



**Red Hat**



**Microsoft Azure**

# Monoliths to microservices: App Transformation

Hands-on Technical Workshop

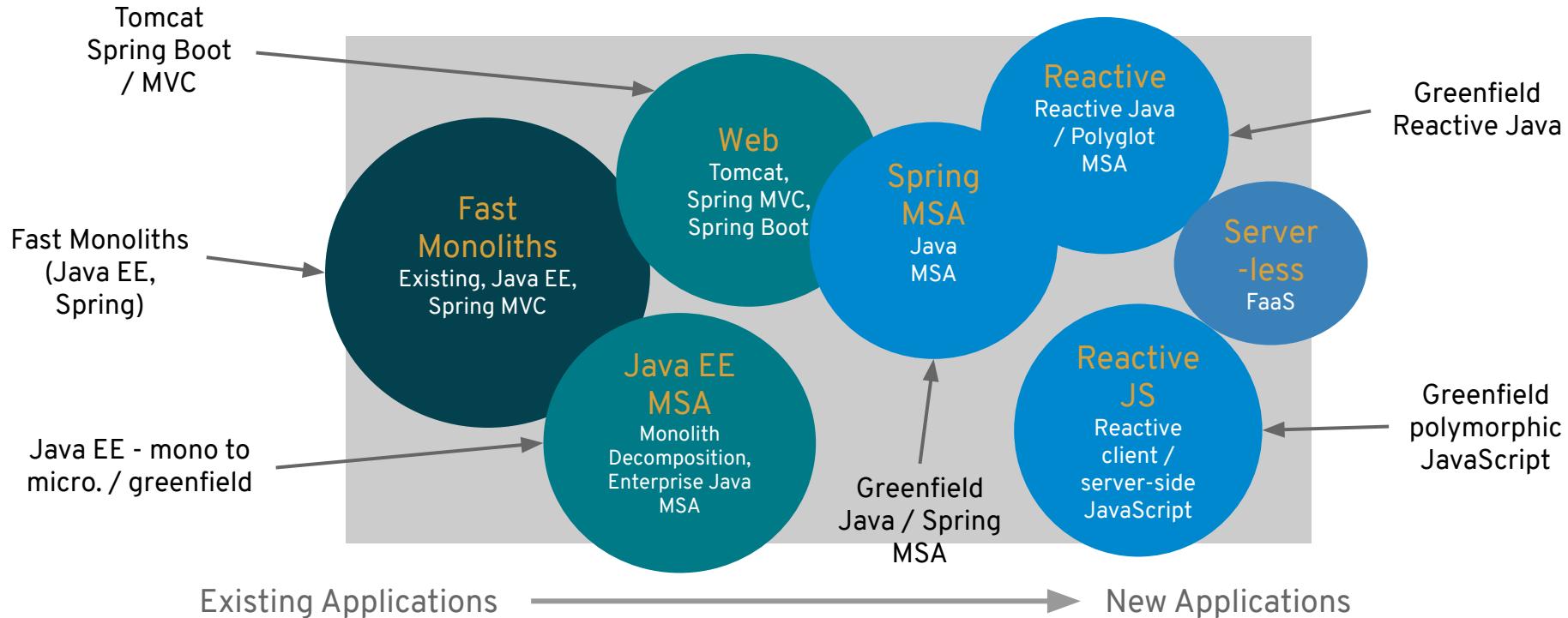


**Red Hat**

---

# Moving existing apps to the cloud

# The spectrum of enterprise apps



# Migration and modernization approaches

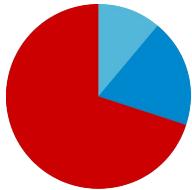
## MODERNIZING EXISTING APPS

- Reuse existing functionality and data as much as possible
- Move existing workloads to a modern deployment platform
- Apply new processes, products, and technology to existing apps

## DEVELOPING NEW APPLICATIONS

- API-centric polyglot microservices architecture
- Autonomous development teams
- Agile development, continuous deployment, DevOps culture
- Containerized & orchestrated cloud deployments

# Application modernization



Existing Apps

How much work required to rewrite?

Review  
Analyze  
Prioritize

Lift & Shift

Connect & Extend

Rip & Re-write

Repurchase

Retire

Retain as is

Smaller or frozen apps are candidates here

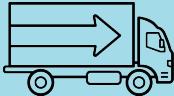
Highly scaled and high rate of change apps are candidates

Not a target

# Patterns in modernizing workloads

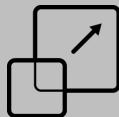
## LIFT & SHIFT

- Containerize existing workloads
- Deploy them on a **PaaS**
- Keep external integrations and data on legacy
- Legacy applications have to be well written and suited



## CONNECT & EXTEND

- Legacy remains intact
- New layer - new capabilities
- Deploy on **PaaS**
- New integration points between legacy and new layers (**Need for Agile Integration**)



## RIP & RE-WRITE

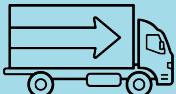
- Legacy is totally replaced
- New interfaces and data
- Use **PaaS** to run
- Some data and features can be re-wrapped, but mostly are retired.



