Leverage the Cloud to Transform Software Delivery

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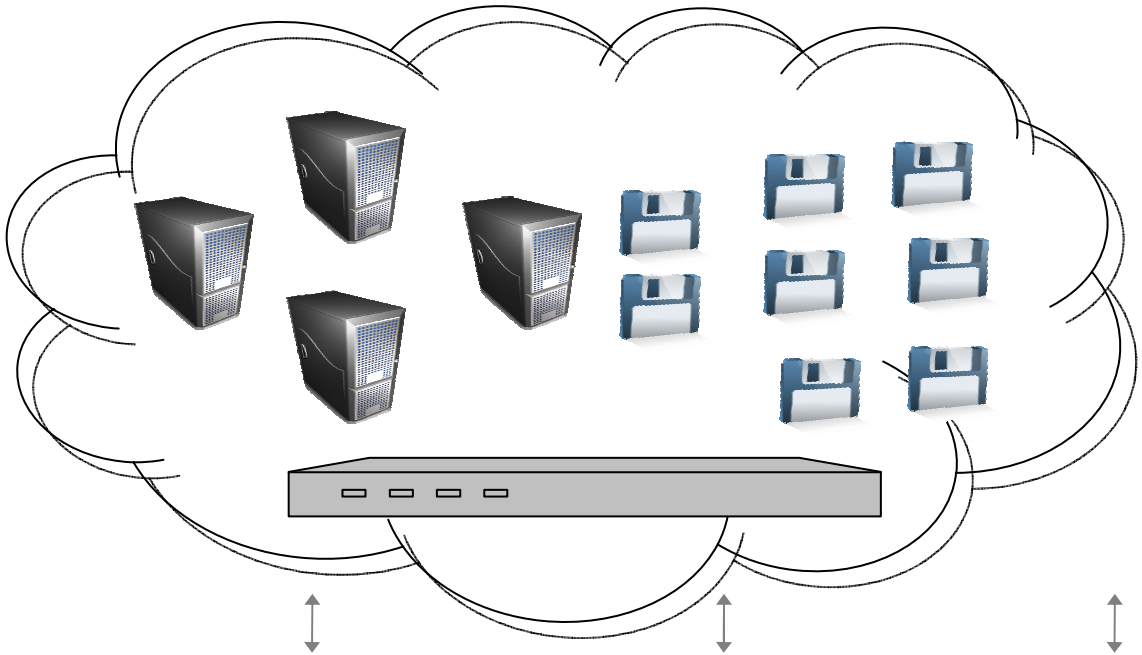
- Do you have a corporate cloud strategy today?
- Are you using cloud computing today?
- Do you use virtualization today?
- Are you using a public cloud today?
- Do you use cloud for development? For production?

What is cloud computing?



- Virtualization
- Images
- Service Catalog
- Provisioning
- Elasticity
- Management/Billing
- Network

VIRTUALIZATION + **STANDARDIZATION** + **AUTOMATION** = **Cost** **Agility**

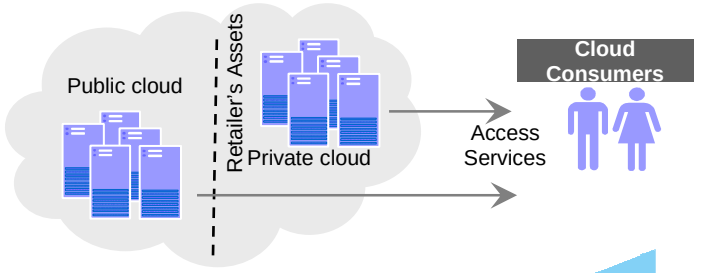
Cloud computing covers a variety of “as a service” and deployment models

WHAT AS A SERVICE?

Business Process as a Service (BPAAS)	Business processes as a service; e.g. indirect procurement, payment processing etc…
Software as a Service (SAAS)	Software as a service e.g. email, CRM, eCommerce, merchandise optimization etc…
Platform as a Service (PAAS)	Application servers, databases, middleware, development tools as a service
Infrastructure as a Service (IAAS)	Infrastructure such as servers, storage, file-systems as a service

HOW IS IT DELIVERED?

Public Clouds	Customer **rents the capability**; hosted “on the internet”
Private Clouds	Customer IT **buys the capability** to deliver cloud services within the enterprise
Hybrid Clouds	Combine elements of public and private clouds



Statistics indicate a potential to radically improve efficiency in development and test

- **85%** of existing computing capacity sits idle
- **30% to 50%** of all servers within a typical IT environment are dedicated to test
- Most test servers run at less than **10%** utilization
- **30%** of all defects are caused by wrongly configured test environments
- Testing backlog is often very long and single largest factor in the delay new application deployments
- **70¢** of every $1 spent is on maintaining current IT infrastructures

