

**RED HAT
SUMMIT**

Application Modernization & Migration to Red Hat JBoss Middleware and OpenShift

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FROM WHERE YOU ARE TO WHERE YOU WANT TO BE

The open technology to help
you realize your vision

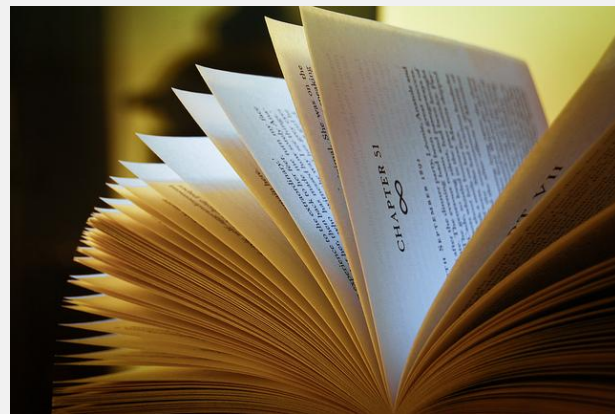
HYBRID CLOUD | MANAGEMENT | DEVOPS
CONTAINERS | APP DEVELOPMENT + INTEGRATION

redhat.com/opentech



AGENDA

- Why change?
- Our approach
- Customer stories



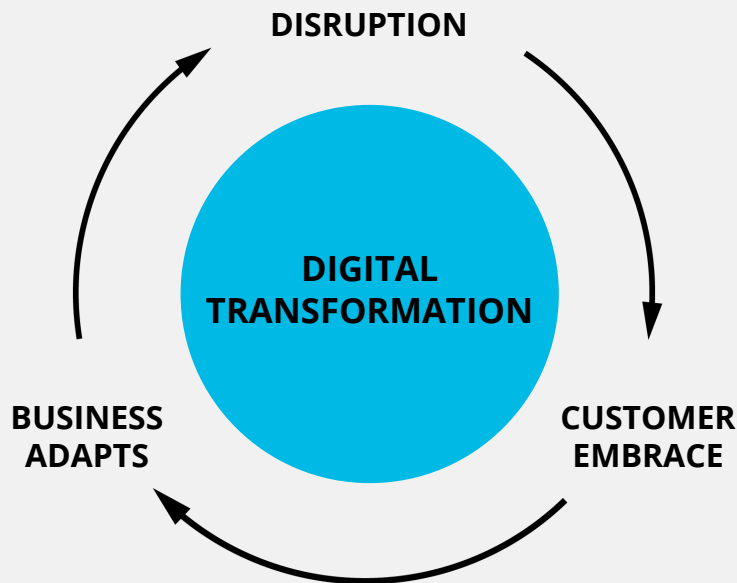
WHY CHANGE?



**“ By 2027, more than 75% of the S&P 500
will be companies that we have not heard of yet. ”**

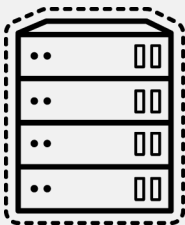
Professor Richard Foster, Yale University

DIGITAL TRANSFORMATION



BALANCING INNOVATION AND OPTIMIZATION

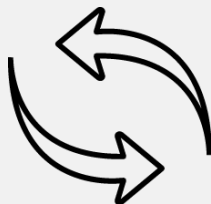
Here's what your peers say are their top priorities and challenges



Optimize the IT
you have



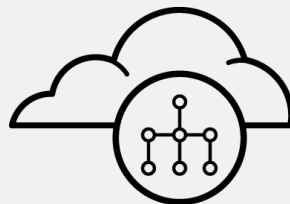
**GAIN
EFFICIENCY**



Integrate apps, data,
and processes



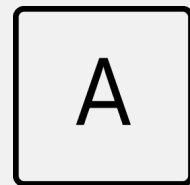
**IMPROVE
PRODUCTIVITY**



Add and manage cloud
infrastructure



**INCREASE
AGILITY**



Build more modern
applications



**MOVE
FASTER**

THE CIO DILEMMA

Business Expectations become IT Challenges



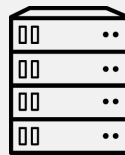
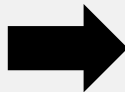
Resources



