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MONOLITHS TO MICROSERVICES: APP TRANSFORMATION

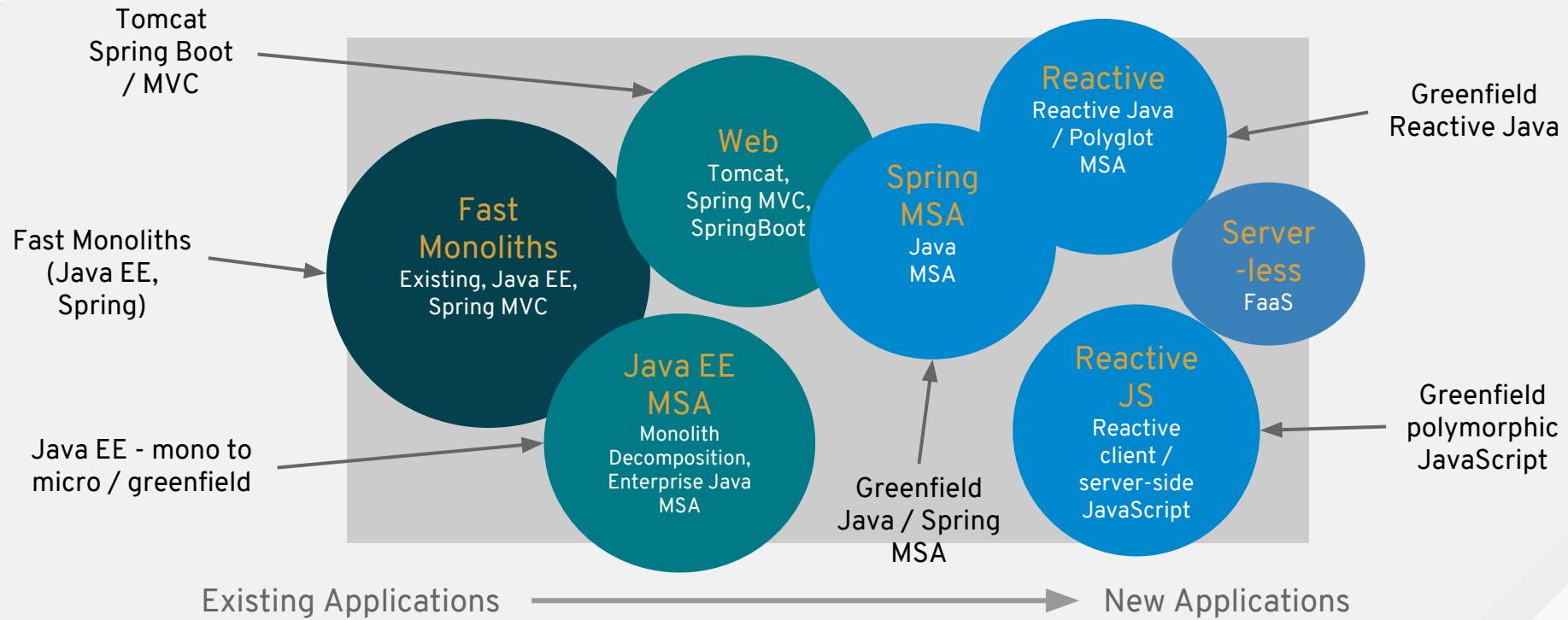
Hands-on Technical Workshop

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Andy Yuen
Tom Corcoran

Senior Solution Architects
Red Hat Australia and New Zealand

MOVING EXISTING APPS TO THE CLOUD

THE SPECTRUM OF ENTERPRISE APPS



MIGRATION AND MODERNISATION APPROACHES

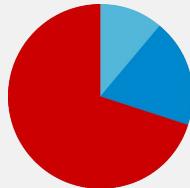
MODERNIZING EXISTING APPS

- Reuse existing functionality and data as much as possible
- Move existing workloads to a modern deployment platform supporting automation and CI/CD
- 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 MODERNISATION



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

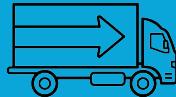
Highly scaled and high rate of change apps are candidates

Not a target

PATTERNS IN MODERNISING WORKLOADS

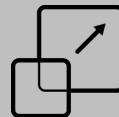
LIFT & SHIFT

- Containerise 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

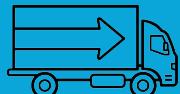
- Legacy is totally replaced
- New interfaces and data
- Use **PaaS** to run
- Some data and features can be re-wrapped, but mostly are retired.