Benefit

Risk

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

Cloud computing can provide a way to increase efficiency

Traditional

High deployment costs to deliver software

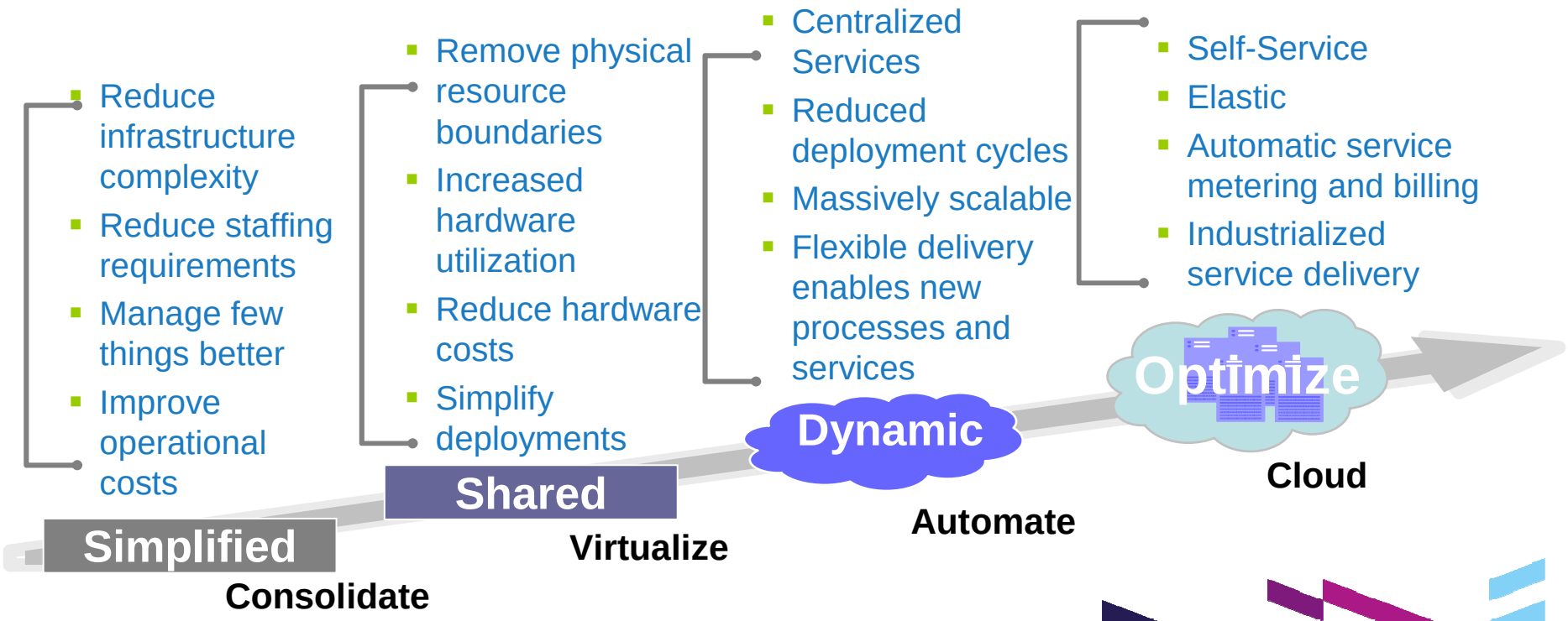
Control and governance chaos in software processes

Lengthy on-boarding of teams reduces time to software delivery

Cloud

- Reduced installation and administration costs
- Lower TCO by improved utilization of hardware and software assets
- Better governance through standardized delivery of services
- Preconfigured software embodying best practices
- Tools can be provisioned in minutes. No download, installation or setup.
- Self-administered portal to access to software resources for a globally distributed team

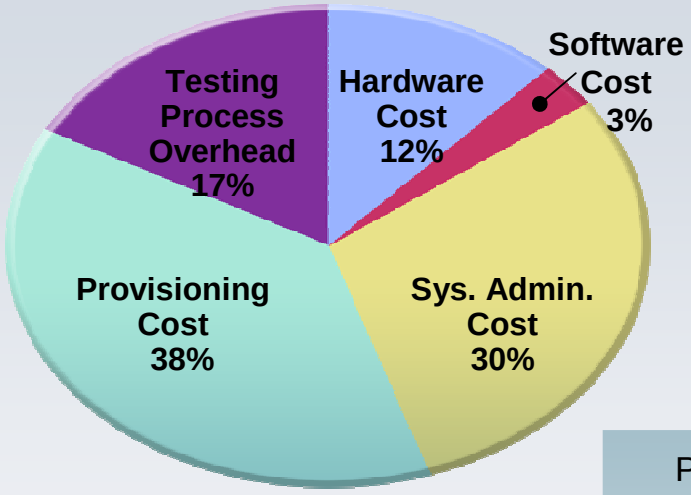
Cloud is another step in the quest for improved efficiency in development and test



Test cloud ROI analysis for international financial institution

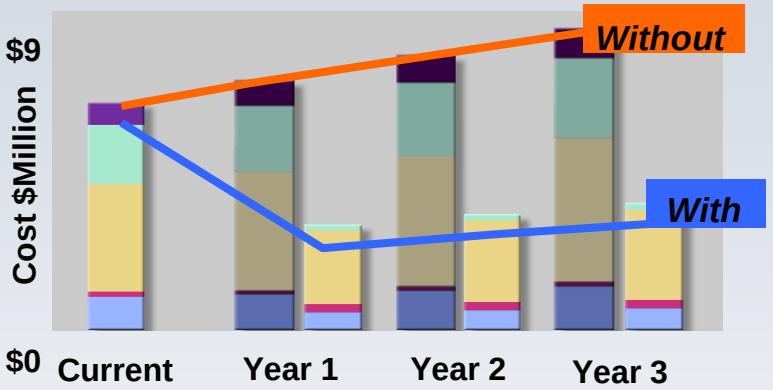
Saving by Category

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%**

IBM has found success with internal cloud deployments

Business challenge

- The average time to provision an environment was five days
- Decided a self-service approach would allow developers to deploy environments more efficiently

Solution

- Enabled rapid provisioning of fully configured, security and architecture-compliant environments
- Delivered automated approval within preset monthly spend limits
- Added a self-service option for purchase of support services

Benefits

- Ability to provision of dev and test environments in one hour
- Significant reduction of labor associated with server provisioning, image setup, approvals and maintenance
- Higher machine utilisation, fewer physical servers, less capital

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
- Increase delivery speed

Capabilities LEVERAGING the Cloud

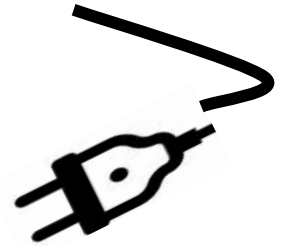
Cloud Exploitation

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

Capabilities ON the Cloud

Standardized Development

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



Consumption patterns emerging across the development and test lifecycle

Capabilities TARGETING the Cloud

4 **Deployment Planning and Automation**:
- Topology planning
- Deployment automation
- Governance of cloud images