# Patterns in modernizing workloads

## LIFT & SHIFT

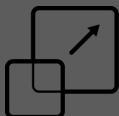
- Containerize existing workloads
- Deploy them on a **PaaS**
- Keep external integrations and data on legacy
- Legacy applications have to be well written and suited



FOCUS FOR THIS SECTION

## CONNECT & EXTEND

- Legacy remains intact
- New layer - new capabilities
- Deploy on **PaaS**
- New integration points between legacy and new layers (**Need for Agile Integration**)

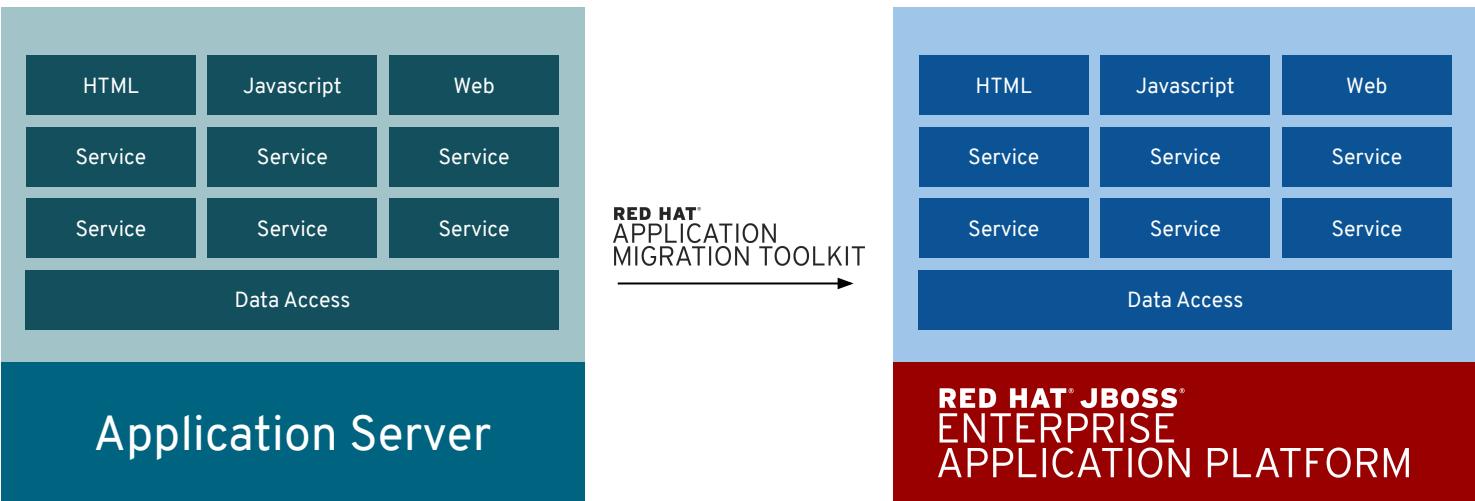


## RIP & RE-WRITE

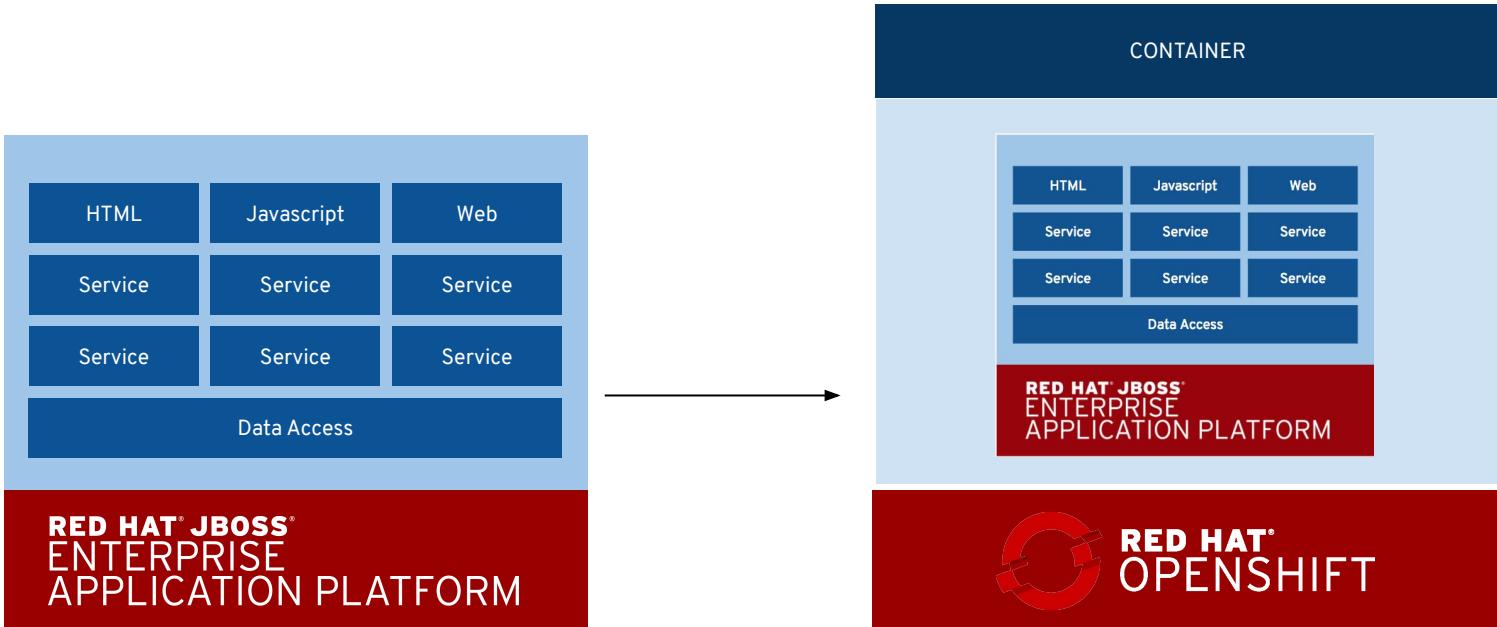
- Legacy is totally replaced
- New interfaces and data
- Use **PaaS** to run
- Some data and features can be re-wrapped, but mostly are retired.



