



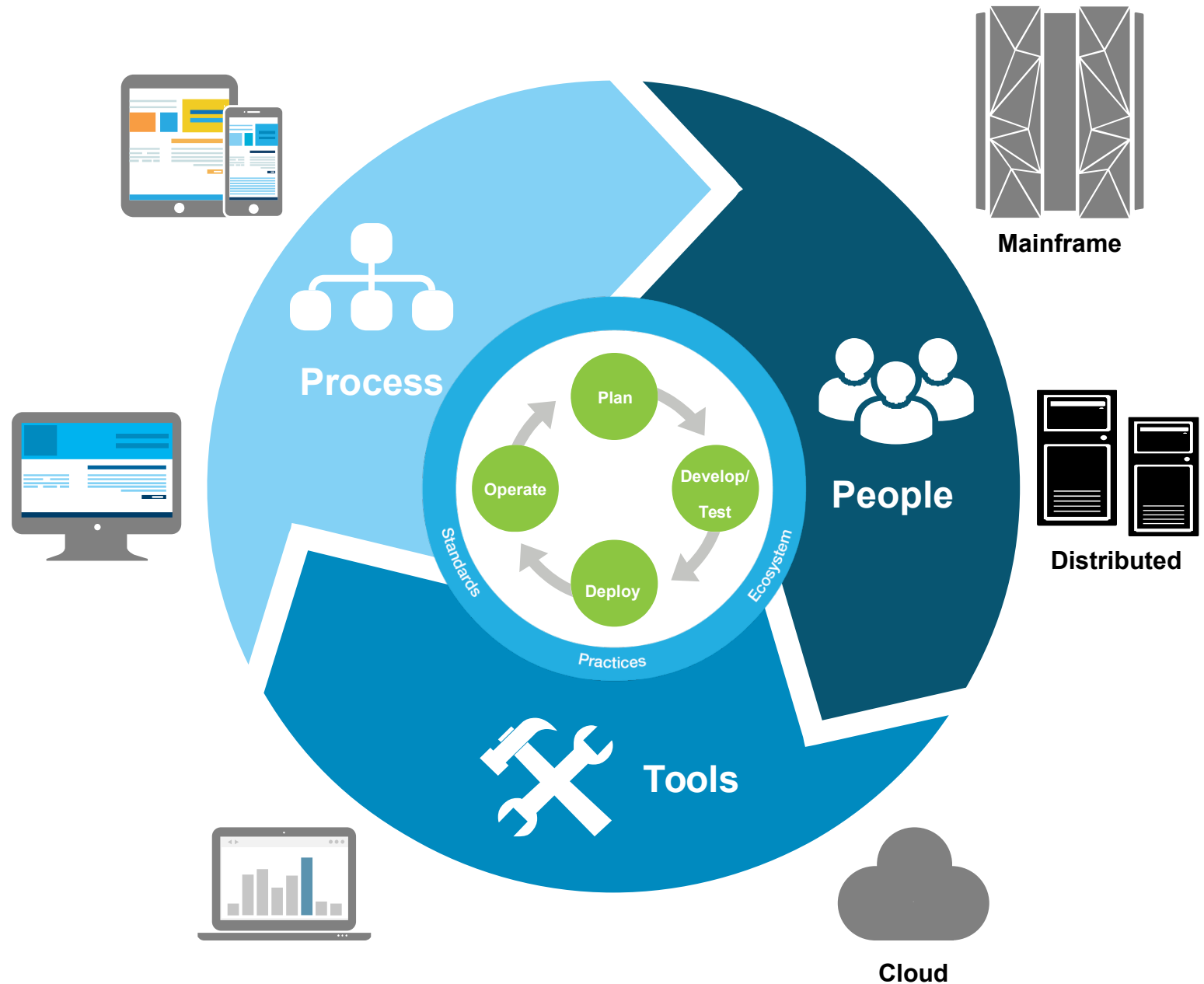
Accelerate Enterprise Systems Application Delivery with DevOps

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[@RosalindRad](https://twitter.com/RosalindRad)

DevOps is not one of these things... It's all of them!

...across the entire lifecycle

...for all technologies and platforms



'Lean' DevOps

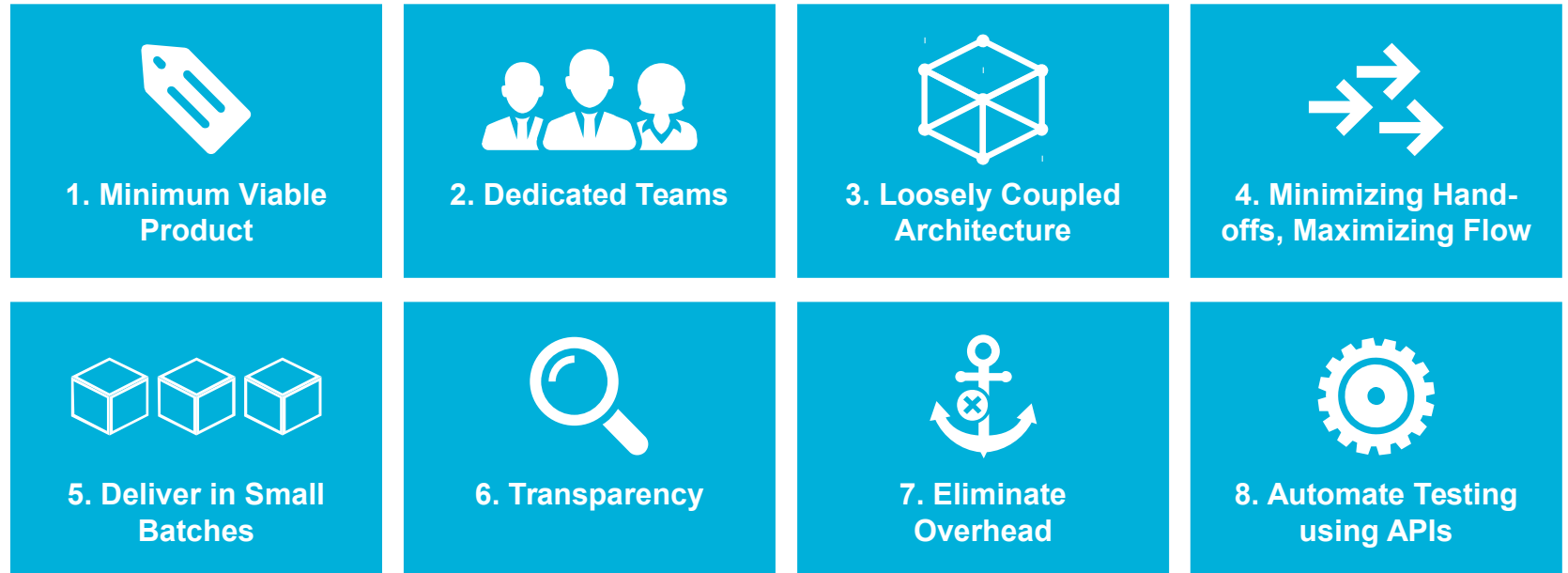
The Process



The New Software Imperative: Fast Delivery With Quality

Eight DevOps Practices Are The Key To Success

- 34% of companies have “crossed the chasm” to critical 3-week delivery increments
- Positive correlation between speed and business satisfaction



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



'Lean' DevOps

The Culture





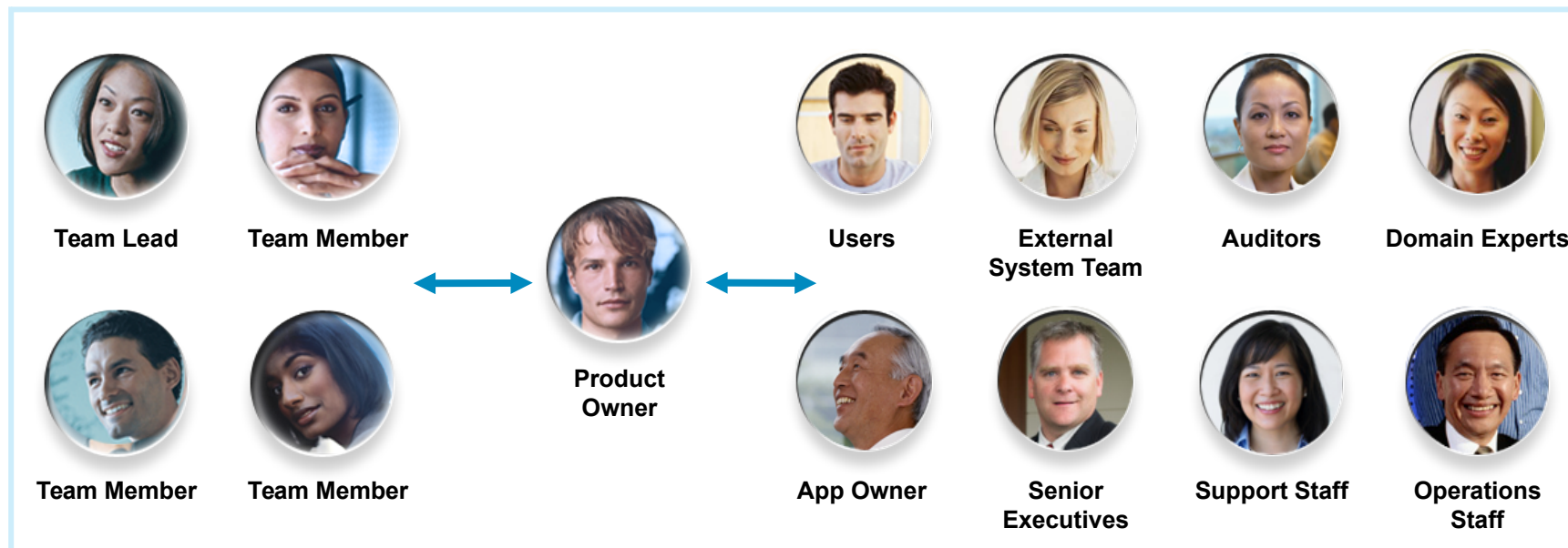
It's all about

the people



Building a DevOps Culture grounded in lean and agile principles:

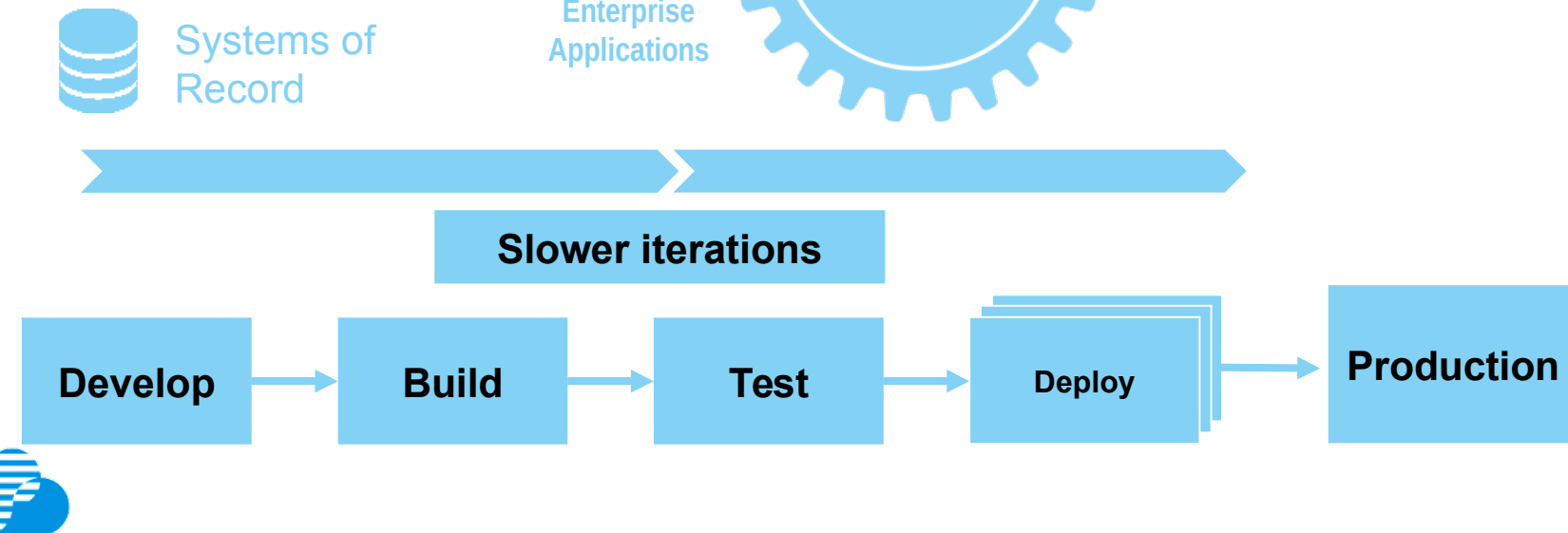
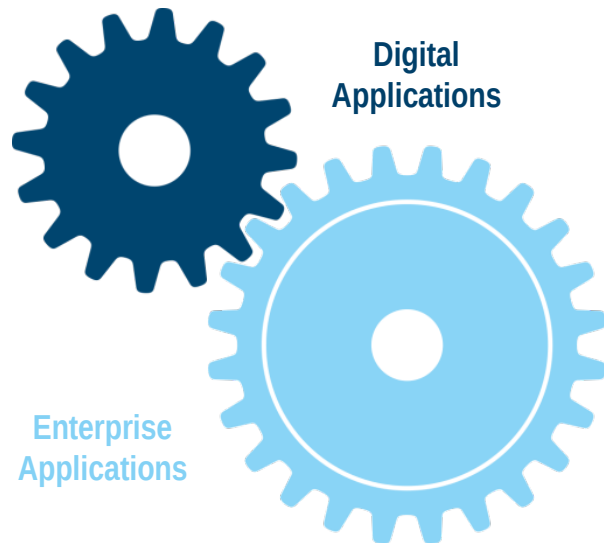
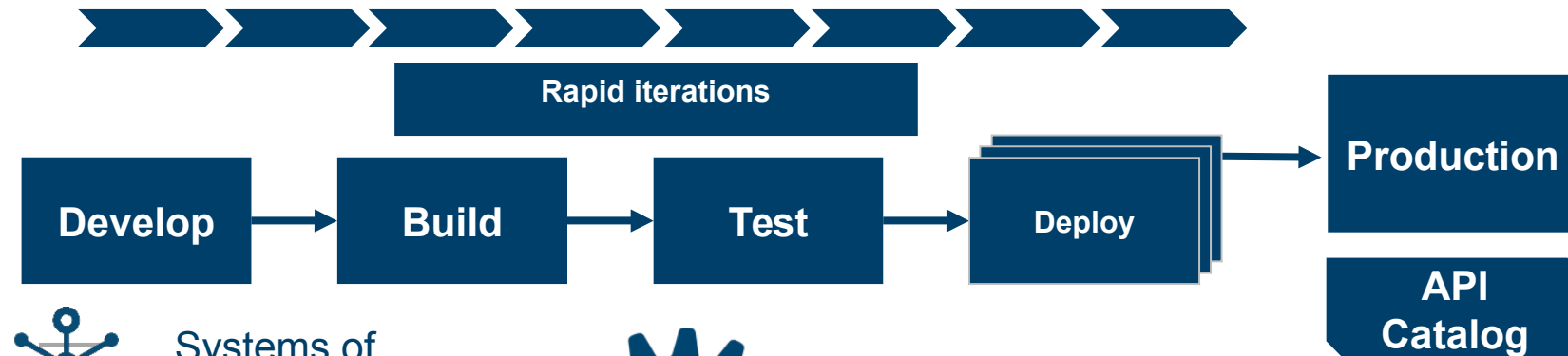
- **Everyone is responsible for Delivery**
- Common measures of Success
- Empower your teams
- Don't under-estimate the value of training and skills enablement!



Unique DevOps opportunities in a mainframe world

Hybrid applications, teams,
development, deployment





Applications and teams move at variable speed

Enterprises need instrumented, automated coordination for two-speed IT

By the end of 2015, 75% of large organizations are expected to have adopted agile DevOps practices, (IDC) and 25% of cloud developers indicated development of cloud apps from within a hybrid environment.

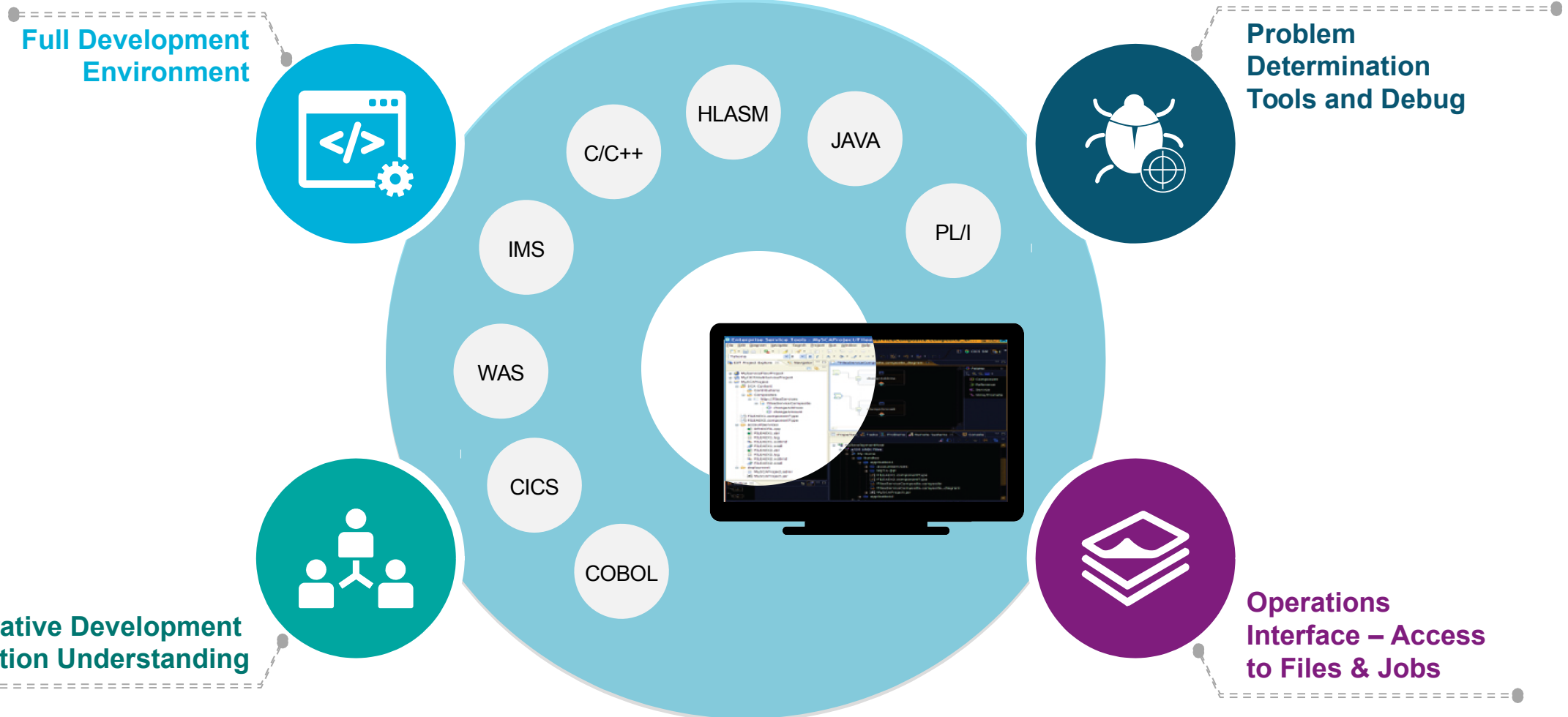
“Lean” DevOps

The tools





Modern Tools for Multi platform development and operations



Break down silos by moving to an agile team environment



Analyst



Document requirements using textual and visual techniques

Project Manager



Leverage real-time planning techniques to make plans instantly executable and resilient to change

Operations



Operations provides feedback before, during, and after deployment

- Requirements
- Collections
- Storyboards
- Use cases

- Agile release plans
- Iterations
- Work Items
- Source code

- Test plans
- Test cases
- Test scripts
- Test executions

Developer



Collaborate across diverse disciplines and teams to meet business requirements

Tester



Achieve quality by design with an integrated, automated testing process

Release Engineer



Automate software delivery tasks and accelerate handoff to Operations





Deploy what is ready, virtualize the rest



Test Environments

Push button deployments to test or production

Continuously test in production-like env.

Virtual components

Databases Mainframe Third-party Services

Dev QA Dynamic Infrastructure

Simultaneously test across multiple test stages

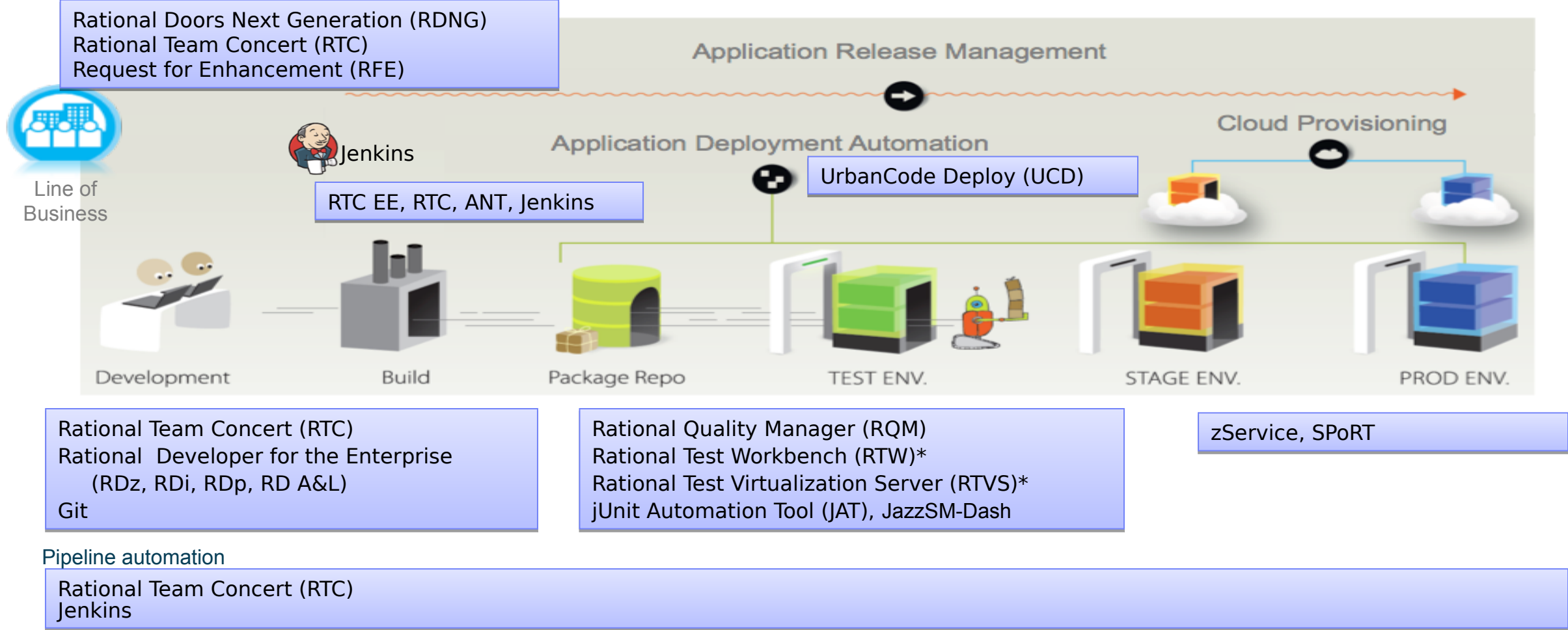
Deploy what is ready, virtualize the rest

z/OS application testing on emulated z System hardware

Integrated with



Continuous Integration Initiative - Golden Topology



You asked... z Systems Software team delivers!

