Innovate2010

The Rational Software Conference

Let's build a smarter planet.

Why Cloud Computing is relevant for Development and Test Environments?

Ashok Reddy

Director, Offering Strategy and Delivery

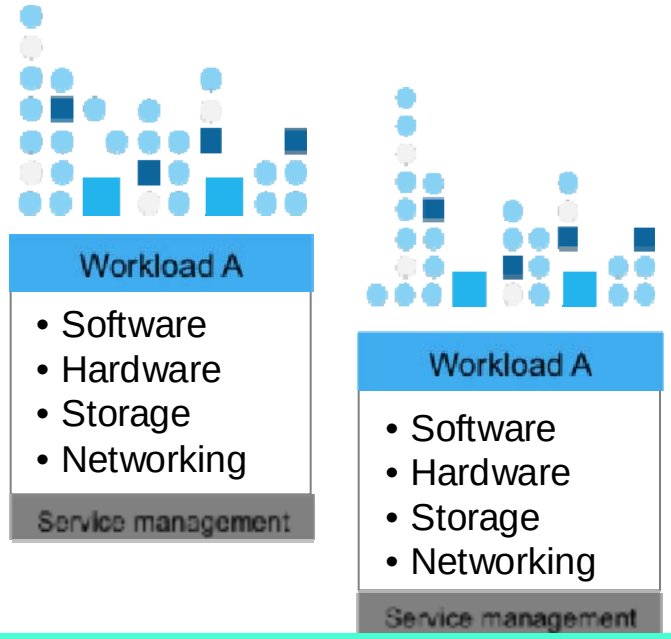
IBM Rational software

Agenda

- **Cloud Computing: Overview**
- Why Cloud Computing is relevant for Development and Test Environments?
- Cloud Development and Test Scenarios
  - For the cloud solutions
  - On the cloud solutions

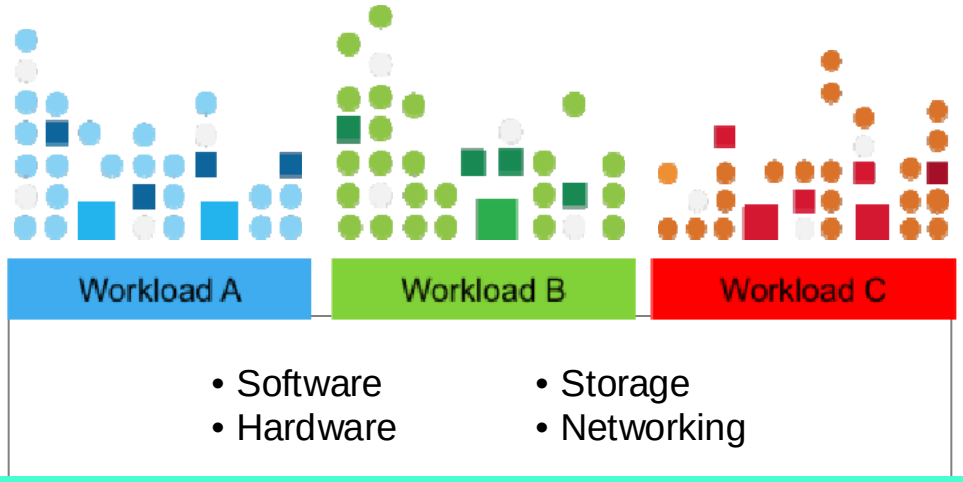
What is different about cloud computing?

Without cloud computing



With cloud computing

- Virtualized resources
- Automated service management
- Standardized services
- Location independent
- Rapid scalability
- Self-service



In essence, Cloud Computing is highly virtualized infrastructure with internet becoming the“operating system”

New consumption and delivery models drive new sourcing options and business flexibility

Flexible Delivery Model

Private …

- Dedicated resources
- On your own internal network
- Highly available
- Customizable
- Most secure and auditable
- Can integrate with legacy solutions

Considerations …

- Flexibility, Customization
- Standardization
- Security, privacy, availability

Hosted by a provider…

- Shares resources
- Hosted and managed by service provider
- Delivers standardized services
- Flexible, pay-per-use basis
- Lowest cost of entry

*If **security**, customization, **availability** and **integration** are critical, then look to private cloud*

*If **reduced overhead, flexibility** and **low entry cost** are important, then look to hosted cloud*

Comparing Software as a Service (SaaS) and Cloud

Software-as-a-Service (SaaS) is not Cloud. However, Cloud helps deliver SaaS

Cloud helps you to deploy and utilize your licensed software more efficiently

Business Models

Rent (Subscription) ***versus*** ***Own***

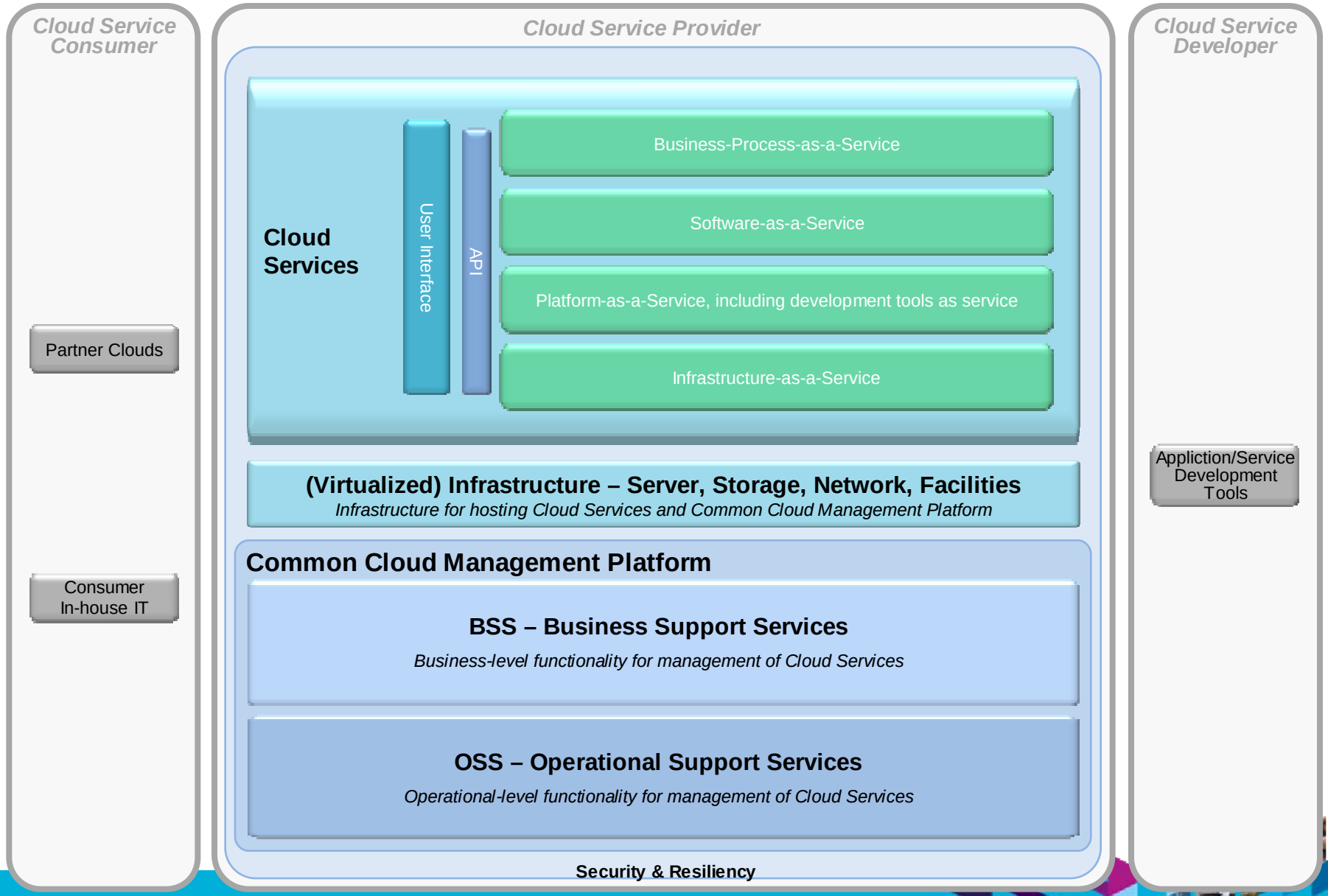
- **Profile:** Customers prefer not owning software or associated hardware. Looking for an **flexible or temporary utilization** and **lower cost of entry**.

- ***SaaS is a business model to rent software and the environment***
- ***Services are usually hosted off-premise***

- **Profile:** Customers require **frequent/constant use** of software **guaranteed availability**. Owns hardware, may have perpetual use license.