# Lift-and-shift monolith to cloud



# Lift-and-shift monolith to cloud



# Majestic Monolith

<https://m.signalvnoise.com/the-majestic-monolith-29166d022228>

## Majestic (fast-moving) monolith

- Large organizations have a tremendous amount of resources **invested in existing monolith applications**
- Looking for a **sane way** to capture the benefits of containers and orchestration **without having to complete rewrite**
- **OpenShift** provides the platform for their existing investment with the benefit of a **path forward** for microservice based apps in the future

# Why migrate to JBoss EAP?

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.

---

# Lab: Moving existing apps to the cloud

## Goal for lab

In this lab you will learn:

- How to use lab environment for today
- How to migrate an existing legacy Java EE application (CoolStore) from Weblogic to JBoss EAP using **Red Hat Application Migration Toolkit**
- How to deploy the result to **OpenShift container platform** to create a *Fast Moving Monolith*
- Different alternatives to building and deploying an application

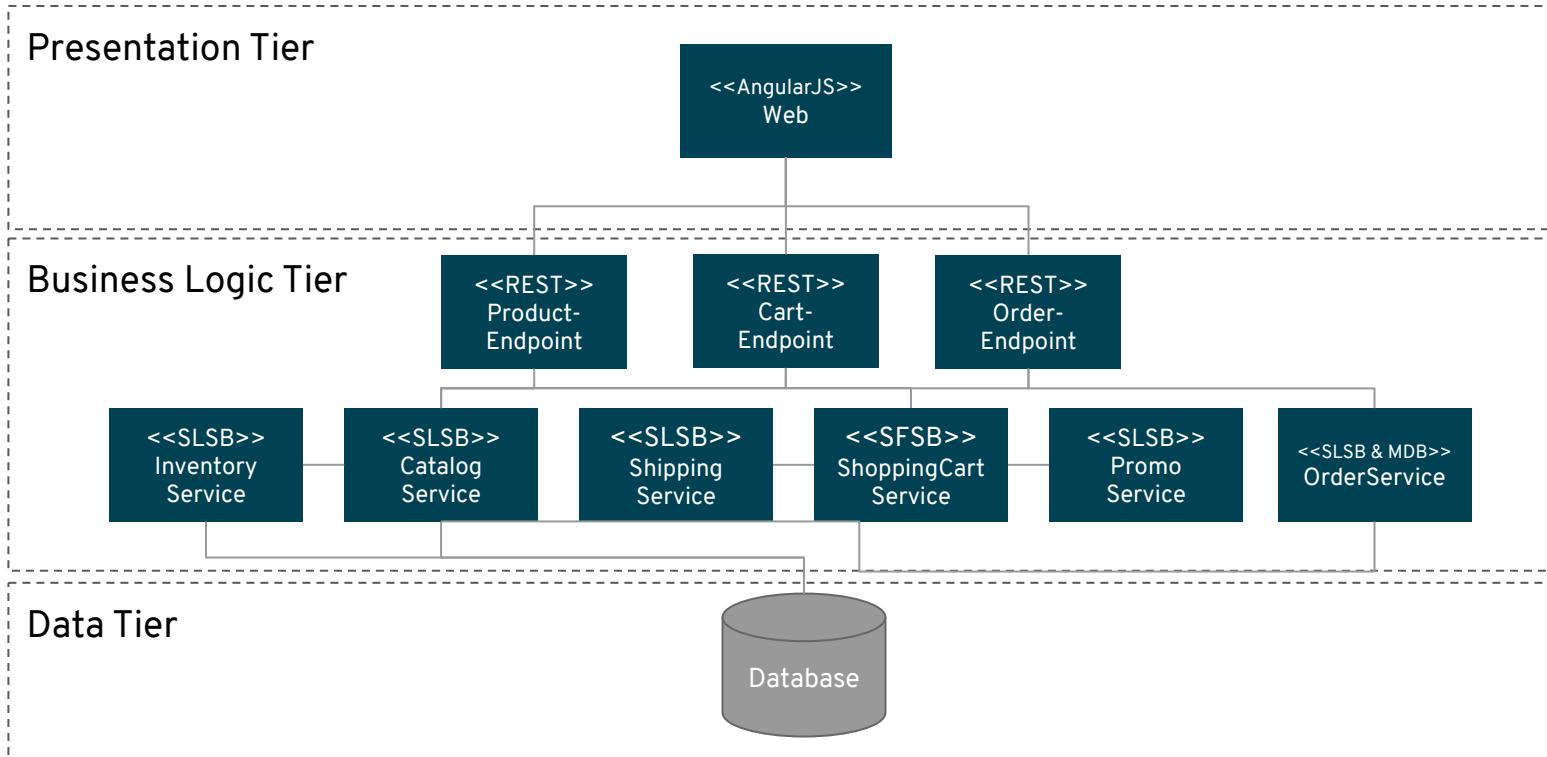
