Application Modernization on z/OS

Re-Modeling for your Enterprise with DevOps for Enterprise Systems

Mike Fulton, IBM Distinguished Engineer
CTO DevOps for Enterprise Systems

Friday, August 14th, 2015
8:30am to 9:30am Dolphin, Oceanic 6

#SHAREorg

SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

Abstract

Application modernization. In order for businesses to ensure that their applications remain up-to-date, vibrant, relevant, and contributing to the financial success of the organization, application development teams need to pay attention to maintaining and enhancing the applications that keep the business running.

In this session, we will discuss the often over-looked topic of application modernization. We will cover aspects of application portfolio management, application analysis and assessment, identifying the applications which are most important to the organization, and application renovation.

Managing an application portfolio is an ongoing process, just like maintenance and re-modeling projects in non-IT environments. Come and learn how to focus your attention on the applications that are most critical to your business in order to maximize the effectiveness of your application modernization work.

Enterprise Client Challenges

- Delivery cost is high for Systems of Record Apps
- Time to deliver changes is high
- Small changes require vast amounts of testing
- Solutions do not satisfy changing needs
- Poor communication between different groups

Utopia: Unicorn fun facts

The unicorns (born on the web companies) set the DevOps bar
Some examples:

- amazon: 11.6 seconds mean time between weekday deployments, 1079 max deployments in an hour[1]
- Google: 15000 engineers working on 4000+ projects, 5500 code commits/day, 75M testcases run daily[2]
- NETFLIX: >100 releases/day[3]
- Etsy: 6419 deployments to production/year, 25/day, by 196 different people[4]

[1] http://www.slideshare.net/Dynatrace/why-everyone-needs-devops-now-gene-kim
[2] http://www.slideshare.net/realgenekim/why-everyone-needs-devops-now
[3] http://www.slideshare.net/jedberg/devops-at-netflix-reinvent
[4] http://www.slideshare.net/beamrider9/continuous-deployment-at-etsy-a-tale-of-two-approaches

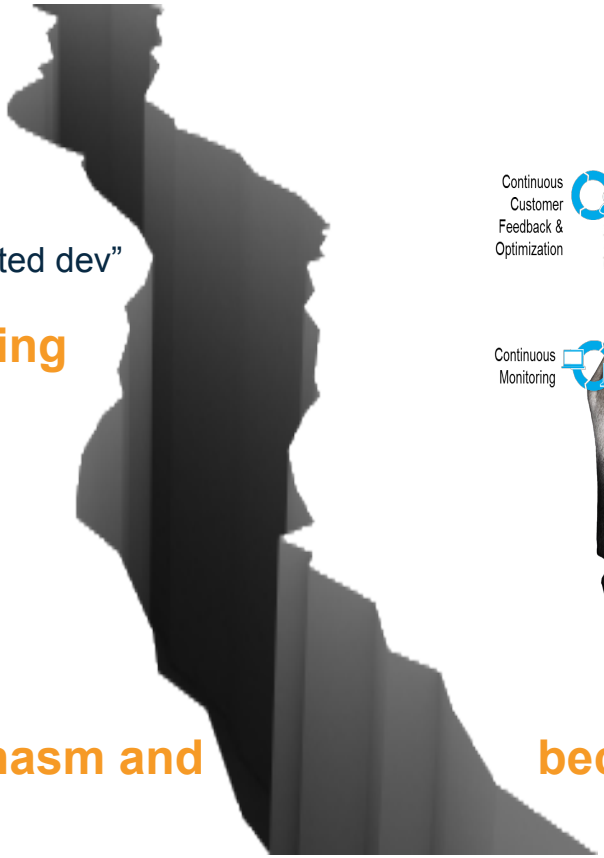
Reality: Most enterprise companies are not unicorns

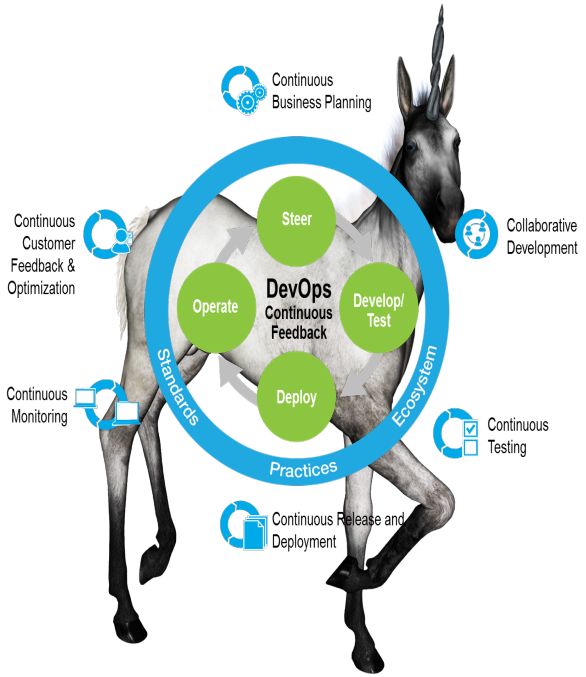
Ancient Infrastructure / Beliefs Remain

- Outdated developer and team tools
- Aging developer population
- Disconnected teams, silos
- FUD:
  - “millennials can’t code COBOL”,
  - “manual processes exist for a reason”,
  - “SoR dev can’t be as nimble as distributed dev”

Ancient Practices Need Overhauling

- Manual testing
- Availability of entire system is required to test
- Mainframe availability required (if some z)
- Reluctance to move test data off mainframe
- Cross-platform coordination required
- Manual project prioritization, status tracking





So, is it possible to cross this chasm and become a unicorn?

Utopia: Enterprise unicorn fun facts

Yes!!! And, many large companies are leading the way.

Some examples:

80 deploys/week, <10 incidents/month[1]

80% reduction in critical defects, 70% increase in system availability, 90% on-time delivery vs. 60% previously[2]

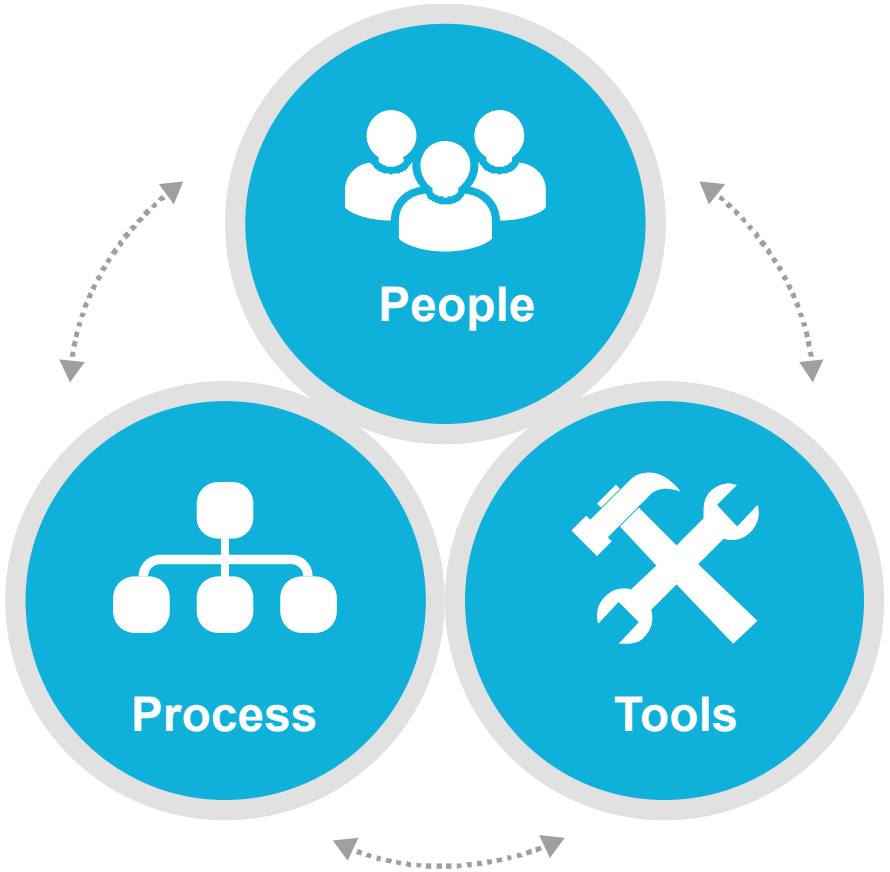
reduced dev cost from 100M to 55M/year, 140% increase in number of products under development[3]

resale up 30% first half of 2014, 24% YoY increase in customer service rating[4]

