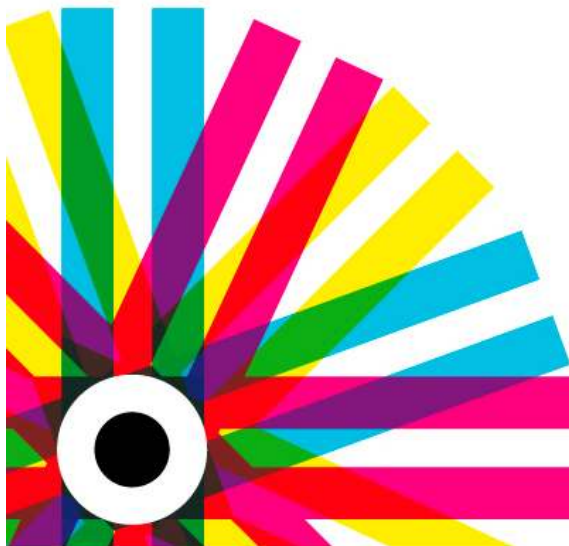




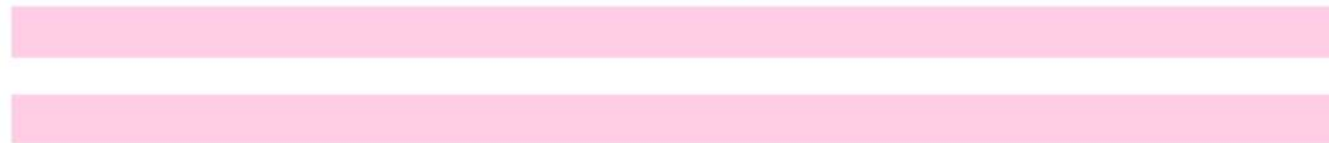
**Paolo Ottaviano**

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

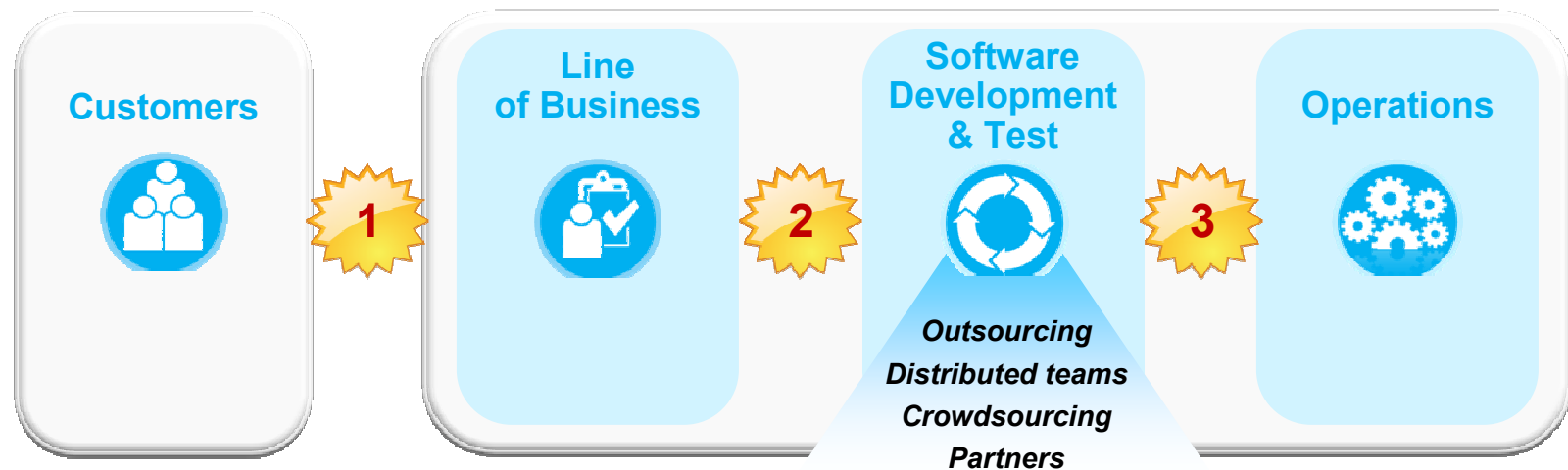


---

***Continuously deliver software driven innovation  
and business value...***



## Inhibitors to accelerated delivery for IT organizations



### **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\*



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

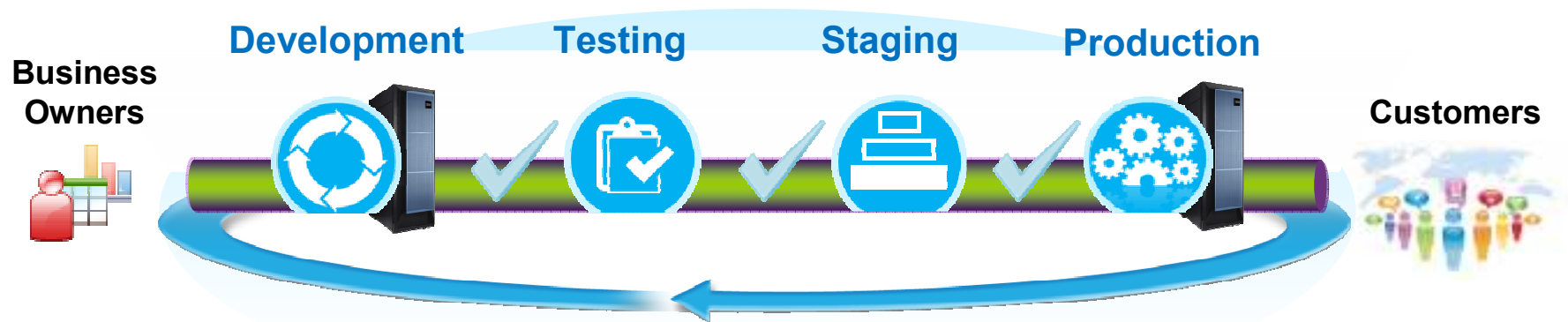
\* Forrester/IBM Study: A New View of IBM's Opportunity for Integrated Optimized Systems Address , 2011

