

# Exploiting and extending Cloud for Enterprise Software Development and Testing

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# Cloud Platform Services

*Pre-built, pre-integrated IT infrastructures tuned to application-specific needs*

## Develop and Deploy Virtual Web Apps

Role:

- Sr. IT Operations Leader
- Sr. Development Manager & Developers

Capabilities:

- Integrated development tooling
- Simplified deployment
- Application-centric visibility
- Self service interface
- Automatic elasticity

## Development and Test Environments

Role:

- VP IT
- VP Dev
- Quality Managers

Capabilities:

- Instant-on access to dev/test tools, middleware, and processes
- Advanced image management
- Virtual developer desktops
- Collaboration
- License management



**Design, Deploy,  
Consume**



## Executive Overview

- In today's world, complex applications are expected to run across multiple platforms, including system z, distributed, cloud and web.
- How can we address the challenges of developing in a rapidly changing environment, with competitive pressures, economic challenges and quickly evolving requirements?
- How can we successfully develop and test complex applications across multiple platforms, including z and cloud?
- How can we leverage the power of the cloud to help with our development effort across multiple platforms?



# Realities can stall software-driven innovation

*Complexities in software delivery compounded by market pressures*

## Complex, Multi-platform Systems and Applications

**62%** of companies have agile projects requiring integration with legacy systems

## Increasing Mandates

2010 Spending in U.S. on governance, risk and compliance was **\$29.8 billion**

## Globally Distributed Software and Product Supply Chains

**50%** of outsourced projects are expected to under perform

## Cost Reduction

**70%** budget locked in maintenance and **37%** of projects go over budget

## Unpredictability in Software Delivery

**62%** of projects fail to meet intended schedule

## Changing Requirements and Time to Market

**30%** of project costs are due to rework and poor execution of requirements

## Challenges in Enterprise Software Delivery

- **Enterprise Software spans multiple platforms:**
  - Many complex applications rely on multiple components across platforms, including z, distributed, web and cloud solutions
  - IT Architecture requires development and test across platforms
  - Organizations will continue to develop and test for all of these architectures for the foreseeable future.
- **Complex application development requires a consolidated development and test process**
  - Well-defined, versioned, and documented application interfaces are critical for success
  - Integration testing and verification is a must
  - Teams need to collaborate, integrate, and optimize





# Cloud computing can help development and test pains

**Traditional**

**Cloud**

Expensive

Be more efficient with  
Hardware and software assets

Lots of moving parts

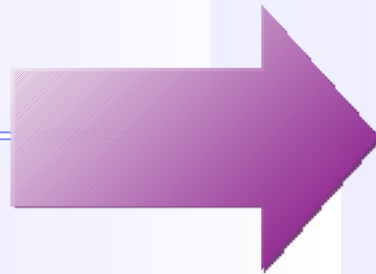
Standardize and automate

Many Stakeholders

Collaborate around patterns

Too many questions ...  
Too many answers!

Govern and Standardize





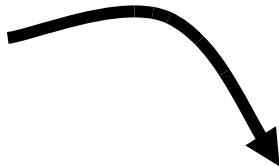
# Rational provides solutions for Development and Test Workloads

*Three types of cloud capability to consider*

## Capabilities **TARGETING** the Cloud

### Software Delivery Automation

- Reduce time consuming, manual deployment tasks for development and tes
- Increase delivery speed



