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 Cloud Applications

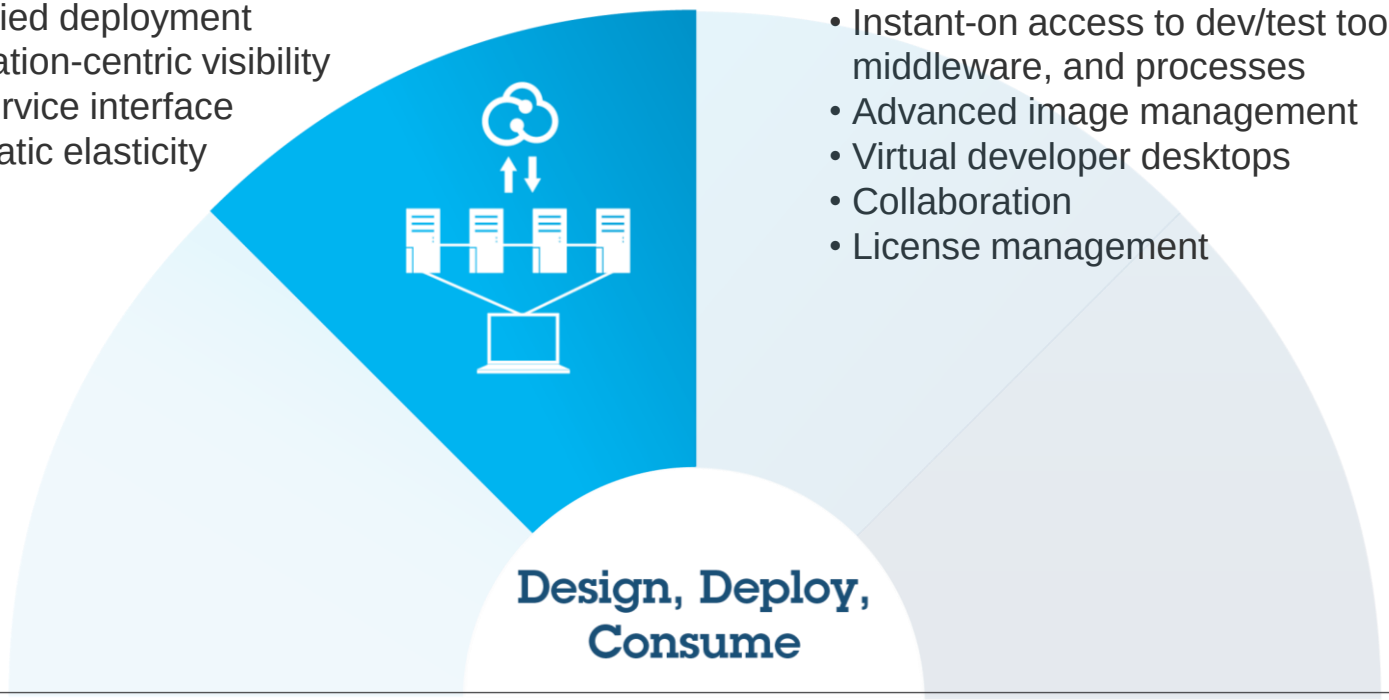
Role:
- Sr. IT Operations Leader
- Sr. Development Manager & Developers

