



# DevOps: Linking Development and Operations

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Director

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Development Manager, DevOps

# Agenda

- Your speakers
- Overview of DevOps Landscape
- IBM DevOps and Continuous Delivery
- The customer
- Key customer challenges
- Rational and Tivoli solution stack
- Solution architecture
- Design and implementation strategy
- Results and lessons learned

# About Your Speakers

**Richard Elberger** ([rich@rae-consulting.com](mailto:rich@rae-consulting.com)) is a recognized expert in the software configuration management and engineering operations field. Prior to founding RAE Consulting in 2008, Mr. Elberger held management and technical leadership positions at Microsoft Corporation, System Management Arts, Inc, and EMC Corporation. Mr. Elberger holds an MBA from University of Massachusetts Amherst, Six Sigma Black Belt certification from Villanova University, and multiple IBM certifications in Rational, Tivoli, SOA, and XML.

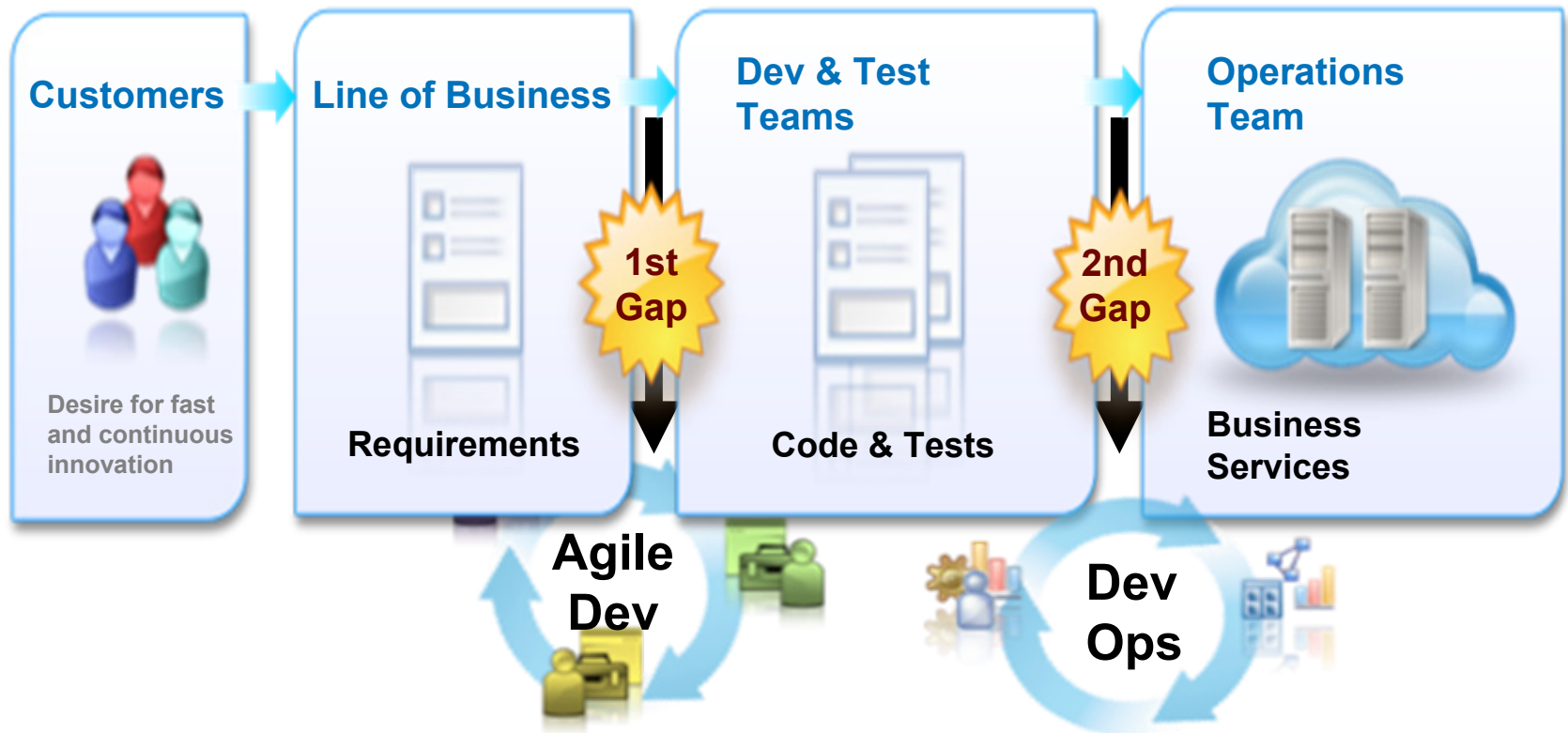
**John Henry Keenan** ([jh.keenan@ie.ibm.com](mailto:jh.keenan@ie.ibm.com)) leads a team of Development Engineers, Cloud Architects, and Test Engineers building cloud content for IBM SmartCloud Foundation solutions. For the past 4 years he has managed the Cloud Cost Management team to evolve usage and accounting technology into the Cloud stack, prior to that role John Henry worked as Product Manager for Tivoli Netcool Performance Management. Most recently John Henry has taken on a leadership role in the IBM Cloud Integration Lab to bring IBM SmartCloud for Continuous Delivery (DevOps) to the market, as well as to deliver SmartCloud Accelerator content for Assurance, Resilience and Security to drive sales and up-sells between SmartCloud Provisioning and the monitoring, storage and security portfolio.

# What is DevOps?

DevOps is a *concept* to describe a number of existing and newly integrated solutions that improve the collaboration and lifecycle management between development and operations.

# Delivery Challenges

*Today's business and technical needs are pushing traditional delivery approaches to the breaking point*