## Capabilities **LEVERAGING** the Cloud

### Cloud Exploitation

- Increase availability of systems on demand
- Usage based on need



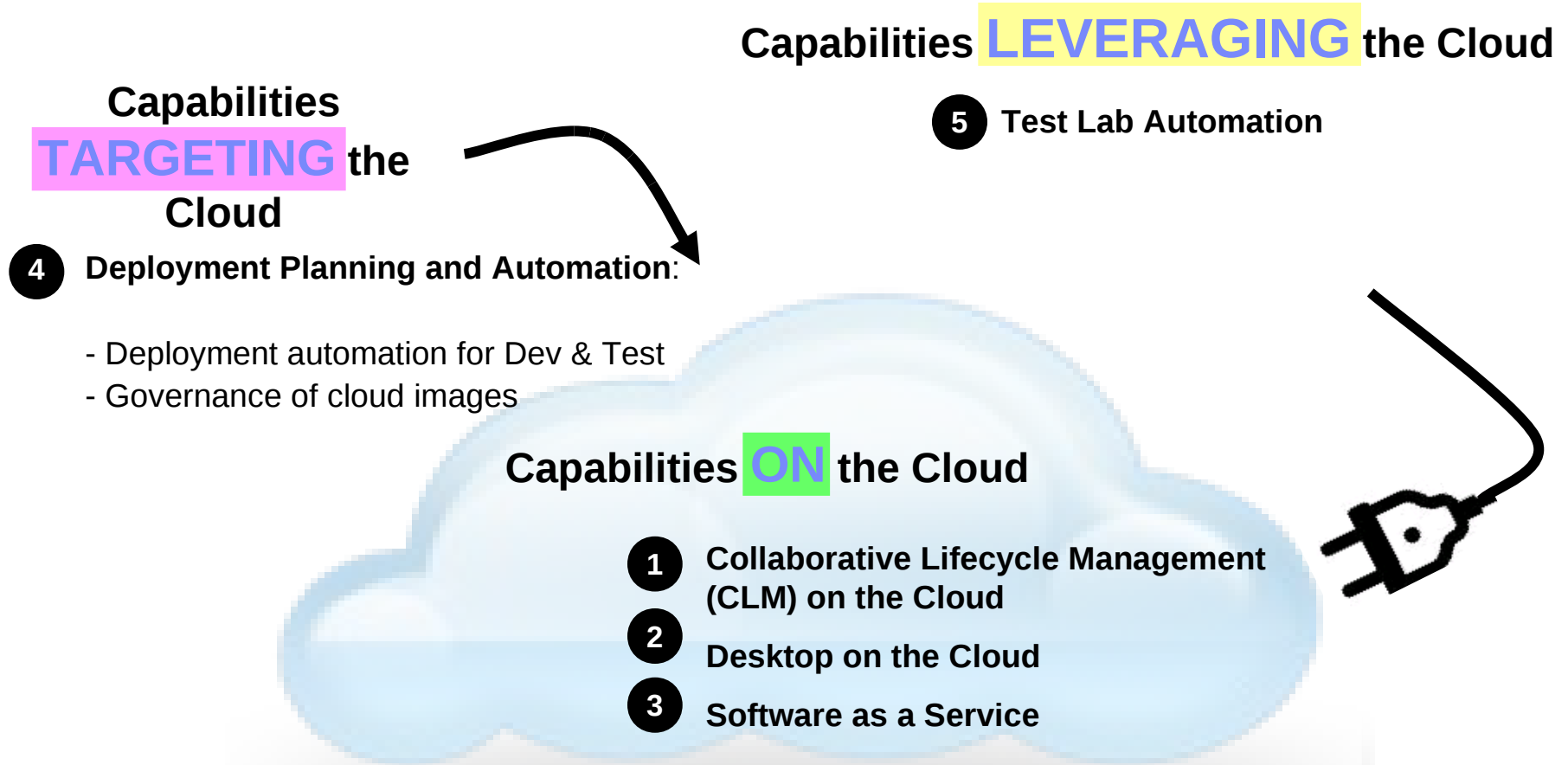
## Capabilities **ON** the Cloud

### Standardized Development

- Increase ramp-up time
- Improve consistency between teams and asset governance
- Self-service access



# Consumption patterns emerging across the Dev & Test lifecycle







## Case Study: A Global Hospitality Client

### ■ Problem:

- A large hospitality company needs to enable global distributed development and test teams to be more effective and efficient at more than 100 locations worldwide, building complex applications spanning system z for reservations and web for customer access

### ■ Challenges:

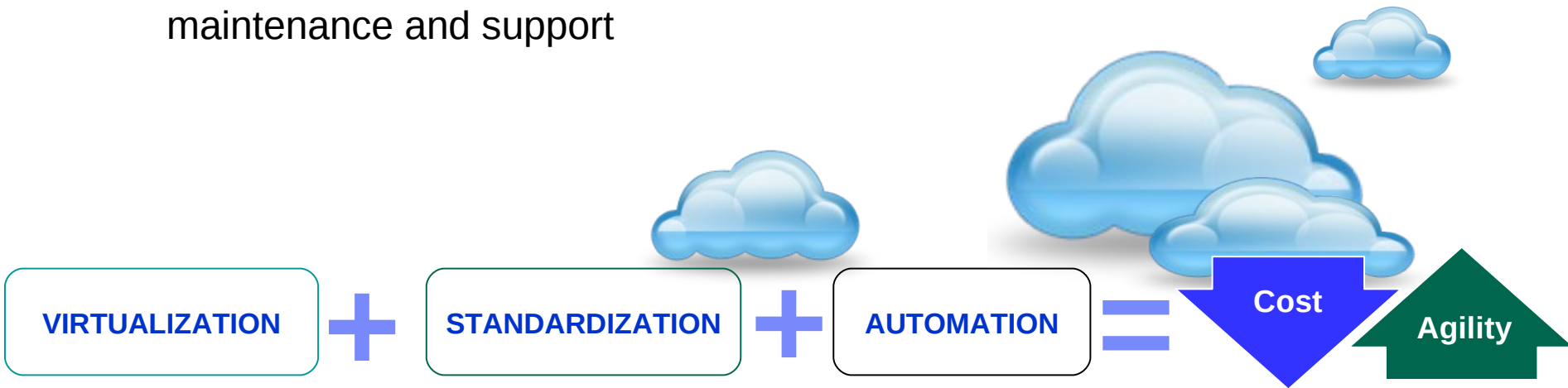
- Costly and complex to install, configure and maintain integrated ALM environments for multiple projects
- Difficult to manage patches and licenses for globally distributed teams and projects
- Every new project rollout is one-of-a-kind. Teams who install, configure and maintain ALM integrations often do so without knowledge of previous implementations
- Practitioners moving from project to project need to relearn processes that differ
- Issues providing global access to project resources
- Difficult to react quickly to changes and ramp up new projects due to customization time, procurement issues and provisioning
- Inability of IT to react quickly to changing business needs





## How can Cloud address these challenges?

- **Solution:** Deploy advanced Application Lifecycle Management (ALM) solution on the cloud across the global development and test teams
  - Pre-fabricated and integrated images allows instant-on and consistent deployment
  - Standardized and automated solution delivery with a self-service access
  - Centralized delivery of standardized services enables ease of maintenance and support