Time



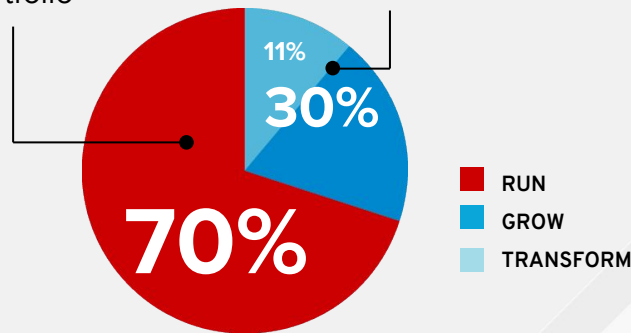
Budgets



Maintain current portfolio

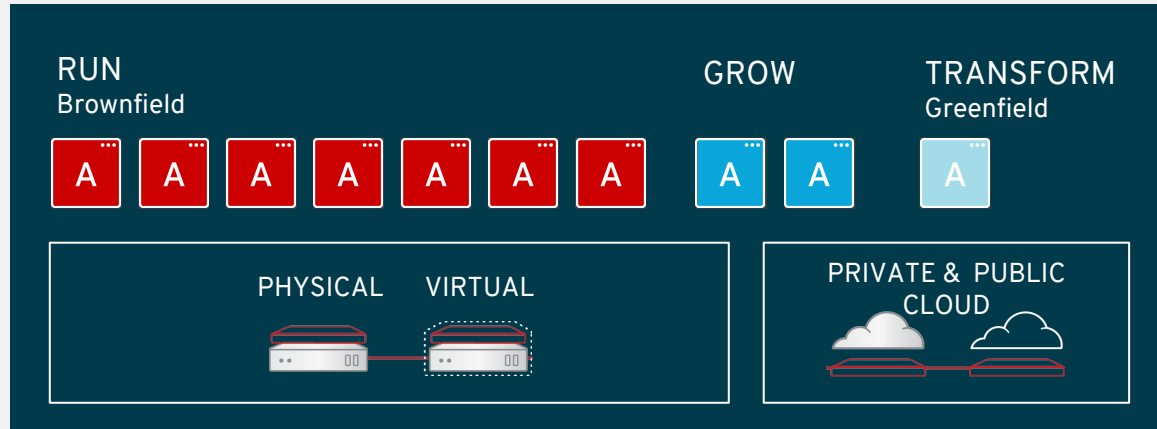


Innovation, Differentiation, Growth



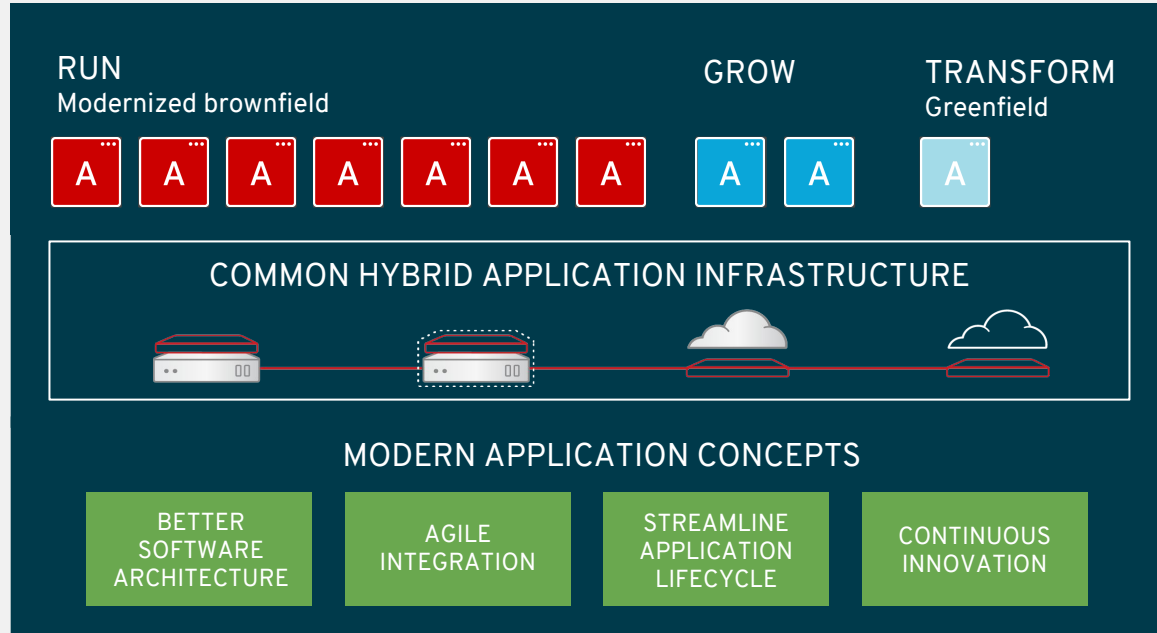
TYPICAL CUSTOMER LANDSCAPE TODAY

Where the journey starts ...



APPLICATION MODERNIZATION JOURNEY

One platform to support you today and tomorrow



MODERN APPLICATION CONCEPTS

Enhancing applications, platform & processes

BETTER SOFTWARE ARCHITECTURE

Future-proof applications

Modularize
“Fast moving monolith”
Microservices
Clean technical debt

AGILE INTEGRATION

Bridge old and new

Decouple, expose & integrate
APIs, services & applications
Need hybrid-cloud-enabled
integration platform