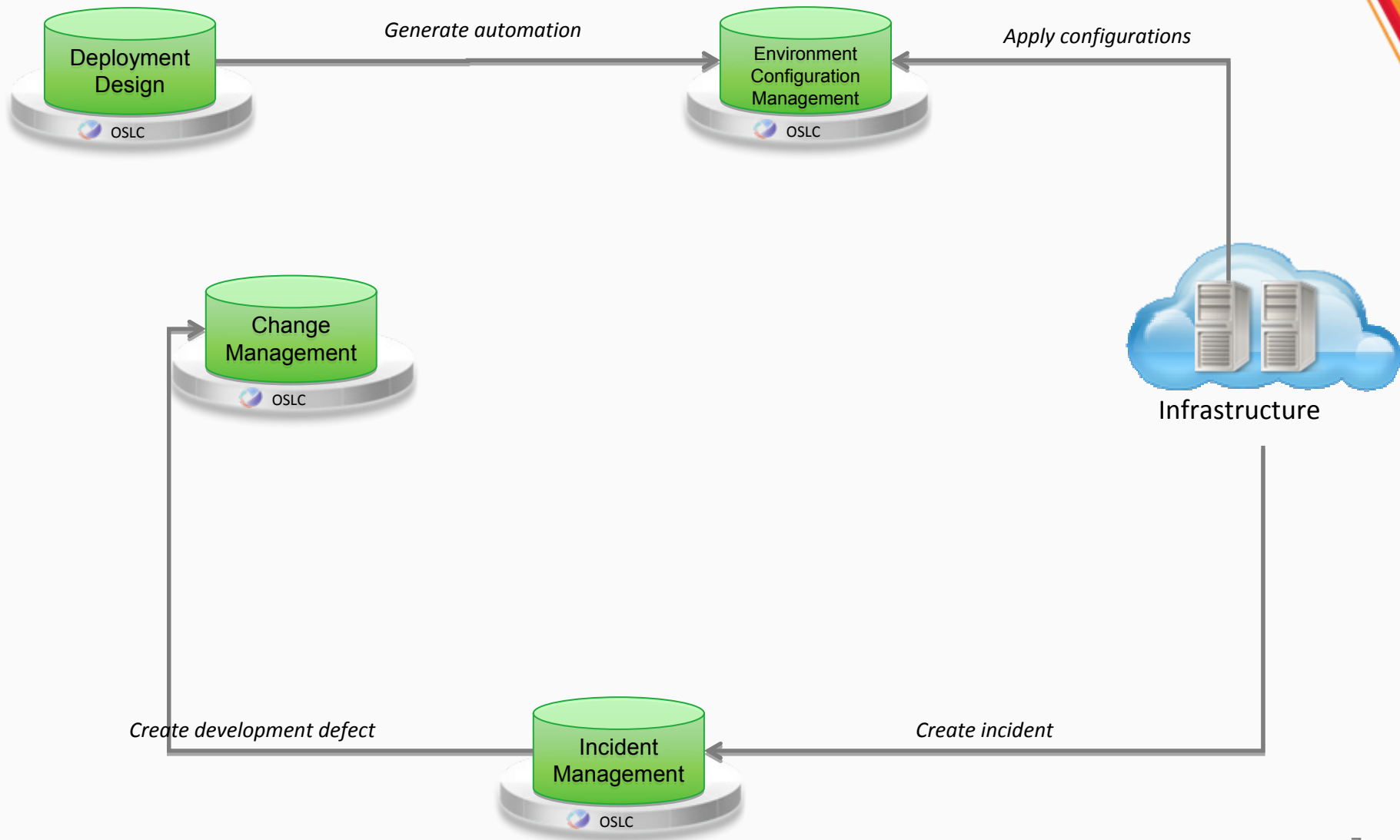
# DevOps Principles & Values

- Collaborate across disciplines
- Develop and test against a production-like system
- Deploy frequently
- Continuously validate operational quality characteristics

# What is Massively Scalable DevOps?

- Fundamentally, it's about moving beyond getting people to use new tools to achieve outcomes
  - Scalability does not simply focus on the technical
- Efficiencies in perfect *information*
  - Does not mean deployments will always be perfect, but will always be what is communicated
- Efficiencies in perfect *communication*
  - Streamlined system integration
  - Individuals focus on role-relevant tools
- Transformed organization that breeds excitement
  - Individuals find more value in their work, and managers can be more proactive in meeting their objectives
  - Decrease the “firefighting”, increase the ability to work ahead
- Build deployment agility
  - Automate the platform and technologies, not individual applications
  - “Infrastructure as Code”