\*\* 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*



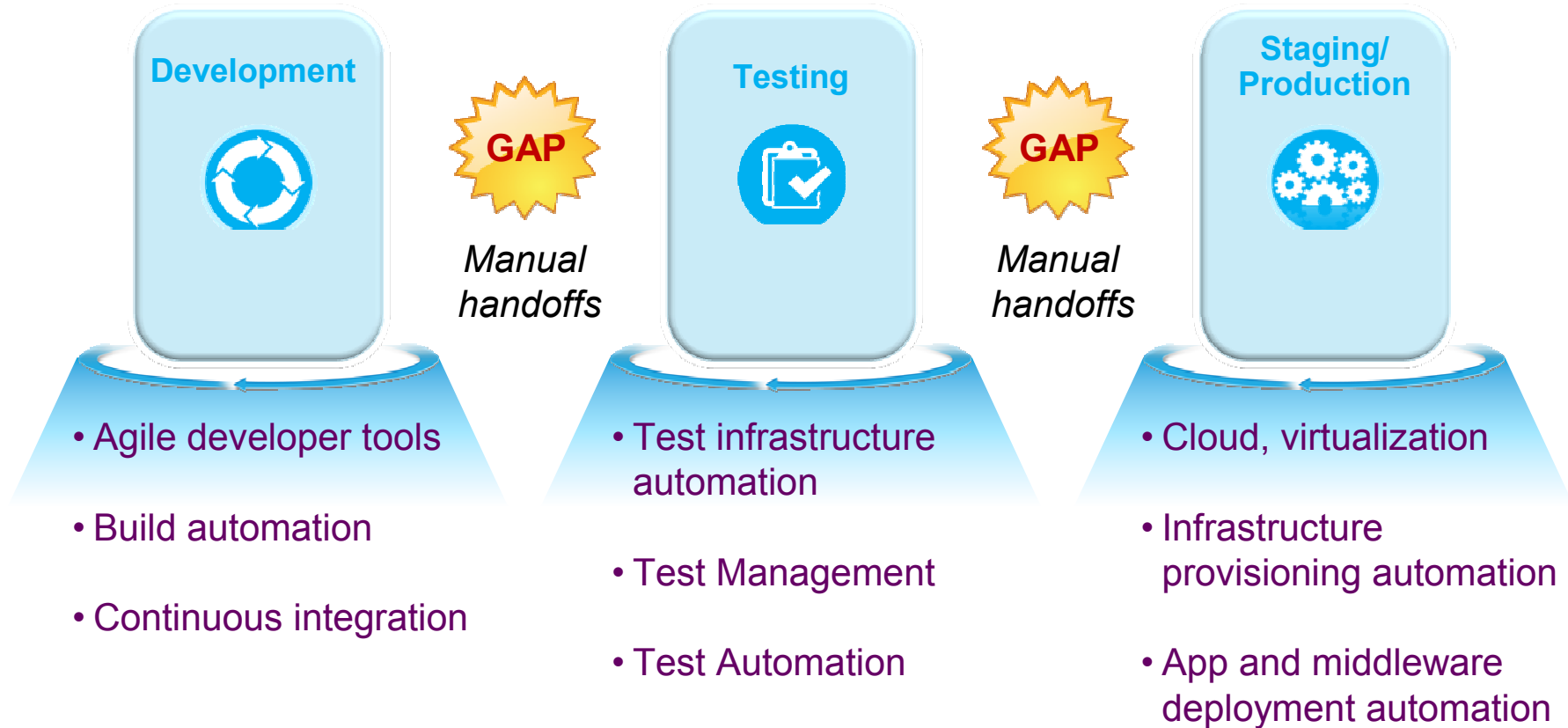
### **Continuous Delivery Pipeline:**

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*

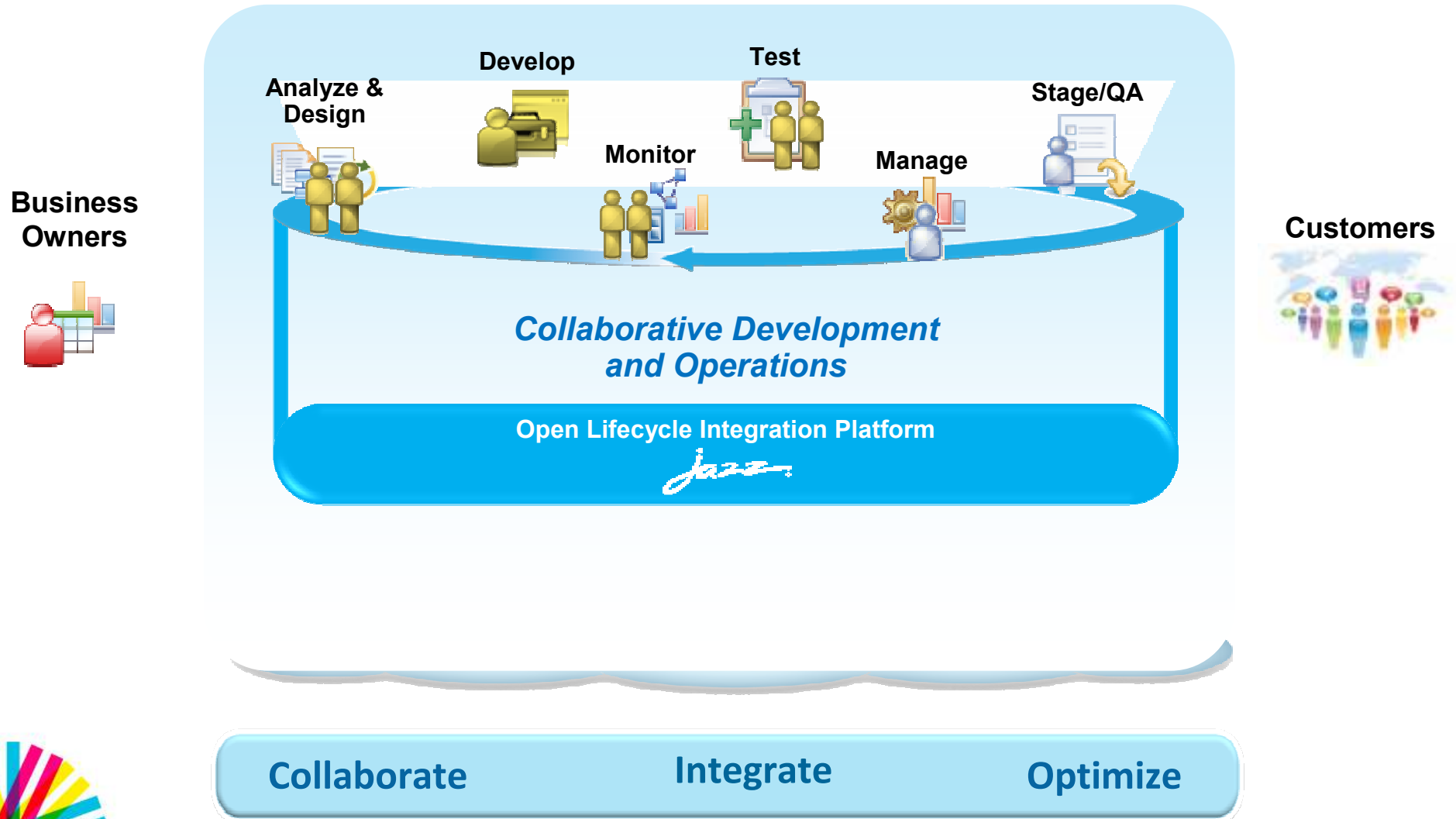


***Gaps and challenges still exist due to lack of integration across people, processes and tools...***



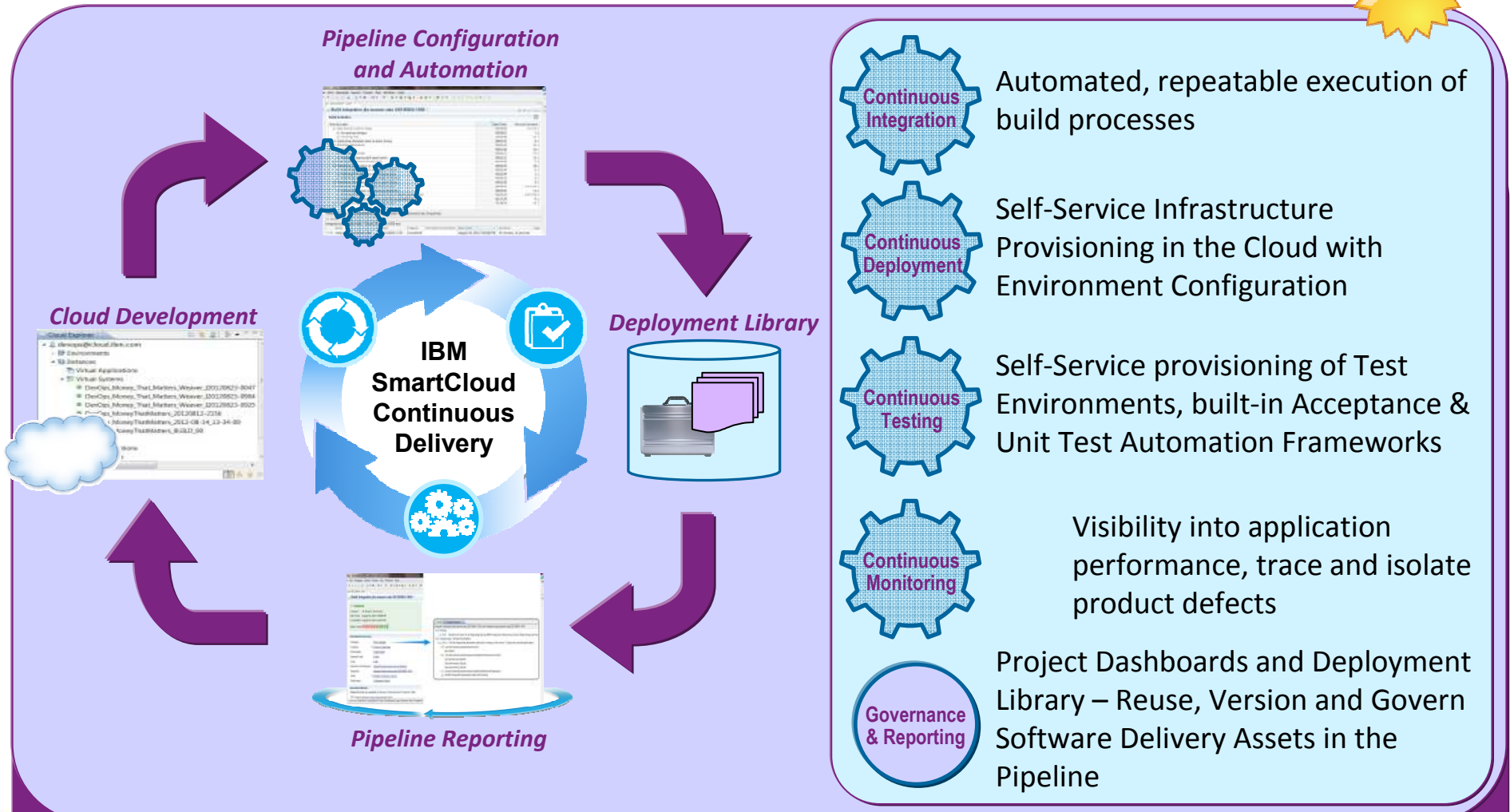
## Solution: Collaborative Development and Operations