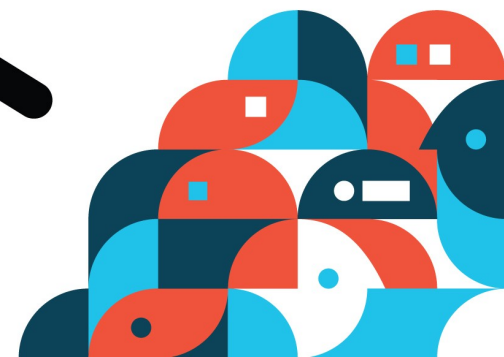
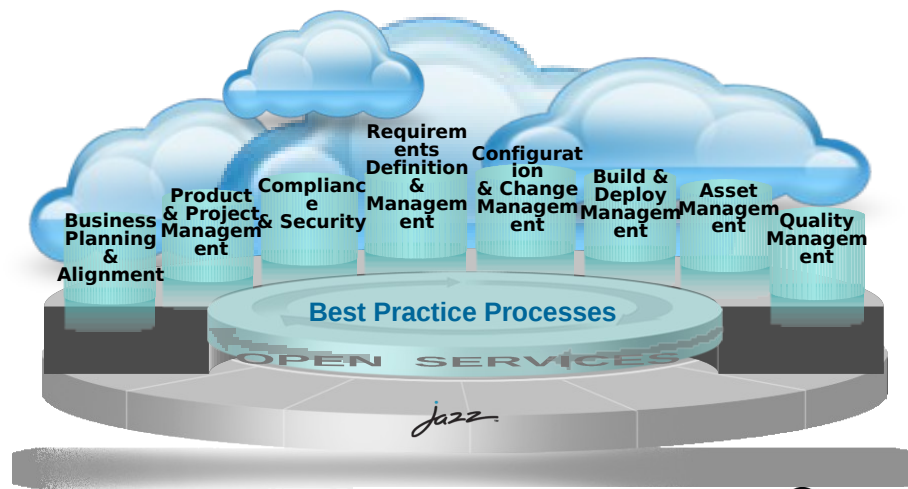




## Solution: IBM Rational cloud-based capabilities

*Available across IBM cloud infrastructures and beyond*

- **All IBM Rational software delivery lifecycle solutions are available on cloud infrastructures**
  - in your own private cloud environment or hosted by IBM
- **Pre-configured images are available today**
  - Rational collaborative lifecycle management solutions
  - Software Development environments on virtual developer desktops (including development tools for system z)
- **Images available for IBM Infrastructures**
  - Public or private clouds
- **Maximize existing Rational investments with Bring-Your-Own-License to the cloud**





## Expert assistance to get your cloud up and running quickly

- **Deployment Services:** Deployment of Rational solutions in IBM Private Cloud infrastructures using pre-assembled images
- **Integration Services** to integrate products in the cloud with other products applications both inside and outside the cloud
- **Customization Services:** Creation of custom images or any customizations to existing images for your software library/catalog
- **Migration services:** Helping customers to migrate data and application





# IBM Smart Business Desktop on the IBM Cloud

▪ Answers the infrastructure challenges of traditional desktops...

## Security Control of PCs

- Patch compliance
- Security risks in data and infrastructure
- Regulations

## Rising Cost of PC Management

- Deployment
- Support
- Controlling and tracking IT Assets
- Unpredictable IT costs



