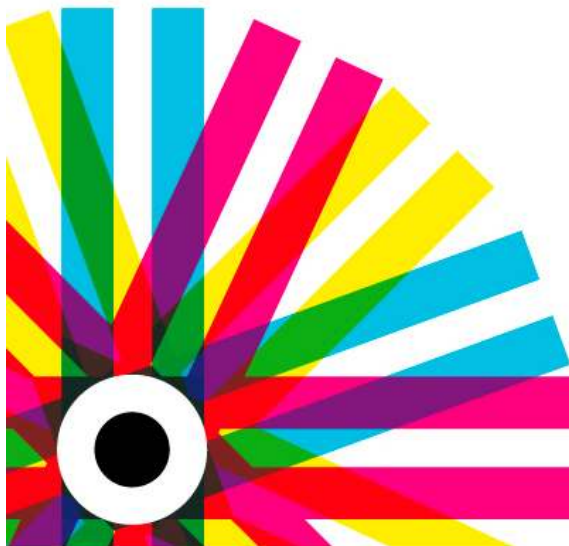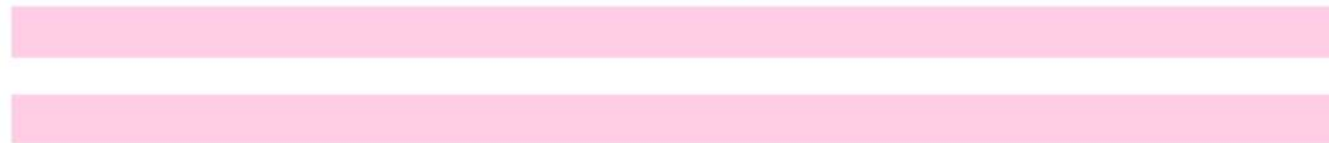**Paolo Ottaviano**

IBM Collaborative Development and Operations

IBM SmartCloud Continuous Delivery

IBM Tivoli User Group 2012

Continuous delivery: Customer and market drivers

Significant pressure on line of business to:

- Innovate to create new business value
  by employing cloud, mobile and social channels
  and leveraging Big Data – Systems of Engagement

- Integrate with transactional systems – Systems of Record
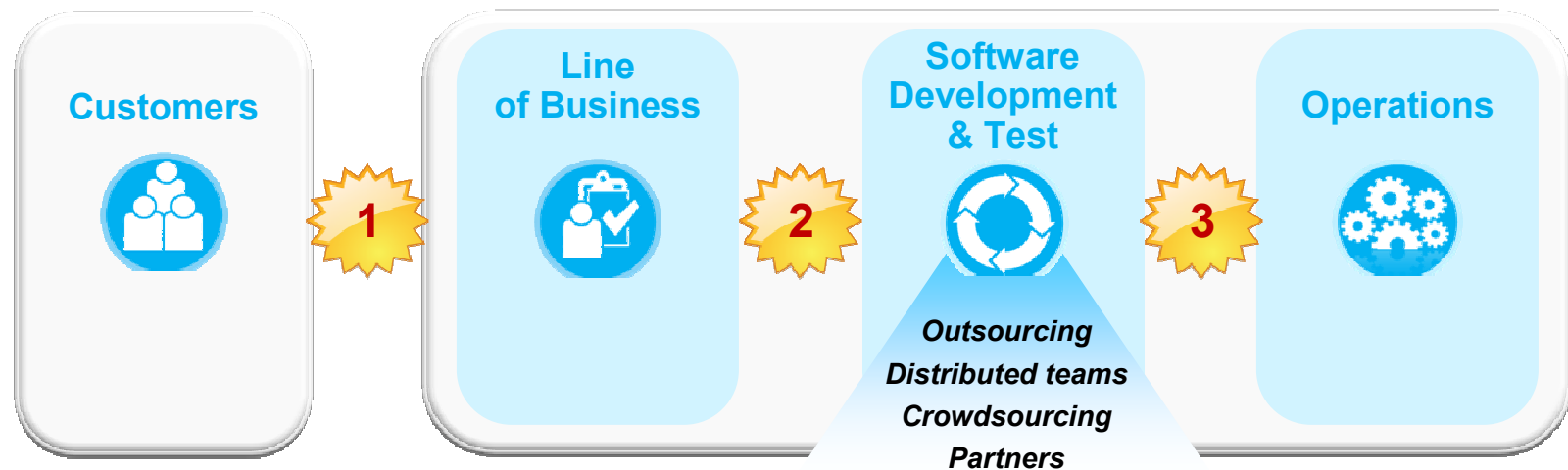
- Balance with governance, risk and compliance

*Continuously deliver software driven innovation
and business value…*

Inhibitors to accelerated delivery for IT organizations

Customers

1

Line of Business

2

Software Development & Test

Outsourcing
Distributed teams
Crowdsourcing
Partners

3

Operations

INHIBITORS

1 Slow feedback between Customers *and* Line of Business

2 Ineffective iteration between Line of Business *and* Development

3 Inefficient linkage between Development *and* Operations

Challenges meeting business time pressures with quality software

*34% of all new IT Projects deploy late**

41%
experience delays in integration, configuration and testing of applications*

51%
applications rolled back due to quality issues escaping into production*

45%
experience delays due to troubleshooting and fine-tuning issues in production*

Customers	GAP	Line of Business	GAP	Software Development	GAP	Test	GAP	Operations

Up to **4-6 Weeks** to deliver a simple code change**

* Forrester/IBM Study: A New View of IBM's Opportunity for Integrated Optimized Systems Address , 2011
** Forrester "Five Ways To Streamline Release Management", 2011

