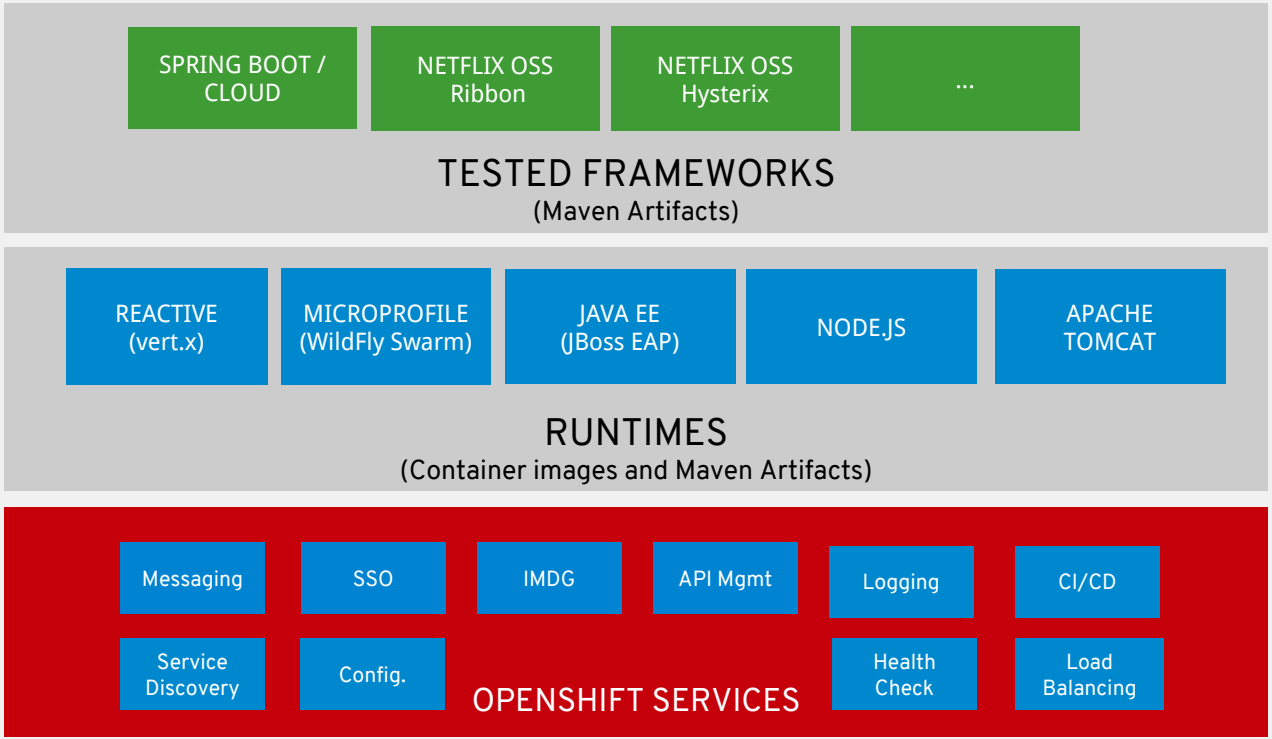
OpenShift Application Runtimes



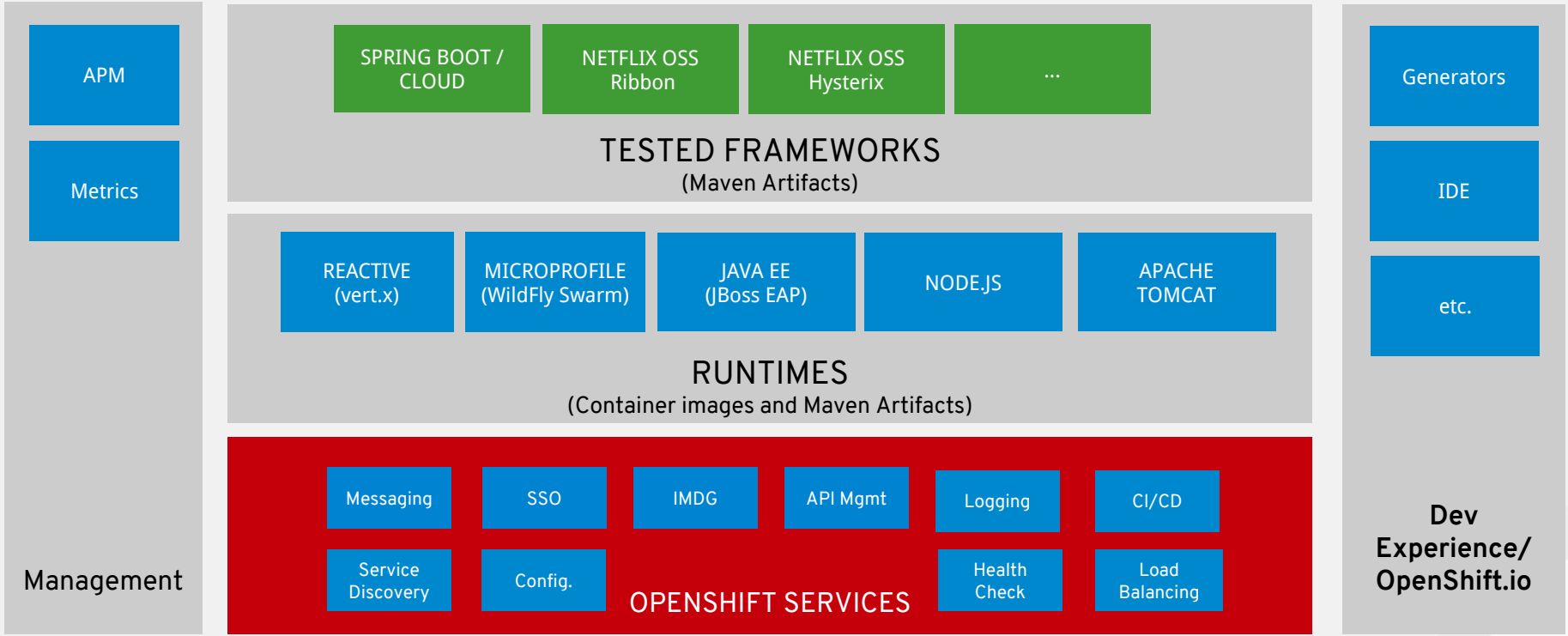
OpenShift Application Runtimes



OpenShift Application Runtimes



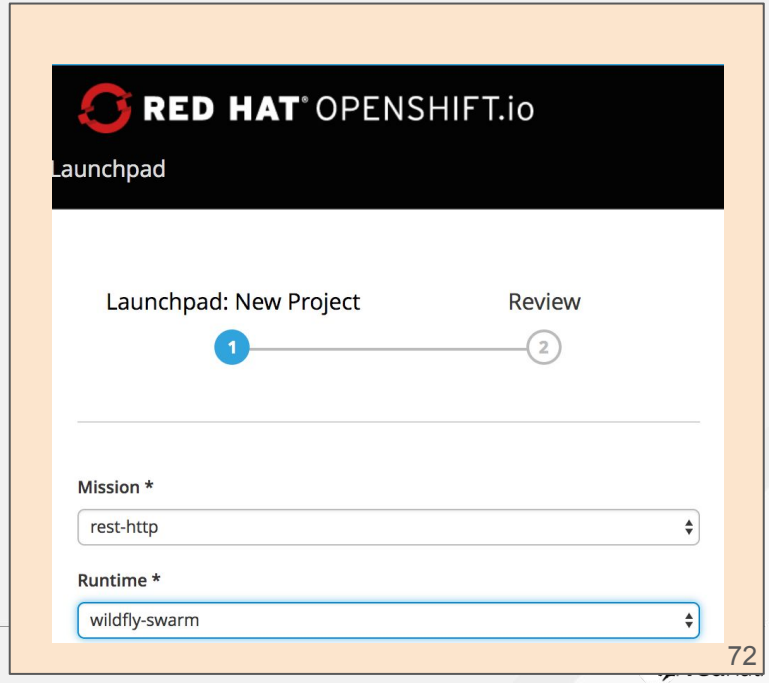
OpenShift Application Runtimes



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



WILDFLY SWARM

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Wildfly Swarm

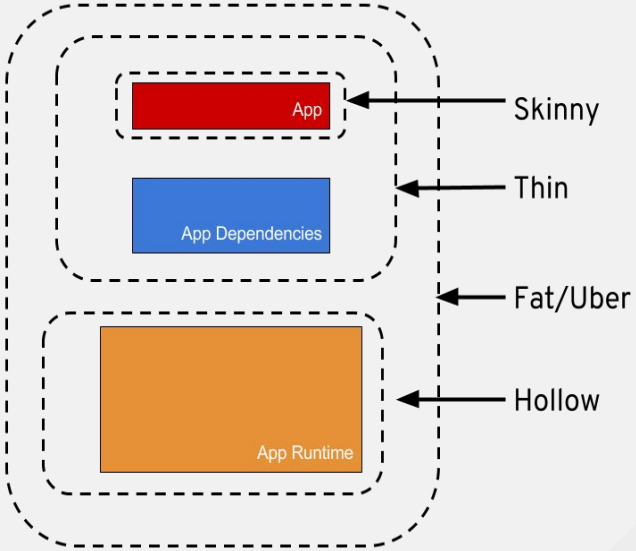
- Microservices offering for Java EE developers
  - Wildfly Swarm components come from wildfly.
- Repackaging exercise
  - Package only what you need