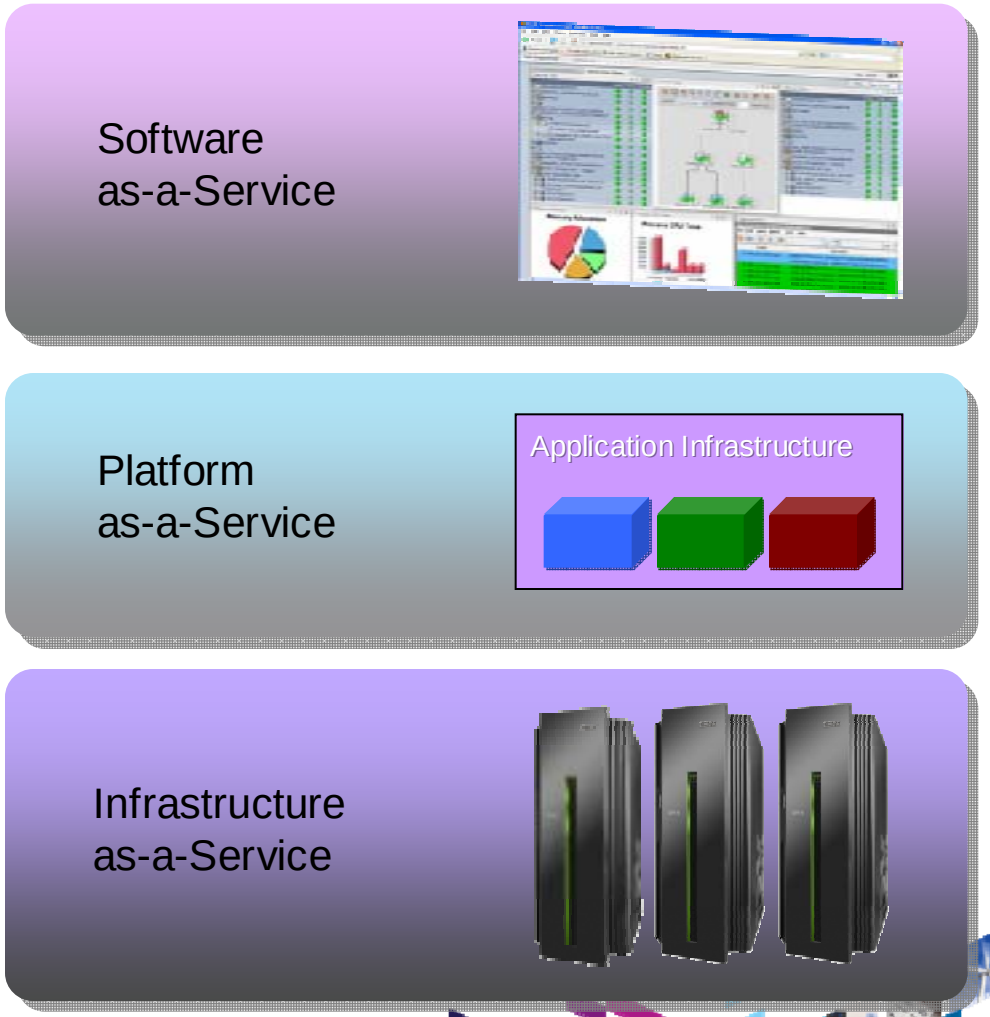
- ***Cloud is a deployment model whereby customers use their 'licensed' software***
- ***Services may be hosted on or off-premise***

Cloud Services: Cloud Common Reference Architecture



PaaS vs IaaS

- In IaaS, the central abstraction is a **virtual machine**. The IaaS cloud provides compute hardware, network and storage to run a collection of virtual machine images. IaaS does not understand or care about the software running inside the virtual machine.
- In PaaS, the central abstraction is the **application**. The PaaS cloud provides middleware runtimes, security, databases, connectivity, caching, routing and other resources to enable execution of the application. PaaS has a **viewpoint** on application, supporting a particular set of programming models and **understanding** the execution of the application deeply.

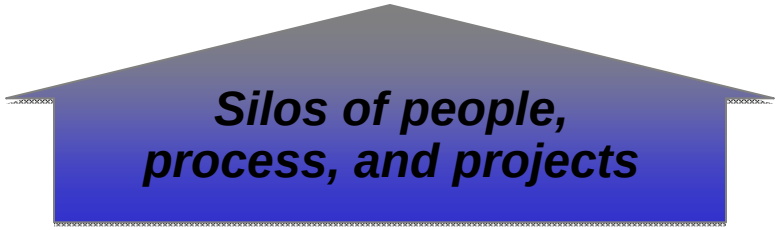


Agenda

- Cloud Computing: Overview
- **Why Cloud Computing is relevant for Development and Test Environments?**
- Cloud Development and Test Scenarios
  - For the cloud solutions
  - On the cloud solutions

Why Cloud is relevant for on the cloud development and test?

85% of computing capacity sits idle
30 to 50% of servers dedicated to test, test servers run < **10%** utilization
30% of all defects caused by wrongly configuration of dev/test environ.



Complex Infrastructure

- Lengthy on-boarding
- Acquiring, installing, configuring and managing environments

High Costs

- Low utilization rates
- Cost inefficiencies
- Poor LoB oversight

Chaos

- Weak project governance
- Lack of domain expertise
- Lack of standardized tools and processes

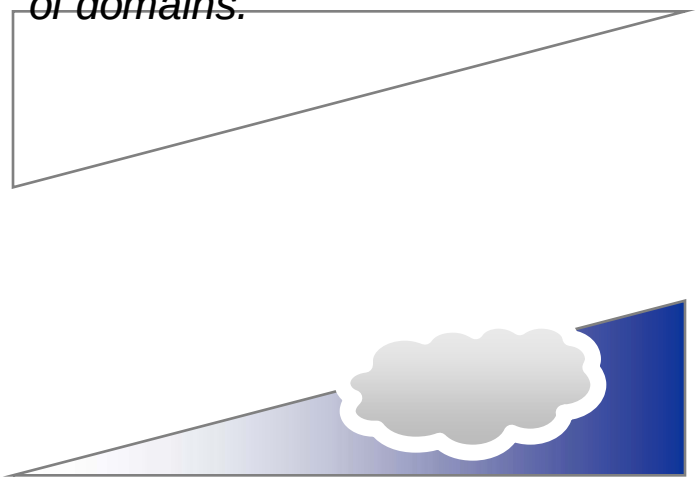
* "Industry Developments and Models – Global Testing Services: Coming of Age," IDC, 2008 and IBM Internal Reports

On the cloud benefits for Software Development and Test

Real improvement from customer implementations

Capability	From	To
Server/Storage Utilization	10-20%	70-90%
Self service	None	Unlimited
Test Provisioning	Weeks	Minutes
Change Management	Months	Days/Hours
Release Management	Weeks	Minutes
Metering/Billing	Fixed cost model	Term/value based
Payback period for new services	Years	Months

Cloud accelerates business value across a wide variety of domains.



Legacy environments ⟷ **Cloud enabled enterprise**

Benefits of leveraging Cloud for Development and Test

Traditional

High deployment costs to deliver software

- Reduced installation and administration costs
- Lower TCO by improved utilization of software assets

Control and governance chaos in software processes

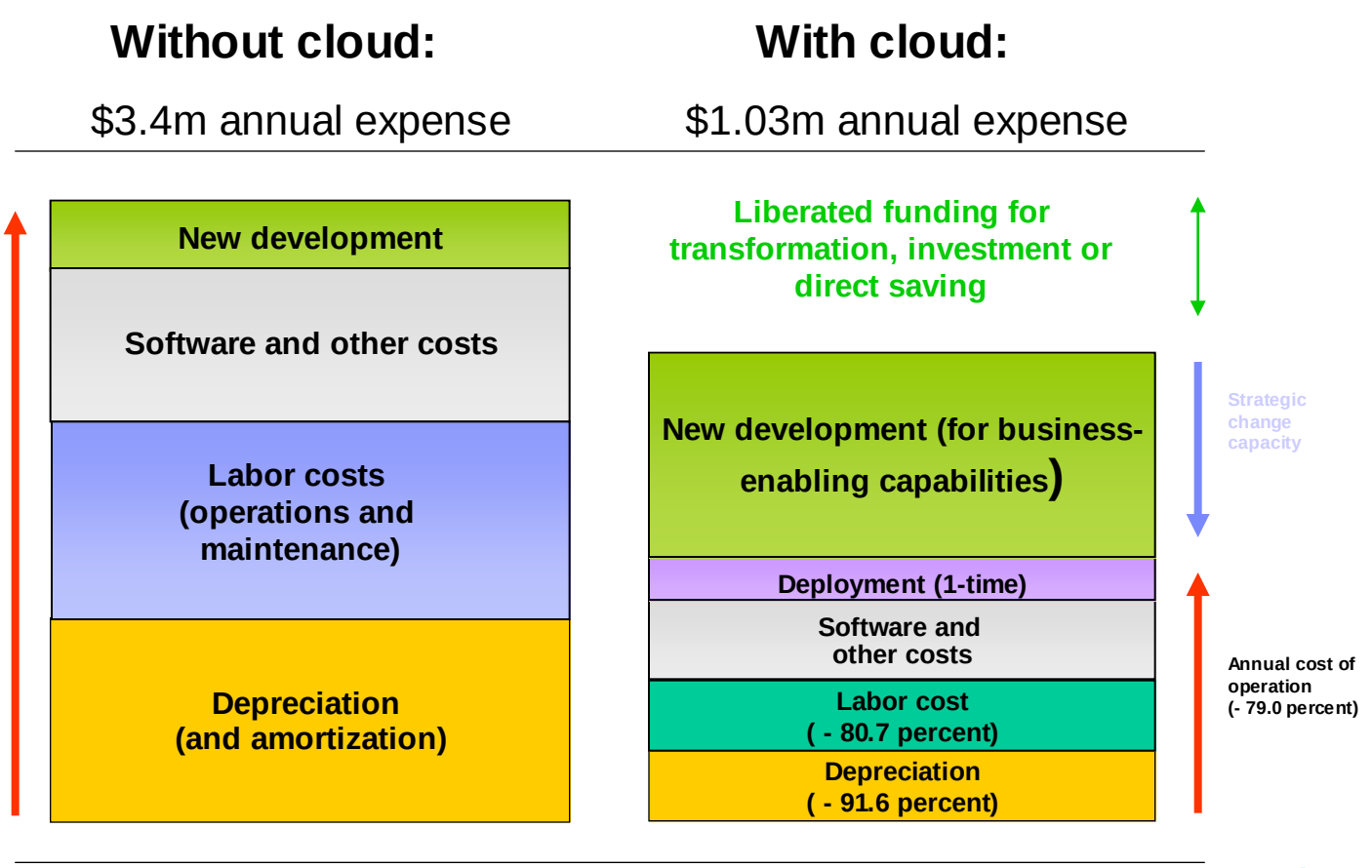
- Better governance through standardized delivery of services
- Preconfigured software embodying best practices