PATTERNS IN MODERNISING WORKLOADS

LIFT & SHIFT

- Containerise existing workloads
- Deploy them on a **PaaS**
- Keep external integrations and data on legacy
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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)

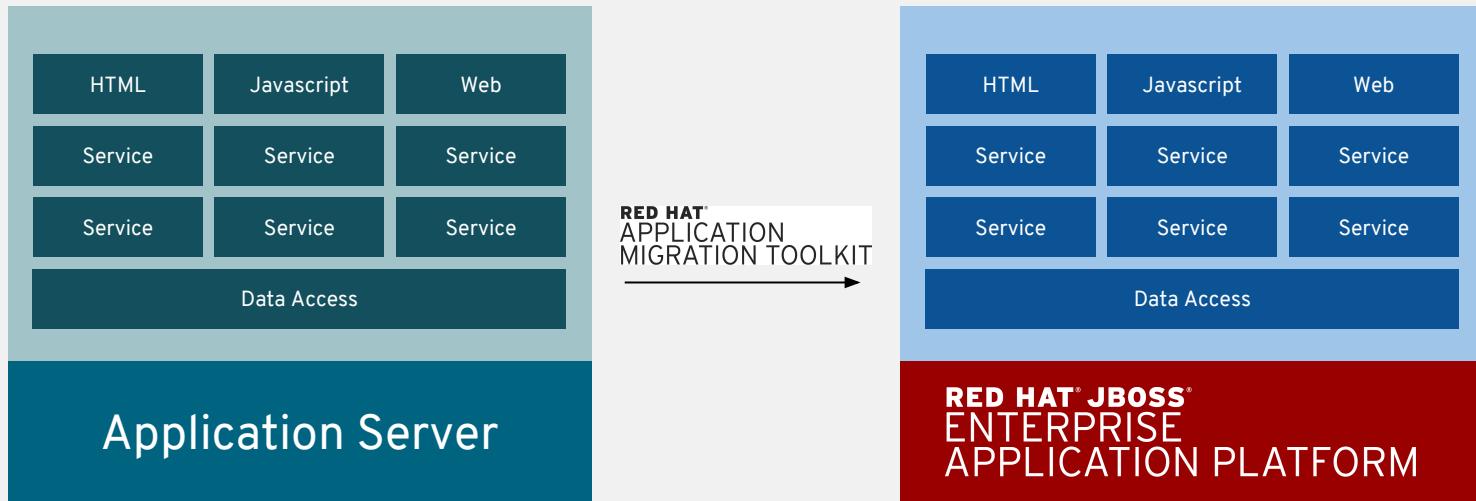


RIP & RE-WRITE

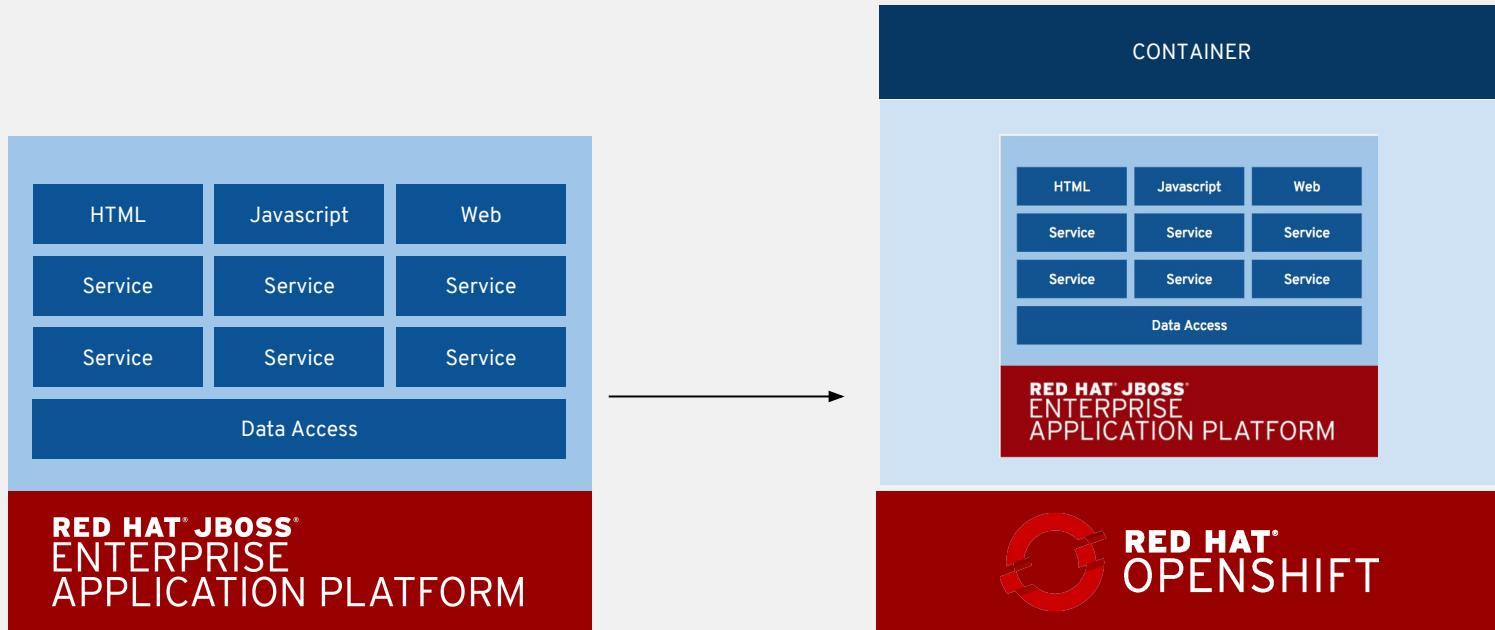
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LIFT-AND-SHIFT MONOLITH TO CLOUD