Continuous delivery pipeline defined

*Ensure applications are production-ready throughout the lifecycle
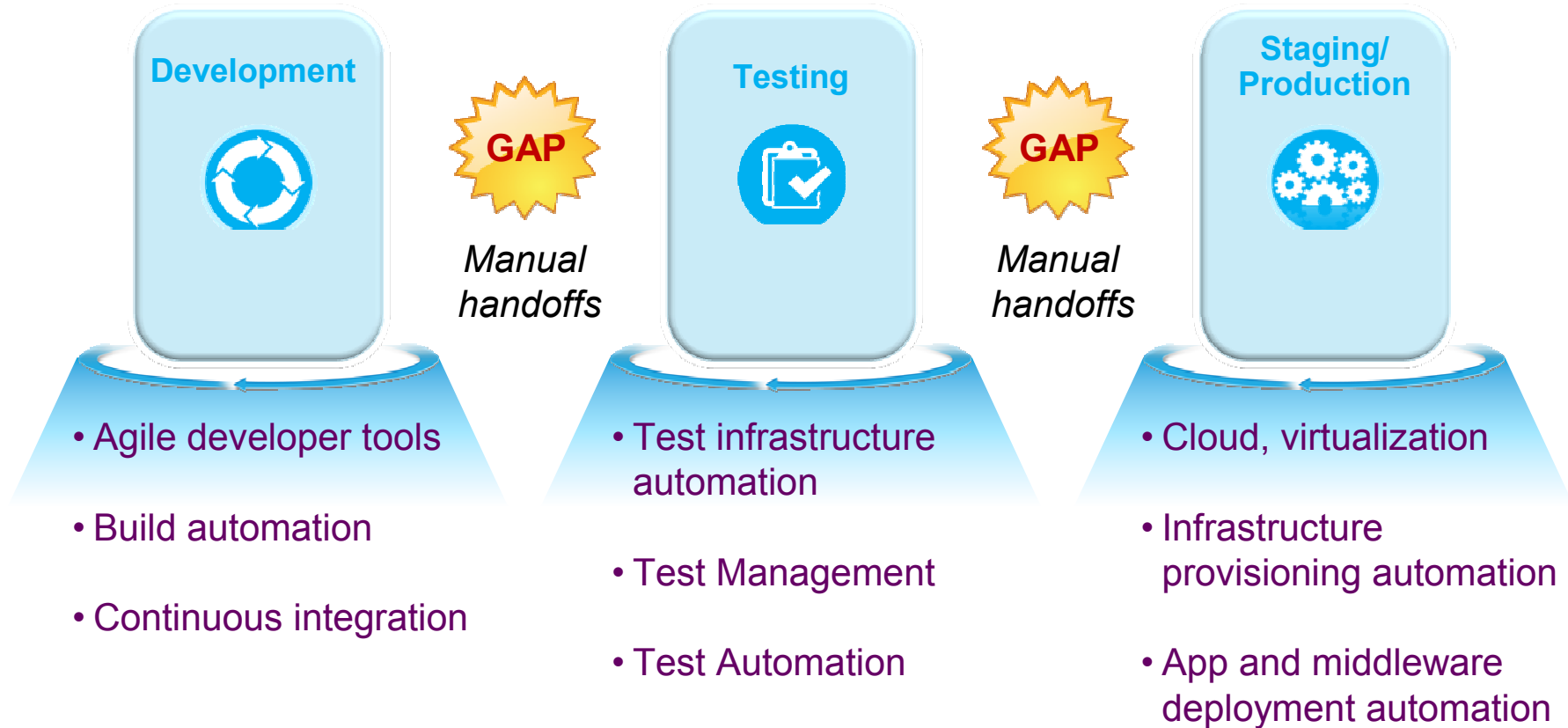and can be released at any time without rollback due to quality issues*

**Business
Owners**

Development   **Testing**   **Staging**   **Production**

Customers
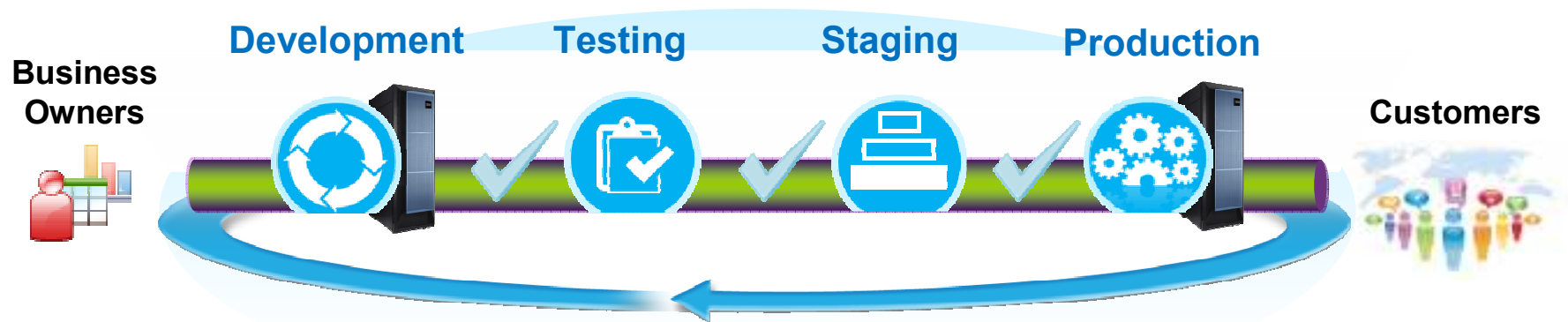
Continuous Delivery Pipeline:

An iterative set of quality checks and verifications that each piece of application
code must pass during lifecycle phases before being released to production.

Approaches taken today
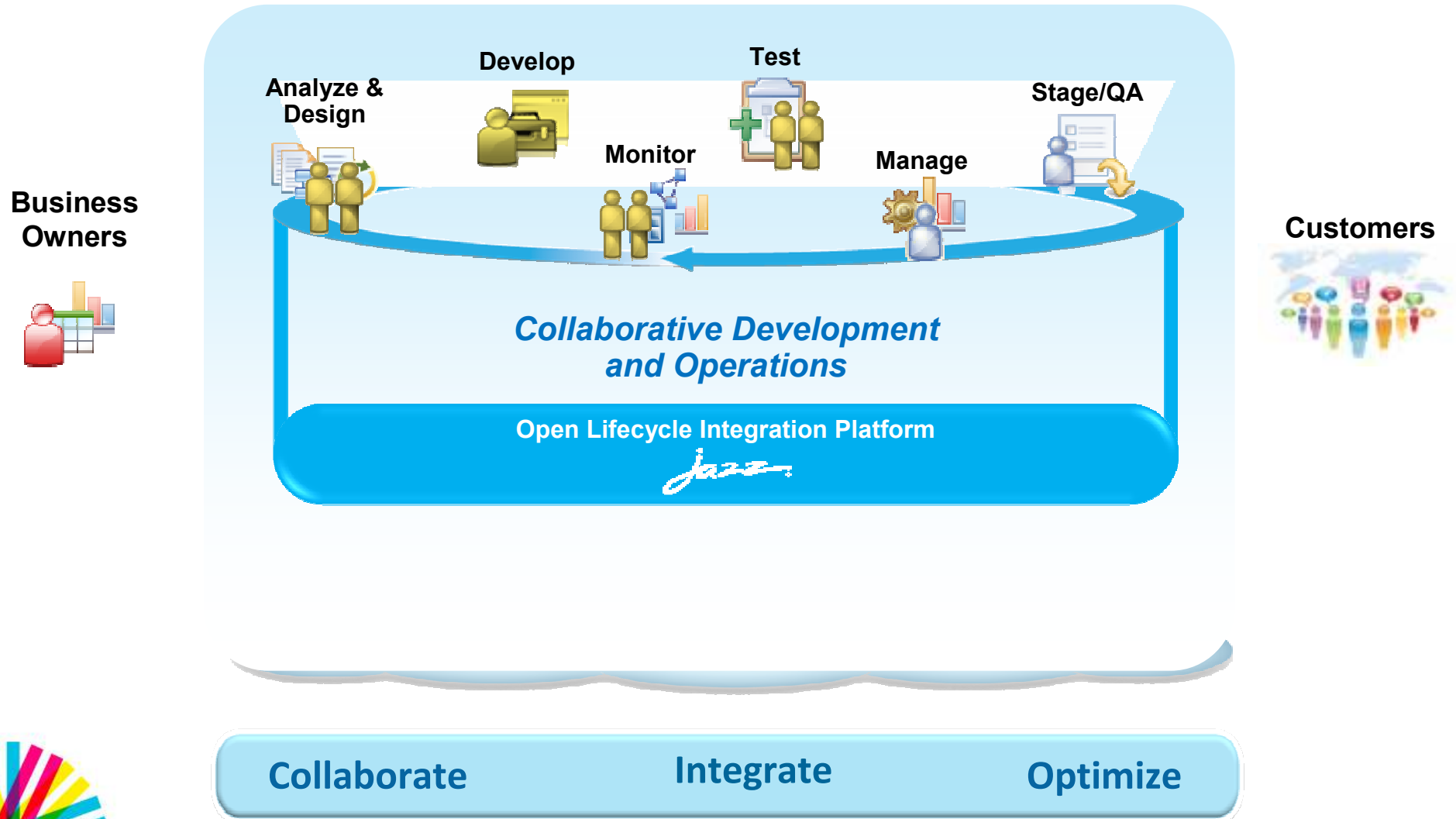
Selective and siloed solutions