IBM z/OS Explorer V3.0 Aqua Release

- **Improved user experience** for all z/OS System Programmers and Application Developers.
- **Dev and Ops capability** available on a common platform.
- **Improved consumability** of z Systems Software Eclipse-based offerings.
- **Simplified installation & maintenance experience** of z Systems Software solutions.



Built on z/OS Explorer Aqua using IBM's Continuous Integration & Test infrastructure:

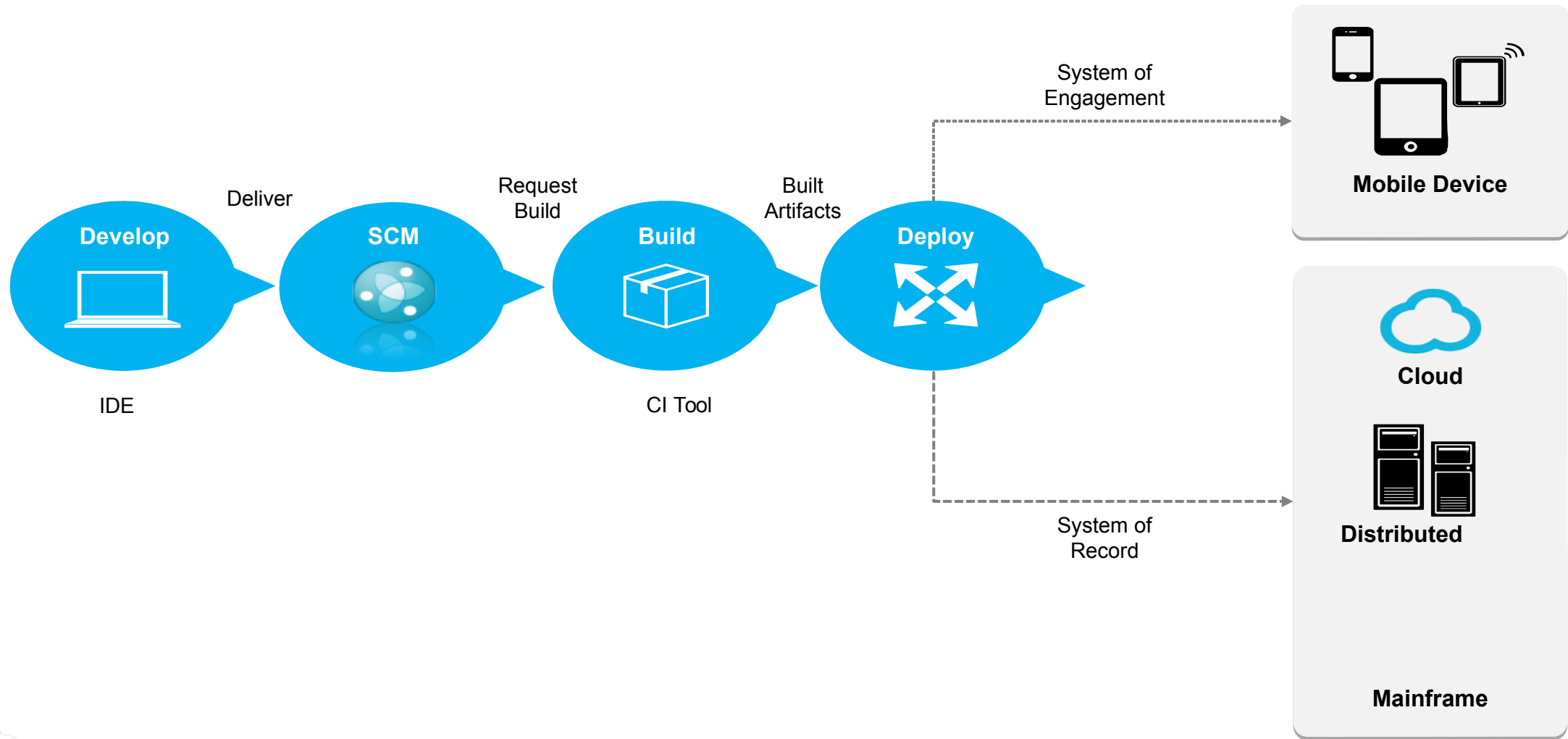
- CICS Explorer V5.3 and CICS Tools V5.3.
- Problem Determination Tools V13.1 .
- Rational Developer for z Systems V9.5.

IBM Continuous Delivery Teams





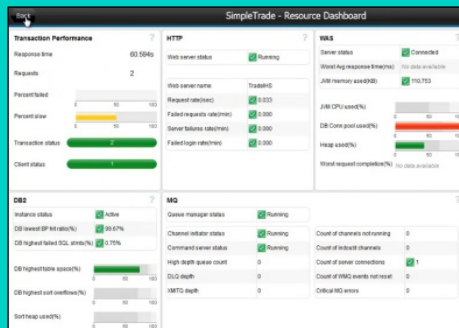
Application Deployment to Multi-Platform Environments



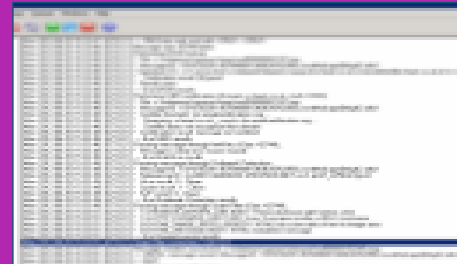
Future made IT operations manage anything from anywhere - with complete visibility across hybrid IT



Gain complete visibility and control over apps and infrastructure



Embedded Analytics for predictive & historic insights

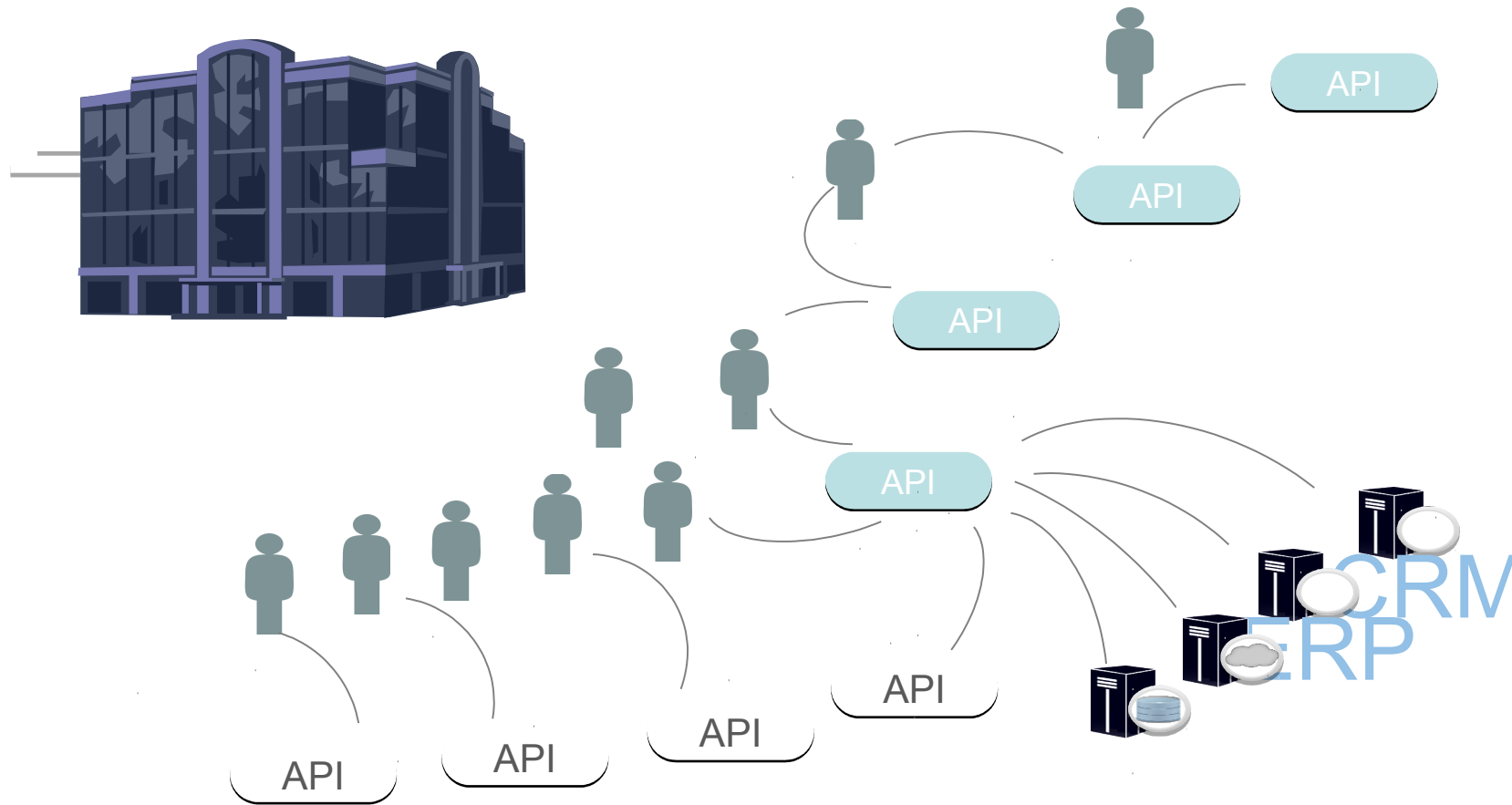


Automate and collaborate workload and performance management



Provide continuous feedback and monitoring of all infrastructure that affects software delivery

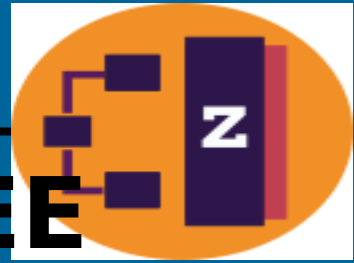
APIs power the modern, digital supply chain