  - Packaging the app server with your app
- Implementation of microprofile
  - Combines Java EE and microservices technologies
- Built from WildFly
 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

OPENSHIFT

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

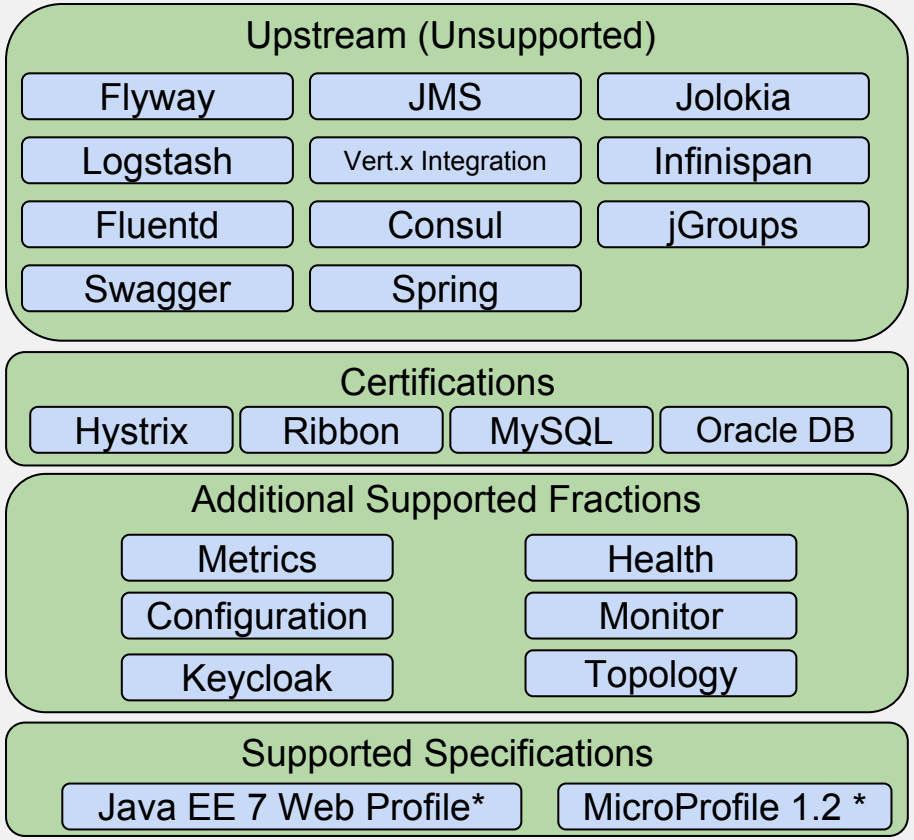
WildFly SWARM

Build microservices

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

OPENSHIFT

MICROPROFILE™



* Planned

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SPRING

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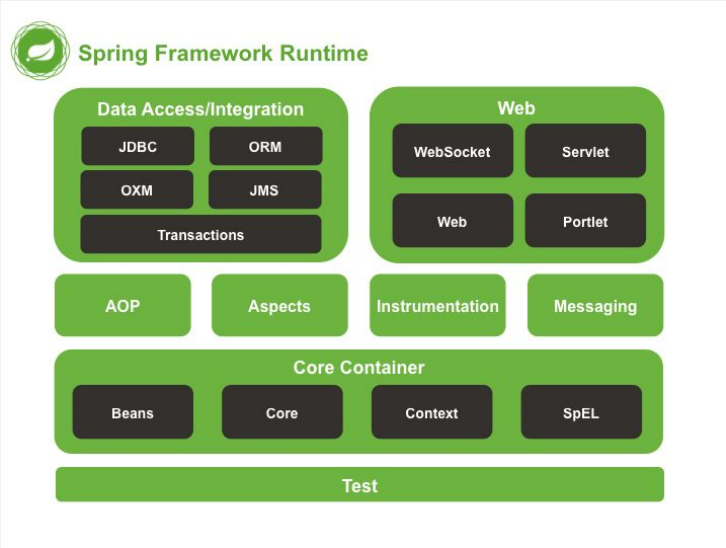
What is Spring ?