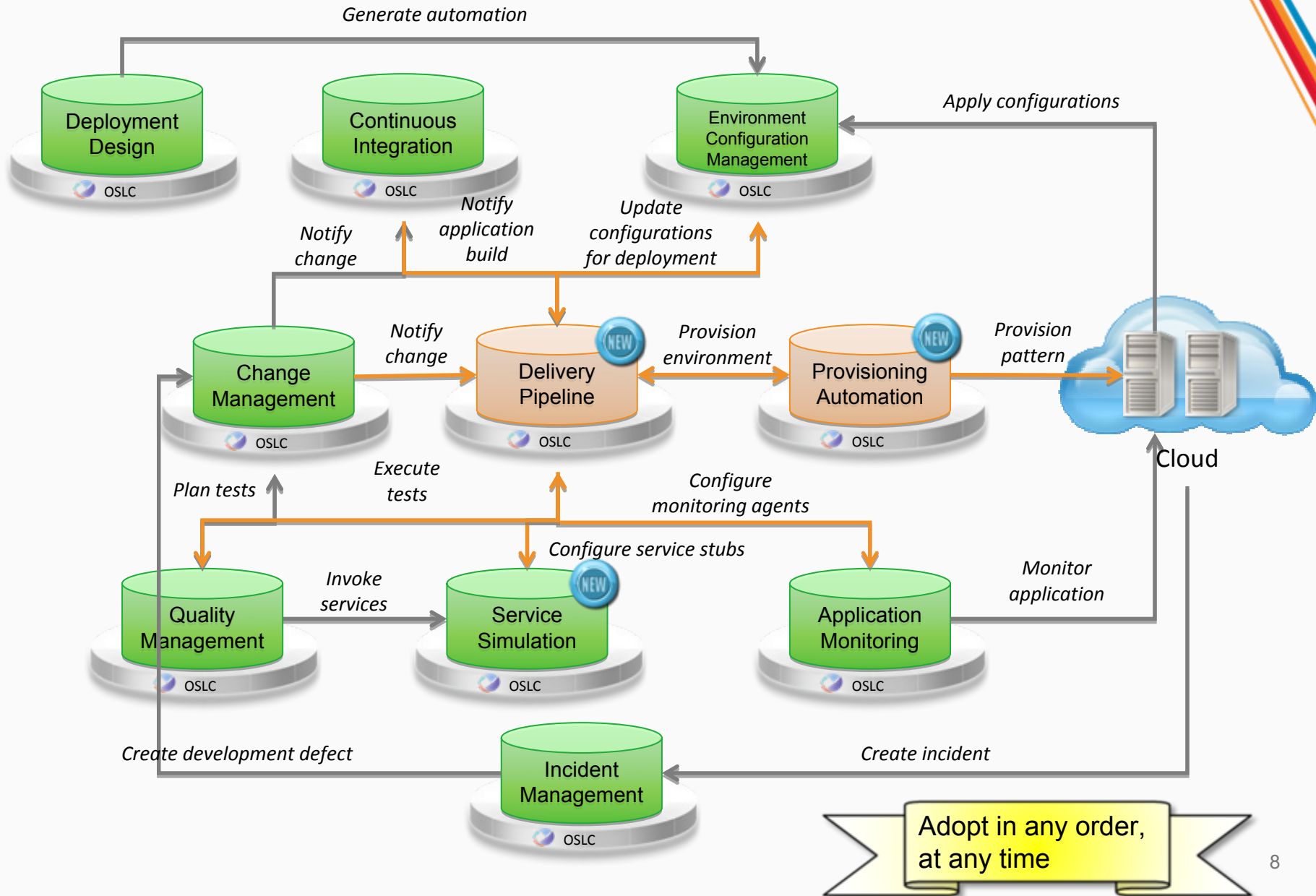
# IBM's DevOps Capabilities Today



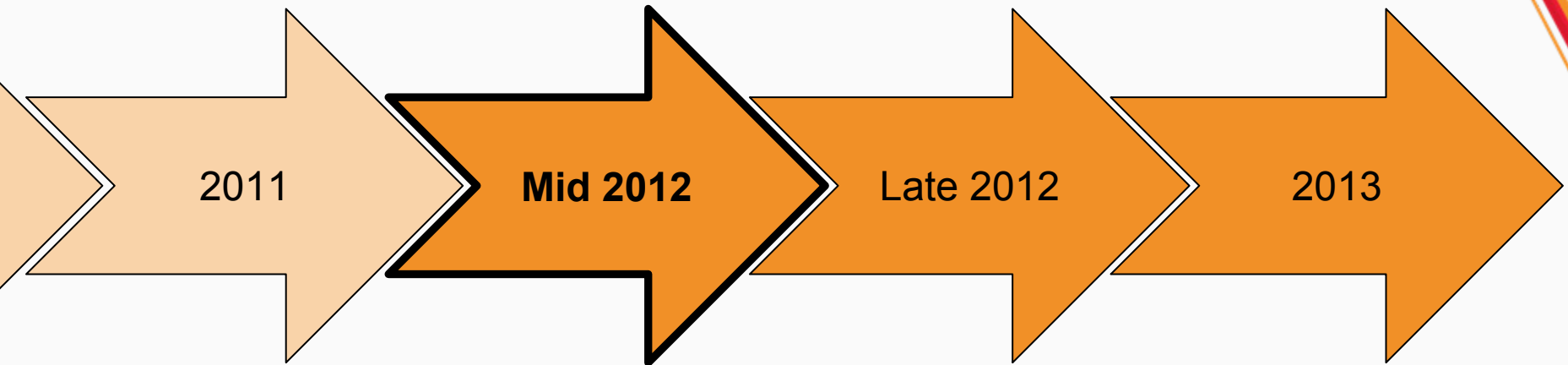


# Integrated capabilities for DevOps

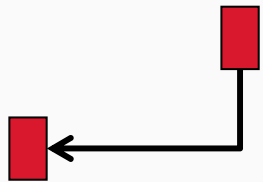
Using open services to drive continuous lifecycle management



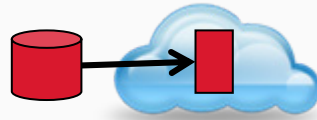
# DevOps Progression



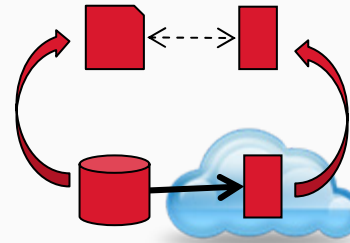
Help desk linkage to software change management



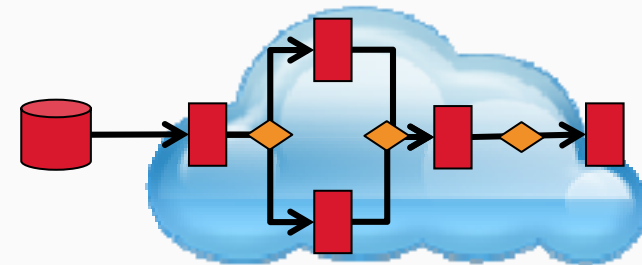
Single stage continuous delivery



Continuous delivery with traceability dashboards

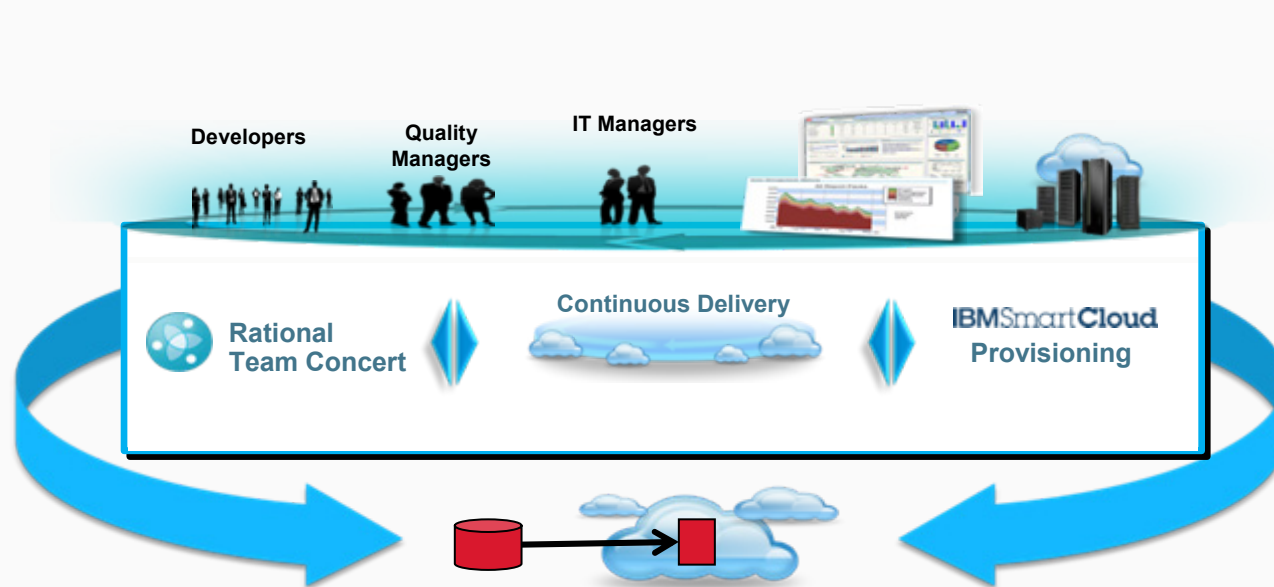


Multi-stage delivery with environment promotion



# Introducing Continuous Delivery

*A simple approach to bringing agility across the lifecycle (beta 2Q2012)*



## Client Value

- Reduce risk, improve quality; manage change from development to deployment
- Improve efficiency, accelerate delivery; automated handover between processes
- Optimize resources; workload pattern composition delivery

## Targeted Entry

- Development team extending Agile into rapid workload deployment in the cloud
- Operation teams delivering scalable, continuous delivery services to the development organization

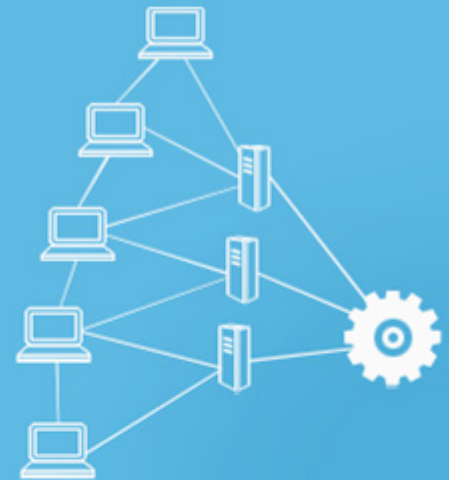
# IBM SmartCloud Provisioning

*Build a low-touch, highly scalable cloud*

**IBM SmartCloud Provisioning** is a true Infrastructure-as-a-Service cloud, reducing cost and providing a highly scalable, rapid-deployment environment with near- zero downtime and automated recovery across heterogeneous platforms.