Onramp and on-boarding of teams reduces time to software delivery

- Tools can be provisioned in minutes. No download, installation or setup.
- Self-administered portal to access to software resources for a globally distributed team

Example savings:IBM Smart Business Development & Test Cloud (Private Cloud)

- Typical cost savings of 50 percent or more with payback within 12 months

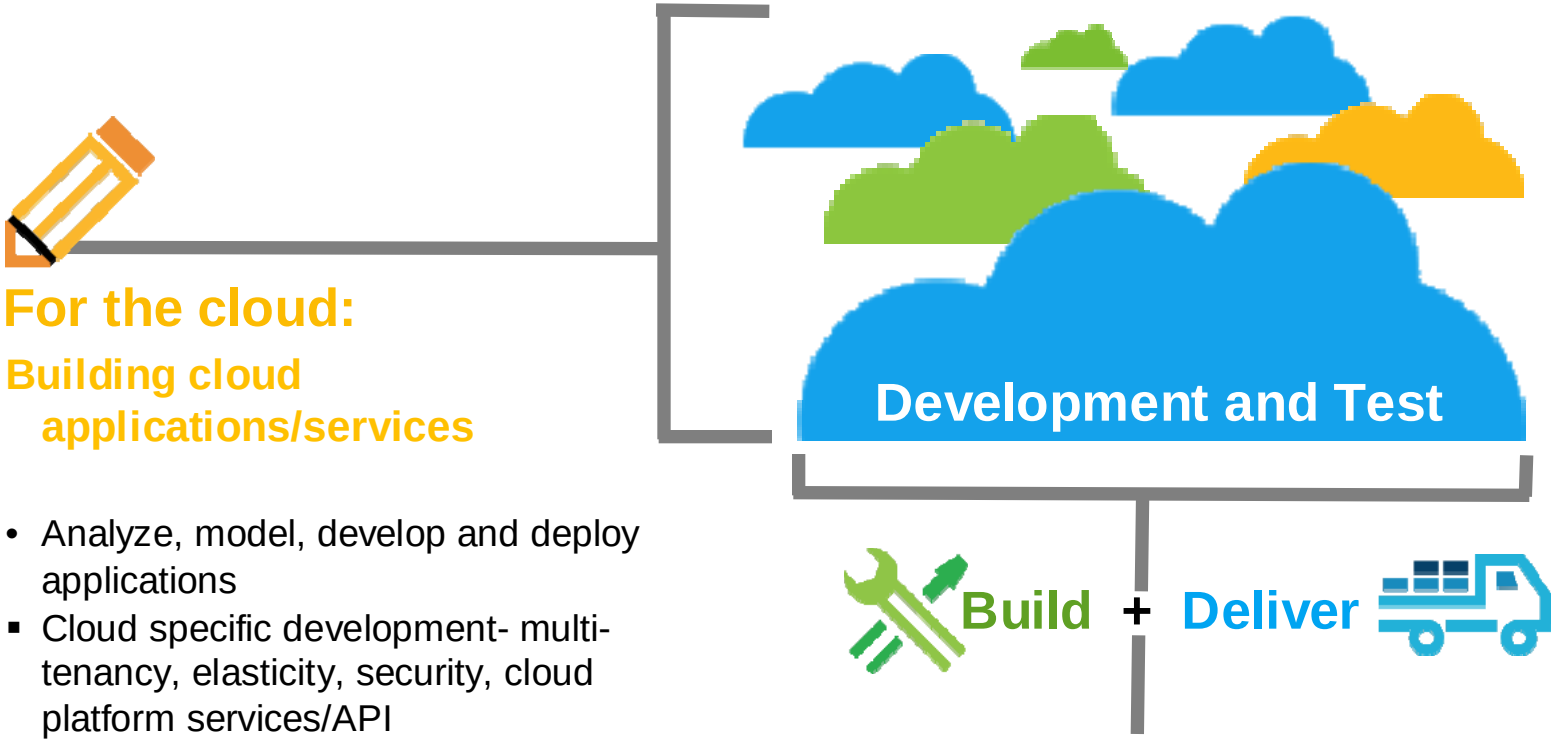


Note: 5-year depreciation period with 5 percent discount rate

Agenda

- Cloud Computing: Overview
- Why Cloud Computing is relevant for Development and Test Environments?
- **Cloud Development and Test Scenarios**
  - For the cloud solutions
  - On the cloud solutions

Development and Test: For the Cloud and On the Cloud



For the cloud:

Building cloud applications/services

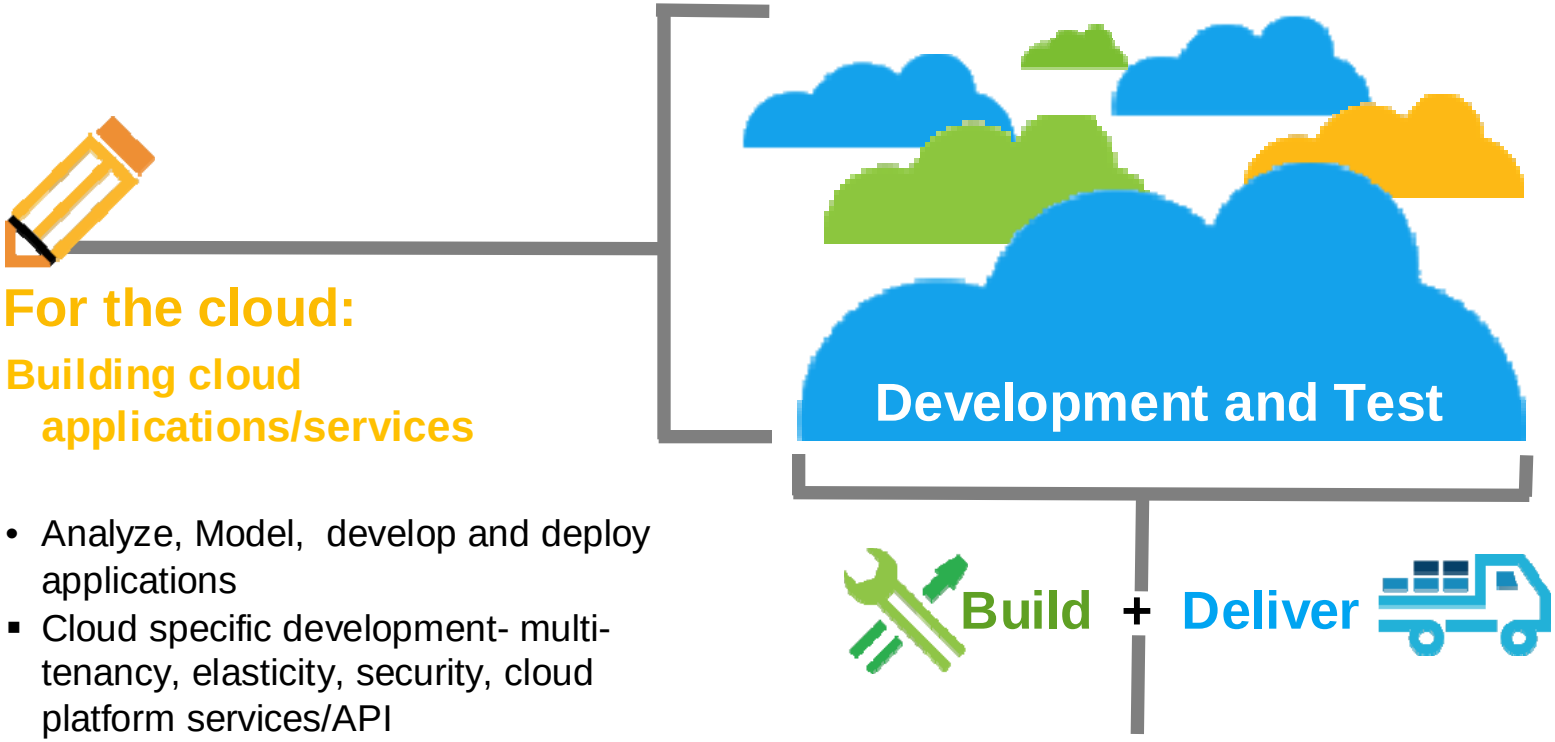
- Analyze, model, develop and deploy applications
- Cloud specific development- multi-tenancy, elasticity, security, cloud platform services/API
- Determine delivery model (private, public, hybrid) and PaaS/IaaS
- Reuse, refactor, move existing applications to cloud
- Lifecycle Management