LIFT-AND-SHIFT MONOLITH TO CLOUD



WHY MIGRATE TO JBOSS EAP ?

- Fully certified Java EE environment
- Smaller footprint than traditional app servers
- Optimised for cloud and container environments
- Optimal for microservices based architecture
- Single code base built for flexible deployment - on-premise, virtual, cloud
- Red Hat supported, stable, secure and innovative
- 100% open-source and 100% Java



WHY MIGRATE TO JBOSS EAP ?

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)	2 - 3 sec	3 sec	40 MB	200 - 400 MB	23K req/sec
JBoss EAP (Spring)	2 - 3 sec	7 sec	40 MB	500 - 700 MB	9K req/sec
JBoss WS/Tomcat (Spring)	0 - 1 sec	8 sec	40 MB	0.5 - 1.5 GB	8K req/sec
Fat JAR (Spring Boot)	N/A	3 sec	30 MB	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

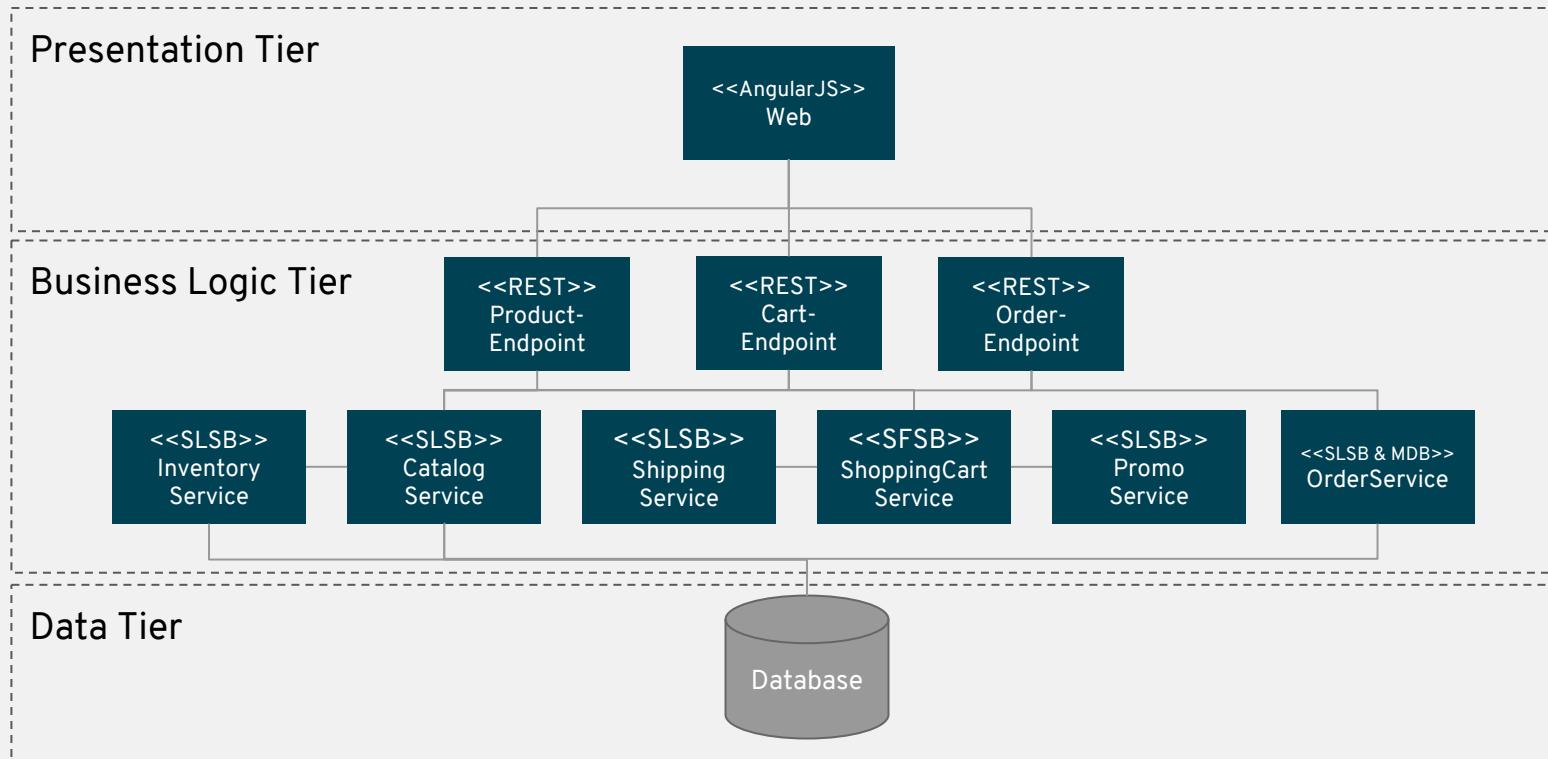
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Red Hat Cool Store Your Shopping Cart

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

<p>Red Fedora</p> <p>Official Red Hat Fedora</p>  <p>\$34.99</p> <p>1 Add To Cart</p> <p>736 left! ⬇️</p>	<p>Forge Laptop Sticker</p> <p>JBoss Community Forge Project Sticker</p>  <p>\$8.50</p> <p>1 Add To Cart</p> <p>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> 
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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

Red Hat Application Migration Toolkit

IBM
WebSphere AS