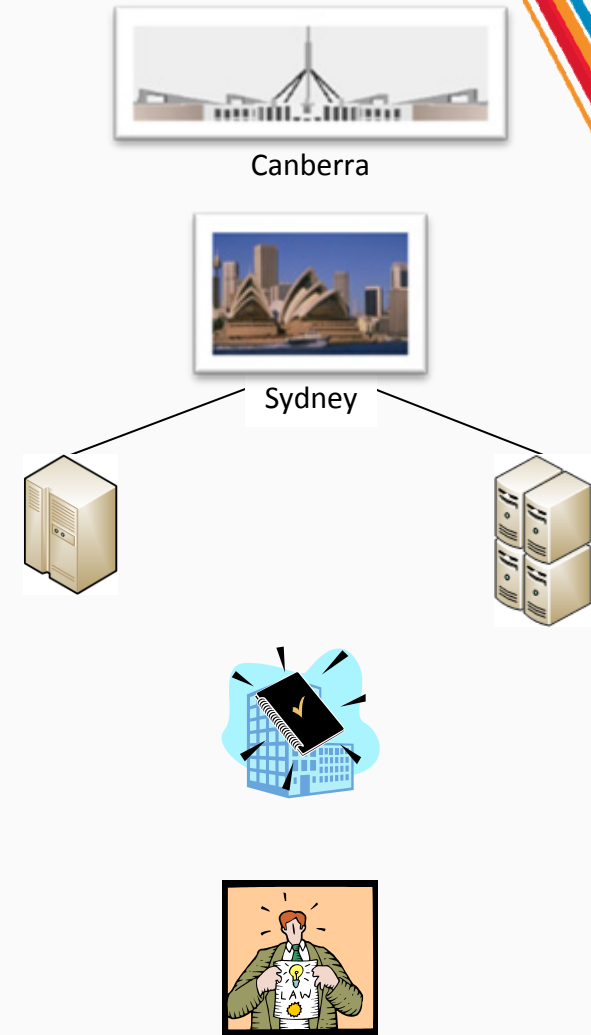
## Key benefits:

- **Rapid scalable deployment**
- **Control image sprawl**
- **Image construction and composition tool**
- **Reliable, non-stop**
- **Save IT labor resources at scale**
- **Reduce complexity**



# About the Customer

- Large Australian government agency
- Large datacenters in multiple geographic locations, numerous front office locations throughout the country
- Complex infrastructure, middleware, and applications
  - Several thousand midrange servers, both physical and virtual
  - IBM Mainframe
- Service provider model
  - Environment oversight and malleability differs depending on environment type – development, assurance, performance, production and so forth
  - ITIL Service Management, Change Management, Release Management metrics for all environments
- Rapid technology and business changes
  - Modernization of existing systems
  - Policy changes
  - New systems to meet changing markets and endpoint technologies



# Key Customer Challenges

## Visibility

Identify configuration disparity between design and runtime

**Solution:** Enable designers to sync with runtime configuration

Traceability from Source Control to Service Management delivery

**Solution:** Use a centralized DSL (or DML) as the delivery hub

## Control

Delivery governance, accountability, and transparency

**Solution:** Development work product delivery governance

Work practice consistency across ownership silos

**Solution:** Test the process through environment promotions

## Automation

Repeatable and scalable delivery across thousands of touch points

**Solution:** Automate the platforms and delivery mechanisms

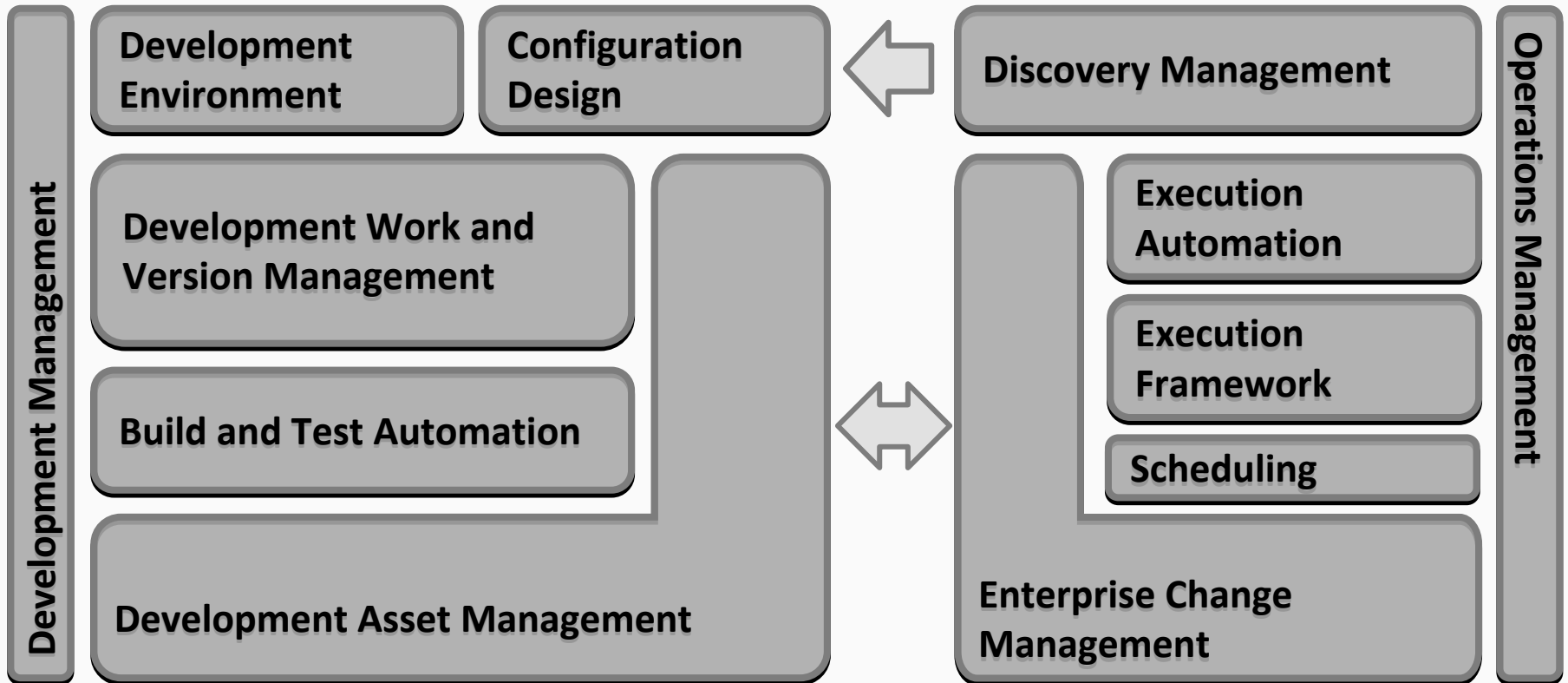
Deep configurability and malleability based on purpose