Capabilities LEVERAGING the Cloud

5 **Test Lab Automation**

6 **Performance Testing**

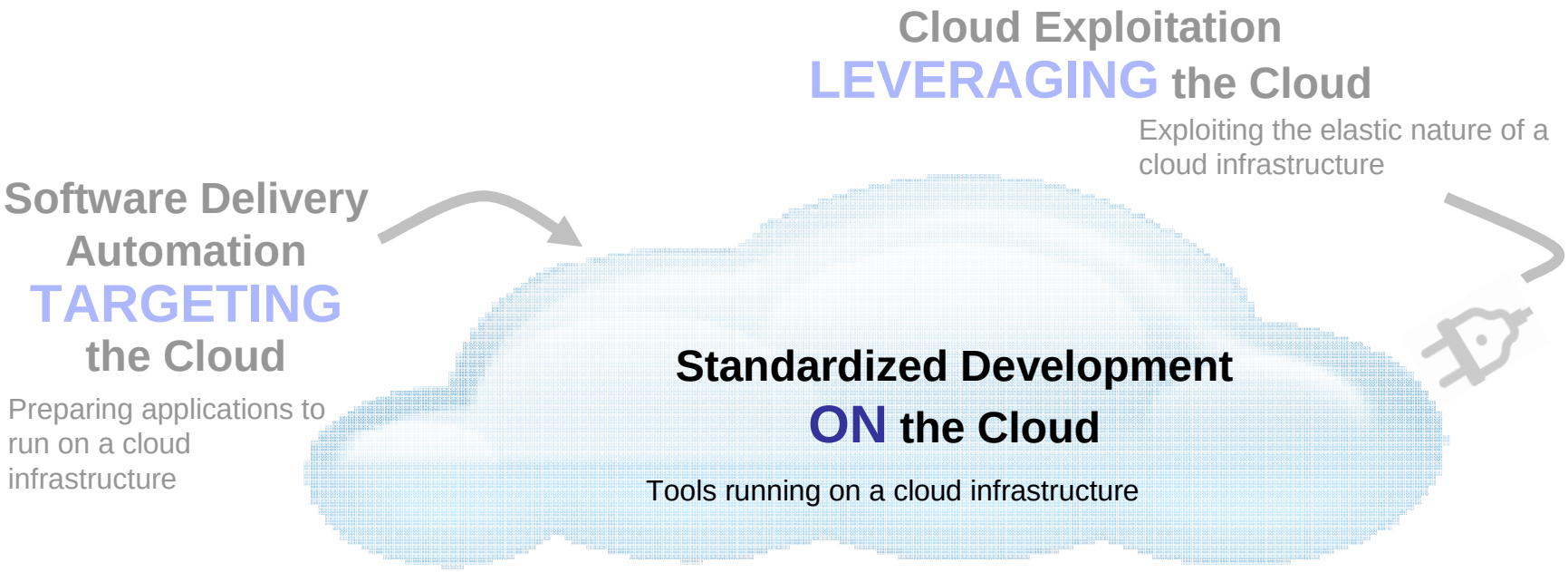
Capabilities ON the Cloud

1 **Collaborative Lifecycle Management (CLM) on the Cloud**

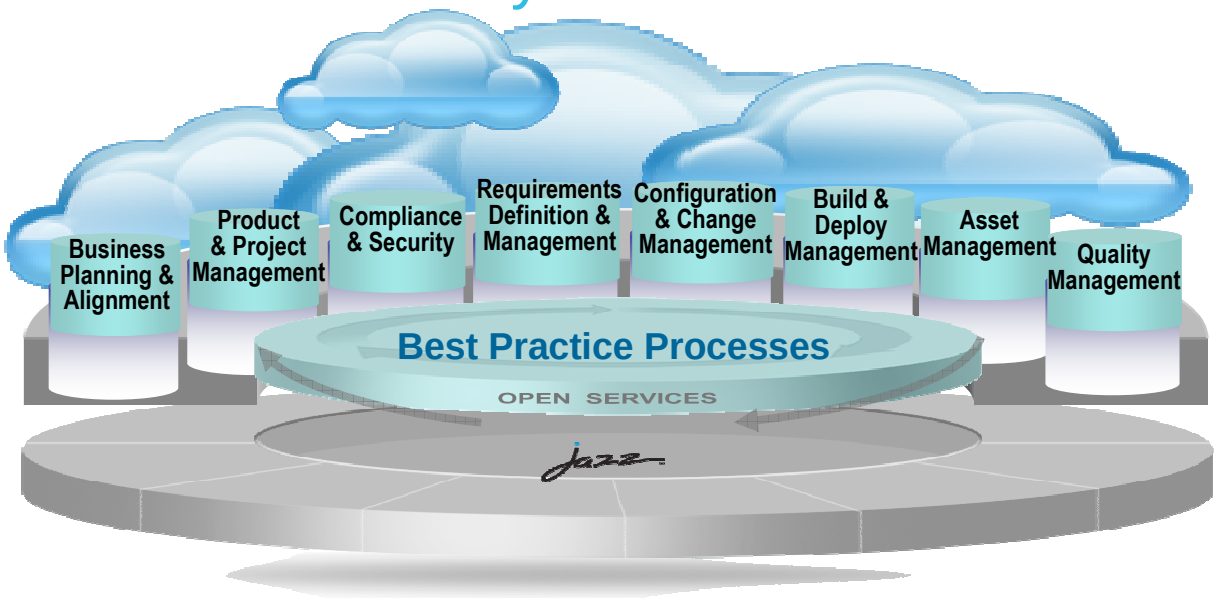
2 **Desktop on the Cloud**

3 **Software as a Service**

Rational solutions for development and test workloads

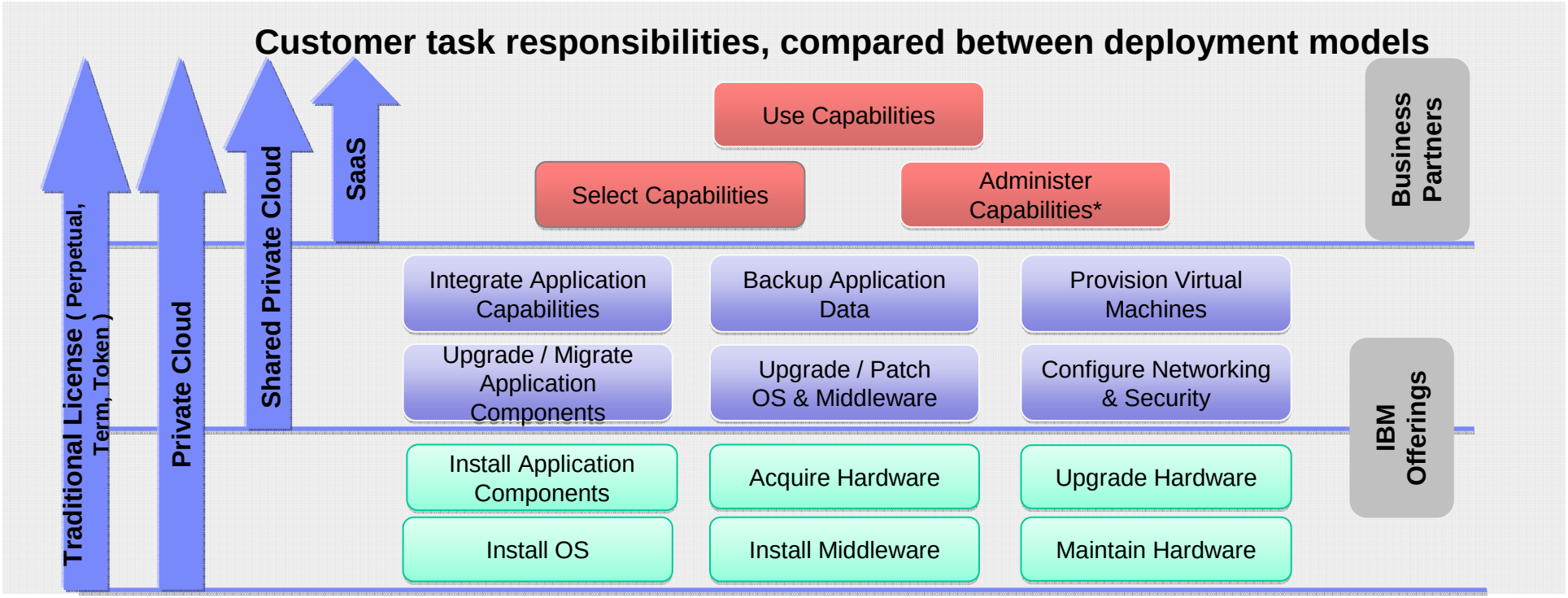


Rational tools run on a variety of cloud infrastructures



- Rational products available today **run on cloud infrastructures**, with support from Rational Lab Services
- Pre-configured images available today are RTC, RRC, RQM, RAM, Build Forge
- Bring-your-own-license (**BYOL**) model
- Supported Platforms:
  - **Private**: IBM Tivoli cloud infrastructure products, IBM CloudBurst appliance, etc.
  - **Public**: IBM SmartCloud Enterprise

SaaS deployment options also exists within Rational's ecosystem



- Rational Business Partners offer Rational capabilities via SaaS model
  - Regional and worldwide coverage BPs

*includes provisioning users and application users security rights

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 infrastructure
- Regulations