STREAMLINE APPLICATION LIFECYCLE

Speed up your business

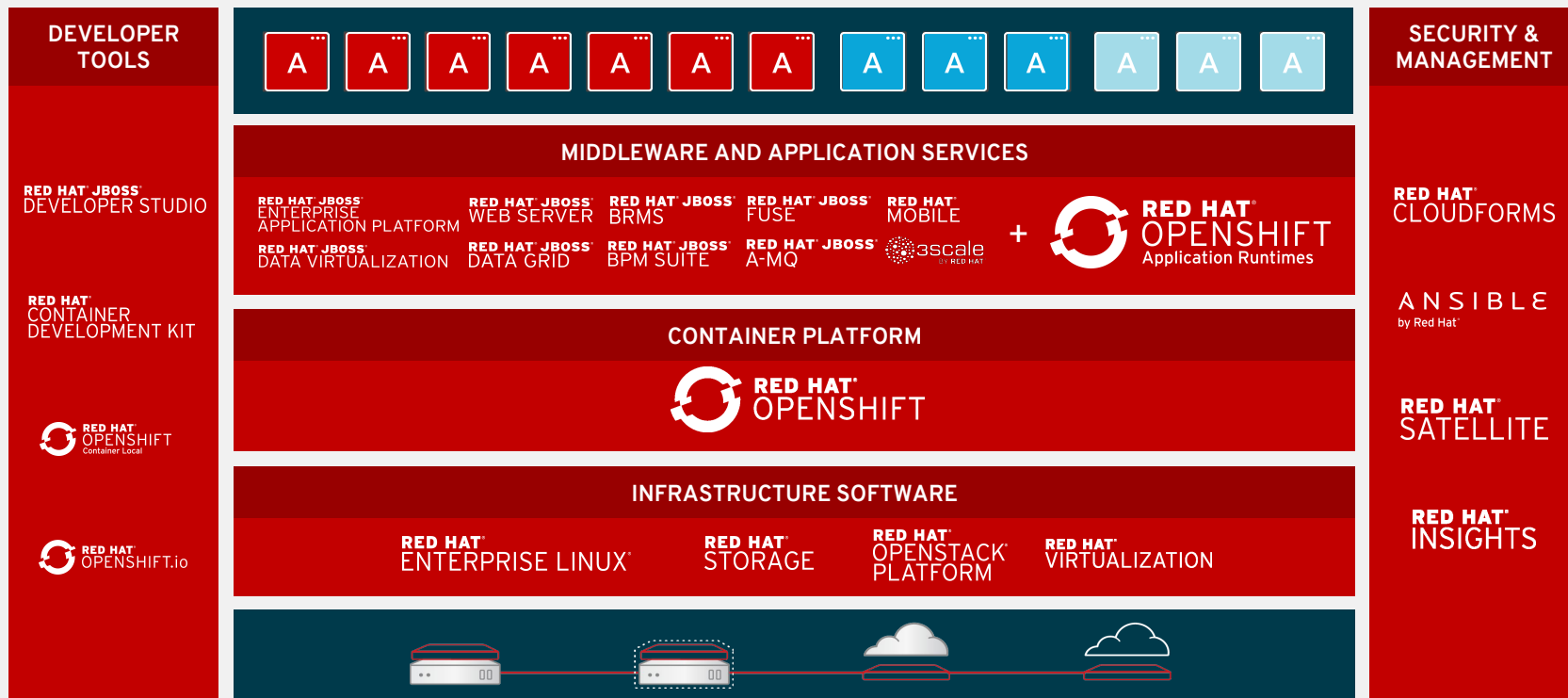
Accelerate time
from idea to production
Continuous Integration &
Delivery (CI/CD)
Automation & self-service
Container technology

CONTINUOUS INNOVATION

Foster an agile culture

Agile methodology
DevOps principles
Collaboration

IT'S ALL THERE: COMPLETE TECHNOLOGY STACK FOR HYBRID CLOUD



WHY CHANGE WITH RED HAT?

Solutions for today and the future



RE-BALANCE
MAINTENANCE
& INNOVATION



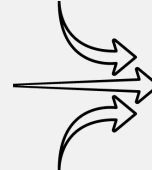
REDUCE / AVOID
VENDOR LOCK-IN,
LICENSE MODELS



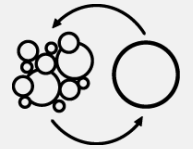
INCREASE
OPERATIONAL
EFFICIENCY



BECOME MORE
PRODUCTIVE WITH
LIGHTWEIGHT TECH



REMOVE
TECHNICAL
DEBT & RISK



ADOPT AGILE
METHODOLOGIES,
DEVOPS, OR CLOUD

WHY MIGRATE?

Red Hat JBoss EAP migration benefits

Benefits experienced moving from IBM WebSphere and Oracle WebLogic to Red Hat JBoss EAP included:

- **39% shorter development time** for new applications
- **43% gain in developer efficiency**
- **89% less application development related downtime**
- **79% less expensive** than legacy platform
- **509% ROI** over 3 years, payback of initial investment in less than 10 months after deploying the platform

Study available at [“IDC - The business value of JBoss EAP”](#)

IDC White Paper | The Business Value of Red Hat JBoss Enterprise Application Platform

IDC
Analyze the Future

Sponsored by **Red Hat**

Authors:
Maureen Fleming
Matthew Mandel
July 2015

The Business Value of Red Hat JBoss Enterprise Application Platform

EXECUTIVE SUMMARY

IDC interviewed four organizations leveraging Red Hat JBoss Enterprise Application Platform (JBoss EAP) to standardize and improve their application development efforts. These Red Hat customers, which praised JBoss EAP for providing a cost-effective solution that enables their standardization efforts, will achieve an average three-year return on investment (ROI) in JBoss EAP of 509% and break even on their investment in an average of 9.4 months by:

- Realizing substantial savings compared with the commercial application development platforms being replaced
- Capturing time savings and efficiencies for their application development teams and improving their productivity levels
- Addressing business opportunities through faster deployment of applications and improved application performance
- Reducing the impact of application downtime with more reliable applications

Business Value Highlights

- 509%**
Average three-year ROI
- \$108,664**
Average (discounted) three-year business benefits per 100 users
- 79.5%**
Less expensive than legacy commercial platform
- 43.2%**
Application development staff efficiencies
- 89.3%**
Less application development-related downtime

Situation Overview

The use of application platforms is fundamental to the deployment of strategic and packaged applications. As enterprises broaden and mature their use of application platforms, they are increasingly focused on standardizing their processes involving development and IT operations. The goal with standardization is to remove waste from the process, which includes wasting time and wasting money.