**Solution:** Research and depth over expediency

# Customer Implementation Business Scope

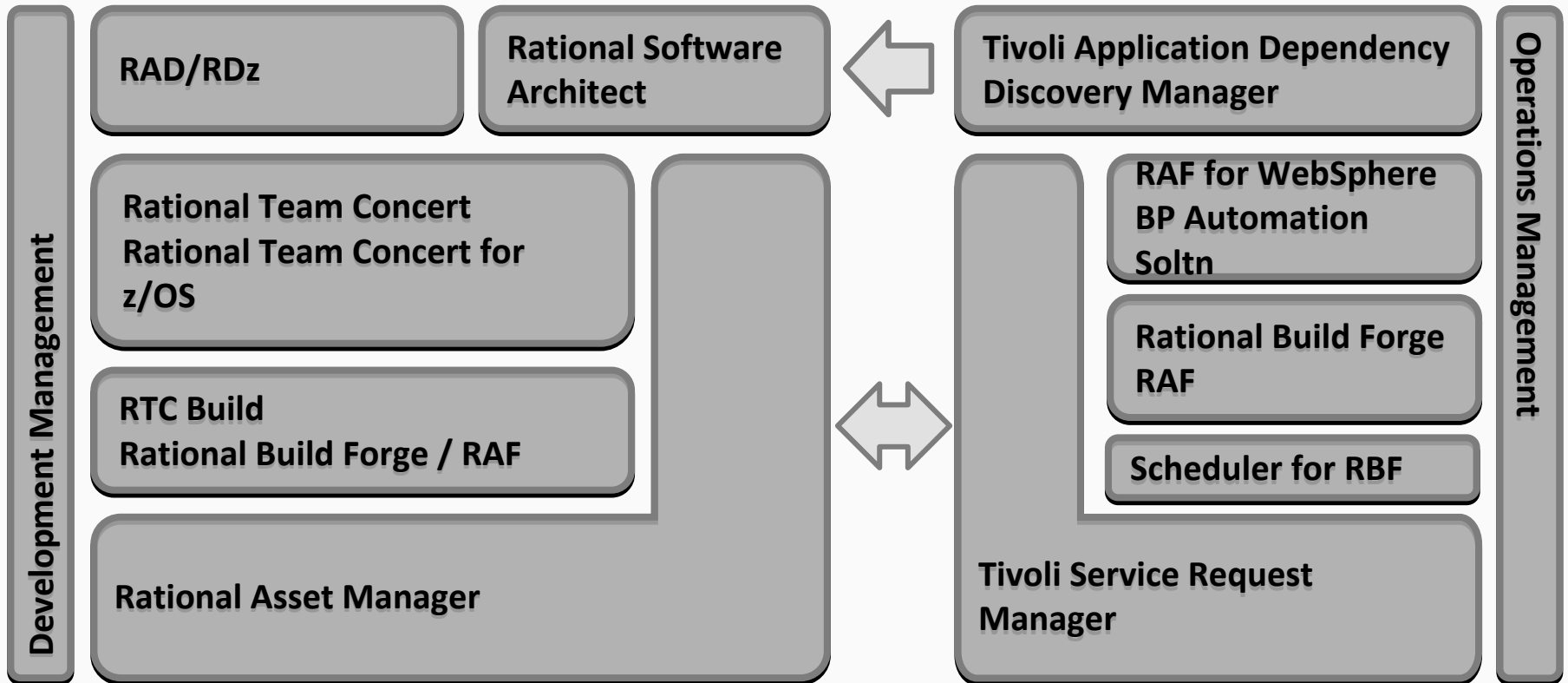
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# Solution Architecture