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





## Introducing IBM SmartCloud Continuous Delivery *Automating the Continuous Delivery 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***

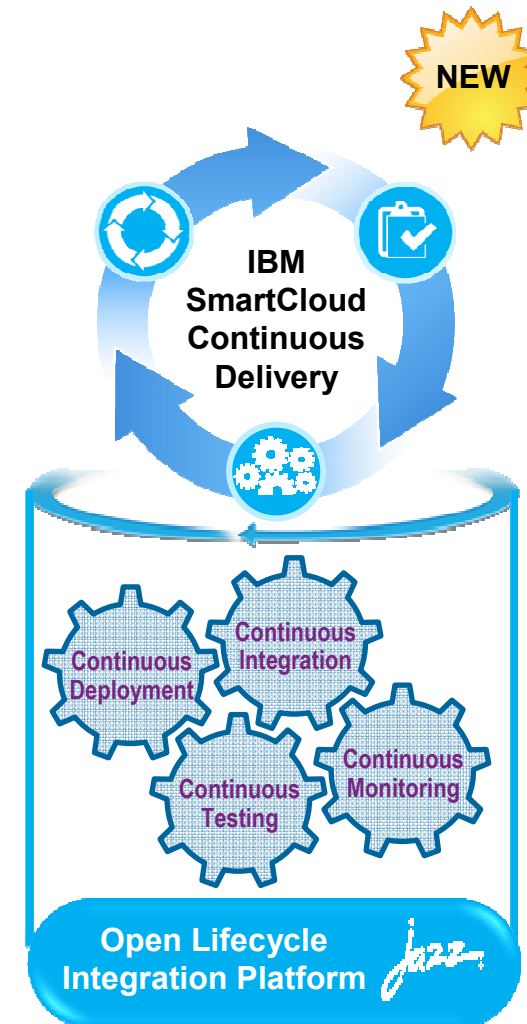
- ✓ **Simplify delivery** processes while increasing the predictability of application deployments through low touch and self-service provisioning that can scale

***30-40% reduction in outages***

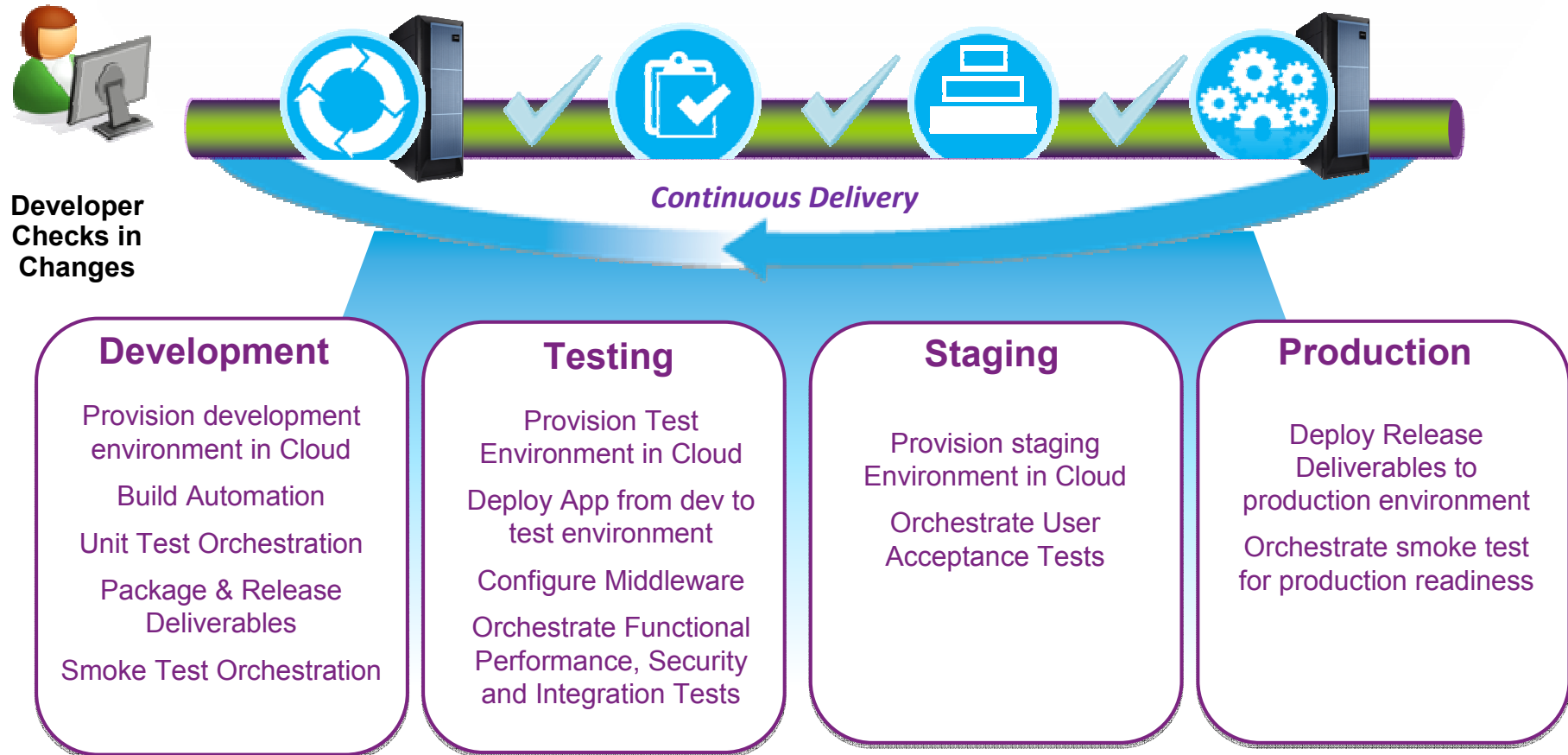
- ✓ **Increase agility** by streamlining operations and development collaboration with in-context communication that provides improved visibility to delivery bottlenecks and a common understanding of quality and performance.