Developers can share, re-use, (re)combine and deliver new capabilities quicker

Composing new capabilities using internally shared APIs and external APIs

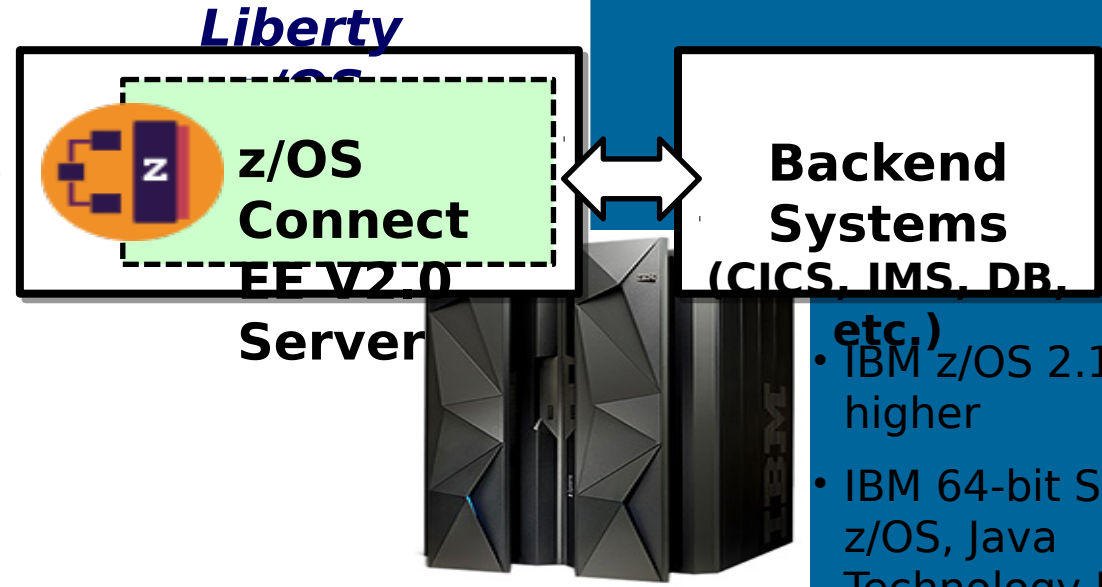




High-Level Overview of z/OS Connect EE V2.0

Runtime Server 1

- Runs on Liberty z/OS
- Hosts APIs you define to run in it
- Connects with backend system
- Liberty + z/OS Connect = "instance"
- You may have multiple instances



- IBM z/OS 2.1 or higher
- IBM 64-bit SDK for z/OS, Java Technology Edition V8.0.0 or V8.0.0



- Tooling**
- IBM Eclipse Explorer V5.3
 - IBM IMS Explorer for Development V3.2
 - IBM Explorer for z/OS Aqua V3.0

Tooling Platform 2

- Integrates with an Eclipse environment
- Define APIs
- Define data mapping
- Deploy APIs to runtime server
- Export API archive for other



High-Level of API Management



IBM API Management

- Create APIs
- Publish APIs
- Socialize APIs
- Manage API lifecycle



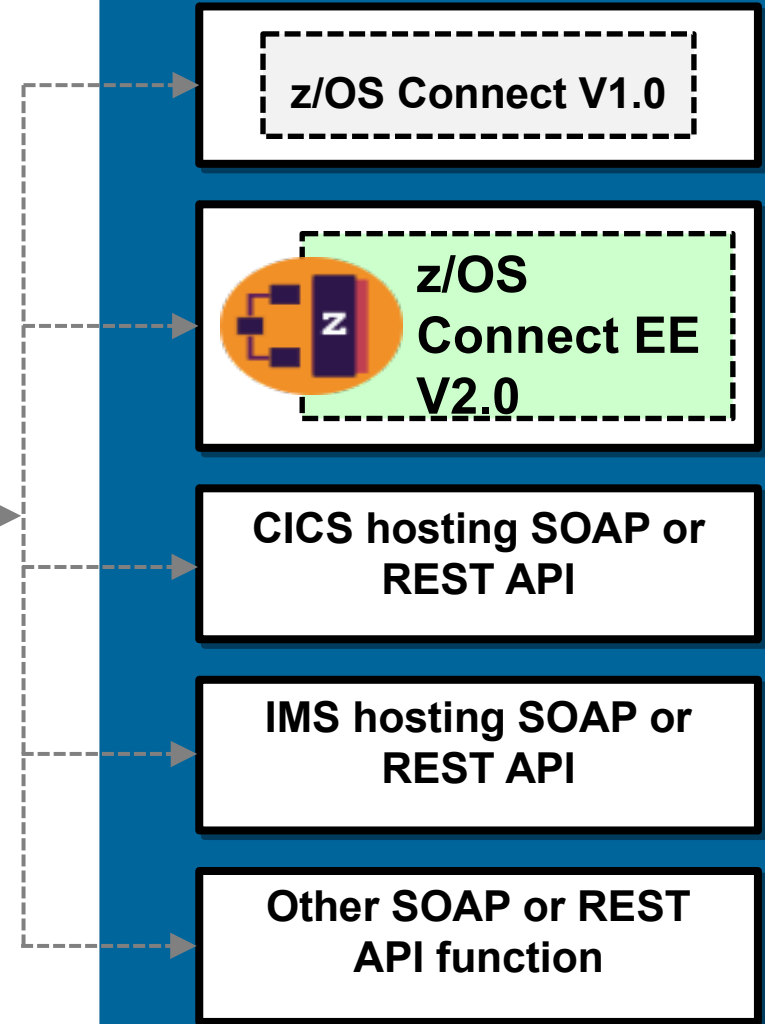
IBM API Gateway

- Security Validation
- Access Control
- Routing to API



As the number of APIs grows, the need to systematically manage the APIs becomes apparent. API Management provides a way to improve business value of APIs created

The relationship is complementary -- not required by z/OS Connect or other API providers, but *very helpful* in an API environment.





Bluemix is an open cloud platform designed for digital transformations



IBM Bluemix™
bluemix.net

- **Stitch an application** from APIs and services
- **Manage your APIs** in private and public catalogs
- **Integrate across** hybrid environments, on and off premises
- **Choose** the appropriate deployment option



90+

Services and growing
1/4 from channel partners

Deliver your services to developers *and* access IBM's middleware
and SaaS portfolios, 3rd party and open services to build your
apps

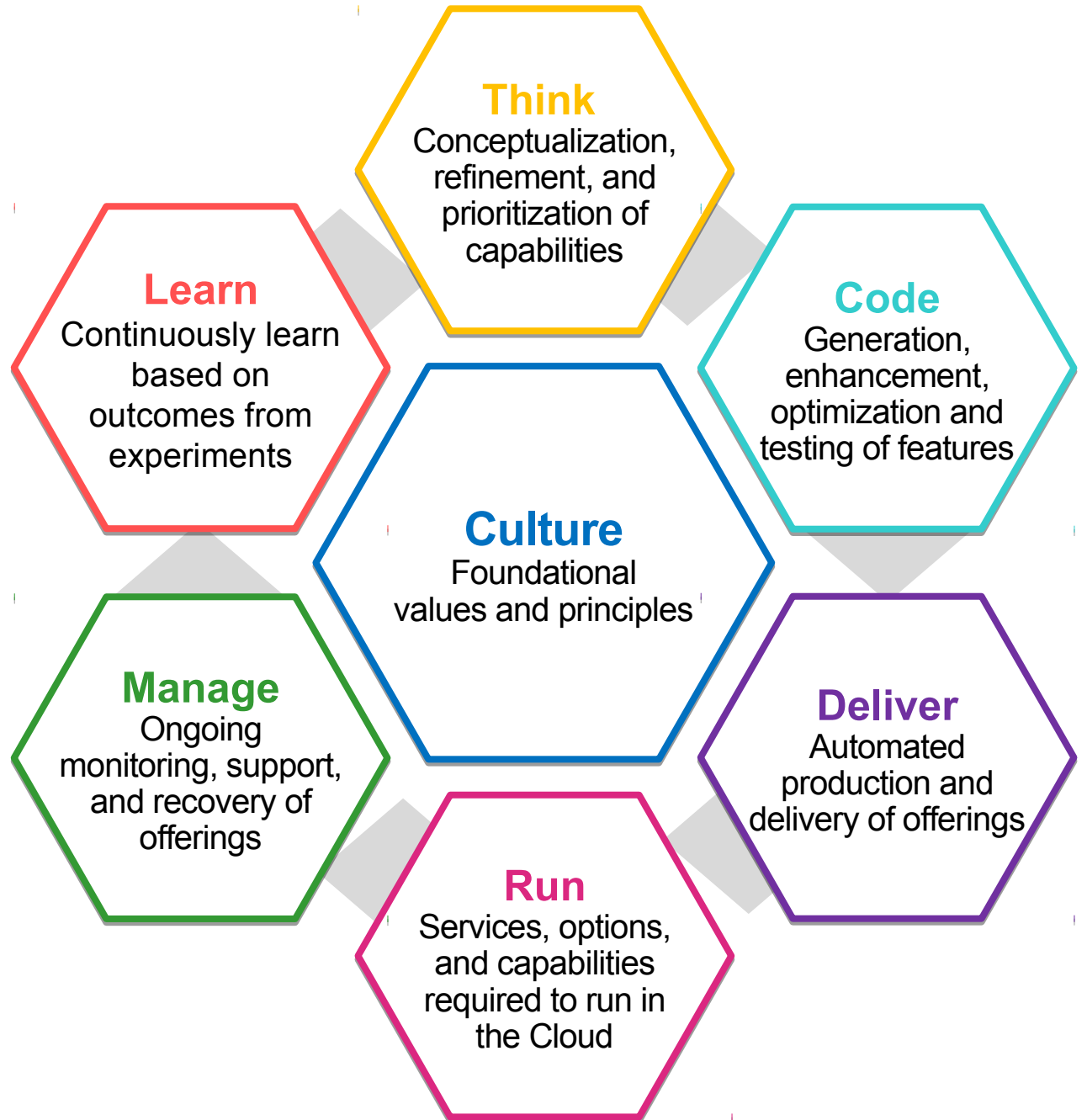


IBM Bluemix Garage Method

Combining industry best practices for **Design Thinking**, **Lean Startup**, **Agile Development**, **DevOps**, and **Cloud** to build and deliver innovative solutions.

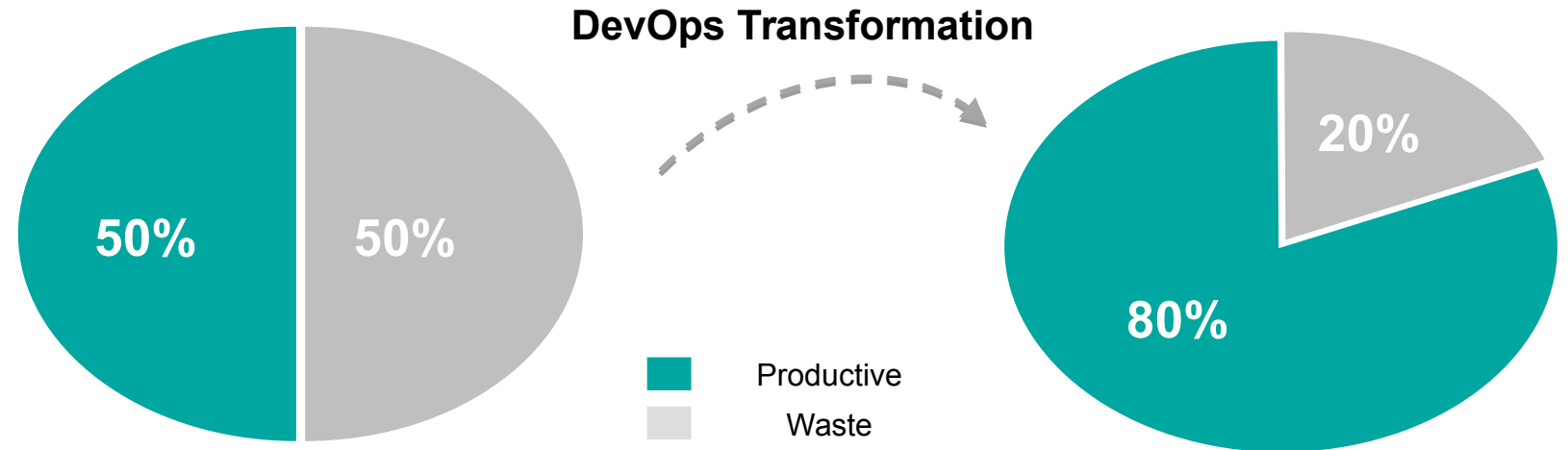
To learn more visit:

<https://www.ibm.com/devops/method>



The Critical Measure of DevOps Success

The Hidden Factory Opportunity



Hidden Factory= additional value you could create if you **eliminated waste** and redirected those resources to **innovation**



DevOps accelerates digital transformation with standardization and automation

Deliver at Speed



Innovate faster by accelerating software delivery across hybrid environments

Transformed from 18-month cycle times to delivering a complete mobile solution in just five months – with 3-week update cycles

Respond at Speed



Improve customer engagement by shortening feedback loops

Generated 1,000 items of feedback on new mobile app in 2 weeks; reduced implementation time by 90-95%

Transform at Speed

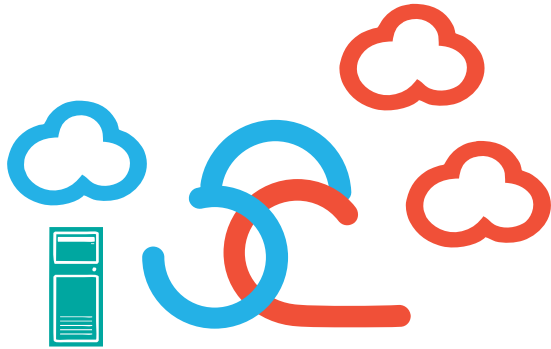


Create a culture of continuous improvement and trust

80% reduction in critical defects over the last three years; 90% on-time delivery vs. 60% previously

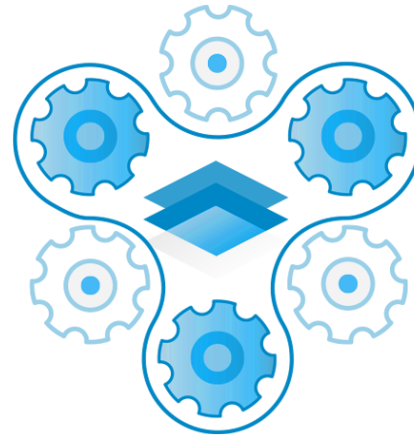
Building out new digital capability with speed

Cloud



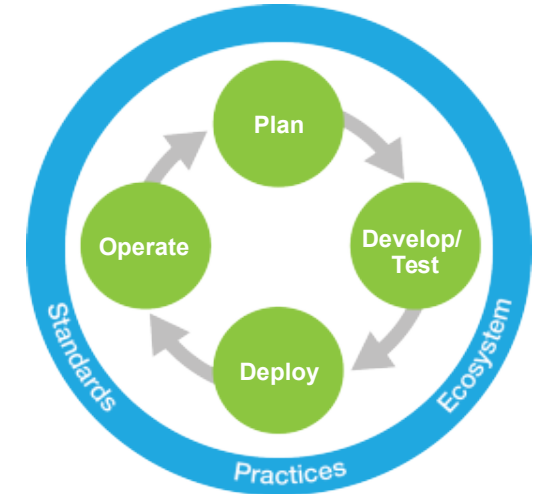
Agile infrastructures

Integration




Bridging on premises assets to on cloud services

DevOps



Lean delivery methods & tools, across the lifecycle

Key enablers



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.*



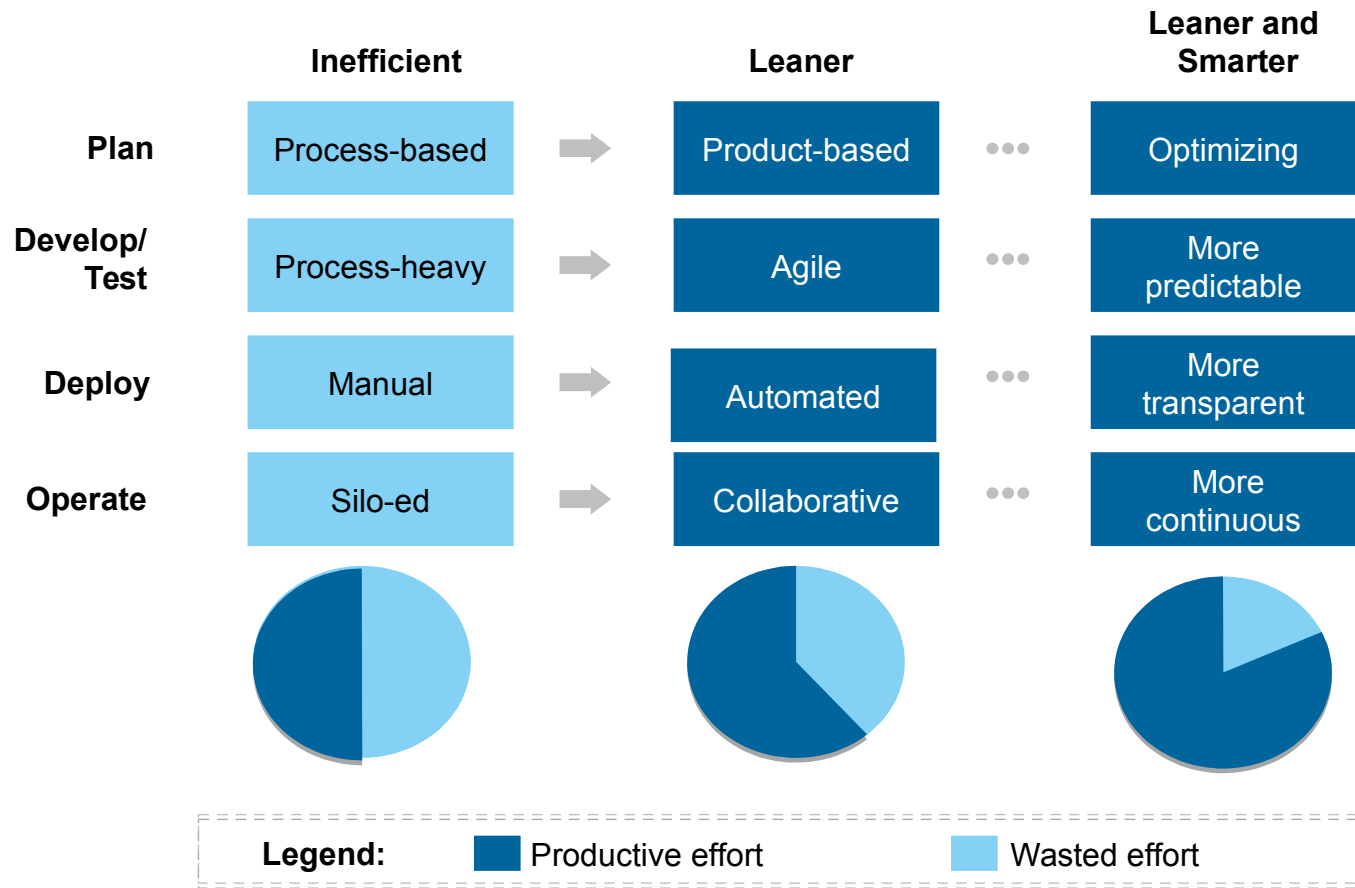
Next steps

Where can I learn more?



Start your transformation today with an IBM DevOps Workshop

Sign up for a free [DevOps assessment workshop](#)



Workshop Objectives

- Define business drivers for DevOps, and see what is currently possible for your organization
- Identify existing or planned DevOps initiatives, and map them to the business drivers
- Determine the top inhibitors within the current software lifecycle
- Create an adoption roadmap for these DevOps practices, including milestones, time frames and known adoption challenges.

Overview

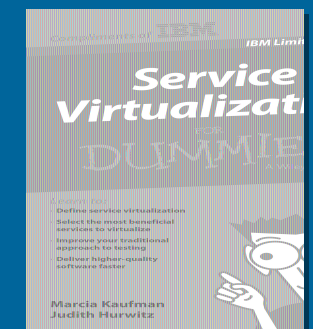
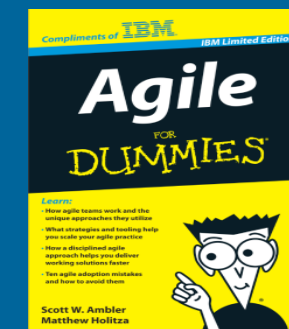
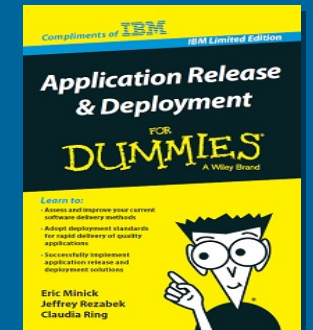
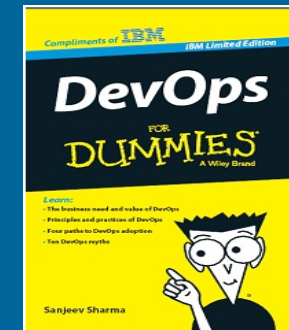
- No charge
- Led by IBM DevOps Solution Architects
- Audience : For senior IT and LOB executives and managers in application development and IT Operations



Resources

Continuing your 'Understanding DevOps' journey

- For Dummies books:
 - <https://ibm.biz/mmdevops>
 - <http://ibm.co/devopsfordummies>
 - <http://ibm.co/agilefordummies>
 - <http://ibm.co/ServiceVirtualizationForDummies>
 - <http://ibm.co/ARDfordummies>
- IBM DevOps Page:
<http://ibm.com/DevOps>
- IBM DevOps for Enterprise Systems:
<http://bit.ly/1PB02KS>
- DevOps Lean Assessment (Beta):
<http://bit.ly/IBMLeanAssess>





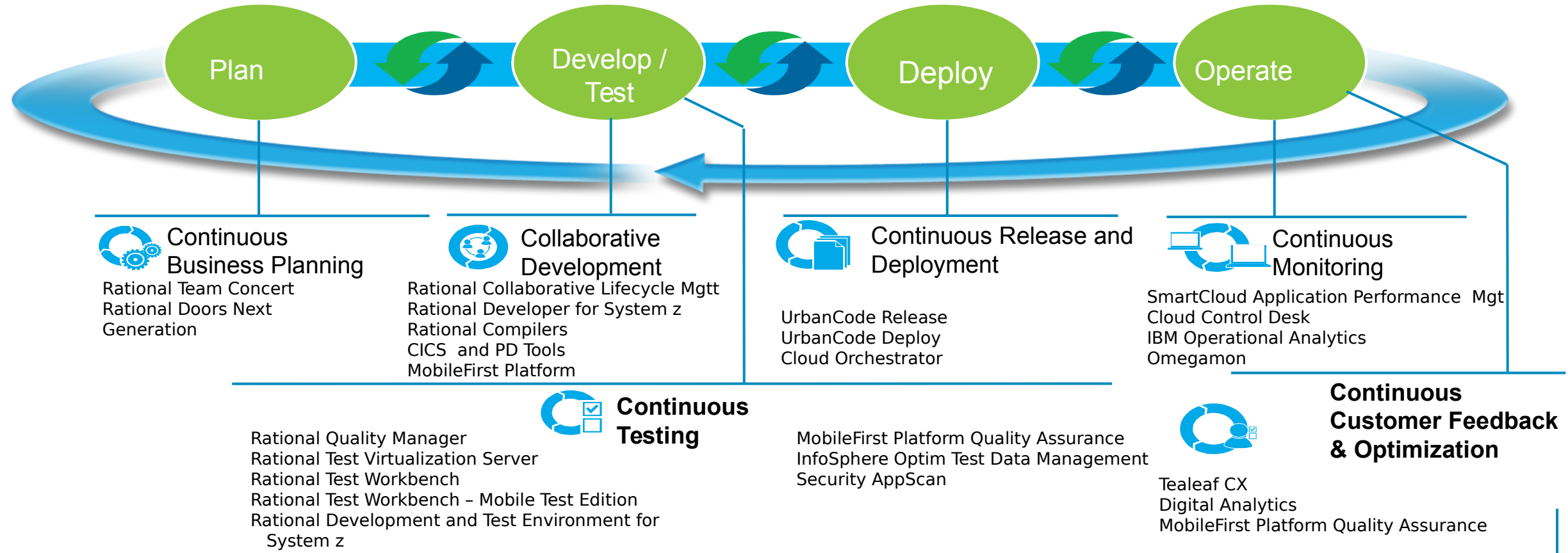
Thank You

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Backup (Product Technical charts)