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

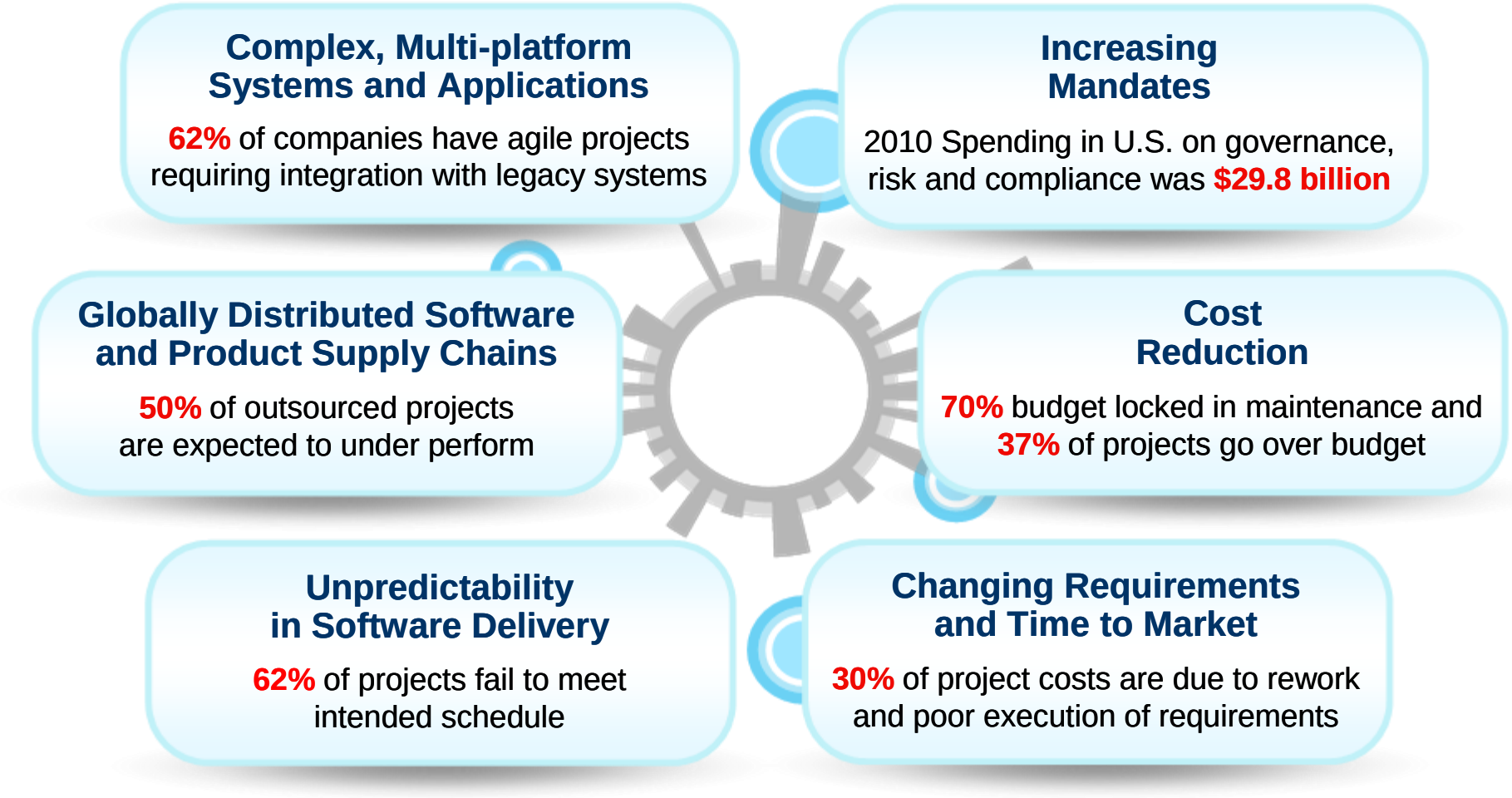


Executive Overview

- 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



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

Capabilities LEVERAGING the Cloud

5. **Test Lab Automation**

Capabilities TARGETING the Cloud

4. **Deployment Planning and Automation**:
   - Deployment automation for Dev & Test
   - Governance of cloud images