***Reduce deployment times 50% or more***

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



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



***Or adopt incrementally ...***



## Features and Capabilities

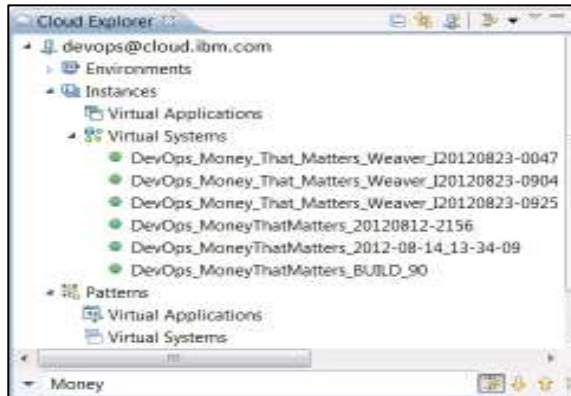
Share between  
Dev and Ops



Automate  
delivery

Assembly Label	Start Time	Assembly Duration
1. Add Server Configuration	09:00:00	1 m 22 s
2. Applying Changes	09:00:01	7 s
3. Fetching files	09:00:08	59 s
4. Publishing metadata asset to each host	09:03:27	9 s
5. Publishing application	09:04:42	50 s
6. Copying	09:04:46	20 s
7. Starting unit tests	09:04:57	39 s
8. Publishing application package to library	09:05:11	15 s
9. Publishing application package to library	09:05:25	2 s
10. Publishing application package to library	09:05:39	3 s
11. Publishing application package to library	09:05:44	7 s
12. Publishing application package to library	09:05:58	9 s
13. Publishing application package to library	09:06:04	3 s
14. Publishing application package to library	09:06:18	3 s
15. Publishing application package to library	09:06:24	4 s
16. Publishing application package to library	09:06:38	4 s
17. Publishing application package to library	09:06:44	14 m 58 s
18. Publishing application package to library	09:06:58	1 s
19. Publishing application package to library	09:07:14	1 s
20. Publishing application package to library	09:07:20	38 s

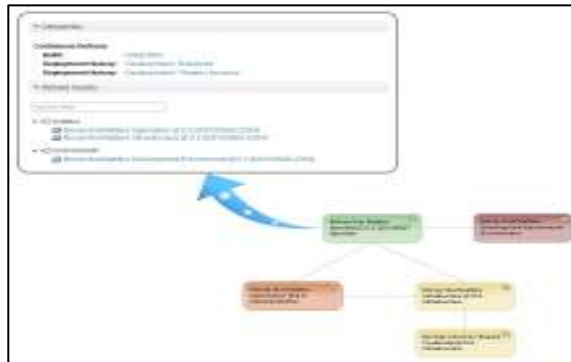
Self Service for  
the cloud



Plan and track  
delivery together



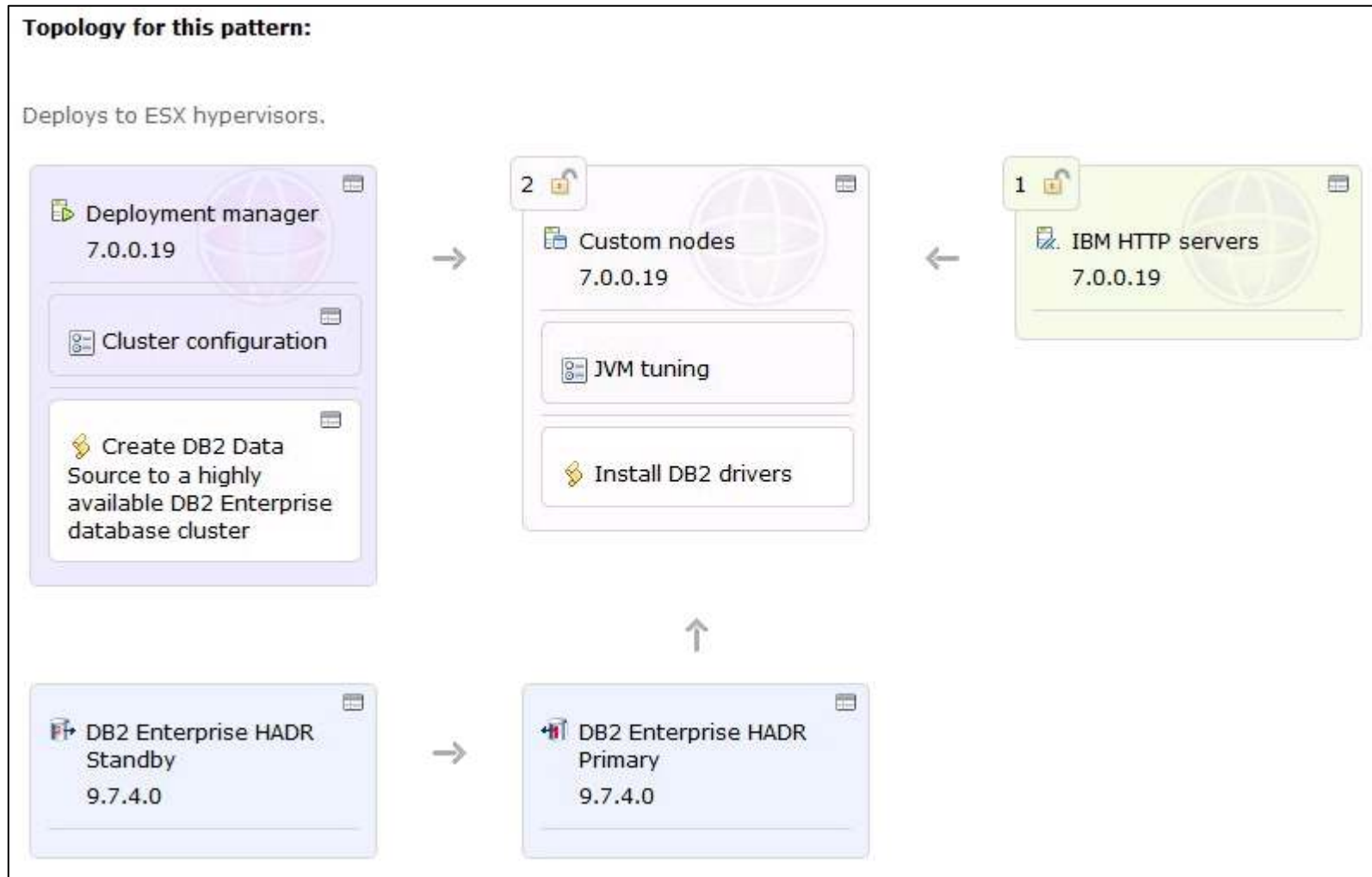
Manage release  
assets



Trace changes  
through delivery



## Share between Dev and Ops



**Share production-like cloud environments early and throughout the development process. Delivery is a team sport!**

## Automate Delivery

The screenshot displays the Rational Team Concert (RTC) interface. The main window shows a project named 'I20120824-1556' with a build configuration 'Build integration.jke.weaver.rake I20120824-1556'. The 'Build Activities' table lists the following tasks and their durations:

Activity Label	Start Time	Activity Duration
Jazz Source Control setup	00:00:00	1 m 01 s
Accepting changes	00:00:01	7 s
Fetching files	00:00:08	53 s
Publishing Manifest asset to asset library	00:01:27	6 s
Building application	00:01:44	42 s
Compiling	00:01:46	10 s
Running unit tests	00:01:57	14 s
Packaging deployable application	00:02:11	15 s
Defining application library entry	00:02:29	4 s
Publishing application to library	00:02:33	19 s
Publishing application package to library	00:02:34	9 s
Defining infrastructure asset library entry	00:02:44	1 s
Publishing infrastructure package to library	00:02:45	6 s
Publishing Environment asset to asset library	00:02:54	4 s
Deploying application to test environment	00:03:01	15 m 02 s
Validating Weaver environment definition	00:03:03	11 s
Sending request to cloud environment to deploy application	00:03:14	14 m 39 s
Started test application at fit-vm8-062.rtp.raleigh.ibm.com	00:17:54	9 s
Running tests against deployed application	00:18:05	10 s

Below the activities table, there are tabs for Overview, Activities, Compilation, Tests, Downloads, Logs, External Links, and Properties. The 'Builds' section shows a summary for 'integration.jke.weaver.rake - Found 16 Builds (1895 ms)'. The build details table is as follows:

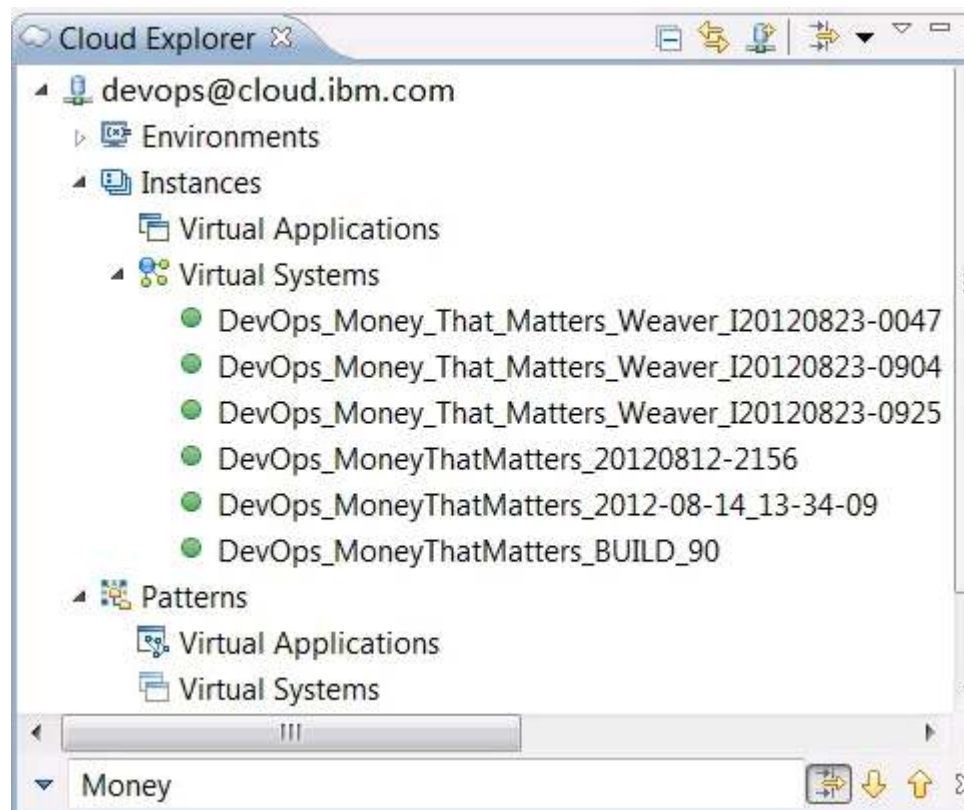
Build	Label	Progress	Estimated Completion	Start Time	Duration	Tags
✓ integration.jke.weaver.rake	I20120824-1556	Completed		August 24, 2012 3:56:08 PM	18 minutes, 16 seconds	



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

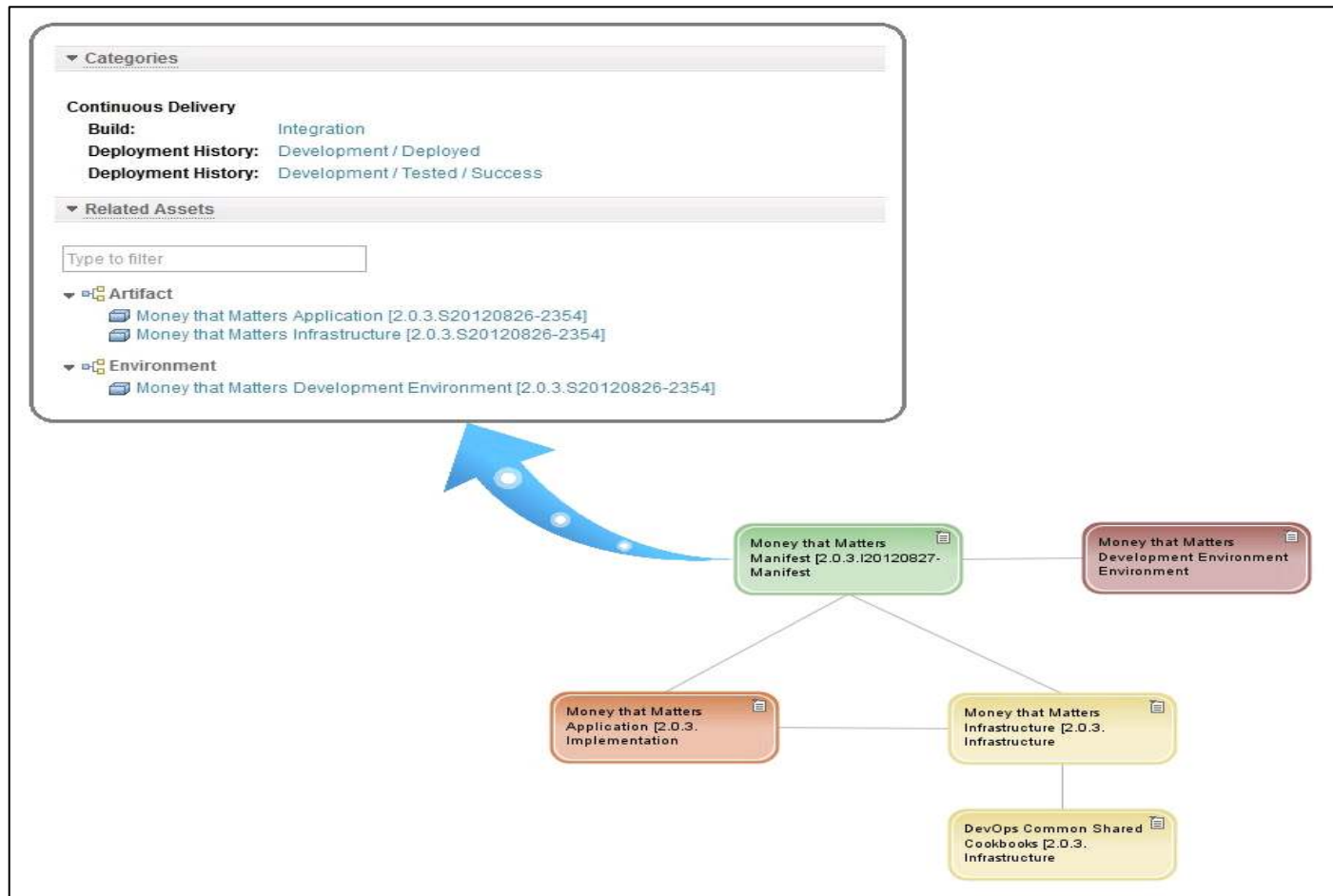
The screenshot displays the IBM DevOps interface for a project named '2.0 M3'. The interface includes a navigation bar with options like 'Project Dashboards', 'Work Items', 'Plans', 'Source Control', 'Builds', and 'Reports'. The main content area shows the project details, including the owner 'Development', the iteration '2.0 M3 [7/2/12 - 8/17/12]', and the plan type 'Iteration Plan'. A 'Planned Items' section is visible, showing a Kanban board with columns for 'Open', 'In Progress', and 'Closed'. The board contains several work items, such as 'As a developer, I want to specify multiplicity of a', 'Create Dynamic Wizard pages and Operations for', 'Use Quick Selection dialog for choosing a', 'Provide usable error messages', and 'Optimize publish behavior to only create or upload'. A 'Burndown' chart is also present, indicating 'Report not found'.