Development

GAP

Manual handoffs

Testing

GAP

Manual handoffs

Staging/ Production

- Agile developer tools

- Build automation

- Continuous integration

- Test infrastructure automation

- Test Management

- Test Automation

- Cloud, virtualization

- Infrastructure provisioning automation

- App and middleware deployment automation

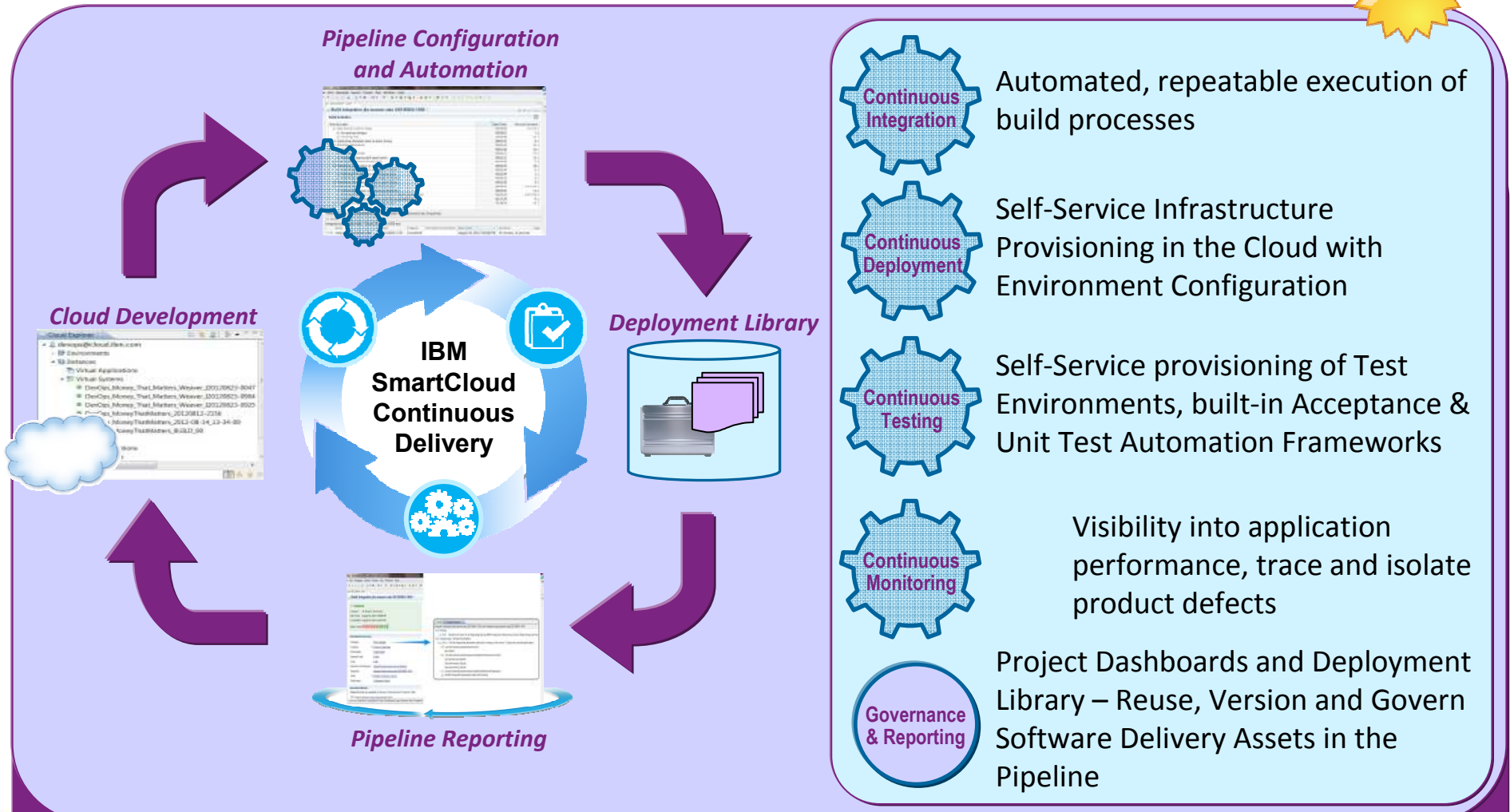*Gaps and challenges still exist due to lack of integration across people, processes and tools…*

Solution: Collaborative Development and Operations

Accelerate delivery and ensure applications are production-ready throughout the lifecycle and can be released at any time without rollback

Business Owners

Analyze & Design

Develop

Test

Stage/QA

Monitor

Manage

Customers

Collaborative Development and Operations

Open Lifecycle Integration Platform

Collaborate   **Integrate**   **Optimize**

Introducing IBM SmartCloud Continuous Delivery
Automating the Continuous Delivery Pipeline

NEW

Pipeline Configuration and Automation

Cloud Development

Deployment Library

IBM SmartCloud Continuous Delivery

Pipeline Reporting

Continuous Integration — Automated, repeatable execution of build processes

Continuous Deployment — Self-Service Infrastructure Provisioning in the Cloud with Environment Configuration

Continuous Testing — Self-Service provisioning of Test Environments, built-in Acceptance & Unit Test Automation Frameworks

Continuous Monitoring — Visibility into application performance, trace and isolate product defects

Governance & Reporting — Project Dashboards and Deployment Library – Reuse, Version and Govern Software Delivery Assets in the Pipeline

Leverage Existing Investments: OSLC Integration with IBM, Third Party and Open Source Solutions

IBM SmartCloud Continuous Delivery
Benefits and Value

✓ **Reduce cycle times** and improve delivery throughput and quality with end-to-end automation, standardization and repeatability

15-35% reduction in average cycle time for delivering new enhancement or defect

✓ **Simplify delivery** processes while increasing the predictability of application deployments through low touch and self-service provisioning that can scale

30-40% reduction in outages

✓ **Increase agility** by streamlining operations and development collaboration with in-context communication that provides improved visibility to delivery bottlenecks and a common understanding of quality and performance.

Reduce deployment times 50% or more

15-35% reduction of defects found later in cycle.