On the Cloud:

Application Lifecycle Management leveraging the cloud

- Agile Development, Quality Management, Requirements, Build Automation and Asset Management Services

Development and Test: For the Cloud and On the Cloud



For the cloud:

Building cloud applications/services

- Analyze, Model, develop and deploy applications
- Cloud specific development- multi-tenancy, elasticity, security, cloud platform services/API
- Determine delivery model (private, public, hybrid) and PaaS/IaaS
- Reuse, refactor, move existing applications to cloud

On the Cloud

Application Lifecycle Management leveraging the cloud

- Agile Development, Quality Management, Requirements, Build Automation and Asset Management Services

Challenges addressed by Development and Test: For the Cloud

Public Service

Private

IBM Cloud

Amazon EC2

Private and Private-Managed by IBM or Partners

Private
VMWare, Xen/KVM, pSeries, zLinux

© 2010 IBM Corporation

Analyze, Model and Automated Deployment: For the cloud

- **Complicated application deployments are expensive, error-prone**
  - Development, test, and ops each have to deploy the application
  - Manual, time-consuming, error-prone
  - No shared understanding of deployment
  - No shared automations
  - Configuration errors cause defects

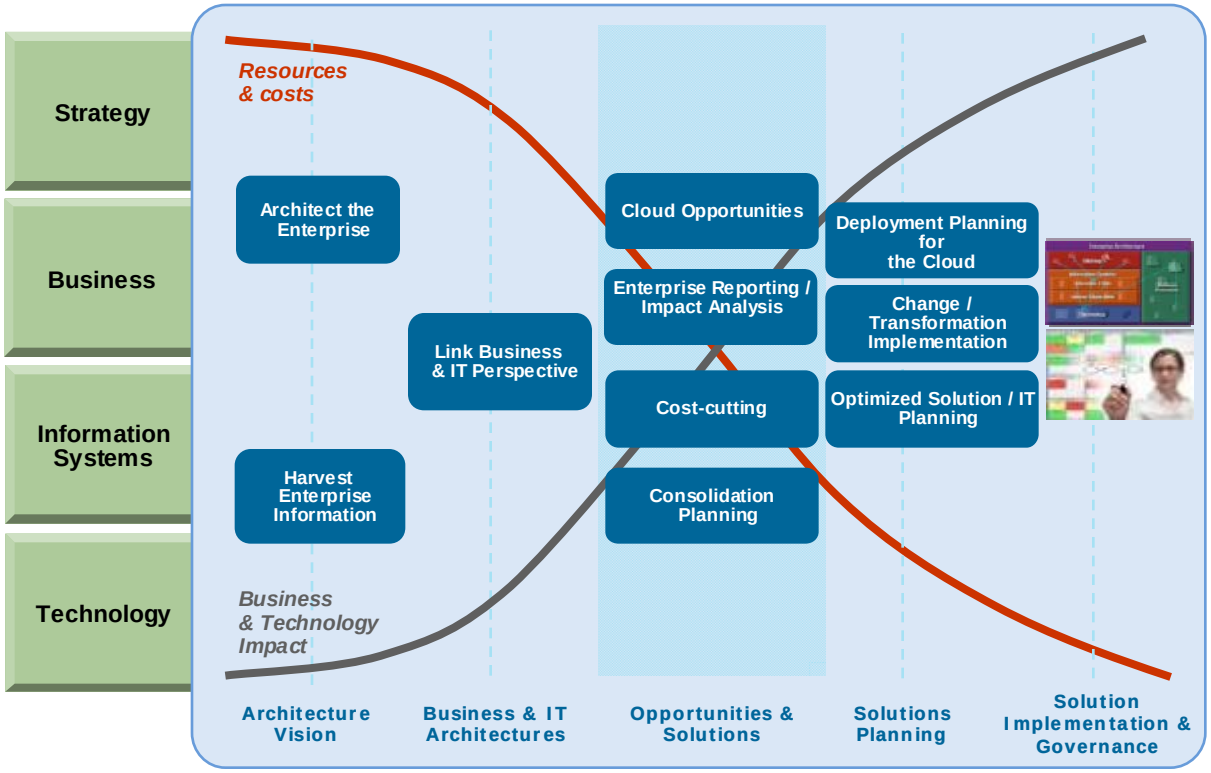
- **Solution**:
  - Cloud planning and strategy, reduce risk in deployment (System Architect and RAM)
  - Model the deployment, leveraging patterns (Rational Software Architect 8.0)
  - Dynamically provision infrastructure on the cloud
  - Generate deployment workflow (RAFW) from the models

Actionable enterprise architecture guides successful transformation to cloud

Cloud planning and strategy, reduce risk in deployment

Analyze, decide and plan how and when to leverage cloud – risk vs. reward

- Connect business needs to cloud strategy and deployment
- Use unified cloud analysis & reporting platform
- Understand dependencies (cloud/non-cloud services)
- Create roadmaps for cloud transition
- Connect cloud targets and templates to solution delivery
- Identify services for reuse



Automated Deployment to the Clouds

Traditional Deployments

- Free-form data
- Ad-hoc topology descriptions
- Many Manual Tasks
- Time consuming and error-prone setup

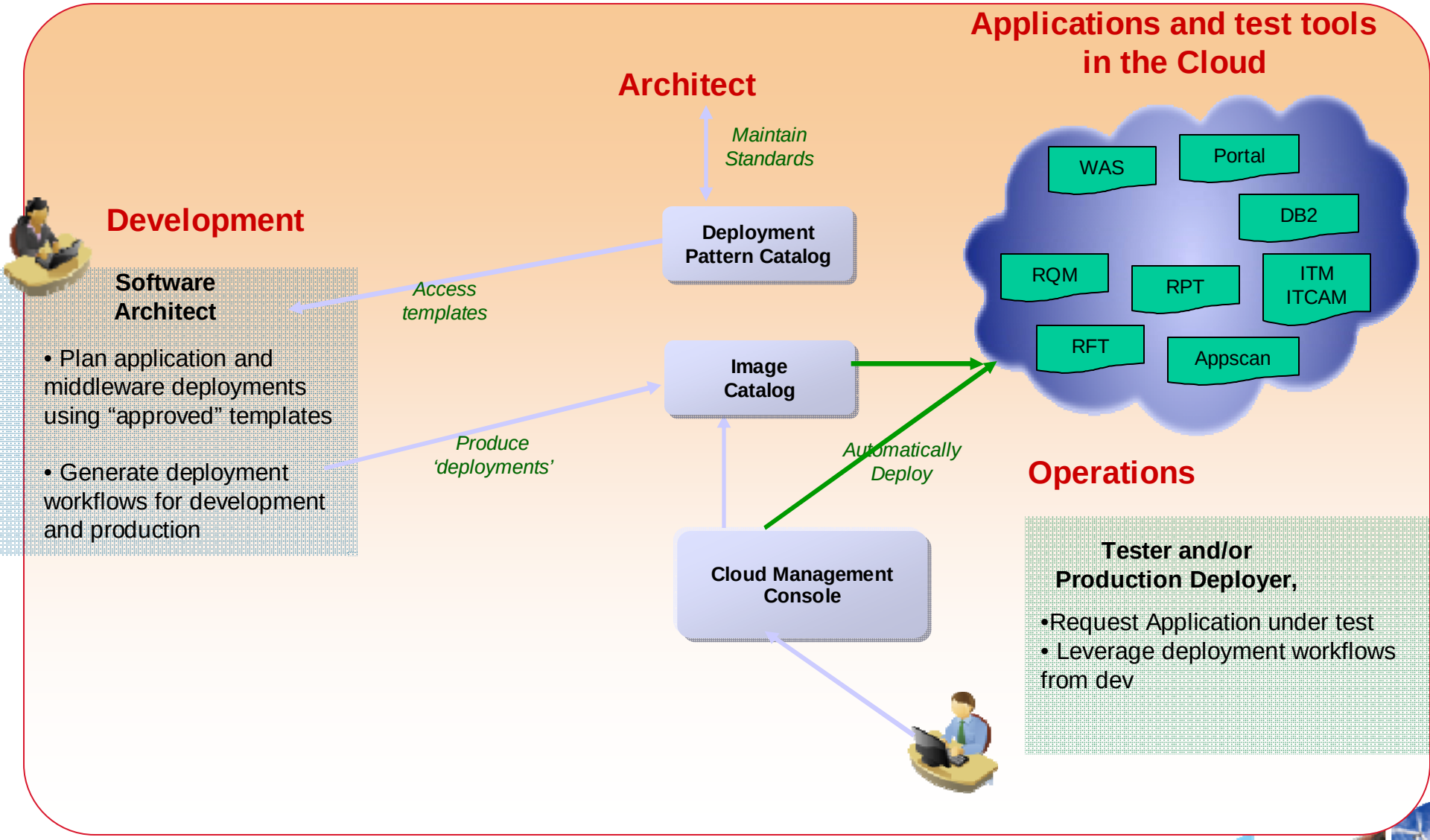
Model-Driven

- Deployment middleware captured as model
- Can be shared between development and operations
- Easily modified