# Coolstore application

Red Hat Cool Store Your Shopping Cart

Shopping Cart \$0.00 (0 item(s)) Sign In Unavailable  
SSO has not been config

<p>Red Fedora</p> <p>Official Red Hat Fedora</p>  <p>\$34.99</p> <p>1 Add To Cart 736 left! ⬇️</p>	<p>Forge Laptop Sticker</p> <p>JBoss Community Forge Project Sticker</p>  <p>\$8.50</p> <p>1 Add To Cart 512 left! ⬇️</p>	<p>Solid Performance Polo</p> <p>Moisture-wicking, antimicrobial 100% polyester design wicks for life of garment. No-curl, rib-knit collar; special collar band maintains crisp fold; three-button placket with dyed-to-match buttons; hemmed sleeves; even bottom with side vents; Import. Embroidery. Red Pepper.</p> 
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

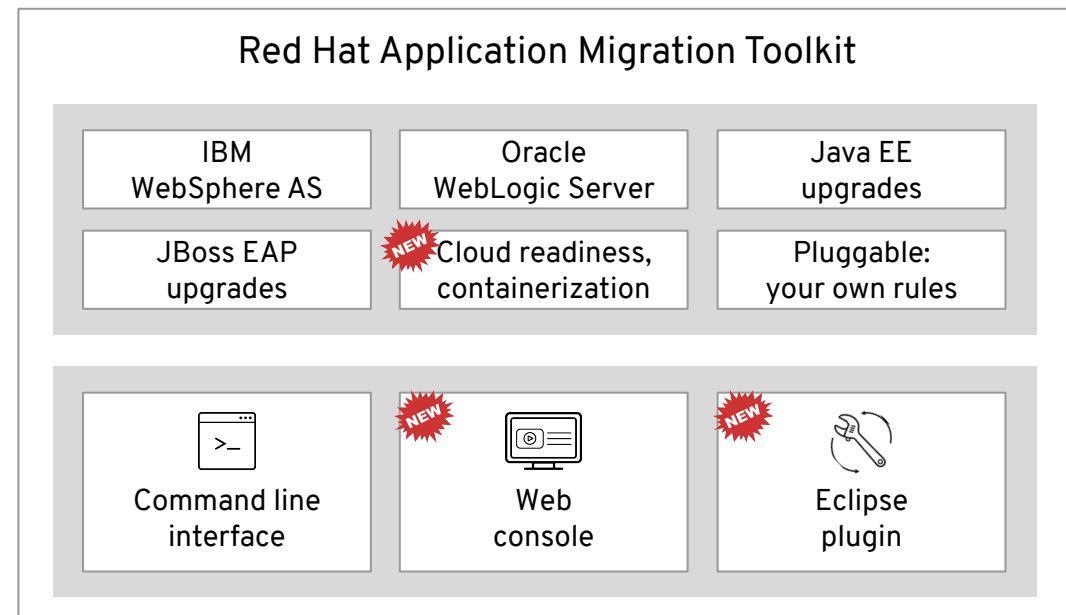
# Coolstore application



# RED HAT® APPLICATION MIGRATION TOOLKIT

**Catalyze large scale application modernizations and migrations**

- Automate analysis
- Support effort estimation
- Accelerate code migration
- Free & Open Source



# LAB: MOVING EXISTING APPS TO THE CLOUD

WEB: [bit.ly/RH-MS-lab-guides](http://bit.ly/RH-MS-lab-guides)  
SLIDES (PDF): [bit.ly/RH-MS-lab-slides](http://bit.ly/RH-MS-lab-slides)