Document K27024 © 2015 IDC. [www.idc.com](#) | Page 1

IDC
The Business Value of Red Hat JBoss Enterprise Application Platform

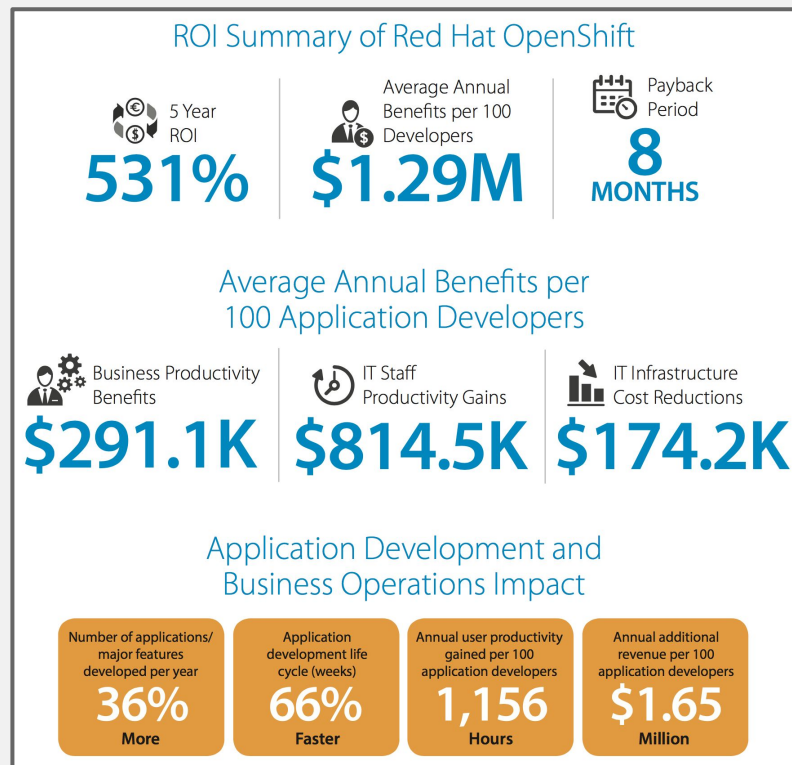
WHY MODERNIZE?

Red Hat OpenShift Container Platform benefits

Benefits experienced introducing Red Hat OpenShift:

- Fast Return on Investment (ROI)
- High increase in business productivity
- More features developed
- Faster development live cycle
- Increased developer productivity

Study available at [“IDC - The business value of Red Hat OpenShift”](#)



SOME CUSTOMERS

Application Modernization and Migration



Miles & More



CenturyLink



Government of the Netherlands



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



OUR APPROACH

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

CORE PLATFORM MIGRATION

Source & target platforms

APPLICATION SERVER

Java EE workloads

FROM:

IBM WebSphere, Oracle WebLogic, Glassfish, Apache Tomcat, JBoss AS Community, Oracle Coherence

TO:

JBoss Enterprise Application Platform, JBoss Web Server, JBoss Data Grid

ESB & INTEGRATION PLATFORMS

Functional & data integration

FROM:

TIBCO, JCAPS, Sonic ESB, Mule ESB, Software AG WebMethods, Oracle ESB, IBM Message Broker, Cordys EBS

TO:

JBoss Fuse, JBoss Data Virtualization, JBoss A-MQ

BPM & DECISION MANAGEMENT

Business rules & processes

FROM:

IBM WODM / ILOG, IBM BPM, Appian, TIBCO ActiveMatrix, Pega, Bonita, Oracle BPM Suite, Oracle Business Rules

TO:

JBoss BPM Suite
JBoss BRMS

APPLICATION INFRASTRUCTURE

Open hybrid cloud & containers

FROM:

Mainframe to Linux/Java, bare metal, Unix/Solaris/Windows to linux, virtualization, hardware storage solutions

TO:

Red Hat Enterprise Linux, Red Hat Virtualization, Red Hat Cloud and Containers (OpenShift, OpenStack, CloudForms), Ansible Tower, Red Hat Storage (Ceph, Gluster) ...

COMBINE OPPORTUNITIES

... to super-power your business and adopt a state-of-the-art IT landscape

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

HOLISTIC APPROACH

Scope of a modernization / migration

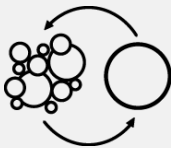


Application Code



Infrastructure

hardware, storage, virtualization, operating system, JVM, application container



Processes & Governance

application lifecycle, build, configuration, deployment, provisioning, DevOps, environments, test, integration, continuous *, monitoring



Knowledge

APPROACH

Key good practices



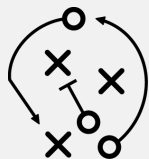
Information sharing based on a central collaborative platform

- Simplified knowledge transfer, with least effort approach: no issue solved twice.
- Red Hat Consulting, Customer Portal, Knowledgebase, Support, Documentation, Trainings.



Reuse, automate, standardize as much as possible

- Infrastructure, deployments, tests, dependencies, stages, processes, management
- Transform: Red Hat Application Migration Toolkit
- Define: Red Hat Developer Suite, Cloud, Containers, System management.



Efficient, proven, pragmatic methodology

- As few changes as possible to get a running functionally identical application
- Holistic portfolio approach for green and brown fields
- Scaling through a factory delivery model

METHODOLOGY

Iterative, managed service, factory scale up.



METHODOLOGY

Iterative, managed service, factory scale up.