NEW

IBM SmartCloud Continuous Delivery

Continuous Integration
Continuous Deployment
Continuous Testing
Continuous Monitoring

Open Lifecycle Integration Platform

Jazz
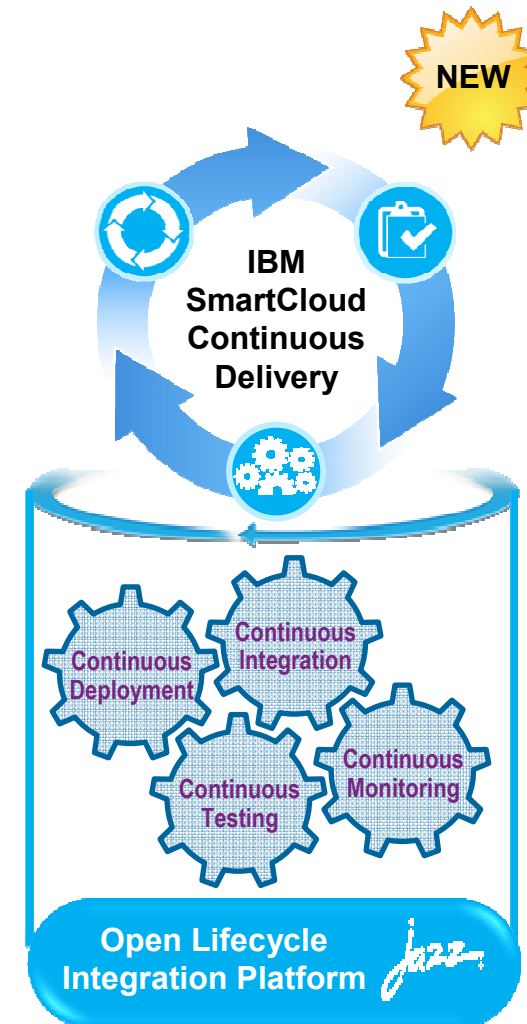
Get Started with IBM SmartCloud Continuous Delivery
Continuously deliver changes with built-in capabilities

Developer Checks in Changes

Continuous Delivery

Development

Provision development environment in Cloud

Build Automation

Unit Test Orchestration

Package & Release Deliverables

Smoke Test Orchestration

Testing

Provision Test Environment in Cloud

Deploy App from dev to test environment

Configure Middleware

Orchestrate Functional Performance, Security and Integration Tests

Staging

Provision staging Environment in Cloud

Orchestrate User Acceptance Tests

Production

Deploy Release Deliverables to production environment

Orchestrate smoke test for production readiness

Or adopt incrementally …

Features and Capabilities

Share between Dev and Ops

Automate delivery

Self Service for the cloud

Plan and track delivery together

Manage release assets
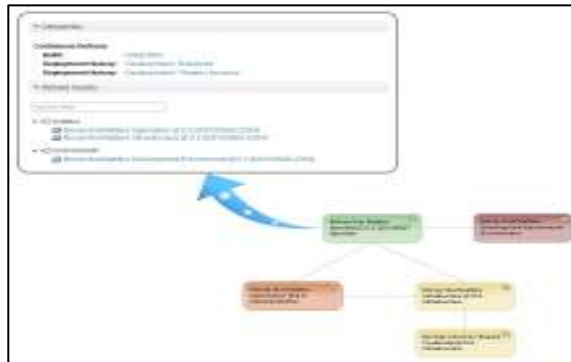
Trace changes through delivery

Share between Dev and Ops

Topology for this pattern:

Deploys to ESX hypervisors.
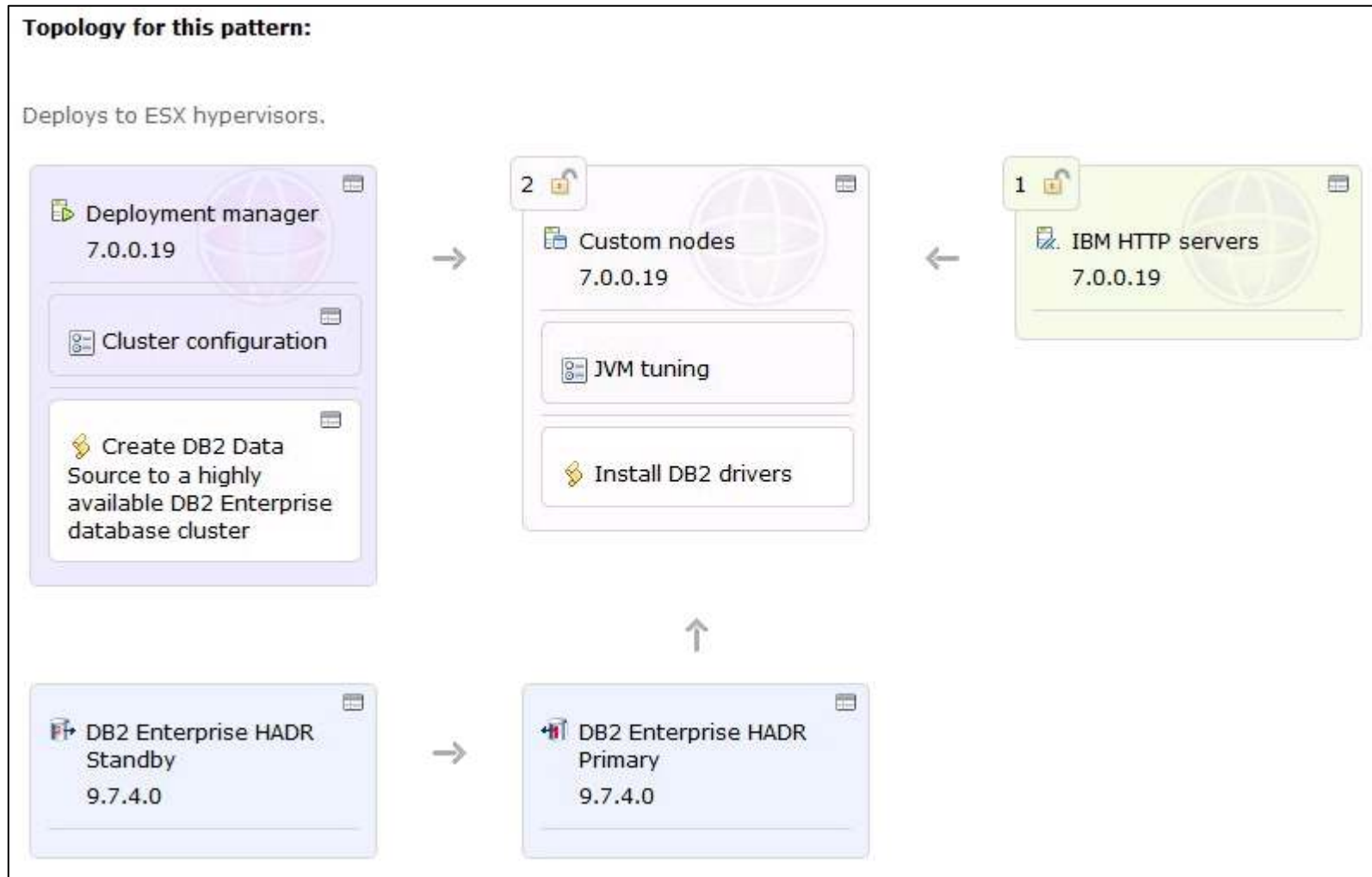
Share production-like cloud environments early and throughout the development process. Delivery is a team sport!

Automate Delivery

Create, configure, and automate a continuous delivery process to build, deploy and test changes in the cloud to support agile development.