Oracle
WebLogic Server

Java EE
upgrades

JBoss EAP
upgrades

Cloud readiness,
containerization

Pluggable:
your own rules

...
Command line
interface

...
Web
console

...
Eclipse
plugin

RED HAT® APPLICATION MIGRATION TOOLKIT

RED HAT APPLICATION MIGRATION TOOLKIT

All Applications Dashboard Issues Application Details Unparseable Dependencies Remote Services EJBs JPA About Send Feedback

Dashboard

monolith

Dashboard report aggregating findings from the analysis.

Incidents by Category

Category	Incidents	Total Story Points
mandatory	10	18
optional	30	0
potential	6	0
cloud-mandatory	0	0
cloud-optional	0	0

Incidents by Category

Category	Number of Incidents
mandatory	10
optional	30
potential	6

Incidents and Story Points

Category	Incidents	Total Story Points
mandatory	10	18
optional	30	0
potential	6	0

Mandatory Incidents by Type

Type	Incidents	Total Story Points
Info	0	0
Trivial	6	6
Complex	4	12
Redesign	0	0
Architectural	0	0
Unknown	0	0

Mandatory Incidents by category

Type	Number of Incidents
Info	0
Trivial	6
Complex	4
Redesign	0
Architectural	0
Unknown	0

Mandatory Incidents and Story Points

Type	Incidents	Total Story Points
Info	0	0
Trivial	6	6
Complex	4	12
Redesign	0	0
Architectural	0	0
Unknown	0	0

Java Incidents by Package

Package	Incidents
weblogic.application.*	6
weblogic.i18n.*	5
javax.naming.*	3

Note: this does not include XML files and 'possible' issues.