- 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, starters

ECLIPSE VERT.X

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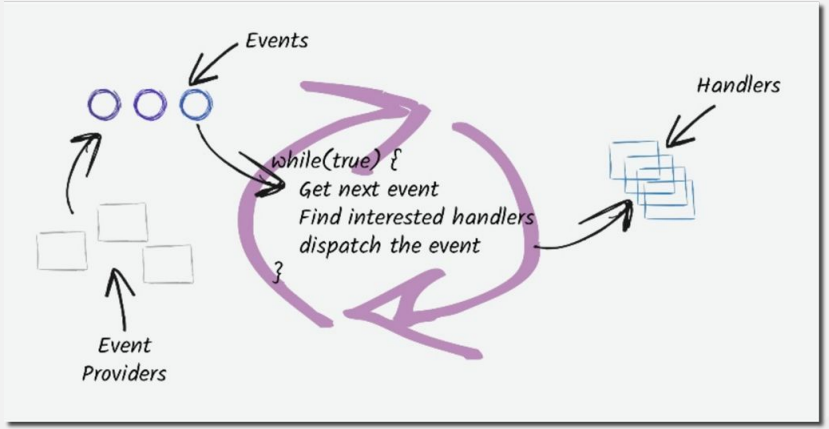
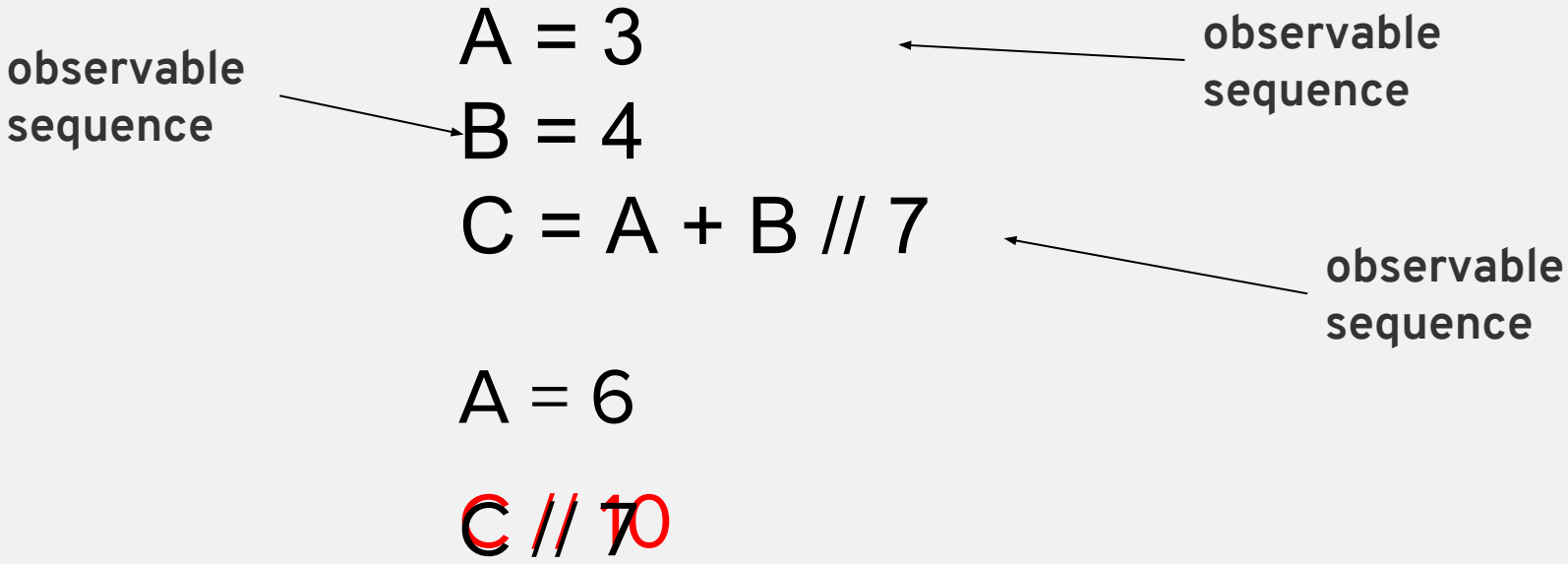
Reactive Programming