SCENARIO 1    GETTING STARTED WITH THIS COURSE



SCENARIO 2    MOVING EXISTING APPS TO THE CLOUD

---

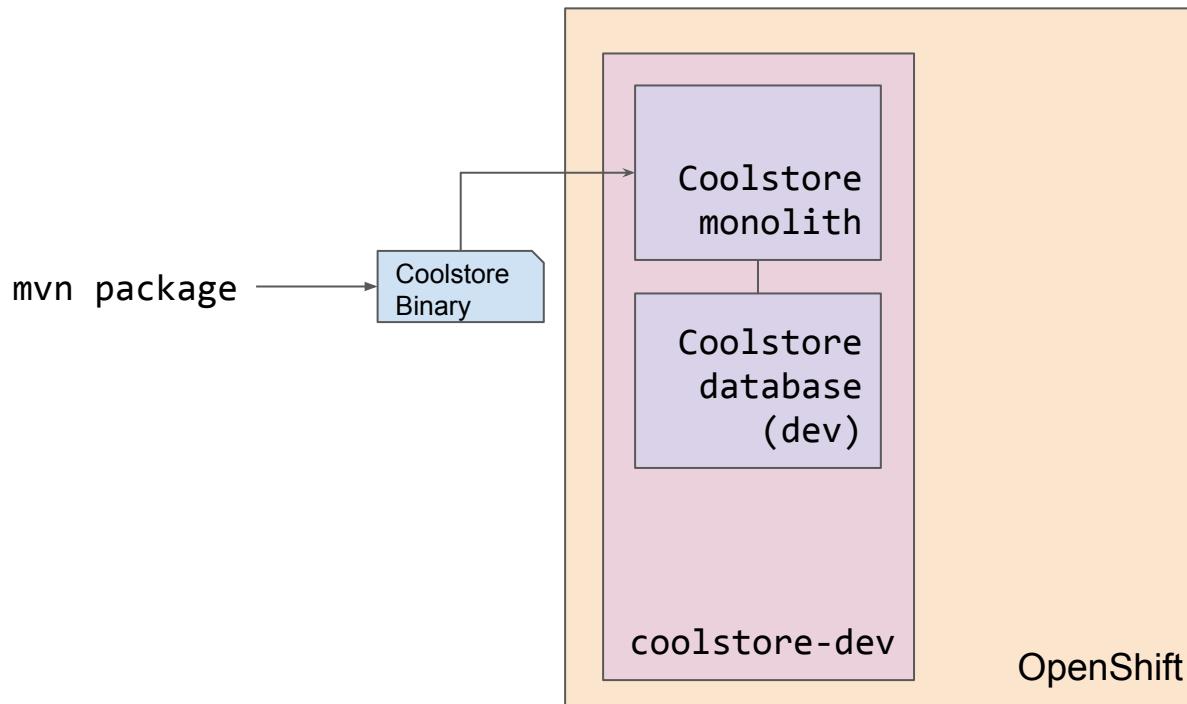
# Wrap-up and discussion

## Result of lab

In this lab you:

- Familiarized yourself with the Lab environment
- Migrated the CoolStore monolith from Weblogic to **JBoss EAP** using **Red Hat Application Migration Toolkit**
- Created a new development project on **OpenShift**
- Deployed the migrated app to OpenShift using a Template and a Binary Build
- In the next lab you will explore OpenShift deeper as a developer

## Result of lab



# BUSINESS VALUE FOR APP MODERNIZATION

## APPLICATION MODERNIZATION & MIGRATION (AMM)

VALUE FOR  
CUSTOMERS

### WITH EAP

**43% gains** in DEV. PRODUCTIVITY  
**79% LESS EXPENSIVE**  
**509% ROI** over 3 years  
**10 months PAYBACK** of investment

### WITH OPENSHIFT

**40% infrastructure SAVINGS**  
**66% FASTER app delivery**  
**8 months PAYBACK**

Sources:

Consulting services data: Red Hat  
IDC “[The business value of JBoss EAP](#)”, 2015  
IDC - “[The business value of Red Hat OpenShift](#)”, 2016

## Business value for app modernization

### APPLICATION MODERNIZATION & MIGRATION (AMM)

VALUE FOR  
CUSTOMERS

#### WITH EAP

**43% gains** in DEV. PRODUCTIVITY  
**79% LESS EXPENSIVE**  
**509% ROI** over 3 years  
**10 months PAYBACK** of investment