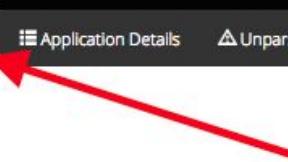
Java Incidents by Package

Package	Incidents
weblogic.application.*	6x
weblogic.i18n.*	5x
javax.naming.*	3x

RED HAT® APPLICATION MIGRATION TOOLKIT

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All Applications Dashboard Issues Application Details Unparseable Dependencies Remote Services EJBs JPA About Send Feedback



Issues

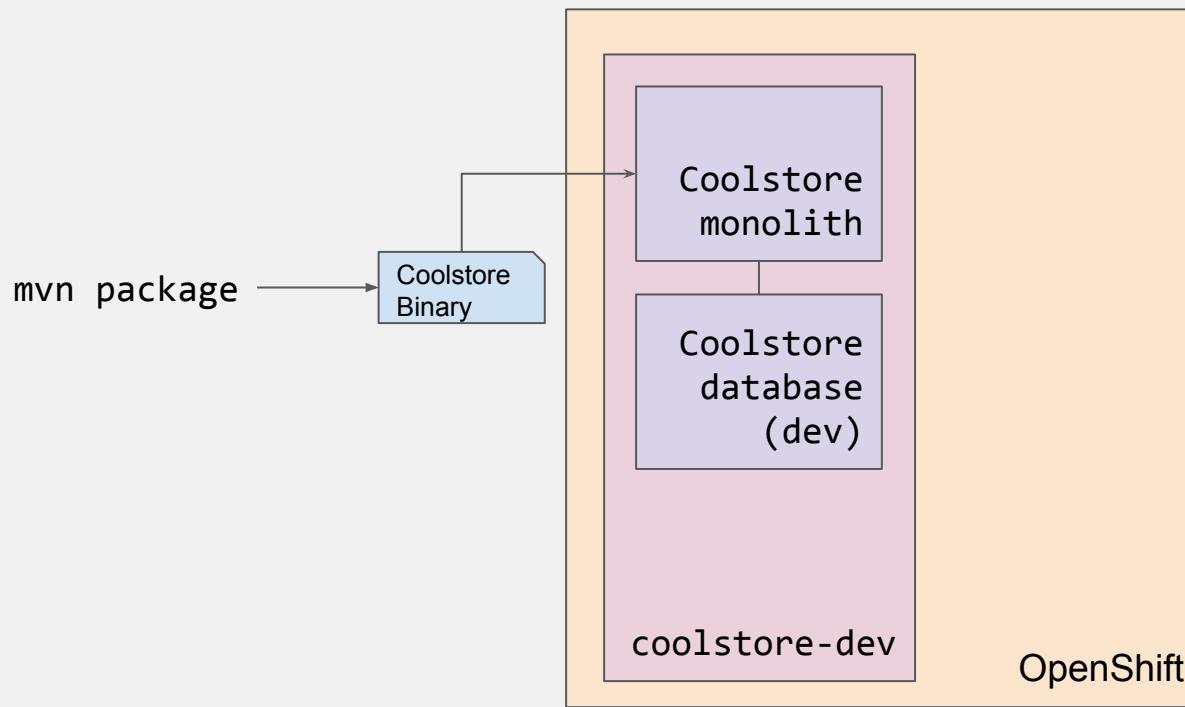
monolith

This report provides a concise summary of all issues sorted by category.

Migration Mandatory

Issue by Category	Incidents Found	Story Points per Incident	Level of Effort	Total Story Points
WebLogic proprietary logger (NonCatalogLogger)	3	1	Trivial change or 1-1 library swap	3
Call of JNDI lookup	2	1	Trivial change or 1-1 library swap	2
Proprietary InitialContext initialization	1	1	Trivial change or 1-1 library swap	1
WebLogic InitialContextFactory	1	3	Complex change with documented solution	3
WebLogic T3 JNDI binding	1	3	Complex change with documented solution	3
WebLogic ApplicationLifecycleEvent	1	3	Complex change with documented solution	3
WebLogic ApplicationLifecycleListener	1	3	Complex change with documented solution	3
	10			18