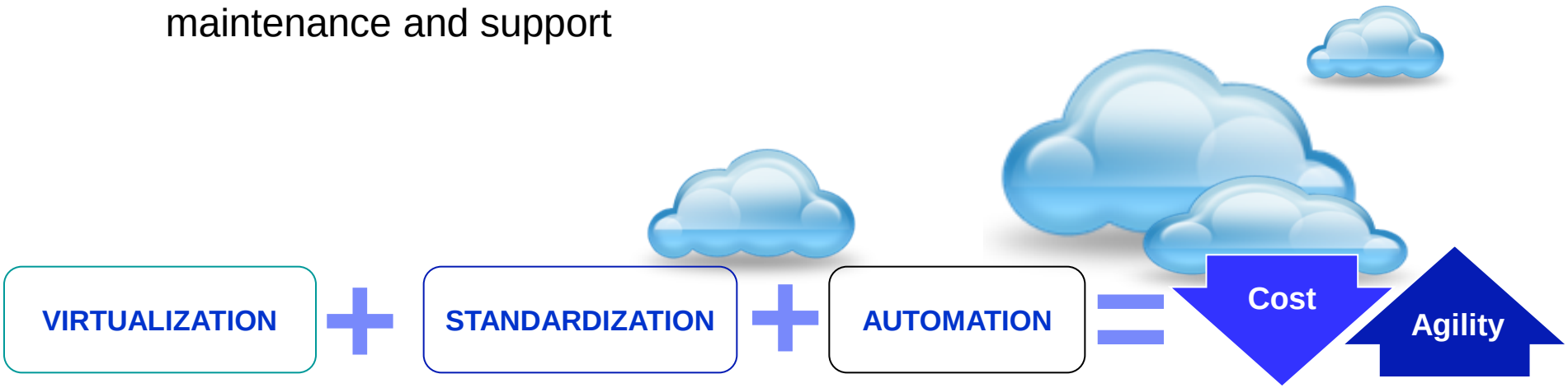
Case Study: A Global Hospitality Client

- **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

IBM SmartCloud Enterprise

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

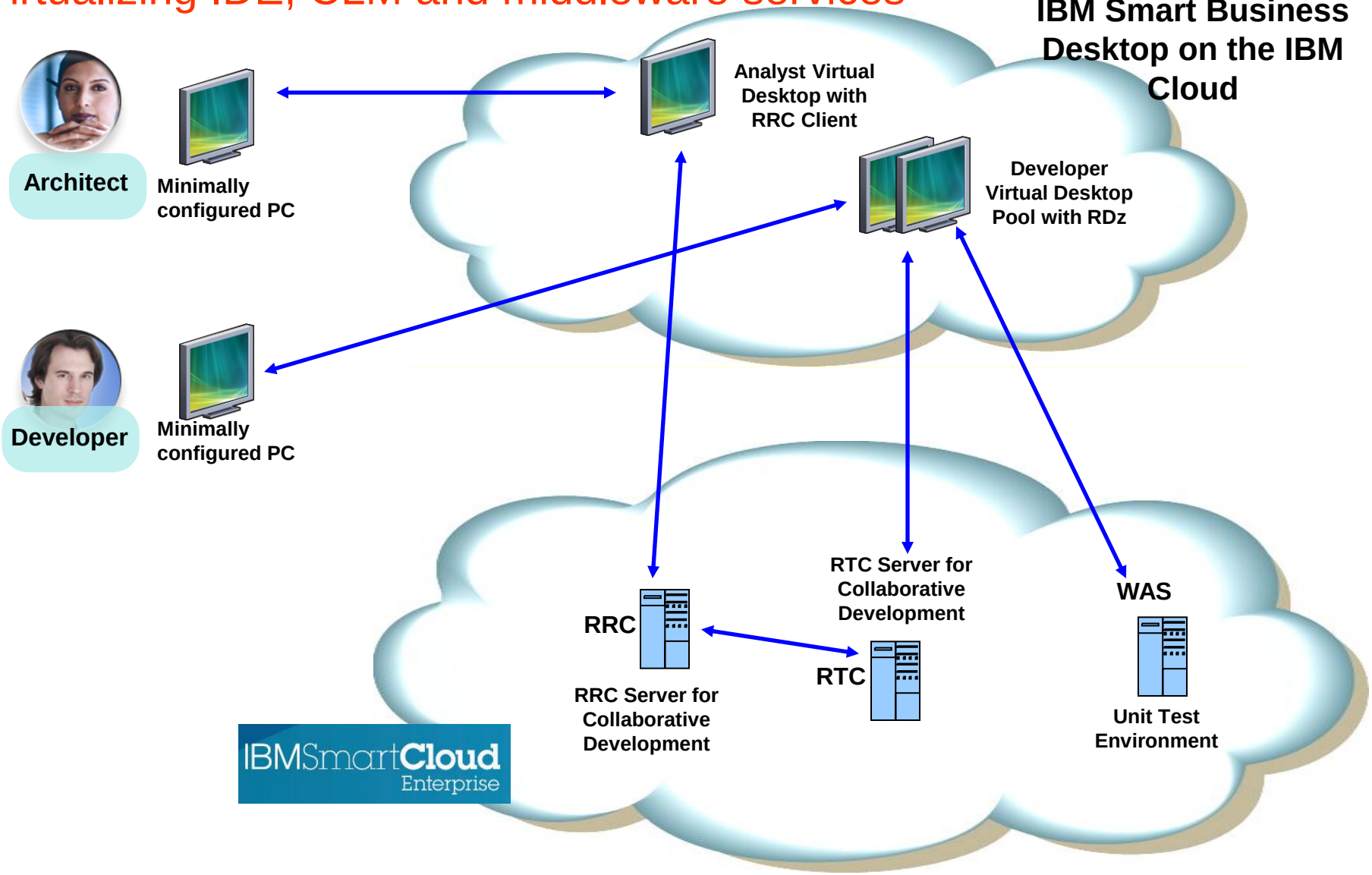
IT Infrastructure Management Complexity

- 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



Case Study: Financial Services Conglomerate Case Study

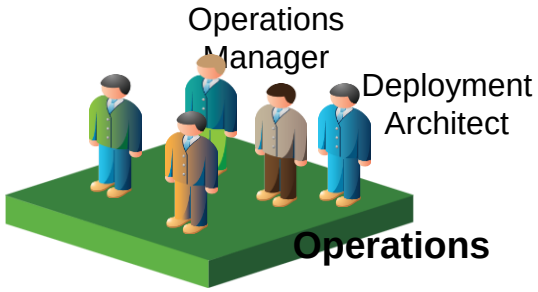
- **Challenges:**
  - 8,000 applications, including 3,000 acquired, across multiple platforms
  - Constant stream of change requests