[1] http://www.slideshare.net/DevOpsEnterpriseSummit/does14-ross-clanton-and-heather-mickman-devops-at-target-41869677
[2] http://www.slideshare.net/DevOpsEnterpriseSummit/tuesday-400-hayden-lindsey-and-carmen-de-ardo-final?
[3] http://www.slideshare.net/DevOpsEnterpriseSummit/does14-gary-gruver-macys-transforming-traditional-enterprise-software-development-processes
[4] http://www.slideshare.net/DevOpsEnterpriseSummit/tuesday-330-shakeel-sorathia-final?qid=d758c122-8df0-4e03-b2da-4ba4c7271897&v=qf1&b=&from_search=11

So…

What is DevOps for Enterprise Systems?



DevOps: Transforming Your Business

DevOps is an Enterprise-wide transformation

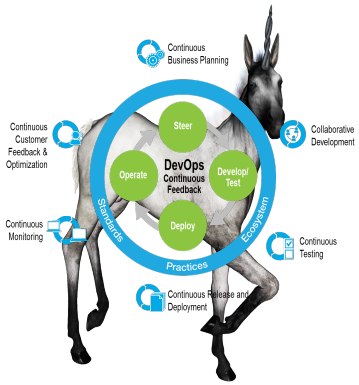
it is not restricted to Systems of Engagement

Determine your key business challenges:

time to market, lack of resources, quality ?

Understand your current processes:

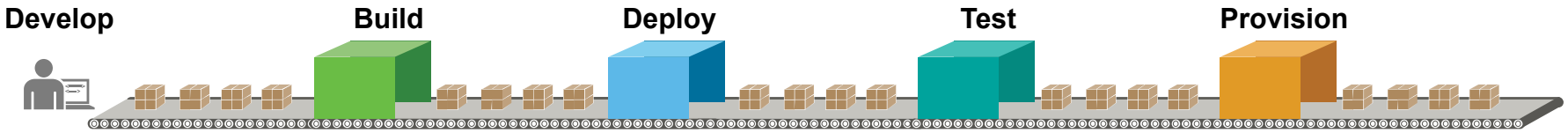
focus on key processes in **your** business creating challenges



Focus on a PoC Application to start

- An important, but not critical app
- Seed a small team keen to transform
  - If possible, a cross component team (mobile, web, z/OS)
- After success, this team can evangelize

Understand Your Development Life Cycle



Think of your Development Life Cycle like an assembly line

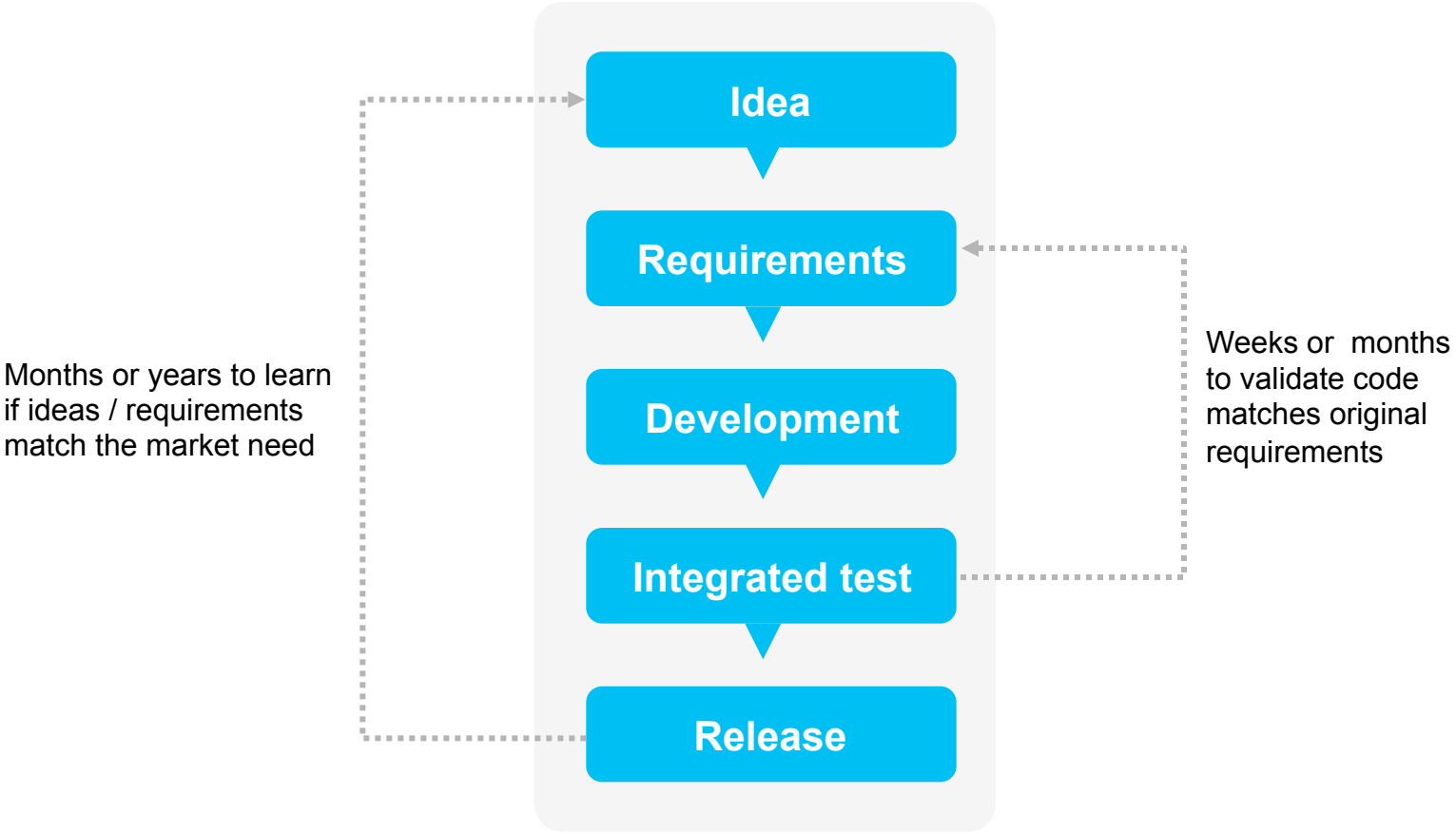
- Identify weak areas: slow, high risk, costly

Gain a Deep Understanding of Your:

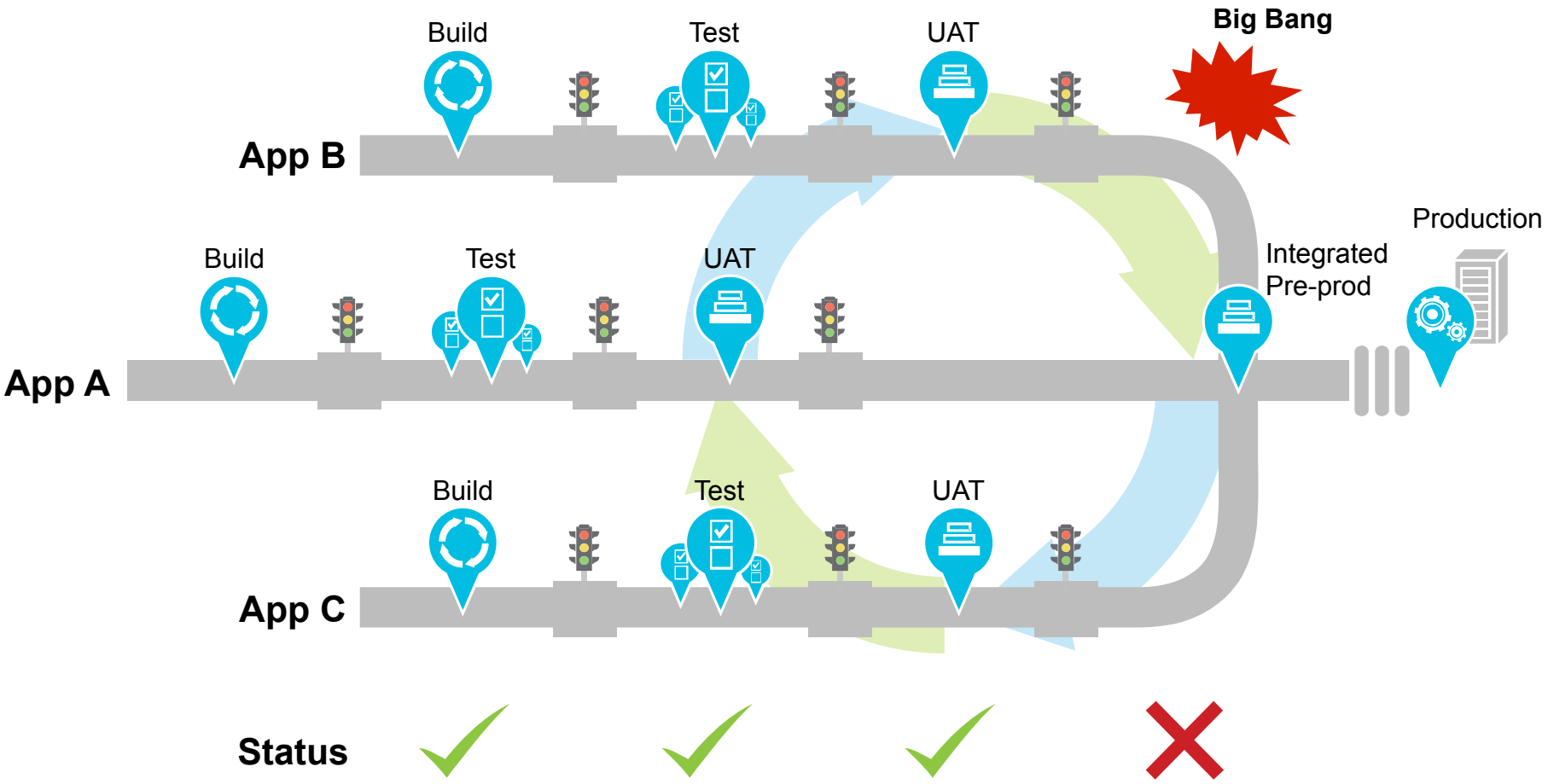
- Team: Enable transparent sharing
- Applications: transform to a loosely coupled architecture
- Test Suites: test changes you make, not the entire app
- Data: what datasets/databases/files does your app access?
- Build/Deployment: codify common build and deployment process for all deployments
- Monitoring: codify acceptable operating parameters for your app to reduce risk

DevOps Best Practice: Deliver in Small Batches

Delayed learning is why waterfall fails

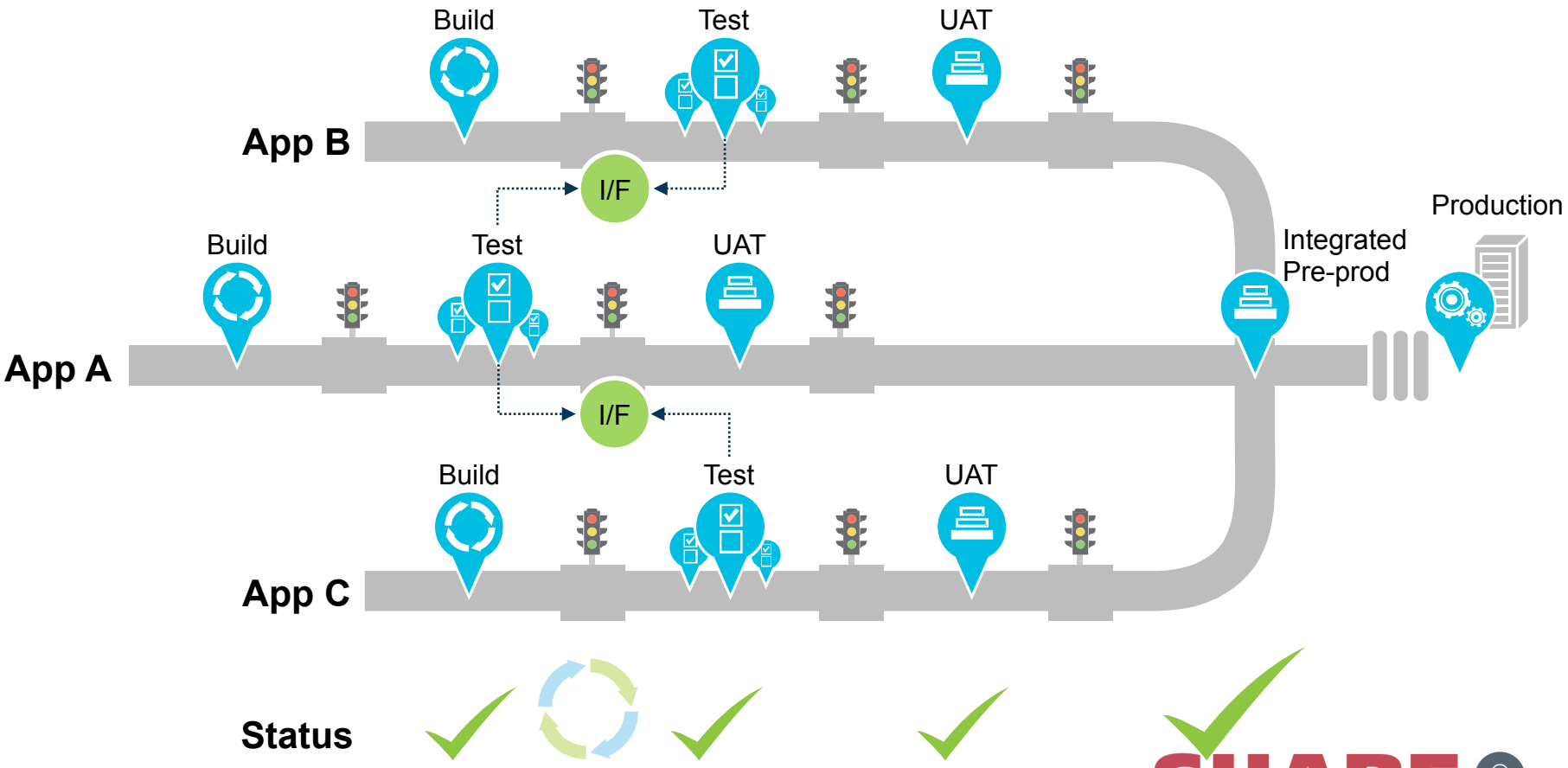


Testing too little, too late… the Big Bang!