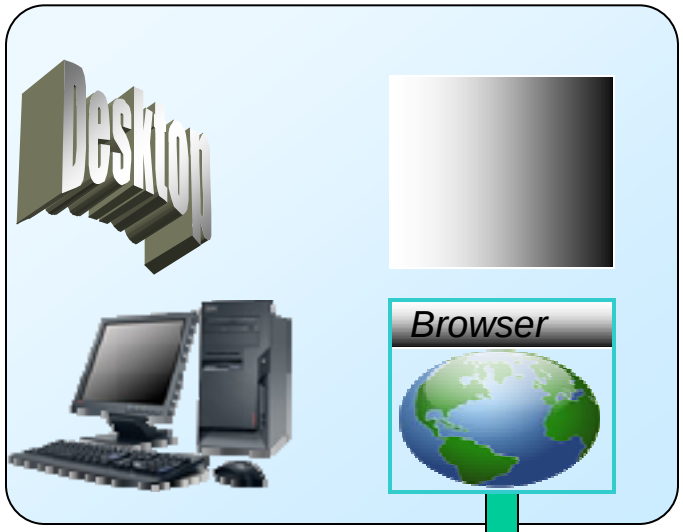
Model-Driven Cloud Deployment

- Automatically provisions OS and Middleware
- Pushes code to deployment environment
- Automatically configures application

Analyze, Modeling and Automated Deployment



What's new in RAD and RSA v8 - Support for the Cloud

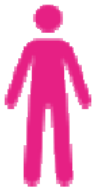


RAD / RSA on the desktop

- Provision and work with Websphere Application Server on the Cloud.

Security is among a top concern with cloud computing...

The IBM Security Framework provides a structure to address this concern



People and identity
Mitigate the risks associated with user access to corporate resources

Data and information
Understand, deploy and properly test controls for access to and usage of sensitive data

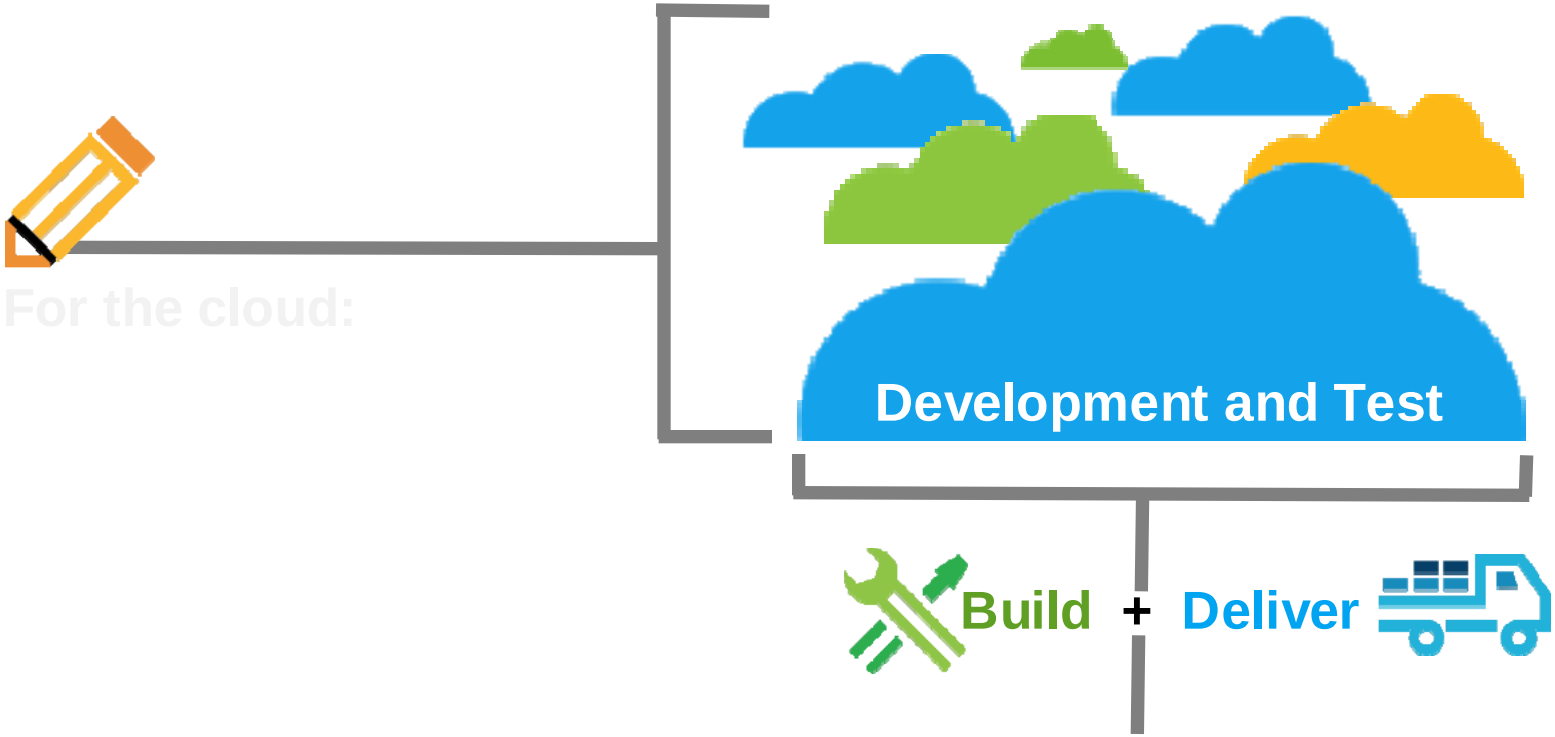
Application and process
Help keep applications secure, protected from malicious or fraudulent use, and hardened against failure

Network, server and end point
Optimize service availability by mitigating risks to network components

Physical infrastructure
Provide actionable intelligence on the desired state of physical infrastructure security and make improvements

- IBM Rational AppScan (On Premise and SaaS)

Development and Test: For the Cloud and On the Cloud



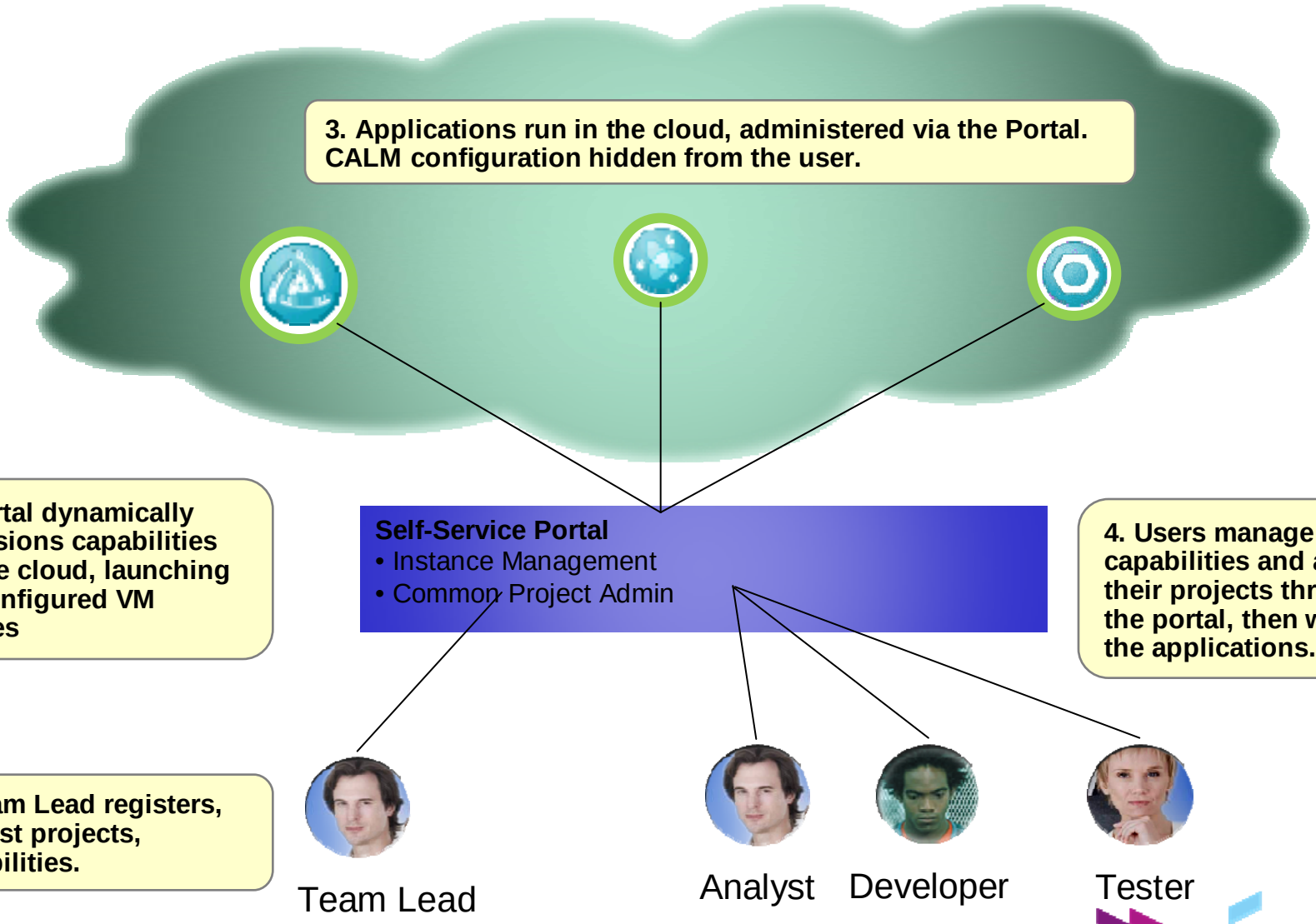
On the Cloud

Application Lifecycle Management leveraging the cloud

- Agile Development, Quality Management, Requirements, Build Automation and Asset Management Services

Application Lifecycle Management On the cloud

What This Could Look Like? A Jazz Portal to the Clouds



With rapid, automated setup through a self-service portal that is designed for ease of use, you can deploy a service within minutes.