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

The screenshot displays the Rational Team Concert interface. On the left, the 'Build integration.jke.weaver.rake I20120824-1556' window shows a 'Completed' status with a duration of 18 minutes and 16 seconds, starting on August 24, 2012, at 3:56:08 PM and completing at 4:14:24 PM. A 'Status Trend' bar shows a sequence of red and green bars. Below this is a 'Contribution Summary' section with the following details:

- Changes: [Show changes](#)
- Compile: 0 errors, 0 warnings
- Downloads: 5 downloads
- External Links: 6 links
- Logs: 1 log
- Repository Workspace: [integration.jke.weaver.rake workspace](#)
- Snapshot: [integration.jke.weaver.rake\\_I20120824-1556](#)
- Tests: 49 tests, 0 failures, 0 errors
- Work items: 2 included in build

An arrow points from the 'Show changes' link to the 'Change Explorer' window on the right. The 'Change Explorer' window compares the current build (I20120824-1556) with a previous one (I20120824-1454). It shows a tree structure of files and folders, including:

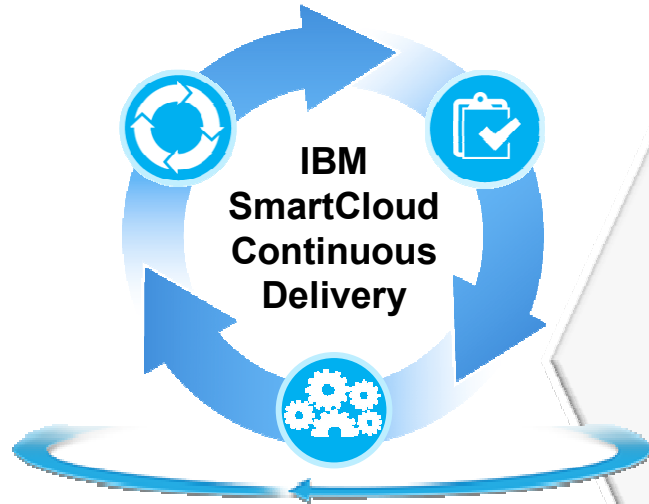
- RelEng
  - Bob - Builds don't seem to be deploying/testing RAM: integration.library.services and stable.library.services
- Sample App - Money That Matters
  - Alice - Get the integration.jke.weaver.rake build running on the server - Deploy the sample application
    - com.ibm.devops.sample.weaver.build
      - .project
      - com.ibm.devops.sample.weaver.build/definitions/environment
        - amf\_test\_env.weaver
        - environment\_39.json
        - environment\_40.json
      - com.ibm.devops.sample.weaver.build/definitions/infrastructure
        - Get the integration.jke.weaver.rake build running



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*

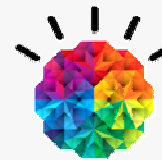


## IBM Private Cloud Solutions:



### 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

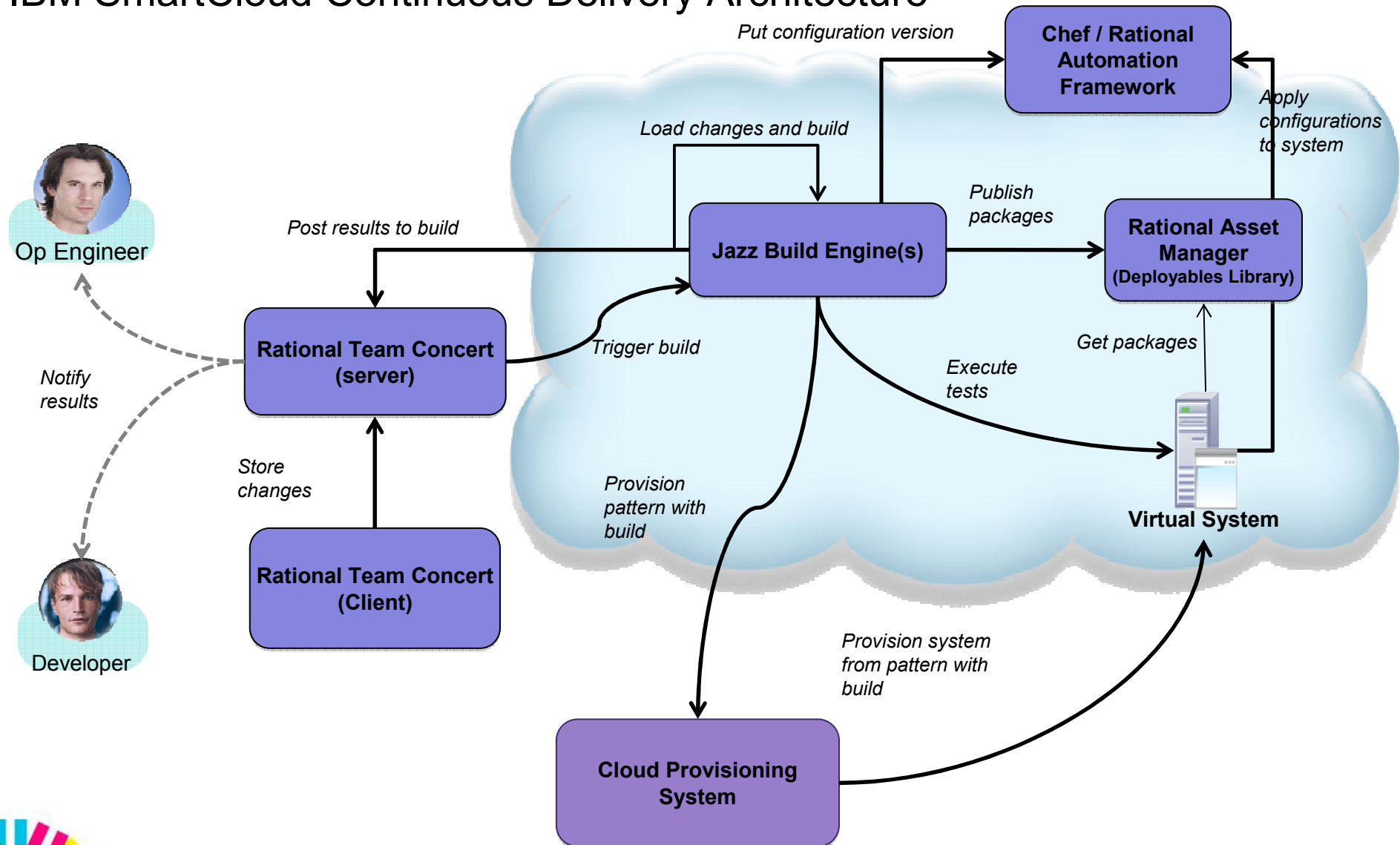


### IBM Workload Deployer

Speeds application deployment to cloud and virtualization environments

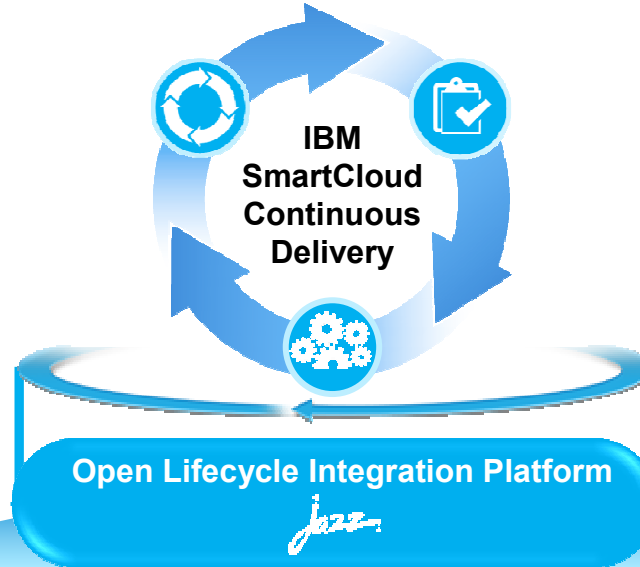


## IBM SmartCloud Continuous Delivery Architecture



## Supported integrations: IBM SmartCloud Continuous Delivery 2.0

- ✓ 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







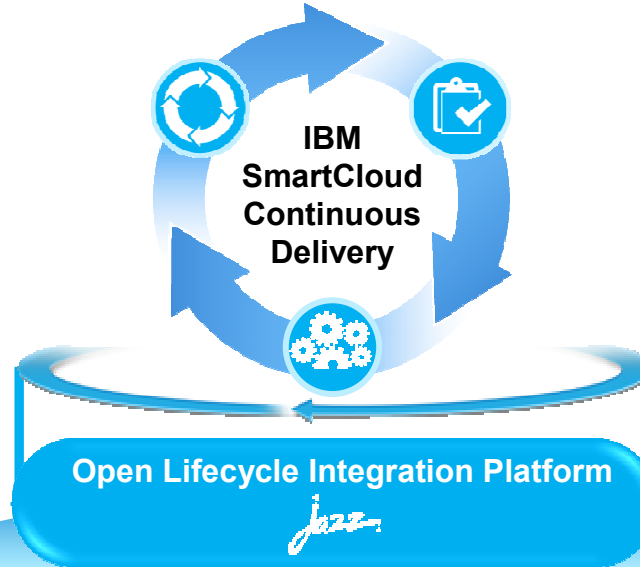
[www.ibm.com/software/rational](http://www.ibm.com/software/rational)