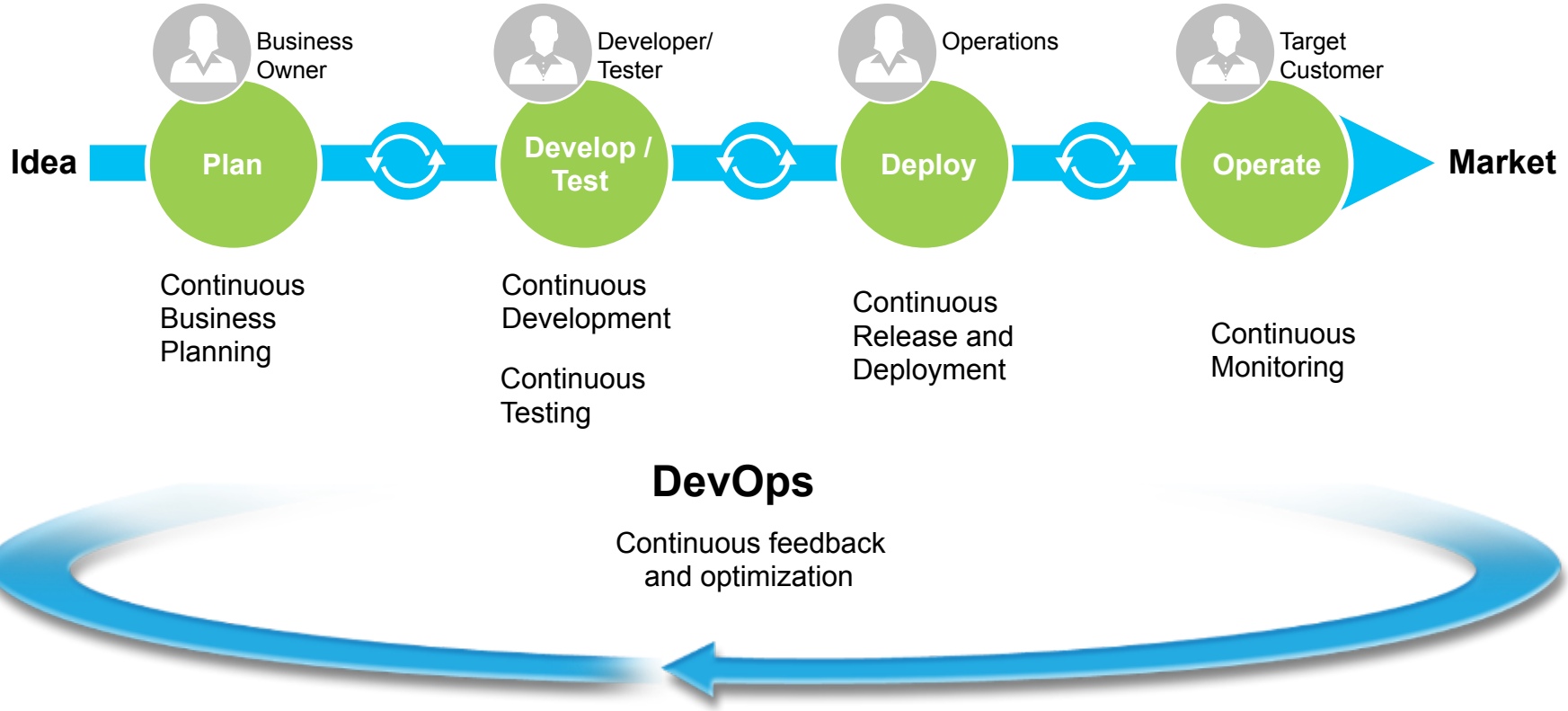
The Shift Left Solution…

Test in small incremental batches

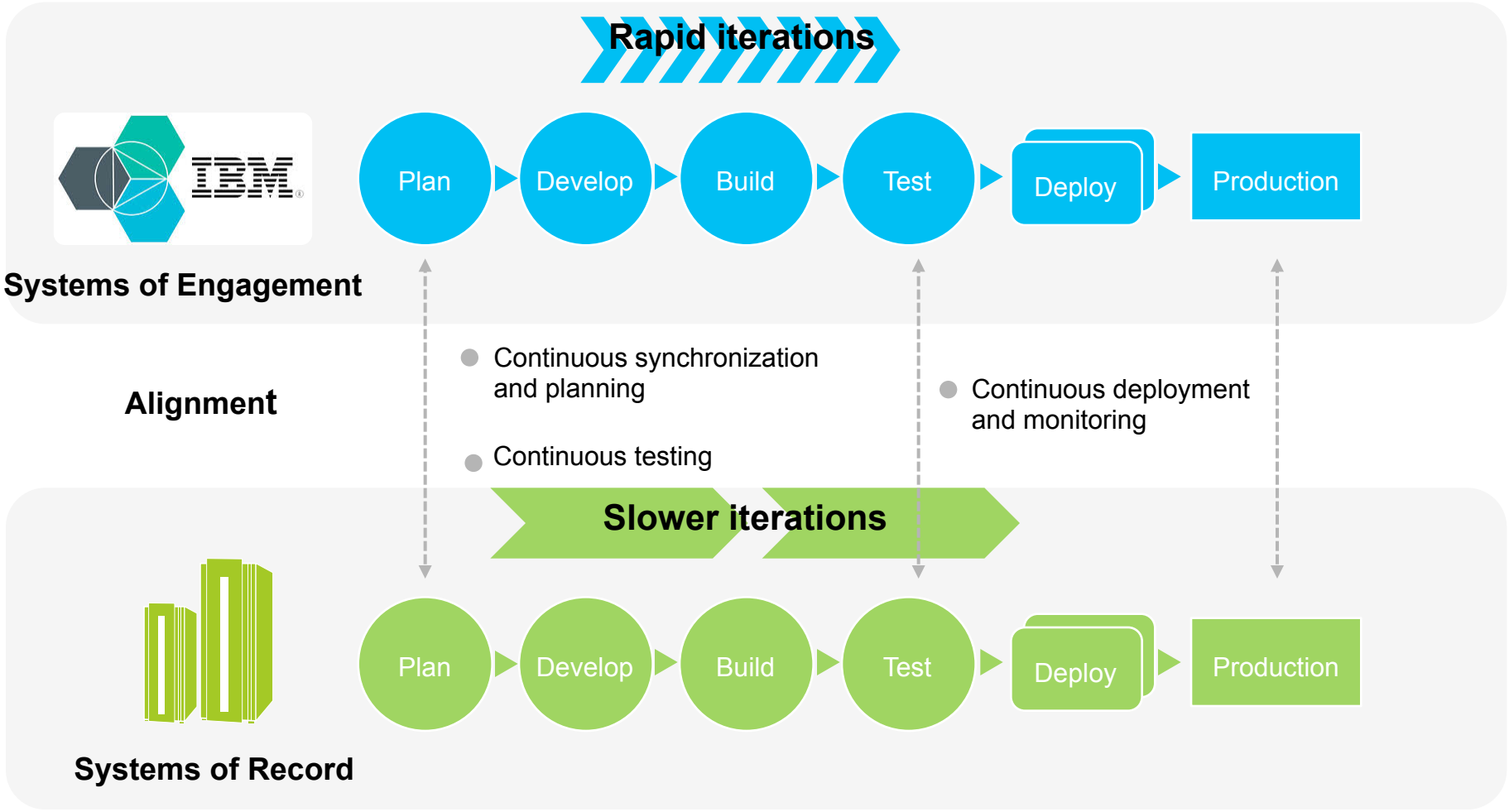


Build for success with a closed-loop approach to app delivery

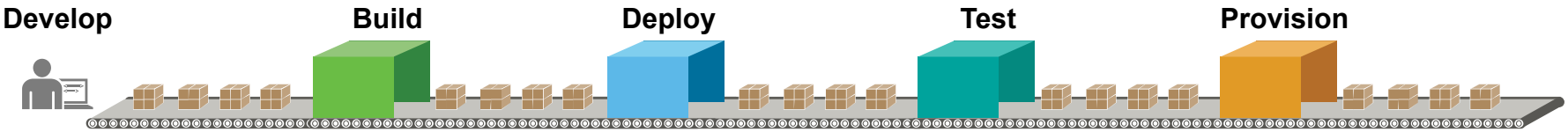
DevOps extends lean and agile practices

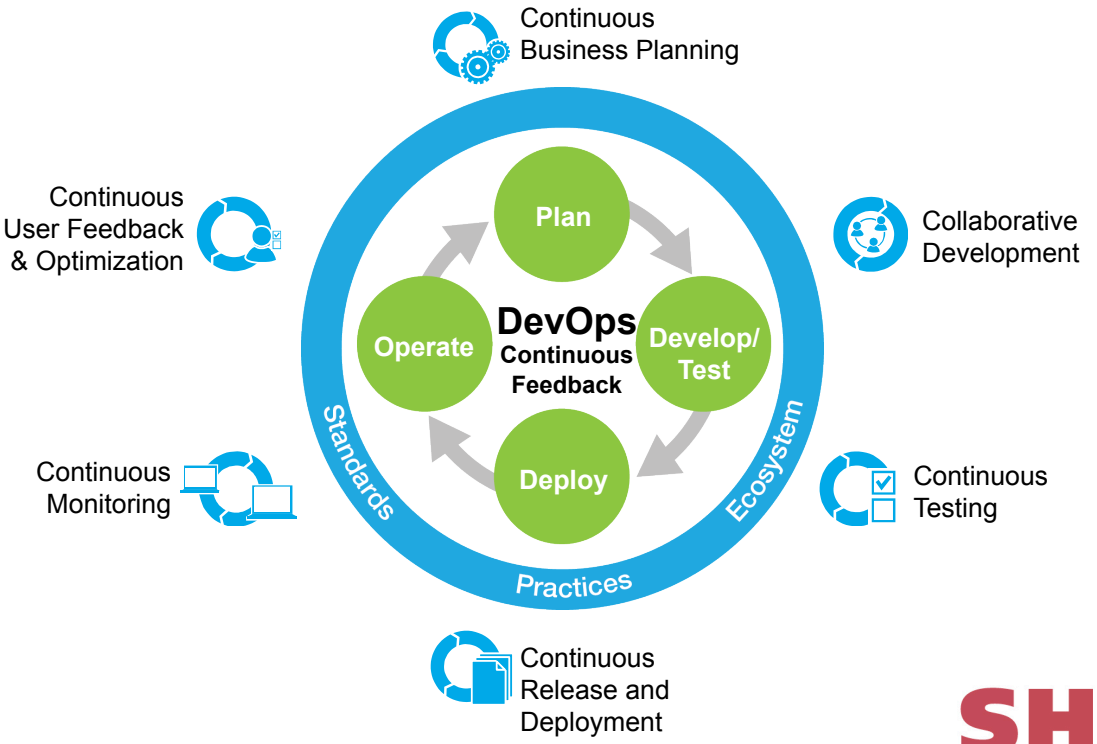


Applications and teams move at variable speed

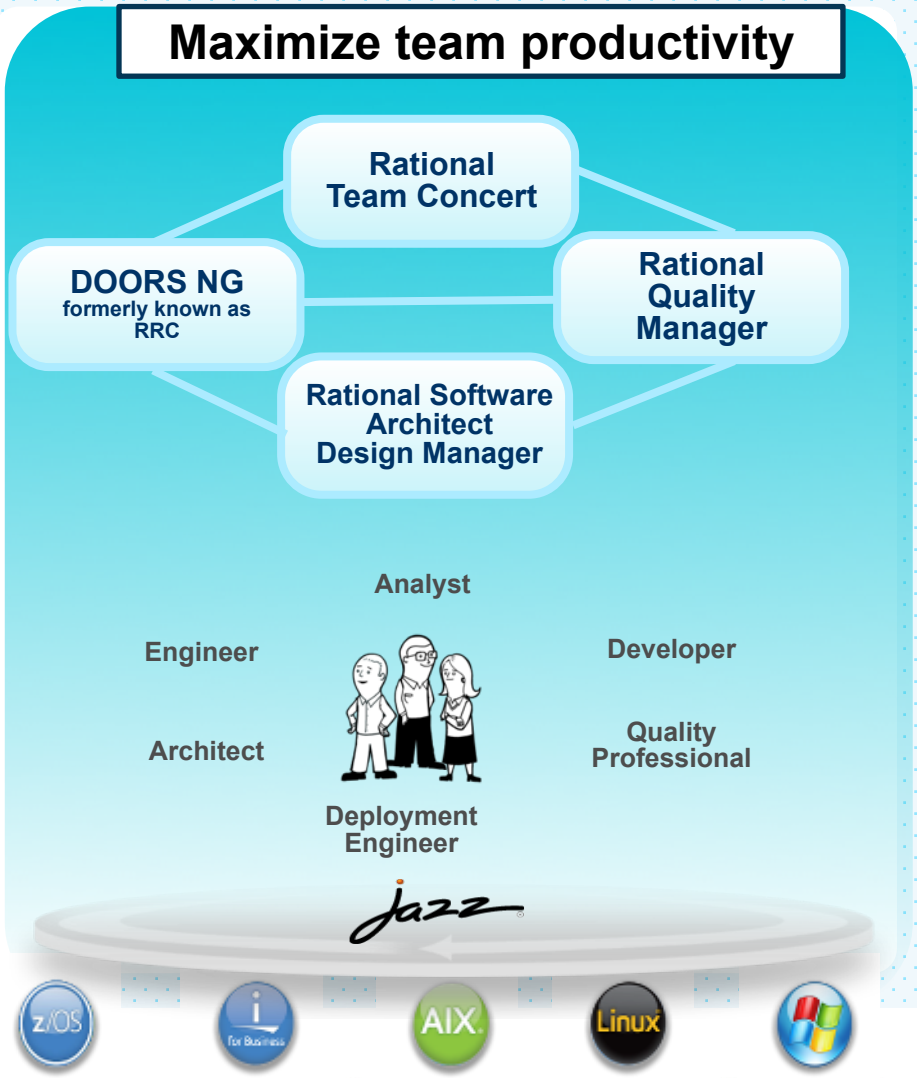


Evolution to Continuous Delivery





Break down silos by moving to an agile team environment



- Manage all types of code from JavaScript to COBOL – mobile to mainframe
- Instant-on, self-serve development capabilities with JazzHub on SoftLayer
- Accelerate agile adoption on the mainframe
- Integrate existing deployment tools
- Enhanced Lifecycle integration adapters for third-party tools

Rational Developer for System z:

THE Premier Integrated Multi-Platform Development Environment