  - Fixed IT operations staff, frozen budget
  - Communication and accountability problems across **25+ application teams**
  - Separate “layered” one-off approach to OS, 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

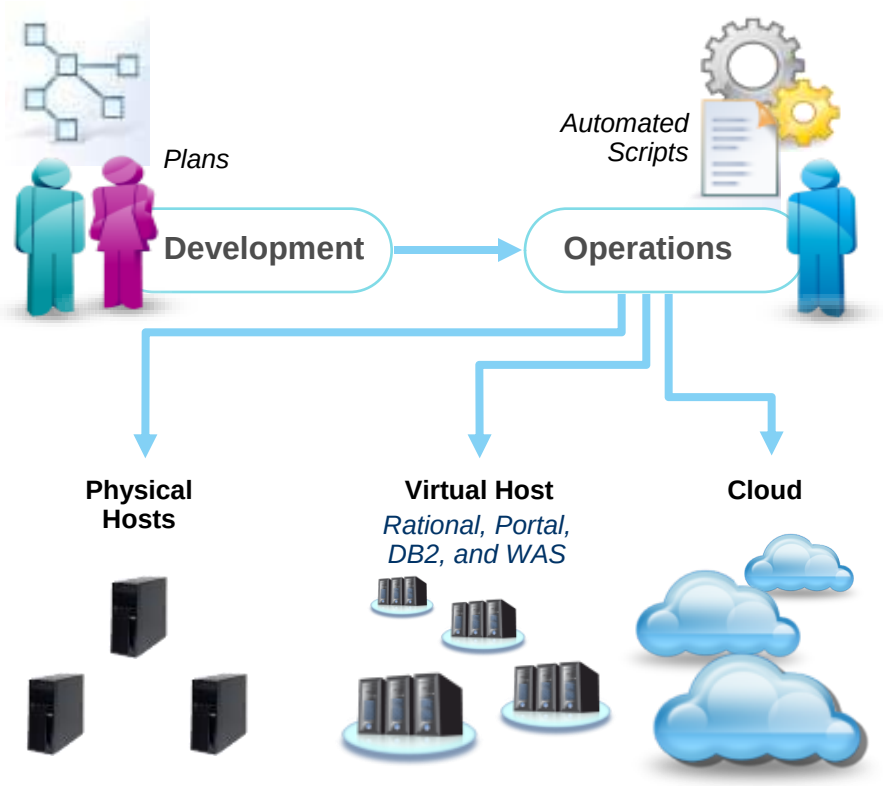
- **Lack of Standardization**
  - Configuration and Infrastructure mismatches
  - Gratuitous differences between Dev/Test and Production
- **Development is from Mars, Operations is from Venus**
  - Architectural Tower of Babel
  - Different objectives, cultures, and practices
- **Complex Processes**
  - 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