Click and choose the service you need

Step 1

Choose the hardware and usage configuration

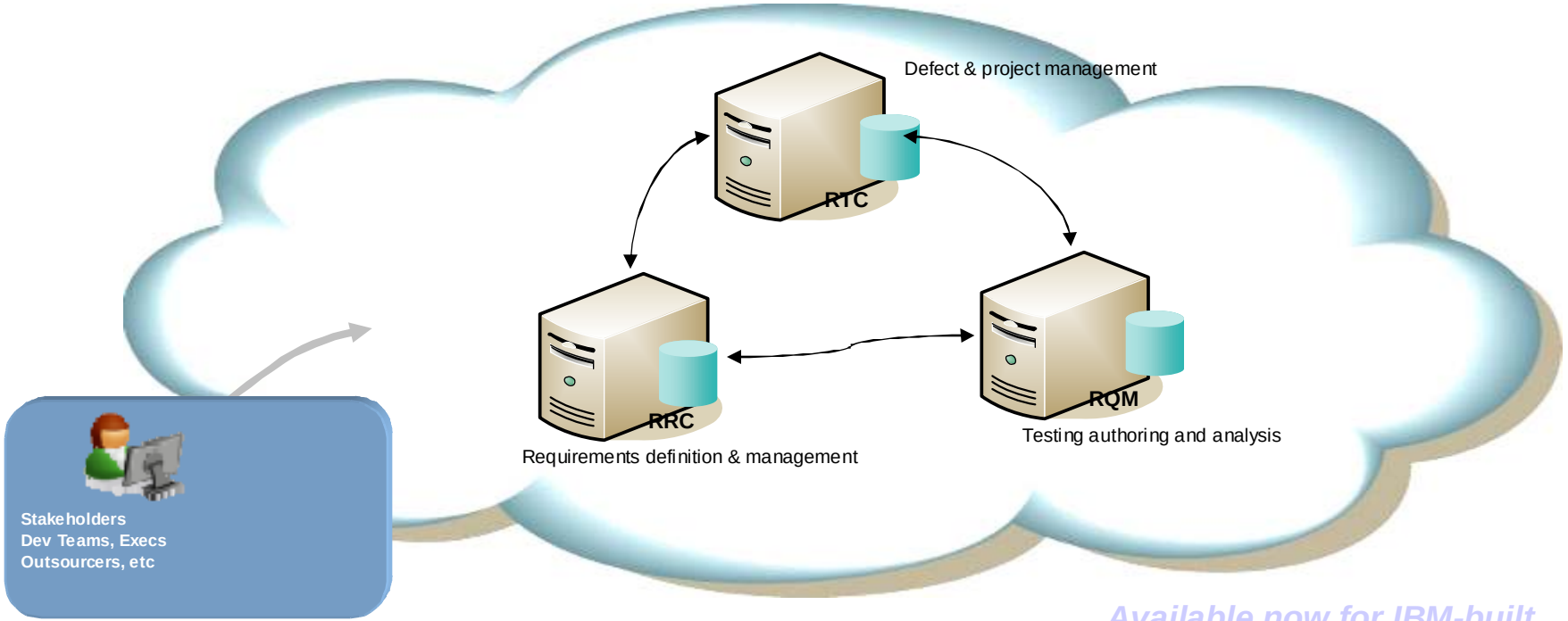
Step 2

Application provisioned and ready to run

Step 3

Launch Demo

Self-assembly of Collaborative Application Lifecycle Management



Available now for IBM-built private Cloud

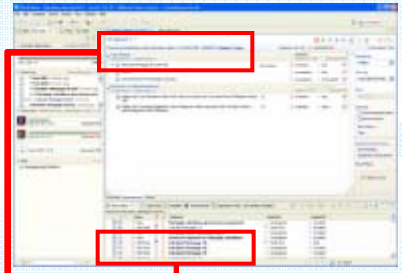
Rapidly accommodate new or existing application development projects, from conception of requirements through development and testing, allowing all stakeholders access for project collaboration and governance.

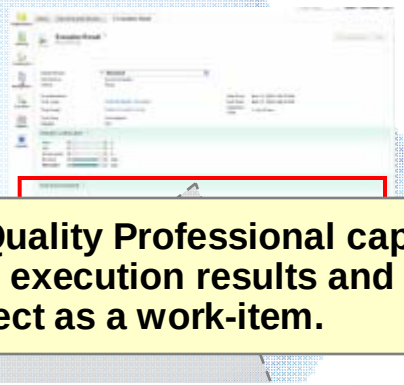
Improving software quality and accelerating team workflows