## IT Infrastructure Management Complexity

- Many makes and models
- Refresh cycles
- Standardization and availability

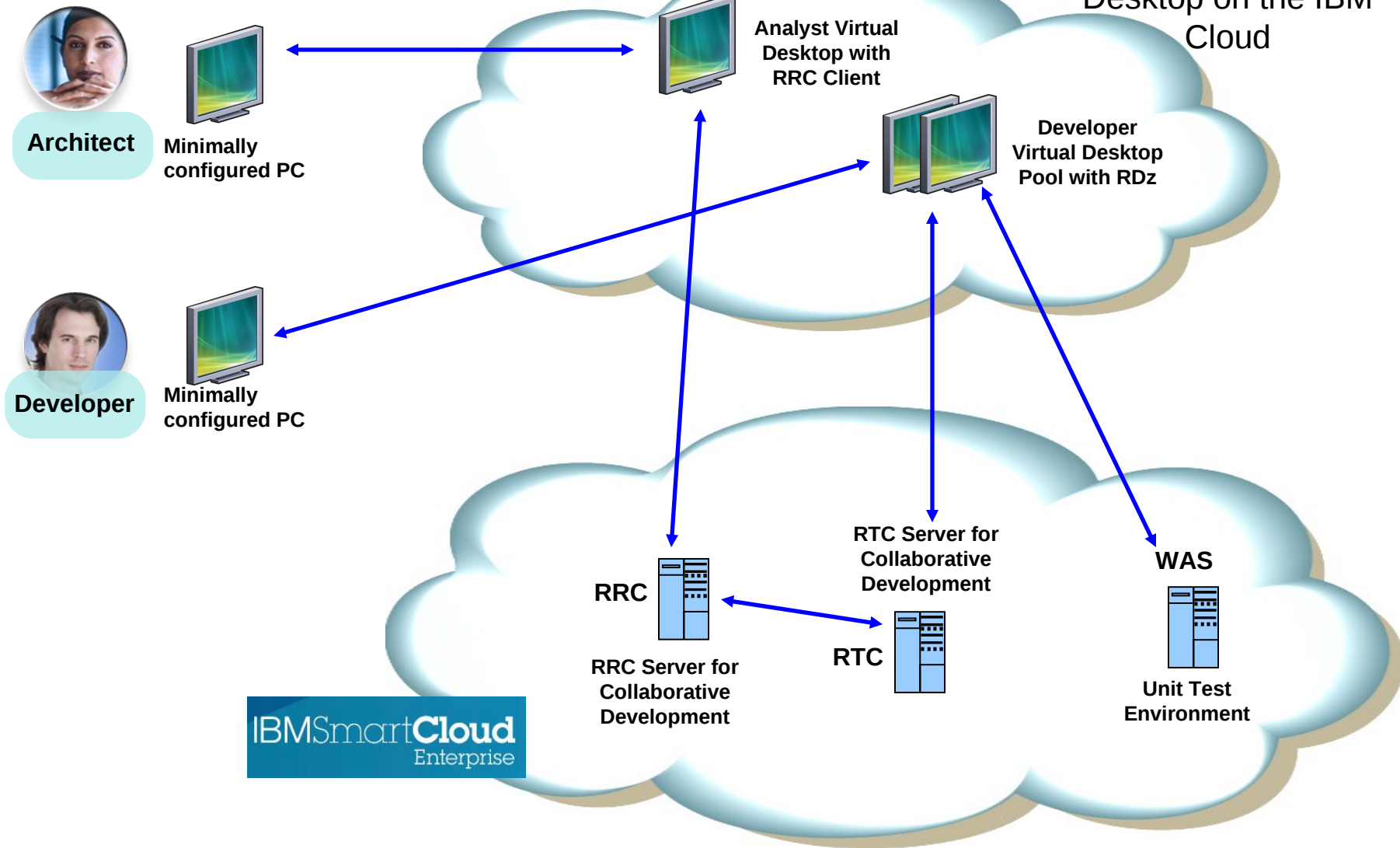
## Distributed Workforce

- Outsourcing and off-shoring
- Mobile and remote workers



# Virtualizing IDE, CLM and middleware services

IBM Smart Business Desktop on the IBM Cloud



## Case Study: Financial Services Conglomerate Case Study

### ■ Challenges:

- 8,000 applications, including 3,000 acquired, across multiple platforms
- Constant stream of change requests
- Fixed IT operations staff, frozen budget
- Communication and accountability problems across **25+ application teams**
- Separate “layered” one-off approach to OS, data center and application deployment
- Numerous deployment errors, manual workarounds
- Backlog of **2500 priority one requests**

### ■ Solution

- Repeatable consistent automation
- Deployment Reference Architecture



## Cloud Computing and z: Complementary solutions for workload deployment

- **It is important for organizations to differentiate and assign workload to appropriate systems:**
  - Stateful, long-running, database-intensive, transactional, core-business workloads: System z (z/OS in particular) is tuned and structured to support such workloads
  - Stateless, easily re-started, performance-enhancing, intermittent or bursty workloads, development and test workloads: Cloud environments can be a cost effective and valuable environment
- **How can organizations govern the process of deploying complex applications across multiple platforms?**
  - Deployment needs to be repeatable, fast and accurate
  - Across multiple platforms including z, web, distributed
  - On pre-configured middleware
  - Test environments need to replicate production





## The “Development / Operations” Gap

### ▪ Lack of Standardization

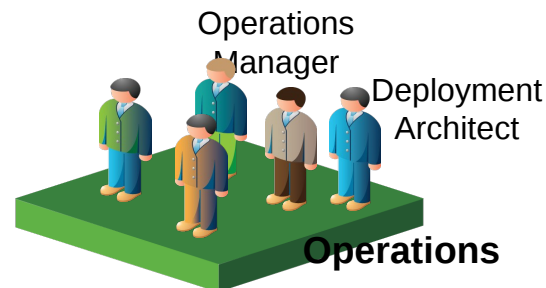
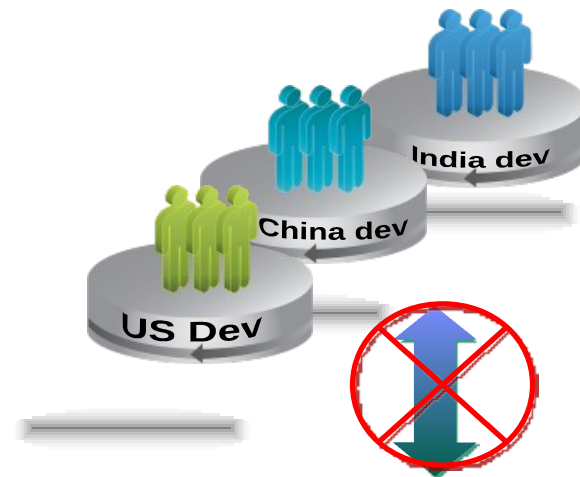
- Configuration and Infrastructure mismatches
- Gratuitous differences between Dev/Test and Production

### ▪ Development is from Mars, Operations is from Venus

- Architectural Tower of Babel
- Different objectives, cultures, and practices

### ▪ Complex Processes

- Manual, inconsistent deployment steps
- Lack of repeatability
- Automations are hard to build, maintain and reuse
- Difficult to validate



## Solution: IBM Deployment Planning and Automation

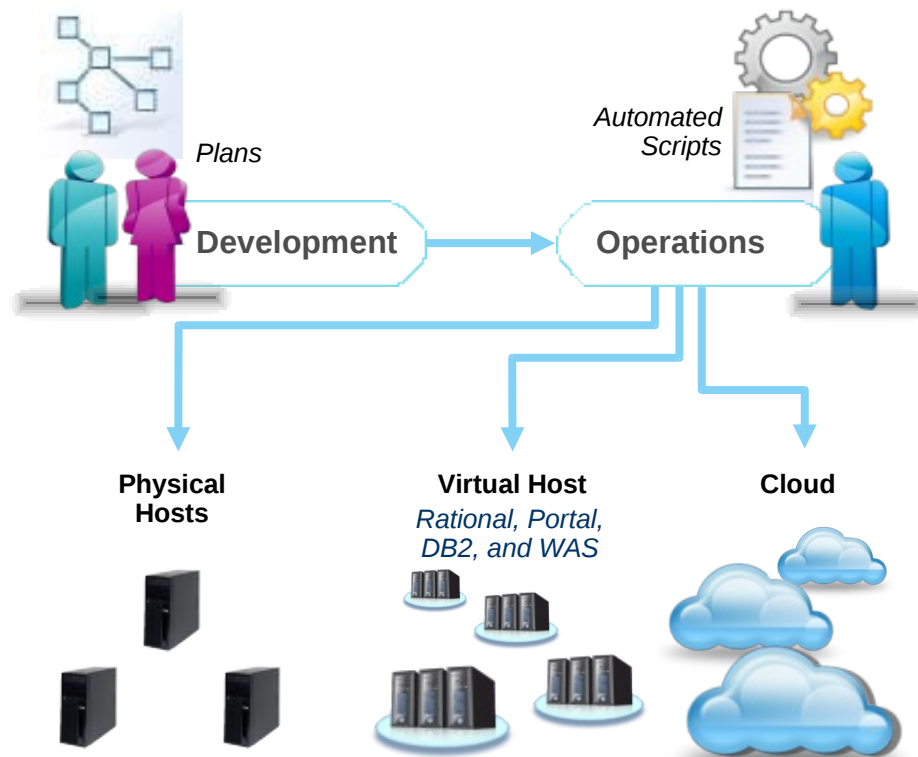
*Enable frictionless transitions across development and operations*