Plan

Design your desired deployment topology using discovered resources and standard configuration templates, and publish automation instructions

Govern

Manage, catalog and share application artifacts, standard templates and deployment plans

Automate

Automate infrastructure provisioning, middleware configuration, and application installation to repeatedly set up environments

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

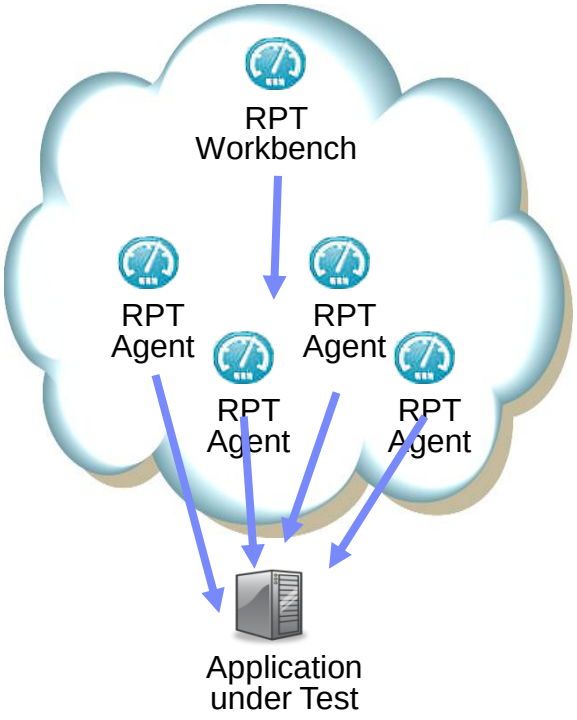
Case Study: IBM and a Major Sporting Event team on Highly scalable load testing of a complex application

The Challenge:

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

The Approach:

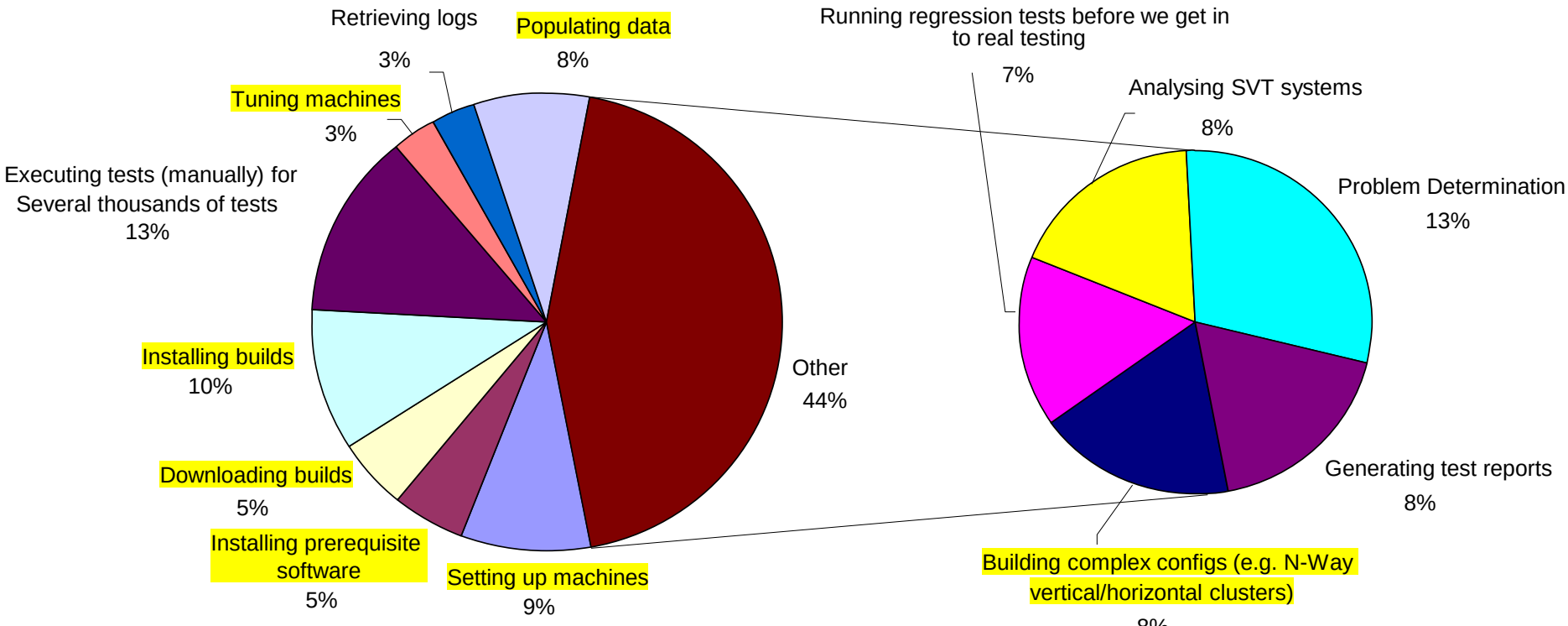
- Operations led development team to focus on non-functional requirements and the deployment architecture
- ***Automated performance testing*** to ensure scalability and stability
- ***Leveraged the Cloud*** to both ***test*** and ***deploy*** a scalable solution