#### WITH OPENSHIFT

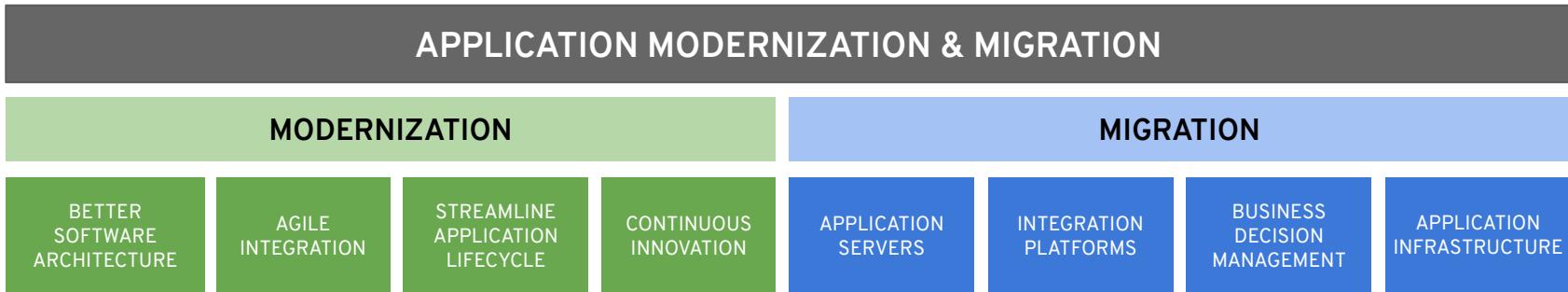
**40% infrastructure SAVINGS**  
**66% FASTER** app delivery  
**8 months PAYBACK**

Sources:

Consulting services data: Red Hat  
IDC "The business value of JBoss EAP", 2015  
IDC - "The business value of Red Hat OpenShift", 2016