IBM DevOps – Broad set of DevOps capabilities

Address bottlenecks across the application delivery lifecycle



Bluemix DevOps services

Agile planning and tracking
Application auto-scaling
AppScan mobile analyzer
Continuous delivery pipeline
Git hosting

Mobile application security
Mobile data
Mobile quality assurance
Monitor & analytics
Push

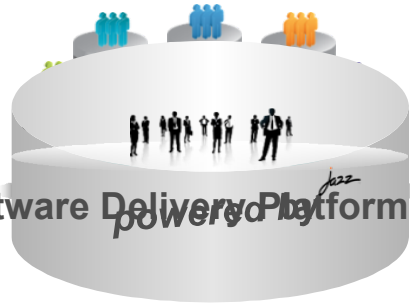
Server-side code
Web IDE



Modernize Mainframe Development

Rational Developer for z Systems – Integrated multiplatform development environment

Integration with Team Concert for Lifecycle and Source Management

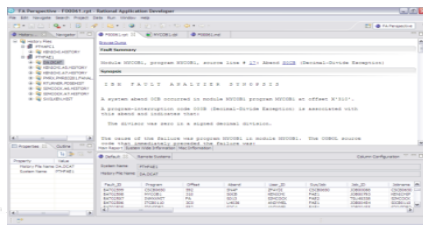


Rational Software Delivery Platform

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

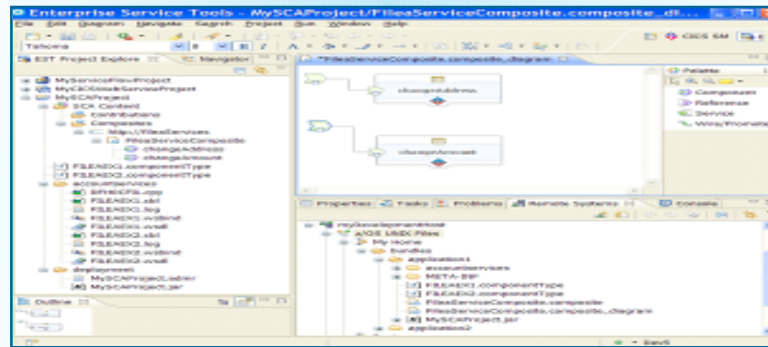


Integration with Fault Analyzer for ABEND Analysis



Rational Developer for z Systems

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 Asset Analyzer for Application Understanding and Impact Analysis



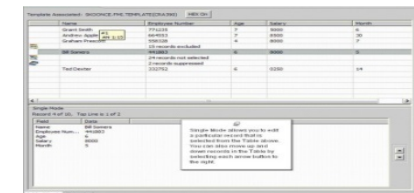
Access to typical System z sub-system functionality in z/OS, CICS, IMS, DB2, WAS



Robust Mobile Development in conjunction with Worklight

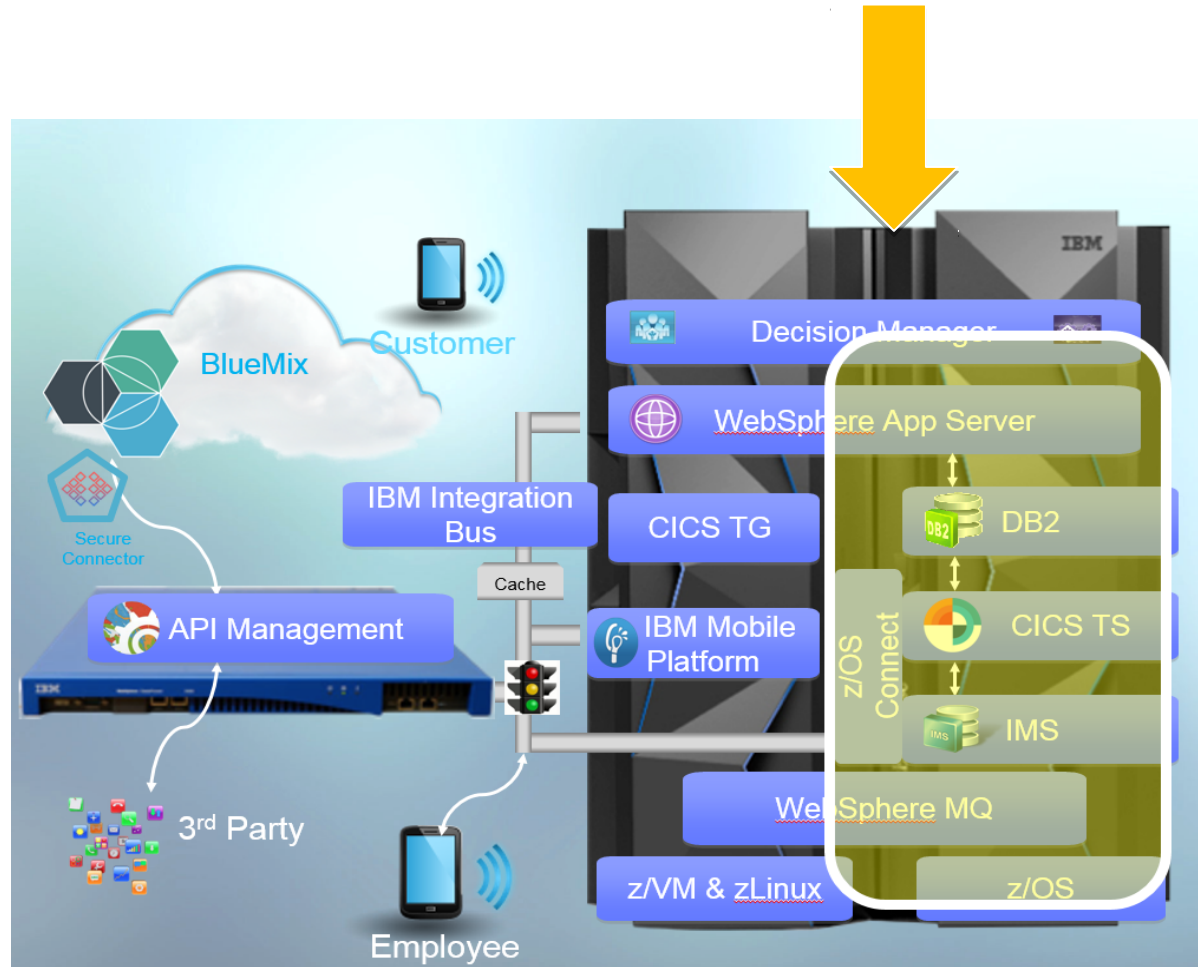


Integration with File Manager for file and test data handling



Speed up mainframe application delivery with problem determination tools

Problem Determination Tools offer a rich set of functionality when dealing with various resources on 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

Problem Determination Tools for z/OS

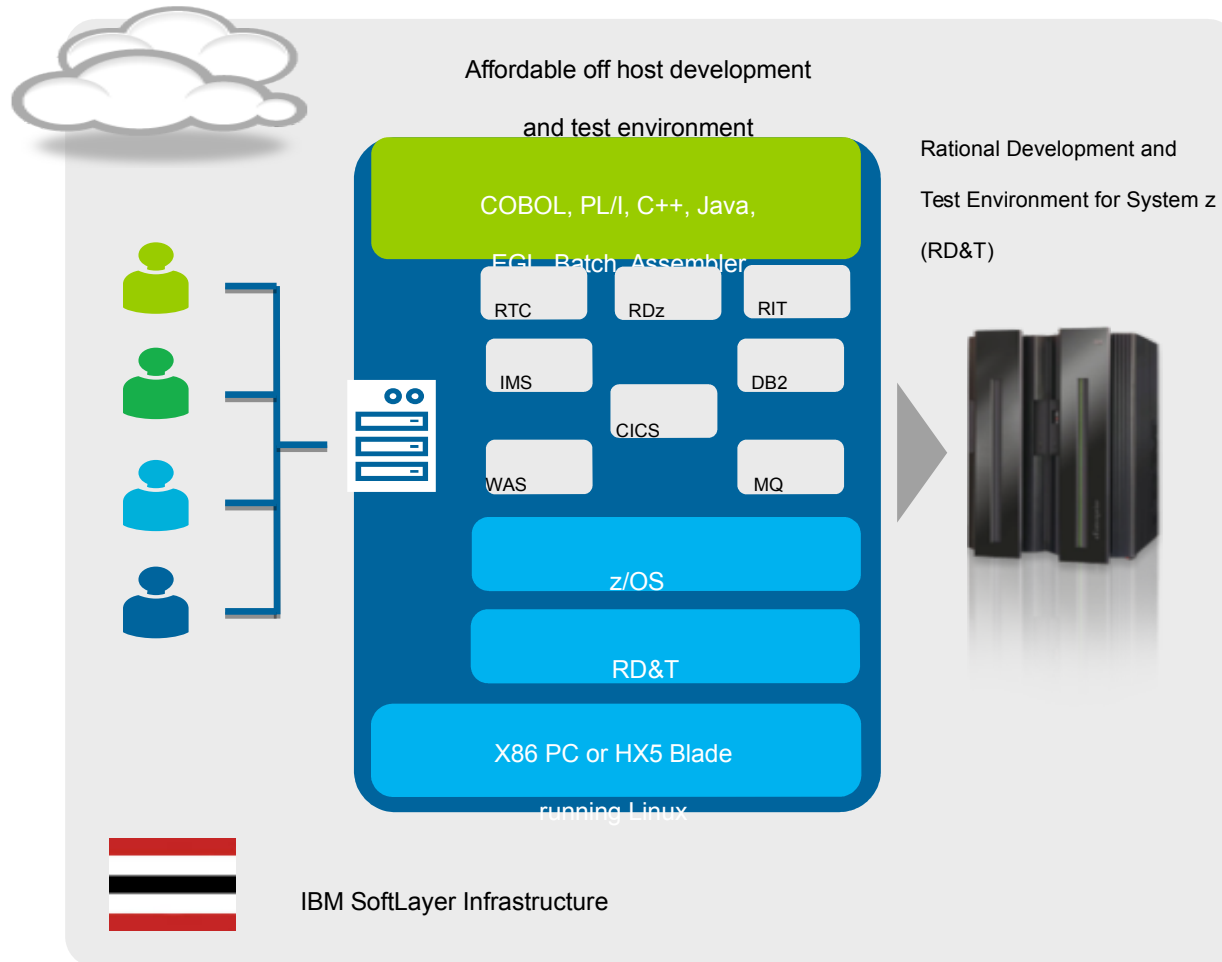
- Application Performance Analyzer for z/OS
- Debug Tool for z/OS
- Fault Analyzer for z/OS
- File Manager for z/OS
- Workload Simulator for z/OS and OS/390
- Data Set Commander for z/OS
- Hourglass