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

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

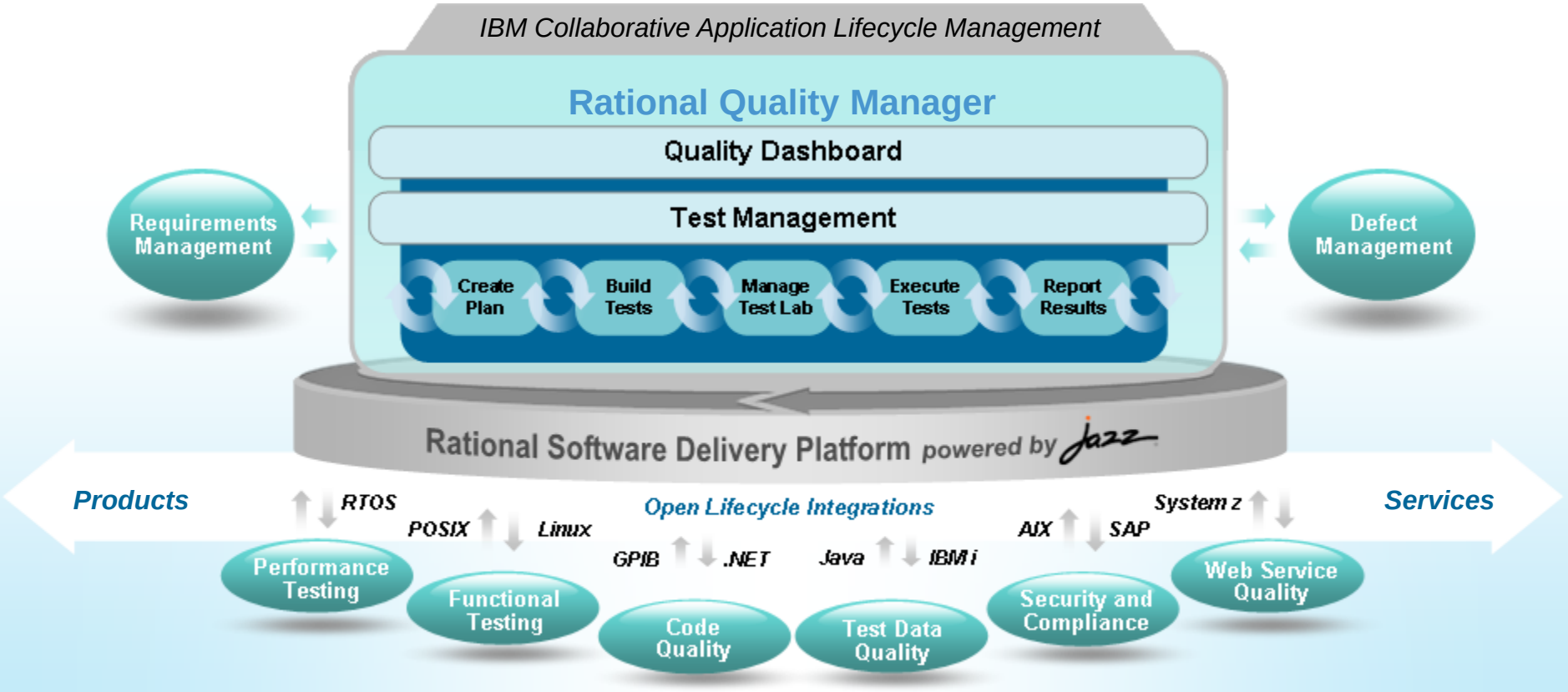
- Reduced CapEx, shared across a dept
- VM Images simplify setup
- VM Image sprawl – no image management
- Only provisions single images
- Multi-node configurations still manual
- Misconfigurations lead to rework