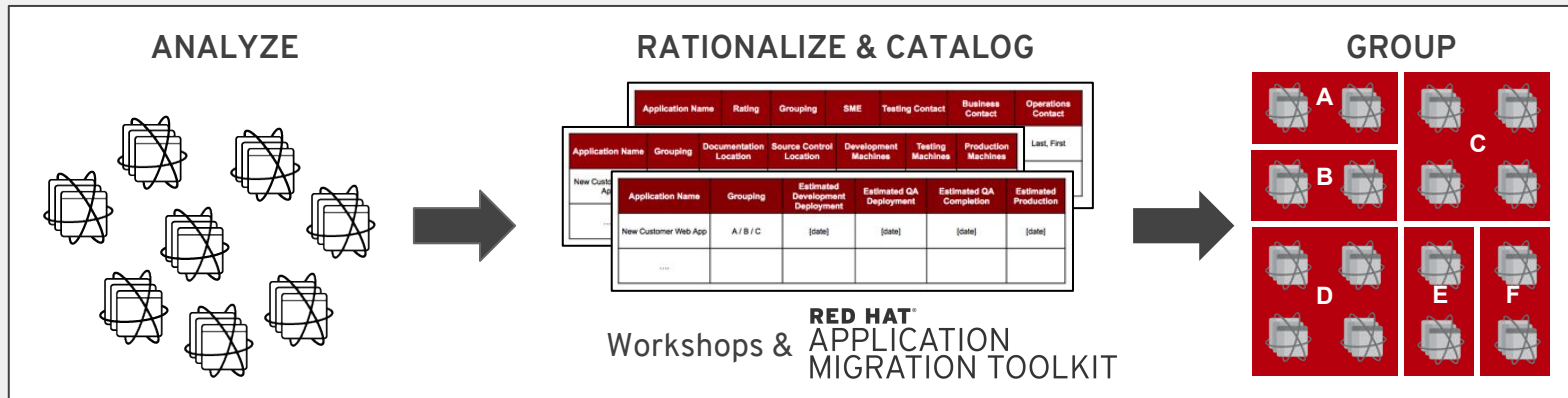


- In-depth AS-IS analysis (catalog)
- TO-BE definition (rationalize)
- Risks identification
- Plan next steps, provide rough estimates and strategy



METHODOLOGY

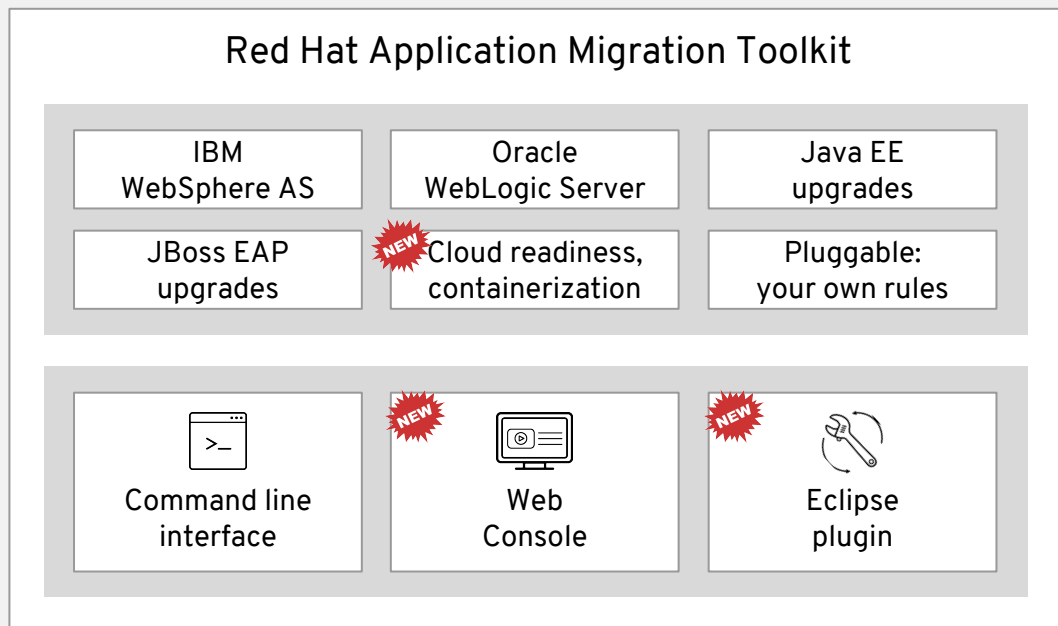
Iterative, managed service, factory scale up.



RED HAT® APPLICATION MIGRATION TOOLKIT 4.0 Beta1

Catalyze large scale application modernizations and migrations

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



RED HAT[®] APPLICATION MIGRATION TOOLKIT

Web Console: manage projects and applications

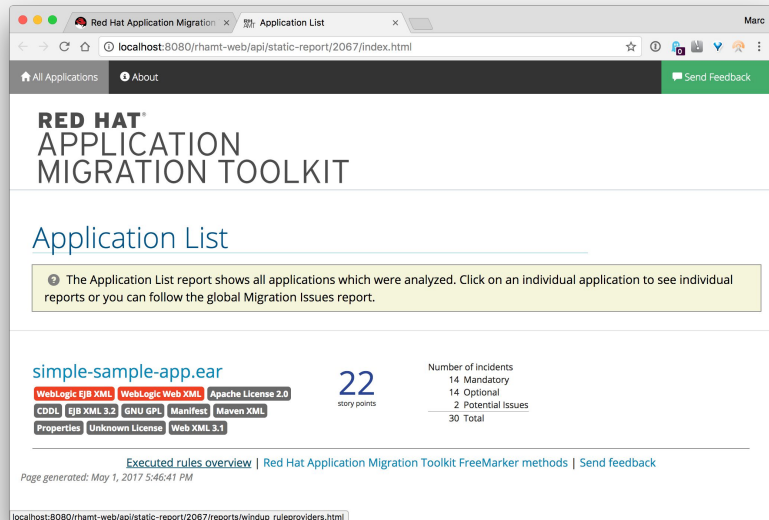
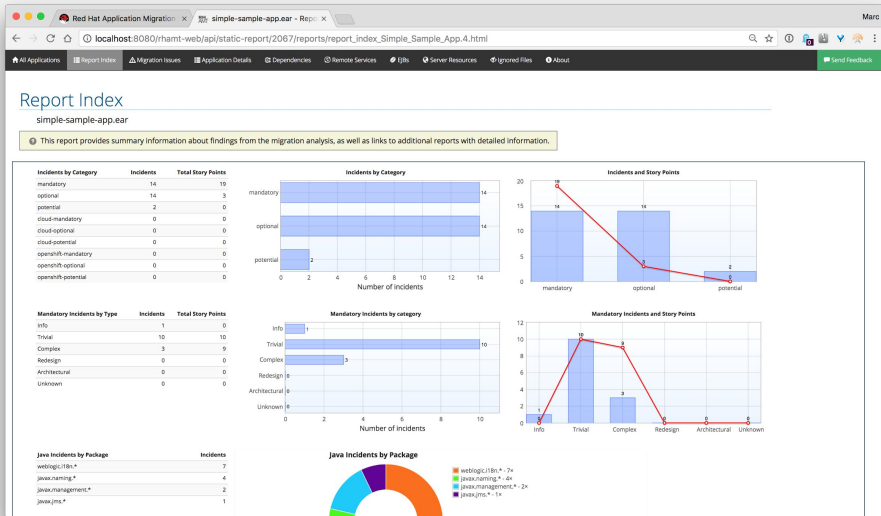
The screenshot shows the 'Projects' page of the Red Hat Application Migration Toolkit Web Console. The browser address bar shows 'localhost:8080/rhant-web/project-list'. The page title is 'RED HAT APPLICATION MIGRATION TOOLKIT - Web Console (Beta)'. The user is logged in as 'rhamt'. The page displays a search bar, a 'Sort by Name' dropdown, and a 'New Project' button. Below this, there is a card for 'Monster Inc' with the text 'All Monster Applications.' and '2 Applications - last updated 7 minutes ago'.