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)

Mainframe dev & test capacity: cloud or on premise

without increasing your MIPS



- Develop and test z/OS applications anywhere, anytime
- Free up mainframe development MIPS for production workload
- Eliminate costly delays by reducing burden on existing IT operations staff
- With RD&T 9.1, exploit z/OS 2.1, CICS 5.2, IMS 13, COBOL 5.1, plus use Rational Integration Tester z/OS components to minimize subsystem dependencies during testing
- RD&T as part of Cloud Managed DevOps: Reduce time to value and minimize ongoing administration and capital expense with cloud deployment

A leading provider of vehicle rentals increased developer productivity by 25% and decreased time to market

<http://www-03.ibm.com/software/businesscasestudies?synkey=G129972A80355S93>

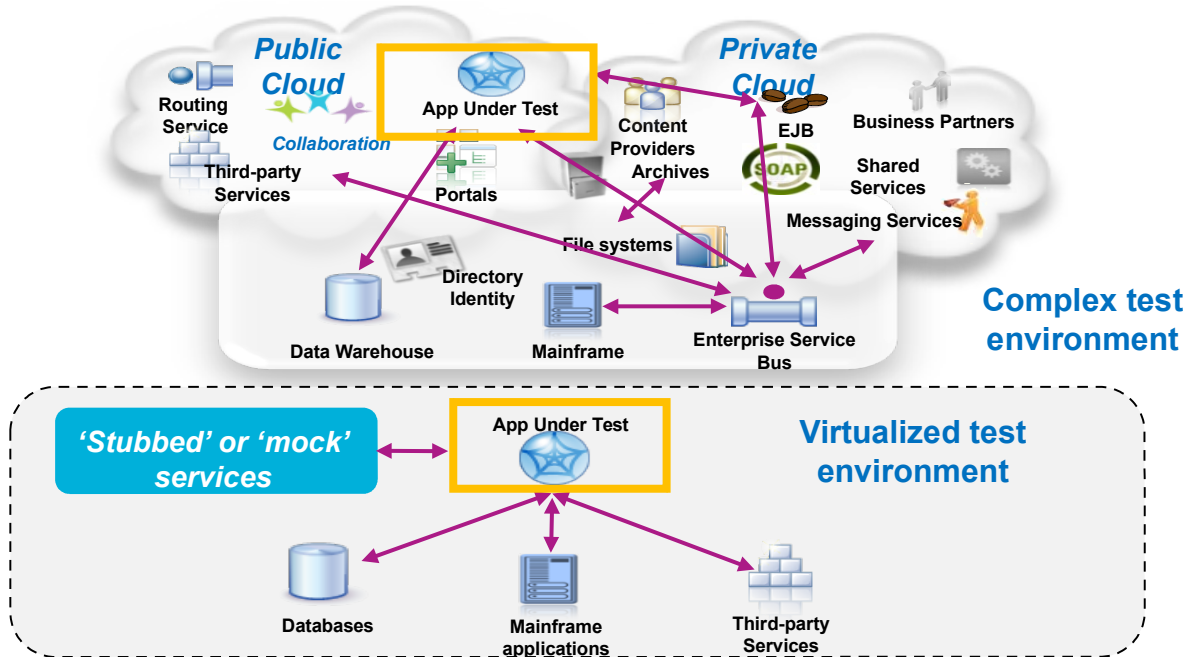
Note: This Program is licensed only for development and test of applications that run on IBM z/OS. The Program may not be used to run production workloads of any kind, nor more robust development workloads including without limitation production module builds, pre-production testing, stress testing, or performance testing.



Virtualize services to reduce ops burden and speed testing



Maintain test environments effectively



Continuous Testing



Includes Green Hat technology

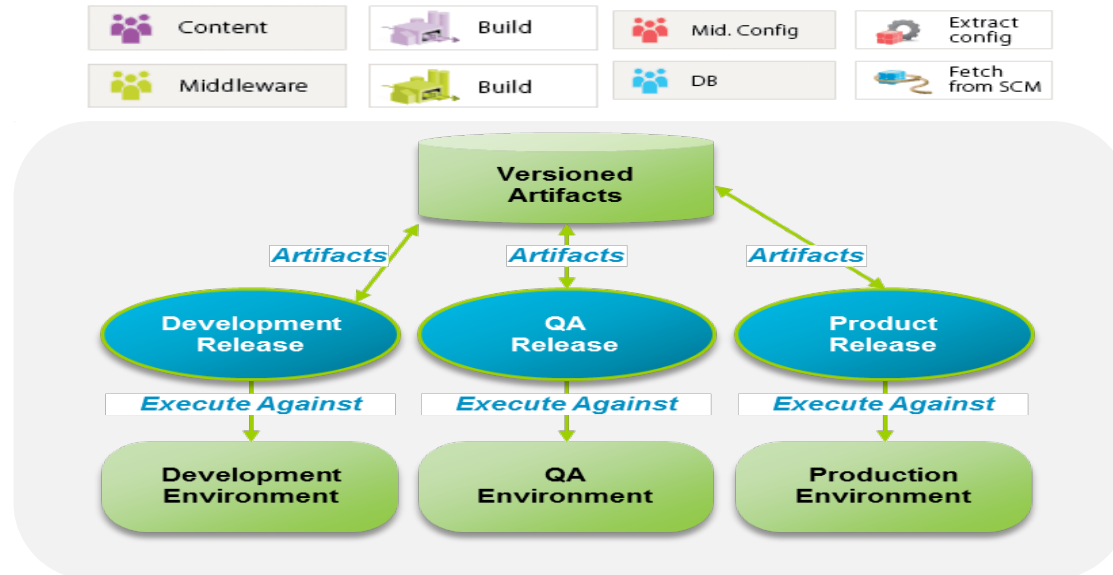
- Test in isolation with 'stubbed' or 'mock' services
- Virtualize CICS applications inside the mainframe and Java applications in the JVM
- Reduce development dependency on operations
- Minimize subsystem dependency during testing
- Reduce infrastructure costs and free up MIPS for production use



Accelerate solution delivery and test provisioning

Deliver test environments in minutes

Application Blueprint



Continuous Release and Deployment

- Orchestrate and automate application deployment across multiple environments
- Quickly deploy multiple test instances in minutes versus hours or days
- Manage from and to for Linux for System z
- Deploy Java and traditional z/OS applications within the same process
- Integrate with existing host SCM to deploy z/OS applications
- Built in integration with Team Concert