# The umbrella

## Value goes beyond cost



Customer value beyond cost - Digital transformation



RE-BALANCE MAINTENANCE AND INNOVATION



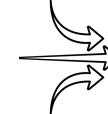
DECREASE COMPLEXITY, INCREASE EFFICIENCY



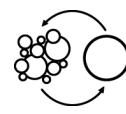
REDUCE / AVOID VENDOR LOCK-IN, INFLEXIBLE LICENSE MODELS



INCREASE SPEED & BECOME MORE PRODUCTIVE

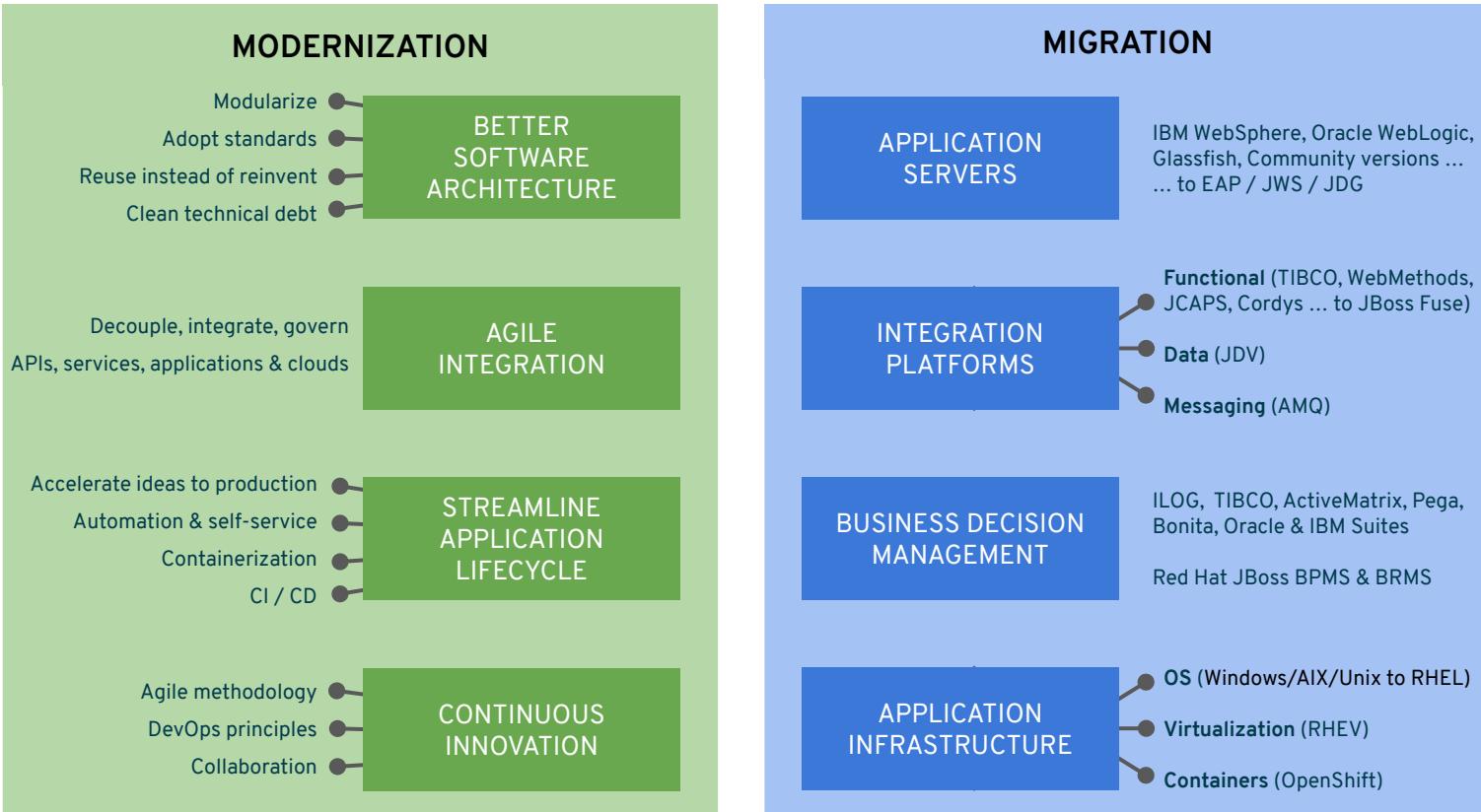


REMOVE TECHNICAL DEBT & RISK



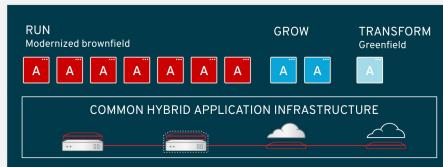
ADOPT AGILE METHODOLOGIES, DEVOPS

# APPLICATION MODERNIZATION & MIGRATION

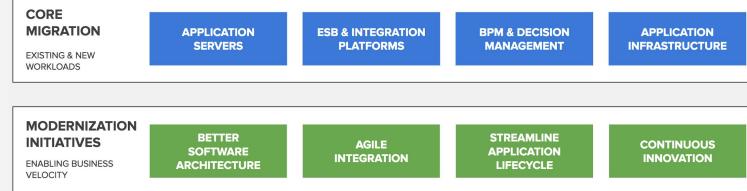


# Red Hat application migration & modernization program

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

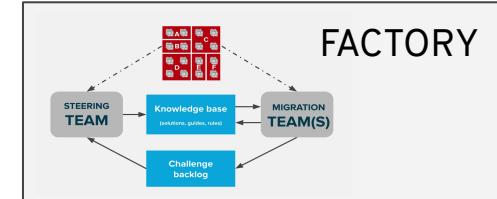
## BENEFITS



## APPROACH



## FACTORY



## Application modernization customers



Government of the Netherlands



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL



Read more at <https://www.redhat.com/en/success-stories>

# Jumpstart your modernization with Red Hat Open Innovation 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

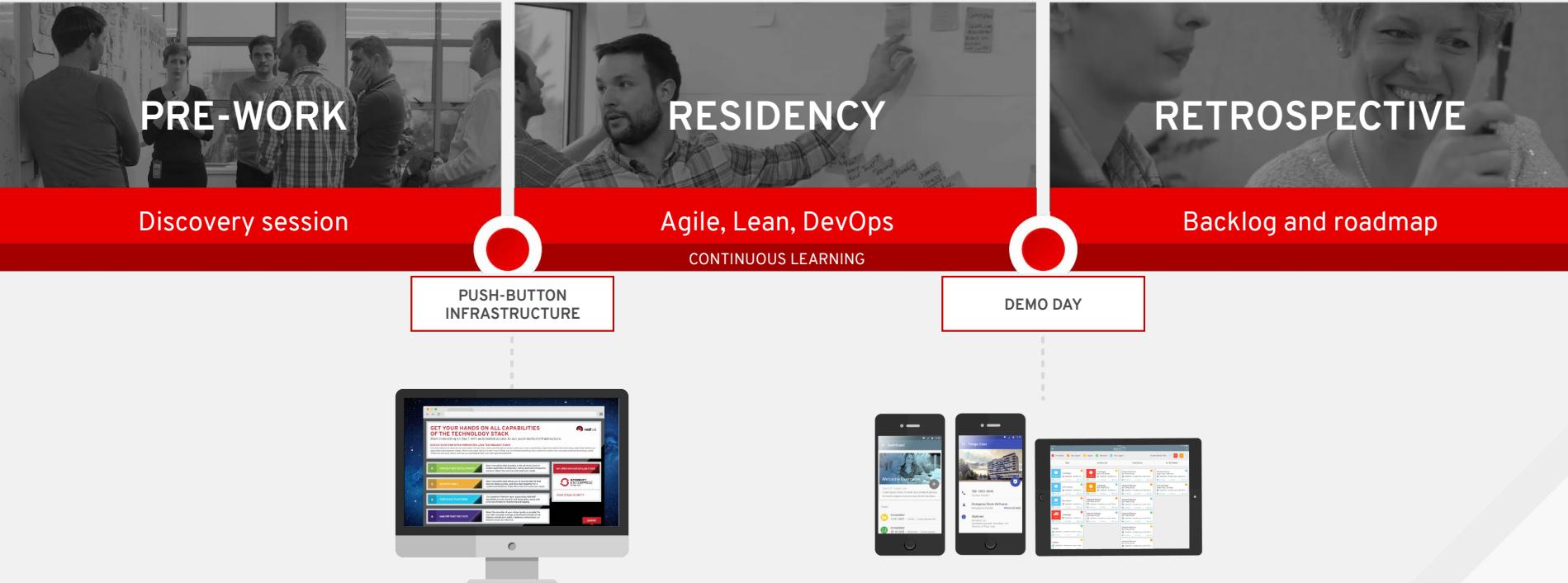


### COMMUNITY INCUBATION

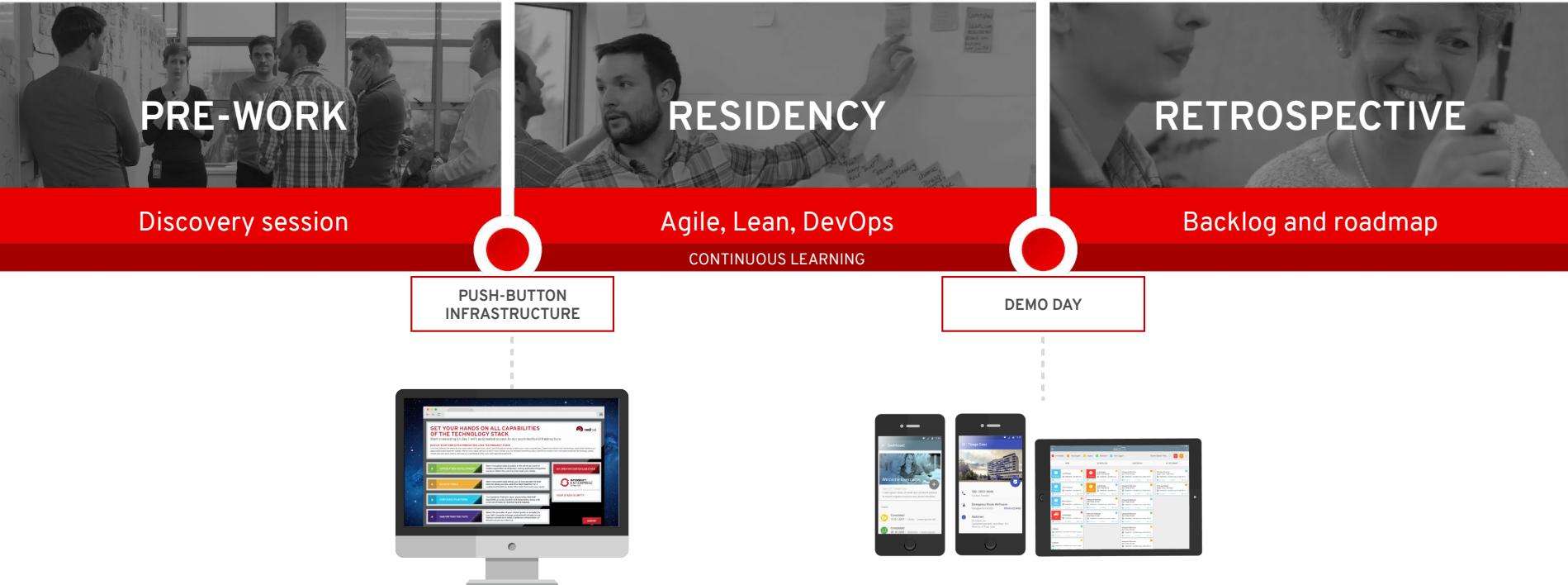