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



Reactive Programming

pseudocode example



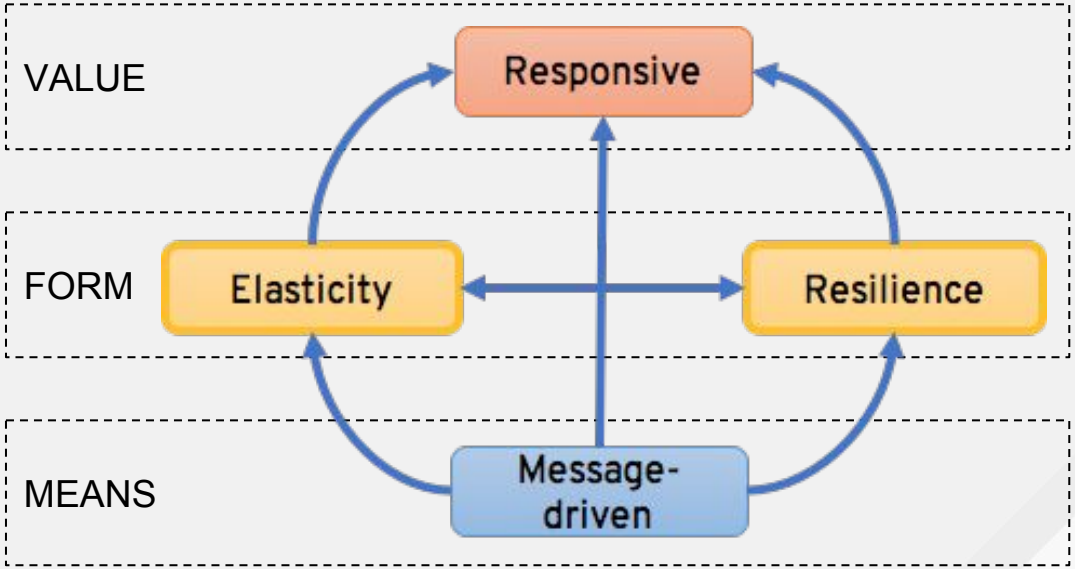
Reactive system

Reactive Manifesto

http://www.reactivemanifesto.org/

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

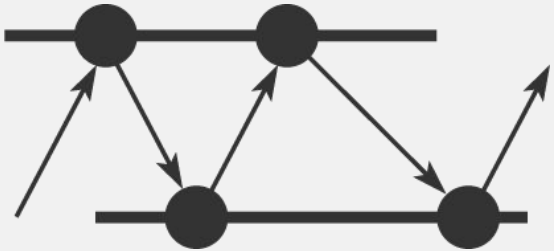
- React to events (message-driver)
- React to load (scalable)
- React to failures (resilient)
- React to users (responsive)



Eclipse Vert.x

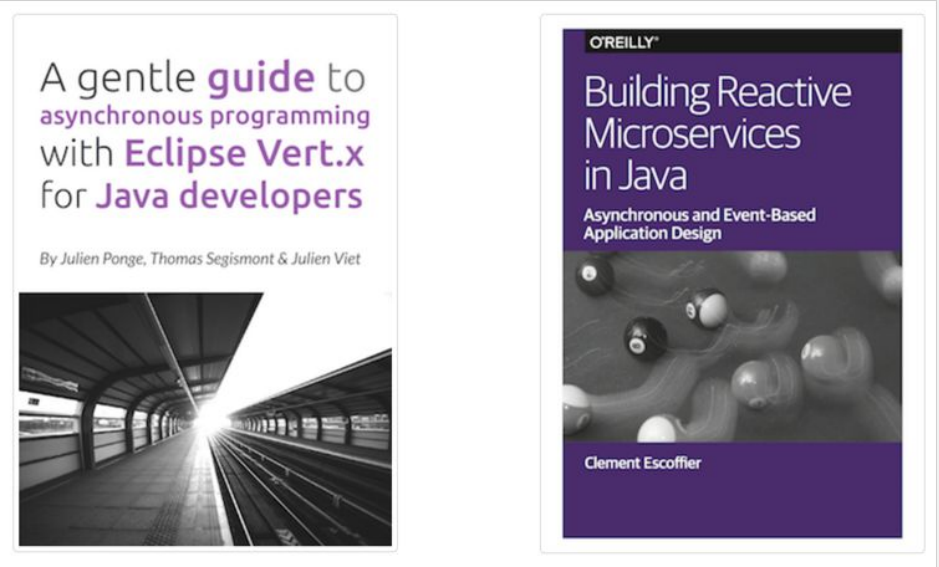
In RHOAR

- 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

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OpenShift Application Runtimes

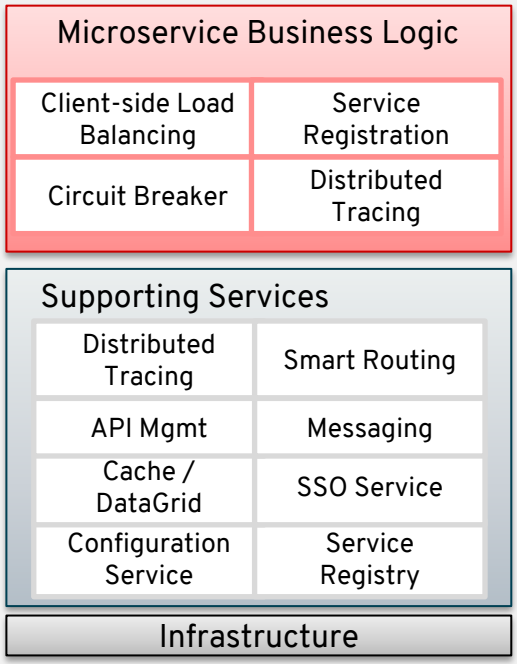
- **Multiple runtime options**
  - JBoss EAP - existing Java EE / Spring apps.
  - WildFly Swarm / MicroProfile - Java EE centric MSA
  - Spring Boot / Cloud - Spring centric MSA
  - Vert.x - greenfield reactive Java
  - Node.js - greenfield reactive JavaScript
- **OpenShift**
  - Public, Dedicated Public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

https://www.redhat.com/en/events/containers-and-cloud-native-roadshow#emea

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

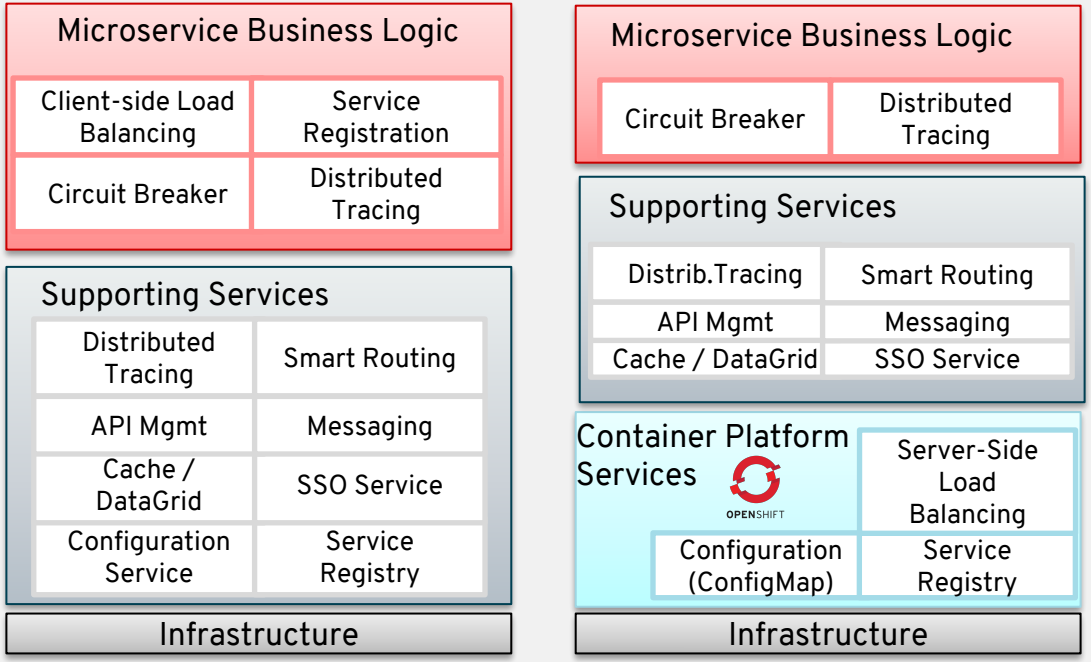
A hands-on experience for Ops and Dev professionals