Rising Cost of PC Management

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

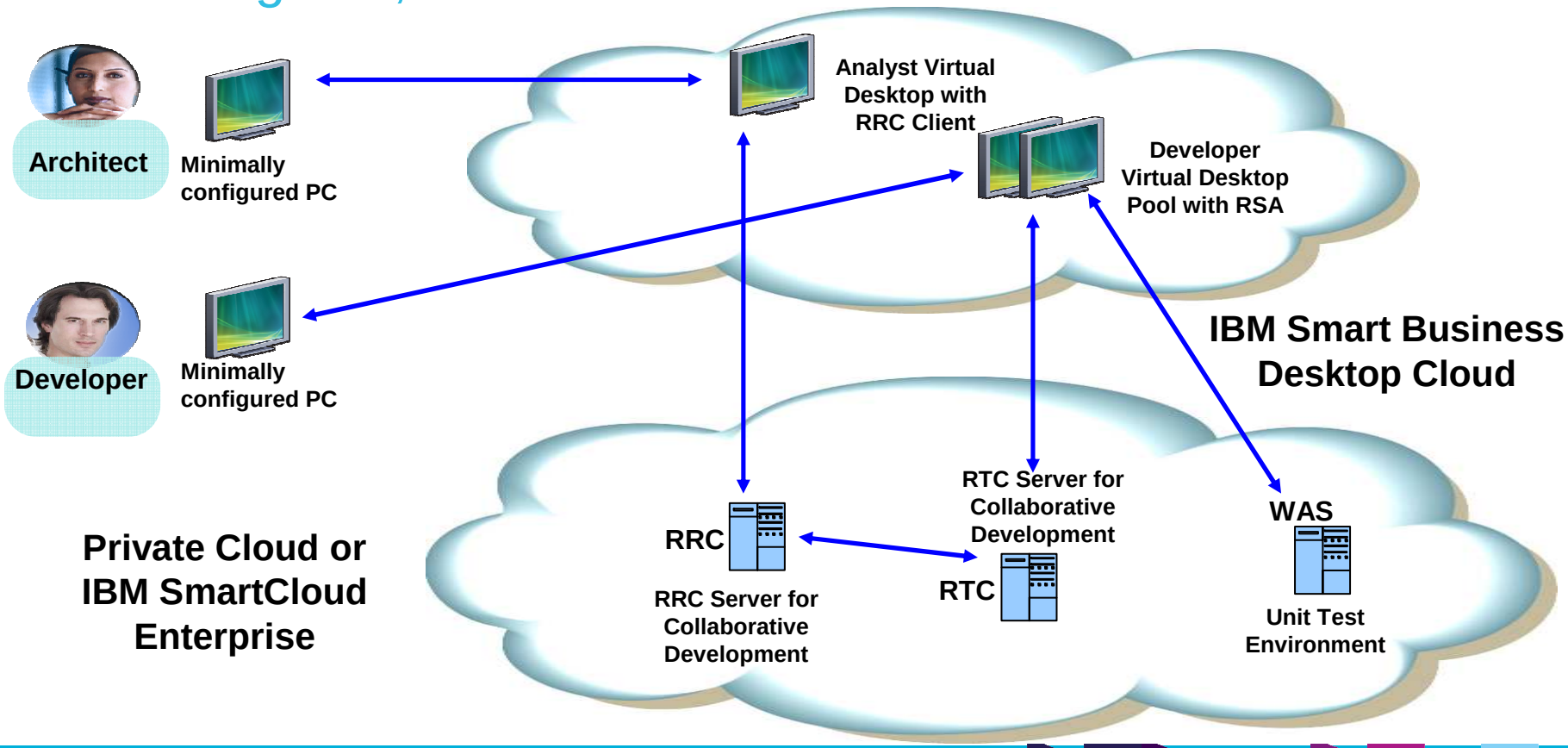
IT Infrastructure Management Complexity

- 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

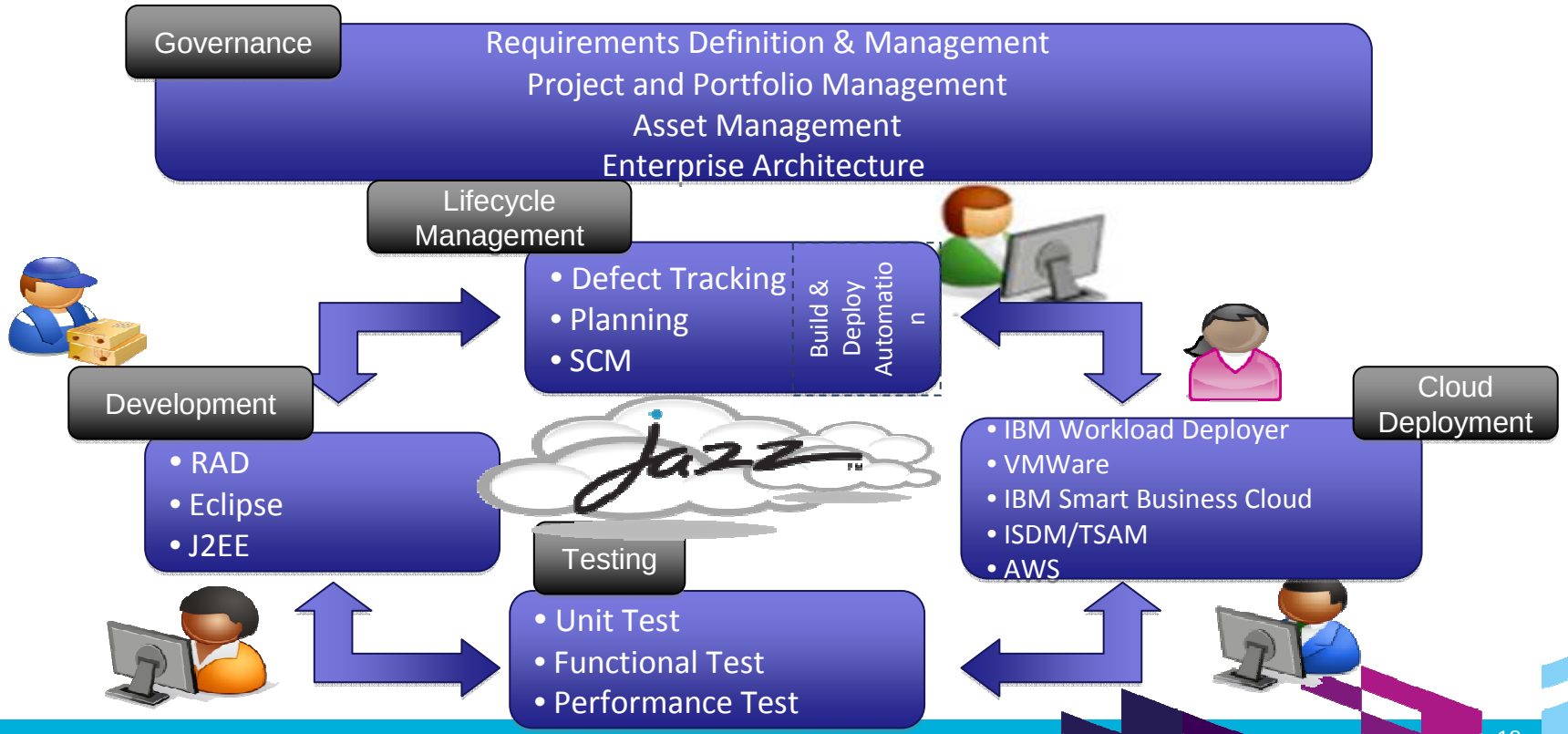


Rational solutions for development and test workloads

Software Delivery Automation TARGETING the Cloud

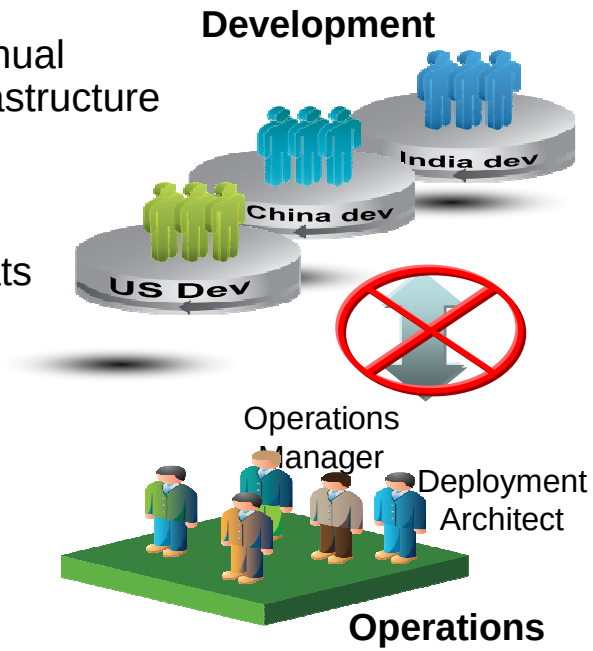
Preparing applications to run on a cloud infrastructure

Cloud computing can impact development and test ***by increasing delivery velocity*** which reduces development cycle time



Deployment is a complex problem

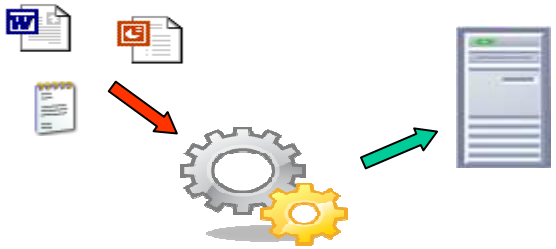
- Development and Operations teams collaboration challenges
  - Hand-off from development teams is inconsistent and manual
  - Application component requirements do not match IT infrastructure
- Deployment requirements are difficult to validate
  - Enterprise, Software & IT architects all use different formats
  - No standardization or templates for reuse
  - Tough to mimic production in dev and test environments
- Complex series of steps
  - Deployment engineers often execute manual steps
  - Not repeatable, prone to error
  - Automations are hard to build, maintain and reuse
  - Hard to tell what if the right things were installed