The screenshot shows the 'Analysis' page for a project named 'Monster Inc'. The browser address bar shows 'localhost:8080/rhant-web/projects/74/project-detail'. The page title is 'RED HAT APPLICATION MIGRATION TOOLKIT - Web Console (Beta)'. The user is logged in as 'rhamt'. The page has a sidebar with 'Analysis', 'Applications', and 'Configuration' options. The main content area shows an 'Analysis' section with a search bar and a 'Run Analysis' button. Below this is a table with the following data:

| Analysis | Status | Date Started | Actions |
|----------|---------------------------|-------------------|---|
| #2067 | ✓ Completed in 9 seconds | 5/1/2017, 5:46 PM | [i] [x] |
| #718 | ✓ Completed in 21 seconds | 5/1/2017, 5:37 PM | [i] [x] |

RED HAT® APPLICATION MIGRATION TOOLKIT

Web Console: issue type analysis and support for effort estimation



RED HAT® APPLICATION MIGRATION TOOLKIT

Web Console: examine hints and introspect application source code

The screenshot shows the 'Migration Issues Report' for 'Simple Sample App'. The report provides a concise summary of all issues that require attention. Below the summary is an 'Analysis Detail' section with a table of issues.

| Issue by Category | Incidents Found | Story Points per Incident | Level of Effort | Total Story Points |
|--|-----------------|---------------------------|------------------------------------|--------------------|
| Mandatory | 14 | | | 19 |
| WebLogic proprietary logger (NonCatalogLogger) | 5 | 1 | Trivial change or 1-1 library swap | 5 |

The table highlights an issue for the file `com.acme.avnil.service.ProductCatalogBean` with 5 incidents. The issue detail for 'WebLogic proprietary logger (NonCatalogLogger)' is shown below:

The WebLogic `NonCatalogLogger` is not supported on JBoss EAP, and should be migrated to a supported logging framework, such as the JDK Logger or JBoss Logging:

```
import java.util.logging.Logger;
Logger LOG = Logger.getLogger("MyLogger");
```

- JDK Logging Documentation
- JBoss Logging Quickstart

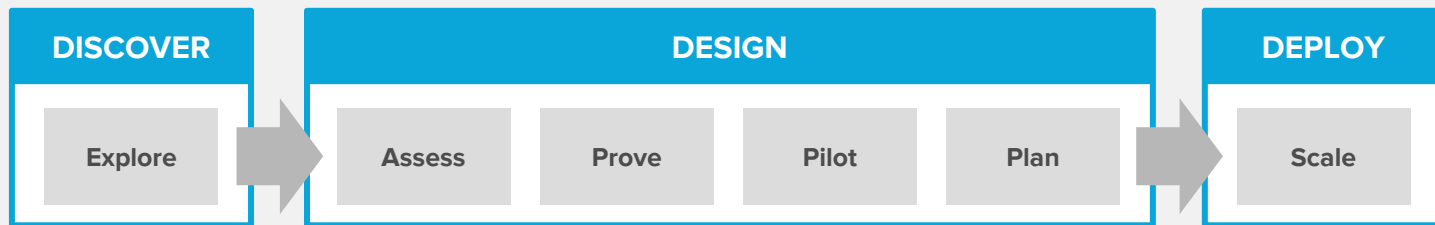
Other issues in the table include 'Call of JNDI lookup' (4 incidents, 1 story point) and 'WebLogic EJB XML (weblogic-ejb-jar.xml)' (1 incident, 3 story points).