EVOLUTION OF MICROSERVICES



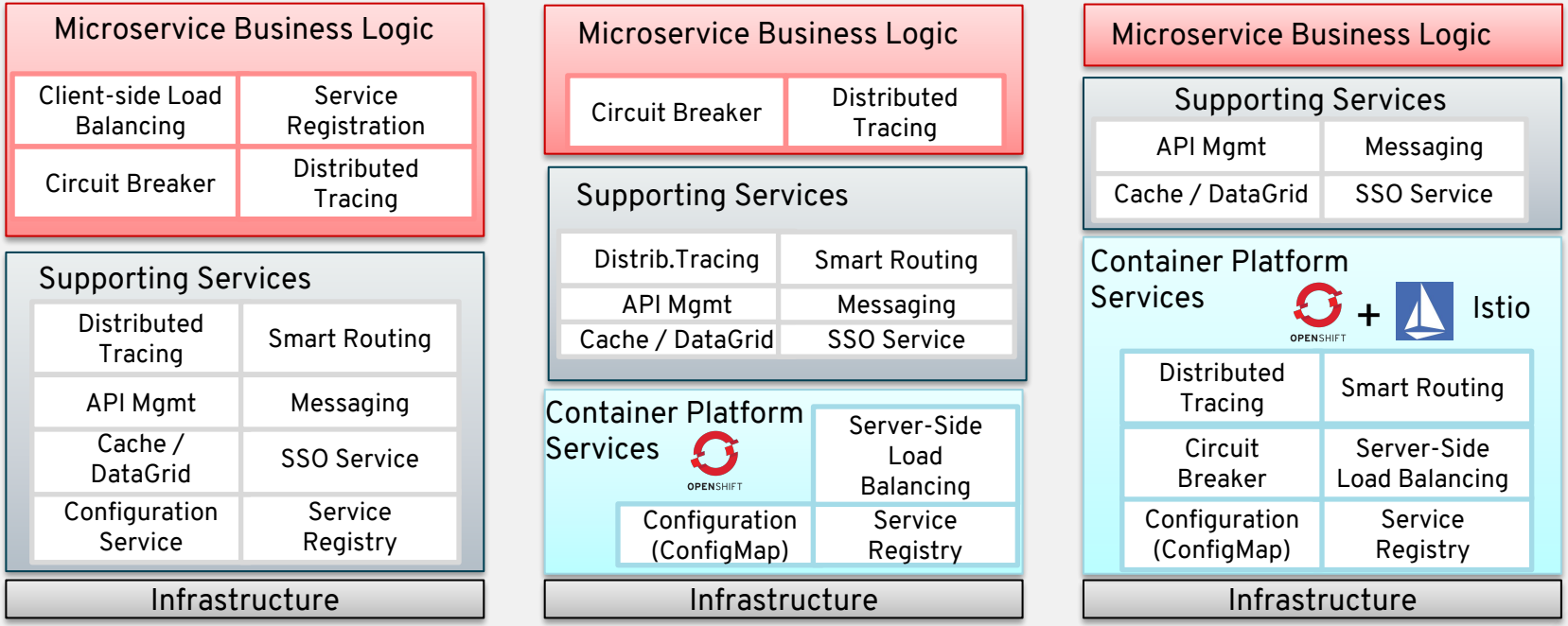
2014

EVOLUTION OF MICROSERVICES



2014 Current

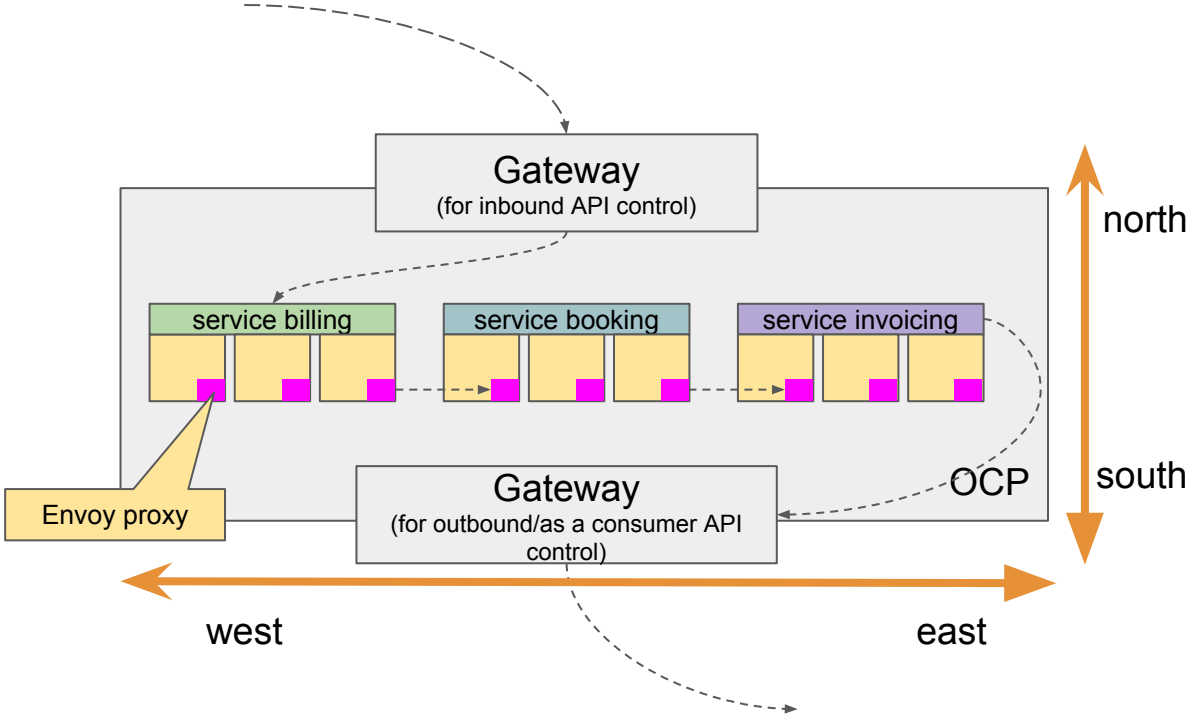
EVOLUTION OF MICROSERVICES



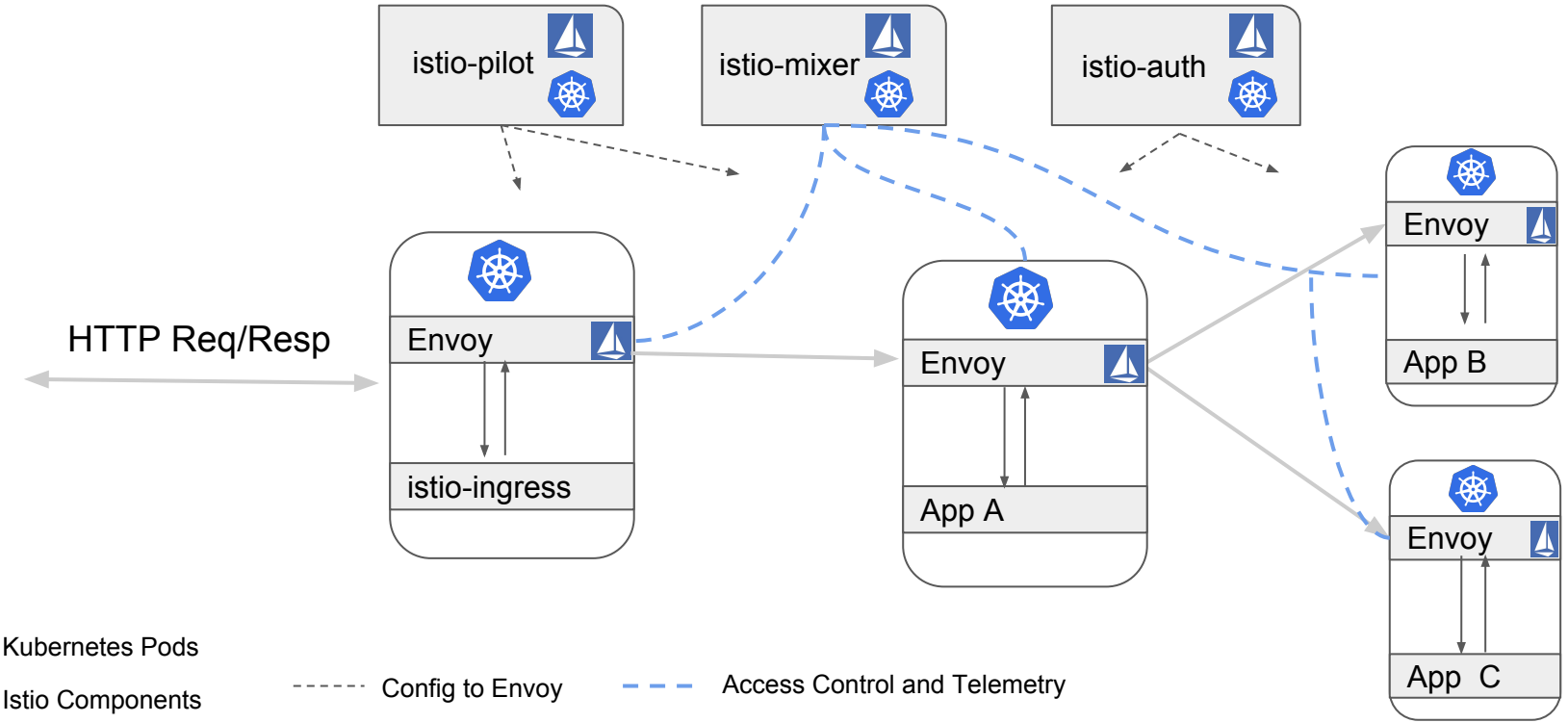