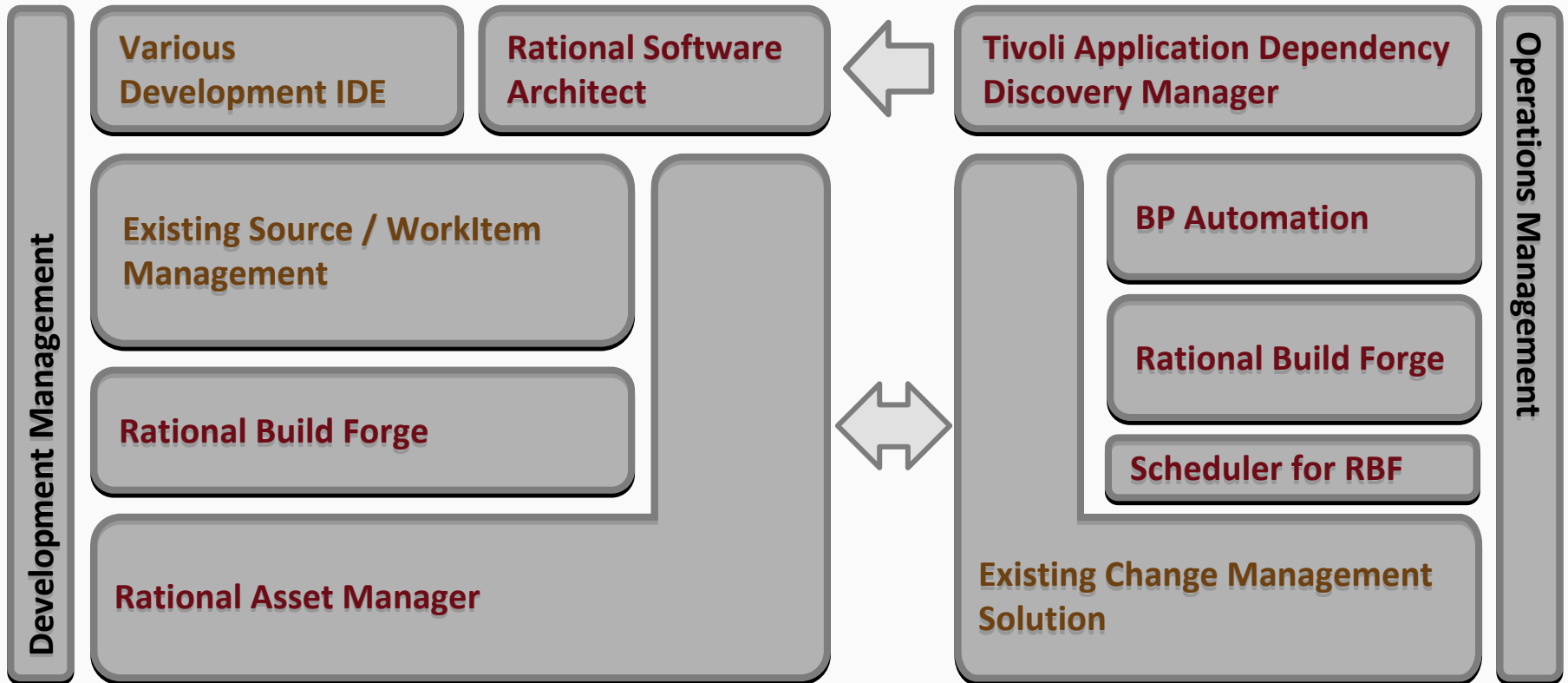




# Pure-play Rational and Tivoli



# Customer Implementation



# An Open Approach for Service Management



## Open Services for Lifecycle Collaboration (OSLC)

- Open Architecture
- Federated Data
- Dynamic Interaction
- Common Services

*For Data Centers*




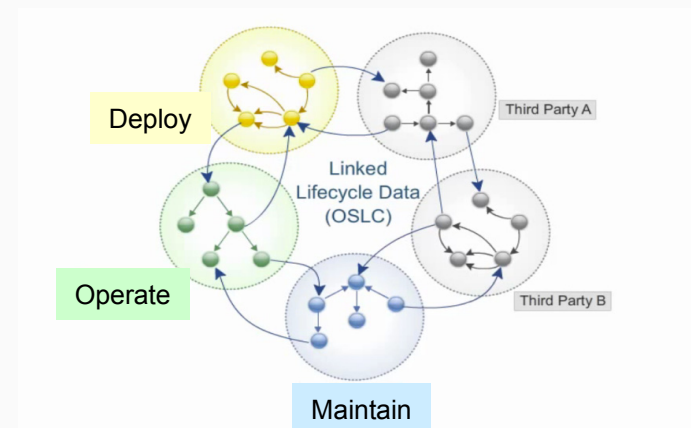
*For Design & Delivery*



*For Industries*



- Community Driven [open-services.net](http://open-services.net)
- Current work on ALM, PLM, ISM Interoperability specifications
- Loosely coupled integration
- Inspired by Internet architectures
- Based on  Linked Data



**New!!**

**[OSLC Performance Monitoring work group](#)**

# Build Management Processing

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# Deployment Management Processing

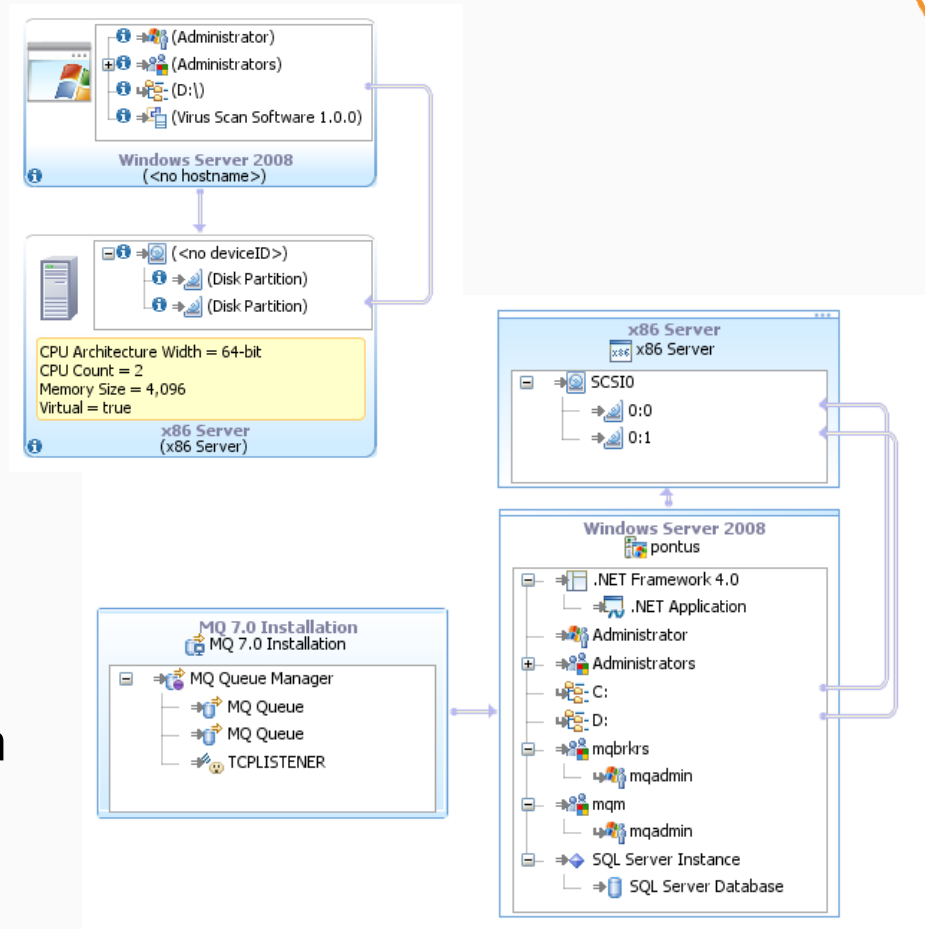
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# Four major disciplines

- Design
  - Model the existing and to-be state
  - Review against organizational and design standards
- Governance
  - Development configuration review and accountability
  - Operational change management and change window approval
- Execution
  - Automation design, workflow generation
  - Deployment operations and problem resolution
- Reconciliation
  - Discover the runtime infrastructure, middleware, and applications *after deployment*
  - Provide data to designers

# Design: Rational Software Architect Deployment Planning

- Deployment Planning is a modeling paradigm to express infrastructure, middleware, and applications
- Enables intense depth of configuration and expression of deployment dependencies from many perspectives
- Caters to virtualization, many technical domains
- Delivers on excellent user experience and ability to transform a diagram to many different *views*
- Integrates with many systems, including Rational Asset Manager, Rational Build Forge, TADDM, and various source control systems



# Design Standards Use Cases

- Standards come from many governing bodies
- General rule is to model the standards
  - So we can compare them to configuration design
- Developed in Rational Software Architect
- Governed and published in Rational Asset Manager