Evolving patterns in application deployment

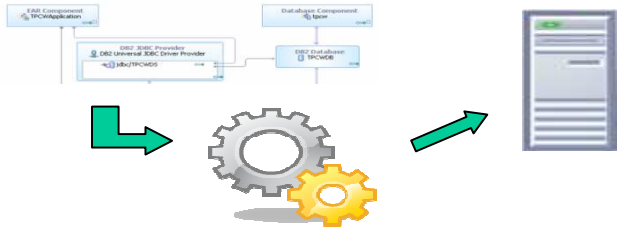
Manual Labor

- Free-form data
- Poor communication
- Many manual tasks
- Long bring-up times



Automation

- Repeatability
- Poor communication
- Manual workflow setup



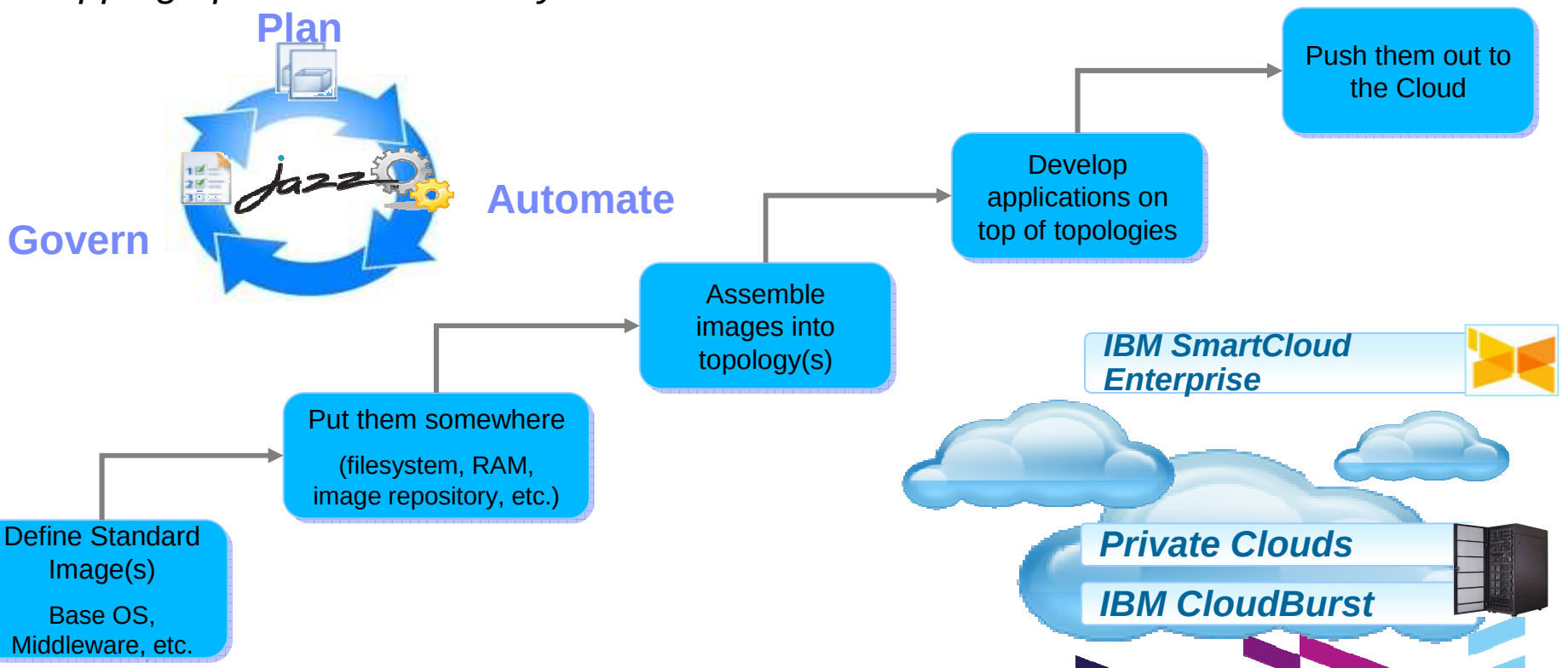
Automate by Design

- Standardize data
- Rich communication
- Workflow generation

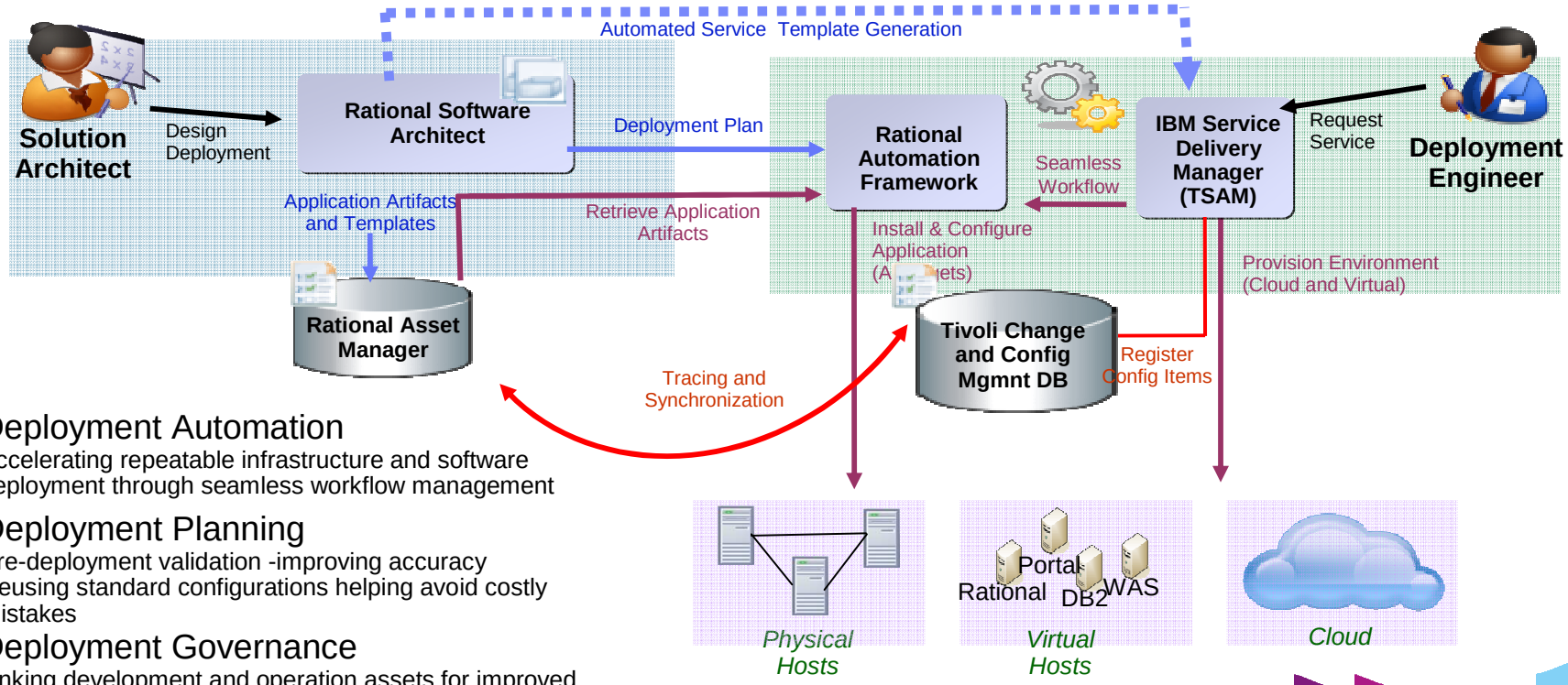
Cloud computing provides a way to encourage *and potentially enforce* changes in application deployment practices

IBM Deployment Planning and Automation

Stepping up to Cloud Delivery