2014 Current Future

Istio

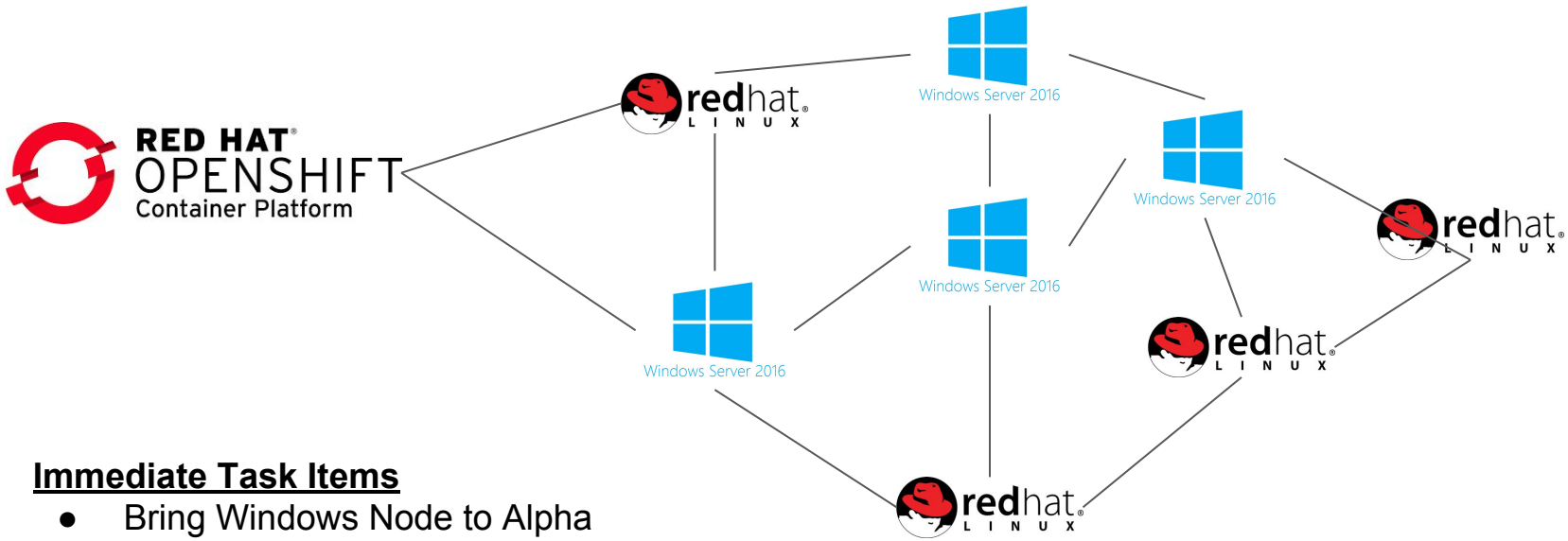
- **Intelligent Routing and Load Balancing**
- **Resilience Across Languages and Platforms**
- **Telemetry and Reporting**
- **Policy Enforcement**