DESIRED RESULT OF SCENARIO 2



LAB: MOVING EXISTING APPS TO THE CLOUD

WEB: openshift-modernize-apps.katacoda.com
SLIDES (PDF): bit.ly/m2m-slides

SCENARIO 1 GETTING STARTED WITH THIS COURSE



SCENARIO 2 MOVING EXISTING APPS TO THE CLOUD

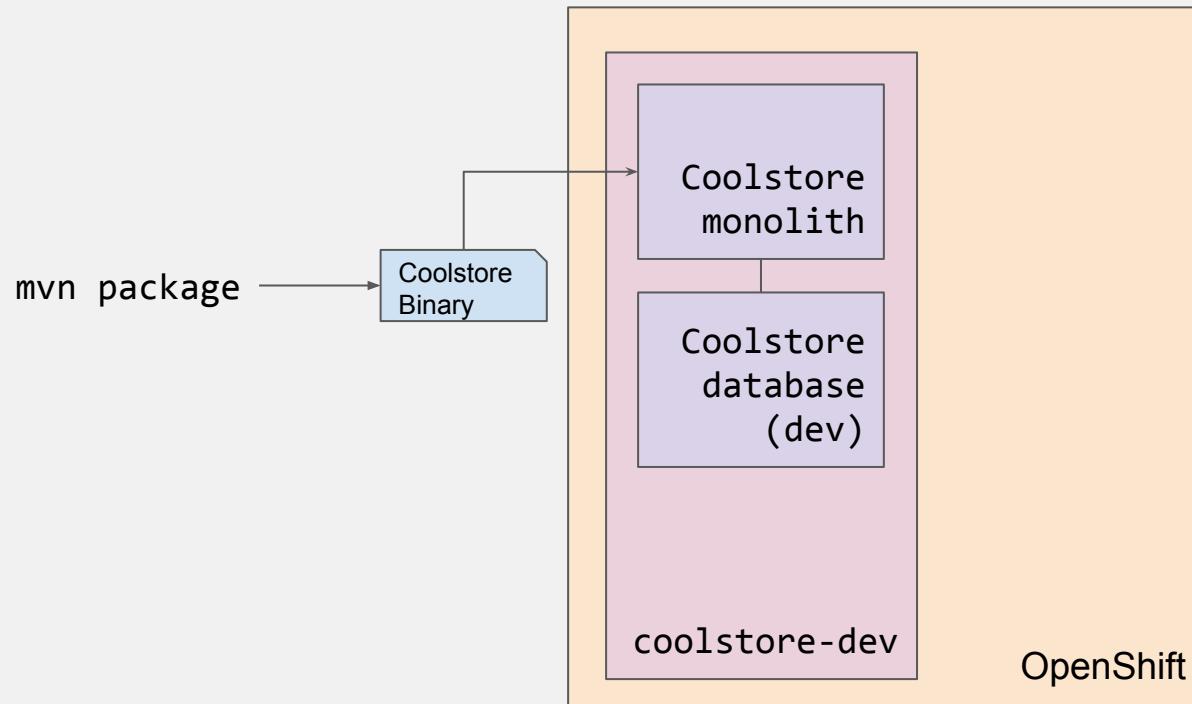
WRAP-UP AND DISCUSSION

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





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THANK YOU



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facebook.com/redhatinc



linkedin.com/company/red-hat



twitter.com/RedHatNews



youtube.com/user/RedHatVideos

BACKUP SLIDES

BUSINESS OPPORTUNITY FOR APP MODERNIZATION

CONSULTING
SERVICES

APPLICATION MODERNIZATION & MIGRATION (AMM)

1\$ subscription = 5-10\$ services
3-9 MONTHS PROJECT DURATION **100-2000 DAYS OF CONSULTING**