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## Supported integrations: IBM SmartCloud Continuous Delivery 2.0

- ✓ 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

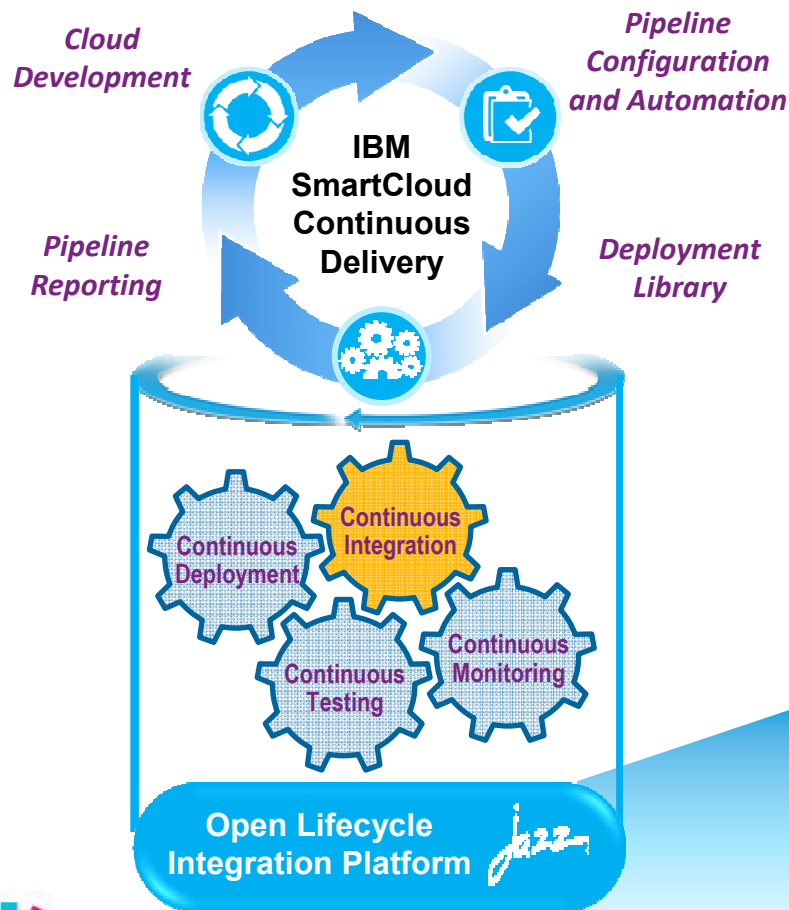
### Continuous Monitoring

- IBM SmartCloud Application Performance Management
- IBM SmartCloud Control Desk



## 1. Continuous Integration capabilities

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



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

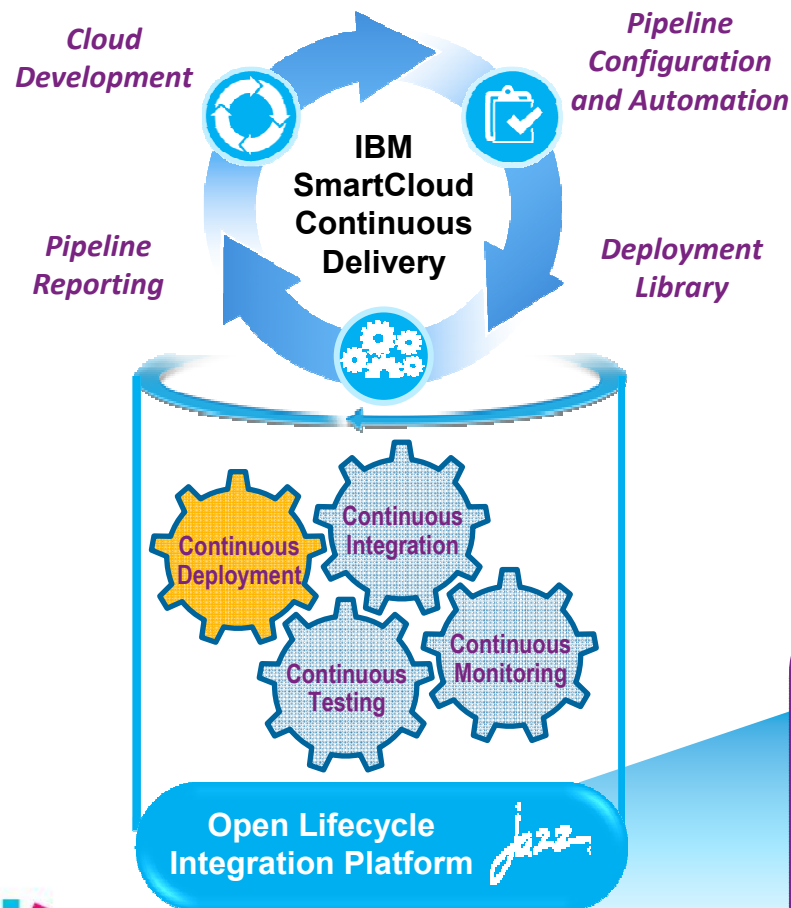
#### Hudson/Jenkins

Can invoke open source frameworks for continuous integration



## 2. Continuous Deployment capabilities

*Extend existing siloed automations to enable integrated continuous deployments*



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

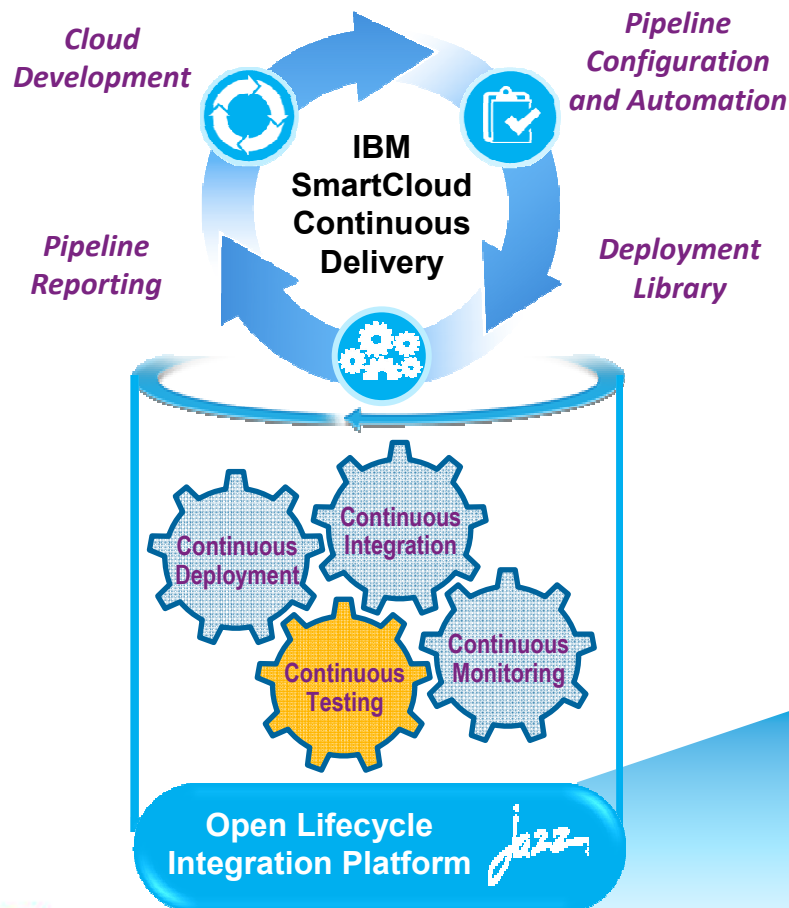
#### **Custom Scripting**

Home-grown scripting solutions via shell scripts



## 3. Continuous Testing capabilities

*Integrate with enterprise quality management solutions & open source frameworks*