Deployment Planning, Automation, and Governance Scenario Flow



- **Deployment Automation**
  Accelerating repeatable infrastructure and software deployment through seamless workflow management
- **Deployment Planning**
  Pre-deployment validation -improving accuracy
  Reusing standard configurations helping avoid costly mistakes
- **Deployment Governance**
  Linking development and operation assets for improved traceability and change management

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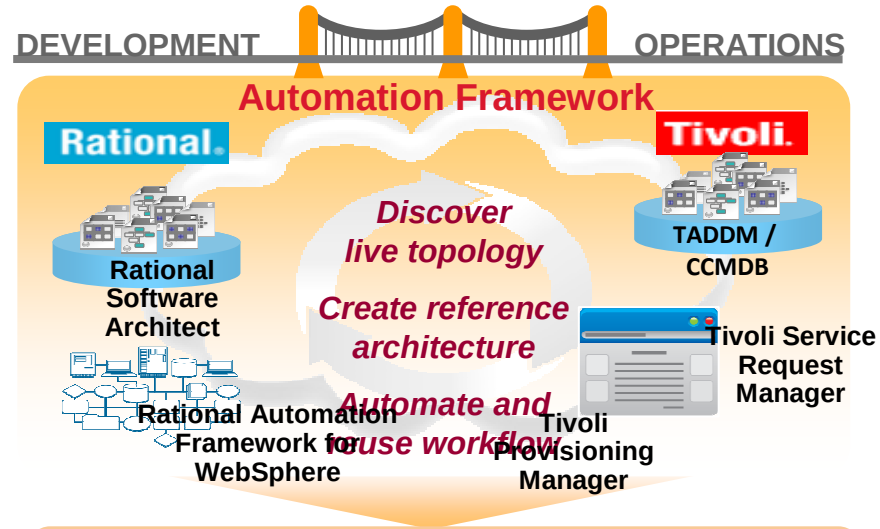
Financial Services Conglomerate Deploys Service Automation