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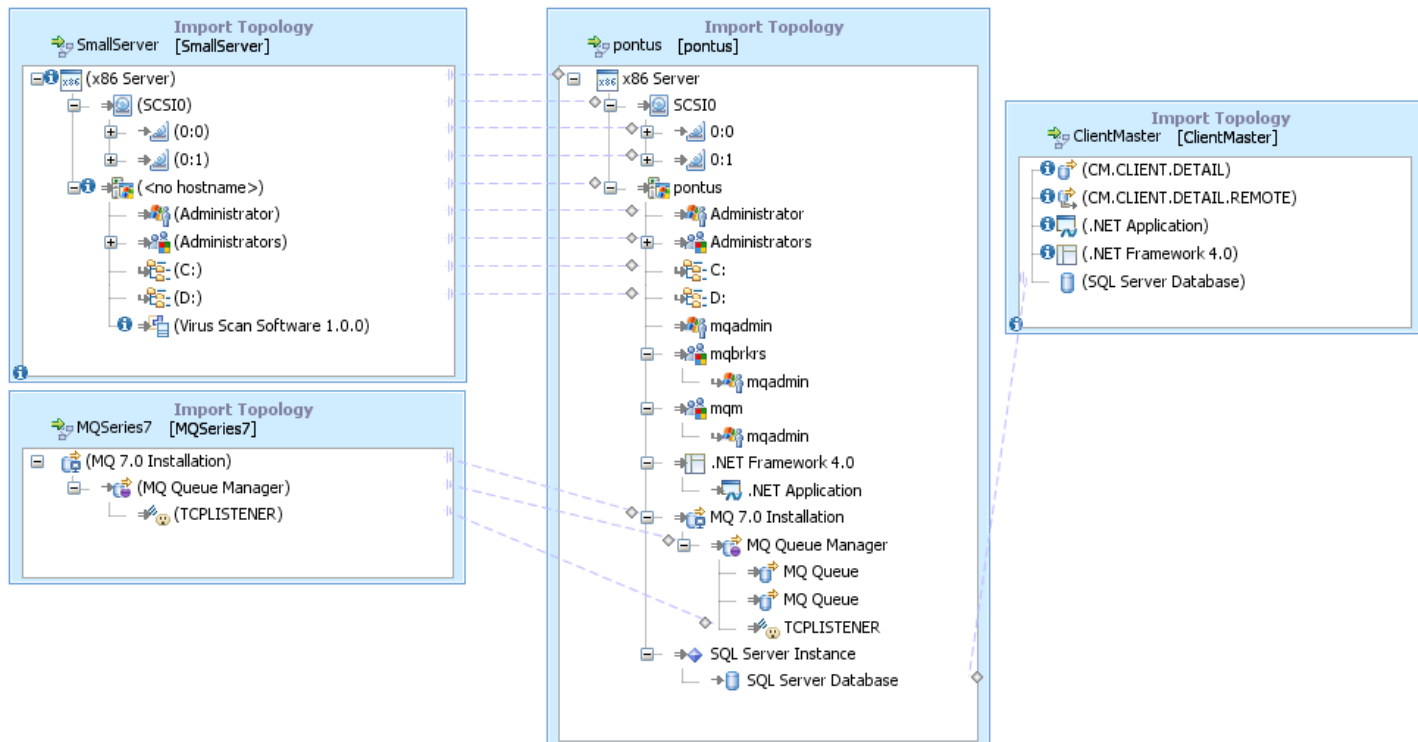
# Design Implementation Method

- Consume standards and guidelines
- Normalize the rules for topology definitions
- Align roles and technical specialties with design layers

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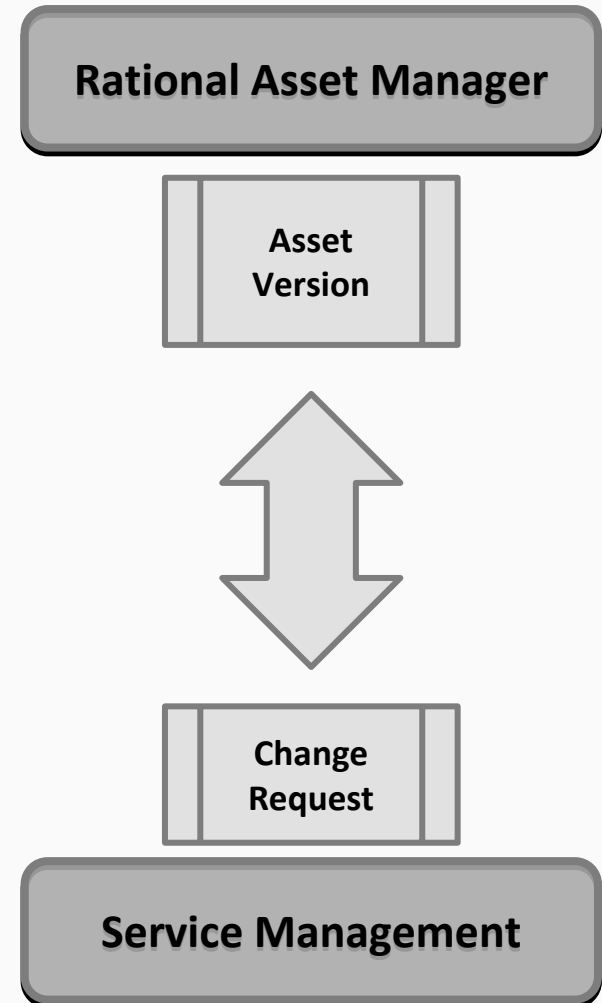
# Review Methodology

- Design compliance is more technical; requires insight of intent, and the realization of the intent
- Conceptual topologies define the design
- Concrete topologies define the realization
- Special RSA Deployment Planning capabilities enable reviewers



# Governance: Rational Asset Manager and Service Management Integration

- Development defines the “what”, “where”, and “how”
- Operations manages the “when” and “why”
- Each party deeply cares about their own systems
  - And typically only wants to know the high-level status from the other system
- By enabling this integration
  - The organization can focus on the tools for their own roles, gaining functional efficiencies
  - Data duplication between systems is very low
- If either party needs details, a link to the details is provided
  - OSLC and Web Services



# A Note on the Service Management Integration

- Service Management “internal process” was untouchable
- We were able to operate on the inflows
  - CR creation and modification
- We were able to operate on the outflows
  - ALM WorkItem record updates, RAM Asset updates, RBF scheduling
- Our key was achieving straight-through processing
  - High data quality
  - Low to nil process variation
  - Perfect recording of operational job start and end times for clear and concise metrics
- Service Management’s key was keeping internal, ITIL process
  - As long as that was intact, we met operational mandates

# Key Aspects to Development Governance



- Architectural compliance
  - Asset owners align implementation, design, and topology assets with architectural assets, both business and technical
- Design compliance
  - Implementation assets aligned with specifications and implementation patterns
- Configuration compliance
  - Topology assets aligned with design documentation
  - Topology driven automation workflows reviewed by operations
- Change request routing
  - RAM policies facilitate communication with the service management system

# Rational Asset Manager Governance Model

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# Configuration Design Approval and Deployment

- Implementation and Topology assets linked to architectural standards
  - Meaning the business architecture
- Review processes assess compliance
- Accountability built in to RAM review process
- We know the version of the standard on which the review was based

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# Execution: Rational Software Architect Deployment Planning and Automation

- Automation is defined from two perspectives: design and execution
- RSA Automation Signatures define the automation design
- RBF Libraries define automation execution
- RSA has special capabilities to bridge design with execution
- These unique capabilities drive massive automation scalability at a granular level
- The key is to automate technologies, not specific applications

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# Reconciling: Tivoli Application Dependency Discovery Manager and Rational Software Architect CCMDB Plug-in