Analyst

Developer

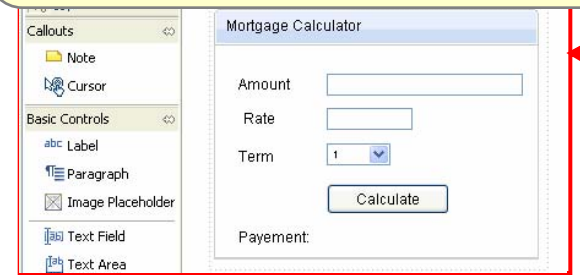
Quality Professional

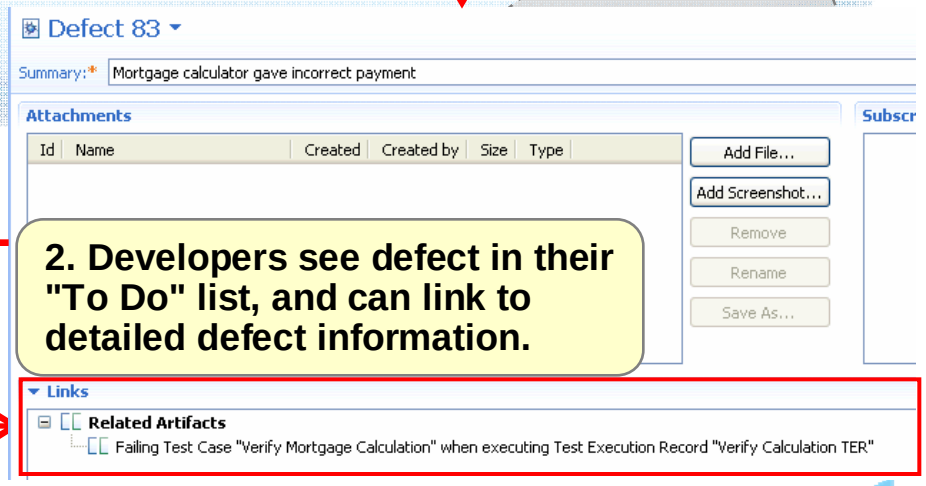




1. Quality Professional captures test execution results and logs defect as a work-item.

3. At any time, developers and testers can link to associated requirements, sketches or storyboards.



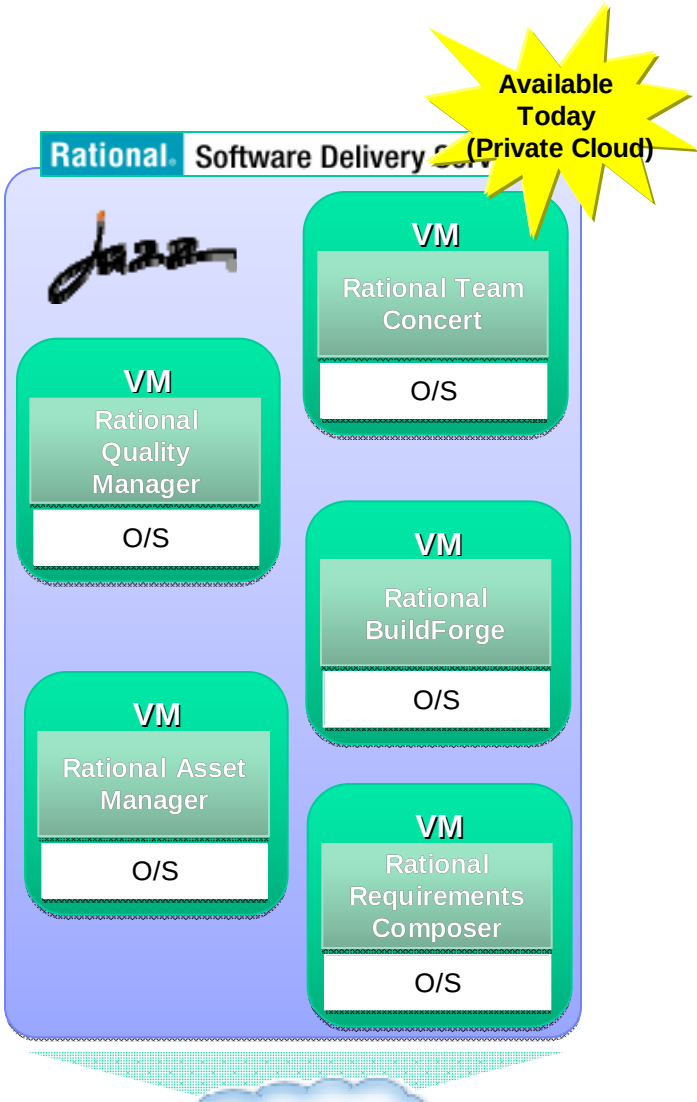


2. Developers see defect in their "To Do" list, and can link to detailed defect information.

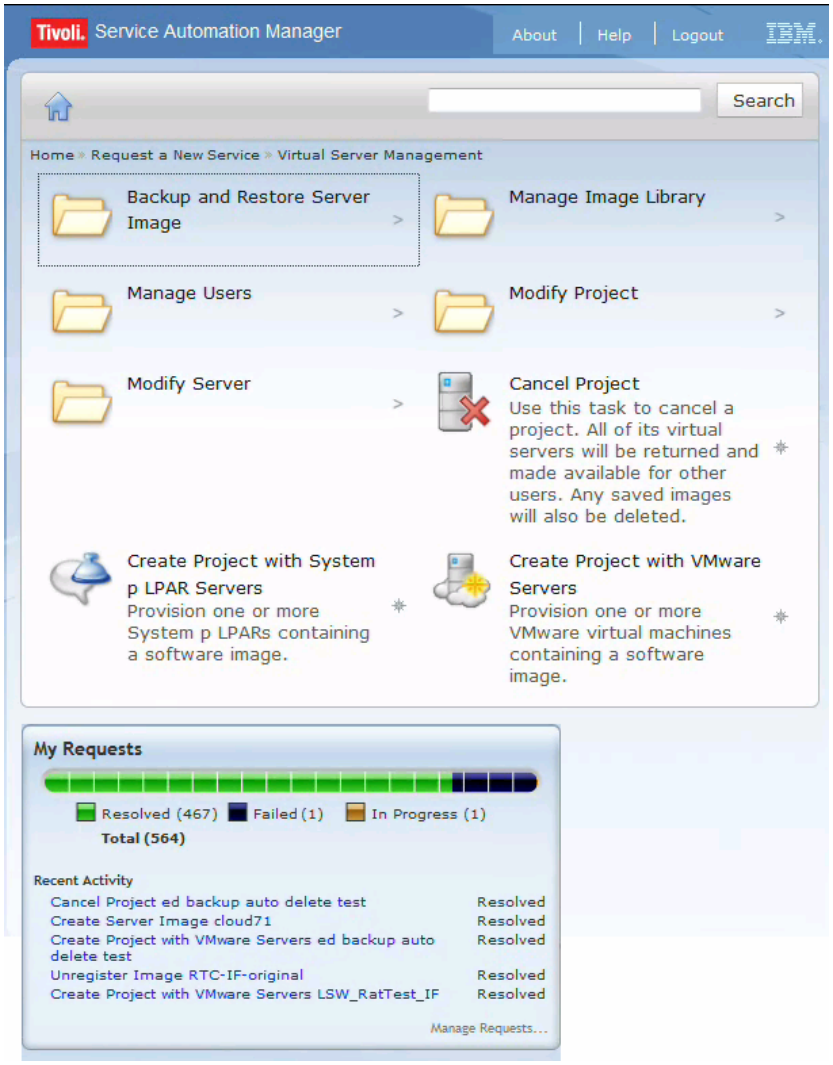
IBM Software Delivery Services

The evolution of the Jazz platform on the cloud

- A collection of Rational products and capabilities available in the cloud addressing the Software Delivery Lifecycle
  - **Agile Development Services**
    Rational Team Concert
  - **Quality Management Services**
    Rational Quality Manager
  - **Requirements management Services**
    Rational Requirements Composer
  - **Build Automation Services**
    Rational BuildForge
  - **Asset management Services**
    Rational Asset Manager
- Self provisioning, access to hardware and infrastructure services on the cloud
- **Benefits:**
  - Low total cost of ownership
  - Capital preservation
  - Improved productivity
  - Governance and Control



IBM Smart Business Development and Test Cloud – at a glance



- **What is the service?**
  - Design and implementation of a private cloud for a test and development environment
- **What is included?**
  - Self-service, catalog portal to request resources
  - Cloud management platform that combines service request management, automated provisioning and change and configuration management
- **What are the supported platforms and key features?**
  - Out of the box support for VMWare, KVM and PowerVM virtualized environments
  - Enhanced Cloud end-user GUI based on Web 2.0 technology
  - Image Management including save / restore
  - Usage Metering and Accounting with ITUAM
- **What development and test tools are included in the service catalog?**
  - Preconfigured software images for: Rational Team Concert, Rational Asset Manager, Rational Quality Manager, BuildForge

Virtual Build and Test On the Cloud

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

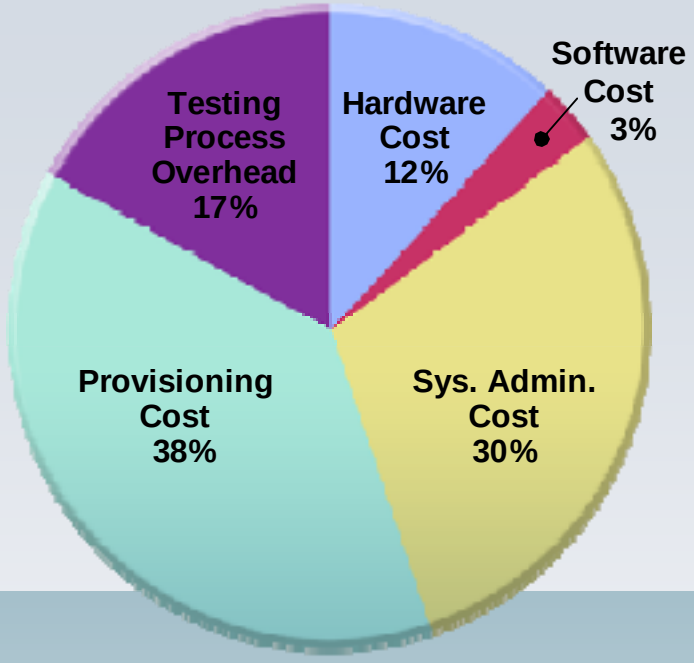
- Capital shared across divisions
- Integrated QM and Lab Management
- Modeled test environments map to cloud image "patterns"
- Infrastructure provisioned & configured
- Applications automatically deployed & configured
- Deployment info shared across dev, test, and ops
- Test tools also in the cloud