The screenshot shows the source code for `ProductCatalogBean` with migration hints. The code is as follows:

```
09. public class ProductCatalogBean implements SessionBean {
10.     private static final NonCatalogLogger LOG = new NonCatalogLogger("ProductCatalogBean");
11.     WebLogic proprietary logger (NonCatalogLogger)
12.     The WebLogic NonCatalogLogger is not supported on JBoss EAP, and should be migrated to a supported logging framework, such as the JDK Logger or JBoss Logging:
13.     import java.util.logging.Logger;
14.     Logger LOG = Logger.getLogger("MyLogger");
15.     WebLogic proprietary type reference
16.     This is an Oracle WebLogic proprietary type (weblogic.ii8n.logging.NonCatalogLogger) and needs to be migrated to a compatible API. There is currently no detailed information about this type.
17.     Please review each item and make sure that no reference to Oracle WebLogic classes is remaining.
18.     private SessionContext sessionContext;
19.     private void setSessionContext(SessionContext ctx) throws EJBException, RemoteException {
20.         this.sessionContext = ctx;
21.     }
22. }
```

METHODOLOGY

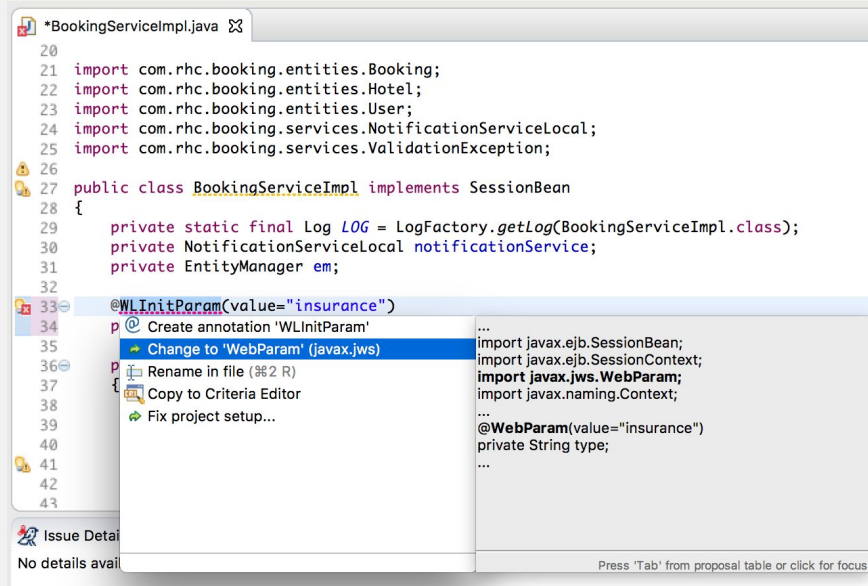
Iterative, managed service, factory scale up.



- Standard, proven, modular, repeatable, pragmatic methodology
- Step by step, low risk and highly efficient: no “big bang”
- Scale up with partners or client’s staff
- It all starts with a “discovery session”

RED HAT® APPLICATION MIGRATION TOOLKIT

Eclipse plugin: task list, inline hints, support for code changes



The screenshot shows the Eclipse IDE with a Java file named `*BookingServiceImpl.java` open. The code editor displays the following code:

```
20
21 import com.rhc.booking.entities.Booking;
22 import com.rhc.booking.entities.Hotel;
23 import com.rhc.booking.entities.User;
24 import com.rhc.booking.services.NotificationServiceLocal;
25 import com.rhc.booking.services.ValidationException;
26
27 public class BookingServiceImpl implements SessionBean
28 {
29     private static final Log LOG = LogFactory.getLog(BookingServiceImpl.class);
30     private NotificationServiceLocal notificationService;
31     private EntityManager em;
32
33     @WLInitParam(value="insurance")
34     p @ Create annotation 'WLInitParam'
35     ↔ Change to 'WebParam' (javax.jws)
36     p Rename in file (§2 R)
37     f Copy to Criteria Editor
38     ↗ Fix project setup...
39
40
41
42
43
```

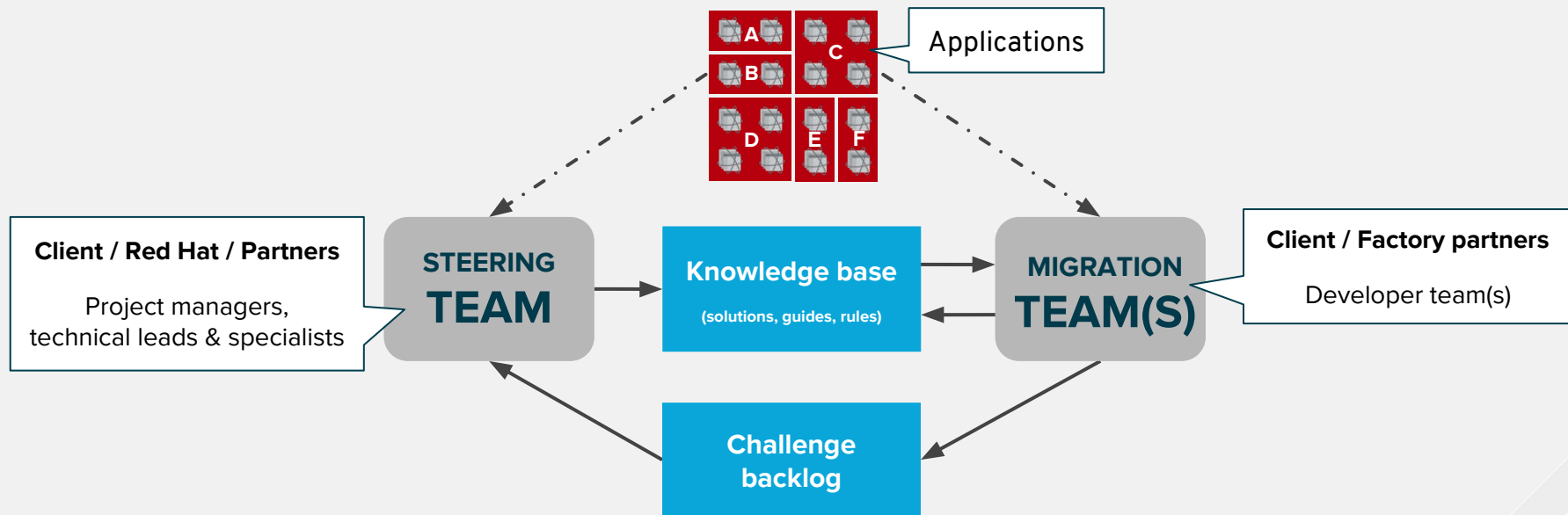
A context menu is open over the code change suggestion on line 35. The menu items are:

- ... (truncated)
- import javax.ejb.SessionBean;
- import javax.ejb.SessionContext;
- import javax.jws.WebParam;**
- import javax.naming.Context;
- ...
- @WebParam(value="insurance")
- private String type;
- ...