Self service for the cloud
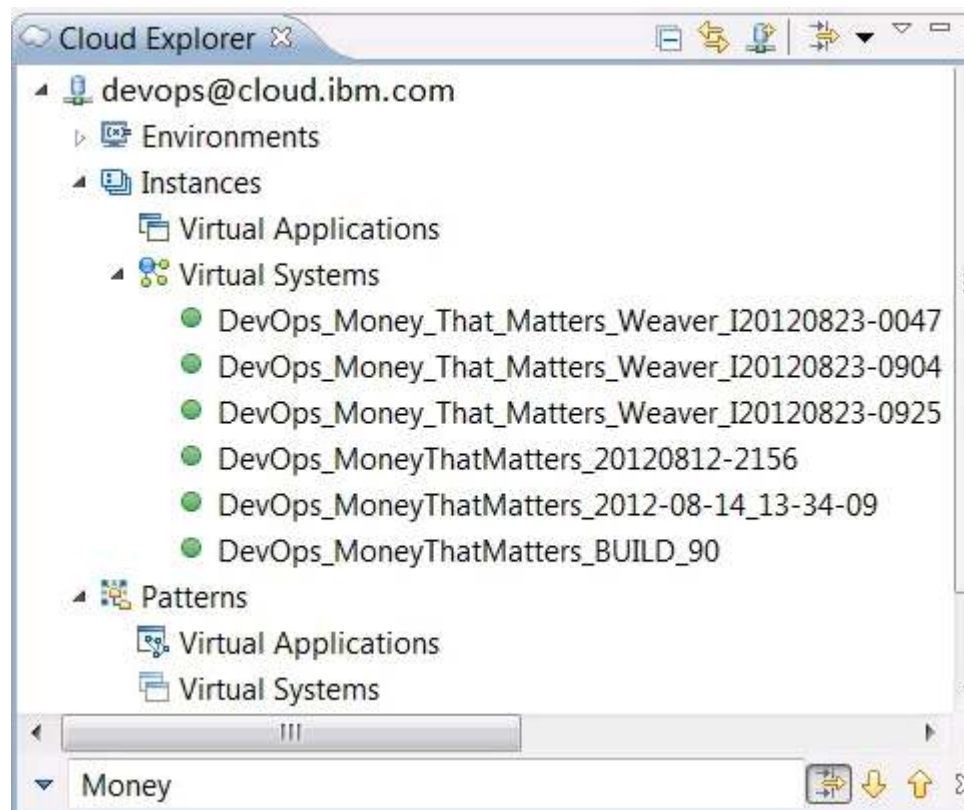
Search, inspect, and manage cloud resources directly from within your Eclipse IDE.
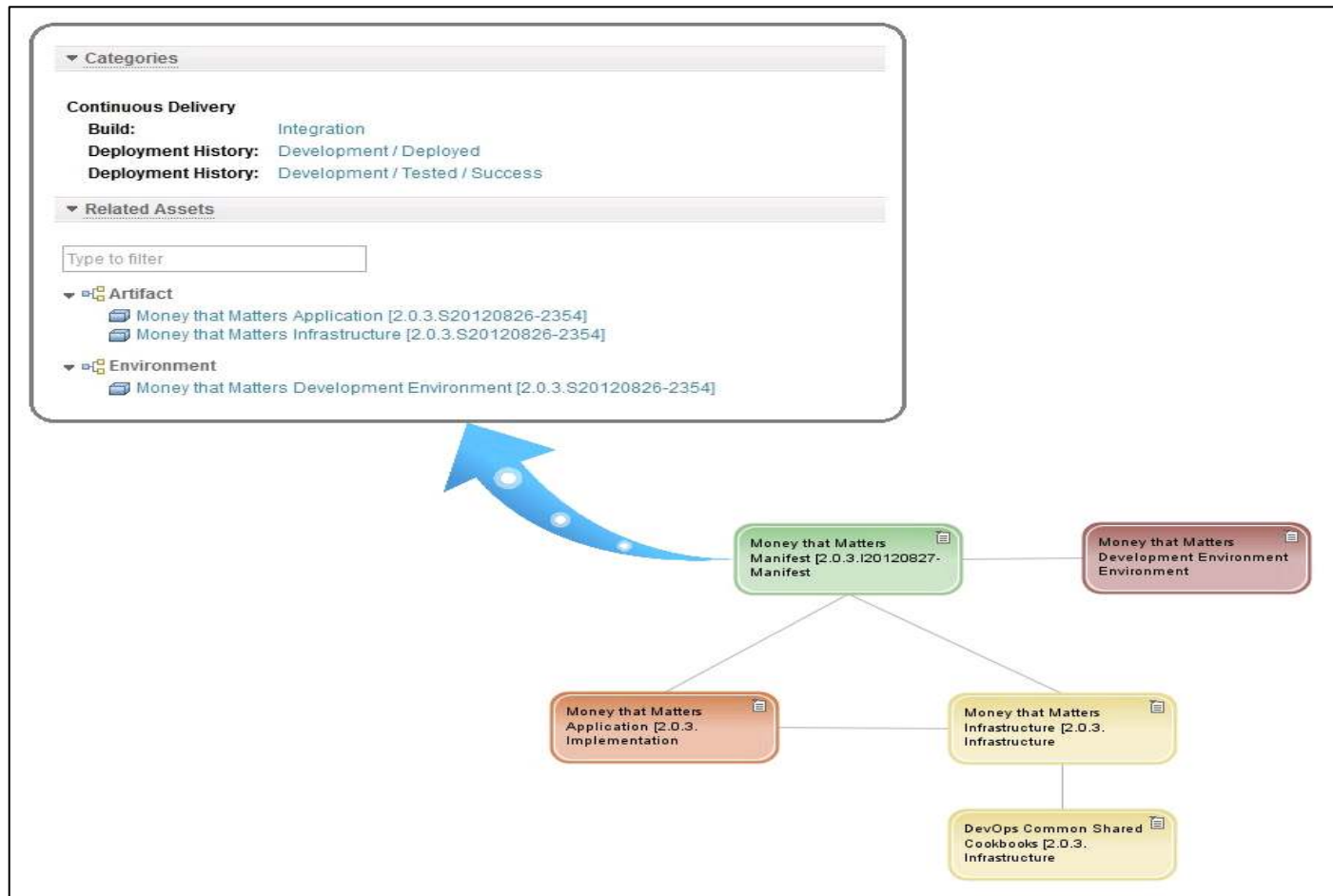
Plan and track delivery together

Extend Rational Team Concert and use an integrated set of tools for planning, tracking and versioning across development and operations.

Manage release assets

A version-controlled library management system to ensure the right bits get to the right place.

Trace changes through delivery

Use build results to find what is included in a release, how and on which environment the release was tested, and identify the reasons for regressions.

Support for IBM clouds and virtual environments

Patterns can be automatically provisioned

IBM SmartCloud Continuous Delivery
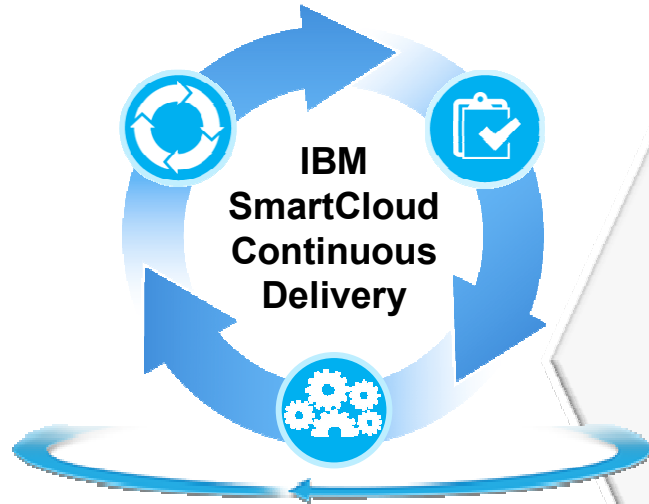
IBM Private Cloud Solutions:

IBM SmartCloud Provisioning
Virtualization management and cloud computing for fast application deployment
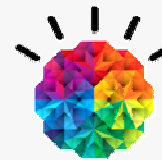
IBM PureSystems
Expert integrated systems combine the flexibility of general purpose systems, the elasticity of cloud and the simplicity of an appliance

IBM Workload Deployer
Speeds application deployment to cloud and virtualization environments

IBM SmartCloud Continuous Delivery Architecture

Op Engineer

Developer

Notify results

Post results to build

Store changes

Rational Team Concert (server)

Rational Team Concert (Client)

Put configuration version

Chef / Rational Automation Framework

Load changes and build

Apply configurations to system

Jazz Build Engine(s)

Publish packages

Rational Asset Manager (Deployables Library)

Trigger build

Execute tests

Get packages

Provision pattern with build

Virtual System

Provision system from pattern with build

Cloud Provisioning System

Supported integrations: IBM SmartCloud Continuous Delivery 2.0

IBM SmartCloud Continuous Delivery

Open Lifecycle Integration Platform

✓ Extending agile development using IBM Rational Team Concert with continuous delivery

✓ Provision and Deploy to private cloud and virtual systems

Continuous Integration

- IBM Rational Build Forge
- Hudson
- Jenkins

Continuous Deployment

- *IBM Private Clouds:*
  - IBM SmartCloud Provisioning
  - IBM PureSystems
  - IBM Workload Deployer
- *Environment & middleware Configuration*
  - IBM Rational Automation Framework
  - Chef / Custom Scripts

Continuous Testing

- IBM Rational Quality Manager
- IBM Rational Test Workbench
- jUnit
- Cucumber

Continuous Monitoring

- IBM SmartCloud Application Performance Management
- IBM SmartCloud Control Desk

Differentiated Capabilities - IBM SmartCloud Continuous Delivery 2.0

1. Shared environment patterns enable DevOps standardization (*production-like*) and enable ultra-fast provisioning of dev and test environments on built-in cloud.

2. End-to-end delivery pipeline focused on integrating and automating the complete workflow (Build, Integrate, Deploy and Test)

3. DevOps platform based on open standards (OSLC) enables out-of-box integration with

    *   Open-source CI capabilities (Hudson, Jenkins)

    *   Deployment capabilities (Chef)

    *   Test Automation (JUnit, Cucumber)

4. Quick re-creation of test environments for defect isolation, reduces time to deliver fixes for defects

Differentiated Capabilities - IBM SmartCloud Continuous Delivery 2.0

Provides additional value by integrating with other IBM products

- Support for PureApplication System and IBM Workload Deployer

- Integration with BuildForge to extend existing enterprise build (CI) capabilities with continuous delivery

- Integration with RQM/RTW enables automated execution of Test plans covering function, regression, performance et al

- Integration with Rational Automation Framework makes it easier to configure and deploy on IBM middleware (WAS, DB2, Portal)

1. Integration with SmartCloud Application Performance Management enables measuring and tracking of performance trends early and often during dev/test

www.ibm.com/software/rational

Supported integrations: IBM SmartCloud Continuous Delivery 2.0

IBM
SmartCloud
Continuous
Delivery

✓ Extending agile development using IBM Rational Team Concert with continuous delivery

✓ Provision and Deploy to private cloud and virtual systems

Open Lifecycle Integration Platform

Continuous Integration

- IBM Rational Build Forge
- Hudson
- Jenkins

Continuous Deployment

- *IBM Private Clouds:*
  - IBM SmartCloud Provisioning
  - IBM PureSystems
  - IBM Workload Deployer
- *Environment & middleware Configuration*
  - IBM Rational Automation Framework
  - Chef / Custom Scripts

Continuous Testing

- IBM Rational Quality Manager
- IBM Rational Test Workbench
- jUnit
- Cucumber

Continuous Monitoring

- IBM SmartCloud Application Performance Management
- IBM SmartCloud Control Desk

1. Continuous Integration capabilities

Replace built-in capability with choice of enterprise Continuous Integration Servers to improve governance and integration of code changes

Cloud Development

Pipeline Configuration and Automation

IBM SmartCloud Continuous Delivery

Pipeline Reporting

Deployment Library

Continuous Deployment

Continuous Integration

Continuous Testing

Continuous Monitoring

Open Lifecycle Integration Platform Jazz

cars.com
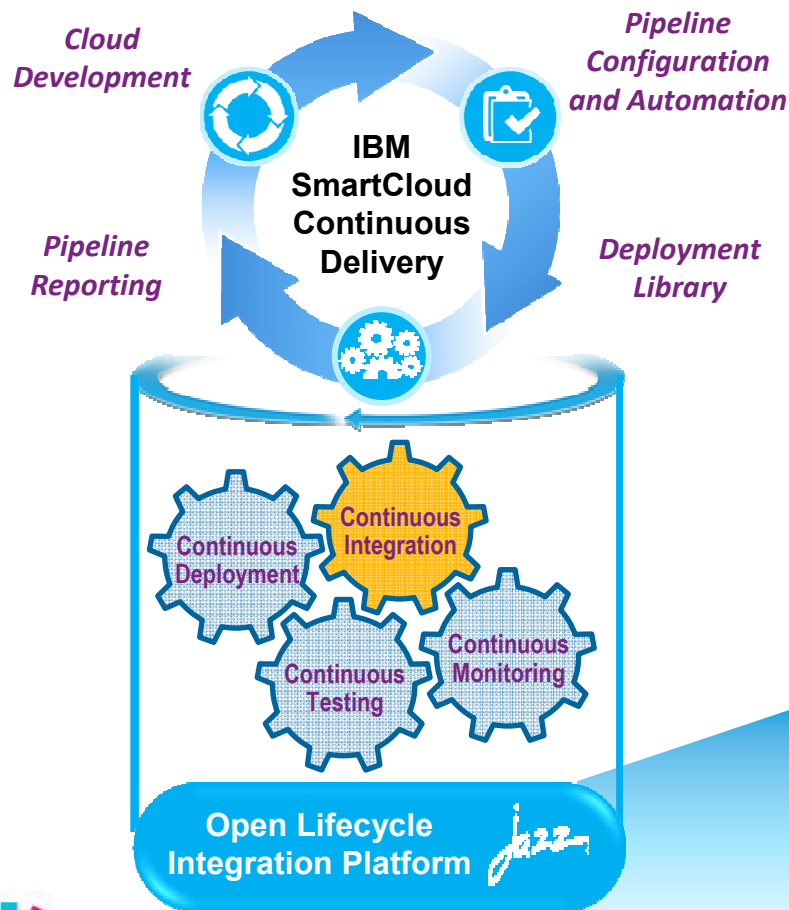
Increased product releases from

30 to almost 200

per year by providing continuous build and integration capabilities to 12 product groups.