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

Q3 CY2017

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)

Q4 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 3.9 (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

Q2 CY2018

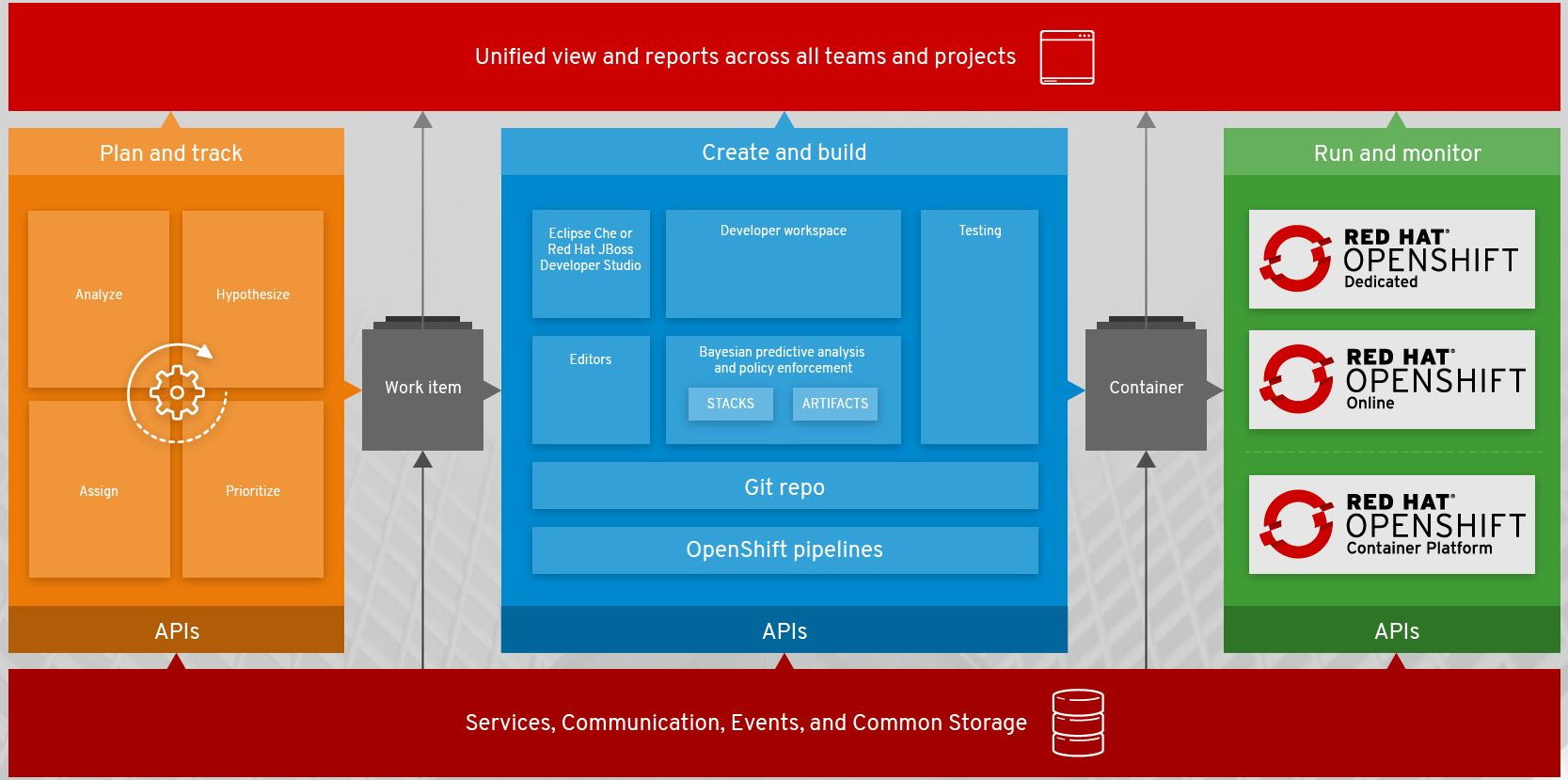
OpenShift Container Platform 3.10 (August)