Communities  
supporting innovation



# INNOVATION LABS PROCESS



# Innovation Labs process



# Drive a culture of innovation

## Through a space that fosters collaboration



### INNOVATE ANYWHERE

- Purpose-driven
- Collaborate and make
- Network and share
- Flex and adapt
- Rejuvenate and connect

# Thank you



LinkedIn: [linkedin.com/company/red-hat](https://linkedin.com/company/red-hat)

YouTube: [youtube.com/user/RedHatVideos](https://youtube.com/user/RedHatVideos)

Facebook: [facebook.com/redhatinc](https://facebook.com/redhatinc)

Twitter: [twitter.com/RedHatNews](https://twitter.com/RedHatNews)

Google+: [plus.google.com/+RedHat](https://plus.google.com/+RedHat)



**Microsoft Azure**

LinkedIn: [linkedin.com/company/microsoft/](https://linkedin.com/company/microsoft/)

YouTube: [youtube.com/user/MSCloudOS](https://youtube.com/user/MSCloudOS)

Facebook: [facebook.com/microsoftazure/](https://facebook.com/microsoftazure/)

Twitter: [twitter.com/azure](https://twitter.com/azure)

Azure Friday: [channel9.msdn.com/Shows/Azure-Friday](https://channel9.msdn.com/Shows/Azure-Friday)

Azure | Channel 9: [channel9.msdn.com/Blogs/Azure](https://channel9.msdn.com/Blogs/Azure)