Continuous Integration:

IBM Build Forge
Automate and accelerate build and release processes

Hudson/Jenkins
Can invoke open source frameworks for continuous integration

2. Continuous Deployment capabilities

Extend existing siloed automations to enable integrated continuous deployments

Cloud Development

Pipeline Configuration and Automation

IBM SmartCloud Continuous Delivery

Pipeline Reporting

Deployment Library

Continuous Deployment

Continuous Integration

Continuous Testing

Continuous Monitoring

Open Lifecycle Integration Platform *Jazz*

ANZ
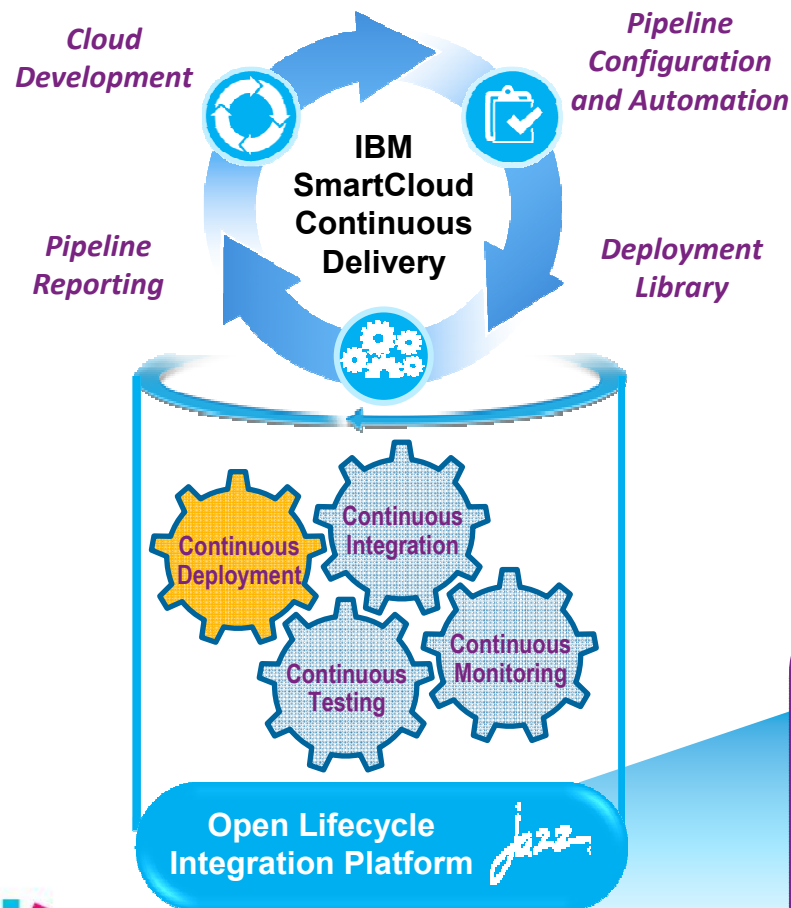
Enabled costs to remain flat as demand for services increased

35 percent

Reduced the time required to begin working on a new project from three months to four weeks

Continuous Deployment
IBM Rational Automation Framework
Automates application middleware configuration and deployments
Chef
Automated environment configuration
Custom Scripting
Home-grown scripting solutions via shell scripts

3. Continuous Testing capabilities

Integrate with enterprise quality management solutions & open source frameworks

Cloud Development

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IBM SmartCloud Continuous Delivery

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Continuous Testing

Continuous Monitoring

Open Lifecycle Integration Platform *Jazz*
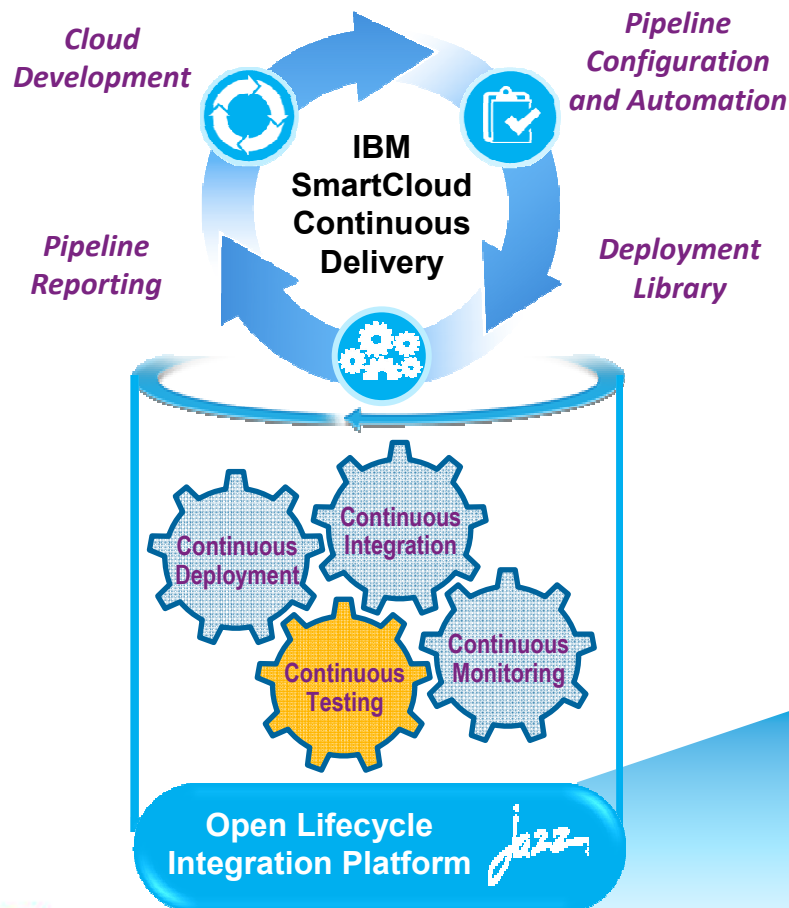
Reduced testing time from
2 weeks to 3 hours

Accelerated product delivery with significantly improved quality

Continuous Testing
IBM Rational Quality Manager
Test Management and Test Execution
IBM Rational Test Work Bench
Service Virtualization and Simulation for testing
Performance and Functional testing
Cucumber & JUnit
Open Source Test Frameworks

4. Continuous Monitoring with Application Performance Management

Integrate application performance earlier and more often in the lifecycle

Cloud Development

Pipeline Configuration and Automation

IBM SmartCloud Continuous Delivery

Pipeline Reporting

Deployment Library

Continuous Integration

Continuous Deployment

Continuous Testing

Continuous Monitoring

Open Lifecycle Integration Platform
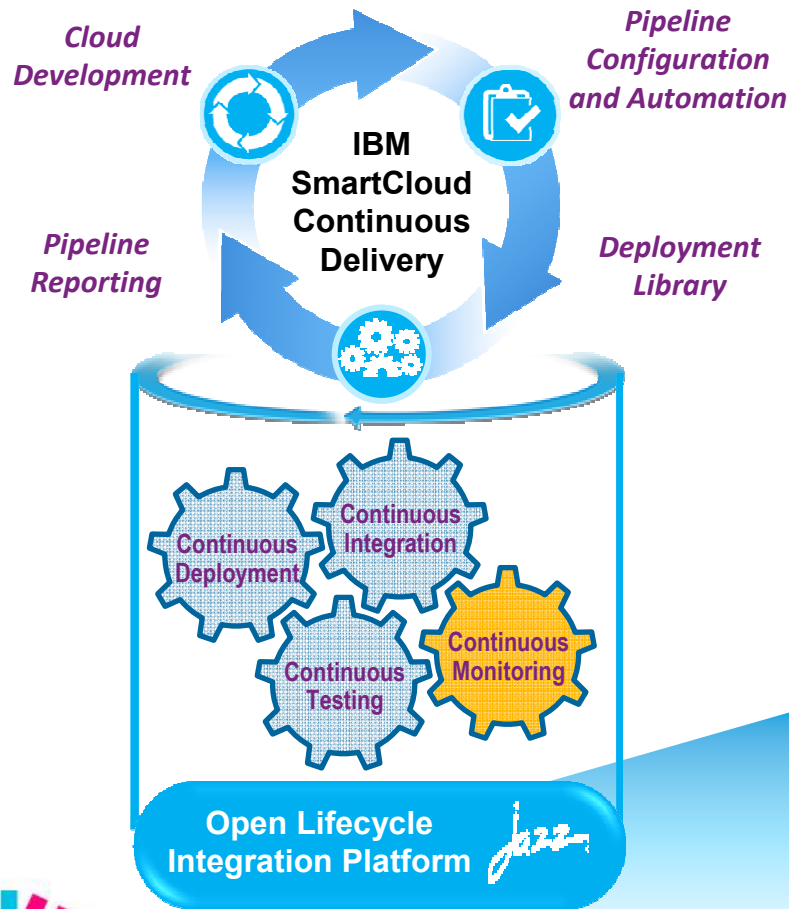
Helped IT administrators increase systems availability from