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

One customer conversation opening many opportunities

APPLICATION MODERNIZATION & MIGRATION



Customer value beyond cost - Digital transformation



RE-BALANCE
MAINTENANCE
AND INNOVATION



DECREASE COMPLEXITY,
INCREASE
EFFICIENCY



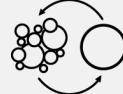
REDUCE / AVOID VENDOR
LOCK-IN, INFLEXIBLE
LICENSE MODELS



INCREASE SPEED &
BECOME MORE
PRODUCTIVE

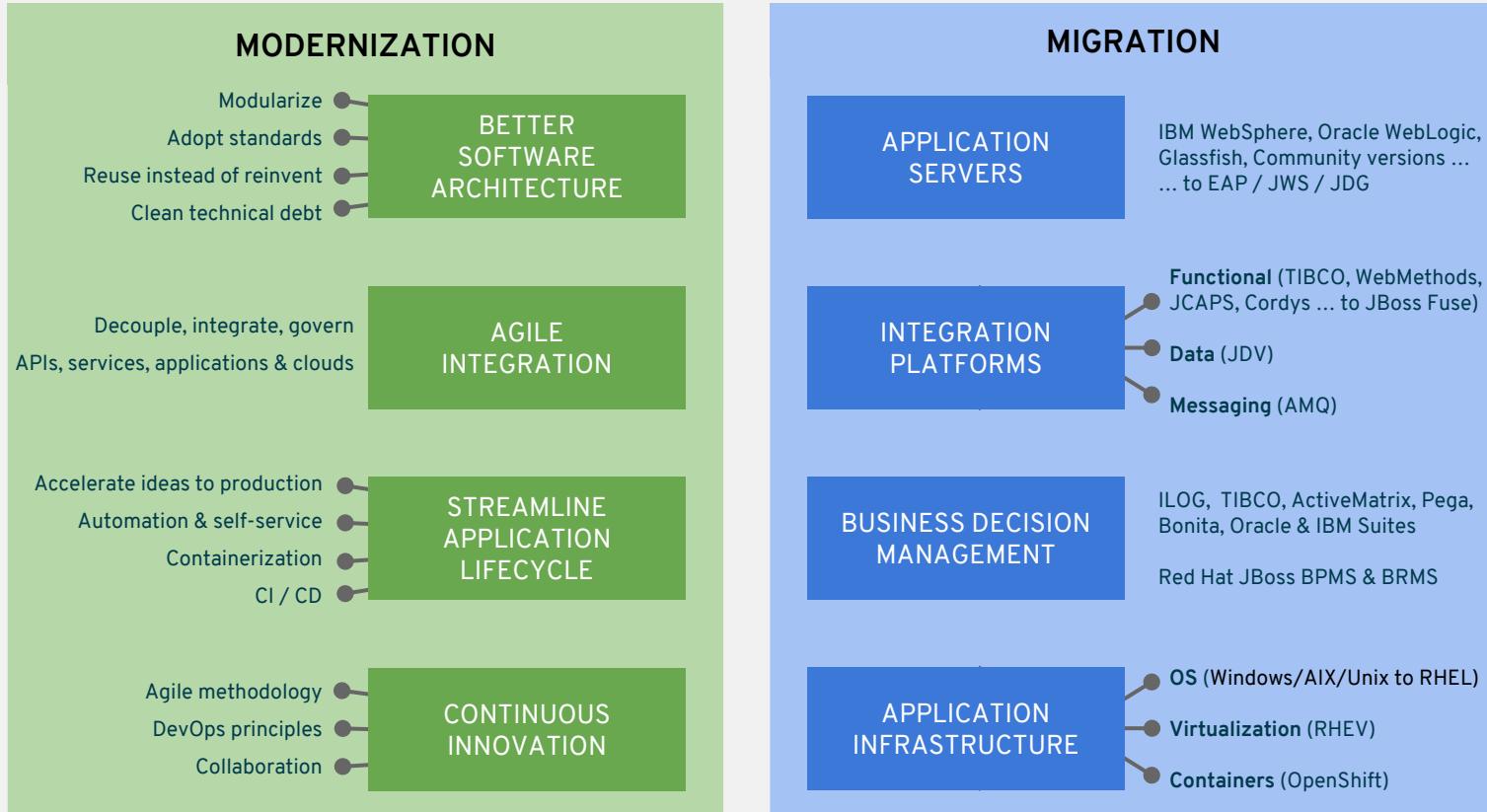


REMOVE
TECHNICAL
DEBT & RISK



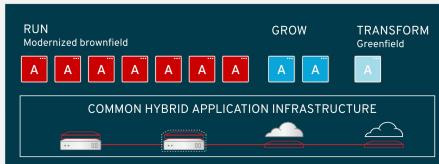
ADOPT
AGILE METHODOLOGIES,
DEVOPS

APPLICATION MODERNIZATION & MIGRATION

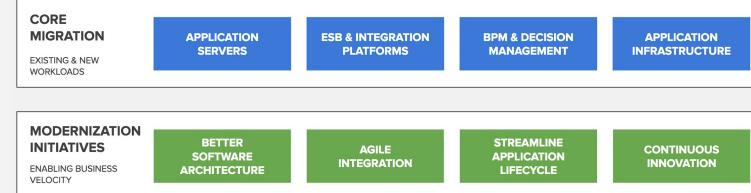


RED HAT APPLICATION MIGRATION & MODERNIZATION PROGRAM

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



COMBINE TRANSFORMATION

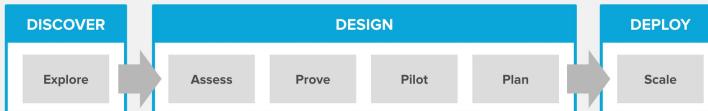