- Discovery is based on environment scope
  - Aligns with how topologies are managed
- Designers use the plug-in to include TADDM configuration
- Plug-in enables designers to update Configuration Items directly from the canvas
- Built-in capabilities allow designers to identify changes from a design perspective

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# Key Steps to the Solution

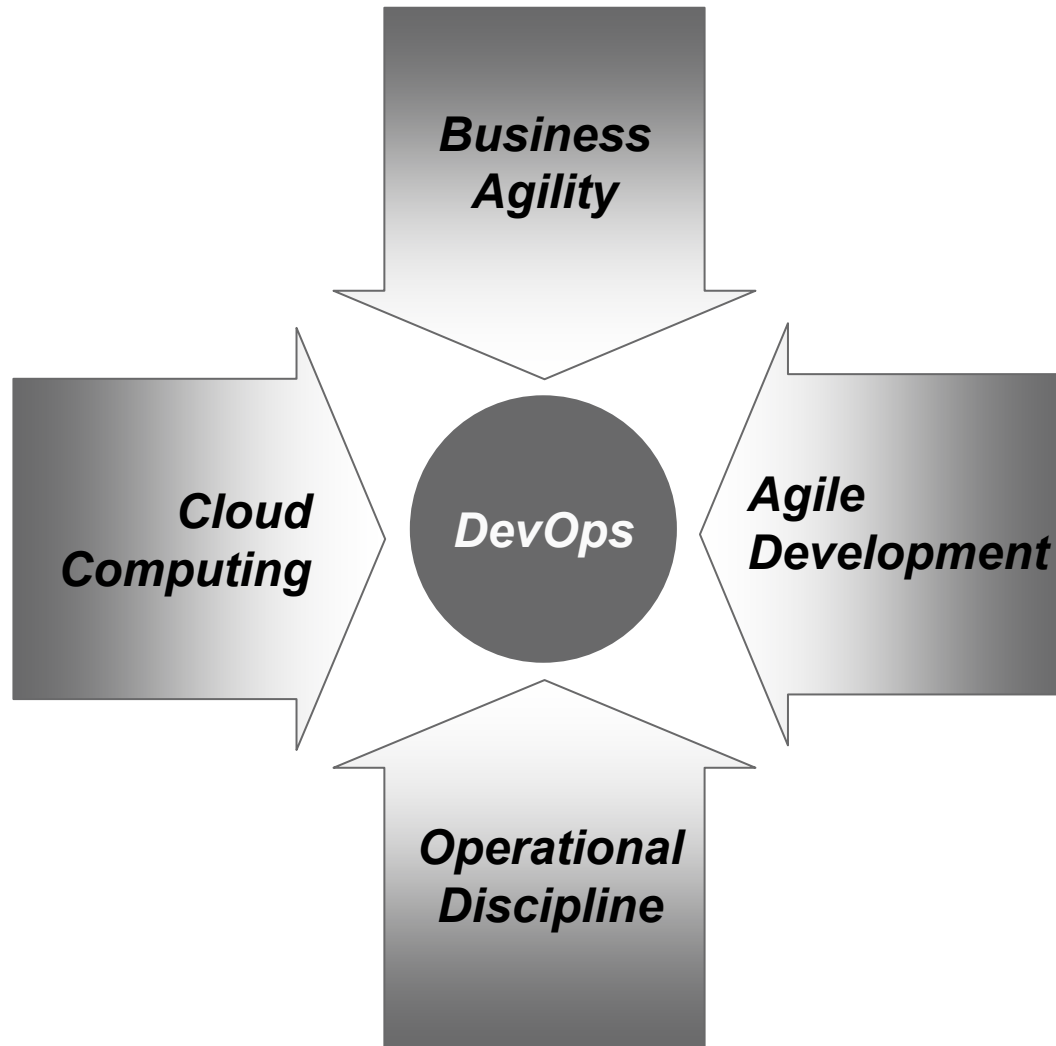
- Organizational realization that there must be a better way than “business as usual”
- Identify key measurements and goals
  - IBM Business Value Assessment (BVA) is a critical tool
- Develop a 3-5 year roadmap
  - Assess design and implementation lead times
  - Identify new and existing system requirements, collaborations, and implementation convergence points
  - Identify internal and external resourcing
  - Plan ahead for not only roll-out but how the organization moves huge, complicated, mission-critical application systems to the new approach
- Evangelize and mentor early – new way of operating means change to existing staff responsibilities
  - Also acts as an early Usability test – essential to not surprise the organization at-large

# Reality Check

- DevOps transforms the IT organization, was it easy?
  - Change is never easy – especially changing broad work methods
  - However, people are smart and come to realize this works – and can be a lot of fun!
- Is everything available out of the box?
  - Short answer – no.
  - All organizations differ, there will always be new technology to bring into the fold
- Was the toolset implementation all smooth sailing?
  - Short answer – no.
  - Deep partnership with IBM enabled RAE Consulting to work directly with development teams and bridge technical issues early and often
- Where do I start?
  - Tackle the more complicated systems first, you will get broad technology stack coverage which fortifies the roll-out scalability

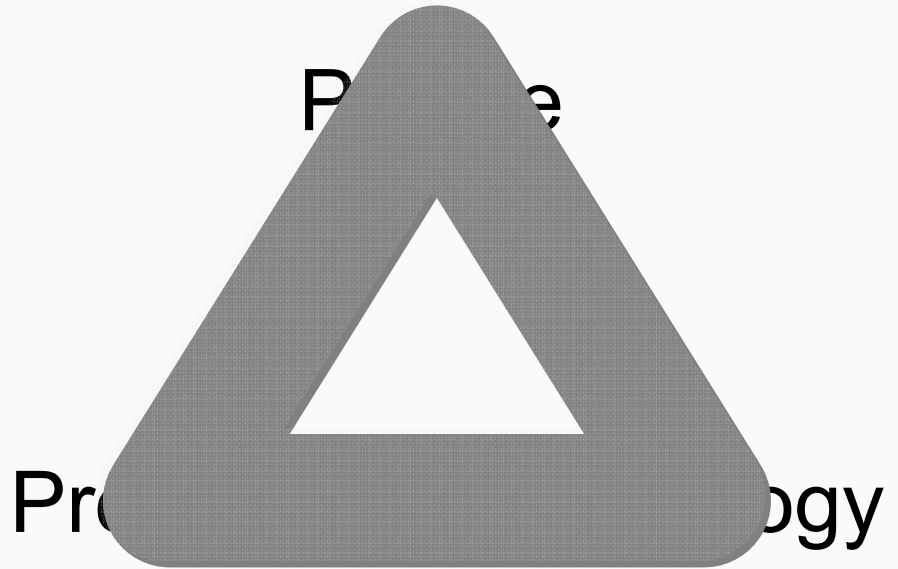
# DevOps: The time is now

*Four key drivers are making DevOps a 2012 imperative for all organizations.*



# Summary

- Cloud is a game changer
- IBM is invested in cloud and DevOps
- We are learning with customers
- Get involved now!





Questions?

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