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

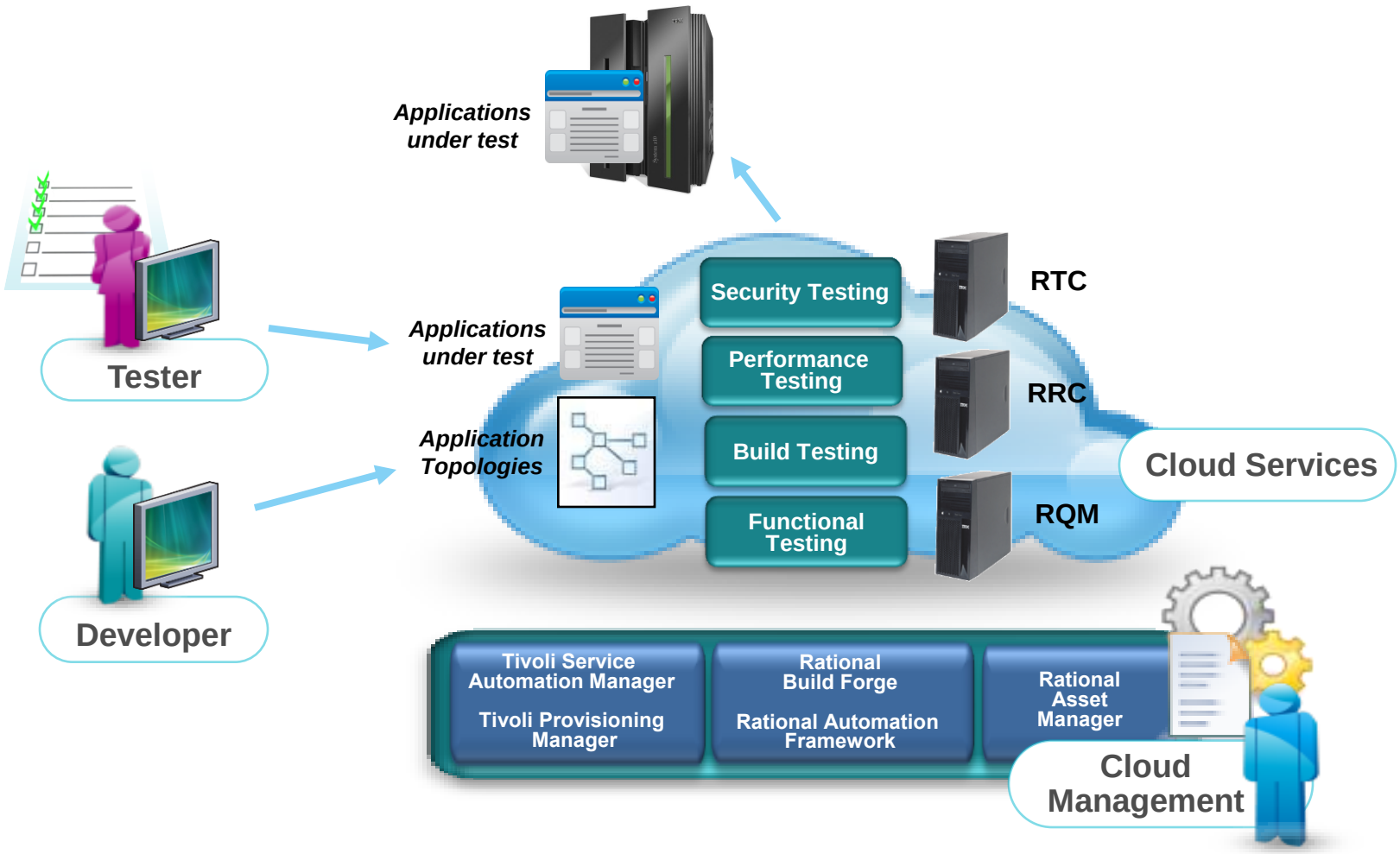
Rational High Level Quality Management Architecture

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



Additional Offerings:
IBM, Third-party, Business Partner, Homegrown, …

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 deelopment and test teams
  - Target the cloud and other platforms to automate deployment of complex applications for production or test.