Develop and Test

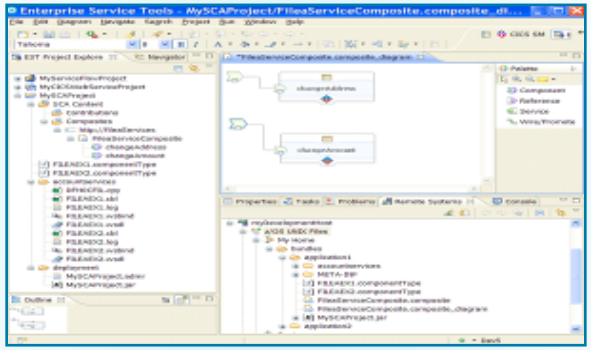
SHARE
Educate · Network · Influence

Rational Developer for System z

A modern IDE for productive development of cross-platform applications written in COBOL, PL/I, ASM, Java, EGL or C/C++ in System z CICS, IMS, DB2, Batch applications, with a powerful state of the art integrated debugger

Integration with Team Concert for Lifecycle and Source Management

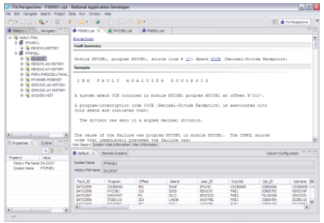
Access to typical System z sub-system functionality in z/OS, CICS, IMS, DB2, WAS



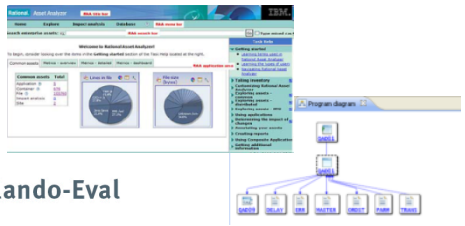
Integration with RD&T for flexible access to System z environment

Robust Mobile Development in conjunction with Worklight

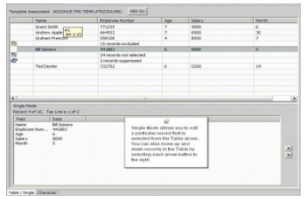
Integration with Fault Analyzer for ABEND Analysis



Integration with Asset Analyzer for Application Understanding and Impact Analysis