- **Gain intelligence into existing IT infrastructure and maximize benefits from existing assets**

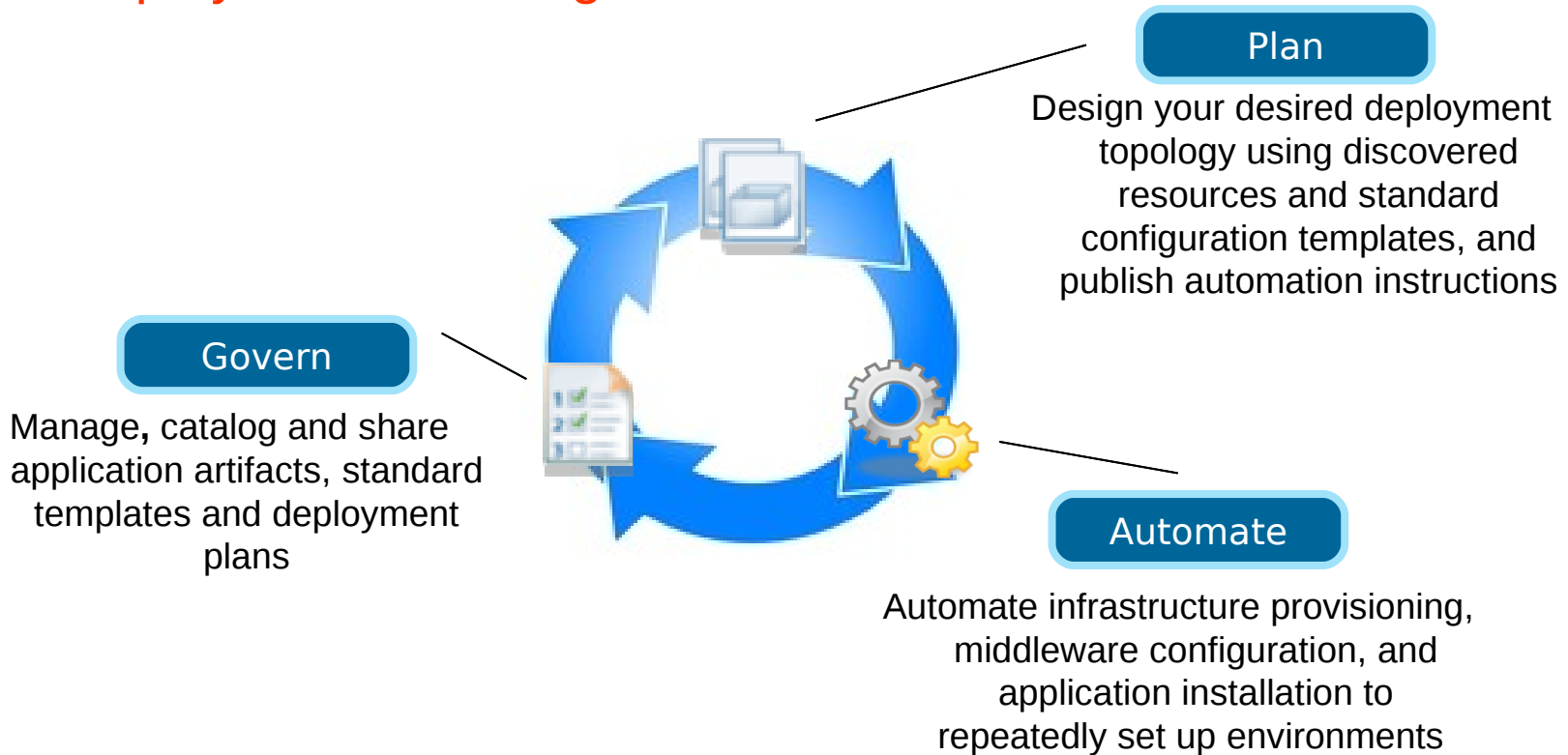
- Reduce IT maintenance effort and costs by discovering and reusing existing assets
- Speed deployment automation and leverage enhanced integrations to include server configuration in deployment plans

- **Deploy to the cloud – or anywhere!**

- Automate the process of deploying complex applications to the cloud by integrating with IBM Workload Deployer and IBM Service Delivery Manager



# IBM Deployment Planning and Automation



***Speed the delivery of high quality applications to physical environments, virtual environments, and cloud environments***



## Case Study: IBM and a Major Sporting Event team on Highly scalable load testing of a complex application

### The Challenge:

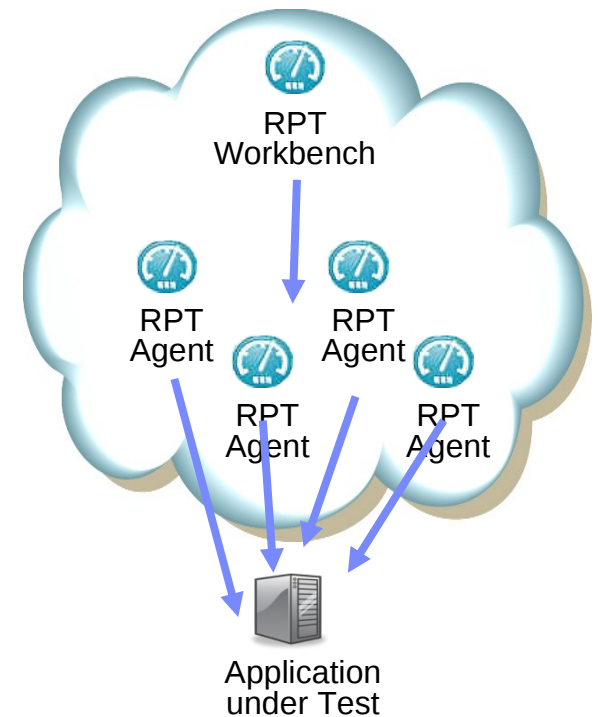
- Global Launch of new online Ticketing Registration Feature – a complex application across multiple platforms