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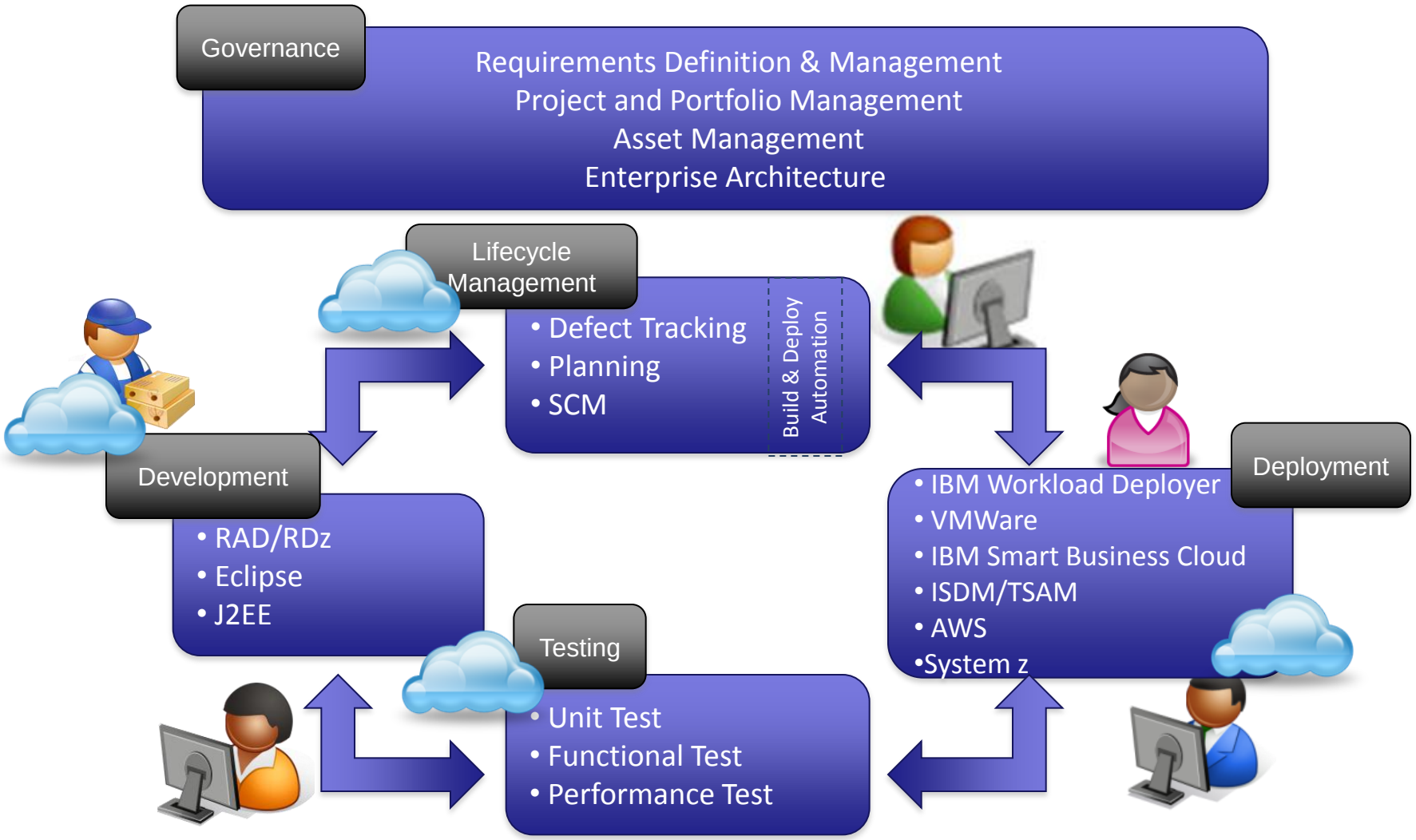
Cloud increases delivery velocity

Reducing development cycle time