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

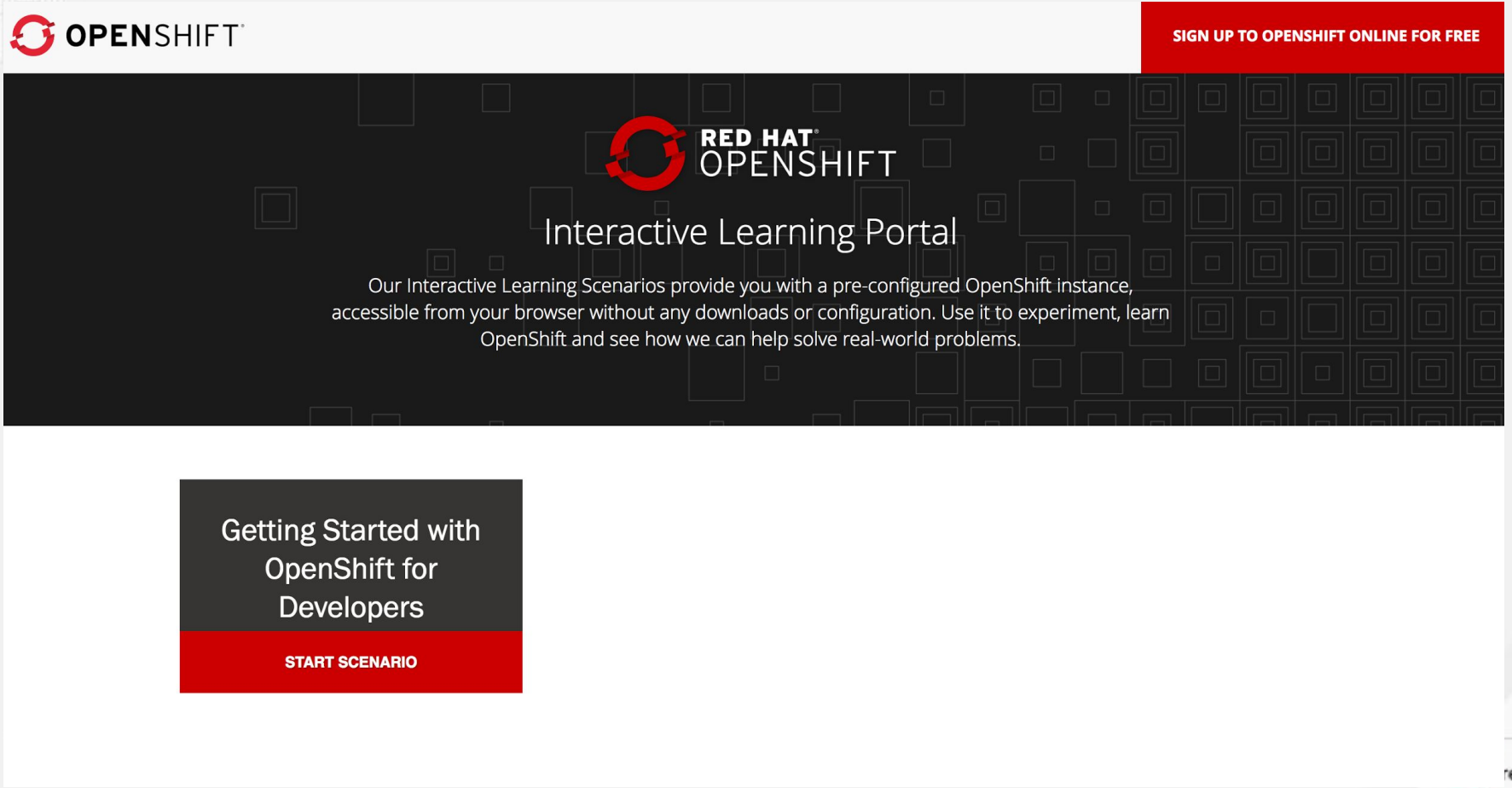
OpenShift Online & Dedicated

- TBC

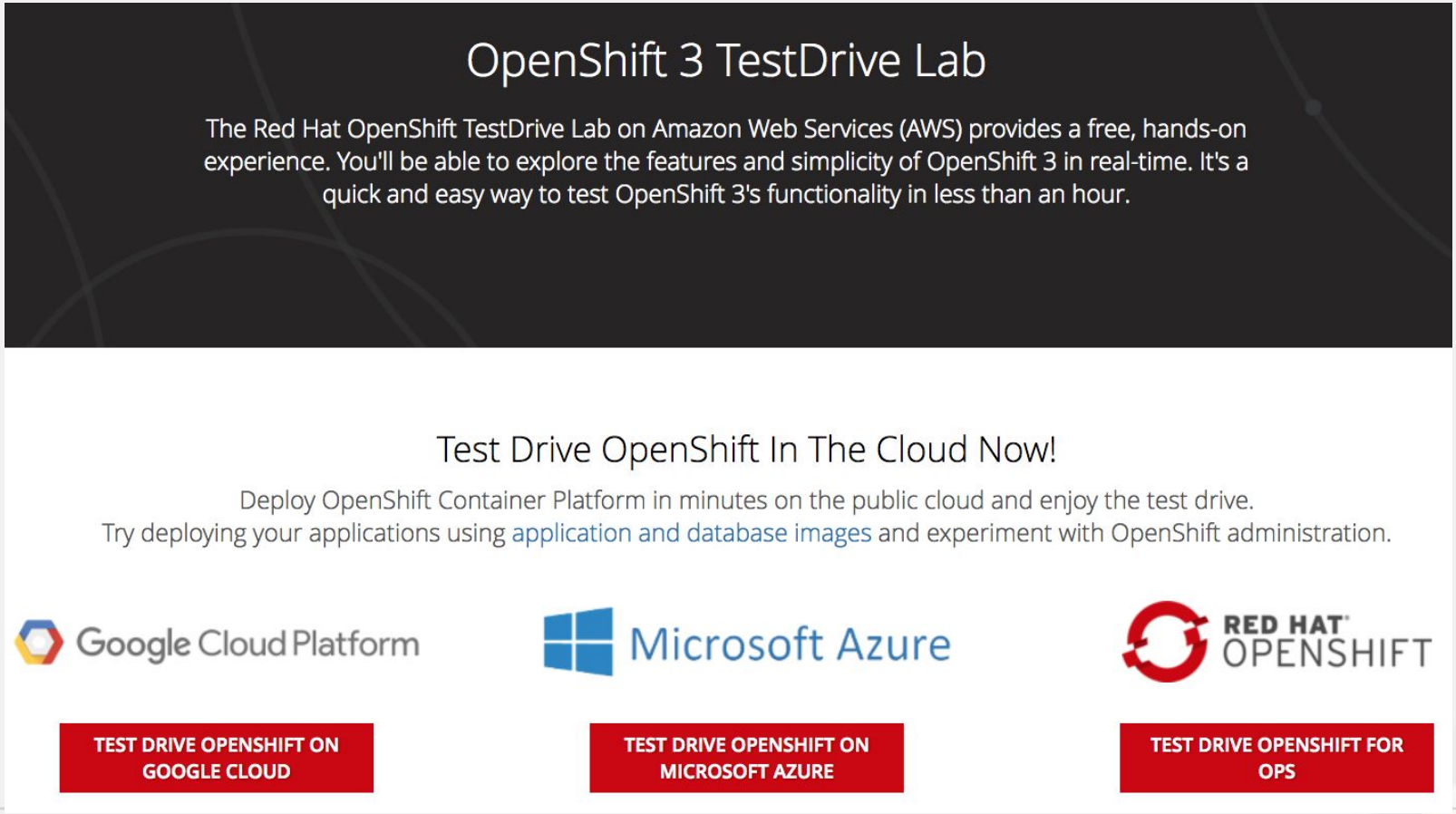
Developer Tools-aaS : OpenShift.io



http://learn.openshift.com



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



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

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

redhat.