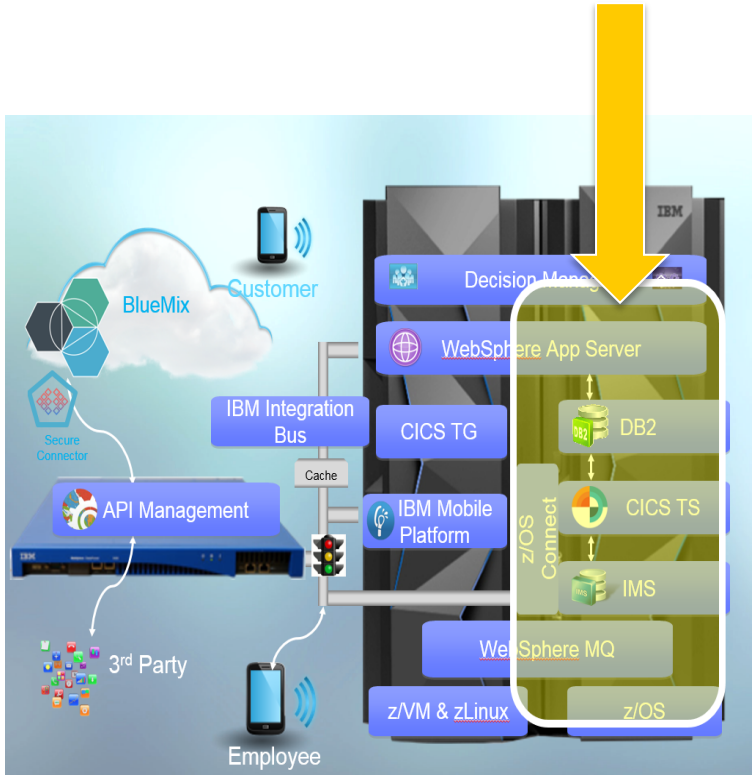
Integration with File Manager for file and test data handling



PD Tools

Speed up mainframe application delivery

PD Tools offers a rich set of functionality when dealing with various resources on z/OS.



Problem Determination Tools for z/OS

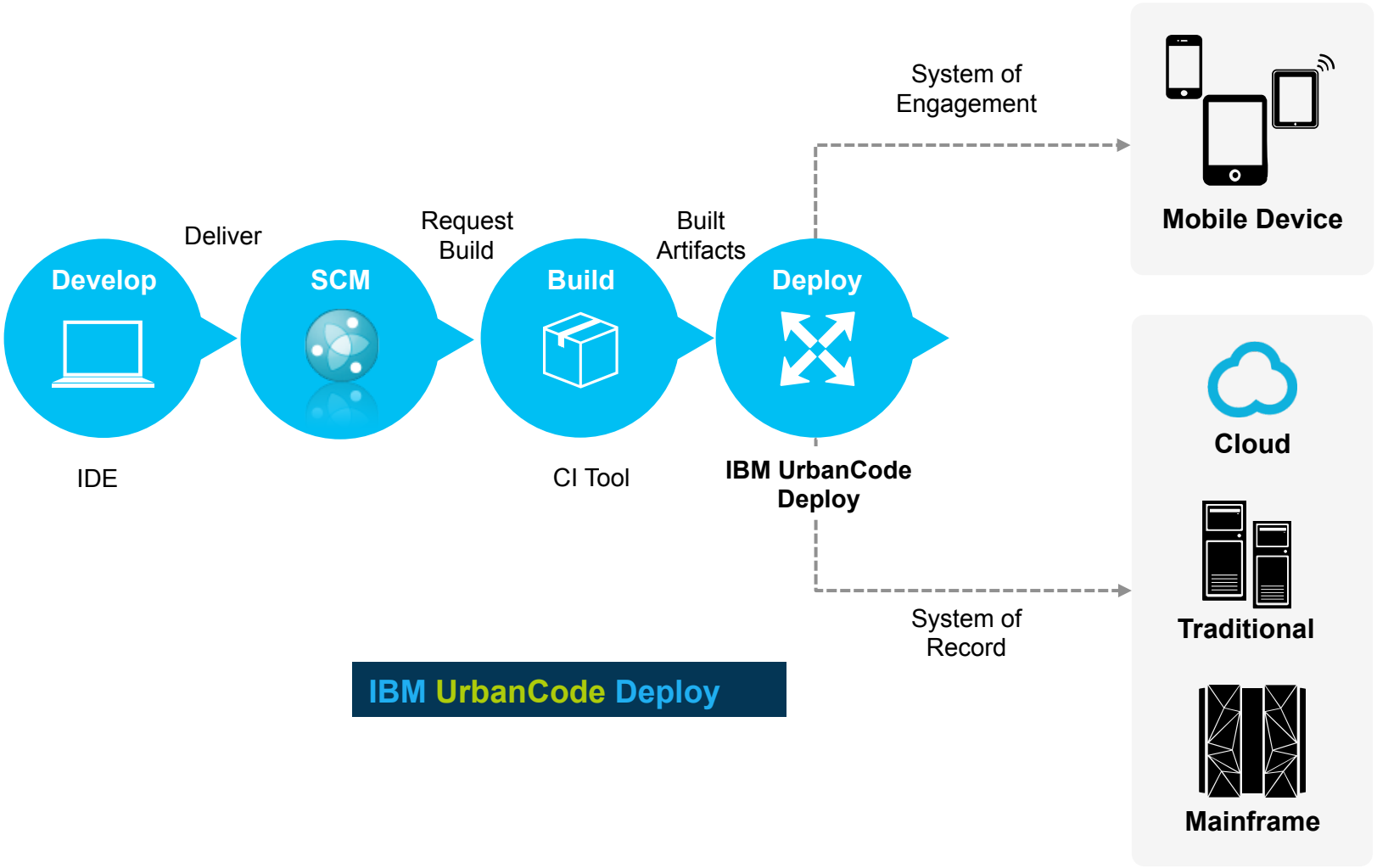
- Interactive debugging of your applications
- Root cause analysis of your application failures (abends)
- Management of your application data
- Performance analysis of your applications
- Quality assurance of your applications

- Application Performance Analyzer for z/OS
- Debug Tool for z/OS
- Fault Analyzer for z/OS
- File Manager for z/OS
- Workload Simulator for z/OS and OS/390
- Data Set Commander for z/OS
- Hourglass

Solution Packs

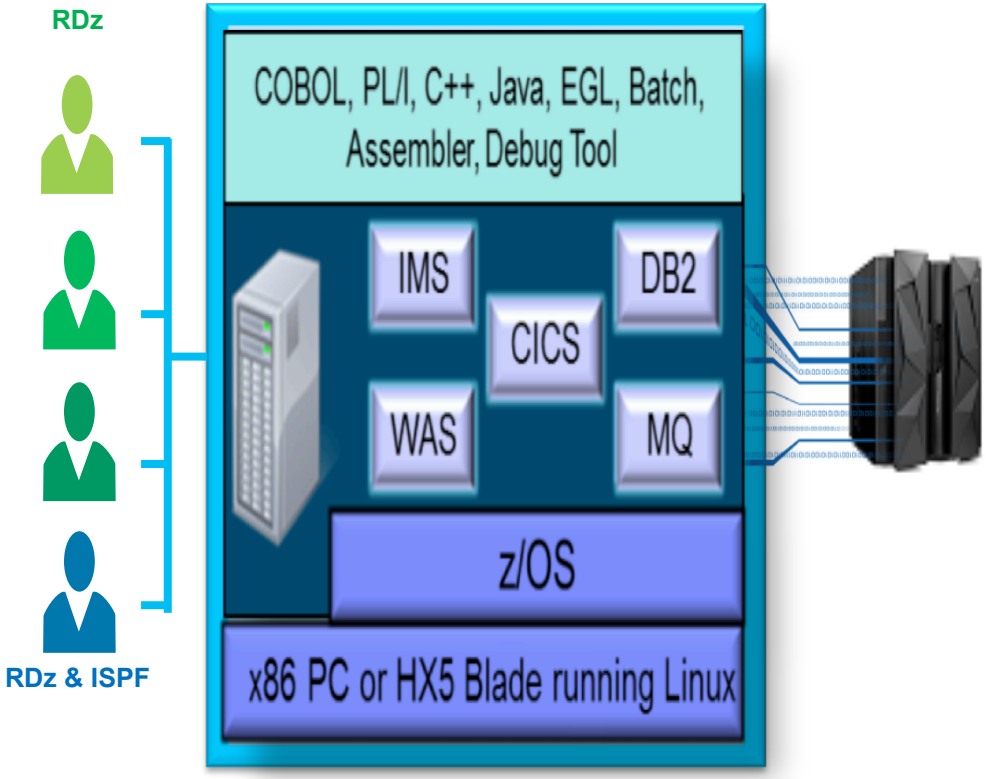
- ❑ Problem Determination Modernization Solution Pack (APA, DT, FA and FM)
- ❑ Problem Determination Solution Pack (DT, FA, FM, WSIM, Hourglass and DSC)
- ❑ Problem Determination Testing Solution Pack (DT, Hourglass and WSIM)