90 percent to 99 percent

Performance Management:
IBM SmartCloud Application Performance Management
Provisions performance profile for development and test to view performance trending and improvements throughout the lifecycle

5. Continuous Monitoring with Incident Management

In-context collaboration of Operations with Dev and Test teams enabling faster incident resolution, and roll outs of upgrades
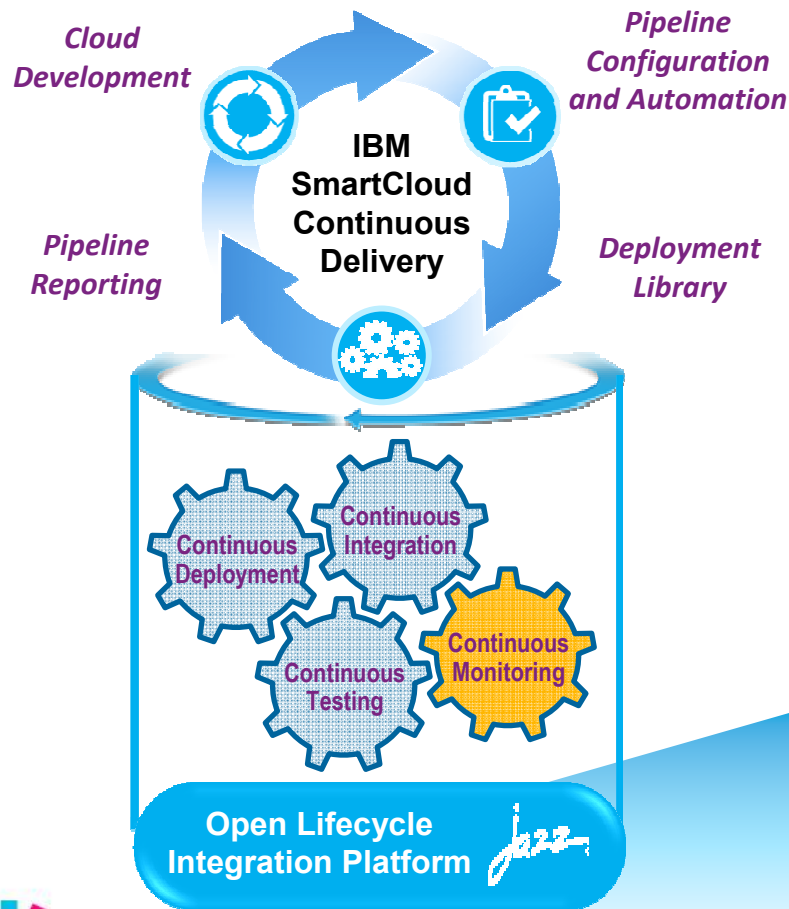
Cloud Development

Pipeline Configuration and Automation

IBM SmartCloud Continuous Delivery

Pipeline Reporting

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Continuous Integration

Continuous Testing

Continuous Monitoring

Open Lifecycle Integration Platform *Jazz*

"I reduce defect identification and repair costs by up to 90%!"

Developer

Incident Management:
IBM SmartCloud Control Desk   **FUTURE**

IBM SmartCloud APM Operations raises incidents that can be fixed collaboratively with context and agility with development and test.
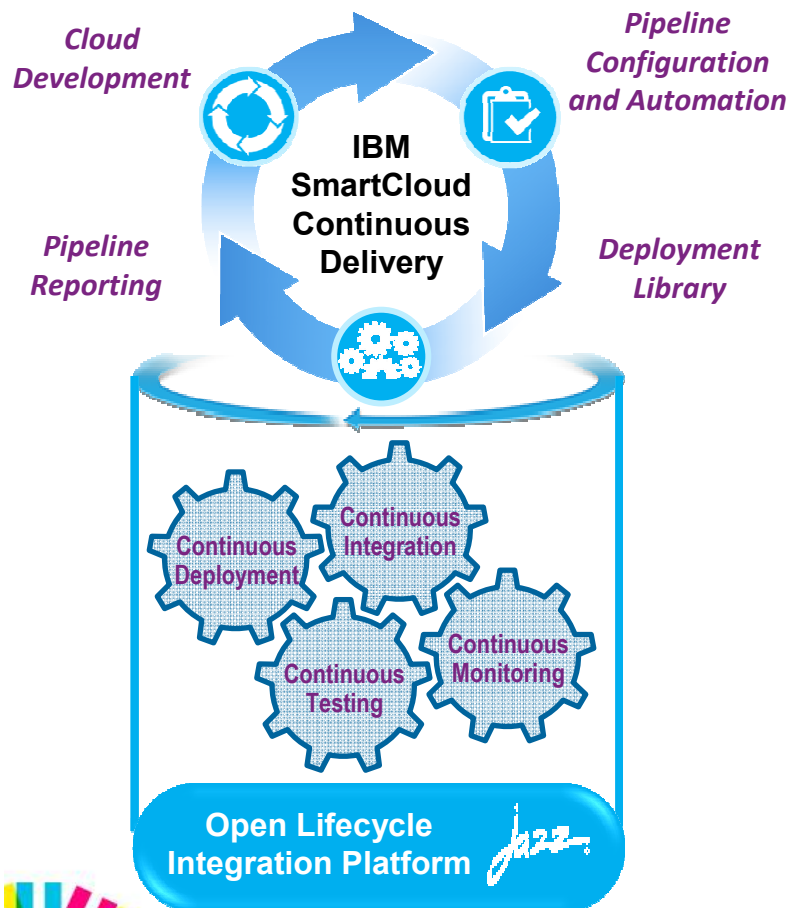Ability to trace and isolate defect and environment.

Summary: IBM SmartCloud Continuous Delivery

Accelerate delivery and ensure applications are production-ready throughout the lifecycle and can be released at any time without rollback

Cloud Development

Pipeline Configuration and Automation

IBM SmartCloud Continuous Delivery

Pipeline Reporting

Deployment Library

Continuous Integration

Continuous Deployment

Continuous Testing

Continuous Monitoring

Open Lifecycle Integration Platform *Jazz*

Business Outcomes

- **Shorten** delivery time from **months to days** through end-to-end automation, standardization and repeatability

- **20%** reduction in resource costs while increasing predictability of deployments through low touch and self-service

- **40%** more agility by streamlining operation and development collaboration with in-context communication

- **20%** increase in application service availability and performance by improving alignment of key stakeholders - dev, test and ops