Test Cloud ROI Analysis

Example International Financial Institution

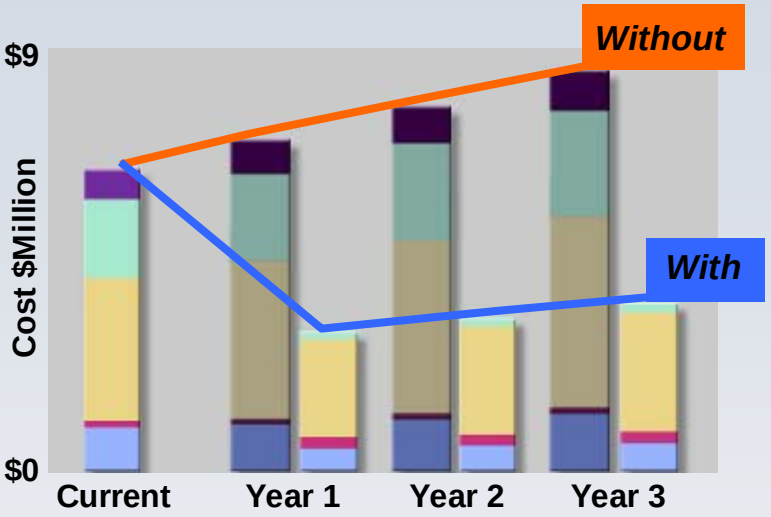
Saving by Category

1st Year After Cloud Transformation



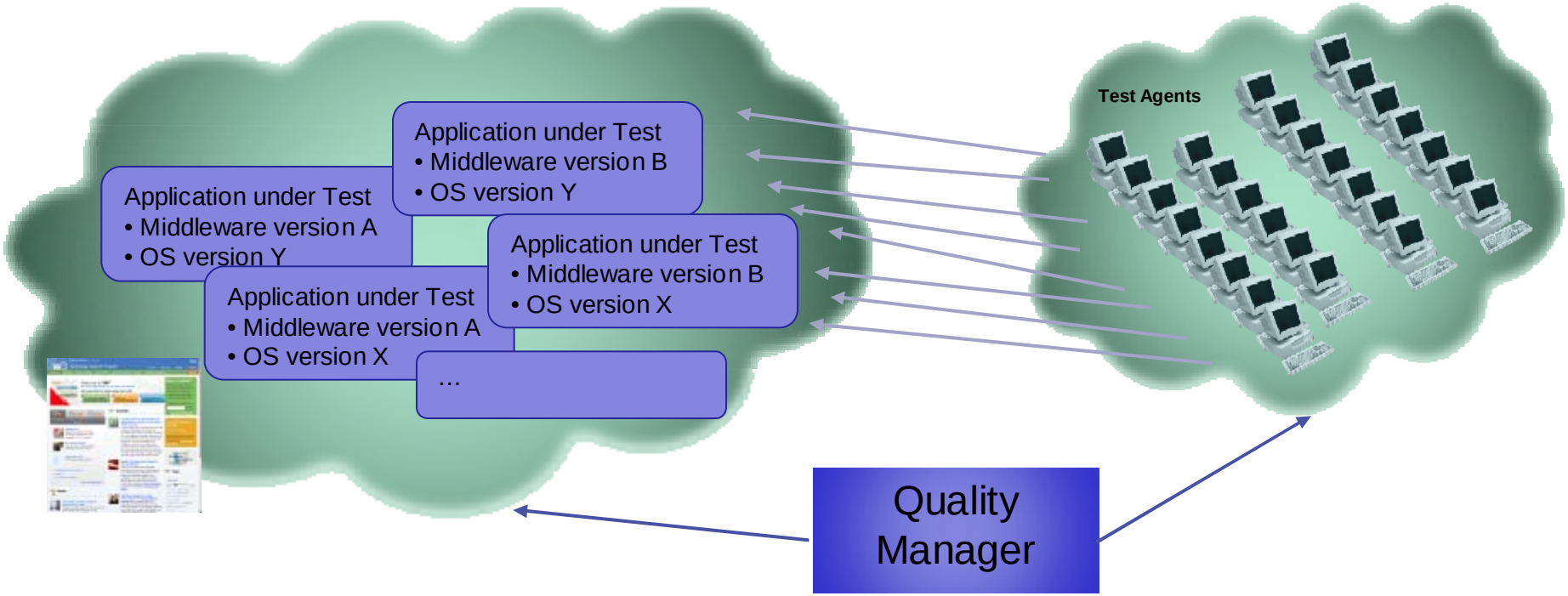
Cost Structure

With and Without Cloud Transformation



Payback Period (Months)	**2.85**
Total Initial Investment for Test Cloud	**$914,929.31**
Net Present Value (NPV)	**$7,949,228.81**
Estimated ROI over 3 years	**868.84%**
Estimate average annual ROI	**289.61%**

Virtual Test Labs



- Create test plans considering time and resources across many dimensions
- Dynamically provision systems under test
  - Improve utilization of lab resources
  - Improve efficiency of test team
- Standard OS/Middleware configurations in preconfigured images
- Easily setup regression tests against varying OS and middleware combinations
- Large scale performance testing
  - Dynamically provision RPT load generators
- Improve efficiency/coverage of regression tests
  - Dynamically provision test agents (RFT)
  - Test against multiple OS/Browser config
- Preconfigured Cloud Images with test agents
- Support multiple cloud platforms

Summary

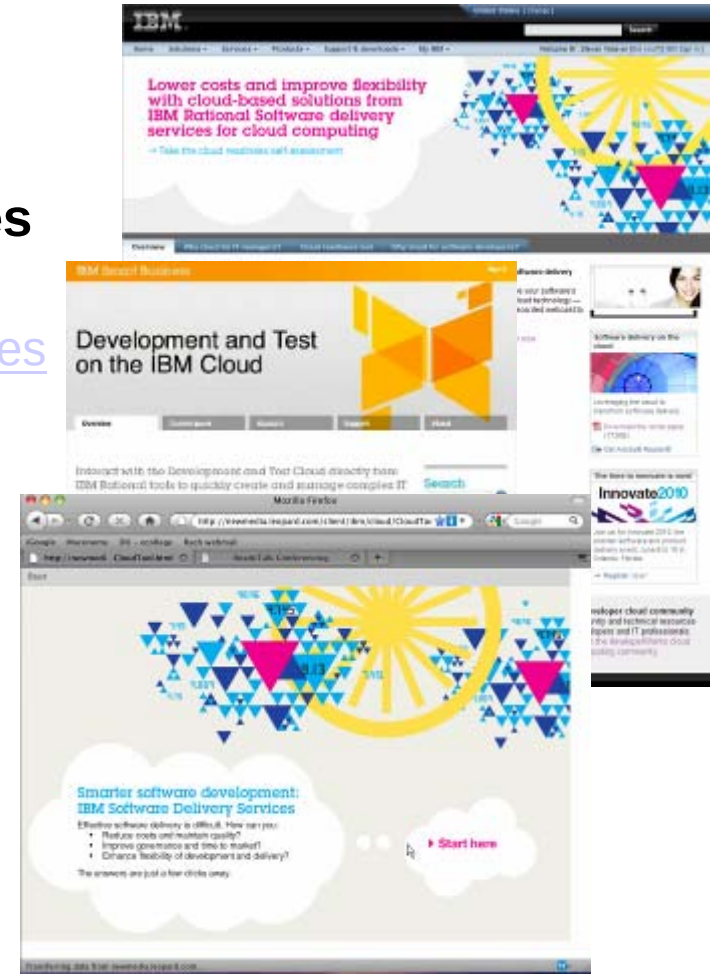
- Cloud has the potential to radically change how we build/deploy software:
  - For the Cloud
    - Internet as a platform
  - On the Cloud
    - Lower costs
    - Increased productivity
    - Faster product delivery
- IBM & Rational are making significant investments in Cloud
- First offerings to be available for the cloud:
  - Analyze, Model, Build and Deploy: RAD 8.0, RSA 8.0, RAFW
- First Offerings on the cloud:
  - Agile Development Service: Rational Team Concert
  - Quality Management service: Rational Quality Manager
  - Build Automation Service: Build Forge
  - Requirements Management Service: Rational Requirement Composer
  - Asset Management and Reuse service: Rational Asset Manager
- More to come in 2010 and beyond.

www.ibm.com/software/rational

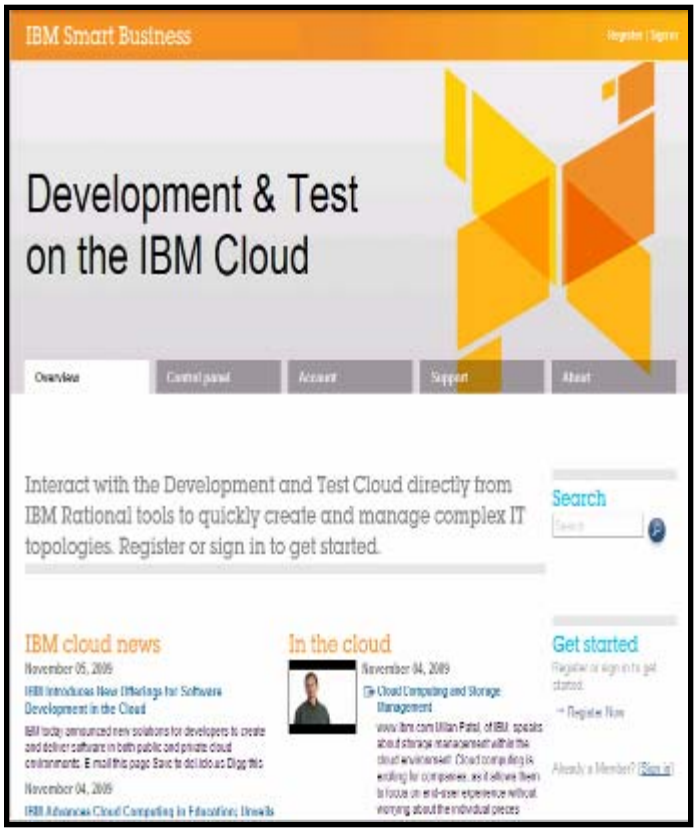
© Copyright IBM Corporation 2010. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way. IBM, the IBM logo, Rational, the Rational logo, Telelogic, the Telelogic logo, and other IBM products and services are trademarks of the International Business Machines Corporation, in the United States, other countries or both. Other company, product, or service names may be trademarks or service marks of others.

Cloud on the Web

- **Visit Rational Software Delivery Services for Cloud Compuing on the Web:**
  - http://www.ibm.com/rational/info/cloud-services
- **IBM Rational YouTube Channel**
  - http://www.youtube.com/user/IBMRational
- **IBM Cloud YouTube Channel**
  - http://www.youtube.com/user/IBMCloud
- **IBM Developer Cloud Web Pages:**
  - http://www.ibm.com/cloud/enterprise



IBM Smart Business Development and Test on the IBM Cloud



www.ibm.com/cloud/enterprise

What is the service?

- A dynamic virtual development and test infrastructure service, designed for the enterprise, on the IBM Cloud

What are you buying?

- Choice of virtual server configurations
- Option to add persistent storage charged per usage
- Network bandwidth charged per usage
- Choice of pre-configured software images
  - Rational Application Lifecycle Management software
  - Lotus, WebSphere, DB2 and Informix stacks

What payment options are available for Rational images?

- Bring your own license model
- Shared Reserved option

What support is available?

- Web-based forum for users to submit requests
- Premium support 24X7 *

* Availability date TBA