Application Deployment to Multi-Platform Environments



Testing off the mainframe

- ✓ Rational Development and Test Environment for System z – test z/OS software on Intel platforms without using z System hardware



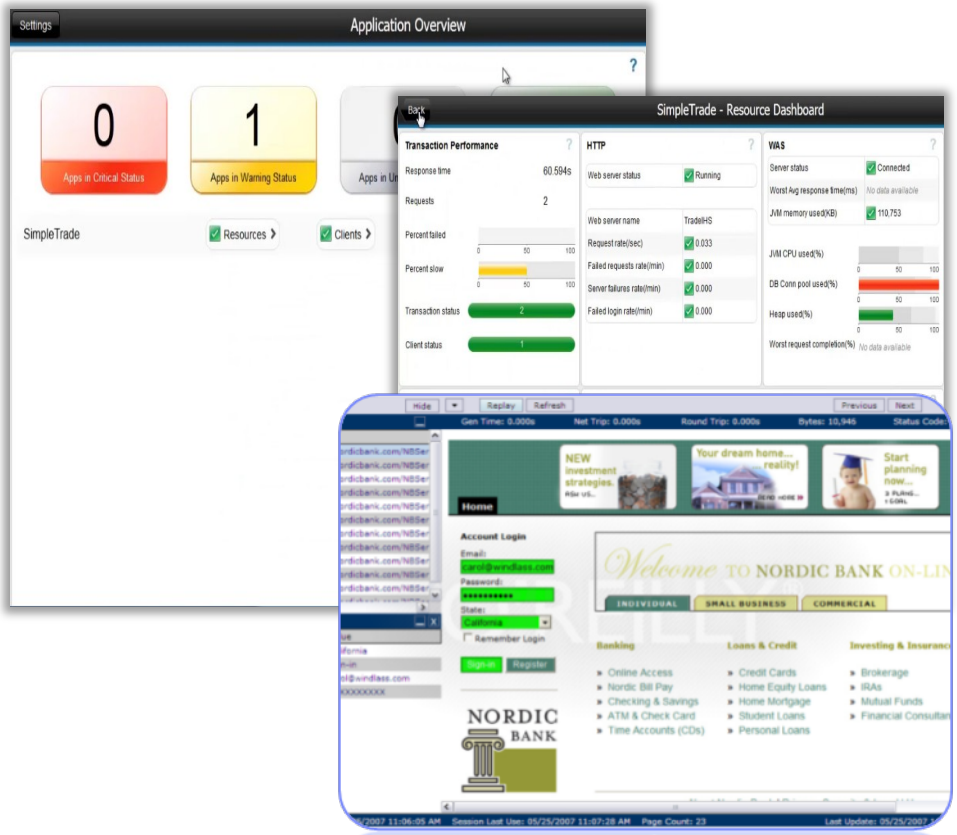
Key practices:

- MVP
- Dedicated Teams
- Loosely Coupled Arch.
- Minimizing Hand-offs
- Maximizing Flow
- Small Batch Delivery
- Transparency
- Eliminate Overhead
- Automate Testing

Manage and Optimize Application and Infrastructure Performance

VISIBILITY **CONTROL** **AUTOMATION**

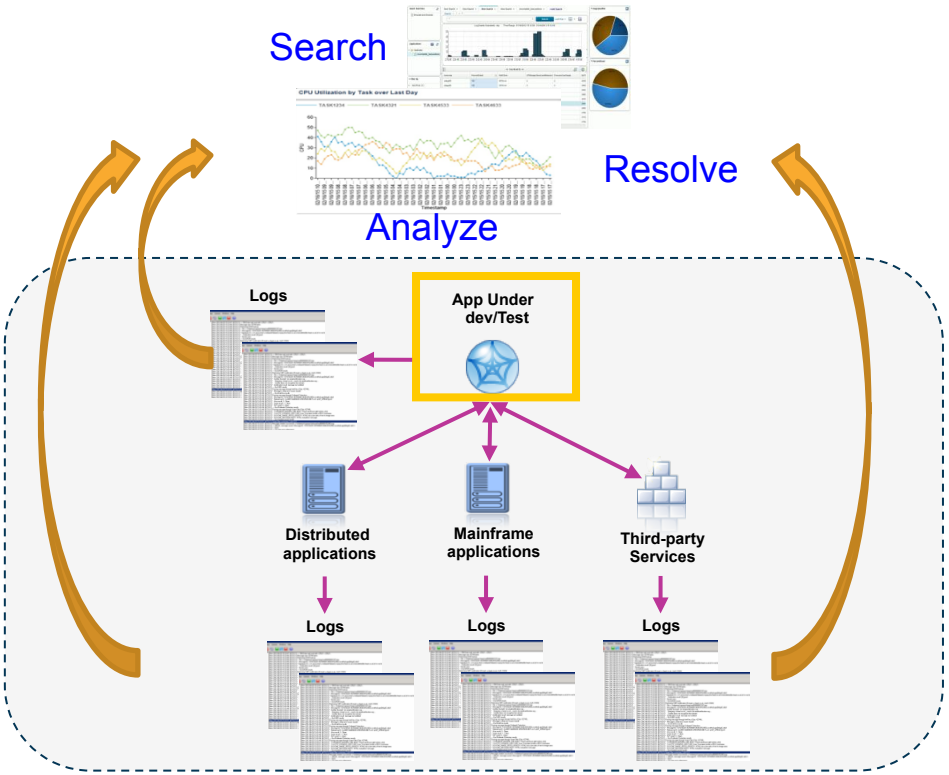
Gain actionable insights



- ***Reduce Costs*** of resources and outages
- ***Increase ability to meet SLAs*** with intelligent alerting and automation
- ***Increase staff productivity*** managing by exception and automated responses
- ***Maximize efficiency of staff*** with common tools, processes and Integration
- ***Create collaboration*** through tool integration and shared information
- ***Efficiency in day to day management***
  Link actions to situations
  - Automate problem responses
  - Capture expert knowledge
  - Common data and KPIs

Consolidate and index logs for quick search and analysis

Your Application can generate many messages in several logs across the enterprise



Don't ignore the log data!