Situation

- **8K** applications including **3K** acquired
- 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

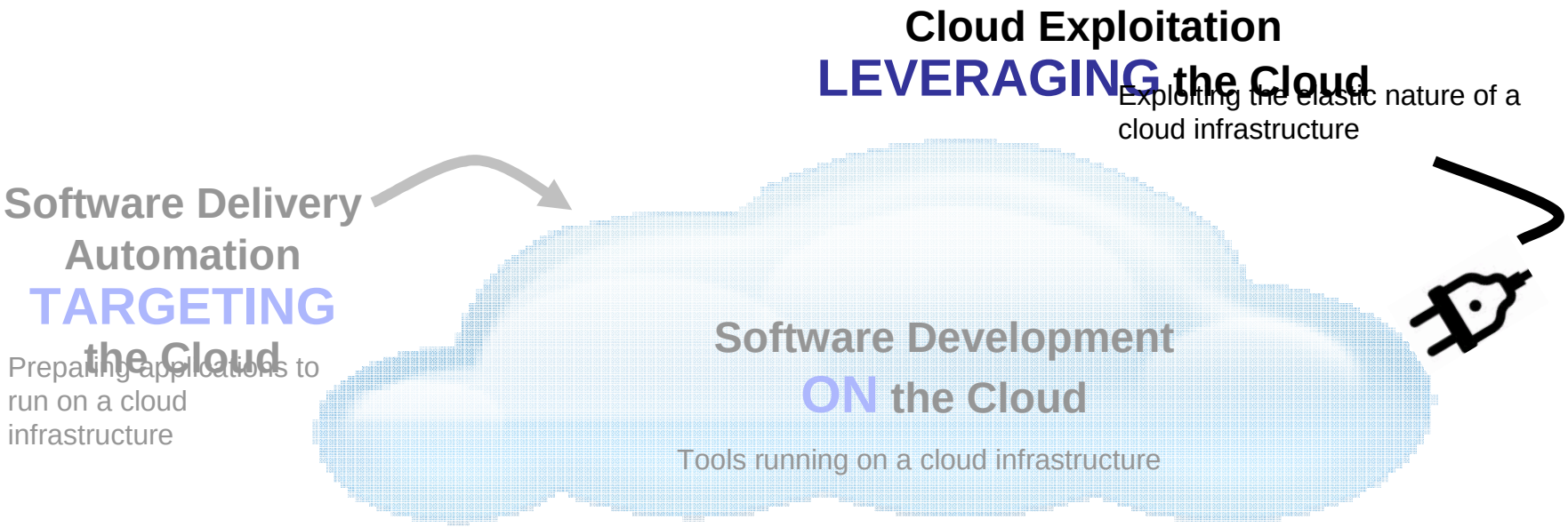
- **Repeatable consistent automation**
- **Deployment Reference Architecture**



Results

- ✓ Reduced backlog
- ✓ Cost savings through consistent deployment
- ✓ Compliance and traceability
- ✓ Best practices capture

Rational solutions for development and test workloads



Clients and IBM are executing tests leveraging cloud

Transforming testing and business results

- **Affordably implement large scale load testing**
  - Support multiple complex product releases each year
  - Automate provisioning of test capabilities and environment
  - Decrease dependency on deep product and integration skills to set up test environments
- **Increase test coverage while reducing cost**
  - Save time setting up test platform
  - Reduce the significant fixed-cost base required for large-scale performance testing
  - Achieve cost avoidance with automation and standardization
  - Improve reusability of assets, skills and test patterns

Results

Achieved savings of $1.37M in 1Q 2011

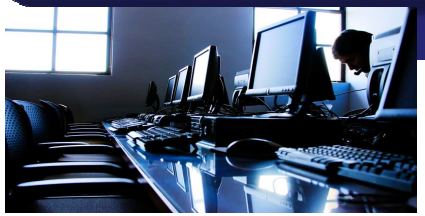
Expected to achieve savings target of $5M in 2011

Reduced set up from months to days

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

IBM and a Major Sporting Event team on Collaborative Development and Operations

The Challenge:

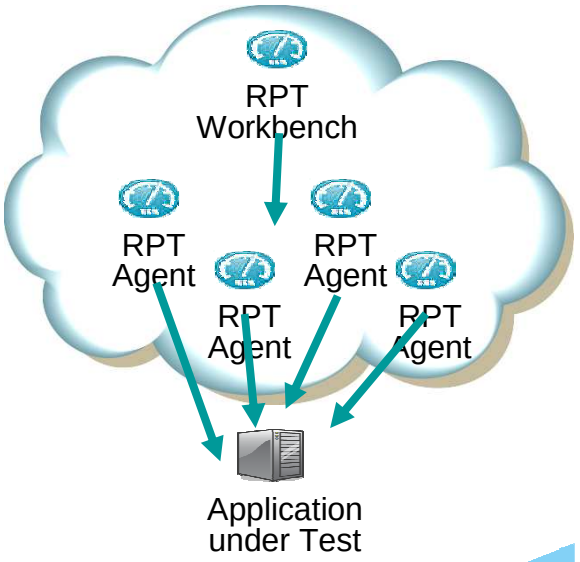
- Global Launch of new online Ticketing Registration Feature

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



Rational solutions for development and test workloads

Cloud Exploitation
LEVERAGING the Cloud
Exploiting the elastic nature of a cloud infrastructure

Software Delivery Automation
TARGETING the Cloud
Preparing applications to run on a cloud infrastructure

Standardized Development
ON the Cloud
Tools running on a cloud infrastructure

Cloud is an opportunity for development and test

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

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