Manage and Optimize Application and Infrastructure Performance

VISIBILITY

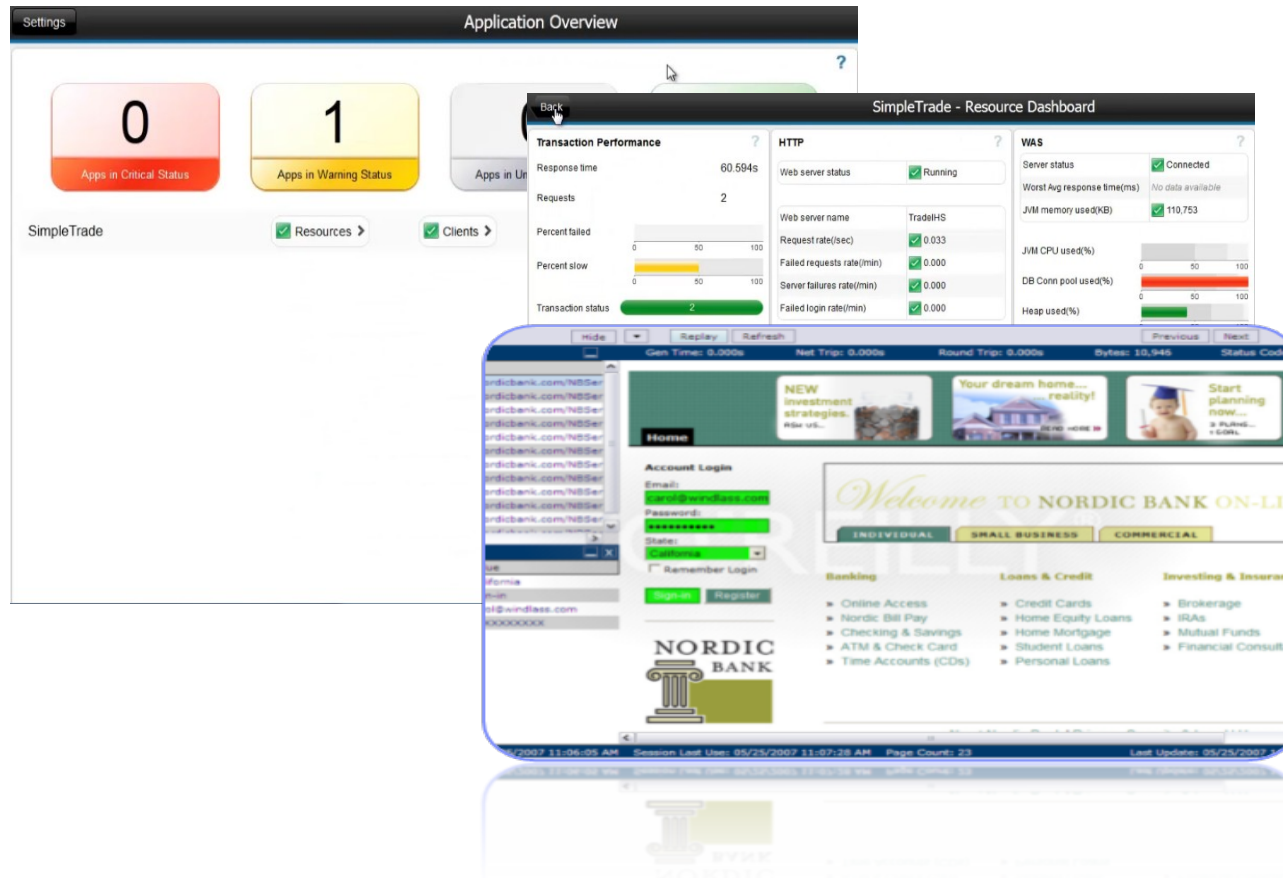


CONTROL



Gain actionable insights

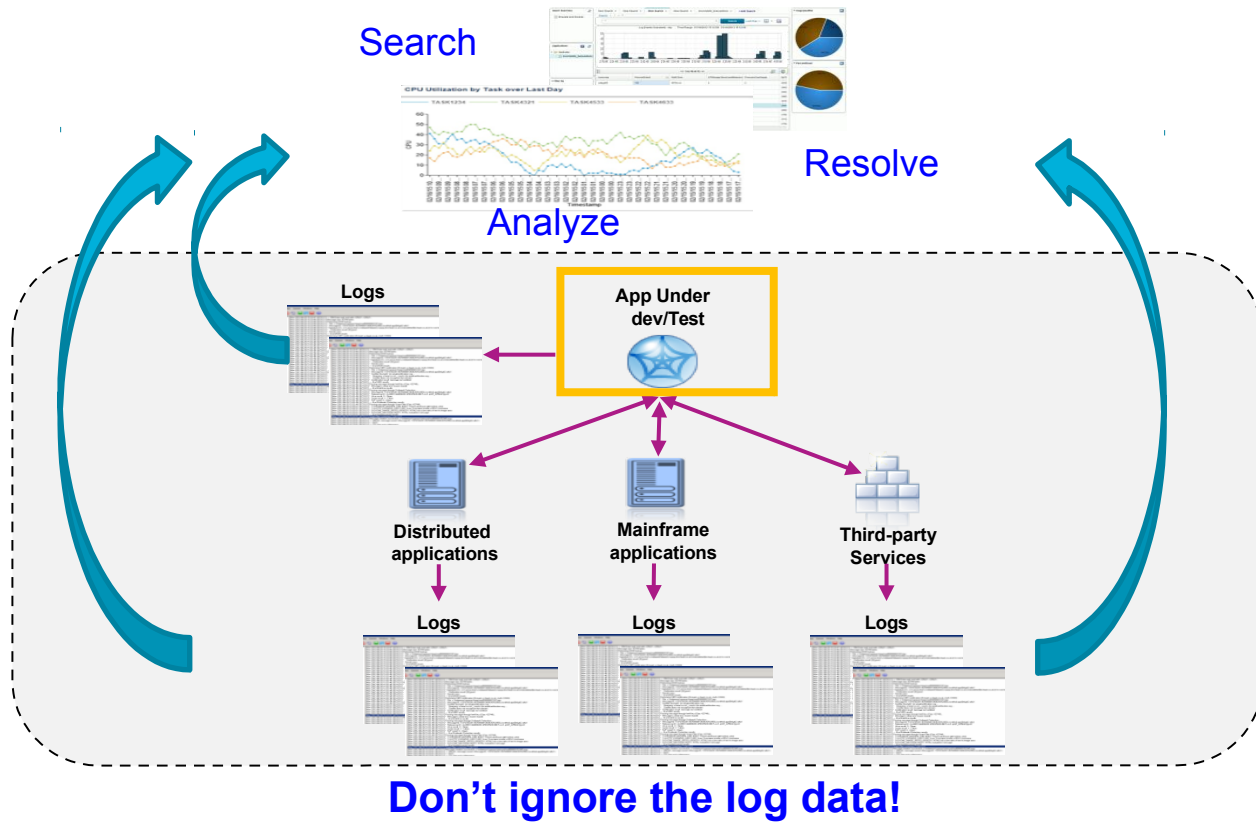
AUTOMATION



- **Reduce Costs** of resources and outages
- **Increase ability to meet SLAs** by managing environment with intelligent alerting and automation
- **Increase staff productivity** through 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 doing the day to day management** - Link actions to situations
 - Automate problem responses
 - Capture expert knowledge
 - Common data and KPIs

Consolidate and index log data for quick search and analysis

Your Application can generate tons of log messages in several logs across the enterprise



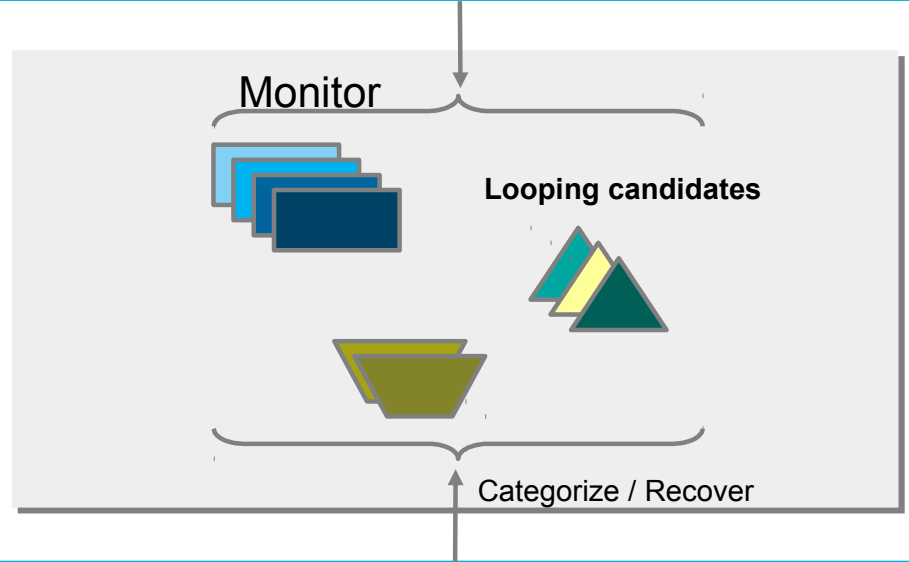
Don't ignore the log data!

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

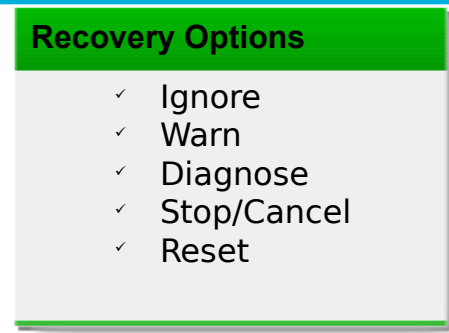
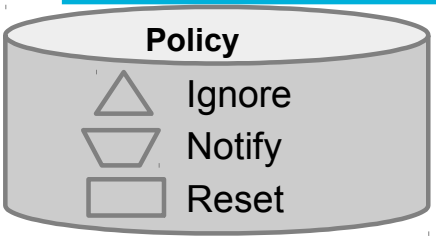
- Consolidate and index large volumes of log data to enable quick search
- Search multiple logs from multiple systems from a single user interface
- Analyze logs as you search to surface and easily identify problem areas
- Use Expert Advice to assist in problem resolution
- Out-of-the-box insights, quick 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 integration

OMEGAMON XE for z/OS



System Automation



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 when started tasks / jobs show abnormally high CPU utilization
- Some jobs are causing CPU to loop and are hard to detect
- Prevent these types of work from dominating the system

Solution

- OMEGAMON XE for z/OS data is analyzed by System Automation for high CPU utilization
- System Automation can categorize different types of work and allows for defining various recovery actions through policy – not programming!

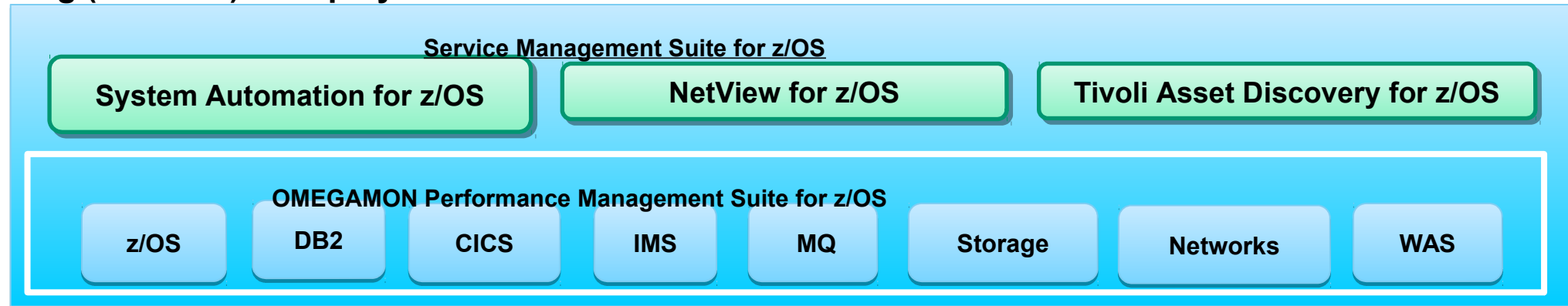


Service Management Suite for z/OS

Provides comprehensive service management capabilities for IBM zEnterprise



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



- Single offering that contains capabilities to manage z/OS and all key subsystems
- High Availability & Automated Operations to improve Service Levels and reduce system downtime
- Ability to visualize and automate your mainframe environment as a single system
- Eliminates boundaries between system and application components
- Network & Performance Management to increase efficiency of resources and personnel
- Tools tightly integrated providing proactive automation, which helps on problem resolution even before an alarm goes off



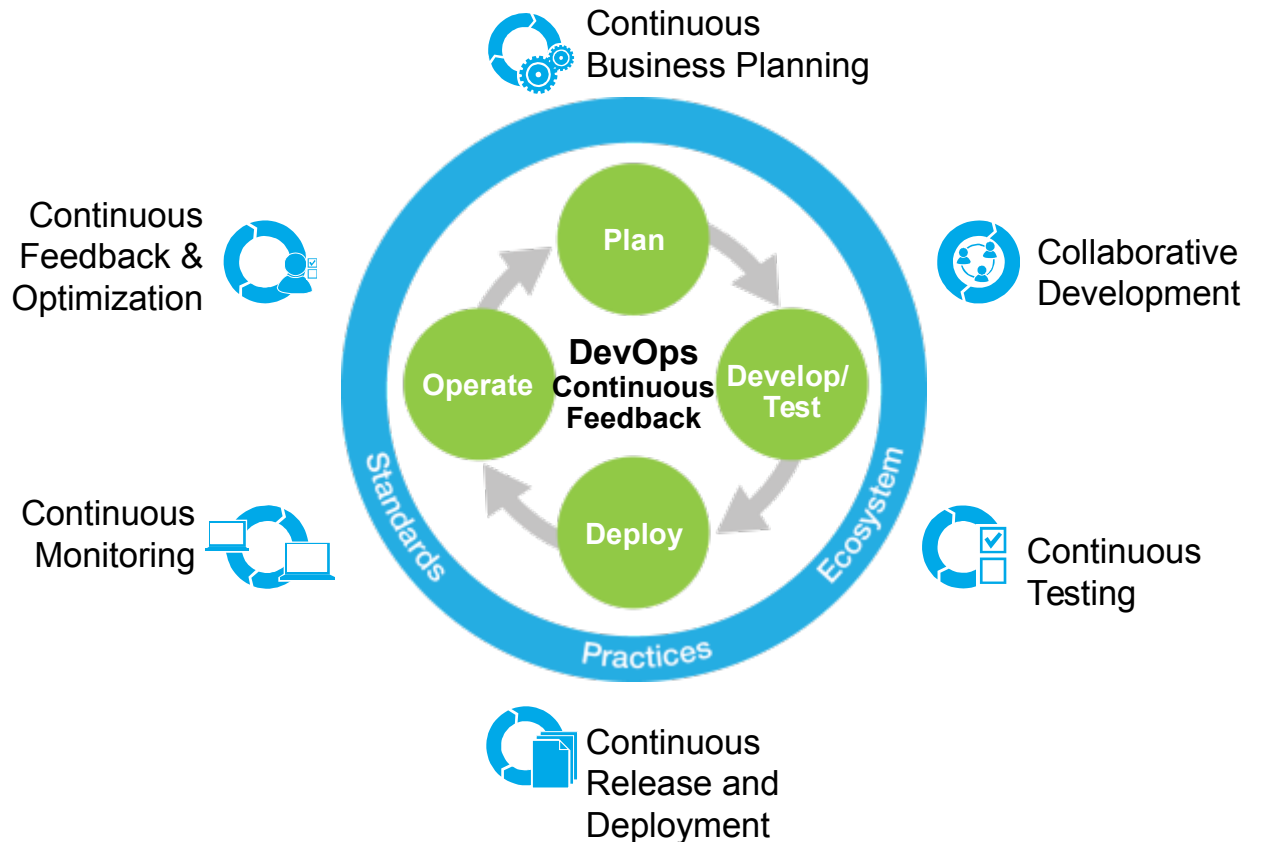
IBM DevOps Point of View:

**Accelerate
software delivery –
for faster time to value**

**Balance speed, cost,
quality and risk –
for increased capacity to
innovate**

**Reduce time to customer
feedback – for improved
customer experience**

DevOps is an enterprise capability for continuous software delivery that enables organizations to seize market opportunities and reduce time-to-customer feedback.



The Shift Left Solution...

Test in small incremental batches