### The Approach:

- Operations led development team to focus on non-functional requirements and the deployment architecture
- **Automated performance testing** to ensure scalability and stability
- **Leveraged the Cloud** to both **test** and **deploy** a scalable solution

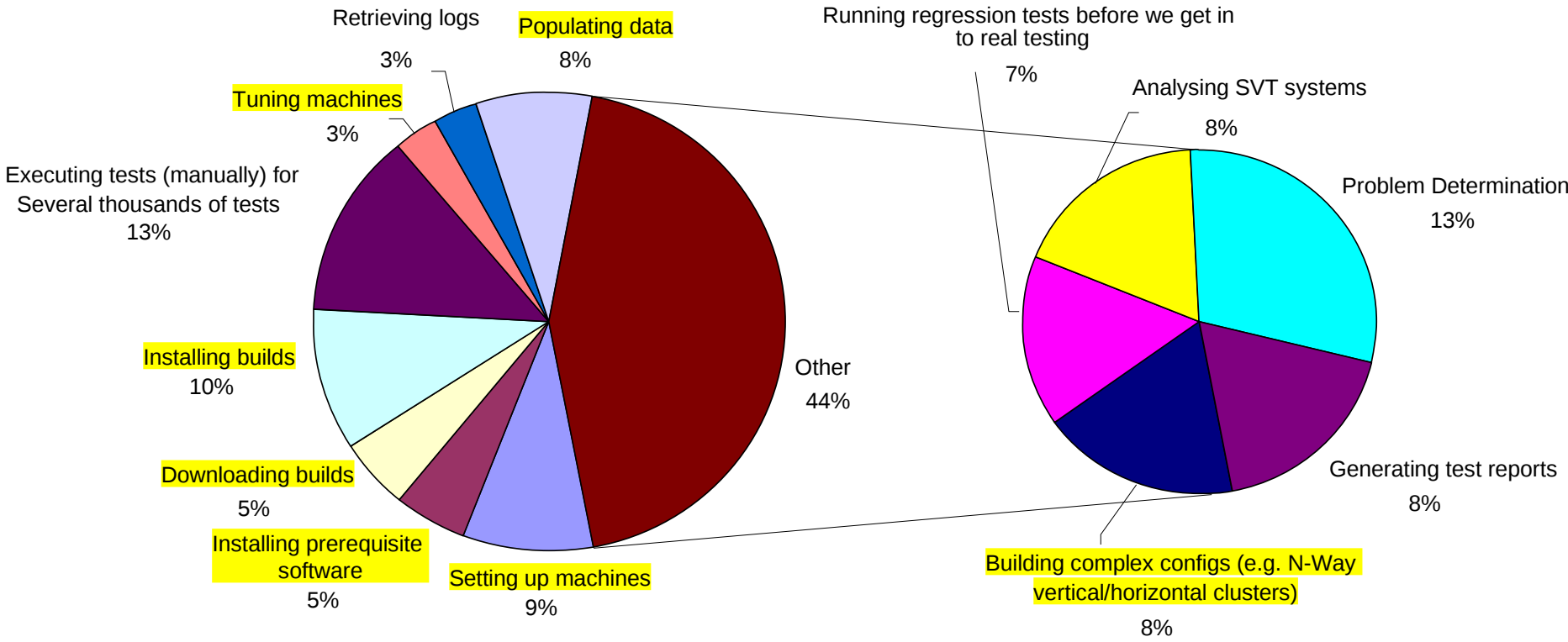
### The Results:

- Reduced infrastructure costs by leveraging cloud and reuse of test environment for operations
- Simulated thousands of concurrent users using RPT Agents on the cloud
- Faster time to market and more efficient operations
  - Development focus to improve operational characteristics
  - Improved Development/Operations collaboration





# Where do test teams spend time in test execution today?



**Areas of savings**

**Opportunity for cloud technology to cut test preparation costs by automating deployments and reducing rework caused by mistakes in manual processes.**

Data derived from experience in an IBM team.



## Infrastructure issues impact application testing

### Dev/Test Stakeholders – *Access, install, and setup pains*

- **Difficult to access / acquire test resources**, and tools on time
- **Long set up time, inadequate skills** to set up the test environment
- **Manual and error-prone** process working with Globally distributed IT and development teams
- Ability to prioritize and manage **combinatorial explosion** of configuration options

### Operations Stakeholders – *Setup, configuration and validation pains*

- **Long set up time** to setup apps, middleware, and configuration to mimic production
- Difficult to **acquire resources** to do adequate testing to assure quality
- **Manual and error-prone** process working with IT and development teams
- **Long and often error-prone process** to communicate with down stream IT and development
- **Difficult to test global** and outsourced applications

### IT Stakeholders – *Acquisition & setup pains*

- **Difficult and expensive to acquire** of hardware resources on time
- **Poor reuse** of resources
- **Long and often error-prone** set up of test machines, e.g. loading OS/Patches as per test specifications
- **Long lead time and error prone process** in meeting the needs of development and operations team
- **Difficult to scale up** with sharp ramp-up and ramp-down of resources



**Test Workload Pains**

## Testing moves towards the clouds

### Traditional Hardware

- Large Capital Expense for each team
- Underutilized hardware
- Time consuming setup/teardown
- Misconfigurations lead to rework