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

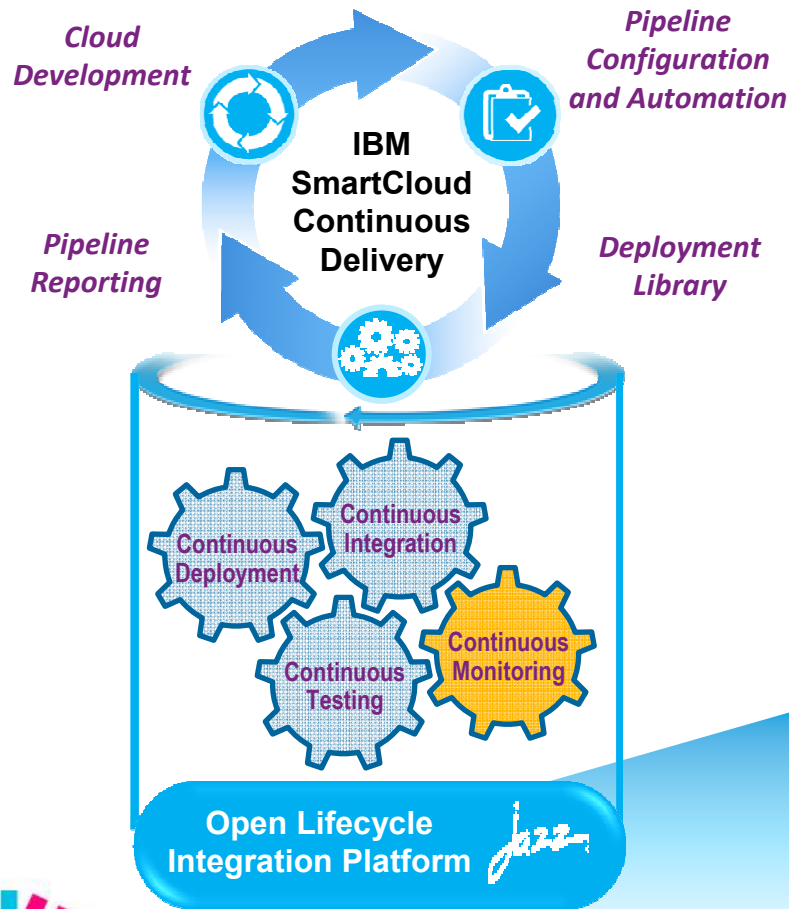
Open Source Test Frameworks





## 4. Continuous Monitoring with Application Performance Management

*Integrate application performance earlier and more often in the lifecycle*



Helped IT administrators  
increase systems availability  
from

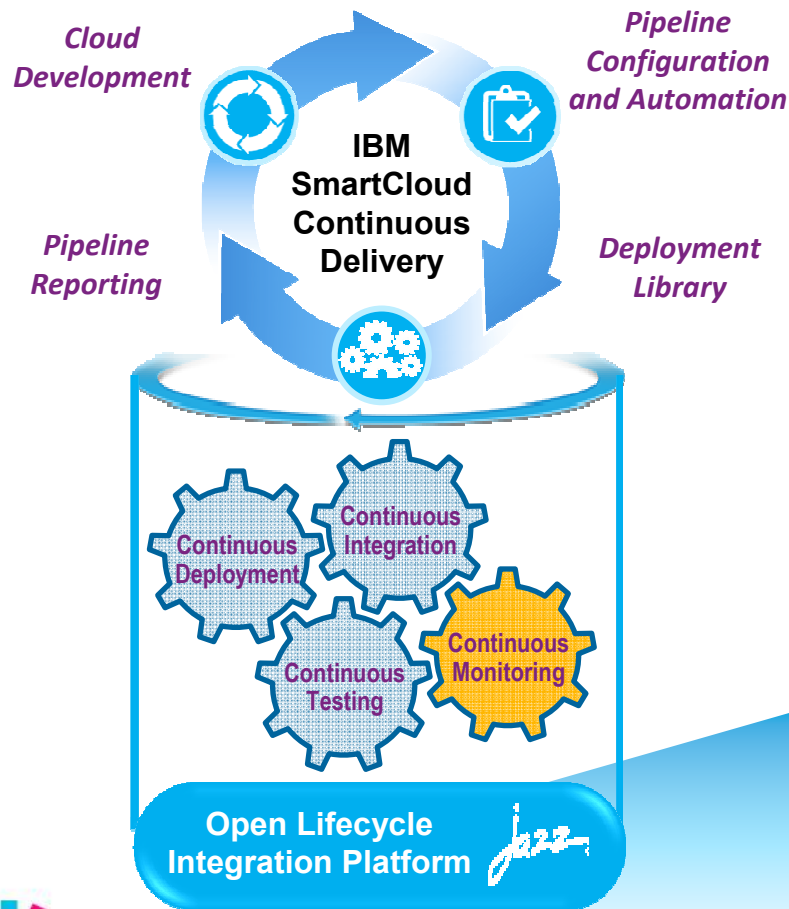
**90 percent to 99 percent**

**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*



*"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.

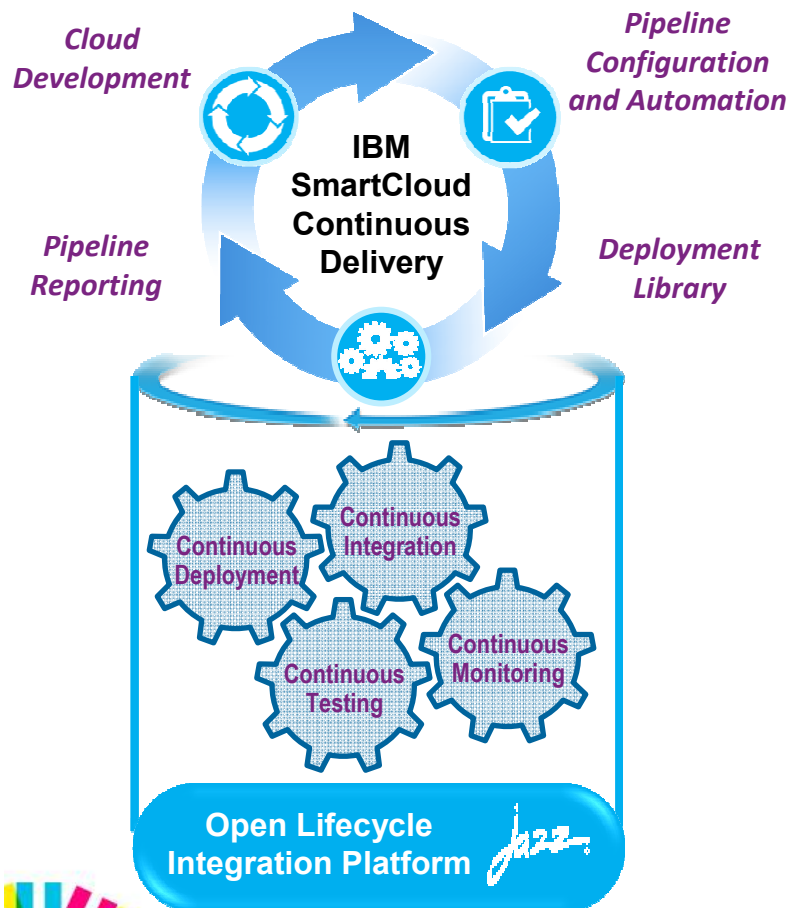
Ability to trace and isolate defect and environment.





## 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*



## 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