The bottom of the screenshot shows the "Issue Detail" panel with the text "No details available" and a footer that says "Press 'Tab' from proposal table or click for focus".

FACTORY DELIVERY MODEL

Project team structure & collaboration strategy



QUICK COMPARISON

DIY vs. Red Hat Methodology



MANUAL COST ASSESSMENT

CHECK OUT the source from version control
DETERMINE vendor-specific code
DETERMINE vendor-specific configuration
DETERMINE provided/consumed services
FIND referenced resources (DB/JMS/JMX)
FIND anti-patterns

40 HOURS / APPLICATION



RED HAT APPROACH

DESIGN

Assess

Prove

Pilot

Plan

3-8 WEEKS

- + YOU HAVE A PLAN IN PLACE
- + TECHNICAL RISKS IDENTIFIED & TESTED

CUSTOMER STORIES

CUSTOMER STORIES

Two main discussions

Migration



Modernization



Making old
apps new again



Modern app
development

#1 MIGRATION TO MODERNIZATION

Public sector

Business challenges

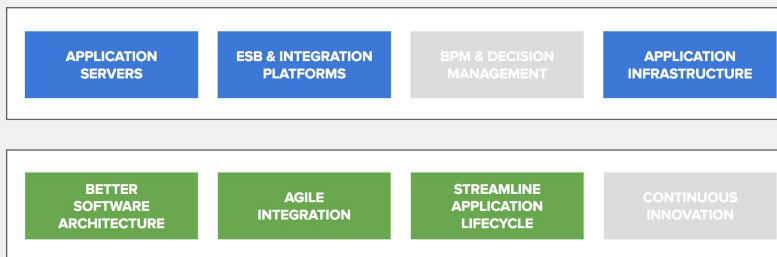
- High IBM license fees
- Very long time-to-market for applications
- High operations overhead (manual processes, lack of flexibility, high turnaround times for server delivery)
- Highly heterogeneous platforms and frameworks
- 250+ applications

Result

- Dramatic cost reduction
- Shorten application delivery time
- Flexible, modernized application delivery approach
- Decreased server turnaround time (from 2 weeks to 2 minutes)
- Retooled to standard, vendor agnostic technology

Solution

- Code and application server migration to JBoss EAP on RHEL
- Adoption of agile and DevOps good practices
- Integration platform consolidation around JBoss Fuse on RHEL
- Application containerization to OpenShift Container Platform



#2 MODERNIZE NEW AND EXISTING

Automotive sector

Business challenges

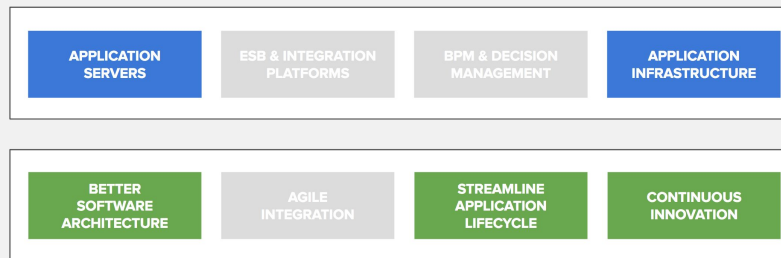
- Challenging self-hosting (application life-cycle processes, service window, down time, issue reproduction)
- Applications rebuilt for each staging environment
- several days to deploy an application update
- Usage of very heterogeneous frameworks, languages, versions
- 650+ applications, 500+ virtual machines

Result

- Time-to-market reduced by orders of magnitude
- Reduced costs, technical debt and lock-in
- Improved operational flexibility (hybrid cloud, standards)
 - consistency across environments
 - updating, patching processes
 - scaling and bursting capabilities

Solution

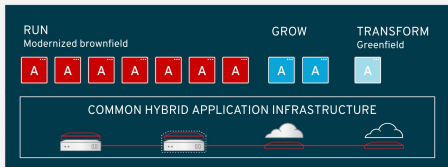
- Core platform for existing and new applications (microservices)
- Hybrid OpenShift Container Platform setup
- Provisioning with Ansible Tower
- Java EE and application server migration
- Adoption of DevOps practices



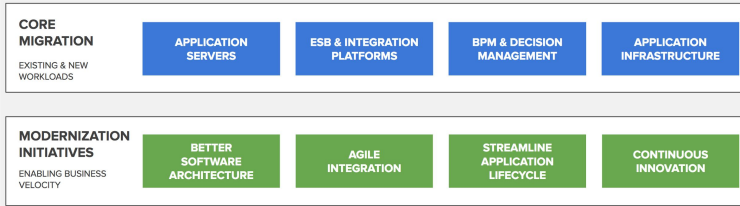
SUMMARY

WRAP-UP

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



COMBINE TRANSFORMATION



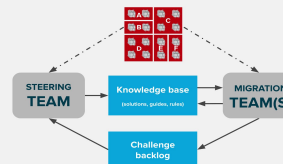
BENEFITS



APPROACH



FACTORY



NEXT STEPS



- Talk to your Red Hat representatives
- Request a discovery session
- Download the [Red Hat Application Migration Toolkit](#)

Contact us: thartwig@redhat.com & mzottner@redhat.com

RED HAT
SUMMIT

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THANK YOU



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