### Virtualized Labs

- Reduced CapEx, shared across a dept
- VM Images simplify setup
- VM Image sprawl – no image management
- Only provisions single images
- Multi-node configurations still manual
- Misconfigurations lead to rework



### Cloud-based Automated Labs

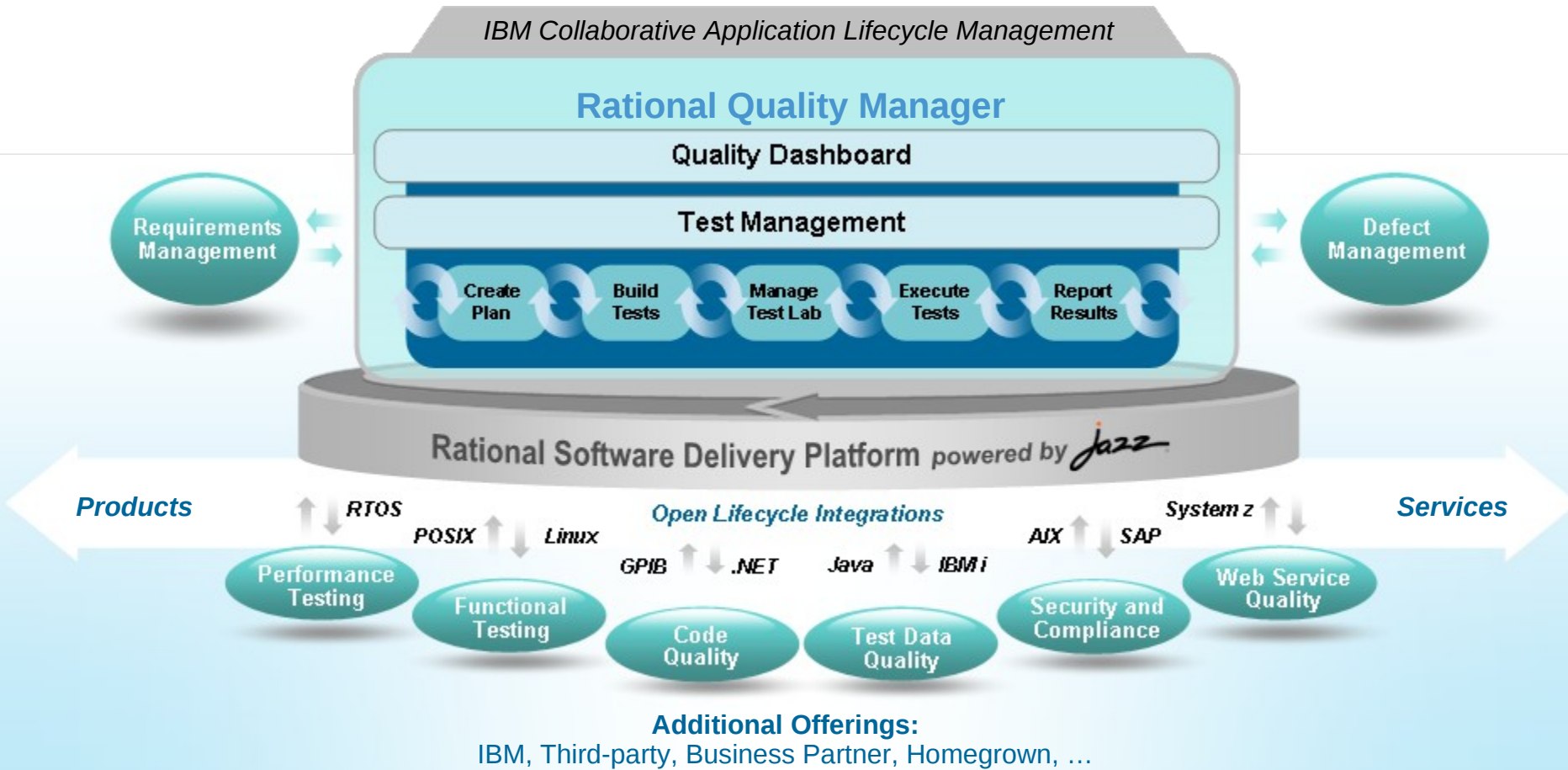
- Capital shared across divisions
- Integrated QM and Lab Management
- Modeled test environments map to cloud image “patterns”
- Infrastructure provisioned & configured
- Applications automatically deployed & configured
- Deployment info shared across dev, test, and ops
- Test tools also in the cloud