Save time and minimize problem determination and resolution effort with IBM Operations Analytics for z Systems

Consolidate and index large volumes of log data to enable quick search

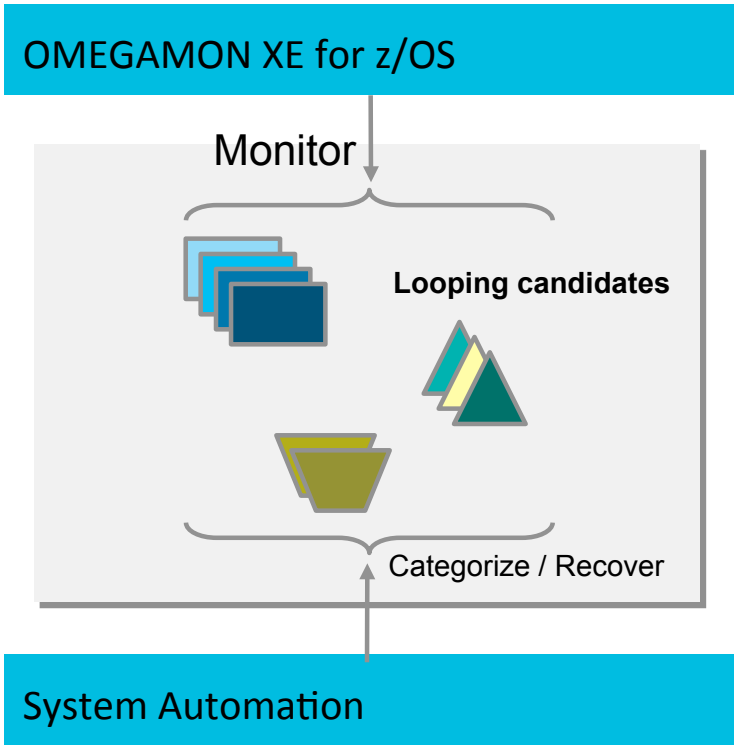
Search multiple logs from multiple systems from a single user interface

Use Expert Advice to assist in problem resolution

Out-of-the-box insights, quick searches and dashboards provided for WebSphere, DB2, CICS, IMS, MQ and Network

Customize to meet your needs. Build quick searches and graphical views tailored to your application development environment

Improved System Performance with Automation/Monitoring



Situation

The overall z/OS system utilization and also the utilization of individual started tasks / jobs is understood for normal and peak hours

Problem

Detect abnormal CPU utilization for started tasks / jobs

Detect looping jobs that are hard to detect

Prevent these types of work from dominating the system

Solution

Data from OMEGAMON XE for z/OS analyzed by System Automation for high CPU utilization

System Automation categorizes different types of work

- allows for defining various recovery actions
- through policy – not programming!

Service Management Suite for z/OS

Operate

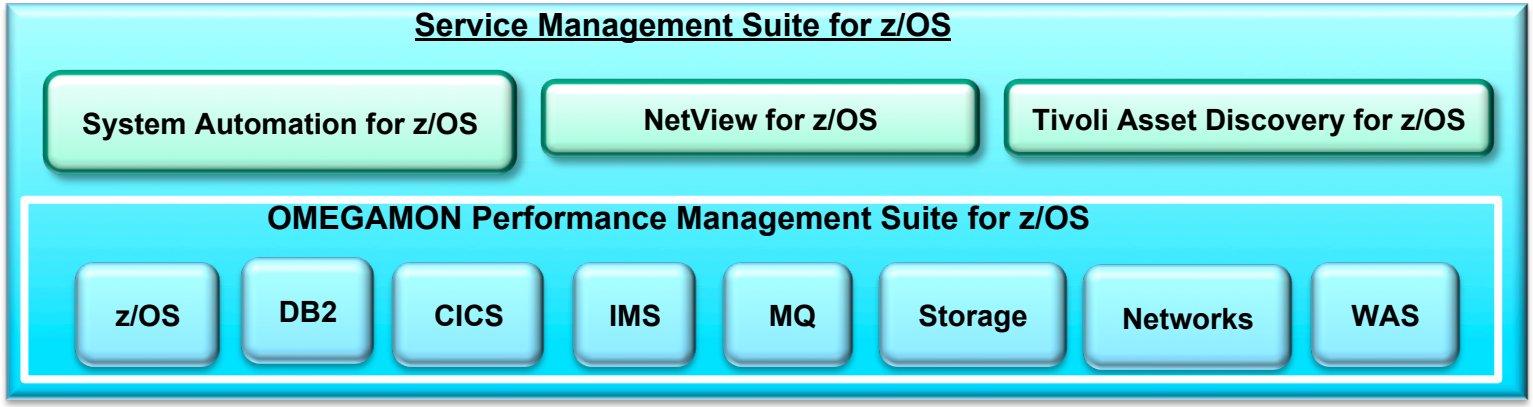
Provides comprehensive service management capabilities for IBM zEnterprise

VISIBILITY

CONTROL

AUTOMATION

Simple Pricing (OTC PID) to deploy infrastructure and middleware solutions as needed



- Single offering to manage z/OS and all key subsystems
- High Availability & Automated Operations to improve Service Levels and reduce system downtime
- Visualize and automate your mainframe environment as a single system
- Eliminate boundaries between system and application components
- Network & Performance Management to increase efficiency of resources and personnel
- Tools tightly integrated providing proactive automation: helps problem resolution before alarms go off

What's New?

New Compilers to optimize performance on z13

- *Enterprise COBOL for z/OS V5.2*
- *Enterprise PL/I for z/OS v4.5*
- *z/OS XL C/C++ V2R1M1*
- *XL C/C++ for Linux on z Systems V1.1*

Rational Developer on z

- *Headless code review & code coverage in zUnit Automated Unit Testing Framework*
- *Multiple users can debug the same CICS transaction, same region, same time*

Rational Development & Test

- *Exploit added zEnterprise capability (Parallel Sysplex)*
- *New licensing to support automated testing and variable usage patterns*

Rational Test Workbench 8.7

- Virtualize DB2 on z and PL/1 support

UrbanCode Deploy

- *OOTB automated JCL submission/monitoring simplifies z/OS app deployment*
- *Plugins for CICS, DB2, and IMS for predefined deploy steps*

Rational Team Concert

- *New component history, change history views, ISPF search command to find strings*
- *Enhanced integration: RTC for z can generate UrbanCode deployment packages*

Secure Managed Cloud Services – RD&T and CLM

Modern and open tools for z Systems

Java 8 and z13

Optimized CICS, IMS and DB2 transactions

Up to **50%**

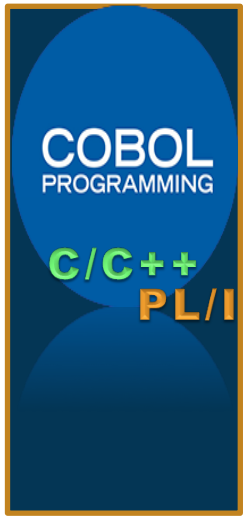
improvement for generic applications

Up to **2X**

improvement in throughout per core for security enabled applications

COBOL, PL/I, & C/C++ Compilers

z13 exploitation for increased performance



Up to **17%**

performance improvement

1.5x performance gain for COBOL apps using packed decimal

30x performance gain for COBOL stmts with SIMD instructions

Results based on internal IBM lab measurements. Results for specific applications will vary, depending on the source code, the compiler options specified, and other factors

DevOps for Enterprise Systems – Key Takeaways

1. **DevOps is about transforming application development and delivery in order to accelerate digital innovation.** *So DevOps is a topic for both business and IT roles in the organization.*

2. **You don't buy DevOps, you do DevOps.** *DevOps is an approach, a mindset – a combination of culture, process and technology (including infrastructure, tools and services).*

3. **DevOps is not only about the hand-off between Development and Operations.** *DevOps is about applying lean and agile principles across the application delivery lifecycle (biz-dev-test-deploy-operate) to achieve continuous delivery of digital innovation. Key concepts: automation, feedback loops.*

Build and deploy in small batches[1]

While not specific to a product, this is a critical best practice

- ✓ Reduces project risk
- ✓ Encourages automation
- ✓ Simplifies problem determination
- ✓ Speeds up feedback – “reduces queue size”
- ✓ Improves flow
- ✓ Reduces cycle time
- ✓ Increases efficiency
- ✓ Lowers overhead
- ✓ Improves project visibility
- ✓ Encourages decoupled architectures

[1] http://dev2ops.org/2012/03/devops-lessons-from-lean-small-batches-improve-flow/

Key Practices Accelerate Delivery

Loosely Coupled Architectures

Deliver in Small Batches

Minimize Hand-offs, Maximize Flow

Eliminate Overhead

Automate Testing using APIs

Minimum Viable Product

Dedicate Teams

Practice Transparency

Base: 600 IT professionals with app development responsibilities from US, Canada, UK, France, & Germany Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, May 2014

Thank You!

Complete your session evaluations online at www.SHARE.org/Orlando-Eval