Migration → Modernization
Making old apps new again ← Modern app development

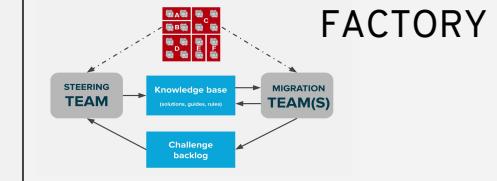
BENEFITS



APPROACH



FACTORY



SOME CUSTOMERS

Application Modernization customers



Government of the Netherlands



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

JUMPSTART YOUR MODERNIZATION WITH RED HAT OPEN INNOVATIONS LABS

MODERNIZE TRADITIONAL APPS

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

INNOVATION ACCELERATED

DEVELOP CONTEMPORARY APPS

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



COLLABORATION

Space to work,
innovate, and discuss



RESIDENCY

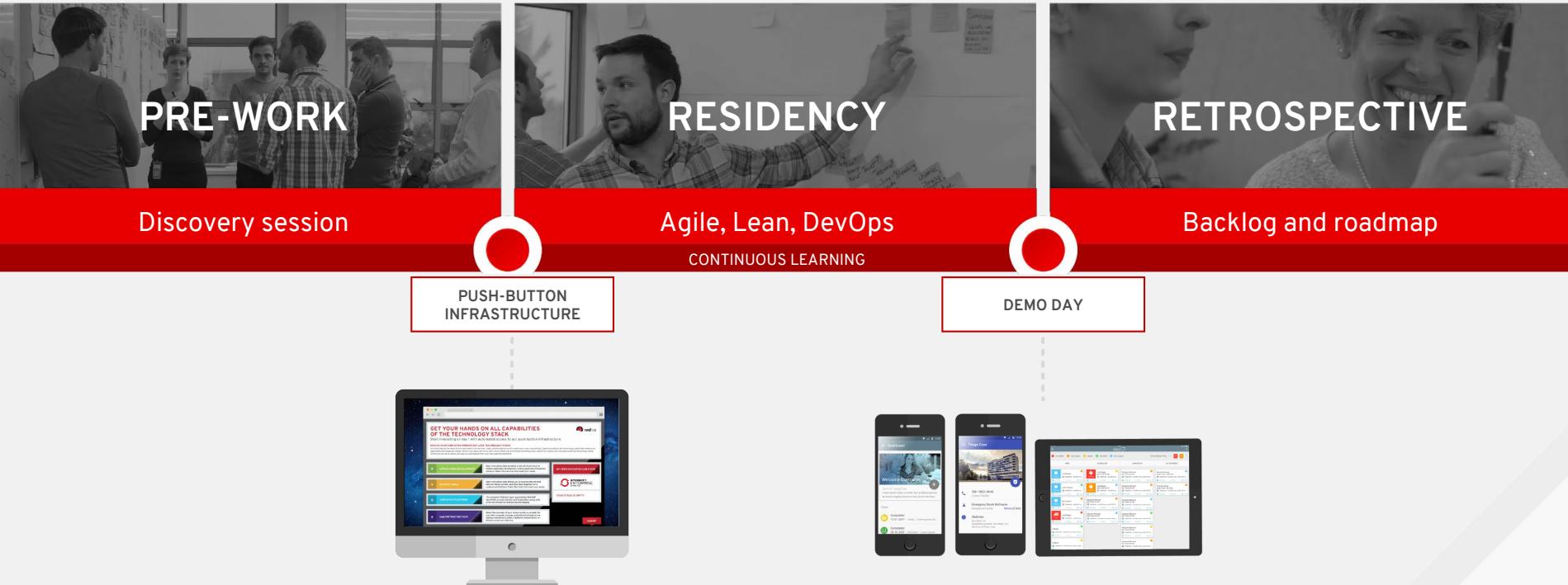
An eight-week accelerated
teaming engagement



COMMUNITY INCUBATION

Communities
supporting innovation

INNOVATION LABS PROCESS



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