# Rational High Level Quality Management Architecture

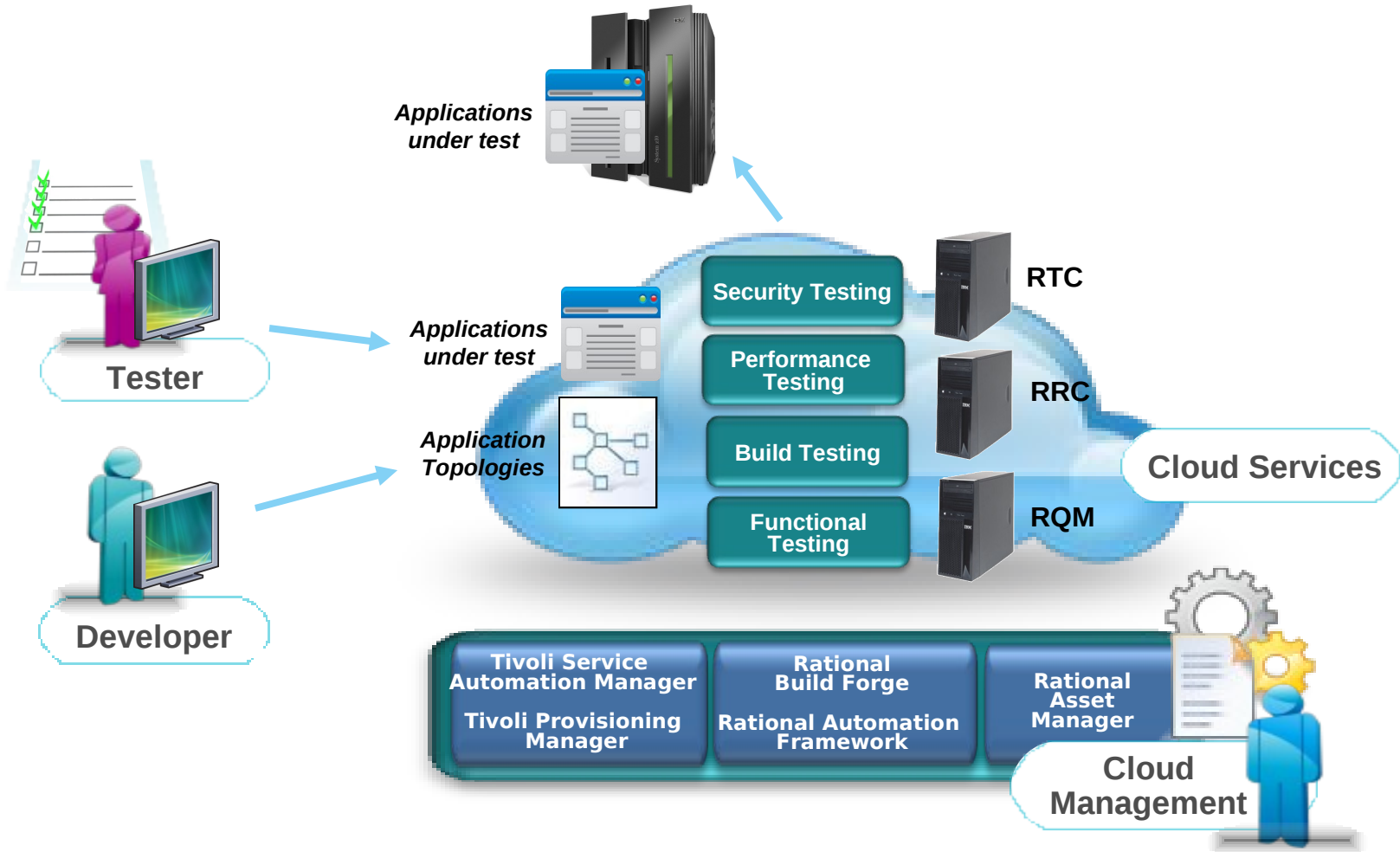
Optimize software quality with a centralized test management hub and integrated full lifecycle support across any platform and type of testing







# Rational Cloud Blueprint for Dev/Test Lab Provisioning



## Summary: Cloud is an opportunity for development and test for Complex, Enterprise Software Delivery



### Doing more with less

Reduce capital expenditures and operational expenses



### Reducing risk

Ensure the right levels of security and resiliency across all business data and processes



### Higher quality services

Improve quality of services and deliver new services that help the business grow and reduce costs

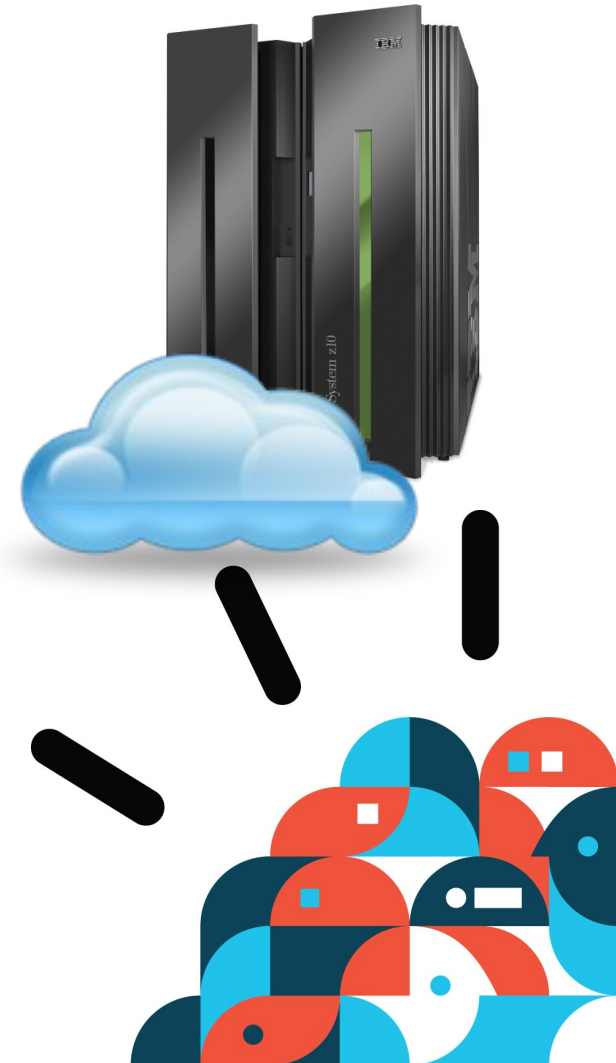


### Breakthrough agility

Increase ability to quickly deliver new services to capitalize on opportunities while containing costs and managing risk

## Summary: Cloud is an opportunity for development and test for Complex, Enterprise Software Delivery

- In today's world, complex applications are expected to run across multiple platforms, including system z, distributed, cloud and web.
- Cloud and z are complementary solutions for workload deployment
- IBM addresses the challenges of developing software in a rapidly changing environment by providing solutions that:
  - Leverage the cloud for more effective software delivery, across multiple platforms, including z
  - Run on the cloud to reduce the resource costs and time associated with enabling globally distributed development and test teams
  - Target the cloud and other platforms to automate deployment of complex applications for production or test.





# QUESTIONS

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



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# Cloud increases delivery velocity

*Reducing development cycle time*

